

Revue de géographie alpine

Journal of Alpine Research

Dossiers

97-1 | 2009

Semaine alpine 2008 : innover (dans) les Alpes

Ecological networks in the Alpine Arc

Innovative approaches for safeguarding biodiversity

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Cet article est une traduction de :

Réseaux écologiques dans l'Arc alpin

Des démarches innovantes pour la sauvegarde de la biodiversité

Résumés

In response to decreasing biodiversity and new phenomena such as climate change, the number of initiatives aimed at creating ecological networks is increasing. Research and activities based on the theme of ecological connectivity are generating a completely new perception of methods of protecting the natural environment: there is a shift from a conservationist approach to natural systems to one that is more functional. The place and role of protected areas within their regions are being redefined. Such areas are now situated in a wider territorial context and new cooperative arrangements are encouraged with local actors. The alpine approach adopted in establishing a transalpine ecological network, illustrated by several examples, underlines the importance of both an international framework for such activities and the need to extend them to include not only the classic actors in the protection of the natural environment, but also other sectors that until now have seldom been involved.

Face au constat d'une perte accrue de biodiversité et de phénomènes nouveaux, tels le changement climatique, les initiatives de mise en place de réseaux écologiques se multiplient. Les réflexions et les actions conduites autour de la thématique de la connectivité écologique font naître une perception complètement nouvelle des pratiques de la protection de la nature : un changement d'une conception patrimoniale conservatrice vers une approche plus fonctionnelle des systèmes naturels. La place et le rôle des espaces protégés au sein de leur région sont redéfinis, les situant dans un contexte territorial plus large et engendrant de nouvelles collaborations entre acteurs locaux. L'approche alpine pour la réalisation d'un réseau écologique transalpin, illustrée par différents exemples, souligne l'importance d'un cadre international pour ces démarches et d'une ouverture sur l'ensemble du territoire impliquant en plus des acteurs classiques de la protection de la nature, la collaboration avec des secteurs jusqu'à présent peu impliqués.

Entrées d'index

Mots clés : Alpes, connectivité écologique, Convention alpine, espaces protégés, réseau écologique

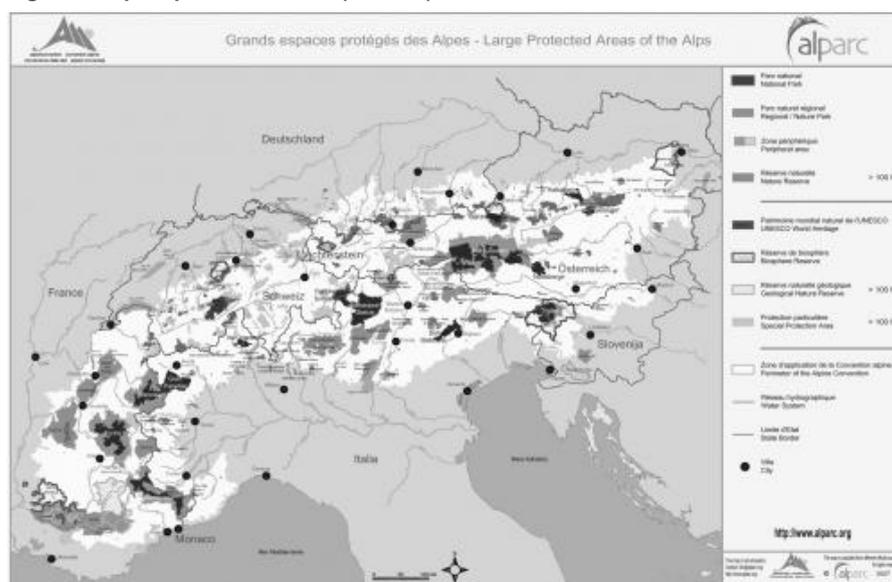
Keywords : Alpine Convention, Alps, ecological connectivity, protected areas, ecological network

Note de la rédaction

Translation: Brian Keogh

Texte intégral**“Ecological networks”: a new concept in the protection of the natural environment****Declining biodiversity**

- 1 Today the Alps are a largely protected area. In 2008, the Alpine Network of Protected Areas (ALPARC) included some 900 protected areas of every category (> 100 ha), representing about 25% of the total area covered by the Alpine Convention (fig. 1). Even allowing for the fact that protection of the natural environment is not the main vocation of a large number of these areas (Plassmann, 2002), the area of national parks and natural reserves that is specifically set aside for safeguarding biodiversity is considerable (7% of the area of the Alpine Convention (source: GIS ALPARC, 2008)). However, despite these efforts, biodiversity is continuing to decline. The main reasons, in these mountain areas as in the rest of Europe, are the destruction of natural habitats and the deterioration of cultural landscapes associated with the fragmentation of vital areas of fauna and flora (Jaeger et al., 2005), phenomena that manifest themselves mainly outside the protected areas.

Figure 1. Alpine protected areas (>100 ha)

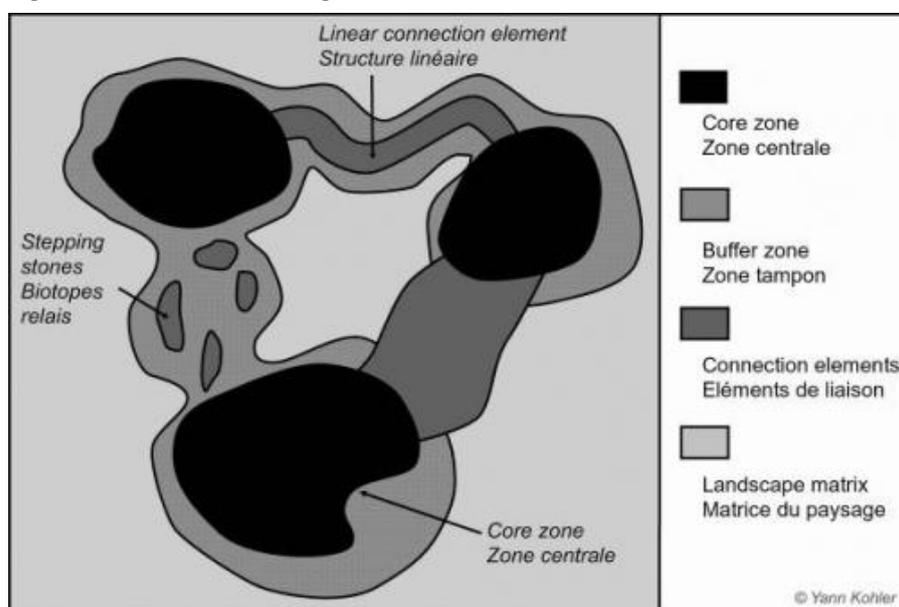
- 2 The maintenance of biodiversity depends therefore not only on the preservation of natural habitats (areas which support the largest number of animal and plant species) and traditional practices, but also on the interstitial areas that allow biological exchanges between these habitats. It is therefore important to respect the natural dynamics of the area as a whole (Burel, Baudry, 1999).
- 3 The need to develop new approaches is even more relevant given the recent phenomenon of climate change. This is an issue that requires a long-term management vision, something that is also necessary in the design of ecological networks. These networks may therefore constitute an important element of the new approach required since they also imply the adoption of a similar long-term vision.
- 4 Given this observation, initiatives to set up ecological networks have become more common and the Alps have certainly been no exception in this respect over the past ten years. In this article, we will examine the really innovative aspects of these approaches that are aimed at extending the concepts of natural environment protection beyond the areas set aside for it so far, to areas that are farmed, used or urbanised. We will also

consider the significance of this changing practice in the environment. Can the concept of ecological networks meet the new requirements – that is, the need to take into account the ecological functions of the area as a whole?

Ecological networks: a dynamic means of protecting the natural environment

- 5 An ecological network is made up of core areas or zones – in general, protected areas – that guarantee the resources necessary for the survival of the species that it supports. In an ideal situation, these core areas are surrounded by buffer zones, creating a transitional area which limits the influence of neighbouring zones and minimises negative marginal effects. These different zones are connected with one another by linking elements such as ecological corridors or stepping stones that allow the movement of individual animals within the network as well as genetic mixing (fig. 2). They thus help maintain the four different levels of biodiversity: specific diversity, genetic diversity, population diversity and habitat diversity, some of which have been shaped by traditional human know-how, often then serving as connecting elements (hedges, low walls, etc.).

Figure 2. Elements of an ecological network



- 6 Since each species has different requirements with regard to the types of links it uses, it is not possible to define a precise corridor as being a definitive migration path between different biotopes. Instead the needs of priority species and specific problems related to the local situation must be dealt with in an appropriate manner. This explains the dynamic character of these connection structures, which implies a certain reversibility of spatial planning. It is not a question of creating other static conservation elements like the core areas of the network (classic protection areas such as parks or reserves) but more of providing solutions adapted to local problems (Bennet, 1999).
- 7 In the context of ecological networks, this means that it is important not to simply concentrate environmental measures along the borders of fields or hedges, or on fallow land, but rather to encourage working practices that are sustainable and respectful of the environment over the area as a whole. To ensure that ecological interconnections function correctly, the concept of ecological networks thus provides for the conservation of core areas of substantial size, stepping stones with similar characteristics to the core areas, and corridors, combined with a more thoughtful use of the area.
- 8 The development of these new concepts has been deemed necessary because it appears that the standard protection tools are not effective enough to ensure that biodiversity is maintained. With climate change, the loss of biological resources and diversity, and the degradation of natural habitats, questions relating to the protection of the natural environment are becoming so important that they cannot be limited to a few protected

areas. What is required is a project dealing with the area as a whole. Furthermore, the major problems are in fact situated outside these protected areas.

Innovation in protecting the natural environment

- 9 The term “innovation” has its origins in the economic and technical field, where it is defined as the development of new ideas or inventions and their implementation with the objective of improving economic performance levels. In the present context, that of environmental management, innovation is understood more as a process of:
- a) recognition of a problem or of a failure to function correctly;
 - b) definition and/or adaptation of new or markedly improved methods to remedy the problem;
 - c) application of the solution and/or new procedures (based on elements of existing knowledge).
- 10 The emphasis is therefore put on the adaptation of existing tools to present reality.

Taking action in the Alps

The development of a common vision for the Alpine massif as a whole: observation of trends and ideas for promising methods for the future

- 11 At the pan-Alpine level, the theme of ecological connectivity emerged in 2004 with a study conducted within the framework of the Alpine Convention that took stock of existing experience and initiatives undertaken within the Alpine Arc (ALPARC 2004). This study concluded that a common approach for the entire Alpine area was needed to guarantee the coherence of different national and regional approaches. Indeed, each of the Alpine countries has already adopted different approaches at different levels: for example, the Swiss national ecological network (REN) at a national level, the German initiative “BayernNetz Natur” at the regional level, or the departmental ecological network of the French department of Isère, at a more local level. However, all these initiatives are limited to administrative areas (countries, regions, departments, etc.), without there being any attempt to firstly integrate them within a wider bio-geographical context.
- 12 The importance of international cooperation in protecting the natural environment across the Alpine area as a whole has been recognised and acted upon since the 1980s. 1994 witnessed the signing of the Alpine Convention’s protocol on “Conservation of nature and the countryside”, an international treaty drawn up between the 8 alpine states as well as the European Union. Article 12 of this protocol is particularly important in this context in that it provides for creating a “national and cross-border network of protected areas, biotopes and other environmental assets protected or acknowledged as worthy of protection” (Alpine Convention, 2003).
- 13 The first coordinated trans-national projects, such as the reintroduction of birds of prey (bearded vulture from 1987) or, later, the monitoring of habitats (HABITALP Interreg project from 2002 to 2006 (Lotz, 2006)), are evidence of this. For the implementation of ecological network projects, this cooperation was all the more important given that the species as well as the corridors and other connecting elements do not stop at administrative borders. In addition, the different alpine regions are closely interdependent. The impact of an obstacle may be felt at a considerable distance from the obstacle’s location as, for example, with a dam and its effects on areas downstream.
- 14 It is for these reasons that, in 2007, the four alpine institutions, ALPARC, CIPRA (International Commission for the Protection of the Alps), ISCAR (International

Scientific Committee on Research in the Alps) and WWF (with its alpine programme), launched the “Ecological Continuum Project”, its aim being to improve ecological connectivity in the Alps (Kohler et al., 2008). Unlike the national approaches adopted by different individual states, the cross-border approach developed by these four organisations is based on an entirely new vision of protecting the natural environment of the alpine massif as a whole, from France to Slovenia.

Protected alpine areas in the heart of pilot regions

- 15 Four pilot regions were selected to test a methodology developed within the framework of the project and to carry out the first ecological network projects. These pilot regions were made up of several protected areas and other zones situated between and around these areas. This represents a major challenge for these protected areas that find themselves confronted with unknown situations, forcing them to “take an interest in” areas situated beyond their administrative boundaries and to work together with new partners, in other words to change from a static situation to one based on dynamic exchanges. Among these new partners are the different actors of the region concerned, such as farmers, hunters, planners and developers, to name but a few.
- 16 Protected areas thus take on a new role within their region: they are no longer seen and no longer act as “nature islands”, but instead are integrated in a more global approach. The new law concerning national, regional and marine parks in France is evidence of this in that it introduces the notion of “ecological solidarity” between the heart of the parks and the surrounding areas¹. Until now, the effects of protected areas on their neighbouring region have been perceived above all in economic terms, with the emphasis on financial spin-offs and the added value generated by the presence of a protected area in the region (Jungmeier et al., 2006; Job, 2003; Kuepfer, 2000). This project provides them with a new structuring role in a programme for planning and organising the region. As for the regions, they too have their place in a project on the scale of the entire Alps, based on the vision of an alpine ecological network.

Political support from an international treaty

- 17 The political context has also evolved in the case of the Alps. Thus an official platform, the “ecological network” platform, has been put in place as part of the Alpine Convention (based on the protocol governing the protection of the natural environment). This involves a group of experts which, through its composition, is also innovative: it brings together, for the first time since the signature of the treaty, researchers, State representatives, experts and NGOs, who are not part of the usual observers, with the aim of jointly defining a working framework for the Alps.

The special importance of protected areas as experimental zones

A cultural revolution

- 18 Protected areas are key elements in the creation of ecological networks. First, the extensive protected areas form indispensable core areas within the ecological networks (ALPARC, 2004) and, second, these areas provide possibilities for “testing” and acquiring experience on setting up ecological networks in the Alps. Among the personnel of protected areas are geographers, biologists and other experienced naturalists with a very good knowledge of the terrain, the species and the special issues in the area. In addition, the government departments responsible for protected areas are partners known to and recognised by the local actors and therefore provide the ideal link in

transmitting, discussing and developing such projects in their region (fig. 3).

Figure 3. Group work in the pilot regions – exchanges with local actors



Workshop in the context of the ECONNECT project in Admont, Austria, October 2008.

- 19 The importance of protected areas in discussions on these questions is undeniable. This can be seen in France, for example, where regional natural parks (PNR) are at the heart of a working group on “corridors”. The objective of the group is not only to reflect on the notions of ecological connectivity and their importance in a park area, but also to set up scientific pilot projects. It was in this way that the regional natural parks, in a document prepared in 2007 for their 40th anniversary, undertook to “contribute to the national and European ecological network based on common reflection to determine a hierarchy of natural areas, their functions within the ecological network (corridors, buffer zones, core zones) and the heritage species (translation)”. To do this, the “Parks define, together with other administrative levels, structured and coherent territorial strategies to protect the natural environment. They then try out these notions in landscape and spatial management, protection and planning tools (translation)” (Fédération des Parcs Naturels Régionaux de France, 2007). The study and commitment in favour of ecological connectivity were thus written into the objectives of the Charter of certain regional natural parks (the Chartreuse, for example). The Queyras regional natural park has placed this question at the centre of a joint international project aimed at creating a biosphere reserve around Mount Viso, in Italy, with several parks and neighbouring protected areas.
- 20 It is not only the natural parks, however, which are concerned by these questions by virtue of their objectives and special missions. Discussions on connectivity aspects are also being undertaken in other types of protected areas, such as the Berchtesgaden national park in Germany with the PACE research project (which analyzes existing connections between habitats in this trans-border region with Austria) or in the Ecrins national park in France which, in partnership with a research group, is conducting research into “bocage” landscape and the existing genetic flows within this landscape.

Conclusions and outlook

- 21 Discussions and measures undertaken around the theme of ecological connectivity are giving rise to a completely new perception of practices to protect the natural environment: the place and role of protected areas within their region are being redefined, placing them in a wider territorial context. Furthermore, the Natura 2000 sites must also be considered as important structuring elements. The new networks resulting from such discussion and research and the different projects and cooperative

- agreements – the spatial networks as well as the networks of actors – are providing new perspectives that will facilitate reaction to future environmental challenges, among which there is always the intensive use and continuing fragmentation of the landscape as well as climate change. Nature, and above all ecological processes, are acquiring a new role in the conception of an area, while at the same time becoming unavoidable elements in its planning and development.
- 22 Joint efforts focussing on the alpine massif as a whole are contributing directly to a very concrete application of an international treaty, the Alpine Convention, with its protocol on the protection of the natural environment. This positive and innovative process initiated by and with the alpine actors may open up the way to other similar actions. In addition, through this initiative the alpine countries are respecting their commitments undertaken within the framework of the Convention on biological diversity (CBD).
- 23 Finally, through this common approach focussing on the Alpine area as a whole, the Alps are also contributing to the establishment of the Pan-European Ecological Network (PEEN). This project offers European countries a theoretical vision of a very large-scale ecological network. For the first time in Europe, thanks to the “ecological network” platform of the Alpine Convention, there is an official commitment from several alpine countries to translate the theoretical concept of this pan-European network into practical projects on the ground. It is thanks to this measure, among others, that there is an opening up to areas outside the Alps as well as a guarantee to act appropriately in relation to the different national actions such as the work undertaken on the “green and blue network” in France. There are also initiatives aimed at linking the Alps directly to other neighbouring mountain massifs: an Austrian project, for example, is underway on the restoration of a corridor between the Alps and the Carpathians. Several actors involved in the protection of the natural environment, including the WWF, have brought together important partners, such as companies responsible for operating motorways, with a view to restoring migration paths between the massifs. This project is particularly important for the return of large predators to the eastern Alps; such predators are still numerous in the Carpathians.
- 24 One of the most important current projects in the Alps on this theme is the ECONNECT project, a project of the EU’s ETC Alpine Space Programme, which is aimed at reinforcing ecological connectivity in the Alps. ECONNECT thus aims to provide a framework for action undertaken in the Alps but should also facilitate links with other levels of organisation, such as the work at the pan-European level or the connection with other mountain massifs beyond the Alps.
- 25 Although it is at the spatial level that work to set up ecological networks in the Alps and beyond takes place, the temporal aspect should not be forgotten: indeed the measures in question should be implemented on the ground over a long-term period. Thus this innovative approach to protection of the natural environment is both spatial and temporal and, in a certain sense, even cultural since it reorganises relations between users of the area and encourages new actors to cooperate with one another in a new common vision.
- 26 The first experiments conducted in the department of Isère, France, and in Switzerland, indicate that this new approach strikes the right chord. The approach aims at getting local actors involved and making them responsible for the different aspects of protection relating to the daily lives of the local population. Among the local actors who have been willing to get actively involved are hunters, who because of their activity are particularly sensitive about the ecological aspects and are very appreciative of the fact that their experience in the field is taken into account. Similarly, farmers also feel very concerned about these problems. The involvement, sometimes financial, of numerous actors such as road maintenance services or motorway management companies are proof of the interest that this subject arouses, on condition that there is adequate communication with the general public. These positive examples of groups of actors who might be thought somewhat reticent with regard to such measures are evidence of the great potential of these new approaches. An ecological network project can thus facilitate cooperation between different areas by providing the possibility of formulating problems and identifying a common solution. Given that the bases of the ecological network concept

are relatively easy to communicate and understand, and offer the possibility for each actor to contribute at his particular level, this may lead to a real change in methods to protect the natural environment.

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- Pour plus d'informations sur les réseaux écologiques dans les Alpes : www.alpine-ecological-network.org

Notes

- 1 Law n° 2006-436 of 14 April 2006 relating to national parks, marine natural parks and regional natural parks – République française.

Pour citer cet article

Référence électronique

Yann Kohler, Thomas Scheurer et Aurelia Ullrich, « Ecological networks in the Alpine Arc », *Revue de géographie alpine* [En ligne], 97-1 | 2009, mis en ligne le 23 juin 2009, Consulté le 29 juin 2009. URL : <http://rga.revues.org/index808.html>

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Droits d'auteur

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