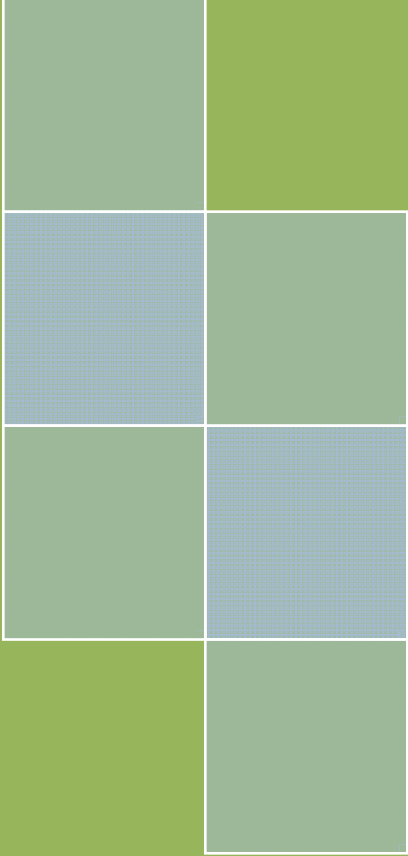




POLICY RECOMMENDATIONS

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These policy recommendations were elaborated within the ECONNECT project, funded by the EU within the framework of the European Territorial Cooperation Alpine Space Programme and co-funded by the European Regional Development Fund.

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Why policy recommendations?

This document was developed in the context of the holistic strategy of the ECONNECT project, which was funded by the EU within the framework of the European Territorial Cooperation Alpine Space Programme and co-funded by the European Regional Development Fund. ECONNECT aims at the enhancement of ecological connectivity in the Alpine Space. ECONNECT has developed new methodologies for connectivity analysis, modelled and mapped connectivity, implemented measures in the field, and analysed legal aspects.¹

¹*Landscape connectivity: the degree to which a landscape facilitates or impedes movement among resource patches. (Taylor et al.: Connectivity is a vital element of landscape structure, 1993)*

Functional connectivity: measures how well habitats are connected and depends on both the degree of physical separation between habitats and on the ease of species movement and dispersal between. (Ecological Continuum Initiative, Glossary – resource; 2008)

As part of the communication and knowledge transfer strategy, this document has the objective to inform policy makers and decision makers at all levels, from local to regional to trans-national, about key conclusions of the project. It is intended, among others, for government agencies and agencies at EU ministries. The purpose of the policy recommendations is to stimulate further development of and support for the ecological connectivity concept, as its implementation will result in enhanced effectiveness of programmes to conserve biodiversity both in cultural landscapes and in wilderness areas of the Alps, and the ecosystem services associated with it.

To find out more about ECONNECT please visit the project website:
<http://www.econnectproject.eu/cms/>



The ECONNECT Project

The ECONNECT project was designed to improve understanding of the concept of ecological connectivity and to enhance such connectivity across the Alpine range. The project pursued a holistic approach in developing multi-tiered ecological networks that integrate protected areas, administrative bodies, scientific institutions and a multitude of stakeholders across national borders. The project, which was developed under the Alpine Space Programme of the EU, had a total budget of €3,198,240, of which the European Regional Development Fund (ERDF) contributed: €2,285,120. The project ran from September 2008 to November 2011.

Sixteen partner organisations from six Alpine countries collaborated in the project:

- Austria: University of Veterinary Medicine, Vienna - Research Institute of Wildlife Ecology (lead partner); Hohe Tauern National Park; Environment Agency Austria; Gesäuse National Park; University of Innsbruck - Institute of Ecology.
- Germany: National Park Berchtesgaden.
- France: CEMAGREF; Council of the Department of Isère.
- Italy: Alpi Marittime Natural Park; Autonomous Region Valle d'Aosta; European Academy of Bolzano; Ministry for the Environment; WWF Italy.
- Liechtenstein: CIPRA International.
- Switzerland: Swiss National Park.
- International: The Task Force Protected Areas / Permanent Secretariat of the Alpine Convention coordinating ALPARC
- Observers: Federal Agency for Nature Conservation; BfN (DE), International Scientific Committee for Alpine Research ISCAR (CH); Nature Park Logarska Dolina (SI) and Biosfera Val Müstair (CH).

Alpine Biodiversity needs Ecological Connectivity

The Alpine Arc is one of the most biodiversity-rich (Millennium Ecosystem Assessment - Mountain systems - document 293) and at the same time, in its permanent settlement areas, one of the most densely populated regions in Europe. In this human-dominated landscape, the natural environment is subject to multiple pressures driven by economic activity, including transportation, tourism, agricultural and economic development and urbanization. All of these are apt to bring about habitat destruction and fragmentation.

Fragmentation not only reduces the overall size of natural habitat but also leads to landscape “patchiness”, that is, the isolation of natural areas into distinct habitat “islands” that prevent essential ecological processes from taking place. The integrity and functioning of ecosystems, including the conservation of biodiversity and provision of important ecosystem services, largely depend on the existence of an ecological continuum. An unfragmented ecological continuum in the landscape would ideally consist of a rich variety of interconnected natural habitats hosting a rich variety of species.

The reduction of habitat fragmentation in the Alpine Arc is essential for achieving effective biodiversity conservation, in compliance with a number of international and regional conventions and agreements, including *inter alia* the Alpine Convention, the Convention on Biological Diversity and the European Union Habitats Directive, of which the NATURA 2000 network is a central pillar. It is also in line with the targets set out in the new EU 2020 biodiversity strategy.



ECONNECT Vision

ECONNECT envisions an enduringly restored and maintained ecological continuum, consisting of interconnected landscapes, across the Alpine Arc region, where biodiversity will be conserved for future generations and the resilience of ecological processes will be enhanced.

This assumes that:

i) Larger tracts of interconnected and permeable landscapes in undisturbed and human-dominated landscapes maintain more biodiversity than fragmented landscapes, which enables regeneration and renewal to occur after ecological disruption. Following disruption, smaller less diverse ecosystems may suddenly shift from desired to less desired states and their capacity to generate total economic value may decrease.¹

ii) Functioning ecological processes are the foundation for the adequate provision of ecosystem services.

This implies that:

iii) Active adaptive management and governance of resilience must not be limited to individual elements of an ecological network (corridors, core zones), but must necessarily be applied to the entire territory (matrix) and across all sectors of society, while enabling non-exclusive, multi-functional spaces for sustainable economic and recreational activities Alpine communities.

iv) In the face of marked global anthropogenic change and applying the precautionary principle,² policy makers are urged to initiate wide-reaching decision-making processes and implement any needed policy changes on a legal/institutional level to sustain desired ecosystem states and transform degraded ecosystems into fundamentally new and more desirable configurations.



¹**Total Economic Value (TEV)** appears in environmental economics as an aggregation of the main function-based values provided by a given ecosystem. Those include use and non-use values.
Use Value - Direct: Obtained through a removable product in nature (e.g. timber, fish, water).
Use Value - Indirect: Obtained through a non-removable product in nature (e.g. sunset, waterfall).
Option Value: Placed on the future ability to use the environment. This reflects the willingness to preserve an option for potential future use.
Non-Use Value: Placed on a resource that will never be used, otherwise known as Existence Value or Bequest Value.
²The application of the **precautionary principle** has been made a statutory requirement in the European Union law. See: Recuerda, Miguel A. (2006). "Risk and Reason in the European Union Law". *European Food and Feed Law Review* 5.

Executive Summary

Policy implications addressed

Title	Problem / Question	Approach
A) Valorisation of ecological connectivity	Ecological connectivity is not appreciated sufficiently by society, despite its indispensable role in biodiversity conservation and the provision of ecosystem services.	Ecological connectivity has to be valorised as an irreplaceable element for biodiversity, ecosystem services, and hence for society and economy.
B) A comprehensive legal framework in support of ecological connectivity in the Alpine region	The legal framework for establishing an ecological network covering the entire Alpine region and for local ecological connectivity measures is lacking or insufficient.	The legal framework in support of ecological connectivity measures at various scales has to be established, supplemented and improved.
C) Spatial planning as key sector for ecological connectivity	Spatial planning and implementation are conducted separately by individual sectors, whereas ecological connectivity demands a holistic, integrated approach.	Ecological connectivity has to be included in spatial planning instruments at all levels (from the local to the international level), using multi-sectoral approaches.
D) Protected area authorities as key actors	Protected area managers currently do not have the mandate and authority to initiate and support the process to ensure the spatial and functional integration of the protected area into its surroundings and to implement a regional ecological network which is necessary to preserve biodiversity at a larger scale.	Protected area managers should be supported and empowered by the administrative authority to take an active role in the process to implement a local and regional ecological network both within and outside protected area boundaries.
E) A common management system for geographic data	Currently excessive time and resources are being invested unnecessarily in iteratively procuring, processing and analysing data from multiple heterogeneous sources. Sometimes data are not easily accessible at all.	Publicly funded data and analyses have to be made openly available through a harmonised centralised data management platform.

Note: Policy recommendations are not prioritised.

A) Valorisation of ecological connectivity

While society appears to appreciate the value of protected areas (e.g. sanctuary, recreation) and generally accepts the importance of biodiversity and the associated ecosystem services, there is little understanding of the dynamic needs of our environment. It appears prudent to raise awareness of the limitations of a static protected area approach to Alpine environmental protection in the face of rapid regime changes.

Biodiversity and ecosystem services provide important values to society and economy. Ecosystem services generate much economic value, although commonly the general population is not aware about this. Likewise, ecological connectivity represents an indispensable value for society and the economy, because it plays a central role in ecosystem functioning. When the connectivity between habitats is lost, these habitats gradually degrade and biodiversity levels within them (and associated ecosystem services) decline. Hence, ecological connectivity is a determining factor for the survival, migration and adaptation potential of all plant and animal species present in a given habitat and – by extension – a determining factor for the preservation of ecosystem services.

Policy recommendation: *Valorise ecological connectivity for Alpine society and economy*

The development of an ecological network for the entire Alpine region would provide a solution to the growing fragmentation of the Alpine space especially as an adaptation strategy to climate change. The regional analysis, undertaken within the pilot region approach of the ECONNECT project has shown the striking fragmentation that currently exists in Alpine valleys and at mid-altitudinal levels (see JECAMI analysis). Where the pressure on biodiversity is highest, one can observe a high degree of habitat fragmentation, particularly in the zone between the Alpine valley-floors up to an altitude of around 1500 meters – an area of significant land use conflicts. Sustainable solutions to these conflicts require negotiations with all the relevant stakeholders.

Assessing and communicating the full values and benefits provided by biodiversity is difficult. An example of an economic valorisation attempt is the TEEB ('The Economics of Ecosystem and Biodiversity') initiative.¹ This initiative has achieved significant progress in making the economic value of ecosystems and biodiversity visible and measurable, which also includes identifying and quantifying impacts that occur when ecosystems are damaged or services are lost. With the TEEB approach it is possible to measure, monitor and report on natural capital (as is conventionally done for economic and human capital). The TEEB study not only took into consideration the so-called "provisioning" services of ecosystems, but also improved understanding of the value of "regulating" and "cultural" services, which are harder to measure.

¹ **The Economics of Ecosystems and Biodiversity (TEEB)** study is a major international initiative to draw attention to the global economic benefits of biodiversity, to highlight the growing costs of biodiversity loss and ecosystem degradation, and to draw together expertise from the fields of science, economics and policy to enable practical actions moving forward (<http://www.teebweb.org/>)



B) A comprehensive legal framework in support of ecological connectivity in the Alpine region

A supporting legal framework is an indispensable prerequisite for the establishment of an ecological continuum throughout the Alpine Arc. The necessary legal frameworks are currently inadequate, and, most importantly, do not cover the implementation of transnational ecological connectivity measures. To increase the chances of success, it is imperative to identify legal opportunities and obstacles for the feasibility of every project. An added difficulty is the lack or inadequacy of legal institutions governing private lands, where fragmentation needs to be reduced. Furthermore, due to the absence of an integrated legal framework connectivity issues are insufficiently taken into account in land use planning processes.

Policy recommendation: *Establish a legal framework to realise ecological connectivity measures at various scales*

Connectivity is an issue involving very different scales and multiple and diverse stakeholders. It became clear within the ECONNECT project that the respect of private landowners' rights is a key element for the conservation and improvement of connectivity. It is impossible to realise a sustainable ecological continuum without the participation of private and public landowners and interest groups (the ECONNECT pilot region approach is based on such stakeholder involvement).

The Austrian National Park Strategy (2010) provides an example for an inadequate legal framework. It states as one of its goals: "The national parks play an active role in the establishment of ecological networks as an integral part of regional development". (See: <http://www.nationalparksaustria.at/filemanager/download/71081/>). However, a legal framework for the implementation of this connectivity goal is lacking. Furthermore, the distribution of administrative competencies between the 'Bund' and the federal states is not clear (Mauerhofer, 2010).

The ECONNECT project analysed and compared the legal frameworks favouring ecological connectivity among the Alpine member states. One tool emerged as being especially appropriate for overcoming legal and social barriers: the EGTC (European Grouping of Territorial Cooperation), a new European legal instrument designed to facilitate and promote cross-border, transnational and interregional cooperation. The EGTC enables interest groups and cooperating institutions, as well as regional and local authorities from different member states, to form cooperative associations within legislation.



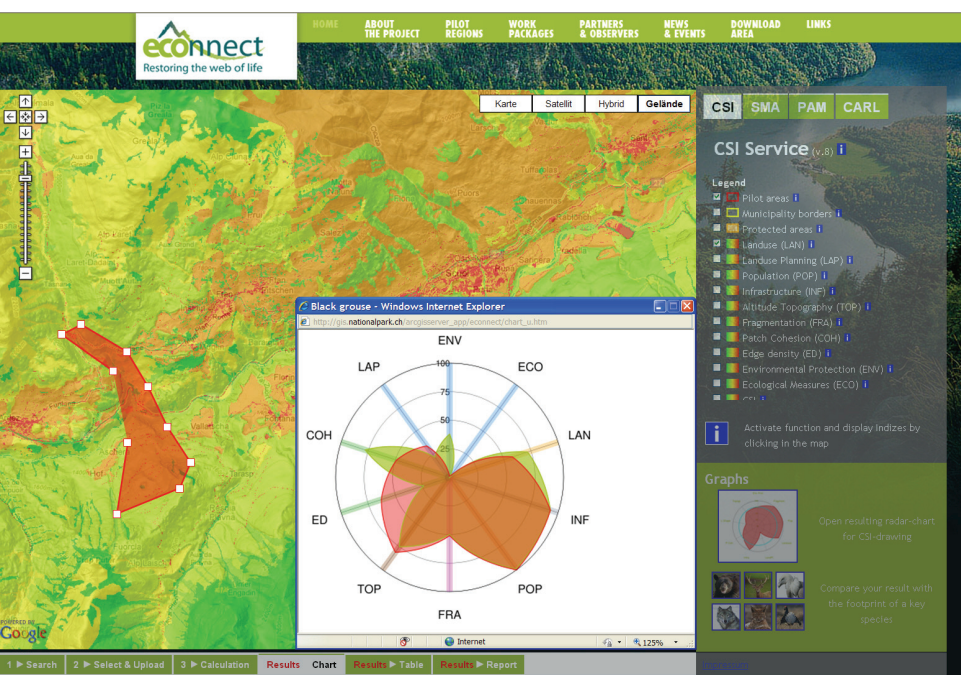
C) Spatial planning as key sector for ecological connectivity

The central role of ecological connectivity is poorly understood and even less recognised in spatial planning processes. Maintaining and restoring ecological connectivity in the landscape by preserving larger and connected tracts of habitat is essential for biodiversity conservation and for enhancing the resilience of ecological processes in the face of global anthropogenic changes in the multi-functional Alpine landscape. Today, throughout the Alpine Arc, spatial planning and implementation are conducted separately and without coordination by a multitude of individual authorities and institutions (e.g. forestry, water management, transport).

Policy recommendation: *Integrate the concept of ecological connectivity into all spatial planning instruments at all scales (local to international) using an inter-disciplinary approach*

Because the achievement of ecological connectivity requires interdisciplinary planning processes and measures, it must become central to a holistic spatial planning approach. The planning process must be integrated across all relevant sectors, including agriculture, tourism, industry, transport and environmental conservation. Ecological connectivity must be included in the spatial planning instruments of the local, regional and national management and governance authorities. Successful integration of ecological connectivity into spatial planning must consider varied social, cultural, legislative, economic and ecological demands, while assigning sufficient resources and capacities for biodiversity conservation and the maintenance of ecosystem functions.

ECONNECT has developed several tools and indicators that will facilitate raising awareness and the implementation of ecological connectivity through a multi-sectoral planning process (e.g. JECAMI - the Joint Ecological Continuum Analyses and Mapping Initiative, CSI - the Continuum Suitability Index, and CARL - the Connectivity Analysis of Riverine Landscapes).



D) Protected area authorities as key actors

Protected areas are a key element of ecological networks due to their spatial role in the network and their potentially catalytic function for the initiation and support of the process to maintain and restore ecological connectivity. Protected areas not only have valuable interdisciplinary competences and know-how regarding several aspects which are essential for the process, like communication skills and specific ecological knowledge. Moreover, according to several international and European agreements and guidelines, they are obliged to ensure the spatial and functional integration of the protected area into its surroundings (e.g. Natura 2000).

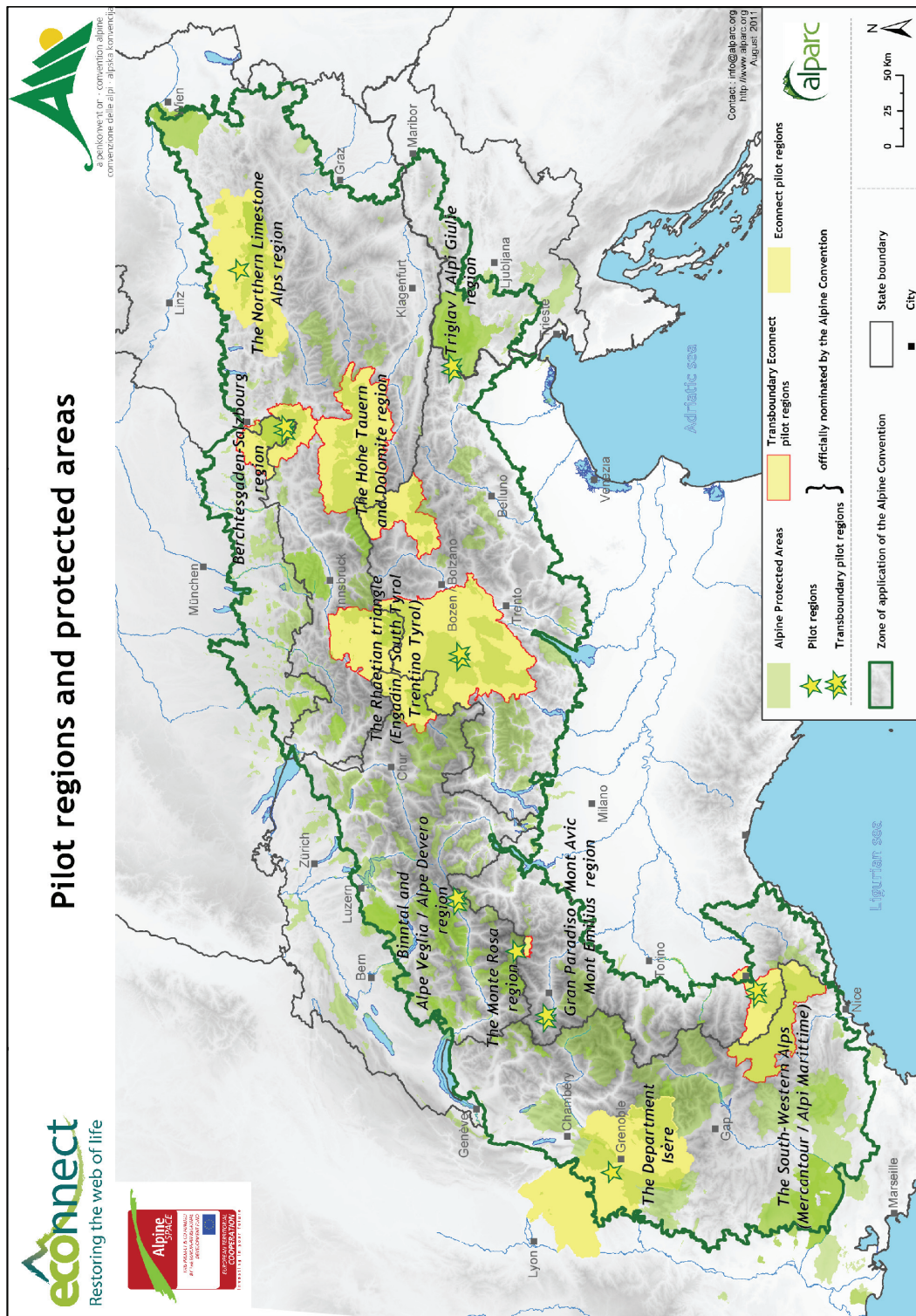
Nevertheless, these roles have limits, and it is often very difficult for protected area managers to initiate and support a planning and implementation process in territories beyond the protected area itself. It is evident that protected area managers have no direct decision competence for areas outside the protected areas' official boundaries, even though, as core zones, protected areas constitute a fundamental element of the ecological network of a certain region. The park manager needs political support and official legitimisation to participate actively and as an initiating organisation within the process. Such legitimisation is particularly important for protected areas featuring a pilot region for connectivity in the Alps. Legitimisation has to be conferred by the competent administrative organ in accordance with the political systems of the individual Alpine countries (federal or centralised systems). Currently legal competence for the landscape between protected areas is situated mainly within local, regional or national agencies and not with the protected area management authorities. Financial and human resources should be strengthened within these authorities to ensure the realisation of an ecological continuum over the long term (see Map 1).

Policy recommendation: *Enable protected area managers to play an active role in the local and regional ecological network by supporting and promoting the process and involving relevant stakeholders*

Park borders are generally too constrained to allow for fully functional ecosystems at a scale large enough to conserve biodiversity. Indeed, the Alpine parks and nature reserves alone are too small to protect Alpine biodiversity, especially in times of climate change where increased migration of fauna and flora is essential for the survival of whole groups of species. This migration needs horizontal and vertical interconnected habitats with as little fragmentation as possible.



Therefore, protected area managers should be enabled to actively support the functioning of ecological processes beyond the borders of the protected area itself. For this reason it is necessary that local or regional authorities grant them official legal competence to engage including within the peripheral zone or entire park region. Close cooperation with the competent administrative authority in questions of ecological connectivity is fundamental.



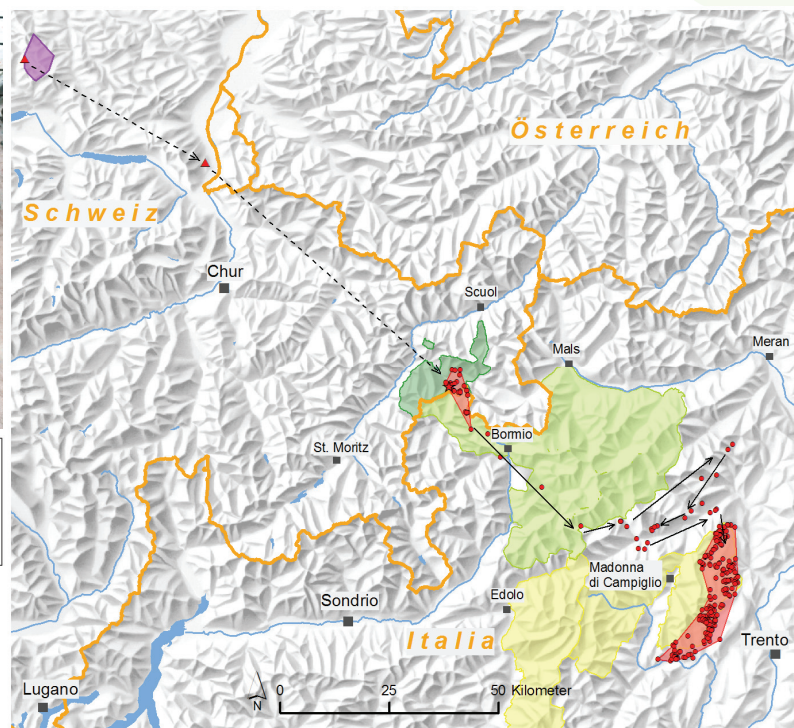
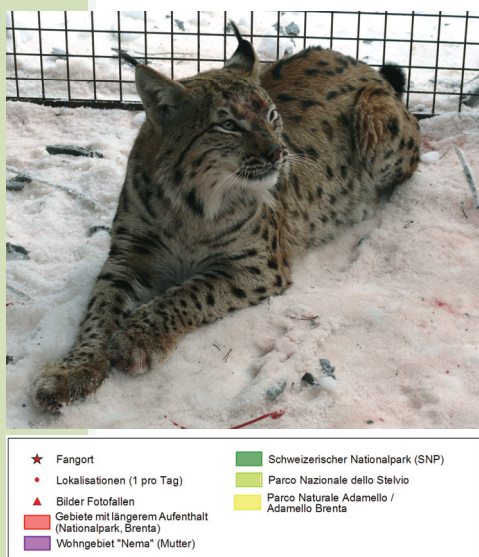
Map 1 The Alps according to the Alpine Convention with the ECONNECT pilot regions, including protected areas. Protected area managers need an official legitimisation to intervene in areas outside their territory as facilitators and partners of a process, based on stakeholder involvement, leading to an alpine ecological continuum. *With courtesy of ALPARC, Guido Plassmann & Stéphane Morel (2011).*

E) Establishment of a common management system for geographic data

Numerous, if not all, European and Alpine projects need access to a significant amount of various georeferenced data. More often than not this data has already been collected through previous European and national initiatives, projects, as well as by public administrations. However, access and analysis is frequently extremely constrained. Data collection and maintenance, for the most part, has been purchased with public funding and it appears an inordinate waste of resources to have to reacquire already existing data sets. Not only is data acquisition very costly, but there is also a risk of breaking copyright laws if licensing agreements of proprietary data are not managed well. Georeferenced data, which is needed for spatial analysis of habitats and barriers, is to a large degree owned by regional and national administrations and is thus public sector information. To reuse this information in an analysis and thus creating new information on which decisions can be based is in everyone's interest. This will enormously reduce time and money spent for data acquisition and management and will generally stimulate the creation of new information.

Policy recommendation: *Make data which has been collected with public funds openly available through a joint data management system at a European (Alpine-wide) scale*

ECONNECT has clearly shown that necessary and important data sets are widely dispersed among diverse institutions and that access is generally difficult, prohibitively expensive or impossible. In the various regions and countries of the Alpine Arc data is often acquired and stored in different formats and with divergent spatial attributes. Lack of common standards and metadata add to this unsatisfactory situation. This constitutes an impediment to the reuse and comparability of public sector information, which is essential for planning cross-border ecological networks well and efficiently. To solve this problem it is necessary to create a joint data management system with common standards, quality assessment, a maintenance strategy and easy user access. Such a system should contain basic spatial data that are commonly needed for European projects in the field of spatial and environmental planning. This data should be easily accessible in order to avoid waste of funds, energy and time. European projects producing such data should have an obligation to populate the database with data following standardised and harmonised data formats.



Further reading:

AFFOLTER, D., ARINAS ENVIRONMENT AG, HALLER, H.; "The Continuum Suitability Index (CSI) – Technical Report"; 2011. *unpublished*

BOU- VINALS, A., FÜREDER, L., WEINLÄNDER, M.; "CARL - Connectivity Analysis of Riverine Landscapes"; 2011. *unpublished*

EGTC (European Grouping of Territorial Cooperation),
http://ec.europa.eu/regional_policy/funds/gect/index_en.htm

ECONNECT Project, <http://www.econnectproject.eu/cms/>

ECOLOGICAL CONTINUUM INITIATIVE; Glossary; resource document; 2008.

FEDERAL MINISTRY OF AGRICULTURE, FORESTRY, ENVIRONMENT AND WATER MANAGEMENT, DEPARTMENT OF SUSTAINABILITY AND RURAL AREAS; "Austrian National Park Strategy"; 2010, Vienna;
<http://www.nationalparksaustria.at/filemanager/download/71081/>.

HALLER, R.; "Freier Durchgang für Tiere und Pflanzen in den Alpen"; ArcAktuell 2, 2011; p 32-33.

HALLER, H.; "Ein Jungluchs auf Reisen"; Cratschla 2/2009: p 4-13.

JECAMI (Joint Ecological Continuum Analyses and Mapping Initiative); Haller, R.; Arinas; 2011. http://gis.nationalpark.ch/arcgisserver_app/econnect/jecami.htm

MAUERHOFER, V.; „Zusammenfassung der tabellarischen Analyse "Rechtsinstrumente für ein alpenweites ökologisches Netzwerk"“; 2010; ECONNECT Project.

PERMANENT SECRETARIAT OF THE ALPINE CONVENTION; "Alpine Convention"; 1995, Bolzano (Italy).

RECUERDA, M. A. "Risk and Reason in the European Union Law"; European Food and Feed Law Review 5; 2006.

SARUKHÂN, J., WHYTE, A.; "Millennium ecosystem assessment - document 293"; 2005, Washington, Covelo London.

TAYLOR, P.D., FAHRIG, L., HENEIN, K., MERRIAM, G., 1993. Connectivity is a vital element of landscape structure. *Oikos*, 68: 571-573.

TEEB ("The Economics of Ecosystem and Biodiversity"); <http://www.teebweb.org/>

UNITED NATIONS; "Convention on Biodiversity - CBD"; 1992, New York (USA).

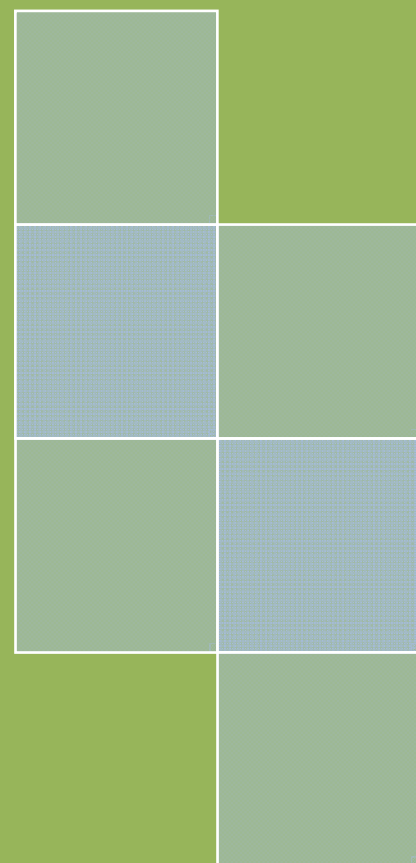
Photographs:

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