



Ecological coherence: Transboundary forest corridors and planning

A case study for the TEN-N in Strasbourg area

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1 Habitats and connectivity

1.1 Introduction

This report deals with the Trans European Nature Network TEN-N, which is a network of protected areas and its physical connections in the landscape. No natural or protected area stands on its own: natural areas are always connected somehow with surrounding areas, through physical connections (corridors) and species which move between areas. This is often called an 'ecological network'.

An ecological network consists of habitat patches for a population of a particular species that exchanges individuals by dispersal (Van der Sluis & Schmidt, 2021).

The concept 'network coherence' stems from landscape ecology, and is known under different terms, like landscape connectivity, a concept much used in ecological networks, and more recently the wider concept of Green Infrastructure. These aspects are embedded in national or regional policies and strategies.

Biological diversity is highly dependent on the quality, quantity, and spatial cohesion of natural areas. In a fragmented situation where wildlife is spread over a large area in small numbers, and remaining areas are too small, sooner or later, wildlife species will disappear. Europe is intensively used by man, with the result that habitats are 'fragmented' and sometimes lost. Due to the fragmentation of their habitat, many species in Western Europe have already disappeared or may disappear from several regions in the future. Whether species survive or not, often depends on a fragile balance. The impact of climate change may result in species and habitats moving north in Europe, may be less severe if landscapes are well connected. Also stochastic processes, an epidemic disease or a coincidence may result in the extinction of a species. Landscape fragmentation severely affects the abundance of species. An answer to this problem is improving network coherence, that is, strengthening of the ecological network. will give species a better chance of survival in the long term.

The network coherence is important to allow for repopulating or restocking of small areas and habitats, areas need to be connected to the remaining core areas for wildlife in the vicinity (R. H. Jongman, Bouwma, Griffioen, Jones-Walters, & Van Doorn, 2011; Snep & Ottburg, 2008). For birds, this means that the distance from source areas to their habitat is less than the normal distance they might cover when flying. For non-flying animals it might mean that a physical connection is required that functions as a corridor e.g., woodlands, streams, rivers, natural grasslands, and so forth (van der Grift et al., 2013; Van der Sluis, Bloemmen, & Bouwma, 2004).

The connectivity of the landscape for a species depends on the mobility of a species and the type of the available habitat and its configuration in the landscape. Likewise, for habitats it depends on the landscape matrix, the natural configuration of habitats, and inherent properties of the particular habitat. Corridors are very important for certain species. The connectivity is very much defined by species characteristics: range, habitat choice, dispersal distance, carrying capacity. These are species specific characteristics which cannot be changed. The landscape itself can to some extent be adjusted.

In the 'EU Biodiversity Strategy for 2030: Bringing nature back into our lives,' the European Commission has set ambitious targets for halting biodiversity and strengthening the Trans-European Nature Network TEN-N:

... in order to have a truly coherent and resilient Trans-European Nature Network, it will be important to set up ecological corridors to prevent genetic isolation, allow for

species migration, and maintain and enhance healthy ecosystems (European Commission, 2020a, 2020b)

And further:

Member States ... should assess carefully how to ensure sufficient connectivity in the network, taking into account the specificities of habitats and species, and decide on the best ways to do it, through the designation of protected areas, buffer zones, landscape features or otherwise (European Commission, 2020a)

Spatial connectivity is very important considering this renewed approach launched in the Biodiversity Strategy 2030, and it is a task for all member states to work on.

Studies have been done in the past on connectivity for specific ecosystem types, such as forests (C Estreguil et al., 2019). Also studies on (Pan) European networks and studies on landscape connectivity are available (Bouwma, Foppen, & Opstal, 2004; I. Bouwma, R. Jongman, & R. O. Butovsky, 2002; Van der Sluis & Bouwma, 2019; Van der Sluis, Jongman, Bouwma, & Wascher, 2012).

Much work has focused on the development of national ecological networks. This has been successful to some extent, decreasing fragmentation and meeting national targets for species and habitats conservation. However, due often national centred approaches not much attention has been paid towards transboundary connectivity. In order to realize truly a cohesive transnational European network, it is essential to address this issue.

Few studies are known to deal with transboundary connectivity (Leibenath, Blum, & Stutzriemer, 2010; Opermanis, MacSharry, Aunins, & Sipkova, 2012; Opermanis, MacSharry, Evans, & Sipkova, 2013; Rüter, Vos, van Eupen, & Rühmkorf, 2014; Vasilijević et al., 2015). However, in particular aspects of governance have sporadically been covered (Wingerden et al., 2005).

A recent report from ETC-ULS mentions: ...Natural and semi-natural landscape elements connecting Natura 2000 sites dominated by forest and woodland extend over 33 % of EU territory. Around 80 % of those Natura 2000 sites are connected by natural and semi-natural terrestrial ecosystems outside the Natura 2000 network (including agro-forestry areas) (ETC-ULS Briefing no. 05/2020: Building a coherent Trans-European Nature Network). This ETC-ULS report is based on an assessment of connectivity. To identify the links of the GI network, a resistance-surface-based connectivity approach was used. This is a technical approach, which should be related to species and habitats needs for connectivity (Carrao et al., 2020).

This report studies the transboundary connectivity, with a particular focus on the governance and international cooperation aspects, as well as the outcome, the resulting network of areas across boundaries. A proper understanding of how transboundary cooperation is facilitated and enhanced, and what is hampering cooperation, can guide in setting up arrangements that foster this cooperation.

1.2 Aim of the study

To get a better understanding of what is fostering or hampering transboundary cooperation with regard to transboundary connectivity and network coherence, a study area has been selected for a detailed assessment. A regional study is essential to understand and appreciate how local decision making processes take place, and to have a good understanding of the specific problems that are encountered. The region of study is the Strasbourg transboundary area, which is described in more detail in par. 2.2.

Aim of the study is to provide insights in particular on forest connectivity:

- How do countries define ambition levels for ecological networks or TEN-N and Green Infrastructures;
- What hampers the development of TEN-N, at administrative levels;
- How can cross-boundary networks be developed more effectively, in particular, what governance structures can stimulate transboundary cooperation;
- What are ecological requirements for trans-European forest nature networks.

The report discusses in general landscape connectivity since this is an inseparable element of network coherence, still, particular focus is on forested areas. Forests are a major structure forming element of landscapes, generally with high biodiversity, but they are also specific targeted in the Biodiversity Strategy.

This particular study has a geographic scope of Strasbourg region, and a particular focus on forest ecosystems.

The study initially encompassed also a field assessment of transboundary structures, corridors, and a comparison with the original study from Carrao et al. (2020), however, this assessment was not possible since the dataset which resulted from the ETC-ULS study is not retrievable for the detailed assessment. During the interview week in the Strasbourg region, there was no time, travelling time was a lot, and meetings were planned on the day meant for the field inspection. Second, the local experts for the field visit were not available during that period of the year. So a short visit was done, to have a better understanding of the border region, but no in-depth assessment of structures was possible at this stage.

The methods for data collection and interviews are described in Chapter 2. Chapter 3 describes the main organisations involved in transboundary networks. These are considered as the local setting. The results of the cooperation, based on the interviews, are presented in Chapter 4, this has some subjective aspect as a result of the interviews. For that reason it was decided to keep this separate from Chapter 3, despite some overlap. Recommendations for network development and cooperation are presented in Chapter 5.

Acknowledgements

The author wishes to thank the respondents for their time, contributing to the research with their knowledge and insights in regional and transboundary planning. Also thanks to all interviewees that provided many detailed comments to improve the manuscript. Thanks to Annemarie Bastrup-Birk and Sabine Roscher for their useful feed-back on earlier versions of the report.

Thanks also to Inge Koning for her assistance in realising some of the appointments, and being a translator for one of the interviews.

2 Methods

2.1 Introduction

In a pre-study general information was collected on the state of affairs in the border region of Germany and France, around Strasbourg. An internet survey provided various reports, studies, and web-pages (see 'regional documentation, under references). However, most reports found were outdated, representing the situation from a decade ago. In the next step, a list of questions was prepared, to guide the interviews with key experts or stakeholders.

Through contacts with the European Commission some key-persons in Region Grand Est were identified, that were approached for an overview of people involved in the work on (transboundary) development of the network, the 'Biotopverbund' in Germany, or the 'Trame verte et bleue' in France. This resulted in a list of some 25 people involved in the Oberrheinkonferenz / Conférence du Rhin Supérieur - Expertenausschuss Ökologie und Naturschutz / Groupe d'experts Ecologie et Protection de la Nature.

From this list, 9 people were identified for interviews. Appointments were booked, as much as possible during the first week of November. Further information was collected and a short site visit was made of the border region.

2.2 Study area

The study area runs from appr. Basel via Karlsruhe to Saarbrücken (Sarre) (figure 1). In France, this area includes the Alsace, which is part of Region Grand Est and includes department 'Haut Rhin' and 'Bas-Rhin'. In Germany this area resorts mostly under the states of Baden Württemberg, and partly Rheinland-Pfalz. The various stakeholders and dedicated authorities work at different scale levels and have different areas of jurisdiction.

The border length here is appr. 250 km. This area involves many different authorities, which also illustrates the difference in approaches of the various German and French authorities.

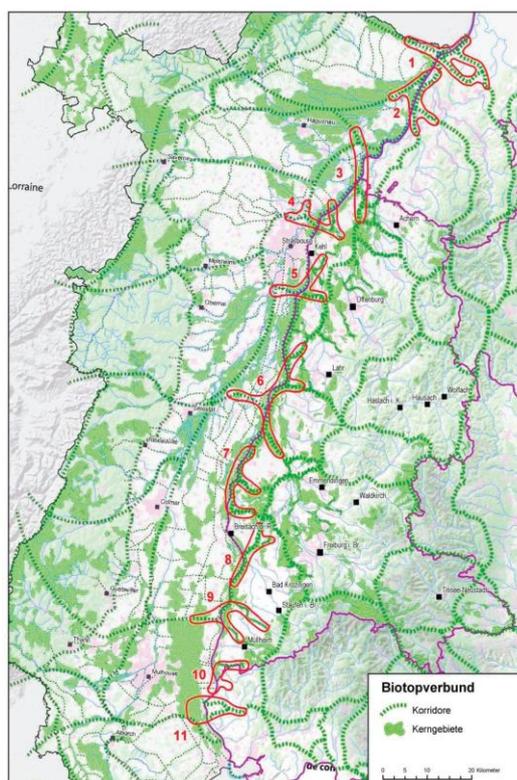


Figure 1: map showing the study area from Basel to Karlsruhe (ECOSCOPE, 2014)

2.3 Interviews

In total eight interviews were held during the week from 1-5 November, one in the following week. The respondents were equally distributed over Germany and France. The interviews also covered the different hierarchical levels. The full list with details is presented in Annex II. In Germany interviews were held with experts at Saarbrücken, Karlsruhe, Mainz, and Freiburg. In France interviews were held with planners from Strasbourg, La Petite-Pierre (Alsace), and Metz.

Most interviews were 'in person', except for where this was not possible (due to COVID regulations), or where the location was too far to reach, or when the contact person was not available during the week.

A questionnaire was prepared as a guidance for interviews: it was adjusted where necessary, or some specific elements were discussed in more detail where of particular relevance for the study.

Mrs. Karin Deventer (Germany) was interviewed online, working at the Bundesland Baden-Württemberg. She is with Mrs. Reifenstein coordinating the activities on the Biotopverbundsysteme in the entire Bundesland.

Mrs. Audrey Stephan (France) was interviewed in Strasbourg, 2-11-2021. She is working for the local representation of the French Ministry of Ecological Transition. She is responsible for the 'Trame verte et bleue', the "SRADDET", Schéma régional d'aménagement, de développement durable et d'égalité des territoires (Regional planning, sustainable development and equality of territorial scheme).

Dr. Michael Altmöos (Germany) was interviewed in Saarbrücken, 3-11-2021. He is coordinator of 'Arbeitsgruppe' biodiversity of the GrossRegion or Grand Region. He worked a long time as landscape ecologist on network cohesion, amongst others in Rhineland Palatinate. His current working area does not include the border region. He coordinates work with Gregoire Palierse from France.

Mr. Denis Münch (Germany) was interviewed online, 3-11-2021. He is with Ulrich Jäger working in the department "large protected areas, large nature conservation projects and biotope systems" – including ecological network such as wilderness – in Rhineland Palatinate. Their field of work concentrates on the technical advice of authorities and external parties as well as the preparation of technical concepts.

Mr. Francois Chazel was interviewed live on 4-11-2021 in La Petite-Pierre. The focus was on the Life Biocorridors project, for the entire Man and Biosphere reserve 'Vosges du Nord/Pfälzerwald Transboundary Biosphere Reserve'. He is responsible for the coordination of the implementation of the scheme for the French part of the Parc d'Alsace, and implementation of the actions undertaken on the territory of le Parc naturel régional des Vosges du Nord (Northern Vosges Regional Natural Park).

Mr. Klaus Dieter Schulz from the Regionalverband Südlicher Oberrhein was interviewed on 5-11-2021 in Freiburg. He is responsible for the ecological network for the Regionalverband, which is not the responsible authority but rather represents the municipalities and residents from the German territory.

Mr. Pierre Faure and Mrs. Estelle Proano-Lang from Region Grand-Est (Metz) were interviewed on the 9th of November. They are responsible for the implementation of the ecological network in region Grand-Est. This interview was done with assistance of Inge Koning, for translation of the questions.

3 Key-players in Transboundary network development

3.1 Introduction

The development of TEN-N and corridors is recognized as a positive policy for promoting nature conservation both at European and global levels (R. H. Jongman et al., 2011; Van der Sluis & Schmidt, 2021). Organisations involved in the TEN-N development can be European, regional, national and transboundary. The different administrative levels are discussed in the following paragraphs, resp. European, national, regional and transboundary organisations.

The key organisations directly involved in transboundary cooperation and management are the Regions, here Region Grand-Est (Fr) and the Länder (Ge), in particular Baden Württemberg and Saarland. These administrations are responsible for conceptualizing and implementing the ecological network. In France, work is organised by a team on the 'Trame verte et bleue' (TVB). The Landesamt für Umwelt Rhineland Palatinate, the northern part of the study area, is a partner in working groups of the Gran Region, Biocorridors and IKSr.

3.2 European organisations

In 1995 the pan European biological and landscape diversity strategy (PEBDLS) was developed under the auspices of the Council of Europe, in order to achieve the effective implementation of the convention of biological diversity (CBD) at the European level. A key element of PEBDLS has been the development of the Pan European Ecological Network (PEEN) as a guiding vision for coherence in biodiversity conservation (R. H. G. Jongman, Bouwma, Griffioen, Jones-Walters, & Doorn, 2011). PEEN was endorsed by European signatories of the Kyiv statement (Council of Europe, 2003).

To fulfil its obligations arising from the Bern Convention and to realise the Emerald Network the European Union set up the Habitats Directive (Council Directive 92/43/EEC) and subsequently the Natura 2000 network. The European Commission is overseeing the implementation of the Birds and Habitats Directive, which also asks member states to cater for network coherence. So far, there was not a very pro-active approach, neither from the Council of Europe and the European Commission. Recently under the Biodiversity Strategy 2030 this approach has been reinforced though and countries are encouraged and -where possible- supported, through guidance documents and defining targets which can foster improved network coherence.

In particular two organisations have been involved in collecting knowledge and information on ecological coherence: the Joint Research Centre, and the European Environmental Agency, partly through their Topic Centres (ETC-BD and ETC-ULS). This resulted in publications on forest connectivity such as Christine Estreguil, Caudullo, and De Rigo (2014) and such as on Green Infrastructure (C Estreguil et al., 2019). Publications from EEA and ETC included a study on generic connectivity (Strnad et al., 2013), connectivity for priority habitats (Van der Sluis & Bouwma, 2019) and on Green Infrastructure (EEA, 2018).

Some larger NGOs such as IUCN and WWF have also prepared guidance documents to improve network coherence (Hilty et al., 2020; Vasiljević et al., 2015). An organisation that ceased to exist but worked a lot on network coherence across Europe was the ECNC, European Center for Nature Conservation (Biro, Bouwma, & Grobelnik, 2006; I. Bouwma et al., 2002; I. M. Bouwma, R. H. G. Jongman, & R. O. Butovsky, 2002).

3.3 National organisations

3.3.1 French key-players

Since 2007, the green and blue infrastructure is one of the major national projects supported by the 'Ministère de la Transition Ecologique et Solidaire'. The main legislative milestones are the law n° 2009-967 on the implementation of the 'Grenelle de l'Environnement', or the environmental Round Table that brings together state and civil society in order to define new actions for sustainable development. The second law n° 2010-788 on national commitment for the environment proposes and specifies a set of measures intended to preserve biological diversity. It provides, inter alia the basis for the green and blue infrastructure (Trame vert et blue, TVB), an approach that aims to maintain and restore a green-blue network (Van der Sluis & Schmidt, 2021).

At the national levels the guidelines and objectives of the policy have been defined. At the regional levels the ecological network is defined, and actions are planned to improve network coherence. Implementation takes place at the local level, where it is integrated in the plans and projects can be initiated. Each level takes into account the superior level of planning. The planning is guided through national committees, and subsequent regional committees.

Three levels of application

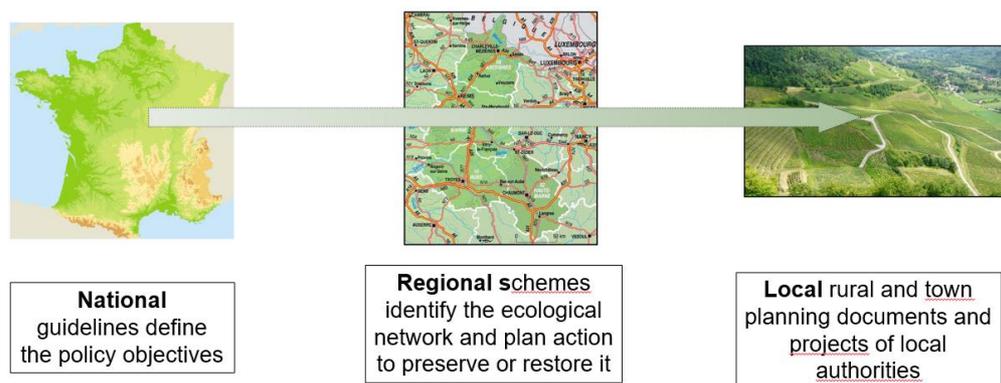


Figure 2: The implementation of the 'Trame verte et bleue', at different levels

At the national level a Trame verte et bleue (TVB) operational committee (COMOP) was charged with the task of defining the approach, means and conditions of implementing the TVB. The work was completed in September 2010, and prepared the basis for the TVB and led to the production of three documents, national guidelines on the conservation and enhancement of ecological continuities. In particular the 'schéma régional de cohérence écologique' (SRCE), or plan for regional connectivity. SRCE Alsace is since January 2020 officially replaced by the "Schéma régional d'aménagement, de développement durable et d'égalité des territoires" SRADDET.

A national TVB committee was established, which is a forum for information, discussion and consultation on all subjects relating to ecological continuities, their preservation and enhancement. The Committee is involved in developing and updating guidelines, and following up on the national guidelines for preserving and enhancing ecological coherence; but also following policies and scientific information on ecological coherence. Since the decentralisation law of 2016 the Regional Council (local parliament) is in charge of the "trame verte et bleue", with the adoption of SRADDET.

3.3.2 German key-players

Germany is a federal republic, consisting of 16 member states. The states (Bundesländer) are relatively autonomous regions. For that reason they are discussed here as national organizations. Germany identifies several layers of government: the Federal Authority (Bund), States (Länder), Districts (Kreise), non-district cities (kreisfreie Städte), association communities (Verbandsgemeinde) and Municipalities (Gemeinden). The 'Bundesnaturschutzgesetz' is a framework legislation: the states / Bundesländer have the power to legislate as long the federal authority / Bund has not made use of its legislative competence by law (Konkurrierende Gesetzgebung). So in the case of the conservation law (Bundesnaturschutzgesetz) the states / Bundesländer can only supplement and/or specify. Deviations are to be marked.

Defragmentation is an important issue in Germany. Work on defragmentation is organized by the states – for example State Agency for Nature Conservation – in cooperation with the Federal Nature Conservation Agency (BfN), consultants and universities, such as the university of Kiel and the university of Kassel. In the planning and realization of linear infrastructures (construction of new roads and expansion of roads, railways, canals) the existing ecological interconnectedness is to be preserved in such a way that colonization and repopulation of habitats by naturally-occurring species can take place in sufficient numbers. Depending on the affected habitats and species, special measures can then be planned to preserve these network relationships.

States and federation work together on the ecological network under coordination of the Federal Nature Conservation Agency (BfN) (Altena, Fanck, Jedicke, & Löw, 2018; Finck, Riecken, & Ullrich, 2005). In the area of study are three states, or 'Bundesländer': Baden-Württemberg, Rhineland Palatinate and Saarland.

The Bundesland Baden-Württemberg is covering four 'Regierungsbezirke', Karlsruhe, Stuttgart, Freiburg and Tübingen. The Bundesland prepares the country-wide concept for ecological connectivity (Verbundsysteme), and prepares the management plans for protected areas. Under Baden-Württemberg resort 44 Land- and Stadtkreise. At the level of the 'Landkreis' are decisions made on management e.g. of meadows, or advise is given to land owners, farmers, on conservation management.

Land Rhineland Palatinate is organised in two areas of responsibility of the upper state authorities "Struktur- und Genehmigungsdirektion Nord" in Koblenz and 'Struktur- und Genehmigungsdirektion Süd' in Neustadt an der Weinstraße. Hereunder resort 24 Landkreise and 12 kreisfreie Städte. The State Agency for Nature Conservation is responsible, among other things, for the creation of a nature conservation concept for the state-wide ecological connectivity (landesweiter Biotopverbund).

Saarland is the smallest state, with the capital city Saarbrücken. There is no subdivision in 'Regierungsbezirke'.

3.4 Regional organisations

The Region Grand-Est is a very large region, which extends all the way from the German border to Paris. It is a merger since 2016 of the former three regions Lorraine, Alsace, and Champagne-Ardenne. The planning of the network still is done at the offices of these regions (i.e. Strasbourg, Metz and Châlons-en-Champagne). The Region is responsible for all spatial planning, conservation activities, as well as the allocation of funds. In Lorraine 2 staff are involved in the ecological network, in Strasbourg also two employees.

In Germany is the 'Regionalverband Südlicher Oberrhein' (Baden-Württemberg), the 'Planungsgemeinschaften Westpfalz' (Rhineland Palatinate) and the 'Planungsgemeinschaft Verband Region Rhein-Neckar' (Rhineland Palatinate), a community based institution, dealing with the common interests of towns and municipalities. They also voice opinions of the region.

Their main field of work is the regional planning (Regionalplan), and the land use plan (Landschaftsrahmenplan). They advise the communities, they represent the area's interests e.g. with the federal government or the EU, and they support the implementation of the TEN-N.

3.5 Transboundary organisations

Except for the responsible administrations, there are various other organizations that have an important role to play. First of all, the **Groß Region/Grande Region**, the **Oberrheinkonferenz / Conférence du Rhin Supérieur** (or, in full: **Expertenausschuss Ökologie und Naturschutz / Groupe d'experts Ecologie et Protection de la Nature**), and the International Commission for the Protection of the Rhine ICPR (Internationale Kommission zum Schutz des Rheins/Commission Internationale pour la Protection du Rhin).

The '**Groß Region/Grande Region**'¹ was established around 2014, to coordinate various activities, including the transboundary nature network (since 2018). This body involves all countries, from Wallonia (Belgium), France, Luxembourg and Germany. In the study area Saarland and Region Grand Est are situated. The office is in 'Haus der Groß Region' in Esch-sur-Alzette (Luxembourg). The Region Grand-Est took over the presidency for 2021-2022. The Groß Region/Grande Region tries to stimulate a shift from knowledge sharing to concrete cooperation actions in the field with regard to the Green and Blue Network, by building on existing activities. It is a much appreciated cooperation, despite the fact that it has no funding from its own. However, the trans-boundary cooperation demands much more time compared to regular conservation projects.

The Groß Region/ Grande Region meets twice a year for half a day. Issues on the agenda are in particular Natura 2000, corridor development, but also management plans for protected areas, threatened species and species protection, invasive alien species and climate change. Besides that there is intensive mail contact, and other informal contacts also at personal level. For some protected areas there is very intense cooperation to such as the Vosges du Nord - Pfälzerwald Biosphere reserve.

The Groß Region/ Grande Region identifies hotspots in the where cooperation is essential in the transboundary area (Altmoos & Hengen, 2017). Each of the countries working in the Groß Region maintains its own ecological network planning. So far, these have not always matched at the national borders due to a lack of harmonisation in approach. It is therefore important to identify at least the medium and large "nodes" in the network and transitions at the administrative borders within and between the countries. Concrete practical projects that strengthen the nature network and its nodes should also be based on such priorities. The identified nodes can serve as inspiration for projects to be initiated. Conversely, practical projects could particularly strengthen existing networks in terms of expanding habitats and its species endowment, therefore create such nodes. Last but not least, the definition of the network and its nodal areas also contributes to the coherence of the Natura 2000 network at the European level.

¹ <http://www.granderegion.net/en>

The Groß Region/ Grande Region has also developed a data portal and shared GIS: GeoConnectGR, with data on the ecological network ² (fig. x). Further, a web portal was developed on biodiversity, which provides statistics on species and habitats in the Groß Region/ Grande Region³. However, bureaucracy stopped the further development of the portal.

Parcs naturels et réseau écologique des sites protégés
Naturparke und ökologisches Netzwerk der Schutzgebiete

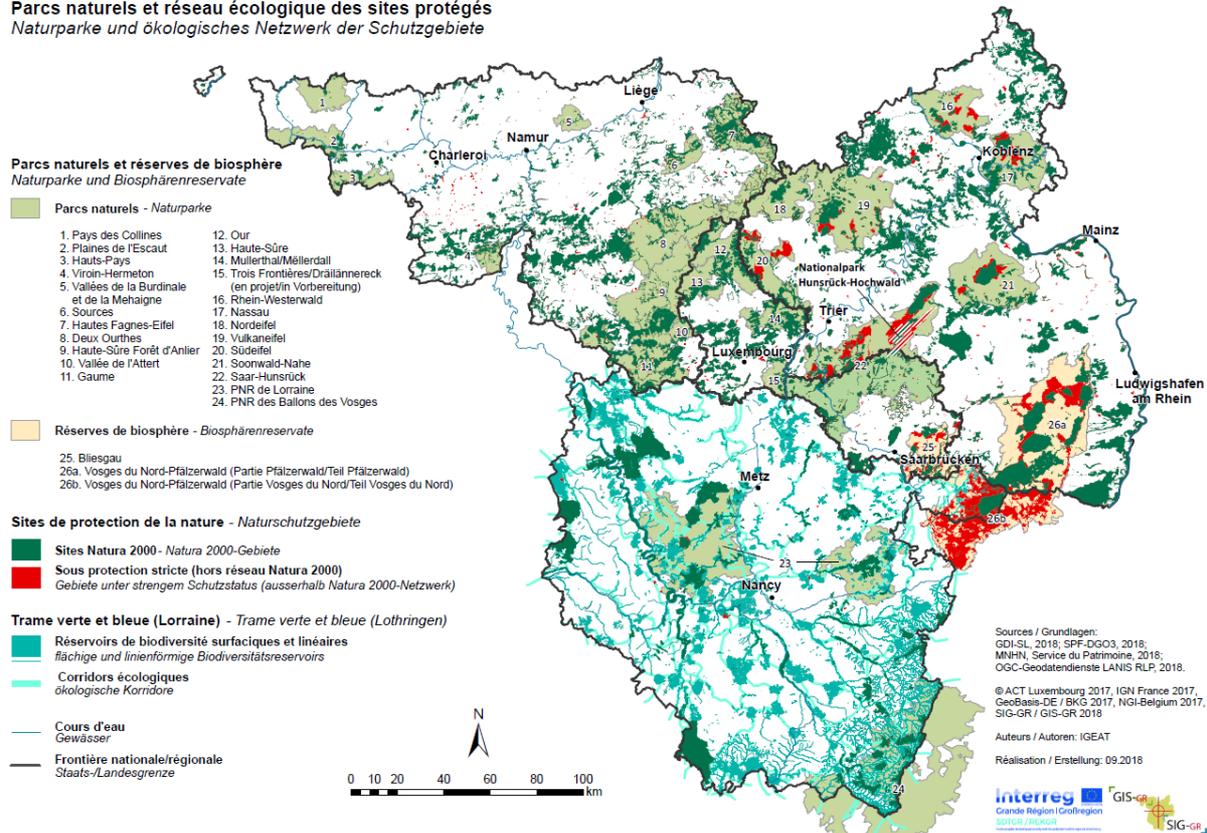


Figure 3: Protected areas and important sites in the Groß Region/Grande Region (Source: GeoConnectGR)The other important body is the ‘Oberrheinkonferenz / Conférence du Rhin supérieur’ (or, in full: Experten Ausschuss Ökologie und Naturschutz/Groupe d'experts Ecologie et Protection de la Nature)

In this body Germany, France and Switzerland are represented. The French national authority is represented, as well as the direct involved (French) region and German ‘Länder’. In France Region Grand-Est, in Germany Regierungspräsidium Karlsruhe, Region Südlicher Oberrhein, and the Landesamt für Umwelt Baden Württemberg. Only for the Northern Alsace, the German side of the border is not included (figure 4). They meet twice a year, and one of its aims is to remove administrative barriers. Some participants mention that this is not a very intense cooperation. They also identify joint projects and major transboundary corridors including some urban corridors. Also, one of its activities has been the mapping of habitats both in Germany and France.

² https://www.sig-gr.eu/de/cartes-thematiques/environnement/protection_nature/parcs_naturels_reseau_ecologique_sites_proteges_2018.html

³ <http://www.bio-gr.eu/en>

Nine states and regions in the Rhine watershed closely co-operate in order to harmonize the many interests of use and protection in the Rhine area in the **International Commission for the Protection of the Rhine (ICPR)** or 'Internationale Kommission zum Schutz des Rheins' IKSR / 'Commission Internationale pour la Protection du Rhin' CIPR. The members of the ICPR are Switzerland, France, Germany, Luxemburg, the Netherlands and the European Commission, which co-operate with Austria, Liechtenstein and the Belgian region of Wallonia as well as Italy.

There are also a number of transboundary cooperations, mostly around national parks that straddle the border, such as Conservatoire des espaces naturels de Lorraine CENL, Parc Naturel Régional de Lorraine PNRL, Réserve Naturelle Nationale de la Petite Camargue d'Alsace, Parc Naturel Régional des Vosges du Nord PNRVN and Conservatoire des sites d'Alsace.

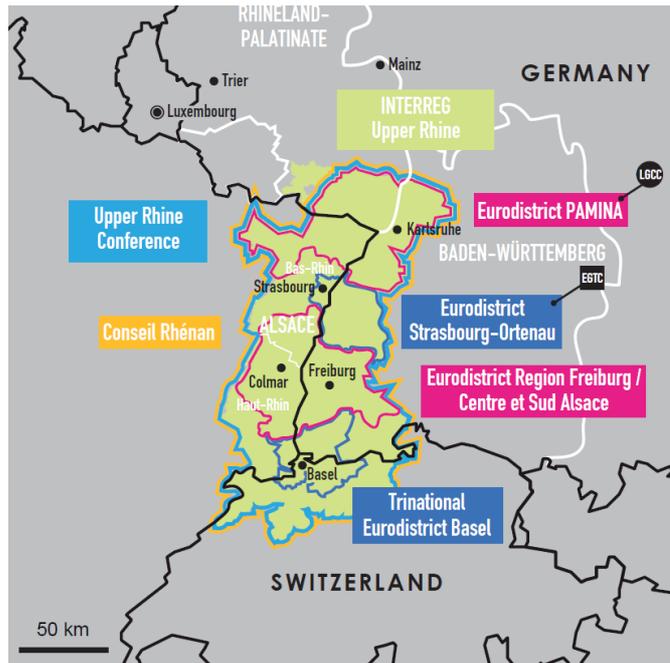


Figure 4: The territory of the Oberrheinkonferenz /Conférence du Rhin Supérieur

The (management of) Parc Naturel Regional des Vosges du Nord is an important organisation, since the area of the parc forms part of the transboundary Man and Biosphere reserve. They have been actively cooperating in the two areas straddling the French-German border. Their tasks consist of the implementation of conservation policy, and specifically coordinating construction and management works on the ground, liaising with the land owners and the general public.

Further, there is a Transboundary 'Man and Biosphere Reserve' (MaB). This area consists of Biosphärenreservat Pfälzerwald-Nordvogesen and Parc Naturel Regional des Vosges du Nord. There are two partners across the boundary that are together implementing the MaB: Naturpark Pfälzerwald (based in Lambrecht), and the French Sycoparc (Syndicat de Coopération pour le Parc), based in La Petite Pierre. The SYCOPARC is an association of 'communes', that funds the activities. Projects that are implemented are funded by Europe, France, the region, departments and administration in charge of implementing policy ⁴. The MaB reserve is organized by those two organisations, each having a coordinator for the MaB.

The Man and Biosphere reserve has benefitted for two consecutive contracts from LIFE funding since 2015. At the time of interview, the work in Germany has been finalised, France has requested for a contract extension due to unforeseen problems while implementing the activities as foreseen in the LIFE project. In particular the presence of WW II ammunition resulted in large delays in stream restoration works, and required additional partners (water board) to fund the much higher costs for restoration. Also the very dry summers and need for watering resulted in a large die-off of the planted hedgerows in France.

⁴ <https://www.parcs-naturels-regionaux.fr/en/mediatheque/videos/how-does-regional-natural-park-work>

One of the aims of the project is to harmonise the corridors within the MaB reserve and to identify restoration needs. There are slight difference though, where in Germany the focus is on wet grasslands and 'Streuobstwiesen', or old orchards with meadows, France has focused more on the restoration and planting of hedgerows. The project will come to an end in June 2022, after which an evaluation will follow.



Picture 1: Valuable 'Streuobstwiesen' and 'Magerrasen' habitats, Northern Alsace, autumn 2021

The International Commission for the Protection of the Rhine ICPR (Internationale Kommission zum Schutz des Rheins/ Commission Internationale pour la Protection du Rhin) is involved in the creation of a concept for the ecological connectivity among the Rhine and is supporting the realization of the project 'Rhine 2040' (<https://www.iksr.org/en/>).

4 Results interviews on cooperation

4.1 The ecological network conception

4.1.1 Introduction

In the introduction the importance of spatial connectivity is considering the Biodiversity Strategy 2030 is highlighted. The Trans-European Nature Network TEN-N is considered the cornerstone, through which the network coherence should be ensured. The network is for all member states a task to work on. However, if, and to what extent this is incorporated in spatial planning depends very much on the country (Van der Sluis & Schmidt, 2021). The implementation will differ in the various countries and regions, it depends on the governance system, and how responsibilities are delegated, and an important difference is unitary or federally organized states. Therefore the respondents in the survey were asked what the legal obligations are in France and Germany.

4.1.2 Ecological network in France

In France the ecological network is organised in the 'Trame verte et bleue' (TVB), or green and blue network. This resulted from a large-scale Round table in 2007, the 'Grenelle environment'. One of the resulting actions was the definition of the TVB. The TVB takes into account the ecological functioning of ecosystems and species in land use planning and focuses on 'common' biodiversity. The TVB consists of five subnetworks, e.g. the wooded subnetwork and the wetland subnetwork. The TVB consists of core areas, buffer zones, and connecting corridors. The network is established on the basis of the different constituting habitats.

The network is defined at three levels: at the national level, the regional level (which is a regional design, or detailing, based on the national design) and at communal level. It is an hierarchical concept, whereby the lower authorities have to follow. Based on national guidelines, regional and local networks are being developed. Regional Ecological Networks (REN) were designed with several methods freely chosen by the regions (e.g. least-cost path). Barriers to species movements (roads, dams, other infrastructure) have been identified and plans for actions formulated to preserve or restore the core areas and corridors.

The first draft of the national network stems from 2012, and was based on the Corine land cover mapping. At the national level subnetworks have been defined for various habitats (open land, littoral, aquatic, wooded, wetlands), which integrated form the French ecological network for green and blue habitats.

Every region had an assignment to draft a more detailed TVB. The map was entirely based on the continuity of habitats and land use, no target species were used for the development of the map. However, presence of some endangered species would give the area additional importance in the network. Species mentioned were Capercaillie, Black stork, bat species, Wild boar (problematic for forest regeneration), woodpeckers, Cerambix beetle, Grass snake and Hazel grouse. For some species a national action plan was developed, others are regarded at a 'second level'.

The region has to ensure that the network is finetuned in discussion with the water agencies, in particular for the water courses and wetlands. However, each region has a followed a (slightly) different approach. This is demonstrated in the box, next page, a table that compares the approaches for the identification of the network for the lynx in France (in French, based on (Assmann, 2011)). This resulted in a TVB map for each (former) Region Alsace, Region Lorraine, and Champagne-Ardenne,

which later merged into Region Grand-Est. The description below shows the differences in approach between neighbouring regions.

In the Alsace, they first defined the ecological matrix, or dominant landscape type at scale 1:250,000. In the next step they defined primary and secondary core areas, as well as restoration areas. Then the natural and artificial barriers were identified for species. Finally they identified the corridors which would connect the identified core areas.

For Lorraine, base maps were prepared at scale 100,000. First a nodal map was prepared with important protected areas. Next, a map was prepared with possible expansion areas or buffer zones. Next step, a map was prepared for development areas, areas with a good potential for species conservation. Finally, a landscape cohesion map was prepared.

The different networks were merged in the SRADDET⁵, 'Schéma Régional d'Aménagement, de Développement Durable et d'Égalité des Territoires'. This is the strategy for the planning and sustainable development of the Grand Est in 2050. This strategy is supported and developed by the Grand Est Region but was co-constructed with all its partners (local authorities, State, energy players, transport, environment, associations, etc.). After this extensive consultation, the SRADDET was adopted by the Regional Council in January 2020.

They have recently started a new mapping exercise at Region Grand-Est, which is currently still under development.

⁵ <https://www.grandest.fr/politiques-publiques/sraddet/>

Box 1: Comparison of the definition of the network for the lynx, in three sub-regions of Grand-Est (Assmann, 2011)

Annexe 2 : Tableau récapitulatif des caractéristiques des cartographies TVB des 3 régions.

	ALSACE	FRANCHE-COMTE	LORRAINE
<u>Maître d'ouvrage</u>	Région Alsace	DREAL Franche-Comté	Région Lorraine
<u>Prestataire</u>	ECOSCOPE	DREAL Franche-Comté	ESOPE-SEMAPHORE
<u>Date de réalisation des études TVB</u>	2003 (plaine) 2009 (massif)	2007	2009
<u>Echelle</u>	1/250 000	1/125 000	1/100 000
<u>Données utilisées*</u>	BD OCS (2002) BD Carto (1998) CLC (90) GERPLAN (CCPR) Cartes SERTIT (1992) DDAF	CLC (2000) Données de falaises, vergers et zones humides.	CLC (2000) IFN
Méthodologie*			
<u>Approche</u>	Approche Paysagère.	Approche espèce.	Approche espèce.
<u>Zones nodales</u>	Tous types de milieux	Milieux forestiers uniquement	Tous types de milieux Milieux forestiers hors périmètre de protection.
<u>Zones d'extension et de développement</u>	Milieux forestiers, prairiaux, rupestre et aquatiques hors périmètre de protection.	Milieux forestiers hors périmètre de protection.	
<u>Corridors</u>	Tracé des corridors par interprétation visuelle, selon des critères écologiques, paysagers et sur dires d'experts.	Tracé des corridors à partir de calculs coûts-déplacements puis confirmation par consultation d'experts.	Pas de tracé des corridors mais analyse des continuités écologiques à partir de la méthode de dilatation-érosion.
<u>Modélisation de la matrice</u>	Pas de modélisation.	Modélisation de zones de perméabilités (à partir des calculs de coûts-déplacement).	Modélisation de zones de perméabilités.
<u>Sous-trames étudiées</u>	Milieux forestiers, prairiaux et intermédiaires.	Milieux forestiers, agricoles extensifs, humides et thermophiles.	Milieux forestiers, ouverts, et humides. (et récemment thermophiles**)

* Continuum forestier
** Emilie Lagarde, 2009

4.1.3 Ecological network in Germany

Germany has the 'Bundesnaturschutzgesetz' at the federal state level. In particular, chapter 4, *section 1: Biotopverbund und Biotopvernetzung; geschützte Teile von Natur und Landschaft*, § 20 mentions the requirement that each Bundesland should include at least 10 % of its territory for the nature network. Furthermore § 21 defines the purpose, aim and content of the statutory biotope network (gesetzlicher Biotopverbund). The aim for 10 % has been raised for the land Baden Württemberg to 15 %, which is considerably higher. It illustrates also how countries may take different choices in their policy implementation.

The establishment of the 'Biotopverbund' has the aim to protect wild species – including their habitats, biotopes and populations –, restore, protect and create areas with functional ecological interactions. It also should improve the coherence of the Natura 2000 network. The Biotopverbund is anchored in the Nature conservation law, a federal law dating from 2010. The Biotopverbund consists of core areas, connecting areas (stepping stones) or landscape elements. The network can consist of formally protected areas or can be protected by other instruments, for example contracts. Landscape elements and structures that enhance connectivity over large distances are of particular interest, e.g. water courses, stream valleys and forest fringes. Also linear elements or point elements like hedgerows, solitary trees, ponds, which are of importance for the network should be protected or restored as part of connectivity measures.

In Germany spatial planning takes place at various levels or plans. At the federal state level (Bund) it is the state spatial plan (Bundesweiter Raumordnungsplan), at the Bundesland or country level it is the country spatial plan (landesweiter Raumordnungsplan), at the level below it is the partial plans of countries (Regionalpläne).

The German national maps were prepared from 2004-2010: a map with areas of national importance (überregionaler Bedeutung), map of core areas and nationally important transboundary corridors based on habitat type, map with gaps in areas for the national ecological network (Fuchs et al., 2010). At transnational level, the large international corridors were identified, and since then there have been further developments at federal and state level. The Vosges du Nord were identified as a transnational corridor, of particular importance for the Lynx and Wild cat. The maps, however, are not legally binding. Such data and information can be a basis for the regional development of the network, into the 'Raumordnungsplan', which is regionally binding. In Practice, however, the bottom-up approach is more the norm.

The 'Landschaftsrahmenplan' (LRP) is a document at regional level, containing a description of natural values, the protected sites and areas, and the required protective, management and development measures. The landscape planning law (Landschaftsplanung, §§ 8-12 BnatSchG) was implemented in 1976 with the nature conservation law (Bundesnaturschutzgesetz). It is the central planning instrument of nature conservation and landscape management and spatially defines the aims of nature and landscape conservation/management as the basis for acting in a precautionary way at local and regional levels. Requirements and measures to achieve these aims must be presented and justified, and should contribute to their implementation⁶.

In Germany the approach may differ per Bundesland or country. In Rhineland Palatinate they started with the development of the ecological network as early as 1991. Based on four case studies, each smaller areas (Kreis) in Germany it was defined what the presence and quality is of valuable habitats

⁶ <https://biodiversity.europa.eu/countries/germany/green-infrastructure>

and areas; target maps were prepared for ecological networks, in two steps (Lüttmann & Servatius, 2015): first, the planning targets are defined based on the available reports, the inventory of habitat types. Next an assessment is done of the species which are representative for the habitat types, their specific habitat requirements of the species, quality of the habitat etc. Based on this the targets for corridors and core habitats is planned.

Baden-Württemberg started with a special programme for the development of the network in 2020. It was initiated with a plan for open areas, 'trockene mittlere Standorte'. In addition a 'Wildwegeplan', a wildlife network map was prepared for forest areas in 2012. This was developed by the ILPÖ Institute of Landscape Planning and Ecology and the Arbeitsgruppe für Tierökologie und Planung. It was coordinated by Landesanstalt für Umwelt, Messungen und Naturschutz Baden-Württemberg LUBW.

Rhineland Palatinate started with the development of the ecological network as early as 1991. The nature conservation concept is called 'Planung vernetzter Biotopsysteme Rheinland-Pfalz' (VBS). The concept presents the goals of species protection and biotope protection for all rural districts and urban districts, with the exception of residential areas. It is 'recommended' to integrate the nature conservation concept 'Planung vernetzter Biotopsysteme Rheinland-Pfalz' (VBS) in the statutory ecological network (§ 21 BNatSchG) and in the spatial planning, it is however not required by law. The VBS is based on a biotope-related approach in combination with an indicator species-related approach. The map series was updated in particular by evaluating official environmental data and on the basis of expert assessments. Also linear features such as hedgerows and riverine forests are incorporated. In total there are clearly defined biotope types as so called goals. In addition, there are other target categories to identify preservation and potential in the area.

Saarland developed the concept of 'Biotopverdichtung' around 2000, in particular for forests, dry habitats, and wetlands.

4.1.4 Key species and habitats for network development

Key species were identified for various types of habitats. Not all states do use key species, e.g. Rhineland Palatinate has them (Lüttmann & Servatius, 2015) but Saarland not. Saarland rather focuses on functional ecosystems. In Baden-Württemberg a study has been done to assess and select target species which can form the basis of the ecological network (Von Geißler-Strobel, Jooß, Hermann, & Kaule, 2006). This shows the variability in approaches, but also the criteria differ on which basis key species are selected. Rhineland palatinate also uses more general indications like 'a minimum patch size of 100 ha deciduous forests with priority for nature conservation', to allow for a complete set of typical species for this habitat type, and natural processes. Likewise, dry-oak forests Galio-carpinetum should measure at least 50 ha and distances between patches should preferably be less than 5 km (Lüttmann & Servatius, 2015). Very detailed species tables were used for the design of the ecological network for RLF⁷. For habitats and species the basis for the selection is primarily the protection status and the importance for the region (D. Münch, pers. comm.).

The key species can be considered as umbrella species: through their promotion many other species are likely to benefit. The habitats and key species are:

⁷ <https://lfu.rlp.de/de/naturschutz/planungsgrundlagen/artdaten/>

Table 1: Key species for network development in Germany and France. Formal status differs for the country. Based on respondents' information and various planning studies (list is not complete)

Habitat or ecosystem type	Key species Germany	Key species France
Forest areas	Lynx, Wild cat, Red deer, Wild boar, Black woodpecker, Hazel grouse, Capercaillie	Eurasian Lynx, Capercaillie, Wood Grouse, Black Stork, Wild boar, Cerambix sp.
Arable land	European hamster	Yellow-bellied toad
Dry biotopes	Wall lizard, Smooth snake, European green lizard	
Marshes and wetlands	Common spadefoot, Treefrog, Moor frog, Agile frog, Common spadefoot toad	Black Stork

The European wildcat (*Felis silvestris*) is in France a national key species for ecological corridors. In addition, in France they monitor the development of woodpecker species as well as a series of butterflies which are indicators for the forest and arable habitat. Except for the flagship species, also species diversity and species richness are monitored, in region Grand-Est in total 117 forest vegetation communities are identified.

The Eurasian lynx may have been studied best, and is one of the rarest species involved. Several LIFE projects have been dedicated to this species, and studies were done to identify the network and corridors for the species (Assmann, 2011). An important link is the connection on the Northside of the Alsace, towards Germany. Another important link is southward, the so-called Belfort-gap, which is however not further discussed here since it is out of the geographical scope of this study. The Belfort Gap (French: Trouée de Belfort) or Burgundian Gate (German: Burgundische Pforte) is the area of relatively flat terrain between the Vosges Mountains to the north and the Jura Mountains to the south. It marks the watershed between the drainage basins of the River Rhine to the east and the River Rhône to the west.

Protection of migration corridors and developing wildlife crossings are important. There are two green bridges in the Palatinate Forest that are frequently used by lynx. As a result of the LIFE project, the lynx spread to large parts of the Palatinate Forest and the Northern Vosges, and also to neighboring areas such as the Donnersberg, the Westrich and, on the French side, the Central Vosges. See also the map identifying key corridors⁸.

Except for species, specific habitats are targeted as well. First of all, the old growth forest is a very important element. In Germany it was introduced in the Rhineland Palatinate under the BAT concept (BAT = Biotopbäume, Altholz, Totholz, or biotope trees, old wood, dead wood), in 2010 (Scheid, 2012). The Pfälzerwald stands out because of its core zones, forest areas that are left undisturbed, with natural dynamics.

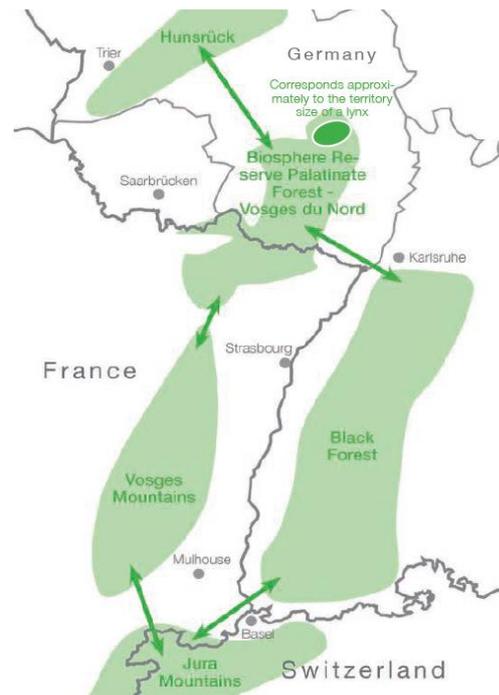


Figure 5: Populations of Eurasian Lynx have been reconnected through measures from the LIFE Lynx programme

4.2 Implementation of measures

4.2.1 Promoted actions to improve spatial coherence

France

The majority of the forests in France are in the hands of private land owners (75%), which requires their cooperation in any planning or implementation action. The focus has been therefore on the restoration of forest ponds, and in some cases to restore old forest kernels, that is, mostly in difficult accessible areas which are of less commercial interest. In farmland it is mostly organic farmers, that are interested in measures such as planting hedges.

Old forest core areas were identified with potential for protection, and meetings were held with land owners. In some cases agreement could be reached on strict protection of the area. In general owners were reluctant to participate due to the economic importance of these areas. The areas for which agreement was reached were usually difficult to harvest, on bad soils or steep slopes. The agreement for not harvesting is binding for 30 years.

In the northern Alsace work has been done on the rivers and wetlands, open agricultural landscapes (orchards, hedges, meadows in Germany) and forests (riparian forests, diversification of coniferous plantations, old growth), taking out culverts and dams and development of fords across the streams. This has been funded by the LIFE project. The activities took longer than foreseen, due to old bombs and ammunition, which also raised the costs considerably. The French partners in the LIFE program managed to cover the costs with support from the partner organisation for water affairs.

⁸ <https://snu.rlp.de/de/projekte/luchs/>



Picture 2: A ford built as part of the LIFE Biocorridors in the northern Alsace. The action aims at reducing the erosion of riverbanks and at providing crossing points in order to reduce diffused pollution along the tributaries of the River Sauer SAC

One of the crucial points in the network is the Col de Saverne/Zaberner Steige in the Northern Alsace, also called the 'point noir' for its high number of wildlife mortalities. This narrow corridor is of particular importance for the Lynx, and was dissected by the current highway A4 -E25 the in 70's (Klar, Herrmann, & Kramer-Schadt, 2006), in addition there is the TGV and the Rhein-Marne Channel crossing. After the finalization of the highway, it was realized that this is the connection between the forests in Germany and France. There is only a small wooden bridge of 10 m wide, and currently the French government is working on the development of a wildlife bridge straddling the highway, financed by the highway exploitation company, to improve the international corridor.

Germany

In Germany measures were taken to safeguard the connection for Lynx, by the 'Landesbetrieb Mobilität'. The company 'Büro ÖKO-LOG Freilandforschung' could demonstrate the use of the wildlife bridge across the A6 (Wattenheim) and B10 (Walmersbach), both very intensively used roads with high vehicle numbers.

One of the interesting spin-off projects is an education project 'Natura 2000 macht Schule', a role play used to educate secondary school students on conservation and conservation conflicts. It was produced in two languages, by the Robert Schumann Schule in Metz.

4.2.2 Financing landscape cohesion and restoration measures

DREAL (France) has some 300.000 Euro, annually, for the region, to stimulate activities related to the TVB. The working document (ECOSCOPE, 2014) is the guidance for identifying eligible projects. Different criteria are used to screen the projects, which should fit the aims of TVB. Every year some 20-30 projects are selected by the regional biodiversity collective, and executed. Those projects are financed by Région Grand Est, Water Agencies and DREAL (French State).

The federal government has particular programs to support 'Naturschutzgroßprojekte'⁹. This program supports projects in areas that are of exceptional national and international interest for nature conservation and are particularly characteristic and representative of habitat types in Germany. The program is meant to contribute to the long-term preservation of natural landscapes. Also the protection and development of cultural landscapes with outstanding habitats and animal and plant species that require special protection is funded. Currently the German federal government spends some €14 million per year on large-scale nature conservation projects. The funding program is one of the largest for nature conservation nationwide. Significant achievements have been made over the past four decades, also beyond nature conservation (e.g. in regional development). Funded projects are of great importance for nature conservation, both nationally and internationally.

Baden-Württemberg has a budget to realise project. They cover 70 % of project costs related to species or biotope protection, or measures to improve the network. Currently FFH Mähwiesen (mowing of species-rich meadows) is not included in the regulations but will be financed from 2022 onwards. Management of such meadows are promoted by the Ministry of Agriculture under the FAKT program: Förderprogramm für Agrarumwelt, Klimaschutz und Tierwohl. Companies can prepare management plans for the municipalities, 90 % of these costs are covered by the state.

Saarland however did not have budget for the past two years (2020-2021), but it is hoped that funding will be available soon.

Rhineland Palatinate has limited funding to develop and to update concepts and spatial plans for the system of the network . Funding programs with the sole aim of networking could not be included in the research. In some cases 'Aktion grün'¹⁰ can be used to finance projects.

Within the Gross Region funding is sometimes available in the 'nodal areas', however, more often from LIFE project funding.

The MaB reserve has benefitted from LIFE funding which covered 60 % of all restoration and management works. The other 40 % of the costs in France were covered by DREAL, communities, EU-funds co-financing by the French government. However, there was a large budget deficit due to unforeseen problems in relation to ammunition, which was encountered doing the river restoration work. This caused a delay due to security reasons, but also an increase of costs from 3.6 to 5 Million Euro, for which additional funding had to be assured. This was found by the river authorities that were willing to step in. However, another problem encountered was the rise in the price of timber and other construction material, costs which were not covered by the LIFE project. The MaB is not a funding body in France. Both beneficiaries of the LIFE projects are responsible for funding the scheme when the initial budget is not sufficient. In addition, in France they request fund from partners (the water agency, etc.) as the EU budget cannot be increased. The agreement is that the land owner or land user obliges himself to do the maintenance.

Some municipalities in France acquire small parcels of land along streams, or small agricultural parcels. Since 2018 there is also a new tool is available, under which voluntary contracts can be made with land owners for up to 99 years tenancy for protecting an area (ORE Obligations réelles environnementales - Real Environmental Obligation).

⁹ <https://www.bfn.de/thema/naturschutzgrossprojekte>

¹⁰ <https://aktion-gruen.de/>

4.2.3 Transboundary cooperation

National organisation of landscape cohesion

In France, work is organised by a team on the 'Trame verte et bleue'. It is organised under the Region Grand Est, but each of the former three regions that were merged has staff responsible, with a similar task.

International cooperation

The '**Groß Region/Grande Region**' functions well. This body involves all countries, from Walloon (Belgium), France, Luxembourg and Germany. In the study area Saarland and Region Grand Est are situated. The Region Grand-Est took over the presidency for 2021-2022. The Grande Region tries to stimulate a shift from knowledge sharing to concrete cooperation actions in the field with regard to the Green and Blue Network, by building on existing activities. They try to identify hotspots where cooperation is essential in the transboundary area. However, the trans-boundary cooperation demands a lot of time compared to regular conservation projects.

The other important body is the '**Ober rheinkonferenz / Conférence du Rhin supérieur**' (or, in full: **Experten Ausschuss Ökologie und Naturschutz / Groupe d'experts Ecologie et Protection de la Nature**). In this body Germany, France and Switzerland are represented. In particular the direct involved (French) region and German 'Länder' are represented. In France the French State representative, Region Grand-Est, in Germany Regierungspräsidium Karlsruhe, Region Südlicher Oberrhein, and the Landesamt für Umwelt Baden Württemberg. They meet twice a year, and one of its aims is to remove administrative barriers. Some participants mention that this is not a very intense cooperation. They also identify joint projects and major transboundary corridors including some urban corridors. Also, one of its activities has been the mapping of habitats both in Germany and France.

Nine states and regions in the Rhine watershed closely co-operate in order to harmonize the many interests of use and protection in the Rhine area in the **International Commission for the Protection of the Rhine** (ICPR) or 'Internationale Kommission zum Schutz des Rheins' IKSR / 'Commission Internationale pour la Protection du Rhin' CIPR. The members of the ICPR are Switzerland, France, Germany, Luxemburg, the Netherlands and the European Commission, which co-operate with Austria, Liechtenstein and the Belgian region of Wallonia as well as Italy.

There are also a number of transboundary cooperations, mostly around national parks that straddle the border, such as Conservatoire des espaces naturels de Lorraine CENL, Parc Naturel Régional de Lorraine PNRL, Réserve Naturelle Nationale de la Petite Camargue d'Alsace, Parc Naturel Régional des Vosges du Nord PNRVN and Conservatoire des sites d'Alsace.

4.2.4 Obstacles for cooperation

A lot has been achieved in the more than 20 years of transboundary cooperation. The Ober rheinkonferenz has been very instrumental for this. At the same time, frustration was reported, since the process seems to have stalled. From 2019-2021 no meetings were held for various and partly good reasons, like COVID. At the same time, the progress in the final phase has been slow, it doesn't come further than joint identification of important nodes for connectivity.

It is difficult to put a finger on where this arises from. One aspect is shortage of manpower. First of all, all staff is very busy with their national tasks and assignments, and the international cooperation is or may be seen as an add-on, which is not much stimulated. In some cases staff positions are vacant, even for the regional or national tasks, let alone for international cooperation. Second, transboundary cooperation requires multidisciplinary staff with a wide view, that can think and work at different scale

levels. Preferably they should have knowledge of areas and ways of work on both sides of the boundary. Transboundary thinking it seems is lacking on both sides, there are few people that have this overview.

Initially, this transboundary cooperation had 'Rückenwind', tailwind, and the French presidency of the European union was one of the factors that caused this. However, in recent years the reorganisations within Region Grand Est and its predecessors has resulted in much turnover of staff. Still, different old regions are involved, different responsible people. Some are located far from the border, like in Metz, the Region is very big.

Some differences might be attributed to culture: the German approach has a strong focus on the planning, integrating the corridors in the overall land use plan. In particular in France there seems a reluctance to make maps, and come to a level of detail which brings it further, and can give the corridors also a protected status. Rather, they have a longer informal process with various stakeholders.

This comes to the point that the willingness to move this further seems lacking. With the Biodiversity Strategy this willingness to cooperate may be invigorated.

In general it has been mentioned that people in the border region are sensitive towards cultural differences, and most of them understand to some extent the 'other' language. Still some people complained that in some meetings communication was difficult and even English was insufficiently mastered to come across language barriers.

The **Groß Region/Grande Region** has been very effective in its operations, however, an issue is the absence of funding which sometimes hampers further cooperation. An example to illustrate this was the small costs in maintaining the web portal on species and biodiversity, which costed only 1500 Euro but this amount could not be realized due to bureaucracy. A relatively small budget could cover operational costs, the fact that the website could not be further maintained will result in much higher costs for the countries to update the data portal at a later stage.

4.2.5 Other obstacles to network development

A problem encountered is the rapid development of infrastructure, changes in land use. This is in particular the case in the Upper Rhine Valley, where the highway, railway, provincial road and expanding urban development cause enormous fragmentation for all natural structures that need to cross the valley. In Germany some control is realised, some nodes have been identified and are protected against further expansion. In France this has not been brought under control, apparently. This is considered a very political issue, the government is hesitant to come to pinpointing areas where development will be limited.

An overall problem is the lack of funding for the network. Some countries like Saarland have not allocated funds, funds in France seem rather limited too, considering the size of Region Grand Est. The project funding is incidental, and sometimes small-scale, it does not address the large landscape structures that are required.

An obstacle is the parcellation of forest land. In particular in France the majority of the parcels is less than 0.3 ha small, which results in many land fragments across agricultural land. For some of the smaller and mobile species these small fragments could however be a stepping stone.

4.2.6 Possible measures for improvement

Cooperation projects

There is a need for operative field projects, where French and German authorities would cooperate and have less formal interactions. Also a 'partenage', partnering with other authorities would be useful, possibly with joint site visits to discuss approaches and foster international cooperation.

The bureaucracy is hampering the cooperation. It was mentioned that auditors might not approve even small costs which would benefit transboundary cooperation (i.e. benefit another country), to the extent that sometimes they give up, do not pursue the activity since it seems pointless. The bureaucracy should be ruled out, or managed better under some overall agreement between countries, such measure should be supported by the implementing ministries.

A good approach is to work together at the lowest level, and organise structures to stimulate and harmonize at higher level: combine bottom-up with top-down. Currently this is insufficiently practiced, except for some cases like with LIFE projects.

In France was mentioned that more dedicated staff is essential, and more dedicated project teams. Also support for local actors is important to realize projects identified in cross-border cooperation.



Picture 3: The presence of extended forest areas allows for presence of Roe deer populations in most of the Alsace

5 Recommendations

5.1 General recommendations

The Biodiversity strategy 2030 (European Commission, 2020a) requires considerable efforts from Member States to improve or complement the existing protected areas. First of all, there is the task to expand protected areas, a completion of the network. This includes non-Natura 2000 areas, which support the network, a **protected area target up to a total of 30 %** of the national territory. This favours in particular the identification of corridors, which can contribute to the 30 %, provided that there is a legal form of protection, as well as targets aimed at conservation for these areas.

Also, specific mention is made of strict protection of areas, which includes old-growth forests, but may also include core forest areas where non-intervention can increase further its potential for biodiversity rich habitats and specific target species such as saproxylic beetles (Calix et al., 2018). However, also wet and dry grasslands or other types of habitats can be included as strictly protected area, provided that natural processes are essentially left undisturbed, which means that only limited and well-controlled activities that do not interfere with natural processes will be allowed. This can include grazing management, or maintaining old cultivation practices.

A second aim is the **30 % improvement in conservation status of species and habitats**. Many threatened and endangered species with a poor conservation status have suffered from fragmentation of the landscape and its detrimental effects on metapopulations (Van der Sluis et al., 2004; Van der Sluis et al., 2012). Improving network coherence for species such as outlined in table 1 can help realise the conservation status improvement target.

Staffing and expertise are still hampering the implementation of measures for improved ecological coherence. As long as regional or national staff is lacking, or funding is too limited to effectively realise the protection of core areas or realisation or restoration of corridors, the transboundary corridors are out of reach.

Important requirement for staff is that they should have a wide knowledge base, or multidisciplinary teams are required. Relevant disciplines are a good understanding of planning processes, some legal background, ecological expertise, as well as understanding of land use of various sectors like forestry or agriculture.

Resource persons for the ecological network, as is identified or appointed in Germany and France, can be helpful to ensure the availability of the required knowledge, and guide various planners towards resources (plans, studies, as well as financial resources).

5.2 Recommendations for transboundary cooperation

This study and the input provided by the respondents underline that the implementation of the TEN-N will benefit much from supportive transboundary structures. These structures should be focussing at the political level, as well as a technical level. In fact, this is the model developed with the **Groß Region/Grande Region**, and the **Oberreinkonferenz / Conférence du Rhin Supérieur**.

At a political level, important discussions can be held, and possibly agreements can be reached on cooperation, and adjustments in approaches and plans (where possible and required).

At a technical level, staff can exchange ideas, and develop joint approaches. Specific areas of connectivity can be identified, and prioritization of key areas and key corridors can be done, which can be guiding for both countries involved.

How this will be shaped exactly should depend on the national governance structures of the countries involved, and local support and willingness to engage.

At the same time, there are particular points of attention for these institutions to be more effective:

- The **political commitment** from the countries to make the cooperation work is essential. This commitment can be shown by setting up the infrastructure or service that is aimed at improved international cooperation and development, such as **the Grande Region/ Groß Region**, and may cover different sectors for which cooperation is essential.
- **Knowledgeable and experienced staff** are key for good exchange of information and ideas, and for bringing forward of the concepts of transboundary corridors. The expertise is not only in the planning, and planning process, but also practical knowledge of the field and natural conditions in the territory, preferably on both sides of the border.
- **Independence, resources incl. funding** is important, staff involved should have sufficient time to be dedicated to transboundary work. Too often staff had other national tasks which resulted in insufficient time to spend on transboundary work. Also, the resources include office space and equipment, as well as an operational budget for activities. The latter can be fairly small, but is essential to overcome administrative hurdles and remain focused on the important tasks (rather than administrative procedures).

At a technical level there are several points that might improve transboundary cooperation:

- Try to use in both countries a comparable methodology to define the network and transboundary corridors;
- Agree -if required by the method- on the same guidance, umbrella or target species, for easier communication and alignment of measures for the network;
- Initiate joint projects, to enhance and stimulate regular contacts and intensive cooperation;
- Apply for funding through e.g. LIFE (Life IP, SAPs or SNAPs.) or Interreg, which provides incentives for cooperation;
- Identify through a joint organisation such as the **Grande Region/ Groß Region** the priority areas to focus on the realization of corridors;
- Safeguard through spatial planning measures the territory, stop land conversion in areas identified as part of TEN-N;
- Do integrated assessments of the 'points noirs', those points in the infrastructure network where frequent wildlife collisions take place, which are the areas that require measures to reconnect core protected areas. Such integrated assessments are not only essential for road infrastructure, but also for waterways (drowning animals), and in some cases specifically for wind farms and light pollution (trame noire).

People involved should be experienced in planning, and aware and sensitive towards planning in the neighbouring country. Though not essential, it is very helpful if they master both languages, to ease communication and cooperation.

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National and regional documentation

Data from the German Federal Nature Conservation Agency (BfN):

- <https://www.bfn.de/karten-und-daten/geeignete-flaechen-und-verbindungsachsen-fuer-einen-laenderuebergreifenden>
- <https://www.bfn.de/fachkonzept-bbd>
- <https://www.bfn.de/daten-und-fakten/bundeskonzept-gruene-infrastruktur-biotopverbund-lebensraumnetze-und>

Documentation for Baden-Württemberg:

Biotopverbund in Baden-Württemberg (Arheidt, Bißdorf, Deventer, & Oppelt, 2017)

- <https://um.baden-wuerttemberg.de/de/umwelt-natur/naturschutz/biologische-vielfalt/biotopverbund/>
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Documentation for L'Alsace:

A good study and comparison of French and German legislation is found in: Vers un réseau écologique transfrontalier dans la Réserve de Biosphère Vosges du Nord / Pfälzerwald, or (in German) Ein grenzüberschreitender Biotopverbund im Biosphärenreservat Pfälzerwald/Vosges du Nord (Scheid, 2012). A detailed assessment for the Lynx was done for the biosphere reserve, Vosges du Nord and Jura (Assmann, 2011).

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Nature park 'Parc Naturel régional des Vosges du Nord':

- Brochure: Project Life Biocorridors, transfrontier biosphere reserve
- Brochure: Pfälzerwald Lifebiocorridors Vosges du Nord
- <https://www.lifebiocorridors-vosgesnord-pfaelzerwald.eu/de/das-projekt/>
- <https://www.lifebiocorridors-vosgesnord-pfaelzerwald.eu/de/kontakt/>

Information Rheinland-Pfalz:

- <https://lfu.rlp.de/de/naturschutz/planunggrundlagen/planung-vernetzter-biotopsysteme/>
- <https://map-final.rlp-umwelt.de/Kartendienste/index.php?service=vbs>

Annex I General questionnaire interviews

The following questions were used to guide the interviews; questions were slightly adjusted where necessary.

General introduction

1. What is your function or position?
2. In which area or region are you actively working or involved in?
3. How many people from your unit are working in connectivity or spatial cohesion?

Spatial cohesion

1. How is the ecological network implemented?
2. Who has designed it, in which way, and when was it drafted?
3. How is this organised at different administrative levels (from municipality to Region or Bundesland)?
4. Is there some kind of spatial modelling used in designing the network?
5. Are particular forest species identified as leading species?
6. Is the network still being expanded?

Financing activities

1. How is financing done, by the Region, or at Federal level?
2. How much funds are involved, is it sufficient?
3. Is also land acquired, bought?
4. Who is responsible for the management, and is that included in the financing programs?

(International) Cooperation

1. How is the cooperation between different administrative levels?
2. How is the cooperation organised with Germany/France? (how intensive, how frequent)?
3. Which issues are discussed, and which elements are coordinated or adjusted based on these meetings?
4. Does that also lead to adjustment of plans?
5. Do you also organise joint field visits, to discuss practical issues in the field?
6. Do you think the *Biodiversity Strategy 2030* will have impact at your work?

Obstacles for cooperation

1. What are most important obstacles you encounter in your national task?
2. Are there major obstacles for international cooperation?

Possible improvements

1. What should be organised differently, to improve the work
2. Do you have suggestions to improve the coordination of the work?

Annex II Consulted officials

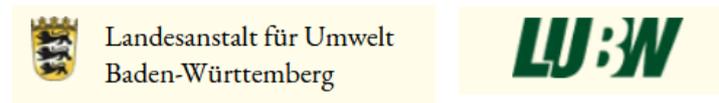
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