

## Ecological Network and NATURA 2000

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### Spatial network of protected areas

The subject of transboundary protected areas and spatial connections (common surfaces, ecological corridors) between the protected areas in the Alps has a central place in the implementation of the Nature Protection Protocol of the Alpine Convention. Several articles refer directly or indirectly to such connections between protected areas (article 3, 11 and 12). The article 12 foresees the creation of an ecological network. Based on this article the Alpine Network of Protected Areas has contributed since 1995 to the application of the Alpine Convention as thematic network, involving the Alpine protected areas in joined actions and creating a common identity. Now, based on the work of this thematic pool, a network with a higher spatial dimension should be realised.

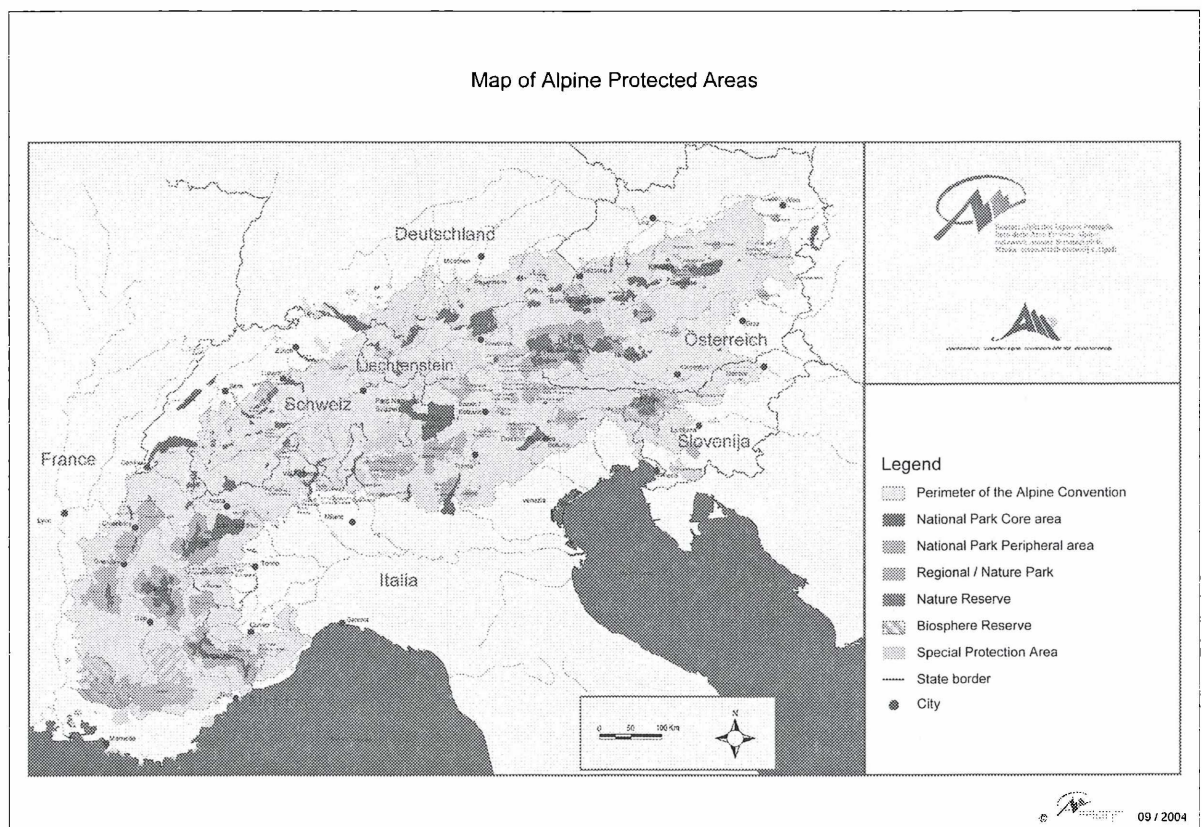


Fig. 1

### Situation in the Alps

The Alps shelter a rich diversity of nature and landscape, which offers a habitat to a large number of plants and animals. The protected areas of the Alps give an important contribution to the protection and preservation of this biodiversity offering a refuge to wildlife.

For plants and animals the landscape is a broad spatial system with which they have interactions at different levels. This system is of special value when it offers a large number of big size habitats as well as a diversity of natural structure elements that are connected at small scale.

This connections are important for natural life, specially for animals, because they need to move and use several types of different landscape parts. Most species are adapted to such a diversity of the landscape and use different environments during there development, in different seasons or during daytime. These spatial requirements vary according to the different species, therefore each specie has its own requirements.

For the long term survival of a species the possibility of genetic exchange between different populations is of major importance, otherwise the threat of degeneration and a accumulation of genetic defaults may lead to extinction.

The fragmentation of landscape and habitats as well as the intensive use of the land threatens the natural life. In the Alps this fragmentation due in priority to concentration of human activities in the valleys, the roads network, intensive agriculture, industrial activity, etc. has continuously reduced and isolated the habitats for animal and plants in the last years. The habitat fragmentation has important consequences for diversity since it is recognized as one of the most important factors for species extinction. Without large habitats the possibilities of survival for many species and populations decrease.

This is the reason why the protection of wildlife and biodiversity can not only relay on the protected areas. Many animals need more space to live than these areas can provide. Scientists agree on the fact that only large and ecological adjoining protected areas can ensure a sustainable and long term protection of the biotic and abiotic nature resources of the Alps and guarantee the natural processes. Therefore large protected areas should be created even beyond national borders.

This could be done by connecting the surfaces of existing protected areas in different states across the frontier. An other possibility is the creation of large complexes inside the different Alpine states through spatial connections between the protected areas where these links are of ecological importance and in accordance with the technical and social conditions. Through these connections the protected areas would not be isolated "islands" any more, but allow the exchange between each other. NATURA 2000 sites as well as the effective protection Priority Areas detected by the WWF in cooperation with other institutions can help to create such connections. In this way, the NATURA 2000 network could be completed and a unity of contiguous surfaces between the alpine protected areas could be developed.

## **Network concept**

A ecological network is composed of different elements:

- core zones (for example the protected areas), as static components and
- connection elements between these zones, as dynamic components of the network.

These connection elements can be linear (rivers, forest borders, ....) and facilitate movements of the flora and fauna or punctual like small biotopes (stepping stones) with the function of migration stations and dispersion pools.

## **Towards an alpine Network**

Large protected areas and joined groups of areas with different protection status are important. They will represent the core zones of an alpine network and are the shelter for wildlife. But the network cannot be based only on protected areas or single elements as nodes between ecological corridors – the network needs a sustainable long term policy, which is based on spatial planning tools. The permeability of the cultural land between the biotopes is also an important element of the network to allow movements of the flora and fauna. Therefore sustainable and ecological adapted land use (extensive land use methods, adapted landscape planning, ...) is important to create effective connection possibilities between the nodes.

The Alps do not only possess a large natural diversity but also a important cultural diversity and the landscape often revels the old traditional living forms. Many of the traditional structures and use forms have given a habitat to special adapted species. In the cultural land there can be found a diversity of its own. This is why cultural land and tradition extensive methods should be forced not only as couloirs or corridors but also as living space.

Every alpine country offers a large variety of different measures and programs in various domains to improve the connectivity of habitats. The existing possibilities of the different countries (measures and programs – for example in agriculture, forestry, infrastructure development,...) have to be applied more efficiently. This means for example, that this measures should be regrouped by local or regional initiatives and projects to improve the interactions between the concerned surfaces and to join the efforts in a common way. Furthermore, the different strategies have to be concerted internationally.

In this context, it is important to underline and to analyse the measures of protection and the possibilities of more intense cooperation between adjoining protected areas. This cooperation can be on a special theme with defined aims such as, for example, the protection of a certain species, the cooperation for sustainable regional development, etc. The analysis of the possibilities to create connections between protected areas which are in the same time composed of selective measures and regional management measures has to take into account the actual spatial distribution of protected areas.

In the Alps a considerable number of associations of protected areas can be detected: complexes of two or more transboundary areas, associations of two or more national areas and also large protected areas with a rigorous protection policy and a surface of several 1000 ha. Those elements play an important role for conservation. The established connections and the common action programmes between such complexes can serve as example for further national and especially international cooperation and facilitate the migration and exchange between habitats even across country borders.

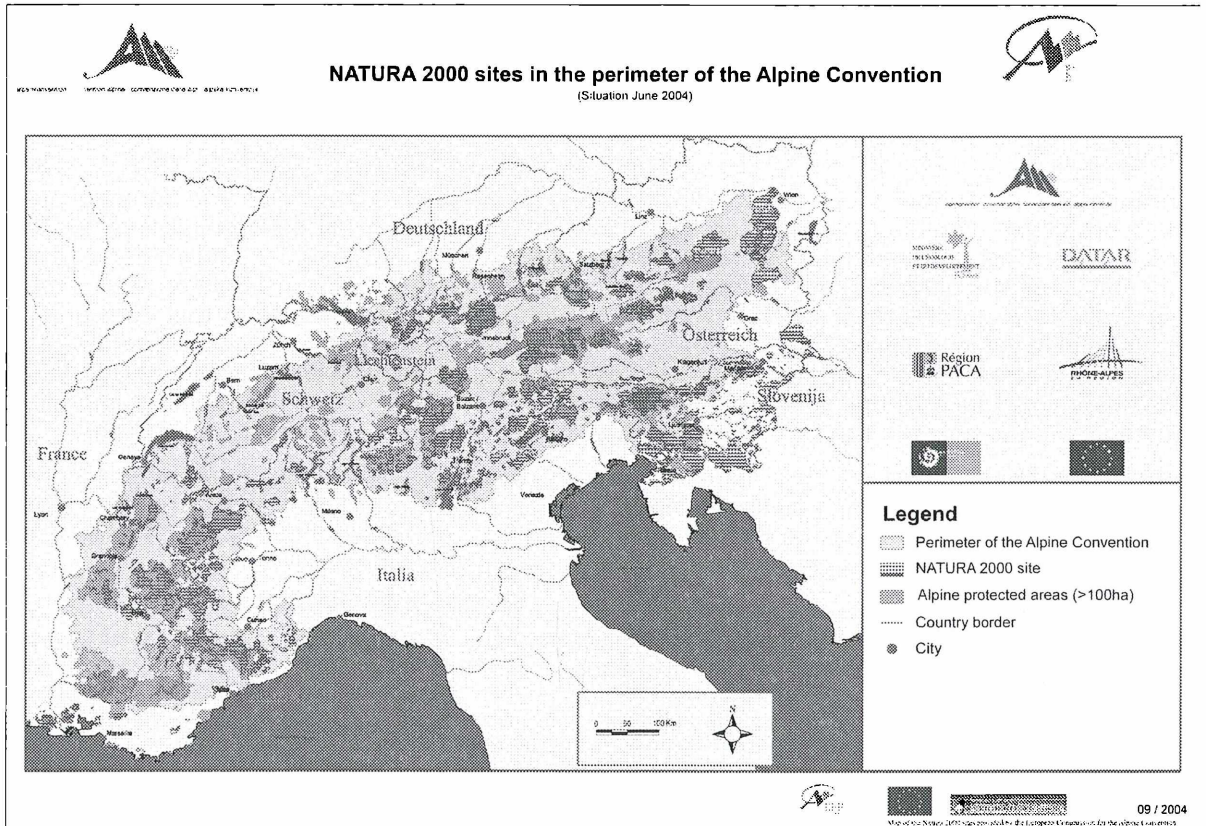


Fig. 2

## Methodology

Different approaches can be chosen for the implementation of an ecological network. One of them is the analysis of the actual situation of habitats, their quality and the existing connections between these biotopes. The following model could be applied to analyse the actual connections between protected areas: the analysis of satellite images and aerial photographs to determine the limits of different types of habitats and to show the actual connections between different zones of the same habitat by mapping and GIS methods. These results also with information from national and regional inventories of flora and fauna, the knowledge of biologists and naturalists and the valorisation of the information by field trips allow the illustration of the actual continuity of habitats. This method was used for the detection of corridors and continuums for the National Ecological Network in Switzerland.

This method makes the detection of existing continuums easier and even more important, the isolation of areas where these continuums are interrupted and where measures have to be taken to improve the connection situation. The knowledge of established wildlife corridors as well as further information from statistics of accidents caused by animals, obvious barriers in the landscape and areas of special biodiversity have to be taken in account.

The situation of several areas can also be evaluated by using indicators or criteria, if the work with satellite images or aerial photographs is not possible. Because of time restrictions and of the large surface that had to be covered (the whole surface of the Alpine Convention), the Alpine Network of Protected Areas has chosen this approach for its project about an ecological network in the Alps. Indicators such as surface and altitude of protected areas, density of habitants, land use type, infrastructure density, etc. can allow some interpretation of the ability for a landscape to fulfil the role of corridor. After the general evaluation of the situation by this method, the different zones where problems may be detected that where isolated have to be analysed more in details, in order to be able to find a solutions of the problems on a local level.

The practical work of establishing corridors and creating connections between habitats has to be done at a local scale, by defining projects for a determined zone, specie or habitat. The approaches have to be chosen in accordance with the needs and aims of the subject and the project. By initiating the juristic and financial basis for such local projects and by sustaining and helping the shareholders in their approach, the first step towards a coherent network can be made.

## **Aims**

The creation of a network of protected areas with ecological connection elements and an adequate minimum protection of surfaces in-between has to be a long term aim. The general purpose has to be the creation of dynamic processes between the different protection forms and the implementation of the different possible measures that have an impact on the whole territory. The existing areas have to be group and connected in small associations to create in this way larger unites for wildlife refuge. Since the creation of new large protected areas is not to expect due to the political and economic circumstances in the Alps, the existing areas have to be connected in a way that they could take to role some large areas had to play. The so formed complexes improve the situation and the network can be enlarged by the time according to the changing situation.

The article 12 requires a network on a national and a transboundary level. This means connections between protected areas including elements which are not under protection yet but are important for the network. The expectations go further than the limits of the protected areas. And it way to go: the coordination of aims and measures of transboundary protected areas.

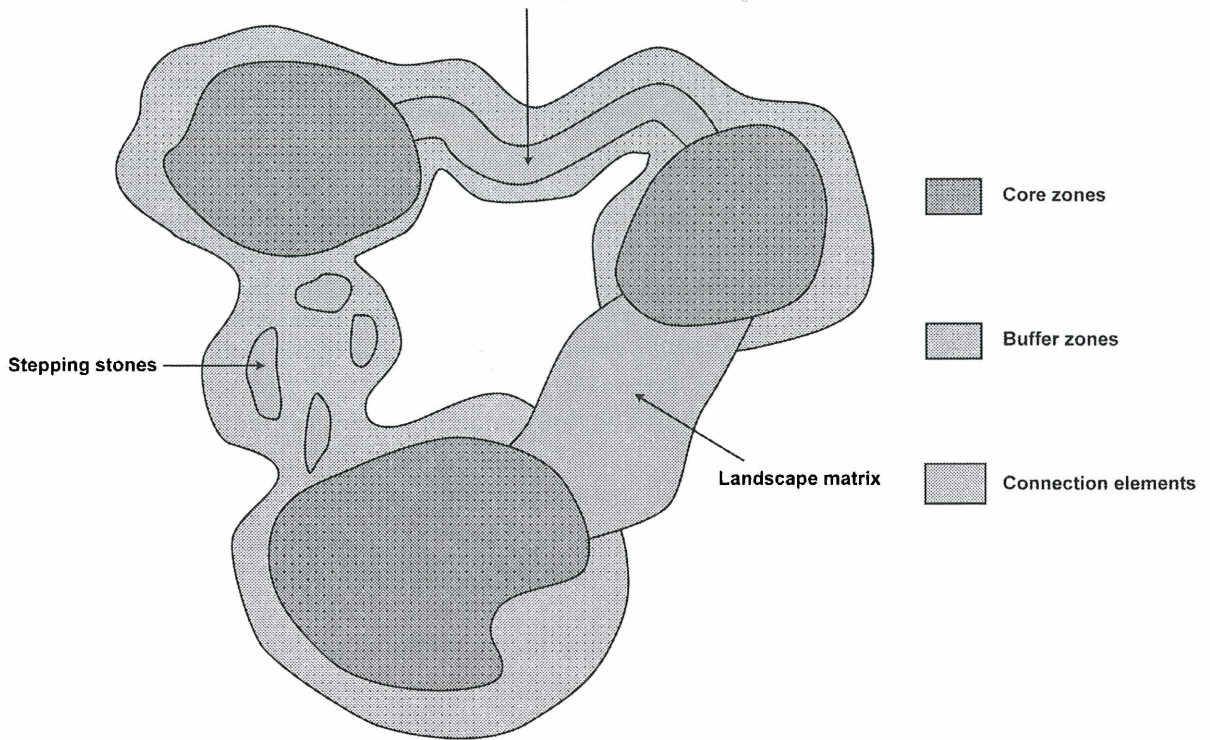
It is important to notify that the experiences made in protected areas in the fields of special species management, measures of sustainable development of land use and cooperation between different stakeholders can be useful in non-protected areas and contribute to the creation of an ecological network.

For the long term implementation of such a concept that represents a fundamental point of the Alpine Convention, further efforts have to be done. First of all, the existing measures and planning instruments in the different Alpine countries have to be synchronised. This can only be realised in large spatial units to reduce the expanding fragmentation and to reinstall a living landscape. The different protocols of the Alpine Convention propose a common way as they are the only ones that are valuable beyond borders of the protected areas for the whole alpine territory. This naturally in combination with the national and regional legislations and t he general rules for nature protection.

## **Perspectives**

The Alpine Network of Protected Areas promotes the creation of a alpine ecological network between protected areas by proposing suggestions of possible corridors in places where these makes sense. Create connections and corridors where this seem appropriated in reason of different criteria, such as special migrations routes for wildlife, geographic proximity, extensive land use, low human impact. Focus efforts on this zones, concentrating the application of measures and programs, using NATURA 2000 site protection programs to establish the network.

The thematic network of protected areas exists and cooperates with success in many different domains. The creation of a spatial network creating connections between the different alpine protected areas is a challenge for the future. An big defy but also a major chance for the preservation of the alpine landscape and the biodiversity in the Alps bringing profit to every involved protected area.



Elements of an ecological network

Fig. 3

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