Chapter 4

Protected Areas and Ecological Networks: Global Environmental Management or Management of the Conservation Institutions?

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Using the ecological network concept, it might possible to achieve sustainable development via territorial zoning (Bonnin 2008; Cedre 2002). Of course, merely identifying zones is insufficient and requires further investigation from a legal point of view in order to understand the regulatory implications of zoning. In other words, it is important to question the various standards applicable to different zones. To what extent is a strict form of conservation still useful? Or in which situations should one reduce constraints and use more incentive instruments, i.e. ones that might lead to the integration of nature conservation into sectoral policies, such as transport or agriculture? Thus, the aim of this chapter is to evaluate the impacts of the emergence of the ecological network concept has had on protected areas. One such impact is that protected areas no longer play the exclusive role of nature and biodiversity conservation.

From a conceptual point of view, ecological networks are often apprehended through the use of a system that represents the three types of areas most commonly utilised in establishing ecological networks. These are the 'core zones', 'buffer zones' and 'biological corridors'[1] (Jongman and Pungetti 2004; Sepp and Kaasik 2002; Carrière et al., this publication). We need therefore to place current and future protected areas into this system.

Although we have intentionally chosen to adopt an internationalist approach here, it is important to highlight the importance of national protected areas before limiting this analysis to natural areas protected by an international classification. Most countries have developed their own protected area classification system, which can range from strict protection systems, as in the case of integral

1 For example, Estonia uses the terms 'core zones', 'buffer zones' and 'ecological corridors', Lithuania the terms 'geosystems', 'buffer territories' and 'ecological corridors', Poland uses the terms 'core zones' and 'eco-corridors'. The Slovak and Czech networks are made up of 'bio-centres', 'bio-corridors' and 'interactive elements'. The Netherlands use the terms 'core zones', 'reconstitution area' and 'ecological corridors'.

Table 4.1 Various international conservation area networks

Denomination	Date of creation	Responsible Organisations	Objectives	B or NB*	Scope	State obligations	Terms and conditions of site designation
European Diploma	6 March 1965	Council of Europe	To protect exceptional and particularly well protected sites	NB	Europe	To maintain the protection level	On the proposal of governments after permission and consent from an expert committee
Ramsar Sites	2 February 1971	Secretariat of the Convention, provided by the IUCN	To conserve wetlands	B	World	To create reserves to conserve wetlands	On the proposal of governments
World Heritage Sites	23 November 1972	UNESCO	To conserve natural heritage of exceptional universal value	B	World	To actively ensure the protection, conservation and development of the heritage concerned	On the proposal of governments after approval by an intergovernmental committee
Biosphere Reserves	1976	UNESCO	To conserve natural habitats; to encourage research	NB	World	To elaborate on appropriate zoning and management plans	On the proposal of governments and European Council experts
Biogenetic Reserves	15 March 1976	Council of Europe	To protect samples representative of the natural heritage; to promote research; to heighten public awareness	NB	Europe	To ensure that the protection status is compatible with the objectives of the area	On the proposal of governments

Mediterranean Specially Protected Areas	1982	Regional Activity Centre for Mediterranean Specially Protected Areas	To conserve natural areas	B	Mediterranean Sea Region	To adopt common criteria in creating and managing the areas	On the proposal of governments
Natura 2000	21 May 1992	European Union	To conserve natural habitats	B	European Union	To protect the habitats listed in the Annexes	On the proposal of governments
System of Coastal and Marine Baltic Sea Protected Areas	1994	Helsinki Commission	To conserve natural areas	NB	Baltic Sea Region	Not yet defined	On the proposal of governments
Emerald Network	1996	Council of Europe	To conserve natural habitats	NB	Bern Convention (Europe)	Not yet defined	On the proposal of governments

Remark: Binding (B) or Non-Binding (NB). 'Binding' refers to the binding force of the legal instrument behind conservation area networks.

nature reserves or certain national parks, to less restrictive protection systems, such as landscape parks, via the targeted and systematic protection of certain habitats or ecosystems (Rodary and Milian, this publication). The introduction of international and European regulations on nature and biodiversity protection, encouraged governments to launch co-ordinated actions to identify and resolve, at the supranational level, the major problems posed by conservation.

As a result, various declarations and legislation[2] implement ecological networks, and it is important to question the place and role of protected areas in these integrated conservation systems (See Table 4.1).

Some international organisations liken protected areas to the core zones of ecological networks. In this regard, the core zones of the Alpine ecological network established by the Alpine Convention Secretariat, are made up of large protected areas (Alpine Network 2004). The Council of Europe, in supporting the creation of the Pan-European ecological network, considers that the core zones of this network are made up of exceptionally valuable natural areas, whether they are to be protected, or are already protected. Other ecological networks being implemented on different scales may have adopted other definitions (Bennett and Wit 2001), and the place of protected areas in the elaboration of territorial zonings remains antagonistic in the absence of consensus on this matter (Carrière et al., this publication). We nevertheless show here that most political decisions and legal texts on the implementation of ecological networks, agree on the role of protected areas as core zones, although in some cases they can also act as corridors.

Protected Areas as Core Zones

Areas protected by international regulations have been multiplying since the 1970s (Rodary and Milian, this publication). Implemented within the framework of a binding international agreement, for example the World Heritage Convention (Paris, 1972[3]), or a non-binding one, such as the resolution of the Committee of Ministers establishing the European Diploma, these protected areas are included in a list, without prejudice to state sovereignty (Kiss and Beurier 2004). States, by adhering to the international convention, accept to take on responsibilities vis-à-

2 There is a multiplication of political declarations anticipating the creation of ecological networks: the Pan-European Strategy for Biological and Landscape Diversity in Europe (Sofia, 1995), the Strategy for Biodiversity and its Plan of Action for Central Asia (2006). Several binding texts in international law exist now on the subject: the Carpathian Convention and its article 4 (Kiev, 2003) in particular, and the Convention for the Conservation of the Biodiversity and the Protection of Priority Wilderness Areas in Central America (Managua, 1992).

3 The exact references of the international conventions quoted are grouped together at the end of this text in Table 4.3. The chapter only mentions the place and date of signature.

vis the protection of these natural areas. The Council of Europe, a pioneer in the field, has since 1965 maintained a list of protected sites based on the awarding of the European Diploma for Protected Areas. Other organisations rapidly followed suit by also opting for the listing of natural areas (Table 4.1), such as UNESCO with its 'World Heritage Sites' and 'Biosphere Reserves'. A site being entered on a list of sites means there will be an exchange of information and best practices between the area administrators within the international organisation in charge, via periodic meetings in particular. This networking facilitates the transfer of knowledge, which can be stimulating for the various actors. However, the use of the term 'networks of protected areas' or 'network of sites' is only justified by these exchanges between area administrators within the international organisation. With the exception of a few bird species, for which an ecological network could consist of unconnected islands of nature, ecological networks imply a territorial continuity that bears little relation to the networks of protected sites at the international level, such as the network of UNESCO's World Heritage Sites.

We show here that while these different lists of protected areas all intend essentially to conserve biodiversity, each targets specific objectives. The evolution of protection methods inside and outside these sites leads to the integration of secondary objectives that also aim to protect 'ordinary nature'.

Common but Differentiated Objectives

Certain conservation area networks aim at safeguarding and protecting exceptional sites. This is particularly the case for the World Heritage Site network, and for the sites of the European Diploma of Protected Areas, which intends to reward the exemplary management of natural or semi-natural areas or landscapes. This represents an exceptional level of European interest in their biological, geological and landscape diversity. Other conservation area networks have more targeted objectives for the protection of natural areas with high ecological stakes. The Ramsar sites network for example aims at protecting a type of ecosystem which is particularly rich biologically, but is also globally endangered. Ramsar sites play a fundamental role in protecting the migratory routes of water birds, as well as in the proper management of the ecological processes and functions of wetlands. Thus, they are involved in the implementation of a coherent spatial structure that plays a specific role in flood prevention, and mitigating the impact of pollution. In this respect, the Ramsar sites fulfil the sustainable development objectives included in the implementation of an ecological network.

Whether it is binding or not, the legal basis of these conservation area networks affects the way protected areas will protect biological diversity, in the sense that this legal basis will not have the same status before the various jurisdictions of the contracting states (Romi 1990). Some conservation area networks are created through a binding international convention, as is the case with the Ramsar network. Others are founded on the basis of a simple resolution or recommendation that does not have a legal value in the strict sense of the word, as is the case for the

European Diploma. Furthermore, the binding aspect of these state obligations results not only from their binding force, but also from their objectives. Indeed, the value of state obligations also depends on the possibility a government has to remove a zone from the network. Yet, in several conservation area networks, governments can still do so without having to justify themselves. With regard to biosphere reserves, a state can remove an area from the network by simply notifying the secretariat. The Ramsar Convention, in Article 2, Paragraph 5, allows the removal of a site from the list of internationally important wetlands, provided there are urgent national interests, and prior information to the bureau in Gland (Switzerland). There is also an obligation to compensate for the loss of wetland resources (De Klemm 1998). The impact of these provisions is important, for including a site in a network equates to protecting it from major and mainly state-led infrastructural projects. Yet, if a state can remove a site from the network at any time, whether or not the obligations are binding, has no influence on the effectiveness of the protection. However, the diplomatic value of a listed site is such that governments almost never remove a site from the network.

The inclusion of protected areas as part of a network of international sites, beyond the legal protection it offers, also allows a supra-national value to be given to certain natural habitats, which in turn makes it possible to appreciate differently certain development projects, when evaluated in relation to a natural area of international importance. Protection then becomes more political than legal. In fact, the sanction mechanisms against a contracting state misusing a protected area go as far as removing a zone from the network. These mechanisms are not without impact; for example we can mention the Whale Sanctuary of El Vizcaino, in Mexico. In 1999, a project for the expansion of a salt production plant was launched in the San Ignacio Lagoon, in the Bay of Sebastian Vizcaino, the last intact lagoon where the Pacific gray whale comes to breed. This site is included in the World Heritage List. The World Heritage Committee warned the Mexican government of the threat a salt plant inside the sanctuary would pose to the marine and terrestrial ecology, the Pacific gray whales and the integrity of the site. In March 2000, the Mexican government decided not to give permission for the construction of the salt plant.

Internationally, protected areas appear particularly important for their ability to protect specific natural habitats. Their role as core zones of ecological networks is, however, also under transformation, and this can be noticed in the evolution of the terms and conditions of protection in certain conservation area networks.

Ecological Networks within Protected Areas

Certain large protected areas integrate the concept of the ecological network into their territory, and can therefore act as an 'experimental laboratory' by modifying the classic approach of conservation. Such is the case of the biosphere reserves that, since the adoption of the Statutory Framework (UNESCO 1996) and the Seville Strategy, have three clearly defined functions. These are described as being

complementary and of equal importance: a function of conservation (protecting genetic resources, areas and ecosystems as well as landscapes), development (fostering sustainable economic and human development) and logistics (enabling and fostering research, permanent monitoring, educational and training activities).

To these ends, they are divided into three types of zones: a central area endowed with a legal status guaranteeing long term protection, and in which most human activity is forbidden; a clearly defined buffer zone, in which only those activities compatible with the conservation objective are authorised; and a transition area which does not normally have a protected status, and which allows and favours the sustainable use of resources (Cibien 2006). Today, this zoning, which was officialised in 1995 by the Statutory Framework and the Seville Strategy, is expressly used to set up biological corridors inside biosphere reserves. The recent zoning of the East Carpathian Biosphere Reserve is a case in point. It does not seem necessary to extend to all protected areas this tendency to set up ecological networks inside the territory of the protected natural area. The size of the protected areas, as implied by this process, can indeed limit the public's understanding and acceptance of protected areas without the creation of tangible benefits. Moreover, certain lists of protected areas at the international level have been established to strictly protect particular areas, and are not well adapted to this type of zoning which integrates economic activity. This is particularly the case for the World Heritage List, or the sites of the European Diploma. This situation does not help their complementarity with other lists of sites, or improve the comprehension of their processes by the public[4]. On the other hand, the biosphere reserve concept as it applies to national legislations and which favours conciliatory measures in addition to economic development (while maintaining areas of strict conservation), might represent a means to achieve the sustainable development of the territory, by enabling the conservation of ordinary nature on the outskirts of protected areas.

Linking Protected Areas together Implies their Conservation

Conserving nature through protected areas also has side effects for the management of ordinary nature outside the land of the protected area considered. Indeed, several international texts simply request that contracting states link protected areas to one another.

Made up of special protection areas under the Birds Directive, and special areas of conservation under the Habitats Directive, the Natura 2000[5] network did

4 Although the Val de Loire which was included in the World Heritage List on the 30th of November 2000 remains an exception, it still illustrates this phenomenon. The perimeter goes from Sully-sur-Loire (upstream) to Chalonnes-sur-Loire (downstream), i.e. an area 260 km long and a few kilometres wide, corresponding to the main riverbed, and including 159 *communes*.

5 In December 2006, the Natura 2000 network included 20,862 sites under the Habitats Directive, of which 1,250 were marine sites, and 4,617 sites under the Birds

not initially aim to implement an ecological network (in the sense described in the introduction). However, the final creation of the network implies a certain ecological coherence, as indicated by several Directive articles. The progress achieved in fulfilling the objectives of the Natura 2000 network now enables the European Commission to begin envisaging the next step, as indicated in its 2006 communication on biological diversity[6]. The first implementation phase was focused on the proposal and designation of sites hosting species and habitats of continental interest by the member states of the European Union. The next steps of the Natura 2000 network will aim to ensure the operational character of the network, particularly to ensure that species and habitats of European importance are maintained in a favourable state of conservation. Establishing the conservation measures necessary for all the designated sites, including the elaboration of management plans, the adoption of an appropriate national status, as well as administrative or contractual measures, now represents one of the priority tasks of member states.

In the context of climate change and land use transformations, the capacity of the network to meet its conservation objectives depends particularly on the maintenance or restoration of an appropriate matrix of landscapes, both in and between the sites, making it possible to maintain essential ecological processes and favouring biodiversity. With reference to Article 10 of the Habitats Directive, the European Commission and certain member states are currently endeavouring to define the conditions and resources necessary for ensuring, within the Natura 2000 network, the coherent management of landscape features (Box 4.1).

Other international texts on the protection of nature also highlight the necessity to link protected areas. The Convention on Biological Diversity (Rio, 1992) is certainly the best example in this regard. According to the terms of Article 8 (a), "Each Contracting Party shall [...] establish a system of protected areas or areas where special measures need to be taken to conserve biological diversity". The Convention did not adopt the expression 'ecological connectivity' in the final text, but instead adopted 'system' which is typically associated with the analysis of the preparation works, and therefore suggests that the Parties should be involved in establishing connected protected areas[7].

Certain regional conventions specifically ask for the establishment of ecological corridors. The Central American Convention for the Protection of the Environment pointed out, as early as 1992, the importance of the Central American isthmus as a biological corridor. In 1994, the Alpine Convention also recognised the importance

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Directive, of which 484 were marine sites.

6 "Halting the loss of biodiversity by 2010 and beyond. Sustaining ecosystem services for human benefit", Commission communication, COM (2006) 216, May 2006.

7 The guide of the Convention on Biological Diversity in fact, based on Article 8(a), advocates "Establishing a larger protected area estate, than would otherwise be the case, with emphasis on creating corridors and "stepping-stones" between protected areas so as to enable species to move with shifting climate".

Box 4.1 Direct legal references to ecological coherence in the Habitats Directive

Preamble
[I]n order to ensure the restoration or maintenance of natural habitats and species [...] at a favourable conservation status, it is necessary to [...] create a coherent European ecological network [...].

Article 1
(k) *[S]ite of Community importance*: a site which, [...] may also contribute significantly to the coherence of Natura 2000 referred to in Article 3, and/or contributes significantly to the maintenance of biological diversity within the biogeographic region or regions concerned.

Article 3
3. [...] 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.

Article 4
4. [...] [T]he Member state concerned shall designate that site as a special area of conservation [...] establishing priorities [...] for the coherence of Natura 2000 [...].

Article 10
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 of the Natura 2000 network, to encourage the management of features of the landscape which are of major importance for wild fauna and flora.

of establishing an ecological network in the Alps, via its protocol for nature and landscape conservation. And the recent Framework Convention on the Protection and Sustainable Development of the Carpathians, signed in Kiev in 2003, defining a legal framework for the sustainable protection of its ecosystems, invited its contracting Parties to take appropriate measures with a view to ensuring a high level of protection of natural and semi-natural habitats, as well as their continuity and connectivity (Fall and Egerer 2004). This convention refers explicitly to the necessity for the Parties to constitute an ecological network in the Carpathians, which implies the creation "of a network of protected areas associated with the conservation and sustainable management of the areas outside of protected areas". Nonetheless, seeking to ensure the continuity of protected areas does not imply their abusive expansion. In fact, the challenge of the connectivity concept is to associate other, more flexible, methods of protection with protected areas.

In addition to protecting defined natural habitats, protected areas can have an impact outside their own space, which contributes to the development of their role regarding biological diversity conservation. The fact that a structure exists can

also serve as logistical support for initiatives on the outskirts of the central area. As such, although their role always appears to be necessary, they must be perceived differently according to the scale of reflection.

Protected Areas as Corridors

Certain protected areas may play the role of a 'corridor', i.e. making it possible to reconnect or connect several populations of species by protecting natural infrastructures. Already at the end of the 19th century, a notion inspired by natural linear features had been proposed by American planners. This resulted in the concept of greenways (Carrière et al., this publication). Greenways are networks of linear features, planned and arranged initially for recreational purposes (Walmsley 2006; Fabos and Ryan 2004), but have since accumulated multiple goals, as well as recreation, including ecology, aesthetics and cultural spaces (Ahern 1995). Greenways do not only have an ecological function, they are multifunctional ecological networks too. Most of them are situated around towns, and aim to make it easy for city dwellers 'to get some fresh air', as well as to maintain a natural landscape around large urban structures. On the European continent, the idea of the ecological network initially took another form, and was first implemented by town planning officials in Russia, Czechoslovakia and Lithuania. They integrated the corridor-tool into their town planning systems during the 1970s, in order to protect natural infrastructures (Jongman 1998). This approach relied on the concept of a polarised landscape, which implies the fragmentation of the landscape into areas for the conservation and restoration of nature, and areas for intensive land use (Frolova 2000; Kavaliauskas 1996). This tradition of natural infrastructure planning explains the prevalence of environmental law pertaining to ecological networks in these countries[8]. More recently, Western Europe took into account the importance of reducing natural habitat fragmentation (Burel 2003), and several countries now have legal texts implementing ecological networks[9].

These historical differences in the conception of ecological networks explain how, depending on its location, the term 'corridor' can take on different meanings. Naturally these terminological variations are a source of confusion (CBD 2005; Bennett and Wit 2001; Carrière et al., this publication). While Europe and international organisations normally use 'ecological network', South American or Asian programmes generally use 'corridor', which nonetheless corresponds to

8 For example, Estonia (the Sustainable Development Act of 1995), Lithuania (the Environmental Protection Act of 1992), the Czech Republic (the Nature Protection Act of 1992) and Slovakia (the Nature Protection Act of 1994).

9 For example, Germany (the Nature Conservation Federal Act of 2002), Belgium, Flemish Region (the Decree on Nature Conservation of 1997), France (the Orientation Act of 1999 on the Sustainable Development of the Territory), and Switzerland (Landscape Conception, 1997).

the same model of conservation[10]. The approach taken by the Conference of the Parties to the Convention on Biological Diversity will be adopted here: the idea of an ecological interconnection is regarded as a 'corridor'. More specifically, the term 'corridor' specifies one or more environments functionally linking different habitats vital to a species or a group of species.

Transboundary Protected Areas as Support for Interregional Corridors

Transboundary protected areas play a particular role in the regional dynamic of nature conservation (Brunner 2002). Making a transboundary protected area part of a network of international sites not only encourages institutional contact between the officials of areas situated on either side of the border, it also bases co-operation within a legal and political framework that can lead to more general initiatives.

Many international nature conservation conventions impose on their signatories a duty to co-ordinate their actions in the field of transboundary protected areas[11], and Party conferences now recommend common management measures[12]. The legal recognition of transboundary protected areas is a first step towards legally recognising that regional co-operation is necessary regarding nature conservation. The fact that several conservation area networks have allocated unique names to protected areas on either side of a border confirms this. This is particularly the case for the Bialowieza Forest, between Poland and Belarus, which was designated as such by the World Heritage Sites and the European Diploma.

One of the main objectives of the Seville Strategy for Biosphere Reserves (UNESCO 1996; Jardin 1996) is to promote the twinning of biosphere reserves, and encourage the creation of transboundary reserves. Internationally designated transboundary protected areas have been multiplying these last years (Table 4.2).

The establishment of joint management commissions which include representatives from each protected area also constitutes a step towards the establishment of co-operation mechanisms on a regional scale. It is interesting to note that, often, the establishment of such commissions coincides with the establishment of corridor protection dynamics on an interregional scale. This is particularly the case for La Amistad National Park between Costa Rica and Panama, for which a permanent bi-national commission has been established, chaired by

10 Such as the Vilcabamba-Amboro Conservation Corridor between Peru and Bolivia, and the Mesoamerican Biological Corridor in Central America.

11 This is the case, for example, of the Bern Convention on the Conservation of European Wildlife and Natural Habitats of 1979, the ASEAN Agreement on the Conservation of Nature and Natural Resources (Kuala-Lumpur, 1985) or the Agreement on the Conservation of African-Eurasian Migratory Waterbirds (The Hague, 1995).

12 The second strategic plan of the Ramsar Convention on wetland conservation (2003–2008) indicates that the Parties ought to co-operate internationally in their delivery of transboundary wetland conservation and their wise use.

Table 4.2 Transboundary protected areas recognised by international denominations

Date of creation	Name of protected area	Countries concerned	International denomination
1973	German-Luxembourg Nature Park	Germany, Luxembourg	European Diploma
1982	Belovezhskaya Pushcha / Białowieża Forest	Belarus, Poland	World Heritage Sites European Diploma
1982	Mount Nimba Strict Nature Reserve	Côte d'Ivoire, Guinea	World Heritage Sites
1989	Mosi-Oa-Tunya	Zambia, Zimbabwe	World Heritage Sites
1990	Talamanca Range-La Amistad Reserves	Costa Rica, Panama	World Heritage Sites
1992	Tatra	Poland, Slovakia	Biosphere Reserves
1992	Krkokonose/ Karkonosze	Czech Republic, Poland	Biosphere Reserves
1994	Kluane/Wrangell-St Elias/ Glacier Bay/ Tatshenshini Alsek	United States, Canada	World Heritage Sites
1995	Waterton Glacier International Peace Park	United States, Canada	World Heritage Sites
1998	Pfälzerwald-Voges du Nord	France, Germany	Biosphere Reserves
1998	Danube Delta	Romania, Ukraine	Biosphere Reserves
1998	East Carpathians	Poland, Slovakia, Ukraine	Biosphere Reserves
1999	Pyrénées – Mont Perdu	Spain, France	World Heritage Sites (mixed landscapes)
2000	Caves of Aggtelek Karst and Slovak Karst	Hungary, Slovakia	World Heritage Sites
2000	Courland Isthmus	Lithuania, Russia	World Heritage Sites
2002	W Regional Park	Benin, Burkina Faso, Niger	Biosphere Reserves
2003	Uvs Nuur Basin	Russia, Mongolia	World Heritage Sites
2005	Senegal River Delta	Mauritania, Senegal	Biosphere Reserves
2006	Kvarken Archipelago	Finland, Sweden	World Heritage Sites

the Ministers of Planning. This commission is responsible for the programme, the projects and the co-ordination of the general activities, as well as for their monitoring and evaluation. The first co-operation agreement was in fact signed in 1979, between Panama and Costa Rica. The creation of La Amistad National Park was ratified by an agreement signed in 1982 and, in 1992 the common advisory commission became a permanent commission, and acquired the power of decision making. This transboundary park is at the heart of an international initiative, the Mesoamerican Biological Corridor. Another example would be the transboundary nature protection area in the nature reserves of the Danube Delta, which was the subject of an agreement concerning the establishment of a greenway in the lower Danube (Bucharest, 2000).

Transboundary protected areas therefore have the potential to play a role in the establishment of inter-regional corridors, particularly via the legal basis they establish, and consequently can procure a basis for a regional conservation policy dynamic.

Archipelagos of Protected Areas as Corridors on a Larger Scale

Depending on their scale, a myriad of protected areas can also constitute a corridor. This would be the case, for example, of a protected area situated on farm land, intended for protecting an otter or some other protected animal. This area is perceived at the level of the regional development system in the same way as protected areas situated on neighbouring agricultural lands, as a biological corridor.

Similarly, the Alpine ecological network, made up of protected areas and implemented as part of the Alpine Convention (Salzburg, 1991), is acknowledged by various studies for its role of corridor. The establishment of spatial links between protected alpine areas is a central theme of this convention, and in particular its nature and landscape conservation protocol (Chambéry, 1994), which contains the Article 12, entitled *Ecological Network*. The Parties to this convention have highlighted that only large protected areas forming a coherent ecological unit could ensure the sustainable protection of the Alpine landscape, as well as the continuity of its natural dynamics. They asked the Alpine Network of Protected Areas to analyse the actual potential of protected areas and transboundary links, and to propose some concrete measures. What emerges from this study is that the Alpine region contains several transboundary protected areas, as well as vast protected areas covering over 1,000 ha. It is possible to envisage the possibility of an ecological continuity between these sites, from the Franco-Italian border, to the eastern border of Austria. Out of eight pilot areas, several have been analysed using indicators, and have been recognised as having significant ecological potential to be ecological corridors, or linkage areas. Many protected areas are linked by them, either crossing national borders or within a country. International borders shared between different categories of protected spaces are estimated to cover more than 250 km, and collaboration between these areas could be a driving force behind the establishment of biological connections.

Table 4.3 International conventions mentioned

Date	Name	Place	Scope	Implementation Date
1971	Convention on Wetlands of International Importance especially as Waterfowl Habitat	Ramsar	World	21 December 1973
1972	Convention Concerning the Protection of the World Cultural and Natural Heritage	Paris	World	17 December 1975
1979	Convention on the Conservation of Migratory Species of Wild Animals	Bonn	World	1 November 1983
1979	Convention on the Conservation of European Wildlife and Natural Habitats	Bern	Europe	1 June 1982
1991	Convention on the Protection of the Alps	Salzburg	Alps	6 March 1995
1992	Convention for the Conservation of Biodiversity and the Protection of Priority Wilderness Areas	Managua	Central America	11 January 1995
1992	Convention on Biological Diversity	Rio de Janeiro	World	29 December 1993
1994	Protocol on the Implementation of the Alpine Convention Relating to the Conservation of Nature and the Countryside	Chambéry	Alps	18 December 2002
1995	Agreement on the Conservation of African-Eurasian Migratory Waterbirds	The Hague	Europe	1 November 1999
2000	The Lower Danube Green Corridor Agreement	Bucharest	Danube	5 June 2000
2003	Convention on the Protection and Sustainable Development of the Carpathians	Kiev	Carpathian Mountains	4 January 2006

The section of the study carried out in the area of the Mercantour National Park, the Alpi Maritime Nature Park and the Alta Valle Pesio e Tanaro Nature Park, shows that even this very isolated region does indeed serve as biological corridor (Alpine Network 2004). This has been confirmed by a follow-up study carried out on certain traceable ibexes that, on departing from the Mercantour National Park, moved in a south-westerly direction until they reached the geological reserve of

Haute-Provence. The Alpine network is also associated with other co-operation mechanisms outside of the Alps. A network of protected areas in the Carpathian Mountains is at the planning stage, as is a similar initiative in the Pyrénées. Since these three massifs form an ecological continuum on a macroscopic scale, partnership projects are foreseen.

Conclusion

The conservation of protected areas as a means to protect natural habitats still appears essential in order to guarantee the long term survival and conservation of certain natural environments. On the one hand, the integration of protected areas into ecological networks, leading to their dilution into vaster spaces, does not seem desirable. On the other hand, it is important to emphasise the complementary nature of these two methods of nature conservation. Nevertheless, the functions of protected areas tend to evolve, which modifies the actual status of territories that, from strictly protected and supervised areas, become the project territories or experimental areas of a form of sustainable development destined to expand beyond their boundaries. Integrating the conservation objectives into the sectoral land use planning policies should also create ecological infrastructures, beyond core zones or corridors. However, this zoning can lead us towards mechanisms that reconcile various activities without any clearly defined prioritisation, and it is important, looking beyond the models for the integration of protected areas into ecological networks, to monitor the efficiency of these systems, particularly through an evaluation process that is yet to be defined.

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