



INPUT DOCUMENT

Natura 2000 seminar for the Alpine region

Sweden – online meeting, 8-11 September 2020

3rd Natura 2000 seminar for the Alpine region



Consortium Information:

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In cooperation with: Nature Bureau Ltd.

Prepared by	WENR, Nature Bureau
Authors	Theo van der Sluis (WENR), René Henkens (WENR), Irene Bouwma (WENR), Richard White (NatureBureau) and Kristina Wood (NaturBureau).
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Reviewed by	Sophie Ouzet, Frank Vassen (ENV D3)

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Event: For more information on this seminar, see the Natura 2000 Communication Platform: https://ec.europa.eu/environment/nature/natura2000/platform/events/the_third_alpine_biogeographical_seminar.htm

Relevant documents can be found here:

https://ec.europa.eu/environment/nature/natura2000/platform/knowledge_exchange/28_document_library_en.htm

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Picture 1. Permanent glaciers (Habitat 8340*) are rapidly shrinking due to climate change (picture: Theo van der Sluis).

1. Introduction to the Natura 2000 biogeographical process and the Natura 2000 seminars

The Natura 2000 biogeographical process was launched in 2011 by the European Commission. The objective of the process is to promote knowledge exchange, networking and cooperation on Natura 2000-related issues at biogeographical region level. At the heart of the process are the Natura 2000 seminars. They are complemented by a networking programme consisting of workshops, meetings and other relevant events.

Assuming that Member States in each region are facing similar challenges in the management of Natura 2000 sites, habitats and species, the Natura 2000 seminars are intended to stimulate transnational exchanges and promote a coherent management of Natura 2000 at biogeographical region level. As the responsibility for implementing Natura 2000 is with the Member States, the seminars create an opportunity for key actors to exchange information at biogeographical level. In addition, they also stimulate discussions with and involvement of other key stakeholders and expert networks, including non-governmental organisations (NGO).

The strategic orientation of the process has been evolving over time. The 'Fitness Check' (2016), an evaluation of the implementation of EU Nature Directives¹, showed that implementation has been constrained by a lack and insufficient focus of funding, by limited stakeholder awareness and cooperation as well as by knowledge gaps. The evaluation also highlighted the need to put in place more effective conservation systems, with a view to achieving the Directives' objectives, having full regard of the socio-economic context in which the Directives operate. On that basis, the Commission proposed to refocus the Natura 2000 process towards promoting best practices in conservation management, identifying funding opportunities and raising stakeholder involvement. The very recent EU-biodiversity strategy for 2030 is yet to be translated into tools and instruments but will have many implications for conservation practice. The biogeographical process therefore aims to deliver:

- strengthened cooperation and exchange of experiences on common challenges, including those related to the specific socio-economic context and to cross-border issues.
- exploring new conservation practices regarding habitat restoration and protected area enlargement.
- identification of key priorities for common actions; and
- agreement on a biogeographical-level roadmap for these actions.

The Natura 2000 seminars generate a roadmap with priority objectives and actions and set the frame for a networking programme. The roadmaps are dynamic documents that are regularly updated with new actions and projects relating to the objectives of the biogeographical process.

¹ http://ec.europa.eu/environment/nature/legislation/fitness_check/index_en.htm

This background document serves as a point of reference for discussions during the Alpine Seminar of 8-11 September 2020. It presents, in a digestible form, information from published sources - in particular, habitat-related guidance and publications produced by national authorities, the European Commission and the European Topic Centre on Biological Diversity (ETC-BD). This has been complemented with first-hand expert knowledge from experts, e.g. from LIFE and NEEMO.

The core of this document (chapter 4) addresses thematic issues and presents summary accounts for the Alpine habitat groups.



Picture 2. *Dryas octopetala*, common on limestone above the tree-line in the Scandes in Sweden (picture: Jonas Grahn).

2. The biogeographical process in the Alpine region

The Alpine region comprises some 8% of geographical Europe and involves thirteen EU Member States² (Figure 1). Five of the longest and highest Alpine ranges of the European Union have been included in the Alpine biogeographic region. They comprise the **Alps** which stretch over France, Italy, Germany, Austria, Slovenia, Croatia (and non-EU countries Switzerland and Monaco), the **Scandes** or Scandinavian mountains which straddle Sweden, Finland (and Norway), the **Apennines**, the spine of Italy, the **Pyrenees** on the border between Spain and France, and the **Carpathians** in Bulgaria, Romania, Slovakia and Poland (that extend into Ukraine).



Figure 1: Alpine biogeographical region in Europe (source data: EEA³, January 2016)

The Alpine region is characterised by a relatively cold and harsh climate, high altitudes, and an often complex, varied topography. On the lower slopes forests and semi-natural grasslands are found. With

² Austria, Bulgaria, Croatia, Finland, France, Germany, Italy, Poland, Romania, Slovakia, Slovenia, Spain, Sweden

³ <https://www.eea.europa.eu/data-and-maps/data/biogeographical-regions-europe-3>

increasing altitude and dropping temperature, trees become scarcer and eventually give way to alpine grasslands, fells and scrub heath communities. At the highest elevation, the biogeographical region is characterised by rocks and snow, and the vegetation is reduced to highly adapted plants able to tolerate such extreme conditions.

The Alpine region is relatively rich in species. Almost two thirds of the plants on the European continent are present here. High mountain peaks harbour many endemics whilst, on the lower slopes, species diversity is more influenced by its transition with other biogeographical regions and the long history of human land use. Altogether, 121 habitat types, 97 plants and 134 animal species listed in the Habitats Directive are found in the Alpine region. Figures 2 and 3 provide an overview of dominant habitat types and habitat type groups in Natura 2000 in the Alpine region⁴.

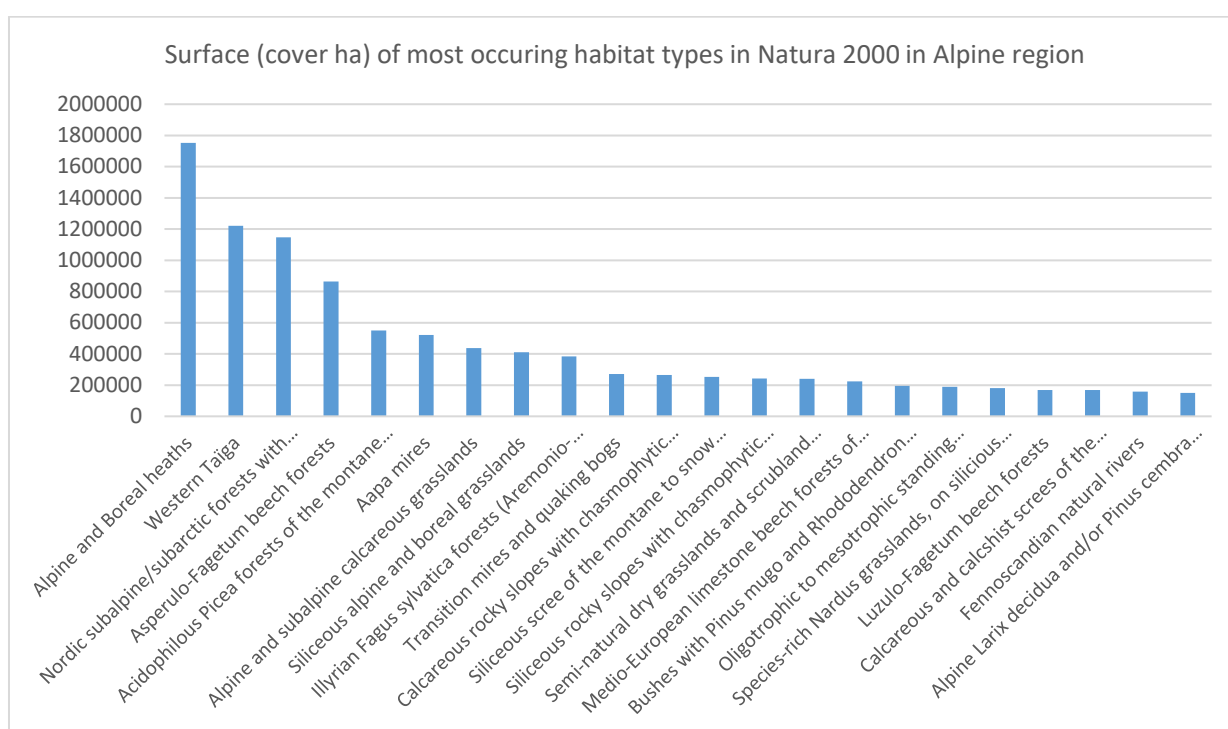


Figure 2. Dominant habitat types in the Natura 2000 sites in the Alpine region, based on 2019 reporting by Member States (Source: EU-wide Natura 2000 database, Publ. 21 April 2020⁵). Please note that some sites only partly fall within the Alpine region, but the entire area is nevertheless included. Habitats with a summed distribution of less than 150.000 ha have been omitted.

⁴ For the full terrestrial alpine region reference list see: <https://www.eionet.europa.eu/etcs/etc-bd/activities/terrestrial-alpine-region-1.pdf>

⁵ <https://www.eea.europa.eu/data-and-maps/data/natura-11>

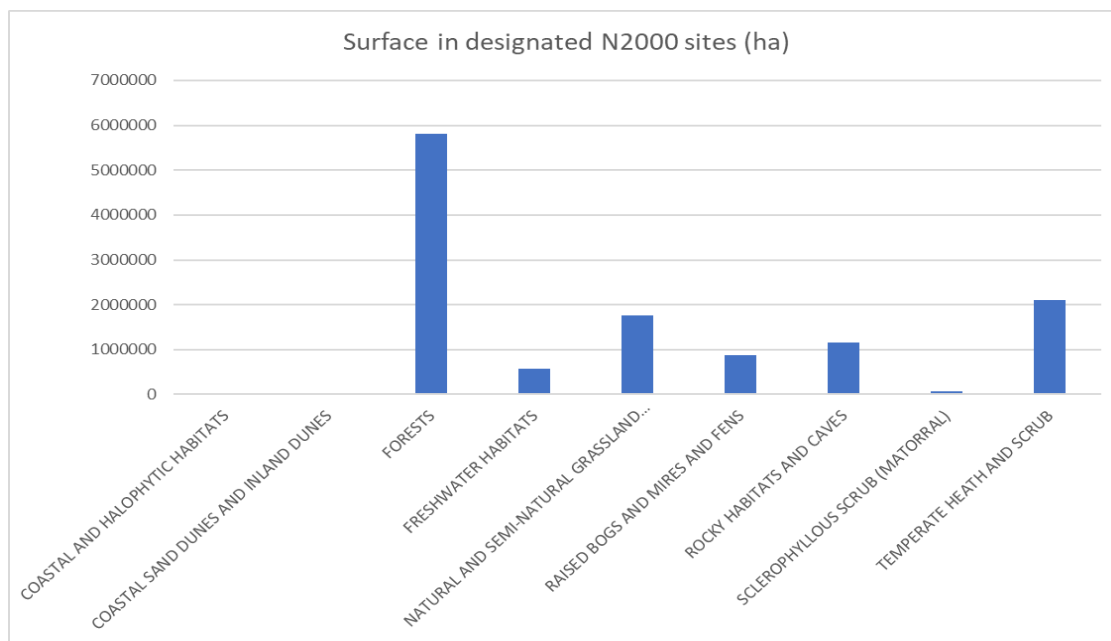


Figure 3. Habitat groups in the Natura 2000 sites in the Alpine region, based on 2019 reporting by Member States (Source: EU-wide Natura 2000 database, Publ. 21 April 2020 ⁶). Please note that some sites only partly fall within the Alpine region, but the information on habitat area is nevertheless fully included here.

In terms of fauna, the area has become an important retreat for many species originally occurring in higher numbers in the lowlands. Large carnivores (wolves, bears, lynxes) and raptors (eagles, falcons, vultures) are nowadays mainly found in the Alpine biogeographical region because these still harbour large unfragmented areas where human disturbance is limited.

Most mountain ranges are poorly populated, particularly above 1,000 m (or 500 m in the case of the Scandes) due to the harsh climate, short growing seasons and restricted accessibility. In many European mountain ranges, traditional pastoral farming has been the mainstay of the economy for centuries, contributing to the region's rich biodiversity. Traditional pastoral land uses are, however, rapidly disappearing under the combined pressure of land abandonment and intensification. In the Scandes the situation is different because of the ongoing and developing traditional reindeer herding by the indigenous Sami people, that causes other challenges for the biodiversity in the face of climate change. Other more recent activities impacting on this fragile environment are large scale afforestation, and in some regions deforestation, the damming and channelling of alpine rivers for hydropower purposes, and the construction of roads. Impacts from tourism take various forms in the region: large scale infrastructure for mass tourism like skiing is posing a threat to fragile alpine

⁶ <https://www.eea.europa.eu/data-and-maps/data/natura-11>

meadows and forest areas and exerts a significant disturbance on wildlife. Small scale tourism like mountaineering, hiking, biking and agro-tourism has less impact and does allow for maintaining rural settlements, providing some farmers with additional income. Another major threat is climate change. Increasing temperatures lead to migration of species and habitats, either upwards into higher zones which fit their temperature range, or northwards. Because of the tight ecological and climatic bands in the mountains a small change in temperature or rainfall pattern can have devastating effects on the mountains ability to absorb and retain water. Most glaciers are shrinking rapidly, and many are likely to disappear over the coming decades. This, with reduced snow cover, will result in a significant increase in drought in the lowlands and marked changes in vegetation, particularly at the higher elevations.

Commercial forestry is the dominant land use throughout the region, and consequently many forests are of limited conservation value. Many alpine countries have introduced national programmes to buy and preserve the remaining 5–10% of natural old-growth forests (Jonsson et al. 2019).

The first Alpine Seminar was held in Graz, Austria, in 2013, and the second Seminar was hosted by the University of Padova, Italy, in 2017. The themes discussed in the second seminar were:

1. Setting conservation status, objectives and priorities
2. Conservation measures and their effectiveness
3. Monitoring and evaluation
4. Addressing threats & pressures to Alpine habitats and species

Some of these issues will be addressed again in the third Alpine seminar hosted by Sweden, with a renewed focus (see next paragraph).



Picture 3: Extensive grazing management of Alpine meadows maintains valuable grasslands and provides income through sales of local farm products - such as in Abruzzo national park (picture: Theo van der Sluis)

3. The four themes selected for the third Natura 2000 seminar for the Alpine region

The third Natura 2000 seminar for the Alpine region, in September 2020, will be hosted by Sweden. In addition to sharing knowledge and best practises, this seminar is aimed at the identification, prioritisation and development of transboundary cooperative actions that contribute to the operational and effective implementation of Natura 2000, and ultimately to improving the conservation status of species and habitats of European interest. The seminar will result in a roadmap of collaborative actions to be taken, as well as (ideally) a series of commitments to deliver on these actions. The roadmap will be shared with NADEG and ultimately made available to all concerned stakeholders.

The seminar is organised around the discussion of four major themes, which have been identified and designed through a meeting of the above-mentioned steering committee and pre-seminar expert consultations. The selected session themes are:

Theme 1 – Defining and coordinating a Natura 2000 restoration agenda for the Alpine region.

Restoration is a key objective in the recently published EU Biodiversity Strategy for 2030. This session aims at sharing experiences on identifying restoration priorities, including through the Prioritised Actions Frameworks (PAFs), coordinating actions for biodiversity in Natura 2000 sites and setting priorities for the Alpine region. It will also focus on exchange of good examples of actions that have been taken in cooperation with others.

Theme 2 – Managing land uses to improve the conservation of Alpine Natura 2000 habitats and species.

Both intensification and land abandonment are key pressures for many habitats in mountainous regions in Europe. To tackle both types of pressures in the frame of the management of Natura 2000, one may resort to similar tools. The discussion will review existing experience and identify possible approaches at national and biogeographical level to address unsustainable agricultural or forestry practices as well as land abandonment in the Alpine region.

Theme 3 – Optimising co-benefits of Natura 2000 management with climate change mitigation and adaptation.

Restoration and conservation efforts, if well planned, can contribute to climate change mitigation and adaptation. Furthermore, in the near future, funding for restoration is expected to become increasingly dependent on integrating climate benefits. The discussion aims at identifying best practise examples and suggesting possible actions to be taken at EU and national level.

Theme 4 – Improving ecological connectivity for the benefit of Natura 2000 Alpine habitats and species.

Integrated landscape approaches explicitly consider the Green Infrastructure between protected areas. Managing and restoring nature outside of protected areas requires specific strategies for

planning, but also for dealing with landowners and other stakeholders. The discussion aims at identifying best practise examples and suggesting possible actions to be taken at EU and national level.

Each of these four themes has been identified as being of common interest across Member States, offering opportunities for further exchanges and strengthening of transnational cooperation around Natura 2000. The following section provides introductory information for each theme. This forms the starting point for group discussions during the third Alpine seminar.



Picture 4: Grazing management is essential to maintain Alpine grassland habitats, such as H6210, semi natural dry grasslands and scrubland facies on calcareous substrates. Maiella National Park, Site IT7140203 Italy (picture: Theo van der Sluis)

4. Background information and issues for consideration in relation to the selected themes

This chapter provides further background information on each of the four themes. Each theme chapter ends with a few examples of completed and ongoing LIFE projects. Annex 3 provides the full list of projects in the Alpine region.

4.1. Theme 1 - Defining and coordinating a Natura 2000 restoration agenda for the Alpine region

4.1.1. Context

The Global Assessment report of IPBES (IPBES, 2019) on biodiversity and ecosystem services concluded that the health of ecosystems on which humans and all other species depend is deteriorating more rapidly than ever before. Restoration of ecosystems is urgent and fundamental, not only to improve biodiversity but also to achieve the Sustainable Development Goals. This triggered the United Nations General Assembly to proclaim 2021–2030 as the Decade on Ecosystem Restoration. Europe aims to lead the way with a new EU Nature Restoration Plan, under its Biodiversity Strategy for 2030 *Bringing nature back into our lives* (European Commission, 2020). Though the EU already has legal frameworks⁷, strategies and action plans to protect nature and restore habitats and species, protection has so far remained incomplete, restoration too small-scale, and implementation and enforcement of legislation insufficient⁸. This can be illustrated by the conservation status of Alpine habitats. Figure 4 shows that almost 75% of the Natura 2000 habitat types in the Alpine region are currently assessed as being in unfavorable conservation status, with 25% even considered to be in unfavorable-bad status.

To ensure that nature restoration is speeding up, is increasing the EU's resilience and contributing to climate change mitigation and adaptation as a key nature-based solution, the Commission puts forward two strands of action:

1. Member States will have to ensure that at least **30% of its species and habitats not currently in favourable status are in that category or show a strong positive trend**. The Commission and the European Environmental Agency will provide guidance to Member States in 2020 on how to select and prioritise species and habitats.
2. Subject to an impact assessment, a proposal for legally binding **EU nature restoration targets** in 2021 to restore degraded ecosystems, in particular those with the most potential to capture and store carbon and to prevent and reduce the impact of natural disasters.

⁷ Notably the EU Birds Directive (2009/147/EC), Habitats Directive (92/43/EEC), Water Framework Directive (2000/60/EC), Floods Directive (2007/60/EC) and Marine Strategy Framework Directive (2008/56/E

⁸ Mid-term review of the EU Biodiversity Strategy to 2020 (COM(2015) 478 and SWD(2015) 187); Fitness Check of the EU Nature Legislation (Birds and Habitats Directives) (SWD(2016) 472); Fitness Check of the EU Water Legislation (SWD(2019) 439).

Over the past years, considerable experience has been gathered in the field of habitat restoration in various Alpine Natura 2000 sites, through the development of management plans and the implementation of LIFE funded projects. It is however acknowledged that transferring experiences and lessons from one site to another, let alone across borders, is not always easy to achieve. This session will therefore review different ways in which best practices can be transferred between sites and Member States.

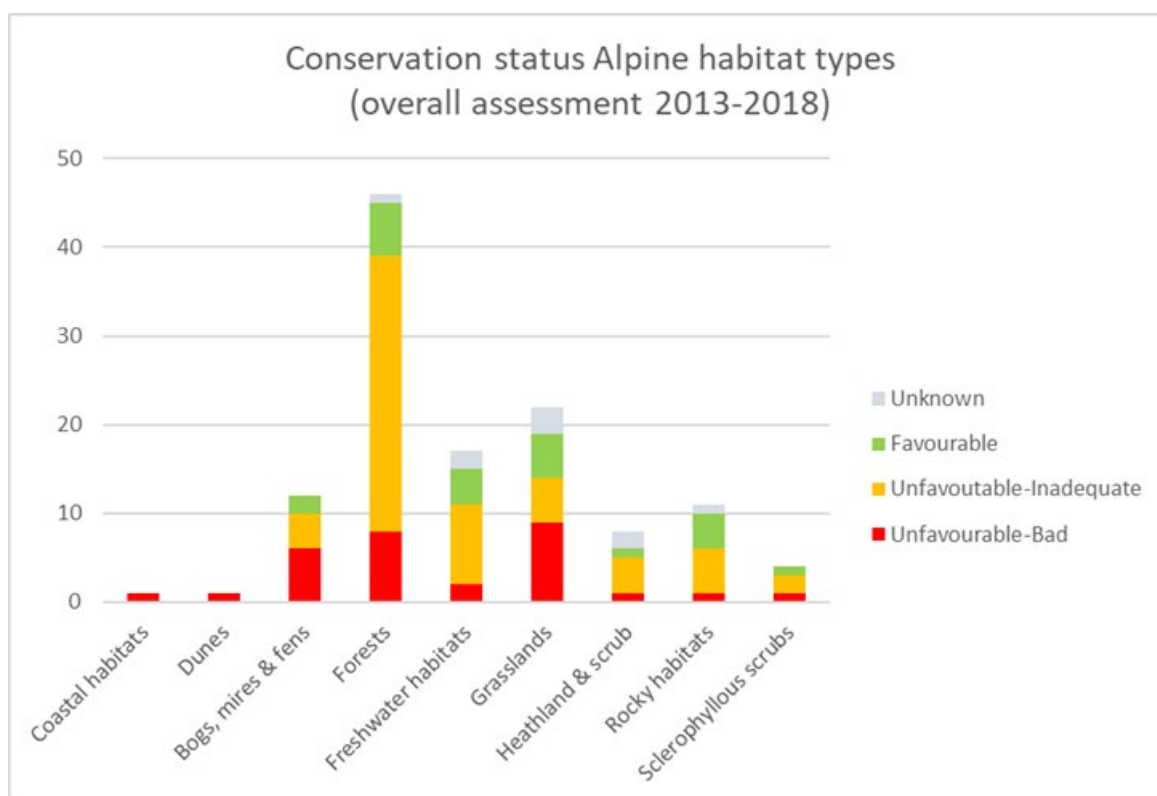


Figure 4. Conservation status of Alpine habitat types (2013-2018) reveals that almost 75% have an unfavorable conservation status⁹.

4.1.2. Objectives of the thematic session

The main objectives of this thematic session are to:

1. Identify priority actions for the restoration of degraded ecosystems in the Alpine regions, in particular those with the most potential to capture and store carbon or to prevent and reduce the impact of natural disasters.

⁹ Data used for the figure: <https://nature-art17.eionet.europa.eu/article17/reports2012/habitat/progress/?period=5&group=Heath+%26+scrub&conclusion=overall+assessment>

2. Exchange of good practice for identifying priorities for restoration actions (including through the PAF¹⁰) that target habitats and species in the Alpine regions.
3. Share experiences on best practice restoration measures undertaken in the Alpine region, including from LIFE projects, in view of ensuring upscaling and replicability.

This session will also identify cooperative actions on how best practices can be shared between the Natura 2000 site managers in various Member States. Key actions for further cooperation and knowledge exchange will be included in the revised roadmap.

4.1.3. Common issues, challenges and approaches

To put biodiversity on the path to recovery by 2030, Member States need to step up the protection and restoration of nature. This should be done by improving and widening our network of protected areas (see §4.4 on ecological connectivity) and by developing an ambitious EU nature restoration agenda. Figure 4 showed that all groups of Alpine habitat types require restoration actions. However, considering that grasslands are dealt with in theme 2 (§4.2), the current session will mainly focus on forests and freshwater habitats.

Forest ecosystems restoration

The new EU Nature Restoration Plan particularly aims for the restoration of those ecosystems with the highest potential for capturing and storing carbon or to prevent and reduce the impact of natural disasters. In the Alpine regions this mainly refers to the restoration of forests. No less than 38% of all Natura 2000 Alpine habitat types are forests, while 85% are assessed to have an unfavorable conservation status. Forest habitats represent 44 % of all protected habitats in the alpine region (data EEA, pers. comm. C. Romao). Forests are hugely important for biodiversity, climate and water regulation, the provision of food, medicines and materials, carbon sequestration and storage, soil stabilisation and the purification of air and water, recreation and tourism. In addition to strictly protecting all remaining primary and old-growth forests, the EU aims to increase the quantity, quality and resilience of its forests, notably against fires, droughts, pests, diseases and other threats that are projected to increase as climate change progresses.

Figure 5 shows the main pressures and threats to Alpine ecosystems, as reported by the Member States. To retain their functions, forest ecosystems need to be restored and preserved in good health. Forestry is considered the main threat to Alpine forest habitats and species (figure 5). Forest areas in the Alpine regions are often restricted to mountain slopes, where they still cover large areas. In some of these forests, care is being taken to maintain them in a (near) natural state and safeguard ecosystem services (like protection from natural disasters like avalanches and rockslides). However,

¹⁰ Prioritised Action Framework - a plan that each MS drafts to indicate major objectives for Natura 2000 and how they will use EU Funding (LIFE, CAP, Structural Funds) for Natura 2000

there are also (large) often non-managed, even-aged forest stands. These are often dense forests with relatively low biodiversity values that run the risk of collapsing (Thorn et al. 2019). Valuable forests are lost to expansion of settlements, infrastructure and increasing river regulation, but also (up the mountains) to facilitate winter skiing. At least 10% of the Alps have been transformed into winter ski resorts, with similar developments taking place in the Pyrenees and the Carpathians (EEA 2010).

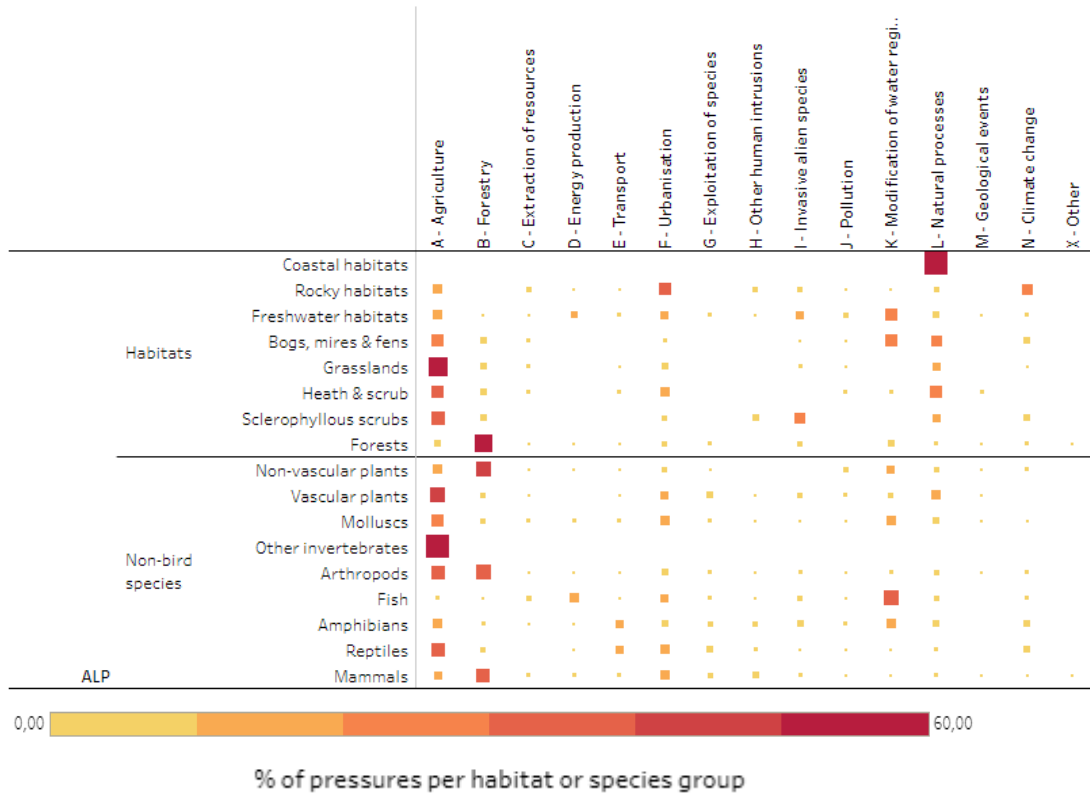


Figure 5. Pressures and threats to Alpine habitat types and species (source ETC-BD).

Freshwater ecosystems restoration

Europe’s Alpine biogeographical region is important as natural freshwater reservoir. Many cities rely on alpine water for their drinking water needs and hydroelectricity supply. Human pressures and global warming have, however, resulted in heavily altered and degraded freshwater ecosystems. Only 10% of Alpine rivers for instance are - at least partly - in natural or near-natural conditions (Litschauer 2014). Riparian areas, which regulate floods, have been cut off from rivers and converted to agricultural fields or built-up land. River straightening and hydroelectric dams destroy freshwater habitats: spawning grounds are being lost; fish migration routes are being cut off. This has devastating effects for many unique and specialised freshwater organisms. The figure below presents synthetic information on the trends for aquatic habitats (figure 6), it shows that the from these 17 wetland habitat types the majority (9) is in a poor condition, but most are stable (7), several (4) are still deteriorating.

and pressures and threats (figure 5) for freshwater ecosystems in the Alpine region, here referred to as ‘freshwater habitats’. Freshwater habitats represent 14% of all Alpine habitat types respectively, while no less than 65% of them are assessed to have an unfavorable conservation status. Agriculture and modification of water regimes are considered the main pressures for freshwater ecosystems. Greater efforts are needed to restore freshwater ecosystems and the natural functions of rivers. This can be done by removing or adjusting barriers that prevent the passage of migrating fish, restoring natural riverbanks, and improving the flow of water and sediments. Large-scale river and floodplain restoration investments can improve water regulation, flood protection, nursery habitats for fish, and the removal of excess nutrients.

# of assessments	EU conservation status			
	Good	Poor	Bad	Unknown
Deteriorating		3	1	
Improving		1		
Stable	4	3	1	1
Unknown		2		1
Total	4	9	2	2

Figure 6. Assessment of trends for Alpine freshwater habitat types (2013-2018) of the Alpine region (EEA 2020). Most rivers are in poor condition, and the majority being stable.

4.1.4. Ideas on opportunities for cooperative work and follow-up

Co-operative work to upscale restoration could for example include:

- Exchange on national or regional priorities for restoration, and associated measures (e.g. through online platforms)
- Exchange of on-the-ground experiences with restoration of specific habitats or ecosystems, to be dealt with in the frame of follow-up workshops
- International training events (e.g. summer schools) on Natura 2000 management restoration issues, with experts and policy officers from various countries as trainers for specific topics, could develop the skills of new experts or managers. At the same time, the trainees would exchange and learn from each other on approaches. Such summer schools could be supported in practice by the Member States by making staff and experts (and possibly facilities) available for training.

4.1.5. Cases and best practices – additional references

Several handbooks on Natura 2000 management provide knowledge on the restoration of Alpine habitat types, among which are forests and freshwater habitats:

- Making Alpine Forests Work for People and Nature (Vanhanen *et al.*, 2012) .
[file:///C:/Users/meie/Downloads/wfse-pol-brief-alpine-forests%20\(1\).pdf](file:///C:/Users/meie/Downloads/wfse-pol-brief-alpine-forests%20(1).pdf)

- Uneven-aged forest management in Alpine Sweden: local forestry stakeholders' perceptions of different sustainability dimensions (Axelsson & Angelstam, 2011).
- Site-specific high zone restoration in the Alpine region – the current technological development (Krautzer *et al.*, 2006). Publication in 4 languages: English, French, Italian and German.

Some examples of Life restoration projects in the Alpine region on forests and freshwater habitats are provided in Table 1. Annex 3 provides the full list of Life+ projects, two of which are described in more detail below: a forest restoration project in Romania and a freshwater habitat restoration project in Sweden.

Table 1: Some examples of LIFE projects focussing on managing land-use in the Alpine regions.

Project title	Project code
<p>In 2012, the Foundation Conservation Carpathia started the project “Ecological restoration of forest and aquatic habitats in the upper Dambovita Valley, Făgăras Mountains” (The aquatic and riparian ecosystems suffered since the 1980s due to the construction of a hydro-power plant with numerous river control and regulation structures along the Dambovita river and its tributary streams. Uncontrolled logging destroyed significant parts of the forest surface and has even taken a toll on the virgin forests still present in the Dambovita Valley. This project aims to protect and restore the remaining wilderness into its natural state. Restoration work among others involves planting of <i>Pinus mugo</i> and chestnut trees which seedlings germinated and grew within the project.</p>	<p>LIFE11/NAT/RO/823 ¹¹.</p>
<p>The rivers targeted by the ReBorn project in Sweden have been heavily influenced by measures taken to facilitate large-scale timber floating during the 19th and 20th centuries. Extensive efforts were made to narrow and channel all water courses, block side channels, and remove boulders and tree trunks from the main channel. Drainage ditches were linked to the rivers and while such ditches are no longer dug, most of the old ditches remain and have long-lasting effects on both forests and water courses. The current forestry practises may also be detrimental to the rivers of the forest landscape. The riparian forest, which is very efficient in preventing particles and nutrients from flushing out into streams, is often cut down or severely damaged. Clear-cutting along streams leads to an increase of sunlight exposure and rising water temperatures. When the project started, the ecological status of many of the stretches of river targeted by this project were no better than ‘moderate’.</p>	<p>LIFE15 NAT/SE/000892 ¹²</p>

¹¹ <https://www.carpathia.org/25-years-of-life-projects/>

¹² https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=5864&docType=pdf

4.2. Theme 2 - Managing land uses to improve the conservation of Alpine Natura 2000 habitats and species

Intensification of agriculture and land abandonment are key pressures for many habitats in mountainous regions in Europe. To tackle these pressures in the frame of the management of Natura 2000 one may resort to similar tools (e.g. agri-environment schemes, etc.). The discussion will review existing experience and identify possible action at national and biogeographical level to address both unsustainable agricultural or forestry practices and land abandonment in the Alpine region.

4.2.1. Context

Nature conservation and land management

The management of agricultural habitats in Natura 2000 sites cannot be considered in separation from the wider context of human activities and land use. Decisions made regarding land use and land management both within and around sites have significant impacts on the ability of a site to recover or maintain favourable conservation status of protected habitats. Similarly, the health of Natura 2000 species depends, to a large part, on the condition of supporting habitats, again linking conservation success to land management issues.

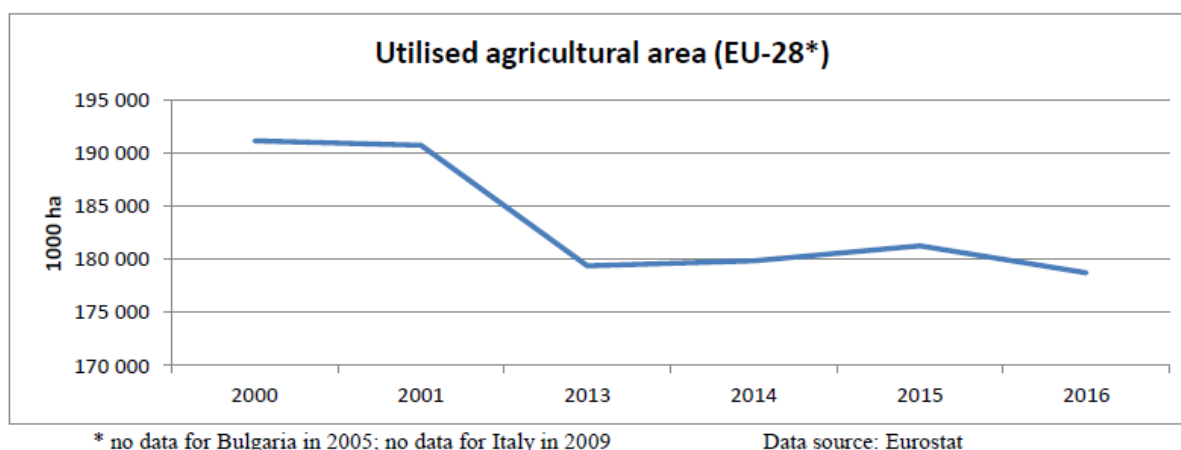


Figure 7. Land abandonment in the EU 2000-2016

Alpine habitats and species are under pressure from two, apparently contradictory, trends in land management; intensification of agricultural and forestry activities, and the abandonment of land (Figure 7). These contradictions can be explained by the fact that agriculture in Alpine regions is more marginal than in many other biogeographical regions. Economic pressures can lead to increased intensification of farming in areas where this is an option. Alternatively, there may either be a shift in land use from agriculture to forestry, or abandonment of any form of land management. Demographic changes may also be relevant, as young people are still moving away from farming in favour of a more urban lifestyle.

Tourism pressures

Tourism is often seen as an appropriate area for diversification away from agriculture. On a global scale, mountain regions make up 15-20% of global visits, second only to the world's coasts. However, as well as bringing economic benefit, tourism can also lead to increased pressure on habitats and species. This is especially the case in Alpine regions where much of the tourism is related to winter sports which rely on additional infrastructure.

Policy drivers for land management decisions

Land management must be considered within a wider context of policies and strategies that influence local decisions made by individual landowners. The most relevant of these for this theme is the Common Agricultural Policy (CAP). Current proposals for the CAP post-2020 include objectives focussed on environmental care, preserving landscapes and biodiversity, supporting generational renewal, and delivering vibrant rural areas (Figure 8).

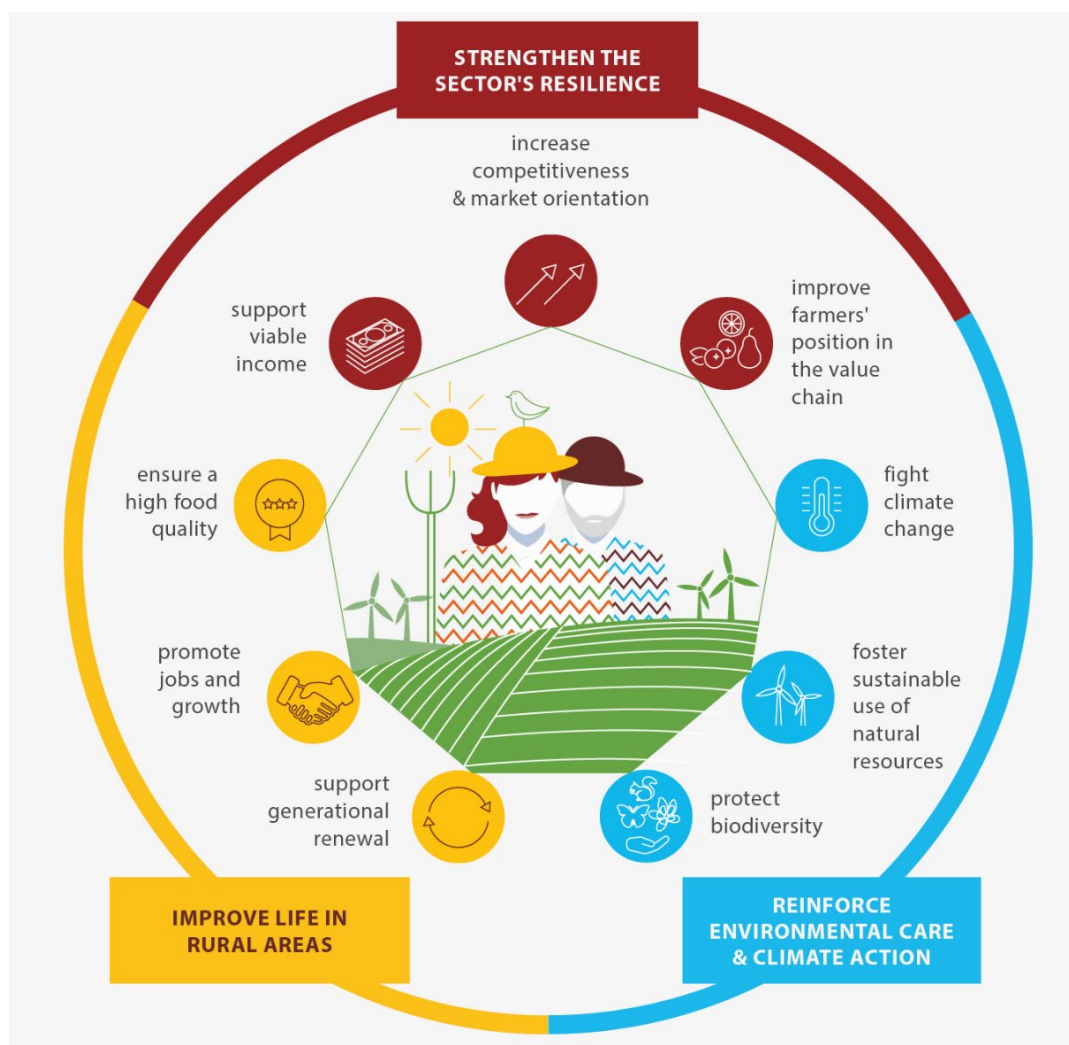


Figure 8. Objectives of post-2020 Common Agricultural Policy ©European Union

These are in response to:

- biodiversity issues such as declining farmland bird populations and loss of farmland landscape features;
- demographic issues including a decline in the number of young people entering farming and the challenges faced by young farmers;
- social and economic issues such as higher levels of poverty in rural areas and higher levels of social isolation in the more remote regions.

Proposed measures include:

- closer links with EU environmental legislation, and planning for the use of CAP funding by Member States;
- specific policy drivers supporting young people setting up in farming;
- alleviating some of the economic pressure on rural communities, especially through decoupled payments and rural development.

Alongside this, the recently published EU Biodiversity Strategy for 2030, and associated action plan, aims to provide conservation with a new impetus across Europe and sets ambitious targets for establishing protected areas and restoring damaged habitats.

4.2.2. Objectives of the thematic session

Relevant presentations will introduce the theme and discussions will focus on the sharing of:

- Experiences with tackling land management issues, in particular:
 - intensification of agriculture;
 - land abandonment;
 - pressure from tourism;
- Effects of relevant policies, both national and European.

Based on best practice from around the Alpine region, participants will be invited to put forward possible solutions and contribute examples of local projects and initiatives that address identified challenges and experience of using national and European policies to bring about change. These will serve as a basis for the final part of the session, in which we will:

- Develop a list of practical ideas for addressing land management challenges
- Prioritise these ideas based on the extent to which they:
 - are relevant across the whole Alpine region
 - are supported by a range of partners willing to work together to produce a concrete list of actions to feed into a revised and updated roadmap.

4.2.3. Common issues, challenges and approaches

Integrating nature conservation and agricultural policy

There is still progress to be made with integrating agricultural and conservation policy, both at an international and national level (Bouwma *et al.*, 2019). Although coherence between the two policy areas has been strengthened since the 1990s, conservation aims and objectives are still seen as a 'bolt-on' extra in terms of agricultural support. Farming is still largely driven by the need to increase production and reduce costs, tending towards intensive monocultures. In Alpine regions this drives both intensification, in areas where such approaches are feasible, and abandonment, where marginal land cannot be economically farmed under an intensive approach. To counter or complement intensive agricultural practices, some are turning to more extensive approaches such as agro-ecology or nature inclusive agriculture. Linking agricultural practices more closely to ecological principles enables farming to make a positive contribution to environmental and conservation gain. In the past, these approaches have been limited to research establishments and localised projects. However, there are signs that they are beginning to influence national policy, as in the Netherlands, and large-scale food production¹³.

Improving understanding of people's attitude towards nature

Research into social attitudes to land management is increasing in importance. Understanding what communities are willing to accept in terms of trade-offs between economy and environment is an important factor in both the design of local projects and the development of policy. One such study in northern Italy suggests that people do value ecosystem services provided by current Alpine farming systems, especially the maintenance of water quality. They were also willing to compromise the levels of production of quality produce to preserve these ecosystem functions. Intensification of agriculture and the abandonment of farming were both rejected by both local and nearby communities (Faccioni *et al.*, 2019). Social research into community values can be a valuable tool in the development of projects and policies.

Integrating nature conservation into economic thinking

Supporting the agricultural economy activity in mountain regions is a key means of turning policy into practice. At a local level, the provision of providing landowners with compensatory funding to counter market forces driving either intensification or abandonment is especially relevant. However, these mechanisms do not always fully consider differences in land management factors within regions. A study in the French Southern Alps suggests that while compensatory measures were helping prevent land abandonment of high-altitude grasslands, they were less effective in lower areas (Hinojosa *et al.*, 2016). Agri-environment schemes must take account of small-scale regional differences in the drivers

¹³ Bouwma, I. *et al.* (2019). *op. cit.*

of land management decision making. Land management and conservation need to be woven into economic strategies at all levels. The Green Economy Action Plan (GEAP) drawn up for the Alpine Convention¹⁴ is an example of a trans-national initiative that seeks to draw together a range of relevant objectives, including one topic on developing an ecosystem services and natural capital-based economy. As well as driving the development of projects in the Alps, this strategy might provide useful pointers for other areas within the Alpine biogeographical region.

4.2.4. Ideas on opportunities for cooperative work and follow-up

Possible follow-up initiatives (for discussion) include:

- Community-scale trials of appropriate ecosystem-based agriculture techniques
- Further research into community values in relation to ecosystem services, agriculture, and forestry
- Develop projects aimed at developing economic strategies (transnational where appropriate) for other areas within the Alpine biogeographic region

Unlike most other EU biogeographical regions, the Alpine region is made of different areas that are not geographically contiguous, which leads to co-ordinating actions and projects in the region being more challenging.

4.2.5. Cases and best practices – additional references

The overall aim of the Dinara back to LIFE project¹⁵ is to protect and restore dry grassland habitats and their characteristic species in the Dinara Mountains of Croatia. In the regional context, grassland conservation is inextricably connected with the abandonment of livestock rearing, and population loss and aging. The conservation of grasslands is not possible in the long-term without re-development of livestock rearing and orienting rural development towards sustainable use of nature resources. The project will focus on connecting nature conservation with socio-economic development and including relevant stakeholders in planning for long-term grassland management.

The general objective of the “LIFE for insects” project¹⁶ is to conserve and enhance the population of key insect species through the restoration of supporting habitats in the Western Carpathians. In the second half of the 20th Century, agricultural land was either intensively farmed through collective

¹⁴ Action Programme for a Green Economy in the Alpine Region, <https://www.alpconv.org/en/home/news-publications/publications-multimedia/detail/action-programme-for-a-green-economy-in-the-alpine-region/>

¹⁵ https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=7260

¹⁶ https://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=6288

farming practices or abandoned. The project aims to reintroduce traditional management to meadow habitats and bring about a shift from intensive to extensive farming approaches.

The LIFE/BESKIDY PL project is also aimed at addressing pressures on habitats and species resulting from changes in land use practices ¹⁷. Focusing on the Beskid Landscape Parks, N2000 sites in the Western Carpathian region of Silesia, the project developed infrastructure to support effective and extensive grazing of meadow habitats. The conservation aims of the project were integrated into agri-environment schemes to support implementation and ensure long-term sustainability of the work.

Table 2: Some examples of LIFE projects focussing on managing land-use in the Alpine regions.

Project title	Project code
Dinara back to LIFE	LIFE18 NAT/HR/000847
LIFE for insects	LIFE16 NAT/CZ/000731
LIFE/BESKIDY PL	LIFE12 NAT/PL/000081



Picture 5: Tourism is one of the main economic activities in the Alpine region, often using old farm buildings such as here in Vallée de la Clarée, Névache, French Alps (picture: Theo van der Sluis)

¹⁷http://ec.europa.eu/environment/life/project/Projects/index.cfm?fuseaction=search.dspPage&n_proj_id=4588

4.3. Theme 3 - Optimising co-benefits of Natura 2000 management with climate change mitigation and adaptation

4.3.1. Context

The effects of climate change are becoming more and more clear: increasing temperatures, shifting seasons, changing precipitation patterns, sea level rise and the potential increase of weather extremes. Climate change already triggers larger fluctuations of groundwater table, increased frequency and intensity of landscape fires (including peat bog fires), desiccation or degradation of certain habitats, higher incidence of invasive alien species, changes in migration patterns or species' ranges, accelerated eutrophication, etc.

Climate change is considered as a major threat to biodiversity, destroying habitats and causing species to move to climatically more suitable areas, increasing the extinction risk of species in fragmented landscapes. There is mounting evidence of the impacts of climate change on biodiversity and the need for the European Union to take integrated action to mitigate and adapt to climate change. Climate change is also a challenge for the indigenous people (the Sami) in the ALP region and their possibilities to survive and manage the land in a sustainable way. In 2013, the European Commission published guidelines on how to manage climate change in relation to Natura 2000 ¹⁸. More recently, the "EU Biodiversity Strategy for 2030 - Bringing nature back into our lives" considers climate change as one of the five main drivers for biodiversity loss.

To assess the vulnerability of the Natura 2000 network to different aspects of climate change and develop possible adaptation and mitigation strategies, it is necessary to understand how the climate in Europe will change in the 21st century. Although many uncertainties exist in predicting future climate and interpreting its impacts, and even though projected scenarios vary considerably across Europe, it is clear that climate change in Europe will have far-reaching consequences for human wellbeing and natural systems. In particular, it is likely that protected areas in the Alpine and the Alpine biogeographical regions will experience more significant changes to their climate conditions when compared to other biogeographical regions (Nila & Hossain, 2019).

In the second Alpine seminar it was acknowledged that climate change is a major threat for the Alpine region. Habitats shift, and their species composition is changing. For example, it is predicted that the area of the Alpine tundra will decrease by between 30% and 74% in different mountain regions across Europe in the event of a 1.5°C global temperature rise, with the natural treeline increasing in altitude (Barredo *et al.*, 2020).

¹⁸ See <https://ec.europa.eu/environment/nature/climatechange/pdf/Guidance%20document.pdf> on https://ec.europa.eu/environment/nature/climatechange/index_en.htm

It is important to have a plan ready for these habitats so that mitigation or adaptation can take place. In the SDF standard data forms Member States can indicate expected impact of climate change to their sites. At present, climate change impacts are indicated for 177 Natura 2000 sites (especially in Sweden, Austria and Italy) (see figure 9 derived from the Natura 2000 Database).

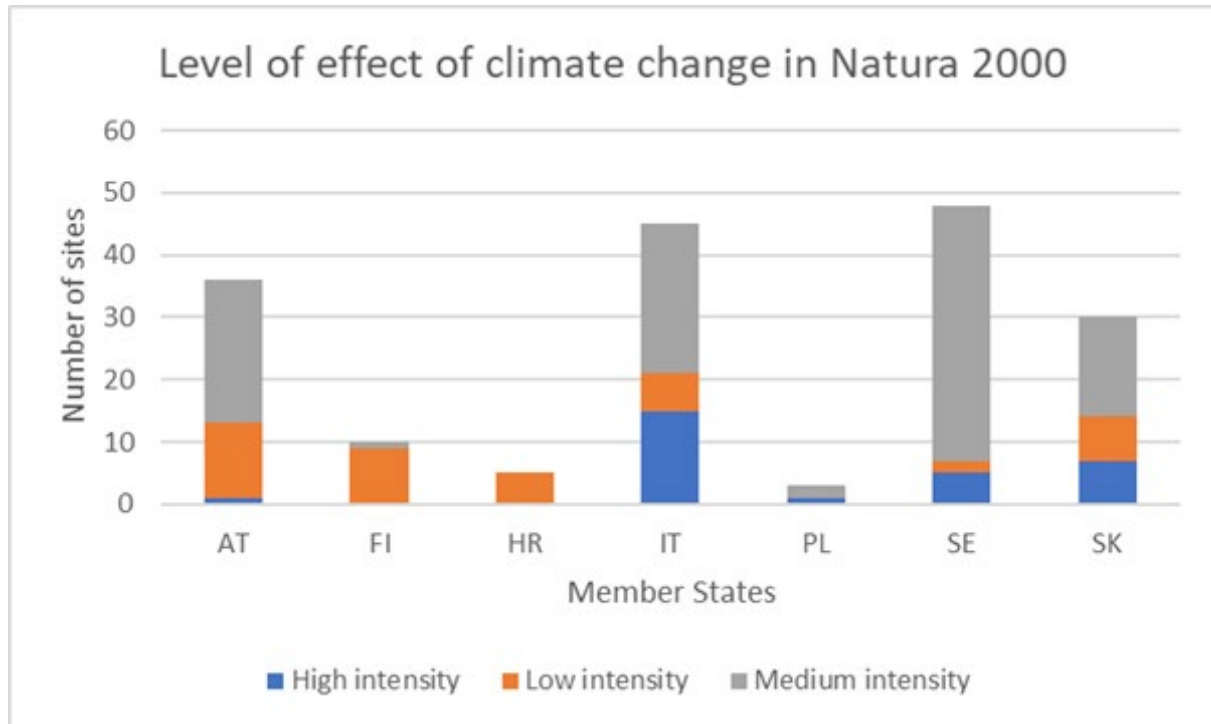


Figure 9. Expected impacts of climate change on Natura 2000 sites as indicated by several EU Member States in their standard data forms.

An adaptive climate-informed conservation plan is required if we are to preserve biodiversity in the face of the range of possible changes (Virkkala, Heikkinen, Kuusela, Leikola, & Pöyry, 2019) or ensure species can adapt. Various actions can be taken either at local or network level to ensure Natura 2000 sites and features adapt to climate change. The latest Article 17 reporting indicates that only few measures taken are related to climate change within the Alpine region (108 measures are taken for habitats and 53 for species).

At the same time, it is accepted that protected areas can also mitigate¹⁹ the effect of climate change. Mitigation – reducing climate change – involves reducing the flow of heat-trapping greenhouse gases into the atmosphere, either by reducing sources of these gases (for land management for example avoid land degradation of peatlands of forest) or enhancing the “sinks” that accumulate and store

¹⁹ Please note that in the context of climate change mitigation has a different connotation than in nature conservation where often the term ‘mitigating measures’ are seen as measures that are taken to reduce the effects of plans and projects on nature. In the Habitats Directive these are referred to as compensatory measures.

these gases (such as the oceans, forests, peatlands and soil). For the Alpine region, mainly forests (and to a lesser extent bogs, heathlands and scrublands) are important as carbon sinks.

Category	Type of measures
Reduction of existing pressures	Restoration measures
	Buffer zone development
	Increase reserve size
Increase ecosystem heterogeneity	Enhance structural gradients
	Allow natural processes
Ensure abiotic conditions	Water quality
	Water quantity
	Nutrient balance
Manage impact of extreme events	Fire management
	Flood management
	Storm management
Increase connectivity	Develop corridors/ stepping stones
	Wider landscape management
	Create new nature areas
	Spatial planning
Other	review existing boundaries/ need to establish new sites
	Relocation
	Asses geographical distribution of protected area network
	Invasive species control

Figure 10. The main categories of measures which can be taken to adapt the Natura 2000 network to climate change (EC, 2013)

4.3.2. Objectives of the thematic session

The objectives of this thematic session are to:

- exchange knowledge and best practices on assessing effects of climate change for Natura 2000 species, habitats and sites;
- exchange knowledge and best practices on adaptation to climate change for Natura 2000;
- discuss opportunities for transboundary cooperation on climate change adaptation on Natura 2000 objectives in future projects.

In this session we will identify common actions on how best practices for climate change adaptation can be shared or developed between various Member States. These actions will be included in the revised roadmap, to ensure their follow-up.

4.3.3. Common issues and challenges

Although climate change is acknowledged as an important threat to biodiversity, addressing its effects remains a challenge and raises many questions:

- How to assess effects of climate change (including from weather extremes) on species and habitats at site level? This question applies in particular to long term effects: several models are available that predict changes in range in the long term at Natura 2000 site level. Increased weather extremes such as fire, drought and floods might pose a risk of extinction to specific species and a risk of loss (or loss of area) to specific habitats.
- How to develop a regional / national climate change adaptation plan?

A more ecosystem-based approach to land management is relevant in the context of adapting conservation objectives in the view of climate change in Alpine regions (Barredo *et al.*, 2020). Habitat restoration and the set-up of ecological corridors might help increase resilience of Natura 2000 features. However, options for climate change adaptation are limited by the unique combination of physical and ecological characteristics of areas at higher altitudes. The role of habitat restoration measures in mitigating climate change cannot be overstated. In addition, land management that is based on the consideration of ecosystem services can both contribute to protecting habitats and species and to mitigating climate change, especially through maintaining and increasing carbon sequestration. But it is key that there be coherence between the different strands of action at a strategic level: careful strategic planning is needed to avoid other sectoral climate change mitigation measures, such as development of wood production, occurring at the expense of biodiversity.

4.3.4. Ideas on opportunities for cooperative work and follow-up

Co-operation could for example focus on:

- Joint monitoring and assessing of climate change impacts;
- Exchanging experiences in the field of climate mitigation measures;
- The submission of LIFE proposals for implementing climate mitigation measures.

4.3.5. Cases and best practices – additional references

There are currently two LIFE projects in the Alpine region (both in Italy) that are reviewing the effects of climate change on grasslands and forests. These projects are not focussing on nature conservation per se, but more on the overall management of the habitats.

The overall aim of the LIFE PASTORALP project (CCA/IT/000060) is to reduce the vulnerability and increase the resilience of Alpine pasture agriculture by assessing and testing adaptation measures, increasing capacity building and developing improved management strategies for climate change adaptation. The achievement of this goal will be based upon a solid science-based knowledge of future climate change impacts on pastoral communities located in two national parks in the western Alps (Parc National des Ecrins in France and Parco Nazionale Gran Paradiso in Italy). Another goal of the project is the deployment of the PASTORALP platform tools for facilitating the development and adoption in the two parks of climate change adaptation strategies, which can then be transferred to other pastoral ecosystems across the Alps, along with the creation of guidelines and recommendations for adaptation planning.

The general objective of the LIFE AFORCLIMATE (LIFE15 CCA/IT/000089) project is to maintain and improve the efficiency of the beech forest ecosystem in the Apennines, through effective forest management that is adapted to climate change. To achieve this objective, the project will define a method for measuring likely impacts of climatic factors to manage beech forests in ways that promote forest regeneration and seed production and ensure resilience. The project aims to achieve biomass increases (and therefore CO₂ sequestration) of 5-7% to 15-20% compared to the reference value deriving from the application of the traditional approach. This will also increase overall ecosystem functionality.

4.4. Theme 4 - Improving ecological connectivity for the benefit of Natura 2000 Alpine habitats and species

4.4.1. Context

Biological diversity is highly dependent on quality, extent and spatial cohesion of natural areas. If wildlife is spread over a large area in small numbers, and if the remaining areas are too small, it will disappear sooner or later. Due to the fragmentation of their habitat, many species have already vanished from parts of their European natural ranges, and range contraction may continue in the future. Improved ecological connectivity will give species a better chance of survival in the long term. Moreover, the impact of climate change, which may result in species and habitats moving further north, is expected to be less severe if landscapes are well connected.

The development of ecological networks and corridors is therefore recognised as a useful policy for biodiversity conservation both at European and global levels (Jongman *et al.*, 2011). The new EU biodiversity strategy 2030 highlights the importance of a coherent Trans-European Nature network, highlighting the need “ ..to set up ecological corridors to prevent genetic isolation, allow for species migration, and maintain and enhance healthy ecosystems” (European Commission, 2020). Ecological networks can be especially beneficial for large herbivores like red deer, or top predators like the wolf, bear, lynx and otter. Corridors tailored towards the movement of large mammals will also benefit many smaller organisms as a result of improved spatial cohesion and expansion of natural habitats.

In 2013, the EC published the Communication on Green Infrastructure²⁰. The new Biodiversity Strategy mentions the ambition to unlock at least 20 billion a year for investing in Natura 2000 and green infrastructure (European Commission, 2020). This will require mobilising private and public funding at national and EU level.

Nature restoration goes hand in hand with climate objectives, therefore “a significant proportion of the 25% of the EU budget dedicated to climate action will be invested on biodiversity and nature-based solutions” (European Commission, 2020). For many natural habitats, major restoration efforts are needed to improve their resilience under a warming climate.

²⁰ https://ec.europa.eu/environment/nature/ecosystems/strategy/index_en.htm

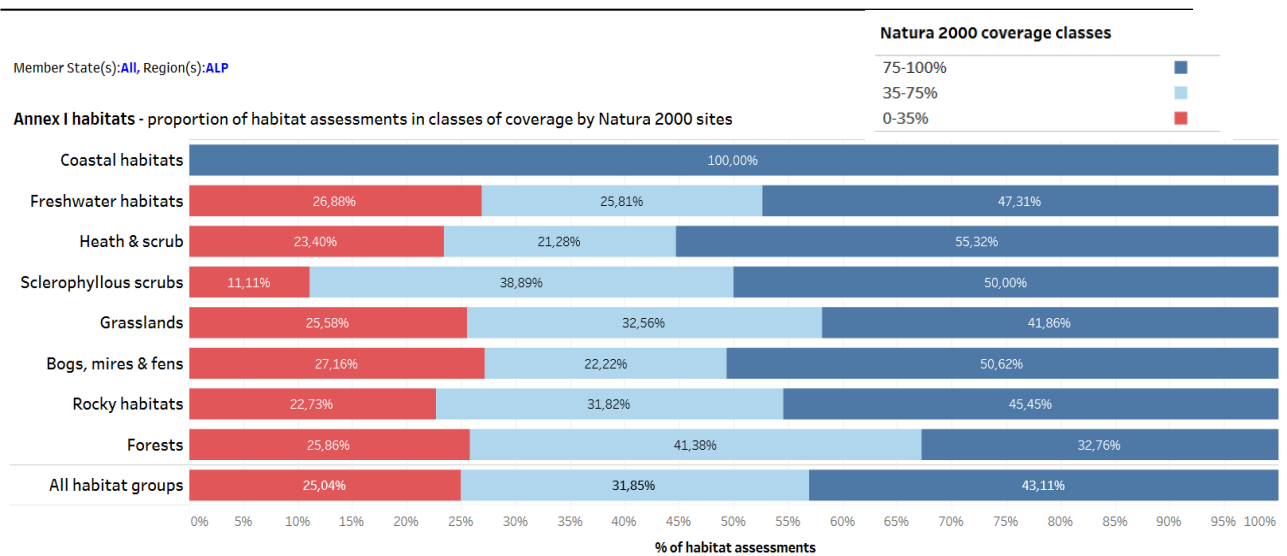


Figure 11: The share of habitats which is included within the Alpine Natura 2000 network. Dark blue is more than 75% covered, red is less than 35% included within Natura 2000. Habitats with a low share within the Natura 2000 network mostly require connections with habitat outside the network²¹.

Land uses can differ markedly in their effects on wildlife in near-by forests or grasslands (the landscape ‘matrix’), even in landscapes with comparable amounts of habitat. Land uses within forested and fragmented landscapes are important influences on wildlife populations. Consequently, conservation planning should carefully consider types of land uses occurring within or adjacent to their boundaries, and stimulate e.g. low-intensity farming, reduced use of agro-chemicals, or more natural forest managements for forest corridors, better conservation of the riverine vegetation and avoiding expansion of human settlement.

Ecological connectivity or network coherence depends on the distribution of natural habitats. The cohesion of a landscape for a given species will very much depend on the species’ characteristics: range, habitat preference, dispersal ability, carrying capacity, etc. These characteristics are species-specific and cannot be changed. However, the landscape itself can to some extent be adjusted.

The basic options for improving ecological coherence or connectivity are as follows:

- enlarging existing core conservation areas;
- increasing the number or density of such areas;
- developing or improving corridors;
- improving the landscape matrix, i.e. natural areas and surrounding cultivated areas.

²¹ File available at EEA, [f226dd70265d4b57a00b3156f9cf8438](https://www.eea.europa.eu/en/observatory/indicators/226dd70265d4b57a00b3156f9cf8438)

4.4.2. Objectives of the thematic session

The objectives of this thematic session are to:

- exchange knowledge and best practices on improving network coherence for Natura 2000 species, habitats and sites in the Alpine region;
- identify species and habitats which are in particular need of improved ecological connectivity and which are of common interest to several MSs;
- discuss opportunities for transboundary cooperation on improving ecological connectivity for Natura 2000 habitats and species.

In this session we will identify common actions on improving ecological connectivity, which can be shared or developed between various Member States. These actions will be included in the revised roadmap, to ensure their follow-up.

4.4.3. Common issues and challenges

All countries struggle with the fact that protecting, maintaining and restoring their Natura 2000 sites is already very resource-demanding, which can result in a lower prioritisation for ecological connectivity.

Unprotected areas that could be instrumental for connectivity are generally subject to economic interests such as commercial forestry, agriculture, rural infrastructure etc. Providing such areas with an additional function for conservation can increase competition and conflict, although win-win solutions might exist. Commercial forest areas can at the same time be beneficial for connectivity, and urban areas can include green zones or parks that act as landscape corridors.

Finally, it is not always easy to demonstrate that the lack of connectivity is the actual limiting factor for a given species (as compared to alternative pressures such as insufficient habitat quality, external pressures on sites, etc.). Considering the resource needs for the designation of additional corridors, a solid knowledge will be required. There might thus be cases where additional research is required to strengthen arguments for connectivity actions.

4.4.1. Ideas on opportunities for cooperative work and follow-up

Firstly, it is important to identify species or habitats that are 'leading' in the landscape design. These can be an 'umbrella' for a larger group of species (whether plants, mammals, birds or insects). E.g. a Red deer can be an umbrella species for many other forest organisms, or Chamois for Alpine grasslands. Measures should be tailored towards such umbrella species to ensure that the widest possible range of species will benefit.

To improve ecological connectivity, experts from various countries may together define possible measures or priority areas for action, identify possible bottlenecks and prepare measures e.g. to

mitigate the impact of fragmentation (roads, dams in rivers, wide valleys etc). In some cases, specific models can be used to identify the most suitable locations for future corridors.

Improving ecological connectivity through restoration of Annex 1 habitats of the Habitats Directive will improve their conservation status, thereby improving spatial cohesion of the Natura 2000 network.

For the biogeographical process, a list was prepared of habitats that are in need of improved restoration and connectivity, based on their unfavourable-inadequate (U1) or unfavourable-bad (U2) conservation status (Van der Sluis, Bouwma, & Condé, 2019). The list was based on the 22 Alpine priority habitats (ETC-BD, 2018), including 6 grassland, 3 mire and bog, 7 forest and 6 freshwater habitats (see: [Revised pre-scoping document for the Alpine region](#)).

Table 3 shows the habitats by decreasing 'restoration score' from top to bottom. Obviously, some habitats have a rather regional distribution (e.g. Apaa mires), whereas others are more widespread throughout mountain ranges in the EU. Member States could identify important habitats based on this table for restoration, across boundaries.

Table 3: Need for landscape connectivity of priority habitats and their potential for habitat restoration (Van der Sluis et al., 2019)

Habitat type	Priority Habitat	Conservation Status	Restoration score	Potential for restoration	Time frame
7310 Apaa mires	*	U1/FV	9	cond. Possible	long
91E0 Alluvial forests with <i>Alnus glutinosa</i> and <i>Fraxinus excelsior</i> (<i>Alno-Padion</i> , <i>Alnion incanae</i> , <i>Salicion albae</i>)	*	U2/U1	9	High	Intermediate
7110 Active raised bogs	*	U1/U2	8.5	cond. Possible	long
3170 Mediterranean temporary ponds	*	U1/XX/FV	8	cond. Possible	short
3180 Turloughs	*	U1/U2	8	cond. Possible	short
7240 Alpine pioneer formations of <i>Caricion bicoloris-atrofuscae</i>	*	U2	7.5	cond. Possible	short
8160 Calcareous scree	*	U1/U2/FV	7	possible	short
4070 <i>Pinus mugo</i>	*	FV/U1	6	cond. Possible	long
91H0 Pannonian woods with <i>Quercus pubescens</i>	*	U2/U1	6	cond. Possible	Intermediate
6220 Pseude steppe	*	U1/U2	5	cond. Possible	short
91G0 - Pannonic woods with <i>Quercus petraea</i> and <i>Carpinus betulus</i>	*	U1	5	cond. Possible	long
91I0 - Euro-Siberian steppic woods with <i>Quercus</i> spp.	*	FV/U1/U2	5	cond. Possible	long
40A0 - Subcontinental peri-Pannonic scrub	*	U1/U2	4	cond. Possible	Intermediate
6110 - Rupicolous calcareous or basophilic grasslands of the <i>Alyso-Sedion albi</i>	*	U1/U2	4	cond. Possible	short
6240 - Sub-Pannonic steppic grasslands	*	U1/U2	4	possible	short
91AA - Eastern white oak woods	*	U2	4	cond. Possible	Intermediate

4.4.2. Cases and best practices – additional references

The International Commission for the Protection of the Alps (CIPRA)

CIPRA is a non-profit umbrella NGO that has been committed to the protection and sustainable development of the Alps since 1952. In total, seven Alpine states and around one hundred member organisations and institutions are represented today by CIPRA, and it is therefore an important Alpine-wide network. The Alpine Convention, launched at CIPRA's initiative, is guiding their activities. It was signed by the Alpine States as a treaty under international law in 1991 and has since provided a platform for cross-border co-operation. One of the important focal areas has been Alpine ecological networks, and ecological connectivity, ECONNECT. The objective of the ECONNECT project, launched in 2008, was to protect, maintain and restore ecological connectivity in the Alps. Several pilot regions have been selected with the aim of developing and testing a methodology that is applicable to the whole of the Alpine region. They organised workshops, seminars and trans-boundary meetings to promote this, and one of the results is a handbook on ecological connectivity, (Köhler, Yann, and Anne Katrin Heinrichs. 2011). See for more publications:

<https://www.cipra.org/en/cipra/international/projects/completed/econnect>

Interreg projects

The ALPBIONET 2030 project finished in 2019 and had a focus on Ecological connectivity. Different regions have different tools to measure and improve biodiversity, therefore an integrative concept for the protection of ecosystems and biodiversity within the Alps is required. The overall objective of ALPBIONET was to consolidate and enhance transnational cooperation in the field of nature conservation while providing a harmonised concept of preserving natural habitats and common planning tools to realise a high level of ecological connectivity for biodiversity conservation.

ALPBIONET2030 aimed to implement:

- A coherent and complementary Alps-wide system of Strategic Alpine Connectivity Areas (SACA), reflecting the valuable and potential areas for ecological connectivity, defined at large scale and implemented at the level of Ecological Connectivity Pilot Regions (in cooperation with the Alpine Convention)
- An integrated wildlife management for the Alps and an increased level of defragmentation in sectoral policies (hunting, forestry, agriculture, tourism, spatial development, etc.)

LIFE projects on ecological connectivity

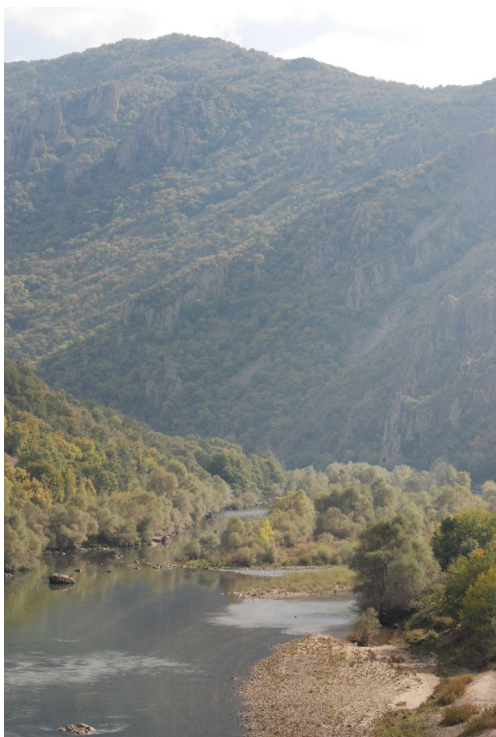
The LIFE BEAR DEFRAGMENTATION project activities helped improve the connectivity of the corridor area for brown bears that were targeted in the project, along with an improvement of habitat quality for the species. Specifically, the project established eight partnership agreements with municipalities within the project area and the signature of 13 land stewardship agreements covering 15 public estates for the creation of tree plantations. An action plan for habitat improvement in the main bear corridor was drawn up. It includes recommendations and management measures to be considered for present and future land use planning and management of the inter-population corridor area.

*Alpine rivers and their ligneous vegetation with *Myricaria germanica* (3230)*

An example of a project action for improving connectivity, following the ideas mentioned above, is the restoration of dynamic Alpine river habitats.

The riverbanks of many Alpine rivers hold plant communities of low shrubby pioneers that colonise the herbaceous formations on gravel deposits rich in fine silt. These deposits are usually dynamic, often being destroyed and recreated in floods.

One of these habitats is “Alpine rivers and their ligneous vegetation with *Myricaria germanica* (3230)”. This habitat type is mostly found in the Alps and Carpathians; an isolated occurrence is also reported from northern Finland. It usually occurs in small patches and its overall habitat area at EU scale is therefore quite small. The overall conservation status of this habitat type assessed over 2012-2018 in the Alpine biogeographical region is unfavourable-bad (and deteriorating), except for in Finland and Slovenia.



Picture 6. *Alpine River, Most Arda, N2000 site BG0002071*
(Photo: Theo van der Sluis)

Table 4: Some examples of LIFE projects focussing on ecological connectivity in the Alpine regions.

Project Title	Project Number
LIFE Connect Carpathians: Enhancing landscape connectivity for brown bear and wolf through a regional network of NATURA 2000 sites in Romania	LIFE12 NAT/UK/001068
LIFE MAGREDI GRASSLANDS: to stop the degradation of the habitat 'Eastern submediterranean dry grasslands' in the 'magredi' of the Friuli lowlands and to improve its extension. The project will increase the connectivity of the dry grassland habitat.	LIFE10 NAT/IT/000243
PIROSLIFE: Consolidation of a bear population in a fragmented management territory: Central Pyrenees	LIFE13 NAT/ES/001394
LIFE GYPCONNECT: Restoration of connections between the Alpine and Pyrenean populations of bearded vulture (<i>Gypaetus barbatus</i>)	LIFE14 NAT/FR/000050
DRAVA LIFE: Integrated River Management, with three transnational conservation actions, which involve stimulation of more natural river dynamics, improvement of river connectivity, decrease of human impact, increase inter-sectoral river management and cross-border cooperation along the Drava River.	LIFE14 NAT/HR/000115

Useful literature

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ANNEXES

Annex 1: roadmap for cooperation in the Alpine region

The second Alpine Natura 2000 seminar took place in Padova, Italy, from 21 – 23 June 2017. A significant range of subjects for future development and concrete collaboration were identified by participants. The table below outlines the events and measures that have been proposed in the previous seminar report.

It should be noted that the road map will be updated and converted to a different format, in line with the road map for other Biogeographical regions.

What?	When?	Where?
Workshop about better integrating the implementation of the Water Framework Directive and the Birds & Habitats Directives	October/November 2017	Hungary
Workshop about Alpine river habitat types	Late Autumn 2017	Austria
Eurosite Natura 2000 monitoring workshop, hosted by Estación Biológica de Doñana, about 'intergrating remote sensing and other new technologies into Natura 2000 monitoring'.	April 2019	Sevilla
Establish a working group of experts to discuss and resolve issues associated with habitat interpretation		
To provide an online platform for the collation of habitat definitions from all Member States and where experts would be able to compare and contrast them.		
Establish a working group to provide guidance on the development of conservation objectives and condition indicators, ideally using the Natura 2000 Communication Platform to collate and share examples of best practice from across the Member States		
To organize a workshop on monitoring species and habitats (potentially General Directorate of National Conservation, Poland)		
To prepare a proposal for INTERREG project between several MSs on a few sites for implementing condition indicators, covering the full circle of implementation, from planning, performance, evaluation and adaptation.		
Bundesamt für Naturschutz (BfN) organizes a workshop Natura 2000 Forest habitat types on secondary sites – conservation and management strategies	19-21 September 2017	Bad Bergzabern, Germany
Establish a database, collecting conservation measures from Natura 2000 management plans.		
Organise thematic workshops to present and share the experience of the Landcare association		

What?	When?	Where?
Establish local forums involving managers, decision makers and stakeholders		
Further disseminate the EUROPARC training manual and toolkit for effective communication on Natura 2000.		
Encourage the use of local media to involve stakeholders		
Create local information platforms and helpdesks to provide support and guidelines to stakeholders.		
An Interreg project about monitoring and reporting – for gathering all the data that individual organisations and countries have, information on available funds could be included in this project as well		
To organize an event about “new techniques in monitoring”, including biostatistics and modelling as a huge evolution is expected here.		
Fight land abandonment via subsidies, programs to promote the regions, media and the implementation of MAES into planning.		
Share best-practice information regarding large carnivores on the EU large carnivore forum		
Establish cross-border conventions to solve problems related to inconsistencies in policies		

Annex 2: List of completed and ongoing Alpine region's LIFE+ projects

Project number	Project title
LIFE03 NAT/F/000100	International programme for the Bearded vulture in the Alps
LIFE03 NAT/S/000073	Saving the endangered Fennoscandian Alopex lagopus (SEFALO+)
LIFE09 NAT/CZ/000364	Integrated protection of rare butterfly species of non-forest habitats in the Czech Republic and Slovakia
LIFE10 NAT/IT/000239	Eradicate Invasive Louisiana Red Swamp and Preserve Native White Clawed Crayfish in Friuli Venezia Giulia - RARITY
LIFE10 NAT/IT/000243	Restoration of Dry grasslands (Magredi) in four Sites of Community Importance of Friuli Lowland
LIFE11 NAT/RO/000825	Conservative management for 4070 and 9260 habitats of ROSCI0129 North of Western Gorj
LIFE12 NAT/AT/000321	Natural wood lands, bogs and habitat network around Aussee
LIFE12 NAT/IT/000818	Semi-natural dry-grassland conservation and restoration in Valle Susa through grazing management
LIFE12 NAT/PL/000081	Protection of non-forest habitats in the Beskid Landscape Parks
LIFE13 NAT/ES/001171	New approaches for the European mink Conservation in Spain
LIFE13 NAT/ES/001210	Restoration of lentic habitats and aquatic species of Community interest in high mountains of the Pyrenees
LIFE13 NAT/ES/001394	Consolidation of a bear population in a fragmented management territory: Central Pyrenees
LIFE13 NAT/FR/000092	Conservation of the French populations of Galemys pyrenaicus and its populations on the French Pyrénées
LIFE13 NAT/FR/000093	Reduction of the human threats affecting the Bearded Vulture
LIFE13 NAT/IT/000728	Strategies to minimise the impact of free ranging dogs on wolf conservation in Italy
LIFE13 NAT/RO/000205	Implement best practices for in-situ conservation of the species Canis lupus in the Eastern Carpathians
LIFE13 NAT/RO/001154	Conservation of Brown Bear (Ursus arctos) population in Romania
LIFE13 NAT/SI/000550	Population level management and conservation of brown bears in northern Dinaric Mountains and the Alps
LIFE13 NAT/SK/001272	Energy in the land - power lines and conservation of priority bird species in Natura 2000 sites
LIFE14 NAT/BG/000649	Bright Future for Black Vulture in Bulgaria
LIFE14 NAT/FR/000050	Restoration of connections between the Alpine and Pyrenean populations of bearded vulture (Gypaetus barbatus)
LIFE14 NAT/HR/000115	DRAVA LIFE Integrated River Management
LIFE14 NAT/NL/000901	Conservation of Black and Griffon vultures in the cross-border Rhodopes mountains
LIFE14 NAT/NL/000987	Urgent actions for the recovery of European Bison populations in Romania
LIFE15 NAT/AT/000167	Dynamic River System Lech
LIFE15 NAT/HU/000902	Conservation of the eastern imperial eagle by decreasing human-caused mortality in the Pannonian Region
LIFE15 NAT/IT/000823	Conservation and management of freshwater fauna of EU interest within the ecological corridors of Verbano-Cusio-Ossola.
LIFE15 NAT/IT/000946	Safeguard and valorization of the plant species of EU interest in the Natural Parks of the Abruzzo Apennine
LIFE15 NAT/SE/000892	Restoration of Boreal Nordic Rivers

Project number	Project title
LIFE15 NAT/SK/000861	Wetland habitat restoration and bird protection of Poiplie, Horna Orava and Senianske rybniky SPAs in Slovakia
LIFE16 NAT/BG/000612	Conservation of threatened birds through retrofitting of hazardous overhead powerlines in Natura 2000 sites in W Bulgaria
LIFE16 NAT/BG/000817	Restoration and improvement of the conservation status of priority forest habitats within Bulgarian Natura 2000 network
LIFE16 NAT/BG/000856	Collaborative management for conservation of forest and grassland habitats negatively affected by IAS in Bulgaria
LIFE16 NAT/CZ/000001	Optimalization of Natura 2000 sites management delivery in the South Bohemia Region and the territory of South Slovakia
LIFE16 NAT/CZ/000731	Conservation of selected Natura 2000 insect species in transboundary area (CZ-SK) of Western Carpathian Mts.
LIFE16 NAT/ES/000768	Restoration, conservation and governance of the Alnus aluvial forests in the Mediterranean Region
LIFE16 NAT/SI/000708	Improvement of Natura 2000 statuses with renaturation of Stren's riverbed on intermittent Cerknica Lake
LIFE17 NAT/BG/000602	Bats and men - sharing LIFE under one roof
LIFE17 NAT/IT/000464	Preventing Animal-Vehicle Collisions Demonstration of Best Practices targeting priority species in SE Europe
LIFE17 NAT/SK/000589	Conservation of subpannonic dry grassland habitats and species
LIFE18 NAT/BG/001051	Conservation measures for the Lesser Spotted Eagle and its habitats in Bulgaria
LIFE18 NAT/HR/000847	Management planning and restoration of Dinara dry grasslands to save biodiversity and support sustainable development
LIFE18 NAT/IT/000806	Crayfish lineages conservation in north-western Apennine
LIFE18 NAT/IT/000931	Salmo ceTtii REcovery Actions in Mediterranean Streams
LIFE18 NAT/SE/000268	Restoration for Improved Resilience, Biodiversity and Status in Boreal Rivers
LIFE18 NAT/SI/000711	AMPHIbian CONservation and habitat restoration
LIFE16 CCA/IT/000060	LIFE PASTORALP - Pastures vulnerability and adaptation strategies to climate change impacts in the Alps
LIFE15 CCA/IT/000089	Adaptation of FORest management to CLIMATE variability: an ecological approach
LIFE08 NAT/RO/000504	Bat conservation in Padurea Craiului, Bihor and Trascau Mountains
LIFE08 NAT/SLO/000244	Conservation and surveillance of conservation status of wolf (Canis lupus) population in Slovenia
LIFE09 NAT/SK/000396	Conservation of Aquila pomarina in Slovakia
LIFE10 NAT/AT/000017	LIFE+Lavant: Habitats network for endangered small fish species
LIFE12 NAT/UK/001068	Enhancing landscape connectivity for brown bear and wolf through a regional network of NATURA 2000 sites in Romania
LIFE13 NAT/PL/000024	Conservation of alkaline fens (7230) in southern Poland / Ochrona torfowisk alkalicznych (7230) poudniowej Polski
LIFE15 NAT/PL/000820	Conservation of black grouse as umbrella species for valuable habitats of the Orawsko-Nowotarskie Peat Bogs
LIFE00 NAT/A/007053	Wild river landscape of the Tyrolean Lech
LIFE00 NAT/A/007055	Schütt-Dobratsch
LIFE00 NAT/A/007069	Protecting the habitat of Myosotis rehsteineri in Bregenz
LIFE00 NAT/IT/007131	Project URSUS - protection of the brown bear population of Brenta
LIFE00 NAT/IT/007139	Bats, calcareous habitats and petrifying sources in the Park of Campo dei Fiori
LIFE00 NAT/IT/007258	Integrated management of insubric-prealpine habitats

Project number	Project title
LIFE00 NAT/IT/007281	NEMOS project - improvement of Alpine wetland areas
LIFE02 NAT/E/008624	Recovery of the bearded vulture in Picos de Europa, Spain
LIFE02 NAT/IT/008538	Conservation of Rupicapra pyrenaica ornata in the Central Apennines
LIFE02 NAT/IT/008574	Alpe Veglia and Alpe Devero: actions of conservation of mountain grasslands and peatlands
LIFE02 NAT/RO/008576	In situ conservation of large carnivore in Vrancea County
LIFE02 NAT/SLO/008585	Conservation of large Carnivores in Slovenia - Phase I (Ursus Arctos)
LIFE03 NAT/A/000011	River management of the central (inner) river Mur
LIFE03 NAT/IT/000139	RETICNET. 5 SCI for the conservation of wetlands and main habitats
LIFE03 NAT/IT/000147	Biocenosis restoration in Valvestino Corno della Marogna 2
LIFE03 NAT/SK/000098	Conservation of Aquila heliaca in the Carpathian basin
LIFE04 NAT/ES/000034	Adaptation of the electric power lines in the SPA of Aragón
LIFE04 NAT/FR/000079	Nature and territories in the Rhône-Alpes Region
LIFE04 NAT/IT/000144	Improving coexistence of large carnivores and agriculture in S. Europe
LIFE04 NAT/IT/000159	Requalification interventions of SIC Ganna's Lake
LIFE04 NAT/IT/000177	Safeguard and showing off of the peat-bogs in Danta (Cadore)
LIFE04 NAT/IT/000190	Conservation actions in NATURA 2000 sites managed by the State Forest Service
LIFE04 NAT/SI/000240	NATURA 2000 in Slovenia - management models and information system
LIFE04 NAT/SK/000244	Conservation of habitat diversity in Slovenský Raj National Park
LIFE05 NAT/A/000078	Conservation strategies for woodlands and rivers in the Gesäuse Mountains
LIFE05 NAT/SK/000112	Restoration of Wetlands at Zahorie Lowland
LIFE06 NAT/A/000124	Untersberg-Vorland
LIFE06 NAT/A/000127	Life in Upper Drau River
LIFE06 NAT/F/000143	Conservation of French populations of Orsini's viper (Vipera ursinii)
LIFE06 NAT/H/000096	Conservation of Falco cherrug in the Carpathian basin
LIFE06 NAT/SI/000069	Intermittent Cerknica Lake
LIFE07 NAT/IT/000436	A new strategy against the poisoning of large carnivores and scavengers raptors
LIFE07 NAT/IT/000502	Improving the conditions for large carnivore conservation - a transfer of best practices
LIFE08 NAT/A/000613	Water development Gail - An integrated model for Natura 2000
LIFE08 NAT/A/000614	Mur experience - Alpine river management Upper Mur
LIFE08 NAT/BG/000278	Recovery of the Populations of Large European Vultures In Bulgaria
LIFE08 NAT/BG/000281	Conservation and Restoration of 11 Natura 2000 Riparian and Wetland Habitats in 10 SCI's Bulgarian Forests
LIFE08 NAT/E/000062	Action to fight illegal poison use in the natural environment in Spain
LIFE08 NAT/IT/000325	Development of coordinated protection measures for Wolf in Apennines
LIFE08 NAT/IT/000352	Conservation and Recovery of Austropotamobius pallipes in Italian Natura2000 Sites
LIFE08 NAT/RO/000500	Best practices and demonstrative actions for conservation of Ursus arctos species in Eastern Carpathians, Romania
LIFE08 NAT/RO/000501	Conservation of Aquila pomarina in Romania
LIFE08 NAT/RO/000502	Securing favorable conservation status for priority habitats from SCI Calimani-Gurghiu
LIFE08 NAT/S/000262	Traditionella fodermarker i mellansverige (Pastures and meadows in the middlemost part of Sweden)
LIFE09 NAT/AT/000224	LIFE River landscape development Enns
LIFE09 NAT/HU/000384	Conservation of Falco cherrug in Northeast Bulgaria, Hungary, Romania and Slovakia

Project number	Project title
LIFE09 NAT/IT/000160	Brown Bear Conservation: coordinated actions for the Alpine and the Apennines range (ARCTOS)
LIFE09 NAT/IT/000183	Development of coordinated protection measures for Apennine Chamois (<i>Rupicapra pyrenaica ornata</i>)
LIFE09 NAT/SI/000374	Conservation and management of freshwater wetlands in Slovenia
LIFE09 NAT/SI/000378	Improving the conservation status of nocturnal animals (moths and bats) by reducing the effect of artificial lighting at cultural heritage sites.
LIFE10 NAT/GR/000638	Safeguarding the lesser white-fronted goose fennoscandian population in key wintering and staging sites within the European flyway
LIFE10 NAT/IT/000241	TIB - Trans Insubria Bionet. Habitat connection and improvement along the Insubria ecological corridor between the Alps and the Ticino valley
LIFE10 NAT/SE/000045	Remediation of migratory barriers in Nordic/fennoscandian watercourses
LIFE10 NAT/SK/000080	Restoration of Natura 2000 sites in cross-border Bratislava capital region
LIFE11 NAT/BG/000363	Conservation of birds of prey in Kresna Gorge, Bulgaria
LIFE11 NAT/ES/000707	Inland wetlands of Northern Iberian Peninsula: management and restoration of mires and wet environments
LIFE11 NAT/ES/000711	Improvement of <i>TAXUS baccata</i> conservation status in north-eastern Iberian Peninsula
LIFE11 NAT/IT/000044	Development of the strategy to manage the Natura 2000 network in the Lombardia Region
LIFE11 NAT/IT/000135	FAGUS - Forests of the Apennines: Good practices to conjugate Use and Sustainability
LIFE11 NAT/IT/000213	Protection and species habitat conservation for the consolidation of the <i>Carabus olympiae</i> population in Valsessera
LIFE11 NAT/IT/000234	Urgent actions for the conservation of meadows and pastures in the territory of Gran Sasso and Monti della Laga
LIFE11 NAT/RO/000823	Ecological restoration of forest and aquatic habitats in the Upper Dimbovita Valley, Muntii Fagaras
LIFE11 NAT/SK/001032	Protection of the Common Tern (<i>Sterna hirundo</i>) in Slovakia
LIFE12 NAT/BG/001011	Conservation and restoration of Natura 2000 rheophilic fish species and their migratory routes in key SCIs in Bulgaria
LIFE12 NAT/ES/000180	Monitoring network for plant species and habitats of Community interest in Aragon
LIFE12 NAT/ES/000322	Conservation of the bearded vulture and its contribution to eco-system services
LIFE12 NAT/ES/001091	Conservation of river fauna of Community interest in the Natura 2000 network sites of the Ter, Fluvi and Muga river basins
LIFE12 NAT/IT/000807	Wolf in the Alps: Implementation of coordinated wolf conservation actions in core areas and beyond
LIFE12 NAT/PL/000060	Protection of the Lesser Horseshoe bat and other bat species in southern Poland (Lesser Horseshoe)
LIFE13 NAT/ES/000724	Sustainable management for conservation of Black pine (<i>Pinus nigra</i> subsp. <i>salzmannii</i> var <i>pyrenaica</i>) forests in Catalonia
LIFE13 NAT/RO/000990	Recovery the natural habitats of community interest from Hunedoara County
LIFE13 NAT/SI/000314	Conservation of Natura 2000 sites Koevsko
LIFE07 NAT/BG/000068	Conservation of imperial eagle and saker falcon in key Natura 2000 sites in Bulgaria