

Relevant instruments in the field of

# **Ecological networks in the Alpine region**

A background report





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## Background

On 7 and 8 November 2005, the Alpine Network of Protected Areas (ALPARC) organised a seminar in Berchtesgaden, Germany, on the subject “Creation of ecological networks between alpine protected areas.” Participants at this seminar decided to compile an AlpMedia dossier (the information service of CIPRA, the International Commission for the Protection of the Alps) containing relevant information on the instruments that play an important role in the establishment of ecological networks at global, pan-European, European, and national level.

Although this dossier makes no claim to be exhaustive, it provides brief information on the most important instruments, such as conventions, legislation, regulations and programmes connected with ecological networks.

The dossier was created thanks to the support of ALPARC and CIPRA and that of the German Environment Ministry, which bore the costs of translating it into French, German, Italian and Slovenian, and, last but not least, thanks to the experts who contributed their knowledge without remuneration.

This background report is available at [www.cipra.org/alpmedia](http://www.cipra.org/alpmedia), where you will also find up-to-date information on ecological networks in the Alps in the form of news, events and links.

## Introduction

### Ecological principles

The landscape of the Alps is varied and characterised by the great diversity of its surface structures. Structural features such as meadows, forests, water bodies and open spaces, along with elements connected with human use of the land, such as irrigation ditches, stonewalls, hedgerows etc., are scattered across the landscape today like a mosaic.

Throughout the course of a year or a life cycle, a vast number of different species of animals use these landscape features. Since resources (food, cover, resting places, mates etc.) are unevenly distributed across the landscape, the habitats of many species are made up of different landscape features and sub-habitats. The interconnectedness – and therefore the accessibility – of the different elements and resources thus represents an essential basis for survival. It is vital that animals are able to move over short or greater distances. A distinction must also be made here between movement between populations or within the same population.



Illustration 1: Landscape feature: course of a stream



Illustration 2: Landscape feature: dry stonewall

#### Movement within populations:

- Daily movement between sleeping place, feeding place and shelter,
- Annual migration to the breeding site (e.g. amphibians),
- Migration between summer and winter habitats.

#### Movement between populations:

- Dispersal: one-off migration of animals (not to a specific destination) to find new places to live or breed,
- Dissemination: animals colonise abandoned or new areas provided they are accessible.

The mosaic-like distribution of landscape elements, habitats, resources and species is now recognised as one of the driving forces underlying ecological processes (WIENS 1976). The uneven distribution patterns in the landscape are also caused by local dwindling of species at particular sites and recolonisation of other sites (island biogeography theory of MAC-ARTHUR &

WILSON 1967; Metapopulations theory of LEVINS 1969, HANSKI & GILPIN 1991; population dynamics theory of PULLIAM 1988).

In the event of a catastrophe, small isolated populations are not able to respond as well and therefore face a greater risk of extinction than large populations. If several small populations are linked up via corridors, their survival prospects are far better, since cases of local extinction can be reversed by recolonisation by neighbouring populations. The threat of genetic impoverishment and degradation due to inbreeding can be significantly reduced by the immigration (even sporadic) of isolated individuals. The term taken from population ecology “metapopulation” for a group of local populations, which are connected by emigrants, is a firm part of nature conservation research (HANSKI & GILPIN 1991). With this theory the subject of corridors and barriers gained a position of central importance (e.g. HOBBS et al. 1990).

## The concept of ecological network

### **An ecological network is made up of different components:**

Core zones, which as a rule are protected by buffer zones and linked up by ecological corridors or other connecting elements (BISCHOFF & JONGMAN 1993).

The Alpine Network of Protected Areas has over 800 extensive protected areas (over 100 hectares) of different categories registered in its database. These protected areas provide an appropriate refuge for a large number of species of plants and animals. Nevertheless, these safe havens alone cannot guarantee the survival of alpine biodiversity.

For many species of animals and plants they are too small. The protected areas do not provide enough space from them to fulfil their basic needs and be able to propagate, because the different landscape features they need are either inadequate or not available at all.

### **Home ranges and migration distances of different species**

Home range: the entire area used by an animal during its lifetime. It includes its territory, patrol routes and migration routes. The size of the home range can be deduced from the distances between activity centres specific to the particular species and individual patterns of space usage.

Migration distance: the distance travelled by animals during their seasonal change of habitat (e.g. between summer and winter areas), during breeding migration (e.g. amphibians) or when propagating and re-colonising habitats.

Home ranges and migration distances illustrate the space needed by individual species. Due to the hunting tradition and the different monitoring programmes in the protected areas, the migration routes of many ungulates are well recorded. The seasonal movements of deer populations between the Swiss National Park and the Stifserjoch National Park are known and have been adequately studied. However, human settlements and infrastructure can interrupt these traditional migrations to some extent. Special networking measures are needed here.

When looking at this topic, it is essential that the smaller species of animals and flora are not forgotten. Particularly the insect group, which is both species rich and has high numbers of individuals, but also others such as reptiles or amphibians, are often neglected due their size, or because they are little known or inconspicuous. But establishing appropriate connections between habitats is particularly important for these species, which often migrate seasonally. The

spotted fritillary (*Melitaea didyma*), for example, is an extremely mobile inhabitant of dry meadows: it can cover distances of 2 to 8 kilometres. For its long-term survival it needs a population of approximately 12 000 individuals and a habitat of 100 hectares (AMLER 1999). Plant species also need sufficient space if they are to survive in the long term. Studies on the Chiltern Gentian (*Gentianella germanica*) have shown that fertility is lower in small populations than in large ones. In small populations genetic diversity declines, which can lead to extinction (FISCHER 1998a+b).

Large predators are a special case. The minimum area required for a wolf population is 600 km<sup>2</sup> (REMMERT 1982); the range of action of a lynx is up to 1000 km<sup>2</sup> (FESTETICS 1981, HUCHT-CIORGA 1995, JEDRZEWSKI et al. 1996). These species need large habitats. The landscape as a whole has to be made more conducive to their survival because protected areas are of only secondary importance for the propagation and return of these species, which have become virtually extinct in the Alps. Numerous examples prove that wolves, lynx and bears spread over large areas and are able to adapt relatively well to given conditions. Protected areas are important in that they provide the habitats for the prey populations of prey for these large predators, and in that way also contribute indirectly to their spread.

Thus, an ecological network of protected areas is primarily important for those species of animals and plants that need large areas to propagate and to satisfy their daily needs and that are less able to cope with the conditions of anthropogenically modified landscapes.

To ensure interchange between populations in the individual safe havens is possible, and thus avoid inbreeding and genetic impoverishment, connections between them must be established. It is also vital that there is enough space for their specific needs, i.e. search for food, breeding and migration. These are conditions that the protected areas as core zones alone cannot provide if they are isolated and not part of a network.

Creating an ecological network in the Alps is therefore extremely important. In terms of the example of the alpine protected areas that means specifically:

## Ecological networks

### *Core zones*

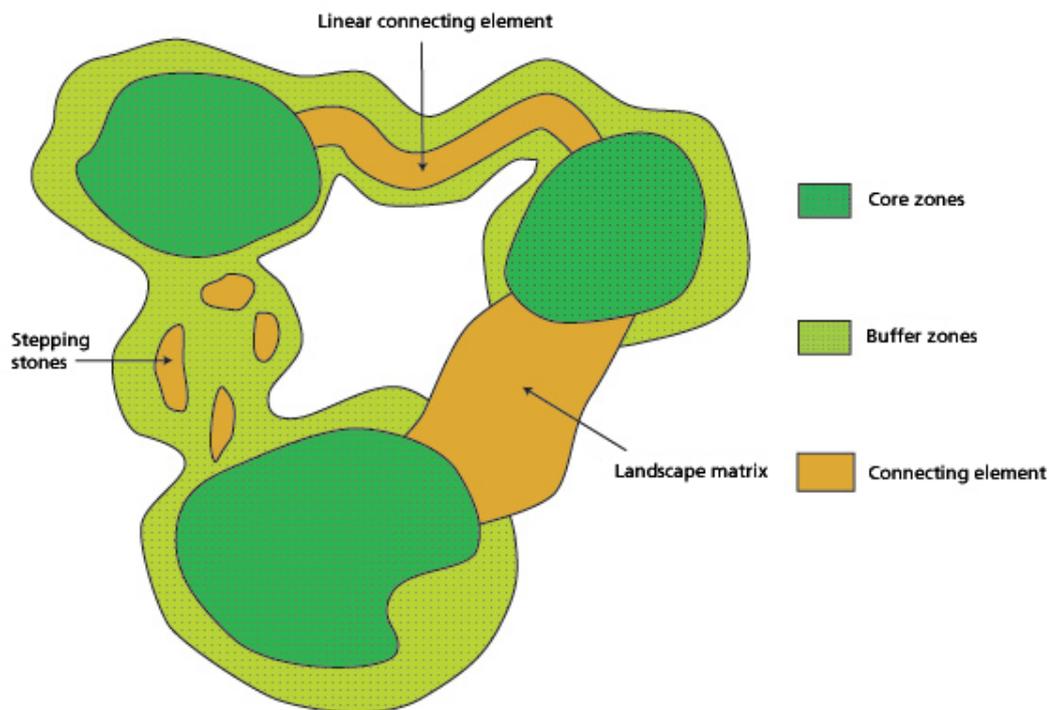
The protected areas, such as the core zone of a National Park, enjoy a degree of protection of greater or lesser stringency as a result of legislation. They therefore represent the core zone of a network. Protective measures here provide alpine biodiversity with the space it needs to survive, spread and develop. Protected areas, particularly extensive ones (>1000 hectares) and complexes of protected areas, both within the individual countries of the Alpine region and transborder ones, are the cornerstones of any network. They are the static elements of the network from which dynamic elements can be created to connect them up.

### *Buffer zones*

The buffer zone or maintenance zone, which often surrounds the core zone of a National Park, also forms the buffer zone for the network system. Its purpose is to shield the stringently protected core zone from the direct environmental influences and to minimise the negative edge effects between the protected area and the usually intensively farmed land. This buffer effect can be achieved using particular agricultural and forest management measures. Also the appropriate

designation of protected areas with lower protection status (country parks, development zones of biosphere reserves or landscape protection areas) around especially sensitive areas can achieve this aim.

Other approaches are also possible; Switzerland's National Ecological Network, for example, talks of extension instead of buffer zones. When analysing an ecological network, buffer zones are often given the exclusive (and often unrealistic) task of protecting the core zone from degradation due to its controlled use. The term extension zone, which covers the entirety of possible usable habitats for a species to be protected, is more in keeping with an approach that aims at the sustainable development of a biotope network. Often these zones are not colonised because the core populations in the neighbouring core zone are not large enough or there are too many disturbances (hunting pressure, tourism etc.). In the Alps these extension zones, that may, for example, be forested areas or dry meadows, form a coherent continuum on the mountainsides, which is not the case with buffer zones. When designating an ecological network, it also makes more sense to define natural extension zones that include one or more core zones that are not officially protected than to confine the network exclusively to buffer zones that are connected to existing protected areas.



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Diagram 1: Elements of an ecological network

### Connecting elements

The purpose of an ecological network is to connect up these different core zones (which may differ in terms of protection status and size of area, biotic and abiotic resources) in order to ensure there is an exchange within the network. For this to be possible, the core zones have to be connected to allow propagation and migration across the usually inhospitable cultural landscape. The connecting elements are the dynamic elements in the network and have to be created and designed to meet the needs of the species in question. Since each species will place

different demands on the connecting elements it uses, a corridor cannot be defined as the only definitively demarcated “migration route” between the protected areas. It must be treated in a way that takes into account the individual needs of priority species and adapted to local conditions. This illustrates the dynamic character of these structures. It is not a question of creating additional static elements like core zones but of providing solutions that are adapted to the specific situation. This can be done using simple means such as preserving open spaces without any built structures or significant physical barriers.

The connecting elements themselves do not necessarily have to have a fixed protection status; they can be areas that are treated in a way that animals and plants can use them and pass through them. The areas between protected areas, in which exchange is important, should be made hospitable to facilitate harmonious coexistence of nature and human use. The aim is not to exclude human beings but to organise their activities and influence on the environment in such a way that mutual sustainable use is possible.

Making possible exchange between protected areas thus does not mean that the protected areas have to actually touch each other. Different kinds of connecting structures can be used to act as passages between the core zones. They can take the form of ecological corridors or linear structures, for examples. Sections of forest and forest edges, watercourses or hedge systems can act as corridors for example. “Stepping stones” can also act as connecting structures. They are small pockets between the core areas that bear the features of the different biotopes and act as “stopovers” and propagation pools between the core areas. These stepping stones are primarily meant to help connect similar biotopes. Their density must be specified according to the species in question.

“Ecological corridors” as links, the key elements in connecting up protected areas and habitats, are described in detail below.

### **Ecological corridors**

An ecological corridor is a connecting element between habitats. However, the term “ecological corridor” also encompasses a broad range of nuances, since there is no such thing as a corridor that fulfils one single function or all functions.

Each species or group of species with similar needs has its own ecological network, uses its own corridors. What is a corridor for one species can represent an insurmountable barrier for another species. A classic example of this is the hedge: so often cited as an important connecting element, it is an important transit route for numerous small mammals such as hedgehogs or martens, but for certain butterflies it is an insurmountable obstacle. Thus corridors can have very different functions: they can represent a habitat, a place for dispersal movements, a barrier, filter, source or sink (cf. diagram 2).

Plants also use corridors, albeit - since they are not capable of locomotion - in a different way from animals. There are two major mechanisms by which plants spread: they are transported by animals or carried by the wind. Plants and seeds that are spread by animals (mammals, insects, birds) will therefore use the same corridors as the animals. Wind-borne seeds and plants can, under particular weather conditions, spread very great distances their corridors are connected to topography and prevailing climatic conditions. But whether the areas they are carried to are hospitable is also an important factor in whether or not they are able to establish there.

It is possible to characterise and classify corridors and the movements that take place in them. Three main kinds of movement of individuals and genes along corridors can basically be distinguished (adapted from BENNETT in NOSS 1993):

- Direct movement of a single individual over a long distance (e.g. in the case of amphibians),
- Periodic movement of a single individual interrupted by breaks (typical for how wolf populations spread),
- Transport of genes by a breeding population that lives within a corridor (typical for the corridor function in plants colonising new areas).

It is important to ensure here that the movements work in both directions and that the corridor can be used regularly.

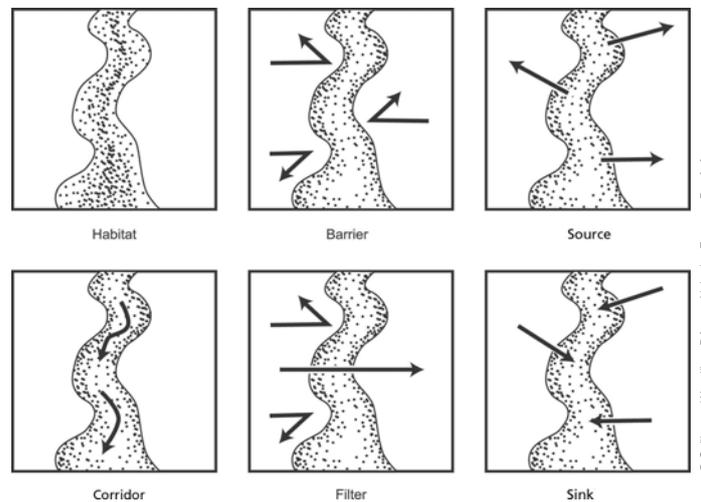


Diagram 2: The six functions of ecological corridors (adapted from THORNE 1993)

Corridors can be characterised and evaluated by their characteristics, length, width, shape, edge zones and composition, as well as by the stepping stone biotopes they contain and by their effects as connecting elements or barriers. It is therefore possible to roughly distinguish corridors or different groups of species by the size and needs of the species. There are corridors for birds that use terrestrial structures for guidance during migration. Due to the fact that their mode of movement is flying, they are hampered only by obstacles in their air space (chimneys, overhead cables, etc.). The availability of suitable resting places is of greater importance.

In a simplified form, other corridors can also be classified for other groups of species, such as large vertebrates (often reliant on forest areas), insects, small vertebrates (fields, forest edges), amphibians, fish.

## Conception of ecological networks

The approaches to designating and implementing ecological corridors can be divided into two categories that reflect two ecological approaches to nature conservation: one centred on landscape ecology and the other on species and behavioural ecology.

From the point of view of landscape ecology, a corridor is a section of the landscape (as a rule linear) that contains a certain number of natural or near-natural habitats (often comparable or similar types of habitat) and links up larger habitats of the same kind. What is important here is a continuum of certain habitats (which can, for example, be classified into the CORINE biotope categories) and the identification of habitat interruption and discontinuity. Different species can be linked to the different habitats. In this way potential habitats and corridors can be identified.

From the perspective of species and behavioural ecology, the question of whether a section of landscape is suitable as a corridor depends on the quality of the landscape for the individuals of a particular species, on whether these areas can be used for migration and dispersal movements, irrespective of their habitat characteristics. Thus, in this case it is exclusively a question of a landscape analysis from the point of view of a defined species, an evaluation of the functionality and usefulness of a section of landscape for the individuals of that species. In analysing corridors for species that have high demands in terms of the quality of their habitat, the findings can also be used for many other species with more modest demands.

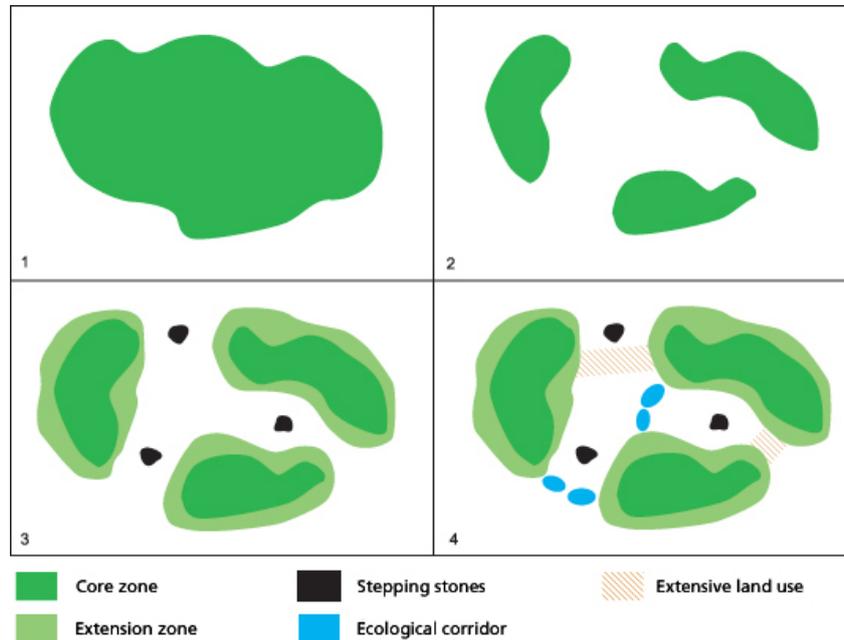
Each approach has advantages and disadvantages. The former makes it possible to identify landscape elements (e.g. vegetation alongside streams) and coherent types of habitat that form a continuum and can therefore be classified as corridors, although without taking the effective dispersal processes into account.

The second approach centres more on the process of migration and propagation, since the landscape is analysed from the perspective of the species. This makes the corridor aspect more complex, because no direct link is made to structural elements of the landscape or uniform habitat characteristics. Corridors defined in this way can only in isolated cases be used for different species, since each species has its own needs and landscape use characteristics.

The two approaches are complementary and cannot be separated from one another.

## Implementing networks

Protecting individual elements is not sufficient to put in place an effective network system. Sustainable use of the land between the core areas, particularly land that is being used for forestry and agricultural activities, but also land used for leisure and recreation, must be made more conducive to exchange processes. This can occur, for example, by extensive adapted forms of use, special management programmes or the reintroduction of old structural features such as hedges, irrigation systems, stone walls etc. Programmes and measures will be discussed in a separate chapter.



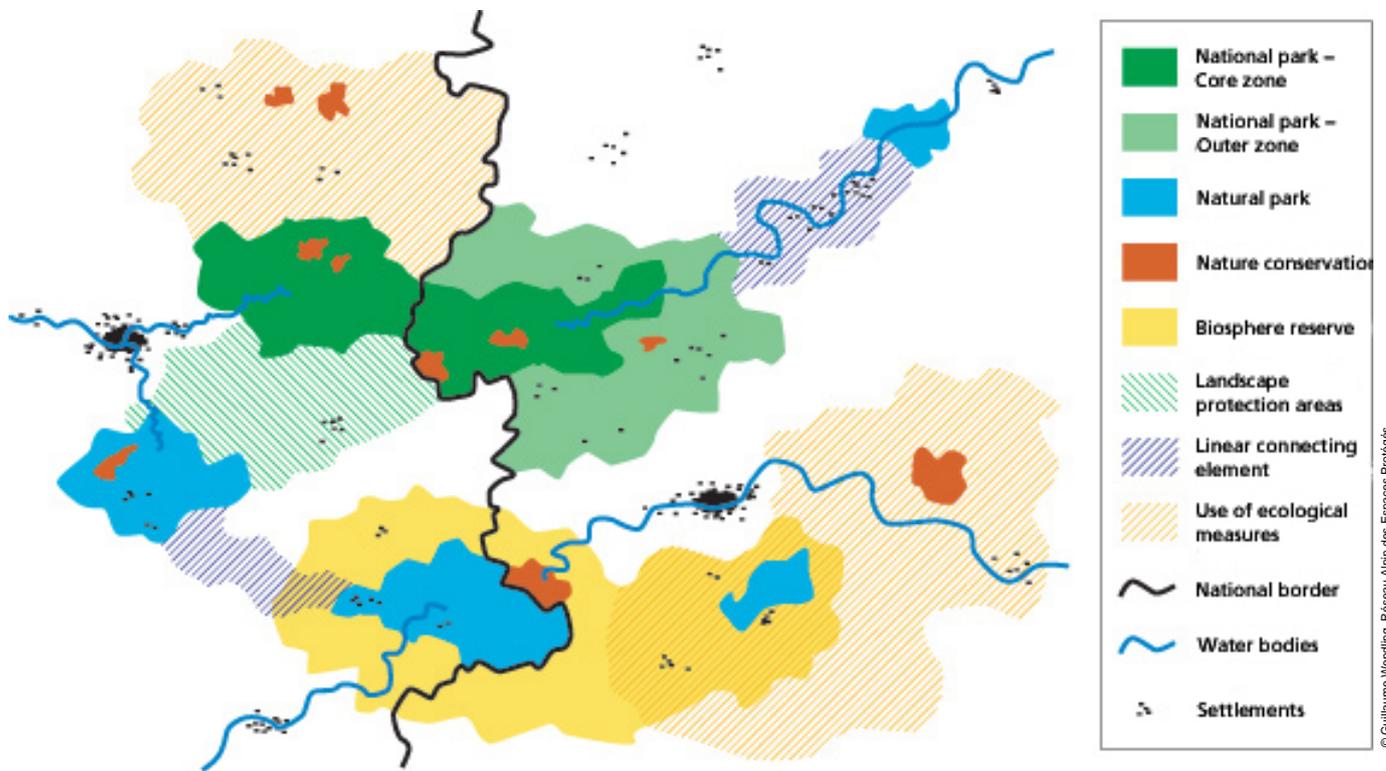
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1. Previous situation: the landscape consists of diverse elements that are interconnected and form a coherent structure.
2. Current situation: the landscape is fragmented, the individual parts of the landscape are isolated from one another in an intensively used cultivated landscape.
3. Interim situation: the core zones that have become isolated from one another are enlarged and stepping stone biotopes are created.
4. Future situation: the existing ecological corridors between the isolated parts of the landscape are revitalised or new ones are created. There is a change from intensive to extensive farming practices. The core zones and stepping stone biotopes can then be interconnected.

Diagram 3: Stages in reconnecting local habitats

A network of this kind cannot stop at national borders. On the contrary: intensive cooperation beyond national borders is essential. Transborder protected areas are the first step towards making exchange and networking possible beyond borders. They can act as an example for further collaboration.

Establishing an ecological network is not just about creating hedges and reinstating the banks of streams. It involves preserving and re-establishing functional connections between habitats.



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Diagram 4: Setting up a transborder network of protected areas

Source: Study 'Ecological transboundary network' (2004)  
(German, French, Italian, Slovenian)  
Editor: Alpine Network of Protected Areas, Gap, 2004  
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## Global instruments

### World Summit on Sustainable Development (WSSD)

The World Summit on Sustainable Development was held in autumn 2002 in Johannesburg, South Africa. 10 years after the “United Nations Conference on Environment and Development” in Rio de Janeiro, the heads of state and government of over 190 countries adopted the “Johannesburg Declaration on Sustainable Development” and a “Plan of Implementation.” In the Political Declaration the participants recognise amongst other things that poverty eradication, changing consumption and production patterns and protecting and managing the natural resource base for economic and social development are essential requirements for sustainable development. The Plan of Implementation cites very specific target dates for a number of fields. For example, a significant reduction of the current rate of biodiversity loss is to be achieved worldwide by 2010. As one of the measures for achieving the 2010 target, the Johannesburg Plan of Implementation mentions the creation of national and regional networks and corridors. While the term “network” can be interpreted in various ways, the use of the word “corridor” makes it clear that it also applies to networks in the physical, spatial sense.

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#### Documents

The World Summit's Political Declaration (English):

[http://www.johannesburgsummit.org/html/documents/summit\\_docs/1009wssd\\_pol\\_declaration.doc](http://www.johannesburgsummit.org/html/documents/summit_docs/1009wssd_pol_declaration.doc)

The World Summit's Plan of Implementation (English)

[http://www.johannesburgsummit.org/html/documents/summit\\_docs/2309\\_planfinal.htm](http://www.johannesburgsummit.org/html/documents/summit_docs/2309_planfinal.htm)

#### Links

Official United Nations website for the Summit (English; no longer being updated):

<http://www.johannesburgsummit.org/>

Website of the UN Division for Sustainable Development including information on follow-up activities to the World Summit within the framework of the UN (English): <http://www.un.org/esa/sustdev/index.html>

Information website of the International Institute for Sustainable Development (IISD), Canada (English):

<http://www.iisd.ca/2002/wssd/>

Information website of the International Institute for Environment and Development (IIED), Great Britain (English):

<http://www.poptel.org.uk/iied/wssd/pubs.html>

Information website on the summit of the Heinrich Böll Stiftung, Berlin, (German, no longer being updated):

<http://www.worldsummit2002.de/>

## Convention on Biological Diversity (CBD)

The Convention on Biological Diversity is one of the two international treaties that was opened for signature in 1992 at the United Nations Conference on Environment and Development“ in Rio de Janeiro. Although not as well known as its “sister,” the Climate Convention, the CBD is no less significant. It has three aims: the conservation of biodiversity (habitats, species and genetic diversity), their sustainable use and the fair sharing of the benefits (profits) arising out of the utilization of genetic resources. In its decision on protected areas and its annexed program of work of spring 2004, the Seventh Meeting of the Conference of the Parties to the Convention on Biological Diversity makes reference to the 2010 target of the Johannesburg Summit. In line with the CBD decision, comprehensive, effectively managed and ecologically representative national and regional systems of protected areas should form a global network in order to achieve the 2010 target. An “ad-hoc open-ended working group“ (i.e. with participation open to all signatories to the Convention) was set up on this subject and met for the first time in summer 2005 in Italy.

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### Links

Website of the Convention's Secretariat in Montreal (English): <http://www.biodiv.org>

The following links are part of the network of the Convention's so-called “Clearing House Mechanism“ (CHM), an Internet-based system to promote the exchange of knowledge and information and facilitate networking:

CHM of the Convention's Secretariat in Montreal (English): <http://www.biodiv.org/chm/default.aspx>

CHM France: <http://www.mnhn.fr/biodiv/>

CHM Germany: <http://www.biodiv-chm.de/>

CHM Italy: <http://www.minambiente.it/st/Ministero.aspx?doc=pubblico/tutela/home3.xml>

CHM Austria: <http://www.biodiv.at/>

CHM Switzerland: <http://www.ch-chm.ch/>

CHM Slovenia: <http://www.gov.si/mop/aktualno/cbd/index.html>

### Documents

Text of the Convention (English): <http://www.biodiv.org/convention/articles.asp>

Text of the Convention (French): <http://www.biodiv.org/doc/legal/cbd-un-fr.pdf>

Decision VII/28 on protected areas of the 7th Meeting of the Conference of the Parties to the Convention (COP), February 2004 (English): <http://www.biodiv.org/decisions/default.aspx?m=COP-07&id=7765&lg=0>

Decisions of the 7th Meeting of the Conference of the Parties to the Convention (COP), including Decision VII/28 on protected areas (French): <http://www.biodiv.org/doc/decisions/COP-07-dec-fr.pdf>

## Convention on Wetlands (Ramsar, Iran, 1971)

The Convention on Wetlands is an intergovernmental treaty, which functions as a framework for national measures and international cooperation on the conservation and wise use of wetlands and their resources. It came into force in 1975 and by 2006 had 150 Contracting Parties and included over 1,500 sites covering a total area of 134 million hectares. It is the only environmental treaty concerned with a single ecosystem.

Ecological networks are not a particular axis of action for the measures of the Ramsar Convention. The strategy on this subject consists of working together as closely as possible with national and international initiatives to achieve ecological networking.

The specific provisions of the Ramsar Convention do not refer directly to the problem of ecological corridors, but they are implicitly covered by the Convention in cases where the Ramsar sites are catchment areas, watercourses and rivers. On the other hand, as a result of their rich biodiversity, most of the sites are integrated into national ecological networks. Following the same line of logic, the Ramsar sites also play a prominent role in the implementation of the provisions of the Pan-European Ecological Network (PEEN) (cf. page 20).

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### Links

Text of the Ramsar Convention (German): [http://www.ramsar.org/key\\_conv\\_g.htm](http://www.ramsar.org/key_conv_g.htm)

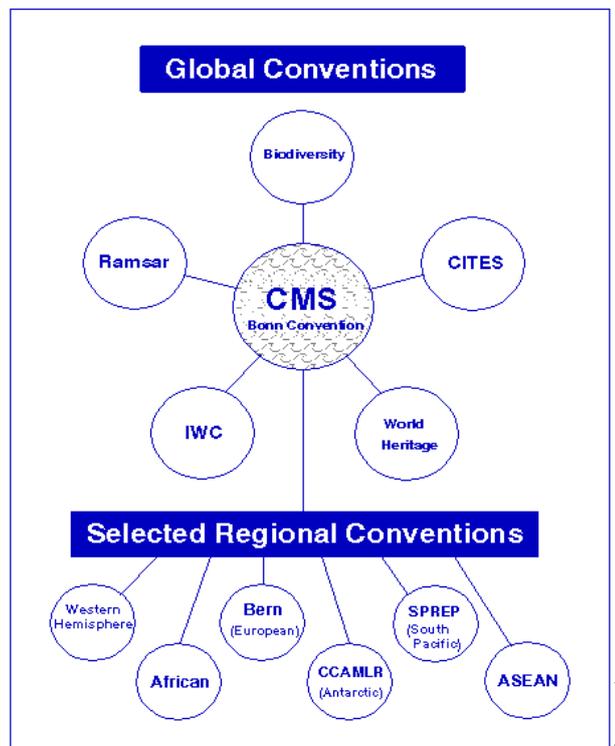
Contracting Parties (French): [http://www.ramsar.org/key\\_cp\\_f.htm](http://www.ramsar.org/key_cp_f.htm)

Contracting Parties (English): [http://www.ramsar.org/key\\_cp\\_e.htm](http://www.ramsar.org/key_cp_e.htm)

## Convention on Migratory Species (CMS)

The aim of the Convention on Migratory Species of Wild Animals, also known as the CMS or Bonn Convention, is to conserve terrestrial and avian migratory species. It is an international treaty that was concluded under the aegis of the United Nations Environment Program (UNEP). It promotes the conservation of habitats and wildlife. In December 2005, 95 countries from all the world's continents were Parties to this Convention.

Article V of the Convention on Migratory Species stipulates that “Where appropriate and feasible each Agreement should provide for, but not be limited to, the maintenance of a network of suitable habitats appropriately disposed in relation to the migration routes.”



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### Links

Convention on Migratory Species: [www.cms.int](http://www.cms.int)

Text of the Bonn Convention (German): [http://www.cms.int/pdf/convtxt/cms\\_convtxt\\_german.pdf](http://www.cms.int/pdf/convtxt/cms_convtxt_german.pdf)

Text of the Bonn Convention in English (English): [http://www.cms.int/documents/convtxt/cms\\_convtxt.htm](http://www.cms.int/documents/convtxt/cms_convtxt.htm)

## International instruments in Europe

### Convention on the Conservation of European Wildlife and Natural Habitats (Bern convention)

The Bern Convention was signed in 1979 in Bern (Switzerland) and entered into force in 1982. Its signatories comprise – apart from the 40 Member States of the Council of Europe – four African countries and the European Community. The aim of the convention is the comprehensive protection of flora and fauna and their habitats. It plays an important role in preparing the way for more stringent and binding regulations at European Union (EU) level. One of the ways the signatories are pursuing the goals of the Convention is by setting up the “Emerald Network” - a cross-border network of areas to be protected. This network is subject to similar standards to those of NATURA 2000, which is confined to the EU, so that it can be seen as extension of NATURA 2000 to the European countries that are not members of the EU. It is the responsibility of the individual countries to select areas for the Emerald Network and decide how to protect them. They must, however, monitor the areas and ensure that their nature conservation value is preserved.

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#### Links

Council of Europe website on nature conservation, including links to the Bern Convention (English):  
[http://www.coe.int/t/e/Cultural\\_Co-operation/Environment/Nature\\_and\\_biological\\_diversity/](http://www.coe.int/t/e/Cultural_Co-operation/Environment/Nature_and_biological_diversity/)

Council of Europe website on nature conservation, including links to the Bern Convention (French):  
[http://www.coe.int/T/F/Coop%E9ration\\_culturelle/Environnement/Nature\\_et\\_diversit%E9\\_biologique/](http://www.coe.int/T/F/Coop%E9ration_culturelle/Environnement/Nature_et_diversit%E9_biologique/)

Council of Europe website on the Emerald Network (English): [http://www.coe.int/t/e/Cultural\\_Co-operation/Environment/Nature\\_and\\_biological\\_diversity/Ecological\\_networks/The\\_Emerald\\_Network/](http://www.coe.int/t/e/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Ecological_networks/The_Emerald_Network/)

Council of Europe website on the Emerald Network (French):  
[http://www.coe.int/T/F/Coop%E9ration\\_culturelle/Environnement/Nature\\_et\\_diversit%E9\\_biologique/R%E9seaux\\_%E9cologiques/R%E9seau\\_Emeraude/index.asp#TopOfPage](http://www.coe.int/T/F/Coop%E9ration_culturelle/Environnement/Nature_et_diversit%E9_biologique/R%E9seaux_%E9cologiques/R%E9seau_Emeraude/index.asp#TopOfPage)

Pilot project on the Emerald Network in Slovenia (English): [http://www.coe.int/t/e/Cultural\\_Co-operation/Environment/Nature\\_and\\_biological\\_diversity/Ecological\\_networks/The\\_Emerald\\_Network/Pilot\\_project\\_Slovenia.asp#TopOfPage](http://www.coe.int/t/e/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Ecological_networks/The_Emerald_Network/Pilot_project_Slovenia.asp#TopOfPage)

## Documents

Text of the Convention (English): <http://conventions.coe.int/Treaty/en/Treaties/Html/104.htm>

Text of the Convention (French): <http://conventions.coe.int/Treaty/FR/Treaties/Html/104.htm>

Information document on the Emerald Network of areas of special conservation interest (English):  
[http://www.coe.int/t/e/Cultural\\_Co-operation/Environment/Nature\\_and\\_biological\\_diversity/Ecological\\_networks/The\\_Emerald\\_Network/02General\\_information.asp#TopOfPage](http://www.coe.int/t/e/Cultural_Co-operation/Environment/Nature_and_biological_diversity/Ecological_networks/The_Emerald_Network/02General_information.asp#TopOfPage)

Information brochure published by the German Environment Ministry on "25 Years of the Bern Convention" (German): [http://www.bmu.de/files/broschueren/faltblaetter/application/pdf/broschuere\\_berner\\_konvention.pdf](http://www.bmu.de/files/broschueren/faltblaetter/application/pdf/broschuere_berner_konvention.pdf)

## Pan-European Ecological Network (PEEN)

The creation of this network is the key element of the Pan-European Biological and Landscape Diversity Strategy endorsed in 1995 by 54 countries of the Eurasian continent as a follow up to the Convention on Biodiversity signed in Rio.

In 1995 it was still largely a theoretical project. Today, the network consists of numerous initiatives to set up national, regional and transregional ecological networks. That includes Natura 2000, the network established in the European Union, and the Emerald Network, which was set up on the same principles under the aegis of the Council of Europe within the framework of the Bern Convention. Other initiatives have also developed. For example, under the auspices of the Alpine Convention, a collaboration between the protected areas was established with the aim of creating an ecological network in the Alps. One of its main methods of doing this will consist in defining transborder ecological corridors. The Carpathian Convention is taking the same approach ...

The next stage will be the Pan-European Conference of Environment Ministers, which will be held in Belgrade in 2007. The main constituting elements of the Pan-European Ecological Network will have to be identified and mapped. A report and maps are currently being drawn up to this end.

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## Links

Pan-European Ecological Network (German, French, Italian, Slovenian, English):  
[http://www.coe.int/t/e/cultural\\_co-operation/environment/nature\\_and\\_biological\\_diversity/ecological\\_networks/PEEN](http://www.coe.int/t/e/cultural_co-operation/environment/nature_and_biological_diversity/ecological_networks/PEEN)

## The Alpine Convention

The Alpine Convention, a framework agreement for the protection and sustainable development of the Alpine region, was signed by the eight countries of the Alpine region - Germany, France, Italy, Austria, Slovenia, Principality of Monaco, Switzerland, the Principality of Liechtenstein - and the European Union.

Article 12 of the Alpine Convention's Protocol "Conservation of nature and the countryside" calls for the establishment of "a network of existing national and transboundary protected areas, of biotopes and other protected elements or those to be protected."

Within this framework, the Alpine Convention's Standing Committee commissioned the Alpine Network of Protected Areas in 2004 to carry out a study on how an ecological network of that kind could be set up in the Alps.

Establishing a transborder network of protected areas is also an element of the Multi-Annual Work Program of the Alpine Conference (MAP) for the period 2005 to 2010. One of the main areas of the Program is entitled "Nature, agriculture and forestry, cultural landscape;" one of the key issues it addresses is the conservation of landscapes, habitats and species. Biotope networks are also mentioned here as a way to achieve this aim. Further steps to promote cross-border networking of protected areas and establishing links with other ecologically significant facilities are also cited as a priority area for the future work of the Alpine Conference (MAP, 2.4.).

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### Links

The Alpine Convention (German, French, Italian, Slovenian): <http://www.alpenkonvention.org>

The Alpine Network of Protected Areas (German, French, Italian, Slovenian, English): <http://www.alparc.org>

### Publications

Permanent Secretariat of the Alpine Convention (2003): Die Alpenkonvention, Nachschlagewerk. Alpensignale Nr. 1. Permanent Secretariat of the Alpine Convention. Innsbruck. Available in four languages: German, French, Italian, Slovenian.

Federal Ministry for the Environment, Nature Conservation and Nuclear Safety, Germany (2004): Alpenkonvention konkret: Ziele und Umsetzung. Alpensignale Nr. 2. Permanent Secretariat of the Alpine Convention. Innsbruck. Available in four languages: German, French, Italian, Slovenian.

The Alpine Network of Protected Areas (2004): Grenzübergreifender ökologischer Verbund. Netzwerk Alpiner Schutzgebiete. Alpensignale Nr. 3. Permanent Secretariat of the Alpine Convention. Innsbruck, Austria. 240 p. Available in four languages: German, French, Italian, Slovenian.

European Academy Bozen/Bolzano (2004): Collectio Alpenkonvention. European Academy Bozen/Bolzano. 270 p. Available in four languages: German, French, Italian, Slovenian.

Permanent Secretariat of the Alpine Convention (2005): MAP, Das Mehrjährige Arbeitsprogramm der Alpenkonferenz 2005-2007. Permanent Secretariat of the Alpine Convention. Innsbruck. Available in four languages: German, French, Italian, Slovenian.

## Carpathian Convention

The Framework Convention on the Protection and Sustainable Development of the Carpathian Mountains (Carpathian Convention) was adopted and signed at the Ministerial Conference “Environment for Europe” on 22 May 2003 in Kiev, the Ukraine by the Czech Republic, Hungary, Poland, Romania, Serbia and Montenegro, Slovak Republic and Ukraine.

Like the Alpine Convention, the Carpathian Convention is a model for international cooperation for the protection and sustainable development of a large, transboundary mountain ecosystem. Unlike the Alpine Convention, the Carpathian Convention explicitly regulates the creation of a network of protected areas (Carpathian Network of Protected Areas, CNPA) as an official intergovernmental implementation initiative of the Convention.

### Article 4, paragraph 5 of the Carpathian Convention states that:

The Parties shall cooperate in developing an eco-logical network in the Carpathians as a constituent part of the Pan-European Ecological Network, in establishing and supporting a Carpathian Network of Protected Areas, as well as enhance conservation and sustainable management in the areas outside of protected areas.

Four out of the seven Carpathian countries (Poland, Slovakia, the Czech Republic and Hungary) have joined the European Union in 2004 and revised their national nature conservation legislation in order to prepare for EU integration.

Carpathian protected areas represent significant factors in regional sustainable development vis-à-vis the promotion of tourism linked to efficient nature conservation along-side traditional economic activities (farming and pastoral farming). They also represent a structural necessity for the preservation of the Carpathians’ unique biodiversity.

Long-term collaboration between the Alps and the Carpathians is needed in order to create the possibility of ecological networks for species migrations and genetic exchange, and to facilitate the exchange of know-how and experience between the protected areas of the two European mountain ranges. In this connection, the Alpine Network of Protected Areas and UNEP (Regional Office for Europe) are accompanying a cooperation project between the Alps and the Carpathians.

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Carpathian Convention (English): <http://www.carpathianconvention.org/>

## Ministerial Conference on the Protection of Forests in Europe (MCPFE)

As a result of its first meeting in Strasbourg in 1990, the Ministerial Conference on the Protection of Forests in Europe developed a pan-European political process to harmonise and implement sustainability principles in European forest management. The 2nd Ministerial Conference in Helsinki in 1993 focused particularly on the conservation of biodiversity in European forests, the third Ministerial Conference in Lisbon (1998) took greater account of economic aspects. The 4th Ministerial Conference in Vienna (2003), which had as its slogan "European Forests - Common Benefits, Shared Responsibilities," established principles for setting up national forest programs (NFPs), strengthening synergies for sustainable forest management in Europe through cross-sectoral cooperation, enhancing the economic benefits of forest management (e.g. preservation of rural areas), maintaining and enhancing the social and cultural dimensions of sustainable forest management in Europe (focusing, amongst other things, on its relevance to tourism. One example of this would be old infrastructure such as ropeways used in the past for transporting materials) and conserving and enhancing forest biological diversity in Europe (taking into account the concerns of the CBD). The countryside conservation aspect was also taken into account. There are numerous objectives and resolutions that reflect the provisions of the Alpine Convention, including not only the mountain forests protocol, but also the protocols on soil conservation, tourism and conservation of nature and the countryside. Since the MCPFE's resolutions are usually reflected in national forestry policies (funding policies for example), they are of great importance for the preservation of biodiversity and for the socio-economic aspects of rural regions. The chairmanship rotates and, following the conference in Vienna, passed from Austria to Poland, which is why the Liaison Unit is currently in Warsaw.

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### Links

MCPFE (English): <http://www.mcpfe.org>

## Pan-European Biological and Landscape Diversity Strategy (PEBLDS)

The “Pan-European Biological and Landscape Diversity Strategy (PEBLDS),” endorsed in 1995 at the European Conference of Environment Ministers held in Sofia, Bulgaria, was developed by the Council of Europe and the United Nations Environment Program (UNEP) in collaboration with other international governmental and non-governmental organisations. In this Strategy, 55 European countries pledged to make international and national efforts to protect in the long term not only the biological diversity of nature, but also the landscape diversity of Europe.

The PEBLDS is a framework program that coordinates all existing activities designed to conserve and restore nature; it also promotes cross-border cooperation in this area. Its fundamental aim is the coherent Europe-wide implementation of the international Convention on Biological Diversity (cf. p. 16), by involving existing networks, initiatives (e.g. Natura 2000 and the EU's Biogenetic Reserves, UNESCO's biosphere reserves...) along with national strategies. The idea is identify any gaps and initiate additional action to tackle them, in particular actions to promote connectivity across the different systems (nature, resource users, the political arena etc.). The Strategy is designed to run for 20 years (1996-2016) and is divided into five-year planning periods.

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### Links

The Strategy Guide (English): <http://www.strategyguide.org/index.html>

Council of Europe (English):

<http://www.coe.int/t/e/cultural%5Fco%2Doperation/environment/Nature%5Fand%5Fbiological%5Fdiversity/Biodiversity/index.asp#TopOfPage>

Participating countries: <http://www.strategyguide.org/straendo.html>

Organisations directly or indirectly involved: <http://www.strategyguide.org/links.html>

Fourth Intergovernmental conference 'Biodiversity in Europe' and 10th meeting of the Council of the Pan-European Biological and Landscape Diversity Strategy, 22 - 24 February 2006, Lake Plitvice National Park, Croatia: <http://www.strategyguide.org/200602/Documents.html>

### Documents

Text of the Biological and Landscape Diversity Strategy: <http://www.strategyguide.org/fulltext.html> (English)  
[http://www.strategyguide.org/fr\\_text.html](http://www.strategyguide.org/fr_text.html) (French)

The role of the Pan-European Biological and Landscape Diversity Strategy: Analysis and recommendations (2003, PDF, 151 KB, English):

[http://www.ceeweb.org/viewpoint/documents/from\\_CEEW\\_point\\_PEBLDS\\_analys\\_recomm.pdf](http://www.ceeweb.org/viewpoint/documents/from_CEEW_point_PEBLDS_analys_recomm.pdf)

## European Network of Biogenetic Reserves

The European Network of Biogenetic Reserves is the result of Resolution (76)17 of the Committee of Ministers of the Council of Europe of 1976. The purpose of the biogenetic reserves is to protect particular habitats or entire ecosystems (both terrestrial and aquatic) and thus contribute to preserving the balance of nature and to conserving areas that are representative examples of the natural heritage of our continent. Areas are selected on the basis of the following criteria:

- Their value for nature conservation.
- The existing protection status

A number of amendments to the original Resolution (1979, 1981, 1986, 1992) were made to reflect particular conditions and requirements. In terms of species or groups of species, mammals, birds, amphibians and reptiles, freshwater fish, butterflies, dragonflies, Hymenoptera, wood-dwelling invertebrates and vascular plants may be taken into account. Biotopes that can be considered include heathland, macchia, wetlands, dry meadows, dunes, halophile vegetation, coastlands, freshwater ecosystems, ancient forests and natural forests. For an area to be incorporated into the network it must also fulfil the requirements that it (or the habitats and species) must be unique, rare or particularly endangered.

The second requirement, that a European Biogenetic Reserve must have been designated as a protected area under the provisions of national legislation (existing protected status), is designed to ensure adequate legal protection in the long term, which is essential if areas of this kind are to be preserved permanently (e.g. prevention of building development, pollution...). Of course, in many cases it will be necessary to deploy additional contractual conservation measures (e.g. to preserve/maintain particular habitat structures). 55 protected areas in Austria currently belong to this network, of which over half are now also Natura 2000 areas. There are many parallels and synergistic effects between this system and the Alpine Convention's protocol on conservation of nature and the countryside.

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### Links

Council of Europe (German, French, Italian, Slovenian, English): [www.coe.int](http://www.coe.int)

## The European Union's (EU) Habitats Directive and Birds Directive and the NATURA 2000 network

In order to preserve biodiversity at the European level, the EU Member States have committed to setting up a coherent ecological network of special areas of conservation at European level. This network is called "Natura 2000." The Habitats Directive (Council Directive 92/43 EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora) and the Birds Directive (Council Directive 79/409/EEC of 2 April 1979 on the conservation of wild birds) are the legal basis for this.

In order to better connect the NATURA 2000 sites, Articles 3 and 10 of the Habitats Directive encourage the Member States to improve ecological coherence by maintaining, and where appropriate developing, features of the landscape that 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) or their function as stepping stones (such as ponds or small woods), are essential for the migration, dispersal and genetic exchange of wild species.

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### Links

Home page of the European Commission's Environment Directorate General on NATURA 2000 (English):  
[http://europa.eu.int/comm/environment/nature/nature\\_conservation/natura\\_2000\\_network/managing\\_natura\\_2000/index\\_en.htm](http://europa.eu.int/comm/environment/nature/nature_conservation/natura_2000_network/managing_natura_2000/index_en.htm)

Home page of the European Commission's Environment Directorate General on the text of the Habitats Directive including its Annexes (English, with links to the different language versions):  
[http://europa.eu.int/comm/environment/nature/nature\\_conservation/eu\\_nature\\_legislation/habitats\\_directive/index\\_en.htm](http://europa.eu.int/comm/environment/nature/nature_conservation/eu_nature_legislation/habitats_directive/index_en.htm)

Home page of the European Commission's Environment Directorate General on the text of the Birds Directive including its Annexes (English, with links to the different language versions):  
[http://europa.eu.int/comm/environment/nature/nature\\_conservation/eu\\_nature\\_legislation/birds\\_directive/index\\_en.htm](http://europa.eu.int/comm/environment/nature/nature_conservation/eu_nature_legislation/birds_directive/index_en.htm)

Pages on NATURA 2000 at the website of the European Topic Centre on Biological Diversity (English):  
[http://biodiversity.eionet.eu.int/activities/Natura\\_2000/index.html](http://biodiversity.eionet.eu.int/activities/Natura_2000/index.html)

Home page of the Federal Agency for Nature Conservation (BfN), Germany, on NATURA 2000 (German):  
[http://www.bfn.de/0316\\_natura2000.html](http://www.bfn.de/0316_natura2000.html)

Home page of the Bavarian State Environment Ministry (LfU), Germany, on NATURA 2000 (German):  
<http://www.bayern.de/lfu/natur/natura2000/start.htm>

Home page of the Ministry for Ecology and Sustainable Development, France, on NATURA 2000 (French):  
<http://natura2000.environnement.gouv.fr/>

Home page of the Ministry for the Environment and Territory, Italy, on NATURA 2000 (Italian):  
<http://www.minambiente.it/st/Ministero.aspx?doc=pubblico/tutela/natura2000/costruzione.xml>

Home page of the Autonomous Province of Bozen-South Tyrol, Italy, on NATURA 2000 (German):  
<http://www.provinz.bz.it/natur/Natura2000/d/Pag12.htm>

Home page of the Federal Environment Agency, Austria, on NATURA 2000 (German):  
[http://www.umweltbundesamt.at/umweltschutz/naturschutz/schutzgebiete/natura2000\\_gebiete/](http://www.umweltbundesamt.at/umweltschutz/naturschutz/schutzgebiete/natura2000_gebiete/)

Home page of the state government of Tyrol, Austria, on NATURA 2000 (German):  
[http://www.tirol.gv.at/themen/umwelt/naturschutz/natura2000\\_oesterreich.shtml](http://www.tirol.gv.at/themen/umwelt/naturschutz/natura2000_oesterreich.shtml)

Home page on NATURA 2000 of BirdLife International and 11 national partners, co-financed by the European Commission (multilingual): <http://www.natura2000benefits.org/>

## National instruments

### Austria: Guideline on Game Protection

The Federal Ministry of Transport, Innovation and Technology (BMVIT) has initiated a revision of the Guideline on Game Protection (RVS 3.01), which stipulates that in transport planning, specific road planning and environmental impact assessments the ecological aspects relating to game as detailed in the Guideline must be taken into account. This Guideline sets out minimum wildlife/ecological standards for wildlife passages on roads. The Österreichische Autobahnen und Schnellstrassen GmbH (Austrian Motorway and Expressway Company) was involved in the development of the Guideline (cf. SCHWARZEL et al. 2000).

Wildlife/ecological spatial planning (German acronym: WÖRP) is an instrument developed in 1983 by the Forschungsinstitut für Wildtierkunde und Ökologie (Research Institute for Wildlife Ecology) in Vienna. It provides a fundamental wildlife/ecological concept that is used in a number of Austrian states, as well as the canton of Graubünden in Switzerland and Liechtenstein. The aim of this concept is the long-term incorporation of species of wildlife into the cultural landscape. This will be achieved by harmonising the creation of biotope networks with studies on game stocks and the carrying capacity of biotopes. WÖRP includes large-scale spatial planning (nationwide basic planning) related to the spatial distribution of wildlife populations and detailed regional planning.

Red Lists of endangered types of biotope were drawn up for Austria, with the Federal Environment Agency as lead agency.

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### France: National ecological network

The country's biodiversity strategy includes plans to create a national ecological network by 2020. This network will comprise areas that are already protected by legislation or contractual agreements, along with additional areas (agreements with local authorities and land use measures). The core areas of the network will thus be areas in which agri-environmental schemes (CAD, French acronym for sustainable farming contract) and the forest charters will be implemented to a greater degree than usual. Plans for creating corridors between the core areas include building measures (green bridges). However, this idea is still in the development stage.

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## Germany: Federal Nature Conservation Act

Since the amendment of the Federal Nature Conservation Act (BNatSchG) came into force in March 2002, each of Germany's states is required by law to establish an interstate network of interlinked biotopes on at least 10 % of its total area. The aim of this network, as described in Article 3 of the Act, is to protect native species and their habitats and to conserve or restore functioning ecological interrelationships. To do this, a three-stage procedure is needed to determine which areas are already contributing to the network of biotopes, ascertain the need for further suitable areas and identify suitable areas for development. In the process, it has to be taken into account that ecological interrelationships occur in extremely different spatial/geographical dimensions. For the network of interlinked biotopes required by Article 3 of the Act, the international and regional levels are significant. All areas, including those with protected status, will only be counted as being part of the network of biotopes if they are suitable for achieving the goal set out in Article 3 (2) of the Act. This means that scientific criteria for selecting suitable areas must be developed. Recommendations on this were developed by a panel of experts representing the central government and the states (BURKHARDT et al. 2004).

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### References/bibliography:

Federal Nature Conservation Act (BNatSchG):

German: [http://bundesrecht.juris.de/bnatschg\\_2002/index.html](http://bundesrecht.juris.de/bnatschg_2002/index.html)

English: [www.bmu.de/files/pdfs/allgemein/application/pdf/bundnatschugesetz\\_neu060204.pdf](http://www.bmu.de/files/pdfs/allgemein/application/pdf/bundnatschugesetz_neu060204.pdf) (PDF, 286 KB)

BURKHARDT, R., BAIER, H., BENDZKO, U., BIERHALS, E., FINCK, P., LIEGL, A., MAST, R., MIRBACH, E., NAGLER, A., PARDEY, A., RIECKEN, U., SACHTELEBEN, J., SCHNEIDER, A., SZEKELY, S., ULLRICH, K., VAN HENGEL, U., ZELTNER, U. & ZIMMERMANN, F. (2004): Empfehlungen zur Umsetzung des Paragraphen 3 BNatSchG "Biotopverbund". - Naturschutz und Biologische Vielfalt 2, 84 S.

### Links

German: [http://www.bfn.de/0311\\_biotopverbund.html](http://www.bfn.de/0311_biotopverbund.html)

[http://www.bfn.de/0311\\_gruenes\\_band.html](http://www.bfn.de/0311_gruenes_band.html)

English: <http://www.countdown2010.net/greenbelt.htm>

## Italy: Ecological agriculture

In Italy, agricultural development programmes are defined at regional level. Each province draws up a plan for rural development, stating the goals of its contractual measures. The agri-environmental programmes are jointly financed by the central government and the regions.

Apart from purely agricultural programmes, there are also programmes targeting the cultural landscape, in which measures for landscape conservation and development are proposed. Schemes to preserve the traditional cultural landscape, particularly in mountain regions, include conservation of important historical landscape features such as dry stonewalls and hedgerows, along with other measures such as project-based payments for traditional fences and irrigation canals. Landscape conservation payments are used to conserve individual features of the cultural landscape. Landscape conservation payments are available for the conservation of particularly valuable habitats (land-related payments). The various regions develop landscape models, inventories and plans to provide guidance for individual measures and support programmes. The landscape conservation payments compensate, for example, for extra work involved in using traditional farming methods and for lower yields.

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## Liechtenstein

By its incorporation into the Worldwide International Instruments and the Pan-European Instruments systems, Liechtenstein has been now fundamentally integrated into international and cross-border cooperation. For Liechtenstein, as a country with a very small land area, foreign-policy objectives are as a general principle always closely coordinated with its neighbouring states, the Austrian state of Vorarlberg, and the Swiss cantons of St. Gallen and Graubünden. Thus, even if it was not always explicitly stipulated by particular legislation or other national instruments, cross-border collaboration on matters concerning nature and the environment has always been important to us. This collaboration on nature and landscape conservation exists, for example, on matters of freshwater ecology, forest reserves, wetlands, management of wild ungulate species, species of large predators, invasive species, wildlife passages and many other areas.

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## Slovenia: Programme to develop Slovenia's forests

Forests are of particular significance in Slovenia. With forest covering 56.4 % of its land surface, Slovenia ranks third in Europe in terms of proportion of forested land. That proportion is increasing as agricultural land is abandoned. Slovenia's forestry policy is based on principles of sustainability, near-natural and multi-function forest management.

The "Programme to develop Slovenia's forests" of 1996 contains the key facts on Slovenian forests and their role in conserving biodiversity. The fact that the forests have a high degree of conservation, cover a significant proportion of the country's land surface and are home to many of Europe's endangered species gives them special importance in any Alpine network. Ecologically important habitats and wetlands in the forests and forest reserves enjoy special protection status.

The development programme envisages involving the forestry agency, as well as the hunting authority and hunting associations in aspects of spatial planning, in particular infrastructure plans, to ensure that habitats for game are preserved.

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## Switzerland: Ordinance on Ecological Quality and Guideline on dimensions for wildlife passages

One of the conditions that farmers in Switzerland have to meet to be eligible for direct payments is that they establish ecological compensation areas (ECAs) on at least 7 per cent of their agricultural production land. Ecological compensation areas are species-rich, extensively farmed meadows and pastures, straw fields and hedgerows, along with other semi-natural habitats. Currently, ECAs account for around 10% of agricultural production land in Switzerland. Since 2001, the Ordinance on Ecological Quality (ÖQV) has provided outcome-oriented incentives aimed not only at promoting biological quality, but also at linking up ecological compensation areas. The aim of this is to use target or reference species typical for the region to connect remaining populations that have become isolated. In the case of meadows, quality evaluation is carried out on the basis of indicator plants. For other types of habitat, additional criteria are also used; for example, for hedges they include structure, minimum width, origins of species, management. The cantons are obliged to participate financially. The allowances for link-up and quality measures are cumulative. In a short space of time, the market incentives provided by the Ordinance have – particularly in mountain regions – brought about extensive network and biological enhancement of species-rich meadows and pastureland that had become endangered by intensive farming and abandonment of pastures.

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In 2001, the Swiss Federal Department of Environment, Transport, Energy and Communications (UVEK) issued a guideline on dimensions for wildlife passages stipulating that passages along wildlife corridors with nationwide significance should be 45 +/- 5 metres wide. In the process of developing this stipulation, the Federal Highways Agency (ASTRA) and the Federal Environment Agency (BAFU) agreed to take remedial action to improve the situation for wildlife along the Swiss network of motorways and major roads. This concept includes plans to establish around 50 wildlife passages over the next few decades to increase the passability of the road network by native wild mammals. The conflict points in need of remedial action were roughly defined in the "corridor report" (SRU 326). The detailed planning – in particular the exact siting and design of the structures and their surroundings – will take place within the framework of concepts developed by the cantons. Documentation on this area is already available in four cantons and is in the planning stage in others. Information from the "corridor report" – supplemented to some extent by that provided by the national ecological network, or REN, (SRU 373), including details on the location of each of the wildlife corridors and specific degree of risk – was also incorporated into the structure plans of 17 cantons, thus increasing the level of protection afforded to these important connecting axes.

Documents can be ordered at [www.buwalshop.ch](http://www.buwalshop.ch). The report on wildlife corridors is available in German and French under the following reference numbers: SRU-326-D/SRU-326-F; the REN report under: SRU-373-D/SRU-373-F; maps: SRU-373-TD.

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## Examples

### Example of an international project

#### Green Belt Europe

The area around the former border between Eastern and Western Europe (Iron Curtain) was so remote and so little used for decades that a more or less uninterrupted ribbon of valuable habitats developed into what is now a "green belt." In many places it has remained intact even after the fall of the Iron Curtain and runs through the whole of Europe from the Barents Sea in the North to the Adriatic and Black Sea in the South. The idea is that this green belt should be preserved and developed to form the backbone of a Europe-wide network of interlinked biotopes. To this end, a process of transboundary cooperation along the entire length of the European Green Belt was launched in 2003, coordinated by the IUCN (World Conservation Union). This process offers the opportunity of stepping up collaboration on nature conservation issues amongst the Member States of the EU, the accession states and their neighbours. The Green Belt could make a contribution to implementing the Pan-European Ecological Network (PEEN, cf. Chapters 2.2 and 2.7) and to improving the coherence of the system of protected areas under Natura 2000 (cf. Chapter 3.2). However, it will only be possible to develop the Green Belt within the framework of a sustainable regional development programme that takes into account the historical, political, economic and social situation specific to each region.

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- German: [http://www.bfn.de/0311\\_gruenes\\_band.html](http://www.bfn.de/0311_gruenes_band.html),  
<http://www.bund.net/green-belt-europe/>  
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- English: <http://www.bfn.de/en/03/030503.htm>  
<http://www.countdown2010.net/greenbelt.htm>,  
<http://www.bund.net/green-belt-europe>,  
[http://www.euronatur.org/Green\\_Belt\\_Europe.370.0.html](http://www.euronatur.org/Green_Belt_Europe.370.0.html)

## Projects in the Alpine region

### Ecological network of protected areas in the Alps

The Alpine Network of Protected Areas, an international institution set up on the initiative of France in 1995 to promote cooperation amongst the institutions managing the protected areas, has been working since 2003 on the concrete implementation of Article 12 of the Alpine Convention's Protocol on Nature Conservation, which calls for an ecological network<sup>1</sup>.

During the German presidency of the Alpine Convention, it was commissioned to carry out a study on the subject of "Cross-border protected area and an ecological network in the Alps."

As part of this study, an overview was drawn up, detailing existing network situations in the Alps, instruments available nationally and internationally, and existing projects. Numerous concrete proposals were put forward on how to create an ecological network of protected areas throughout the entire Alpine region, in particular in eight areas that were selected as examples and studied in greater depth.

The findings of this study prompted the Alpine Conference to recommend that its signatory states take concrete steps to set up a network of this kind. In November 2005, a seminar was held with official representatives of the countries in the Alpine region to discuss and define further steps needed to implement the idea.

The ongoing coordination of this initiative and of the individual stages and first concrete implementation actions in selected test areas is part of the Work Programme of the Alpine Network of Protected Areas.

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#### Links

The Alpine Network of Protected Areas: (German, French, Italian, Slovenian, English): <http://www.alparc.org>

The Alpine Convention (German, French, Italian, Slovenian): <http://www.alpenkonvention.org/>

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<sup>1</sup> Article 12 of the protocol on "Nature conservation and the landscape management" of the Alpine Convention, ecological network:

"The contracting parties take adequate measures to establish a network of existing national and transboundary protected areas, of biotopes and other protected elements or those to be protected. They commit themselves to harmonize the objectives and applicable measures in transboundary protected areas."

## Publications

Alpine Network of Protected Areas (2004): Grenzübergreifender ökologischer Verbund. Netzwerk Alpiner Schutzgebiete. Alpensignale Nr. 3. Permanent Secretariat of the Alpine Convention. Innsbruck, Austria. 240 p. Available in four languages: German, French, Italian, Slovenian.

Alpine Network of Protected Areas (2005): Final report on the seminar "Creation of an ecological network of protected areas," 7-8 November 2005, Berchtesgaden (D), 40 p. Available in four languages: German, French, Italian, Slovenian.

Alpine Network of Protected Areas (2004): Towards a Carpathian Network of Protected Areas. Final report. 38 p.

## The identification of main connection areas in the Alps, by WWF European Alpine Programme, ALPARC, CIPRA, ISCAR

In 2002-2003 the World Wide Fund for Nature (WWF), in cooperation with the Network of Alpine Protected Areas (ALPARC), the International Commission for the Protection of the Alps (CIPRA) and the International Scientific Committee for Alpine Research (ISCAR), involved the Alpine scientific community in the development of a long-term vision for the biodiversity of the Alps. The identification of 24 priority conservation areas (PCAs) for biodiversity was the first step. The second step is the identification of the main potential connection areas of the Alps at a coarse scale (1:500 000), mainly based on an expert approach. It was decided that two categories of connection areas had to be identified: within the Alps (among the priority areas and the protected areas, if and where they are needed) and between the Alps and adjacent regions. To this purpose, preliminary consultations were conducted with some experts and on the 19th-20th September 2005 an international workshop with experts was organised in Buchs, Switzerland, with the technical support of the Alterra Institute (NL) and VINCA (A). The identification of macro-corridors was mainly based on the ecological need (species, habitats and landscape), but feasibility and opportunity was also sometimes considered. The experts' consultations and workshop resulted in the identification of 11 terrestrial and 15 aquatic external connection areas among the Alps and adjacent regions and 21 terrestrial and 2 aquatic internal connection areas. These are only preliminary results and a second experts' consultation will take place in order to validate and complete the methodology and the results. The objectives of this project are: to harmonize this vast scale approach with the one from ALPARC and the Alpine Convention for the identification of more detailed corridors among the protected areas of the Alps, to complete the biodiversity vision, to provide a context to the local initiatives for ecological networks and for land use planning, to create synergies and know how to involve public administrations and to be used for internal strategy planning.

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## National projects

### Switzerland's national ecological network (REN)

The national ecological network (abbreviation: REN) was drawn up as part of a “top-down – bottom-up procedure“ in close collaboration with the agencies responsible for nature and landscape conservation at canton level. It is in effect a technical/scientific report that describes the country's landscape from the point of view of its ecology. It depicts both the fragmentation of habitats and the connectivity features on 1:100,000/1:500,000 maps. They show only at the current situation but also the landscape's potential. This forward-looking and integrated vision gives an overall picture of the key aspects of the country's ecological situation. For this vision to be implemented it will have to be transposed and adapted in detail to the specific situation at any given place.

As part of its strategy to protect important and endangered species and habitats, REN provides additional details and is an important starting point, in particular with regard to the objective of revitalising habitats. It also facilitates a new kind of partnership between all the agencies with activities that are relevant to the landscape in one form or another.

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### Documents

Documents can be ordered at [www.buwalshop.ch](http://www.buwalshop.ch). The report is available in German and French under the following reference numbers: SRU-373-D/SRU-373-F; maps: SRU-373-TD.

### Italy's national ecological network (Rete Ecologica Nazionale – REN)

As a result of numerous European initiatives (European Commission and the Council of Europe), Italy has also passed a programme to define and develop a national ecological network. A national ecological network is an operational instrument that has great guidance and planning value for matters concerning regional policy and use of natural resources. Within this programme, the Environment Ministry therefore commissioned a study on ecological networks for vertebrates in Italy, which was completed in 2002.

The aim of this project was to depict a network or collection of areas of differing ecological quality and differing nature conservation priorities and highlight the possible connecting elements between these core areas so as to prevent further fragmentation of the habitats and breeding routes of vertebrates.

The first stage in this work was to collate the body of knowledge on the distribution and ecological situation of vertebrate species in Italy.

In a second stage, models of habitat use were developed.

Finally, a number of networks were defined as part of this project:

- A global network covering all vertebrate species
- A network for each taxonomic group
- A network of all 149 endangered species on the Red List

These networks were compared with one another and with the latest map of protected areas in Italy in order to identify the qualitative, quantitative and spatial differences between the different networks. The comparison between the global network and the network of endangered species showed that the distribution of the endangered species matches very well the distribution of the areas of particular biodiversity in Italy.

The comparison with the network of protected areas in Italy produced encouraging findings. The protected areas are of great value to the ecological networks and their biodiversity, since they cover and protect important areas of the networks identified.

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## Regional projects

### Biological corridors in the French département of Isère

The French département of Isère is a densely populated Alpine region. As a result of this population density and the intensive farming of the land, the area is highly fragmented. In 1999, the département therefore decided to commission an initial study of the ecological connectivity situation in Isère.

The basis for the département's ecological network was the Swiss REN model.

Following this model, maps were drawn up and main corridors defined.

As a result of this initial study, concrete action was taken to implement the ecological network and safeguard or re-establish the region's biological corridors.

Working to provide information and raise the awareness of the relevant actors and the public is an important part of the remit of the Conseil Général, the département's council. For that reason a document was drawn up, summarising the main findings of the study for the benefit of local decision-makers and other interested parties. Educational programmes on the topic of ecological connectivity were also carried out with young people and school classes.

The concept of ecological networks was well received by the general public and political decision-makers alike and a number of specific projects have already been implemented, including creating passages for small mammals and amphibians.

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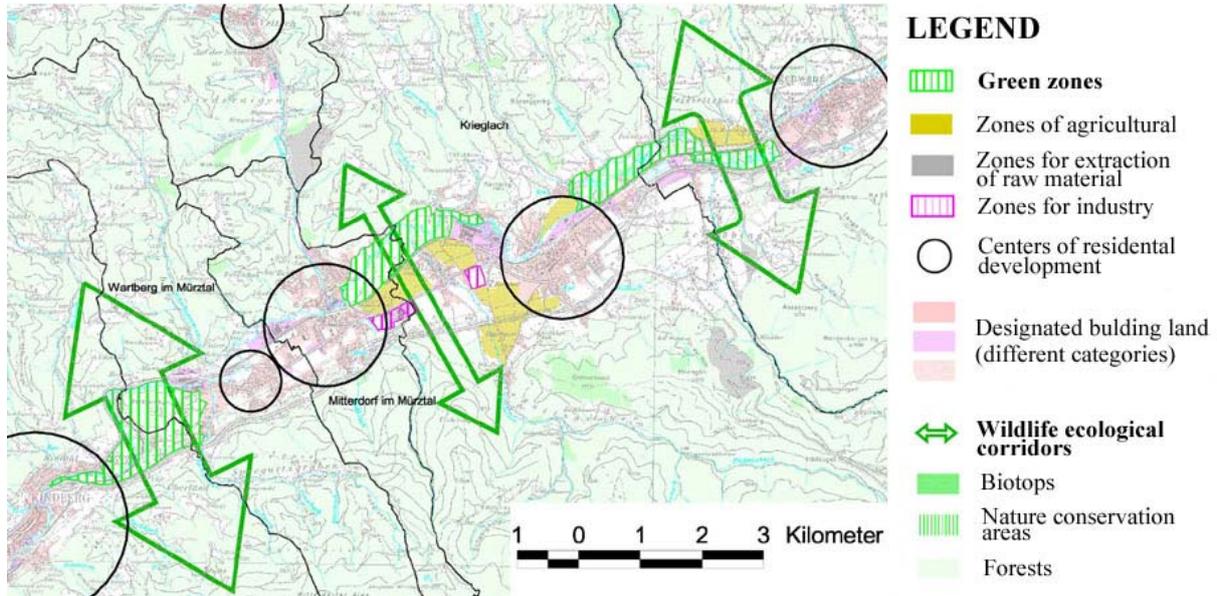
### Wildlife corridors in Styria

In matters relating to designating areas for residential and industrial development, the Austrian spatial planning system gives considerable latitude to individual local authorities. In many cases these local authorities are very small and in competition with each other for inhabitants and tax revenue. This, in conjunction with the rapidly developing transport network which enjoys high status is leading to progressive fragmentation of the Austrian landscape and therefore to breaks in important regional, national and international wildlife/ecological corridors for large mammals such as bears, lynx, wolves and red deer.

While, in the case of new infrastructure projects such as major road and rail network development schemes, building green bridges to maintain the function of these corridors is already state of the art, it is still the exception rather than the rule that these important connectors between open spaces are taken into consideration in spatial planning. An example of this can be seen in the fact that green bridges that have cost a great deal of public money to construct are often degraded by new, inappropriately sited industrial or residential areas.

To rectify these shortcomings, the state of Styria has now included protecting high-ranking wildlife/ecological corridors in its Regional Development Programmes in the form of regulations issued by the state government. The structure of the Styrian spatial planning system means that

the development framework stipulated by the state government is binding on the local authorities. The passability of green bridges at roads and railways is thus maintained and guaranteed in the long term beyond the narrow strip of the road or rail track itself.



**Illustration:** Example taken from a Development Programme in the region of Mürzzuschlag, Styria, showing wildlife/ecological corridors (Abteilung 16, Amt der Steiermärkischen Landesregierung 2003 <http://www.raumplanung.steiermark.at/>)

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## Local projects

### Regiobogen

The Regiobogen project began in 1998 thanks to the efforts of the Trinational Environment Centre, or Truz, a voluntary association based in the south of Germany, near the Swiss and French borders. With the help of EU financing programmes, it has been active in implementing the Interreg II and III cross-border projects. The region is characterised by increasing urbanisation due to the growth of the Basle conurbation.

The aim of the Regiobogen project is to preserve and valorise the ecology of a network comprising sites of high ecological value (such as the Petite Camargue Alsacienne) and biological corridors (hedges, groups of trees...) to guarantee the high-quality landscape in this region within the so-called "border triangle."

The Regiobogen project covers 58 square kilometres and includes 14 local authorities. The project can only be implemented with the consent and participation of landowners. The main partners were the local authorities. This kind of partnership ensures that the work outlives the actual measure itself. Measures were also carried out on private land; in these cases press campaigns were used to establish contact with the property owners.

Between August 2002 and December 2005, almost 40 measures were implemented in this way. The project covers all types of environmental media and includes planting hedges and isolated trees on intensively farmed land, re-establishing dry meadows and areas of rocky vegetation, planting and managing tall standard orchards, revitalisation and renaturation of wetlands (including the renaturation of 3 kilometres of a dead arm of the Rhine). The project also included measures in urban areas, such as nesting boxes for house martins and transforming allotment plots into natural biotopes. All the measures were accompanied by intensive awareness-raising activities: bilingual excursions, presentations for different audiences, photography competitions, a website, press campaigns...

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