D.T1.1.2 Report on questionnaire results and interviews to national experts in sectoral policies in agriculture and forestry

Report for the Deliverable D.T1.1.2 (living document)

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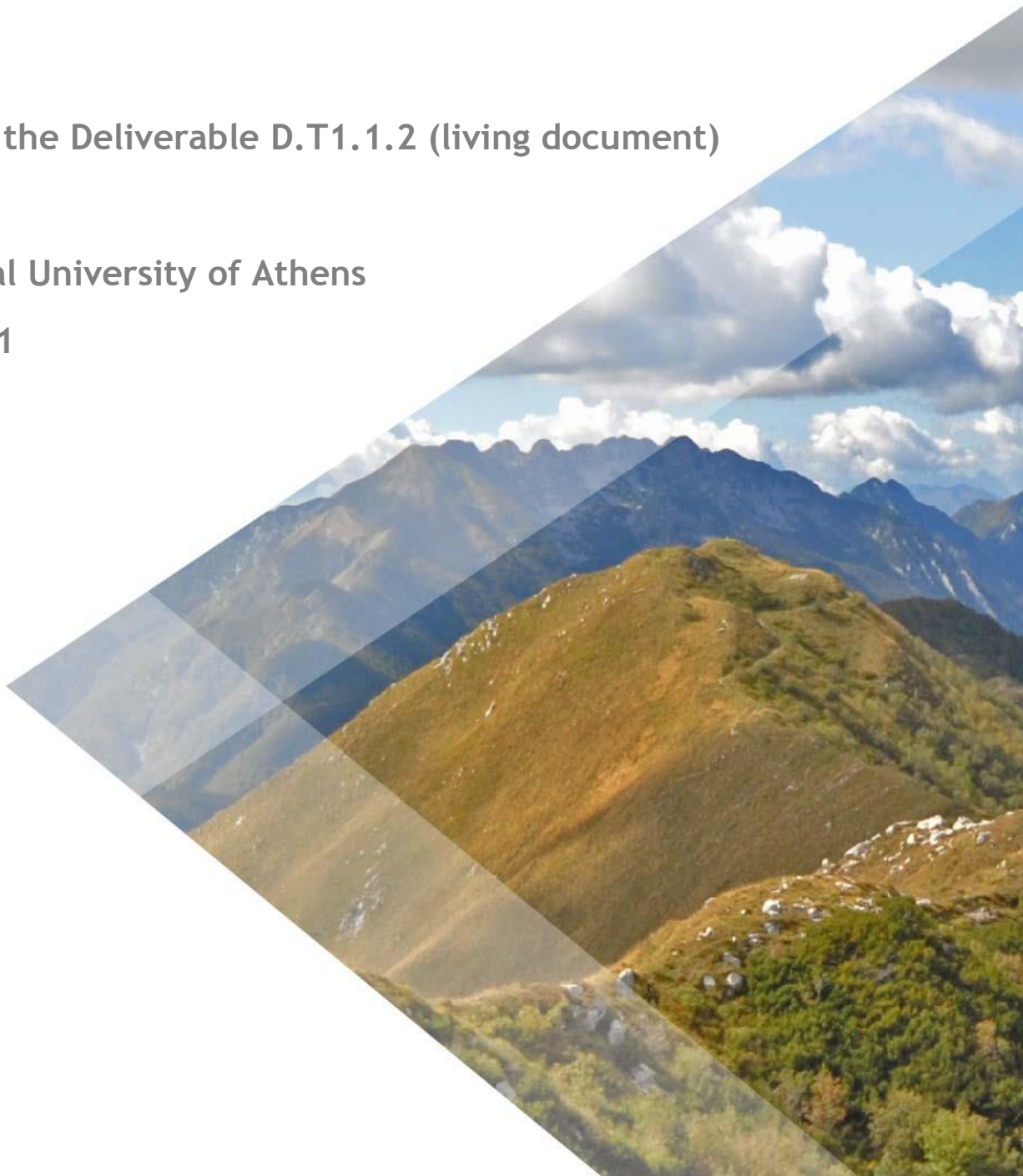

Abstract/Summary

Although Ecological Connectivity seems to be a specific environmental issue, in fact it is a broad field which concerns many aspects of natural ecosystems, agricultural landscape and human activities while it is ruled and managed by several legislative actions in various sectors.

Ecological Connectivity is not very frequently referred by national legislation in a direct way. Nevertheless in many legislative acts there are topics and provisions which affect ecological connectivity, promote green infrastructure or favour ecological corridors indirectly.

Administration and management level varies from country to county but there also many common elements.

The relation between agriculture and Ecological Connectivity is strongly controlled by Common Agricultural Policy, even for countries that are not members of European Union. Direct payments provisions but also Rural Development program includes important commitments and measures that favour Ecological connectivity.

In forest management there are differences on the setup of administration but on implementation level there are many similarities. Forest practices in general favour ecological connectivity.

Hunting rules and hunting control system although it follows some general accepted principles differ from country to country in respect to the administration schemes adopted by the country but also in respect to the policy of the country or the region for game management.

Pilot areas are consisted in general of protected areas and buffer zones connecting them or extending around them. It seems that usually these are areas with no severe human pressure. Nevertheless there are specific issues that may threaten ecological connectivity and must be addressed as soon as possible. On the other hand there already projects and actions which are focused on biodiversity, on wildlife and on agricultural and forestry practices for the protection of the environment which can be expanded and used for knowledge exchange between participant countries.

Introduction

This report summarizes the information collected through questionnaires/interviews on the ecological connectivity in the Dinaric Mountains (Annex I).

The analysis of ecological connectivity governance and planning for the EUSALP area was very useful on preparing the interview questions. This analysis is described by the two following publications:

- (Marot, N., Penko Seidl, N., Kostanjšek, B., & Harfst, J. (2019): Study on the green infrastructure and ecological connectivity governance in the EUSALP area. Ljubljana, University of Ljubljana, Biotechnical Faculty;
- PERRIN, Mathieu; BERTRAND, Nathalie; KOHLER, Yann (main authors and coordinators) et al. (2019) PLACE Report: Spatial Planning & Ecological Connectivity - an analytical overview across and around the Alpine Convention area. Grenoble: Irstea, with the contribution of the Platform Ecological Network of the Alpine Convention and ALPARC, and the support of the French Ministry for the Ecological and Solidary Transition (MTES).

One questionnaire per country has been filled in by experts on the fields of biodiversity, agriculture and forestry, intending to extract information on these three sectors, related to ecological connectivity. Twenty-seven experts were implicated, most of them as representatives of

- federal/state ministries, responsible for environment, nature protection, agriculture etc. (8 interviewees),
- regional or local protection agencies (9 interviewees) and
- nature protection institutes and NGOs (6 interviewees)

but also as

- researchers (3 interviewees) and
- program officials (1 interviewee).

The scope of this report is

a) to obtain an overview of biodiversity, agricultural and forestry national policy topics related to ecological connectivity,

b) to focus this information on the Dinaric Mountains and especially on Pilot Regions of the project and

c) to identify agricultural and forestry practices and policies which harmonize and promote cross border management for improved ecological connectivity.

The concept of ecological connectivity and ecological networks were described in the Questionnaire Introductory part as follows:

Ecological connectivity promotes movements of organisms thus facilitating ecological processes such as gene flow, migration and dispersal of living organisms. Ecological connectivity counteracts the negative effects of habitat fragmentation. This enables long term functioning of ecosystems, preservation of biodiversity and provision of ecosystem services.

Preservation of biodiversity requires large, well interconnected ecological networks going above and beyond the protection of particularly sensitive national parks which function as "islands". To protect living organisms we need to situate them in well-connected networks of protected areas.

Ecological networks consist of core areas such as NATURA 2000 sites, Ramsar Convention's wetlands, national parks networks, game refuges etc and the space connecting them through green infrastructure (such as corridors, buffer zones, green bridges, water sources and lakes or ponds) or through sustainable managed land (such as agroforestry, organic farming or extensive grazing systems).

The broad area of the transboundary ecological connectivity project and the pilot areas of Alps and Dinaric mountains which are depicted in the following map, cover part of Italy, Slovenia, Croatia, Bosnia and Herzegovina, Montenegro, Albania and part of Greece.

The Arc of Aps and Dinaric mountains covers, a wide range of geographical, climatological, cultural and ecological conditions while the economic and administrative context it also varies from country to country.

The Questionnaire/interview distributed to experts, attempts to declare the niche of ecological connectivity in national regional or local policies and strategies. Since Ecological connectivity is usually hidden under different topics, such as biodiversity, agriculture or forestry and hunting, the project focus on the above sectors trying to reveal ecological connectivity issues. The questionnaire is structured in five parts. Section 1, Implementation of ecological connectivity in national legislation, attempts to describe the place of this concept and the related practices, in basic legislation and in sectoral policies but also in policies and strategies at different levels of administration. Section 2 seeks for Implementation of ecological connectivity in agriculture and the related policies focusing on Common Agricultural Policy. Section 3 is about Implementation of ecological connectivity in Forestry namely in forest legislation and in forest management acts while Section 4 is about Implementation of ecological connectivity in hunting legislation and game management. Section 5 named Information on the DINALPCONNECT pilot region in your country, attempts to briefly describe the natural environment management in pilot areas and to give an idea of

practices implemented there which favour ecological connectivity but also of practices that decrease ecological connectivity.

Figure 1: The "Transboundary ecological connectivity of Alps and Dinaric Mountains" project area and the pilot areas

1. Implementation of ecological connectivity in national legislation

1.1 Governance model

The governance model varies in respect to the degree of decentralization and the degree of autonomy of administration entities. The governance model for each country participating in the survey is described below:

Italy: The Italian State is organised in a centralised manner with significant administrative decentralisation, especially at the level of the Regions (with ordinary and special statutes) which, together with the Municipalities, Provinces and Metropolitan Cities, are autonomous bodies with their own statutes, powers and functions according to the principles established by the Constitution. This decentralisation refers to various issues including the protection of the environment, the ecosystem and cultural heritage.

Slovenia: Republic of Slovenia is a unitary parliamentary constitutional republic

Croatia: Republic of Croatia is a unitary parliamentary constitutional republic where the state authority is organised on the principle of the division of power into legislative, executive and judicial branches.

Bosnia and Herzegovina : Bosnia and Herzegovina consists of two entities and the Brčko District. The Federation of Bosnia and Herzegovina (BiH) covers 50 percent of the territory and Republika Srpska about 49 percent of the territory. Brčko District covers the remaining one percent of the total territory. The Federation of Bosnia and Herzegovina, Republika Srpska and Brčko District all have their own constitutions. The Federation of Bosnia and Herzegovina is decentralized. It consists of 10 Cantons (each with its own government) and 79 municipalities. Republika Srpska is centralized and has no Cantons. It shares and delegates some of its competencies directly with 58 municipalities and six cities. Formally part of both entities is the Brčko District, a self-governing administrative unit. The political system in BiH is complex and the relevant national legislation in BiH is developed at the level of entities. Environmental policies and use and management of natural resource are the responsibility of entity and Brčko District governments, regulating environmental matters through laws, regulations and standards. Almost all relevant legislation is adopted and enforced at entity and Brčko District level.

Montenegro: Montenegro is a unitary parliamentary constitutional republic

Albania: Albania is divided into 61 municipalities (Law 139/2015). The model is unitary. The system is based on two tier level (first level municipalities and second level the 12 regions) but the second level (12 regions) is yet under reforming period. Till now there is a direct fiscal relation between central government and Municipalities.

Greece: Greece follows a uunitary model. There are no federal and "states" governments in Greece. On the one hand there is the central government (ministries with their proper public services) and the 7 "decentralized" administrations, and on the other hand there is the local government (elective "self-government") structured in two degrees/levels: the 13 regions (2nd degree/level of local government) and the 332 municipalities (1st degree/level of local government).

1.2 National and regional acts

Ecological connectivity is not mentioned as concept, to any participant country's Constitution.

Specific policies and strategies on ecological connectivity have been developed only in Italy. In Italy policies and strategies on ecological connectivity have been incorporated to the national, regional or local planning as follows:

At national level it is possible to find references to ecological connectivity and ecological networks within the National Biodiversity Strategy (2010) in addition to the National Ecological Network (REN, 2002) as well as to the Italian transposition of the Habitats Directive.
At regional level, all the autonomous regions / provinces of the Alpine arc have territorial coordination plans and/or sectoral plans (the Regional Landscape Plan of Friuli Venezia Giulia) that deal with ecological connectivity by identifying functional ecological connection elements and/or ecological networks. The approaches are very different from each other and at different levels of depth, but basically ecological networks are understood as a network of protected natural areas including those of the Natura 2000 network.

All provinces in the Alpine arc (prior to Law 56/2014 Provisions on metropolitan cities, provinces, unions and mergers of municipalities) have territorial coordination plans and/or sectoral plans dealing with ecological connectivity and ecological networks.

Despite the absence of specific policies and strategies on ecological connectivity in most of the countries, there are direct or indirect references on ecological connectivity in national or regional legislative acts incorporated in sectoral policies. For example in Montenegro policies and strategies on ecological connectivity have been incorporated to Forestry policy, Forest and forestry development strategy, Hunting development program 2014 – 2024, Forest law, the Law on game and hunting, the Law on reproductive materials of forest trees, the Law on Nature Protection and the National Biodiversity Strategy with Action Plan 2016-2020).

Land use and spatial planning policies are usually only indirectly referred to ecological connectivity in national scale. Land use and spatial planning always referred to the natural

environment and especially to the protection of ecosystems (e.g. Slovenia), to the natural resources (e.g. Croatia, Albania) and to the concept of protected area (e.g. Greece) or to the concept of sustainable development (e.g. Albania). In Slovenia land use and spatial planning policies, references are made directly on ecological connectivity, green infrastructure or green systems.

In Italy ecological connectivity is mentioned in a relevant to land use and spatial planning acts of regions of Veneto and at region of Friuli Venezia Giulia.

The spatial planning act of Slovenia is referred in

- ecological functions and green systems,
- connectivity of ecosystems as one of the criteria for planning spatial arrangements,
- protection of connectivity of ecosystems in relation to inner settlement development and in relation to planning of public infrastructure,
- consideration of green systems or connectivity of green and built open spaces in settlements and outside them and
- Definition of elements of a regional spatial plan, among them regional green system.

Spatial Planning Act of Croatia makes special reference to green infrastructure in Article 6:

9. A quality and human development of urban and rural settlements, development of green infrastructure and safe, healthy, socially functional work and living environment

14. Creation of a highly valuable built-up space, taking into account the specificities of certain units and developing green infrastructure with respect to the natural and urban landscape and cultural heritage, especially the regulation of gastro-touristic areas inland and on the coast, while protecting the narrow coastal belt from excessive built-up.

Policy document for Territorial and Development Planning in Albania for the period 2014-2018 makes reference to ecological networks and also (DGR. 1400/2017 - Region of Veneto in Italy directly mention connectivity.

The Montenegro law on Nature Protection makes defines what an ecological network is and claims that “ecological network area shall encompass also natural corridors used by specific wild species of animals”.

Agriculture is usually indirectly referred to ecological connectivity.

For EU country members, Cross-compliance contains engagements for farmers related to ecological connectivity such as the following Standards for good agricultural and environmental condition of land:

- Establishment of buffer strips along water courses
- Minimum soil cover
- Minimum land management reflecting site specific conditions to limit erosion
- Maintenance of soil organic matter level through appropriate practices including ban on burning arable stubble, except for plant health reasons
- Retention of landscape features, including where appropriate, hedges, ponds, ditches, trees in line, in group or isolated, field margins and terraces, and including a ban on cutting hedges and trees during the bird breeding and rearing season and, as an option, measures for avoiding invasive plant species

There are also two Statutory management requirement related to ecological connectivity, one for compliance with Directive 2009/147/EC of the European Parliament and of the Council of 30 November 2009 on the conservation of wild birds and one for compliance with Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild flora and fauna.

In addition to the above commitments, the "greening" commitments of regulation 1307/2013 art.43-47 for crop diversification, ecological focus areas and protection of permanent grasslands are favoring ecological connectivity in EU countries as follows:

Where the arable land of a holding covers more than 15 hectares, the farmer shall ensure that, an area corresponding to at least 5 % of the arable land of the holding should be remain as "ecological focus area". Member State shall decide that one or more of the following are to be considered to be ecological focus area:

(a) land lying fallow (b) terraces (c) landscape features, (d) buffer strips, including buffer strips covered by permanent grassland, provided that these are distinct from adjacent eligible agricultural area (e) hectares of agro-forestry (f) strips of eligible hectares along forest edges (g) areas with short rotation coppice with no use of mineral fertilizer and/or plant protection products (h) afforested areas (i) areas with catch crops, or green cover established by the planting and germination of seeds (j) areas with nitrogen-fixing crops.

Beneficiaries of the Direct Payments may not repurpose or plow the identified environmentally sensitive permanent grasslands located in areas of the Ecological Network - Natura 2000.

Member States shall ensure that the ratio of areas of permanent grassland to the total agricultural does not decrease by more than 5 % compared to a reference ratio to be established by Member States in 2015.

In Italy Ecological Connectivity is mentioned in region of Veneto legislative acts but also in Rural Development Program (RDP) 2014-2020. In "Regional rules for the protection of natural stable meadows of Friuli Venezia Giulia region" and in "LR 9/2007 - Regulations on forest resources" is mentioned indirectly.

In Slovenia Ecological Connectivity is only indirectly supported by protection of linear hedges within the agricultural landscape though Cross compliance.

In Croatia sustainable management of natural resources and environmentally friendly agriculture are among the objectives of agricultural policy

In Bosnia Herzegovina ecological connectivity is not mentioned in agricultural laws on Agriculture or on Agricultural land.

In Montenegro both the Law on Agriculture and Rural Development and the Strategy for the Development of Agriculture and Rural Areas 2014-2020, place special emphasis on sustainable management of agricultural resources. The Decree on the conditions, manner and dynamics of the implementation of measures in agricultural policy is a document that is adopted on an annual level and regulates support systems in agriculture. This legal act recognizes, among other things, measures aimed at supporting the development of organic production, sustainable use of mountain pastures, conservation of indigenous genetic resources in plant and livestock production, as well as measures aimed at preventing the negative impact of agriculture on the environment.

In Albania the Inter-Sectoral Agriculture and Rural Development Strategy - ISARD 2014-20 has no specific reference to ecological connectivity. However, ISARD 2014-20 creates the base for Agriculture and Forestry policy implementation tools (i.e. IPARD measures) that are supportive to the preservation of landscapes and biodiversity and can be used to build up/maintain ecological connectivity outside protected areas. The context description is in chapter 1.4.2, where reference is also made to key legal and policy documents (in 2014). There is a chapter (1.5.2) on biodiversity preservation, setting the base for IPARD measures related to the preservation of environment landscape and biodiversity (discussed in chap 3.1.2 – *"Specific objectives for restoring, preserving and enhancing ecosystems dependent on agriculture and forestry"*), which includes provision useful for ecological connectivity.

ISARD 2014-20 will be followed by SARDF (Strategy for Agriculture, Rural Development and Fishery) that will cover the programming period 2021-27. The drafting of the new strategy is now in its first stages of implementation; the draft strategy should be made available for stakeholders consultations within the second quarter of 2021.

In Greece there are few references in agriculture laws, indirectly related with ecological connectivity. The determination of the criteria by which the agricultural land will be graded in different qualities and classified in productivity categories can affect ecological connectivity since there are different cultivation rules for the different categories. The cultivation of former forest areas is not permitted in NATURA 2000 network sites but there are exceptions a) when the special protection regime of the area has been specified and the agricultural holding is allowed and B) when the special protection regime has not been

specified by regulatory acts but the agricultural have been practiced before the inclusion of the area in the special protection regime.

Ecological connectivity is indirectly mentioned in **forestry** legislation of most of the counties participating to the project.

Ecological connectivity is mentioned directly only in the Italian regional legislative acts of Region Veneto (LR 11/2004 del Veneto, art. 22, 45-ter Norme Tecniche PTCP di Belluno) and of Region Friuli Venezia Giulia (RDP 2014-2020, LR 9/2007 - Regulations on forest resources).

In most countries a forest law, regulates silviculture, forest and forest areas protection and forest sustainable management and wildlife protection.

The content of such laws is described in more details by the Croatian and Slovenian Interviewees.

Slovenian forest act defines the content of the regional forest management plans. The forest management plans are prepared for the whole Slovenia, no matter the ownership. The forest cover 58 % of the Slovenian surface. Forest Act demands that forest management plans ensure the sustainable, close to nature and multipurpose forests. This is ensured by preservation of natural composition of forest associations as well as forest management which preserves all the functions of the forest and is based on the successful natural regeneration of stands appropriate exploitation of forest sites in accordance with the natural development of forest associations as well as harmonising silviculture and the harvesting of wood and other forest goods.

In Slovenian Resolution on National Forest Program, which is a fundamental strategic document aimed at establishing a national policy for sustainable development of forest management, there is beside other sustainable, close to nature and multifunctional aims one objective dedicated directly to connectivity named “Prevent fragmentation of forest areas.”

The Croatian forest act defines the non-market forest functions and among others refers to biodiversity, natural resources and climate change mitigation. The forest act also states general rules for forest exploitation by forest owners based on maintaining and improving biodiversity and landscape diversity, as well as taking care for the protection of forest ecosystem.

The Forest Law of Montenegro in Article 32 “Forests within the nature protection areas and NATURA 2000 Environmental Network” refers that:

- In forests within the protected natural habitats, sanitary felling and measures necessary for tending which ensure protection, stability and natural regeneration of forests could be applied, in accordance with the Law.
- Forests within the Natura 2000 Environmental Network shall be managed in a sustainable manner aiming at protection and conservation of habitat types and environmentally protected sites, in accordance with the Law.

Hunting is regulated in Slovenia, Croatia, Albania, Bosnia and Herzegovina and Montenegro by a Hunting act or law.

In Italy hunting is regulated at regional level by legislative acts as the one of Friuli Venezia Giulia region on Provisions for wildlife planning and hunting activities and on Regional and Provincial wildlife plans.

Slovenian hunting act includes articles on Protection of game from unnecessary disturbance, on Special measures for the protection of game and on Ecocells. Ecocells shall envisaged by game management plans, in order to preserve in particular game and endangered wild species of mammals and birds. It is an obligation for forest managers and forest owners.

The aim of Croatian Hunting Act is ensuring a sustainable management of population of game species and their habitats in a way and extent that allows a permanent promotion of populations vitality, habitat's production ability and biological diversity, which enables the fulfilment of economic, touristic and recreative functions, as well as functions of protection and conservation of biological diversity and ecological balance of natural habitats, game species and wild fauna and flora.
Albania's questionnaire records not only the hunting law but also two more relative laws: the Law on the international trade of endangered species of wild fauna and flora and the Law on Wild Fauna Protection.

In Greece the Forest Code describes thoroughly the rules of hunting in Greece, including the hunted species, the permitted methods, the places where hunting is forbidden and several prohibitions. Two Join Ministerial Decisions establish measures and procedures for the conservation of wild avifauna and their ecotopes/habitats in compliance with the provisions of Directive 79/409/EEC, "On the conservation of wild birds", of the European Council of April, 2 1979, as codified by Directive 2009/147/EC – articles 6, 7, 8 and 9.

Italy indicated the National Law 157/92 "Standards for the protection of homeothermic wildlife and hunting" as the transposition of the above directive Directive 79/409/EEC and the directive 92/43/CEE "On the conservation of natural habitats and of wild fauna and flora" as the legislative acts related to hunting for Italy.

Preservation of **Biodiversity** and functionality of ecosystems are the main targets of ecological connectivity. At European Union level, Natura 2000 network has been established as a coherent ecological network for the conservation of biodiversity. Natura 2000 network is based on the Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora and on the Directive 2009/147/EC on the conservation of wild birds.

In Italy there are also regional laws dealing with biodiversity as the one of region of Veneto (DGR. 1400/2017 regione Veneto Norme Tecniche PTCP di Belluno, art. 18, 19, 20)

In Slovenia, the management plans of Natura network 2000 areas, 2015-2020 (Adopted by the government) Operative program for Cohesion Policy 2014-2020 (annex 6.4), include among other measures the "Establishment of corridors to achieve good state of protected species".

In Croatia the nature protection act describes the aims and the tasks of nature protection. It is also referred to characteristic landscape elements, including those that are, based on their linearity and structural continuity, considering that Spatial planning and management, as well as the planning and use of natural resources should guarantee the conservation of these elements and conservation measures should be applied to prevent unwanted changes on them. The protection of such landscape elements is based on structuring the interconnected and multifunctional networks of green/landscape infrastructure on a local, regional and national level. Their protection is implemented through spatial planning documents, as well as management plans for natural resources.

For Bosnia and Herzegovina the principal legal enactments related to biodiversity are defined in the Law on Nature Protection of FBiH (OG of the FBiH, No. 66/13), the Law on Nature Protection of RS (OG of RS, No. 20/14) and the Law on Nature Protection of BD (OG of BD of BiH, No. 24/04, 1/05, 19/07, and 9/09). Ecological connectivity is mentioned indirectly in Law on Nature Protection of FBiH in Article 67, in the context of ecologically significant areas. Also, ecological connectivity is mentioned indirectly in Law on Nature Protection of RS in Article 29 in the section dedicated to wildlife conservation.

The Spatial Plan of Montenegro until 2020 recognises Montenegrin part of the South-eastern Dinaric Mountains as a corridor. It is mainly located in the northern region and forms a part of the great bio-corridor of the South-eastern Dinaric Mountains (Dinaric Arc), stretching from the Alps to Prokletije and Sarp – Pindor massive. In the area of Prokletije, this bio-corridor is also linked to a large regional bio-corridor called the Green Belt. On Montenegro territory, this corridor runs along the entire border with Albania. Due to the specific regime of using this zone in the past, it has become a refuge and a corridor for biodiversity. This corridor is connected with the Orjen – Lovćen – Rumija coastal mountains corridor. The third corridor is located in the direction of Orijen – Pusti Lisac – Maganik – Sinjajevina Kovren. These corridors are relevant on the regional level, and their parts are

protected through the existing protected areas. It is expected that a significantly larger percent will be protected through the establishment of Natura 2000 network. In such a way, Montenegro contributes to the regional and thus global efforts towards biodiversity protection. Ecological network with corridors has not been established in Montenegro, but research needed for its establishment is in progress.

In Albania there is a Law on biodiversity protection but the ecological networks are mentioned in a Law on Protected Areas (No 8906). That law provides definitions and concepts makes reference to ecological networks and ecological corridors (or bio corridors). According to the Law, ecological network is the system of areas of environmental protection and those of community interest, according to the categories announced on the basis of procedures of this law and related to bio corridor. "Bio corridor" (ecological corridor) is the landscape segment, connecting the bio enters and enables the migration of organisms and communities of them, as well as the exchange of genetic data in between.

In Greece the legislation on environmental protection and biodiversity includes few but concrete references in ecological connectivity. The Law 1650/1986 for the protection of the environment defines that Special Environmental Studies focus on designating protected areas, on defining protection zones, on defining buffers zones and ecological corridors as well as on regulating activities and functions and determine proper measures and actions for the protected areas. Law 3937/2011, “Biodiversity conservation and other provisions” which describes the national system of protected areas, defines what can be considered as ecological corridor and refers that ecological corridor between nature reserves can be characterized as game refuges.

1.3 Management tools

The management of Ecological networks and ecological connectivity has been practiced through the implementation of variable actions that were categorized in different subjects, as it is shown on the following table. These are actions or tools referring to spatial planning, to agricultural practices, to forests practices, to wildlife management and to the establishment of management schemes and functions. In some cases although the tools are not specifically designed to support ecological connectivity, they promote connectivity in different paths. The Development of sustainably managed agricultural landscape and the Maintenance of diverse landscape patterns with traditional agricultural practices are in some cases achieved though the implementation of agrienvironmental actions of the Rural Development Programs. The Promotion of sustainable forest management and the prevention of deforestation/degradation is always an important issue of forest policies affecting undoubtedly ecological connectivity.
Although these tools are not always mentioned in policies as tools or actions that serve ecological connectivity they finally have a positive impact on ecological connectivity.


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European Regional Development Fund - Instrument for Pre-Accession II Fund


DINALPCONNECT

	ITALY	SLOVENIA	CROATIA	BOSNIA AND HERZEGOVINA	MONTE NEGRO	ALBANIA	GREECE
Develop spatial plans that reduce habitat fragmentation and destruction							
Preserve or create ecological connectivity elements							
Develop sustainably managed agricultural landscape							
Maintain diverse landscape patterns with traditional agricultural practices							
Promote sustainable forest management and prevent deforestation/degradation							
Promote agroforestry							
Maintain an appropriate share of cohesive forests in the landscape							
Maintain natural or semi natural habitats							
Protect wild animal populations							
Establish local management schemes							
Establish central management authorities							
Promote cooperation agreements between natural environment management authorities and other schemes							
OTHER (please describe):							

Table 1: Specific (national) tools mentioned in legislative acts for implementing ecological connectivity networks

1.4 Policy strategies and implementation

The concept of Ecological Connectivity has been incorporated in various sectoral policies on EU level and on national level. Nevertheless, Ecological Connectivity is mainly promoted through environmental policies. The policy makers and the stakeholders responsible for the strategic development of ecological connectivity networks are usually on European level, national level or regional level but can be also on municipal level. Research institutions and NGOs participate less intensively to the ecological connectivity governance. Business community is usually ranked low in responsibilities on ecological connectivity governance.

On the other hand the actors/institutions which have the main responsibility to implement actions to further develop the multi-functionality and connectivity of protected areas are mainly national, regional and municipal level policy makers and stakeholders and less important on this are research institutions and NGOs. Business community is again little involved in Ecological Connectivity networks implementation.

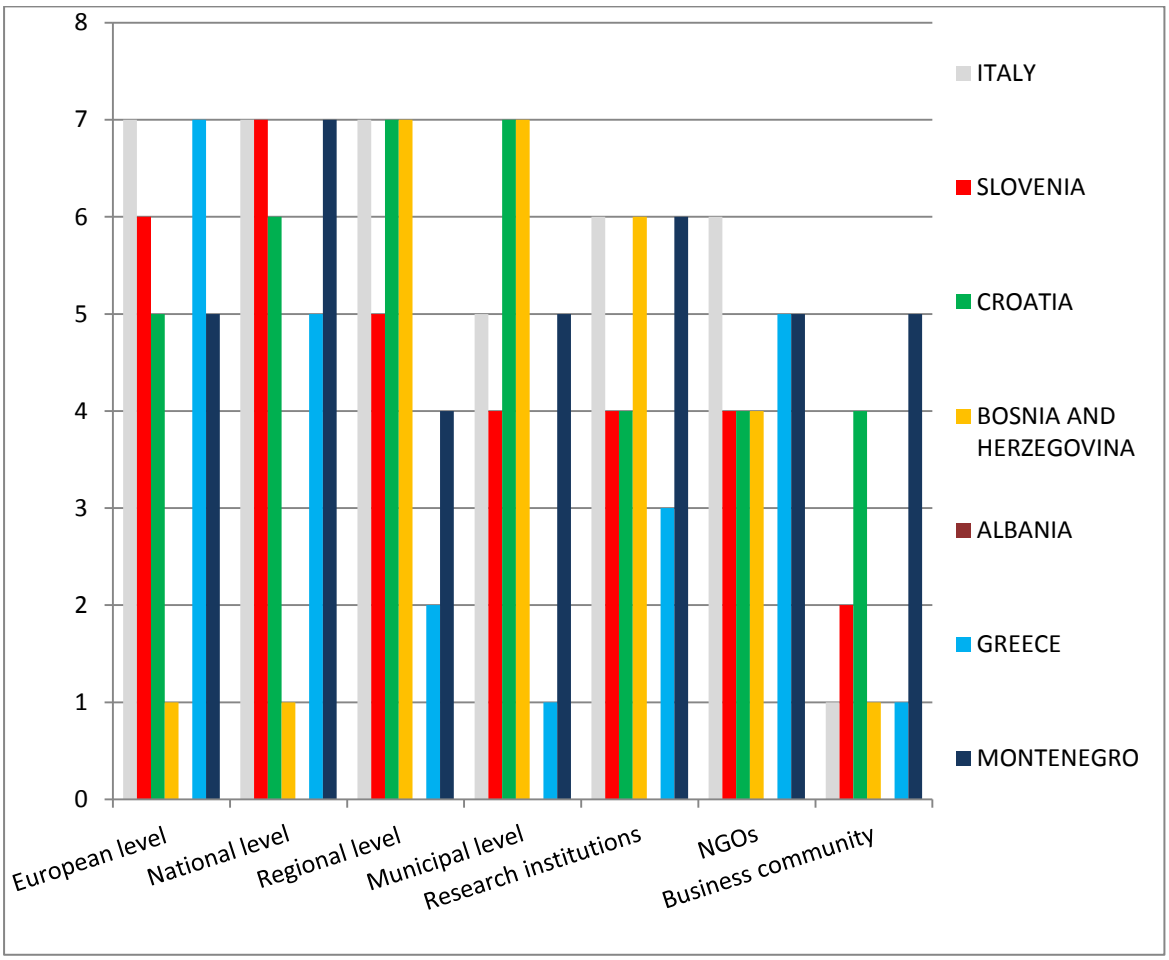

Figure 2: Governance level responsible for the strategic development of ecological connectivity networks

National level in most countries have the maximum responsibility for the strategic development of ecological connectivity, except Bosnia and Herzegovina which is a federation consisted of three entities and Greece where European level is considered the most important. Regional governance level, European level and then Municipal level are considered in total as the second, the third and fourth important governance level for developing ecological connectivity networks related policy and strategies. Nevertheless there are some differences from country to country. In Bosnia Herzegovina which is not EU members, European level it is not so important while Montenegro is. In Greece Municipal but also regional level are ranked very low.

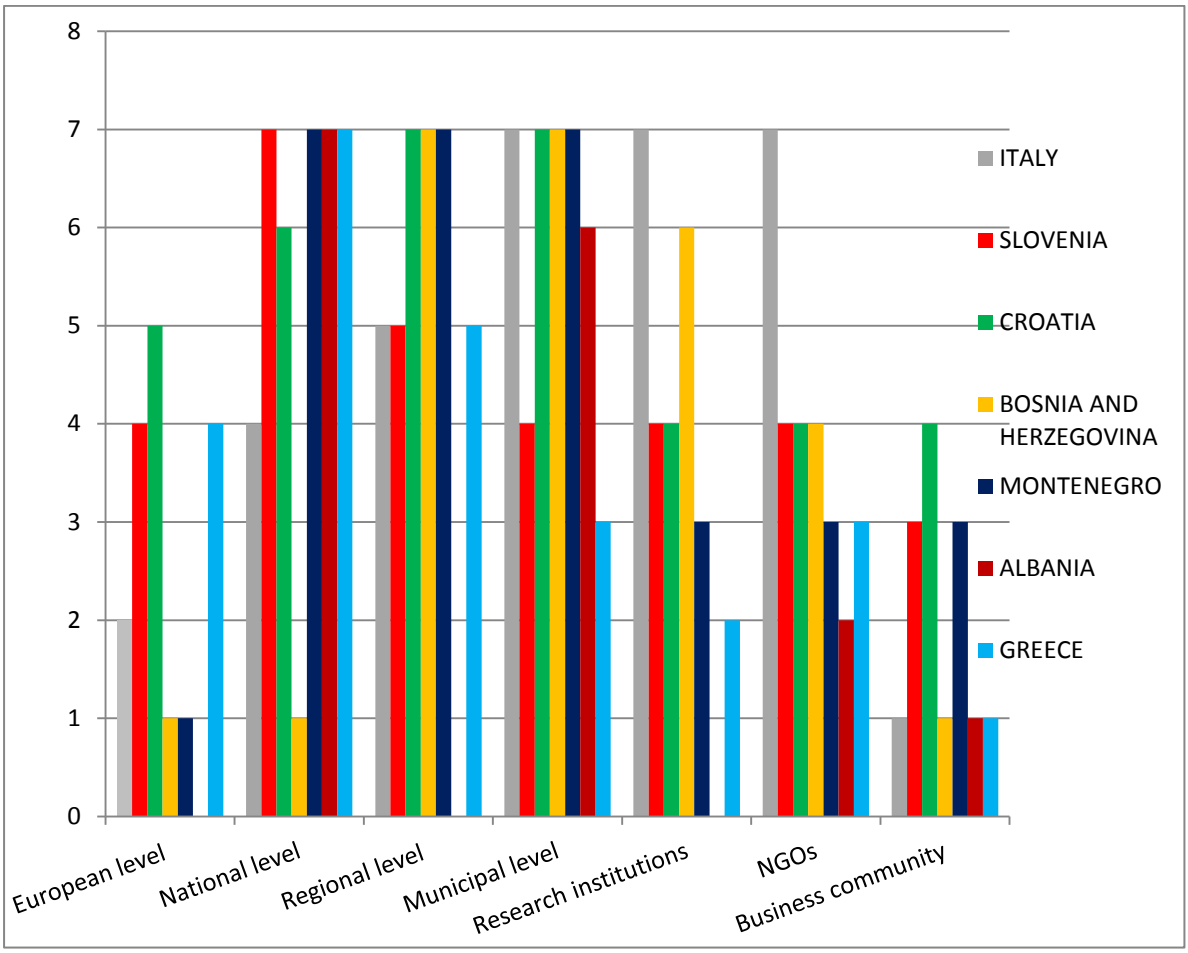

Figure 3: Actors/institutions responsible for the implementation of Ecological Connectivity networks

Research institutions and NGOs have a lower level of responsibility on ecological connectivity policy but their role is also important especially in Italy, Montenegro and Bosnia and Herzegovina for Research institutions and Italy, Montenegro and Greece for NGO's.

Business community shows low level of implication in ecological connectivity policy in most countries except Montenegro and Croatia where business governance level is enough important.

Ecological connectivity is implemented in most countries more at municipality level, at regional level or at national level. Less action is taken to further develop the multi-functionality and connectivity of protected areas by research institutes and NGO's while European Union implement only few actions. Local business very little contributes in ecological connectivity implementation except in the cases of Croatia and Slovenia where it contributes the same as NGO's and research institutes.

1.5 Transnational agreements

Transnational agreements or strategies to maintain or improve the cross border ecological connectivity have been adopted by neighboring countries.

The EU Strategy for the Adriatic and Ionian Region (EUSAIR) is a macro-regional strategy adopted by the European Commission and endorsed by the European Council in 2014. The Strategy was jointly developed by the Commission and the Adriatic-Ionian Region countries and stakeholders, who agreed to work together on the areas of common interest for the benefit of each country and the whole region. The EUSAIR covers nine countries: four EU member states (Croatia, Greece, Italy, Slovenia) and five non-EU countries (Albania, Bosnia and Herzegovina, Montenegro, North Macedonia, Serbia).

The EU Strategy for the Danube Region (EUSDR) is a macro-regional strategy adopted by the European Commission in December 2010 and endorsed by the European Council in 2011. The Strategy was jointly developed by the Commission, together with the Danube Region countries and stakeholders, in order to address common challenges together. The Strategy seeks to create synergies and coordination between existing policies and initiatives taking place across the Danube Region. The EUSAIR covers fourteen countries: Austria, Bosnia and Herzegovina, Bulgaria, Croatia, Czech Republic, Germany (Federal), Baden-Württemberg (DE), Bavaria (DE), Hungary, Moldova, Montenegro, Romania, Serbia, Slovakia, Slovenia, Ukraine

In 2003 Greece and Albania has been sign "Agreement between the Government of the Hellenic Republic and the Government of the Republic of Albania on the establishment of the permanent Greek - Albanian commission on transboundary freshwater issues" under the 2003 "Memorandum of Understanding and Cooperation in the field of environmental protection between the two countries", concerning, beside the Aoos/Vjosa, also the Drinos river and the Prespa lake. In 2010, a new agreement concerning the "protection and sustainable development of the Prespa Park" was signed by Abania, Greece, FYROM (now Northern Macedonia) and the EU, to create a standing, formal coordination body The

agreement was published in the Official Journal of the European Union on 4.10.2011. European Union, Law 4453/2017

Ohrid-Prespa Transboundary Biosphere Reserve which is part of Euro MAP network has been established in 2014 by UNESCO and covers an area of 1,733 km^2 (Albania, North Macedonia)

The lake of Shkodra/Skadar is candidate for designation as UNESCO Transboundary Biosphere Reserve (Albania-Montenegro)

Italy in the figure of the MATTM (Italian Ministry of Environment and Protection of Land and Sea) signed in October 2017 a Joint declaration of Alpine States and Regions on Alpine Green Infrastructure – Joining forces for nature, people and the economy where the states "stress that this Alpine Green Infrastructure network shall also encompass non-protected areas in the whole EUSALP territory so as to ensure structural and functional landscape connectivity".

Slovenia, Bosnia and Herzegovina and Montenegro haven't signed any transnational agreements or strategies with neighbor countries to maintain or improve the cross border ecological connectivity.

The Balkan Green Belt - as part of the wider European Green Belt Initiative- presents an opportunity to establish nature conservation across the national borders of once hostile countries. Balkan Green Belt crosses the borders to link up previously separate, unique natural regions and so contribute to the development of major nature reserves in alignment with international criteria in the hitherto inaccessible border areas. The main effort to preserve these "Balkan Green Belt Pearls" is provided by a network of environmental NGOs including PPNEA (Albania), EuroNatur (Germany), SPP (Greece), MES (Macedonia), ERA (Kosovo) and CZIP(Montenegro).

1.6 Biodiversity strategy

Biodiversity Strategies stipulate several actions related to the protection of natural environment in respect to conservation, to knowledge, to proper environmental governance, to ecosystem services, to cooperation etc.

Biodiversity strategy and its connection to ecological connectivity are presented in a different perspective from each country (Annex II).

Italy records the main priorities that are directly or indirectly related to the topic of ecological connectivity divided in six sectors.

Slovenia refers only two objectives strongly related to ecological connectivity.

Croatia points out five strategic targets.

Bosnia and Herzegovina records four objectives related to the issue of ecological connectivity.

Albania refers one objective related to ecological connectivity out of the 10 strategic objectives of the Biodiversity Strategy.

Greece points out four out of thirteen objectives as related to connectivity.

It seems that the contribution of an objective to ecological connectivity is subjective. Italy for example dedicated a whole sector to landscape but none of the other counties makes any reference to that although probably such objectives are included in their biodiversity strategies (the 5th objective Greek strategy is named “conservation on landscape biodiversity”).

Nevertheless there are some common elements on biodiversity strategies and ecological connectivity relation:

Knowledge is present, at the most of the cases, either as a public awareness or as a need for scientific data.

Nature protection and restoration it is also an important issue for ecological connectivity but the Nature protection system or the National Governance and management system for protected areas is referred only form Greece and Croatia.

Genetic resources are pointed out from Greece, Slovenia and Italy.

Italy includes numerous and precise references to ecological connectivity and green infrastructures. It is also the only country which clearly refers to ecological connectivity and ecological corridors in urban areas and infrastructure in its biodiversity strategy.

1.7 Protected areas and management plans

Ecological networks in EU level are consisted of core protected areas such as NATURA 2000 network sites, Ramsar convention wetlands, National parks, Game refuges etc. and the space connecting them through green infrastructure (such as corridors, buffer zones, green bridges, water sources and lakes or pond) or through sustainable managed land (such as agroforestry, organic farming or extensive grazing systems).

According to IUCN definition “A protected area is a clearly defined geographical space, recognized, dedicated and managed, through legal or other effective means, to achieve the long term conservation of nature with associated ecosystem services and cultural values”.

On the above definition three crucial elements can be distinguished: the defined geographical space, the legal commitment and the proper management. This chapter focuses to protected areas management.

The following table summarizes the governance level of the protected areas establishment at participant counties, meaning the governance level of geographical establishment but also of legal commitments. It is also presented, the governance level of management establishment, implementation and financing through management plans.

		ITALY	SLOVENIA	CROATIA	BOSNIA AND HERZEGOVINA	MONTE NEGRO	ALBANIA	GREECE
Protection areas establishment								
Management plans	Establishment							
	Implementation							
	Financing							

Administration level

State Regional Local

Table 2: Protected areas establishment and management plans establishment, implementation and financing

Although ecosystem services and biodiversity are important in state or international level, the management of protected areas it happens at local level. This fact is depicted on the following table in varying versions, according to the administration system in each country.

At it is shown, the state is always implicated in the establishment of protected areas in all countries except Bosnia Herzegovina which is a federation consists of two entities. In Italy where the Regions, together with the Municipalities, Provinces and Metropolitan Cities, are autonomous bodies with their own statutes, the regional but also the local governance level are also implicated in protected areas establishment. In Slovenia and Croatia although they follow a unitary model of governance, region and local authorities are also implicated in protected areas establishment.

The establishment implementation and financing of management plan varies from country to country. In Italy all three level are implicated in management plans establishment implementation and financing. The state is the main responsible for management plans in Slovenia and Albania but regions are implicated also on establishment for Albania and on

implementation for both countries while for Slovenia local level it is also implicated in implementation. Croatia, Bosnia Herzegovina, Montenegro and Greece establish and implement management plans at local level. The financing of management plans is coming always from the central state, with the exception of Bosnia Herzegovina, but in most cases also from regions (Italy, Croatia, Bosnia Herzegovina, Greece) and from local funds (Italy, Croatia, Bosnia Herzegovina, Montenegro).

2. Implementation of ecological connectivity in Agriculture

2.1 Basic principles

The basic principles for Agriculture are not described in a uniform way form the participant countries. Nevertheless the following table gives some structural elements of Agricultural land use, mainly for EU countries.

	ITALY	SLOVENIA	CROATIA	BOSNIA AND HERZEGOVINA	MONTE NEGRO	ALBANIA	GREECE
Share of arable land in UAA* (2016)	56,7[1]	35,9[1]	56,4[1]	45	9[2] (2009)		38,7[1]
Share of permanent crops in UAA (2016)	17,5[1]	5,5[1]	4,6[1]	5	9[2] (2009)		20,3[1]
Share of permanent grasslands in UAA (2016)	25,7[1]	58,4[1]	38,9[1]	50[3]	87[2] (2009)		40,8[1]
Share of fully converted or under conversion to organic farming, land in UAA (2018)	15,17[1]	10,1[1]	6,94[1]				9,32[1]
Share of irrigated land in UAA* (2016)	20,2[1]	0,7[1]	1,00[1]	0,4	2,3[1] (2009)	19,69[4]	23,6[1]

*Utilized Agricultural Area

Table 3: Basic structure of agricultural land use in participant countries

Agricultural production in Italy is very diverse on national and local level, due to the heterogeneity of the landscape. A major characteristic is the small-scale structure of agricultural holdings in all sectors, especially in alpine areas. Nevertheless, the fruit growing

[1] https://ec.europa.eu/eurostat/web/main/data/database
[2] http://www.sasb-eu.org/en/nature/the-western-balkans/montenegro
[3] Agency for Statistics BiH and Republic of Srpska and Federation of BiH institutes of statistics
[4] http://databaza.instat.gov.al/pxweb/en/DST/START__BU__AM/BU01/?rxid=5888fc6d-ed70-449c-891c-b2148ff59c89

sector, for example, is characterized by a large and young stock of machinery. Technological development is high, including irrigation (switch to drip irrigation), crop protection (hail nets, frost irrigation, etc.) and the use of plant protection products. Harvests are safeguarded through the formation of cooperatives (or wineries in the viticulture sector and dairy farms) and the high degree of financial security (through hail protection consortium and individual insurance plan).

In the grassland sector, traditional systems are still used, such as alpine pasture management and dairy farming. Also in this sector a trend towards machine processing, especially in the hay pusher and loader wagon sector. The decline of dairy farms can be explained by increased keeping of dams (meat production) and additional sources of income (farm holidays, direct marketing).

While there are many ecologically valuable areas in the grassland area (at altitudes above 800-1,000m) and on the lower slopes at the transition to the valley floor, these are rare on the valley floor and continue to be severely threatened.

In all areas, however, the importance of organic farming is increasing, and there is greater sensitivity towards natural and little-treated products.

In Slovenia approximately 34 % of the land area is covered by agricultural land uses, of which 5,3 % are pastures, 21,9 % are mixed agricultural uses, 7,1 % are arable fields and permanent crops(data of 2018). The use of pesticides per hectare per year in 2015 was 5,6 kg per hectare and the use of mineral fertilizers per hectare per year in 2019 was 138,2 kg/ha. In 2016 approximately 58 % of all grasslands in Slovenia were extensively managed."

Montenegro is characterized by the grate share of permanent grasslands

Boznia and Herzegovina is a country rich in natural resources and biodiversity, and large parts of the country possess a favorable climate for agricultural production. Agricultural production in BiH covers a broad spectrum of crop and livestock production systems. Agricultural holdings are generally equipped with basic agricultural machinery. However, it tends to be mostly old and often outdated. Lack of financial resources, necessary for modernization in all segments of agricultural production, is one of the major constraints in the development of this sector. Irrigation, proper crop choice, soil and climate conditions are suitable for all types of vegetable production. Agricultural production in BiH still has the features of extensive production and is largely dependent on weather conditions. However, problems in agricultural production in BiH are mainly related to inadequate and uncontrolled use of pesticides, inadequate management of soil fertility and use of fertilizers.

In BiH suspicious mined areas covers 1.145 km2 which is 2.3% of the entire area of BiH. The largest part of this area is agricultural land. (Data of Boznia and Herzegovina Mine Action Center, 2016)

In Albania, non-commercial farming (i.e. subsistence agriculture) with conventional production is the most common production regime.

In lowland and coastal areas, especially in the area between Berat, Lushnje and Fier, there are areas with relatively intensive agriculture; high use of Plant Protection Products is recorded in some area specialised in fruit growing (soft citrus and apple).

The activity of subsistence and small farmers (the vast majority of Albanian farms) is focused on minimising cash expenses (i.e. not on maximising revenue, output or efficiency); as a result, the use of inputs (fertilisers and PPP) is generally very low, resulting in low pollution (a point of strength), but also in land fertility degradation (a point of weakness), as crop rotation is often not properly applied.

This practice is dubbed by farmers and consumers alike as “bio-production”. Consumers have shown a preference (not attached to a premium price) for products obtained from these small farmers.

Fencing of plots is quite rare, but at the same time plots are not separated by edges or trees rows (see attached image of main production zone in the pilot area).

The structure of organic production continues to be the same, where organic medicinal and aromatic plants (organic BMA) make up 93% of the total, especially wild plants (collected and not cultivated), while other organic products such as forest fruits, chestnuts, spices continue to be produced in small quantities The highest level of organic production was recorded in 2015 when the total production of organic vegetable crops scored approximately 10,000 tons. Organic production in 2017 has increased by 41.2% compared to 2016, mainly due to the increase in production of Medicinal Aromatic Plants

In Greece, the surface water used for irrigation represents 39% of the total amount while ground water used for irrigation represents 61% of the total amount[5]. The biggest water quantities are consumed by the extensive cotton crops and by the olive groves. The methods used for irrigation are flooding, shower or artificial rain and drip irrigation.

Dividing the pesticides sales in county level with utilized agricultural land we get 0,86 KG/Ha while dividing nitrogen fertilizers sales with utilized agricultural land we get of 43,3 KG/Ha[5]

According to Greek statistical authority livestock in Greece in year 2016 includes 3.887.902 Goats, 8.738.618 Sheep, 553.805 Bovine animals and 743.228 Pigs (ΕΛΣΤΑΤ data for the year 2016).

Permanent grasslands in Greece are about 3.600.000 Ha (Land Parcel Identification System ILOTS) which represents 24% of the county’s area. A big part of them is considered as High Nature Value area. The most permanent grasslands are grazed by goats and sheep. Nomadic

[5] EUROSTAT data for the year 2016

system is still practiced in few Greek territories. Pastoral system where the flocks are moved in the uplands during the summer and in the lowlands during the winter is limited the last decades. Pastoral system is a traditional practice adapted to the local conditions and the natural vegetation. It is based on empirical observation of vegetation, grazing capacity and weather conditions and allows the regeneration of the pastures. In Greece the most of the animals graze all over the year at the same pasture, mainly in low and medium altitudes near human settlements, while during the period of the year when the vegetation is sparse are fed by fodder. As a result, the most grasslands at lowlands or near settlements are overgrazed and many mountainous grasslands are undergrazed.

1.3 Common Agriculture Policy and national agricultural policies.

In EU countries (Italy, Slovenia, Croatia and Greece) ecological connectivity is implemented in agricultural sector, mostly through Common Agricultural Policy. The mandatory provisions of direct payments (Pillar I) concerning ecological connectivity were described in section 1.1 National and regional acts. Nevertheless, the same important for ecological connectivity and maybe even more important are the measures of Rural Development Program (Pillar II) especially the Natura 2000 schemes and the agri-environmental-climate schemes but also the agroforestry measure.

Through Natura 2000 schemes farmers with holdings in Natura 2000 network areas, are compensated for the loss of income caused on mandatory commitments imposed by the conservation status of the area. The prerequisite for a country to implement the Natura 2000 payments measure is to enact mandatory commitments for holdings located in specific Natura 2000 areas or zones which cause a loss of income or an additional cost to the farmers. The measure gives the chance to those farmers to be compensated for this loss of income or additional cost which comes from the above commitments.

Italy, Greece and Croatia have adopted this measure. Nevertheless, in Greece the measure was not implemented finally.

Agri-environmental-climate measure of Rural Development program is mandatory for EU country members but voluntary for farmers. Italy, Slovenia, Croatia and Greece implemented several schemes through this measure, including some closely related to ecological connectivity. Nevertheless, Italy does not implement any agri-environment-climate scheme, organic farming measure and NATURA 2000 payments scheme, oriented on ecological connectivity within agricultural landscapes.

Montenegro also applies agri-environmental-climate measure while Albania submitted such a measure to DG AGRI in order to apply agri-environmental-climate schemes to the programming period 2021-2027.

The schemes oriented on ecological connectivity are recorded by the participant countries as follows:

Slovenia	• Preservation of hedges (have to be more than 20m long and 2-4 m wide) • Special grassland habitats • Grassland habitats for rare butterflies • Wet extensive grassland habitats for birds • Grassland habitats on steep slopes • Hummocky meadows • High alpine pastures • Meadow orchards
Croatia	• Grassing of permanent crops • Preservation of high nature value grasslands • Pilot measure for the protection of corncrake (Crex crex) • Pilot measure for the protection of butterflies • Establishment of field strips • Maintaining extensive orchards • Maintaining extensive olive groves • Preservation of dry-stone walls • Preservation of hedges • Installing pheromone, visual and feeding traps • Confusion technique in permanent crops pest protection
Montenegro	• payments for organic production, • sustainable use of pastures and • genetic resources
Greece	• Protection of wild avifauna. • Alternative weed control in rice fields • Application of a method for confusing the sexual orientation of pests in permanent crops • Organic farming (Priority was given to holdings located in Natura 2000 network areas).
Albania	• Organic farming, • Agrobiodiversity preservation (support the breeding of autochthon bovine, caprine and bovine domestic breeds).

Some of the above schemes like the “Preservation of hedges” or the “Establishment of field strips”, are referred to linear landscape elements that function as corridors. Nevertheless the most agri-environmental-climate schemes are not oriented on ecological connectivity in a direct way. Although that in most cases these schemes are not referred directly to ecological connectivity, green infrastructure or corridors, in fact they promote the

connection between natural habitats and favour biodiversity and the movement of wildlife through agricultural landscape, by maintaining the function of agricultural land as habitat for wild organisms ("Pilot measure for the protection of butterflies", "Pilot measure for the protection of corncrake (Crex crex)", "The protection of wild avifauna" etc.), by applying sustainable grazing ("Preservation of high nature value grasslands", "Grassland habitats on steep slopes", "Sustainable use of pastures", "Grassland habitats for rare butterflies" etc.) or by reducing the chemical inputs ("Organic farming", "Confusion technique in permanent crops pest protection", "Alternative weed control in rice fields"). The above schemes serve ecological connectivity more effectively when they are practiced in holdings located in ecological networks.

In EU Countries there is no national, regional or local funding to support biodiversity-friendly agricultural practices out of CAP.

In Montenegro, Annual Agro budget makes payments for organic production, sustainable use of pastures and genetic resources.

In Bosnia Herzegovina there is no funding for such agricultural practices.

In Albania the Agriculture and Rural Development Program Fund (ARDPF) is operating since 2004 supporting a variety of measures such as:

- Protection of olive groves from pests
- The pollination of vegetables in greenhouses with use of pollinators.
- Support to the adoption of integrated biological control of pests in olive groves

In addition several international development projects for agriculture and rural development promoted the adoption of environmental friendly agriculture practices and tried different approaches to support biodiversity-friendly initiatives directly and indirectly. The FFEM (Fond Français pour l'Environnement Mondial) project BiodivBalkans, intends to utilise the instrument of PGI (Geographic Indications) to create the binding guidelines (PGI regulation) for the application along the value chain of practices that will guarantee the sustainable use of some biodiversity-based products in specific areas and to create the added value that will represent the incentive to the consistent application of these vale chain management rules.

The methodology of Eco pastoral systems analysis in two areas (Has and Dukat) was also introduced. In particular, the application of this methodology was used to bridge the gap between a diagnostic of ecosystems with agro pastoral activities and the analysis of a "terroir" as a base for the establishment of a PGI, PDO or the use of any other collective mark to support biodiversity-based businesses.

3 Implementation of ecological connectivity in Forestry

3.1 Basic principles

The basic principles of the forest management system for each participant country are described below briefly, focusing at specified objectives as nature protection and sustainable forestry.

In Italy, forest management has been based on naturalistic silviculture since the 1950s. Forests serve ecosystem functions. From a management point of view particular attention is given to the hydrogeological protection function (water regulation and soil protection) of forests. Over the time the recreational landscape function of forests are playing more and more a fundamental role for the local economy and tourism sector.

All public and most of the private forest properties are under a certain kind of management. The productive function is more accentuated in the coniferous forests of the central-northern area, while in the central-southern area landscape-recreational functions are prevail, due to the greater presence of thermophilic forests.

The principal tasks of the Slovenia Forest Service in the field of forest management planning are: collecting data about forests according to the Regulation on forest management and silvicultural plans, mapping forest functions, making decennial forest management plans for the whole Slovenia for private and public forests for 236 forest management units and 14 forest management regions, and preparing professional foundations, expert opinions, conditions, guidelines and accords for all interventions in the forest and forest space. Besides that, experts of the Slovenia Forest Service co-operate with numerous borderline branches in the space (agriculture, water management, urbanization, nature protection) and with them they reconcile different, often also conflicting interests.

Forest management plans, elaborated for a period of ten years, describe the state of forests and their development trends, set the goals of management in the future (also by taking into account the analysis of management in the past) together with guidelines and measures for the rational implementation of these goals. In the past, the principal and nearly the only objective of forest management was timber production. Nowadays this objective is still significant but the main objective of the Slovenian forestry are sustainable, close to nature and multifunctional forests. This means that all functions of the forests are equally important depending on the area. They are related to important forest functions such as protective, biotopic, water protective, recreational, etc. For an objective and rational assessment of these goals a map of forest functions is used, which was elaborated in 2001 and is regularly updated at renewal of plans in forest management units.

The Law on forests regulates the activities in the forestry sector in Croatia. The forest management plans determine conditions for harmonious usage of forests and forest land and procedures in that area, necessary scope regarding the cultivation and forest protection, possible utilization degree and conditions for wildlife management. Forest Management Plan for management units are developed on 10 years cycles and according to the Law on forests each year 10% of the total forest area is in process of renewal of the plan. This process presents the forest inventory conducted on the stand level that has been implemented in Croatia for many decades. The Ministry of Agriculture supervises the decision-making process of management plans as well as their renewal and revision.

In Montenegro Forest management is centralized and fully entrusted to the Forest Administration, as a state body

In forestry, the Constitution of Bosnia and Herzegovina transfers competences to entity level (FBiH and RS) and Brčko district. The institutions at the two entities and Brčko district levels are responsible for drafting and implementing forest policy and legislation.

In the FBiH, these responsibilities are even more decentralized down to cantonal level. In FBiH the ownership of the public forest resource rests with FBiH which transfers management rights to ten Cantons. The Cantons transfer these rights to Cantonal Forest Management Companies (only one in each canton), which are established in compliance with the Law on Forests from 2002. At the level of the Federation there is a Forestry Department within the Ministry of Agriculture, Water Management and Forestry with a unit responsible for legal matters (all aspects relating to forest law and related legislation) and an FBiH Forest Office (FFO) which deals with forestry development and support and has an overall monitoring role. At the Cantonal level, responsibility for forestry rests with the relevant Ministry within which there is a Cantonal Forest Office (CFO) whose main function is to control the activities of the cantonal forest management company and provide advice and support to private forest owners.

In Republika Srpska, there is the Forestry Department within the Ministry of Agriculture, Forestry and Water Management, which is responsible for forests and forestry. Public forest company Šume RS manages the public forests in RS. It has a hierarchical organizational structure with headquarters, twenty five Forest Management Units, a Research Development and Design Centre, which undertakes forest management planning, a Centre for Seedling Production and a Karst Management Centre.

In Brčko district, where forestry plays a subordinated role, there is the Department for Agriculture, Forestry and Water management. Within this Department, there is Sub-Department for Forestry and Water management dealing with the implementation of forest and game-management legislation, forest management planning and executing projects,

forest protection and other public administrative issues. As the majority of forests are owned by private forest owners, there is no public forest company in Brčko District.

In 2019 forests in Albania, cover an area of 1,051,843 (ha) representing 60.4 % of the forest and pasture fund. Pastures and meadows have an area of 478,081 (ha) or 27.5 % of the forest and pasture fund. Areas with forest vegetation and unproductive that are part of the forest have occupied a 210.382 (ha) or 12.1 % of this fund. On the surface of the forest and pasture fund in 2019, as a result of natural phenomena and human activities is noted a decrease by approximately 17 (ha) compared with 2018. In 2019 the total forest volume was 54,846,686 (m3) and 94.0 % of this volume consisting from public forests and 6.0 % from private forests. As a result of exploitation and fires volume decreased by approximately 31,316 (m3) compared to 2018.

Forestry and pasture resources, which were property of the State until 1998 have been gradually transferred to Municipalities (Law 8337/98). At present over 90% of forestry and pastures not included in protected areas were transferred to local government yet 92% of the pasture area is public property.

- Protected areas remain property of the State and are managed by NAPA (National Agency for Protected Areas). Protected areas in 2019 occupy a general area of 523 831 (ha), equivalent 30.0 % of the forest fund and around 18.0 % of the total area of the country.
- Starting from 1997, Forest Users' Associations were also established

In Greece forest management basic principles are:

- Implement a Mediterranean forestry standard.

- Ensure sustainability and increase the forest contribution to the national economy through multifunctionality, adaptability, socio-economic role enhancement and taking into consideration climate change

- Mainly selective logging and thinning.

3.2 Forest management plans

Management plans are the main tool for organizing silviculture but also for protecting the public and environmental goods of forest and conserving its functions including biodiversity.

In all participant countries except Greece management plans are obligatory. Management plans are prepared, implemented and controlled at local level by the most countries. Montenegro and Slovenia does everything at state level and Croatia which while prepares and control management plans at state level, implements them at local level. In some countries state and region participate together with local authorities in management plans are preparation implementation and control. In Slovenia, except local level, state level also prepares management plans while in Italy and Bosnia and Herzegovina, regions also implement and control management plans.

In Italy management plans are mandatory at all levels (state, regional and local) for all public properties and optional for private properties.

In Slovenia management plans are obligatory at state and local level for both public and private forests.

In Croatia management plans are obligatory at state level for both public and private forests.

In Bosnia and Herzegovina management plans are obligatory at local level for both public and private forests.

In Montenegro management plans are obligatory at state level for both public and private forests.

In Albania management plans are obligatory at local level.

Management plans	ITALY	SLOVENIA	CROATIA	BOSNIA AND HERZEGOVINA	MONTENEGRO	ALBANIA	GREECE
Preparation							
Implementation							
Control							

Obligatory

Yes **No**

Administration level

State **Regional** **Local**

Table 4: Management plans preparation, implementation and control

3.3 Close to nature forestry and ecological connectivity practices

The term close to nature forestry stands for the use of site adapted tree species, development of mixed and uneven-aged, structurally varied forests, stand stability, forbidden clear cuts, based on natural processes. Close to nature forestry is closely related to ecological connectivity implementation in forestry management planning.

In most of the Italian Provinces, naturalistic silviculture is applied to obtain populations consistent with the ecological station, to make use almost exclusively of natural renewal, to favor the structural articulation and mixed composition of the woods, also paying attention to detailed structural elements (presence of plants with cavities, presence of necro mass, microenvironments). At the level of wooded areas, ecological connectivity is obtained through the application of naturalistic silviculture, on the principle of multifunctionality,

according to which interventions on a given stand must tend to produce a balance between the functions that the forest is able to perform, ensuring first of all bioecological functionality.

The Slovenian act of forests regulates the silviculture, the protection, harvesting and use of forests as well as the disposing of forests as a natural asset with the aim of providing sustainable, close-to-nature and multi-purpose management, in accordance with the principles of protection of the environment and natural values, permanent and optimal functioning of forests as an ecosystem and the fulfilment of their functions. The National Forest Program shall set out the above issues and includes guidelines for sustainable management of wild animals and the preservation and improvement of their living conditions. Ecological connectivity is indirectly implemented in forestry management planning through regional forest management and game management plan, which shall:

- present areas designated as protective forests, forest reserves or forests with a special purpose, as well as protected and conservation areas, in accordance with the regulations governing environmental protection, nature conservation and water management;
- define areas of individual forest trees and groups of forest trees outside settlement development areas that are important for the preservation and development of landscape or the preservation and development of habitats of wild organisms;
- present the concept of forest infrastructure and other developments in woodlands;
- designate forests areas in need of recovery;
- specify the intensity of forest management;
- designate areas important for the preservation of wild animals;
- prepare an overview and concept of forest infrastructure and other developments in woodlands and designate multifunctional areas;

In Croatia all state and private owned forests are managed in a “close to nature” practice with the objective of natural regeneration. Furthermore, clear cuts are prohibited by the law, which helps to maintain the forest stands in optimal condition and provides continuous cover over large areas. Croatia has developed sustainable forest management financing mechanism in the form of “green tax”. It is based on the charging of legal entities performing economic activities. Funds collected in this way are used for various works in forest management, including maintaining biodiversity and ensuring sustainable principles of management. Nature protection requirements are integrated in all forestry management plans, in terms of protection measures for individual threatened species, habitat types, protected areas, and sites of the ecological network. Integration of nature protection requirements are supervised by Ministry of Economy and Sustainable Development.

Some forest units (in management plans) are part of Ecological network of Republic of Croatia (now Natura 2000). In addition to preparation of vegetation (habitat) map, for those

forest units are in the forest management plans incorporated measures for protection of ecological network (Natura 2000).

In Montenegro forestry prefers the cultivation of stands that are most adapted to the existing conditions / varieties, and that is the cultivation of mixed stands of different ages, the cultivation of stable stands, without the use of clean felling. The ecological connection with forest planning is reflected through the application of management classes in forestry.

In Albania the targets related to ecological connectivity are reflected first in the Municipality Local Development Plan. Environmental protection, biodiversity and biological products promotion, forests protection and control of illegal lodging are present in these strategic documents. In 2019 manual is made available to local institutions for the preparation and update of communal forestry plans. References are made to the ecological use of forests but with no specific mentioning of ecological connectivity.

One major practice promoted for the improvement of forests ecosystems has been the rehabilitation of forest ecosystems, degraded and abandoned forest lands, forest landscape and habitats of wild flora and fauna. One part of the interventions, especially promoted through subsidy programs (Environmental Services Program) which covers the restoration, conservation and improvement of mountain ecosystems, the improvement of agriculture, forestry, support for the expansion and improvement of forest resources, as well as the prevention of forest fires. The main implementing bodes are Forest and Pasture Users Associations and individual farmers, who may be owners of forest / pasture areas or those individuals using forest / pasture area who have a legal use contract with the former commune or municipality. These specific activities are planned with the development of 30 micro base management plans.

In Greece close to nature forestry is not practiced and ecological connectivity is not implemented in forestry management planning.

No forestry practices decreasing ecological connectivity where recorded from the participant countries. Italy and Bosnia and Herzegovina mention that ecological connectivity in forested areas is usually reduced due to the expansion of other land uses (agriculture, urbanization) and not due to silvicultural practices.

In Italy forest measures enhancing ecological connectivity are financed by state, regions and local authorities for public forests while for private forest local authorities does not contribute to these funds. In Greece financing is coming from state and regions for public forests while for private forests only local funds are used. Montenegro, Slovenia and Croatia use only state funds for both public and private forests, while Bosnia Herzogovina does not support such measures. In Albania forest measures enhancing ecological connectivity are financed by state through Instrument for Pre-accession Assistance Rural Development.

The Rural Development Program 2014-2020 co-financed by EU and county members, is the main financing source of measures enhancing ecological connectivity.

Five out of six sub measures of measure 8 “Investments in forest area development and improvement of the viability of forest” of the Rural Development Program 2014-2020, described in the relative regulatory act, are related to ecological connectivity:

8.1 Support for afforestation/creation of woodland,

8.2 Support for establishment and maintenance of agro- forestry systems measures

8.3 Support for prevention of damage to forests from forest fires and natural disasters and catastrophic events,

8.4 Support for restoration of damage to forests from forest fires and natural disasters and catastrophic events

8.5 Support for investments improving the resilience and environmental value of forest ecosystems

Submeasures 8.1 “Support for afforestation/creation of woodland”, 8.3 “Support for prevention of damage to forests from forest fires and natural disasters and catastrophic events” and 8.4 “Support for restoration of damage to forests from forest fires and natural disasters and catastrophic events” are mentioned by Greece and submeasures 8.5 “support for investments improving the resilience and environmental value of forest ecosystems” and 8.6 “Support for investments in forestry technologies and in processing, mobilizing and marketing of forest products” are mentioned by Croatia. Submeasure 8.5 is mentioned also by Italy. Probably some of these sub measures are in force also in Slovenia

Other financing source of measures enhancing ecological connectivity are described by Slovenia (SIDG (Company for Slovenian state forests) for state forests), Croatia, Montenegro and Albania (World Bank).

Croatia has developed sustainable forest management financing mechanism in the form of “green tax”. It is based on the charging of Public Used Non-timber Forests Services to all economic entities in the State. Funds collected in this way are strictly designated and used only for implementation of activities supporting and executing sustainable forest management.

In Montenegro all funds are planned from the state budget, based on programs to improve measures in state and private forests.

There is no financing source for measures enhancing ecological connectivity in public and private forests in Bosnia and Herzegovina.

Fines/sanctions in the cases of illegal harvesting and logging are issued in all countries. In Slovenia this task is carried out by the Forestry Inspection Service, in Montenegro by the

competent courts, depending on the size of the damage, in Croatia by the State Inspector's Office and Ministry of Finance, in Albania by the State Police and in Greece by the Forest Service. In Bosnia and Herzegovina, the FBiH Forest Inspection (FFI) performs overall inspection services safeguarding the implementation of all actions relating to the law on forests within FBiH while the Forest and Hunting Inspection (FHI) carries out forest control measures for both public and privately owned forests based on ten year and annual forest management plans within Republika Srpska.
Provisions on restoring damaged sites and ecosystems in forestry exist in Italy but only in the case of major natural disasters. Minor damages are considered part of the natural dynamics to be managed with ordinary practices. In some cases, they may favor biodiversity. There are no provisions on restoring damaged sites and ecosystems after damage caused by humans.

In Croatia and Slovenia forest owners (state or private) are obliged to restore damaged sites and ecosystems after damage caused by natural disasters or by humans.

In Montenegro a forest recovery plan shall be passed for degraded forests caused by natural disaster or by humans. Forest recovery plan shall be laid down by the Ministry by 30th April of current year, with the Governments consent.

In Bosnia and Herzegovina there are regulations dealing with restoration from natural disasters. In the Law of National Park Una it is defined that Public Company Una NP is responsible for restoring damaged sites. Speaking of forest ecosystems surrounding National park Una responsibility for their restoration have Public Forest Company (which is managing public forests based on the agreement with Cantonal government).

In Albania the restoration of forests damaged by forest fires is implemented by the rural development program.

In Greece forest service has the obligation to restore damaged by natural disaster or humans, sites and ecosystems.

4. Implementation of ecological connectivity in Hunting

In all participant countries there are national legislative acts which rule wild game and hunting, valid for the whole territory of the country. In case of Bosnia and Herzegovina which is a federation, there are separate laws for the Federation of BiH, for the Republika Srpska and for the Brčko District. In most hunting sub-national laws contain no exemptions from national laws.

Nevertheless in Italy special statute regions and provinces have legislative autonomy in many sectors including in hunting management. Three examples are given from the

Autonomous Province of Trentino, from the Autonomous Province of Bolzano/ South-Tyrol and from Friuli Venezia Giulia region

Eg.

1. In Trentino, hunting is partially granted in natural parks under determined conditions (provincial Law n.18/1988).
2. The hunting system in South Tyrol, instead, is based on the subdivision of the territory into 145 hunting reserves, established by law, corresponding more or less to the municipalities, in which only residents and those who own substantial land estates are allowed to hunt, in order to strengthen the link between the hunters and the territory where they live. This has positive consequences, such as a greater attention to the conservation of the natural environment and a mutual control of the territory that prevents poaching, which in fact is almost non-existent in South Tyrol.
3. In Friuli Venezia Giulia Region, the regional law n. 6/2008 states that the wildlife management is entrusted to the hunting reserves. The hunting reserves operate on the basis of hunting plans which are approved by "hunting districts". Both the reserves and the districts are entirely composed by hunters, while the national law states that in the hunting management entities should be represented the farmers, the hunters, the environmentalists and the public entities. While national law states that hunting has to be annually planned with a "hunting calendar" (hunting season) after hearing the opinion of ISPRA (Italian Institute for Environmental Protection and Research), in Friuli Venezia Giulia Region the "hunting calendar" doesn't exist and hunting season is established "una tantum" by law (Regional Law 24/1996)

In Montenegro there is also a possibility of sub-national laws containing exemptions from national laws on hunting.

Adaptation to local conditions but no exemptions from national laws are made in Greece by regional forestry ordinances issued by the Decentralized Administrations (Forestry Service).

Hunting Management plans are prepared by the competent ministries (Croatia, Bosnia and Herzegovina and Montenegro), by region and province (Italy), or by both of them with a participatory process (Slovenia). In Albania Law No 7/2014 set Moratorium on Hunting for a period of two years, renovated in 2016 (Law No 61/2016), which restricts the hunting in Albania for a period of five years

In Greece there are no hunting management plans available. However, the organizations that should be involved are the local forestry services under the supervision of the Department of Wildlife and Game of the Ministry of the Environment. An annual Ministerial Decision (MoE) issued every year regulates hunting in regards to the duration of the hunting

season, huntabe species, daily bag limits etc. It also includes specific and general arrangements.

The data used for preparation of hunting management are census data on animal populations, data on animal removal, which is hunting, collisions and natural mortality, data on habitats, on natural conditions, but also historic data and socio-economic aspects.

Hunting Management plans are implemented by the competent ministries through hunting clubs and hunting organizations (Croatia), by region and province (Italy), by hunting clubs and State managed hunting grounds (Slovenia), by Hunting organizations that receive the hunting ground for use after the conducted procedure of the Public Competition (Montenegro) or by by hunting ground users (Bosnia and Herzegovina).

5 Information on the DIPLACONNECT pilot regions

5.1 General view

Four Transboundary pilot regions have been selected for the needs of the current project. These regions include protected areas close to the national borders. In all cases there is at least one common current transboundary issue which both PP and their respective protected areas wish to work on. Action plans for Pilot regions to promote ecological connectivity on transboundary level are going to be developed through the current project:

ITALY – SLOVENIA

Tarvisiano Hunting District - Triglav Hunting Management Area (Triglav National Park)

SLOVENIA – CROATIA

Natura 2000 KRAS - Natura 2000 Učka i Ćićarija

CROATIA – BOSNIA AND HERCEGOVINA

Natura 2000 LISAC – Una NP and Drvar municipality

ALBANIA – GREECE

National park of Bredhi i Hotoves – National Park of Northern Pindos

Each pilot area is consisted in two parts, one in each side of the border. The pilot areas but also the parts of them present different administrative and management characteristics in each country. The following table summarize these characteristics placing the countries with common pilot areas beside each other.

PILOT AREA	ITALY	SLOVENIA		CROATIA		BOSNIA AND HERZEGOVINA	ALBANIA	GREECE
Nature protection area establishment								
Management plan establishment								
Financing source of nature protection								
Biodiversity-friendly Agricultural and forest practices funding								
Part of Natura 2000 network	YES	YES	YES	YES	YES			YES

Administration level

State Regional Local

Table 5: Pilot areas nature protection, management and financing

The Nature protection area of "Tarvisiano Hunting District - Triglav Hunting Management Area (Triglav National Park)" is established and financed in regional level in Italy following the general administration model of the country while in Slovenia the state is responsible for the establishment and financing the nature protection area as well as for the establishment of the management plan which is missing in the Italian part of the pilot area. Administration and management in the Italian side is made by the public body Julian Prealps Nature.

Although both countries claim that their pilot area region has adopted state funding to support biodiversity-friendly agricultural or forestry practices, it is declared that this happens in the frame of Common Agricultural Policy. No more details are given for the implementation of specific measures in the area.

Natura 2000 KRAS and Natura 2000 Učka i Ćićarija protected areas, in both sides of the border (Slovenia and Croatia), present the same administrative and management status. Natura 2000 KRAS is administrated and managed by the Public enterprise Škocjan Caves Regional Park and Učka i Ćićarija protected area by the Public institution Nature park. The Agricultural and forest practices funding is also referred to Common Agricultural Policy with no more details. Once a year, municipalities in the Kars area carry out a tender for obtaining

grants. A large share of purchases and activities that are eligible for co-financing affects the Ecological Connectivity indirectly. For example various education activities take place raising awareness about nature protection and biodiversity, and various measures are applied affecting the agricultural landscape.

Natura 2000 LISAC – Una National Park and Drvar municipality, pilot area is ruled totally at state level for the Croatian part while at the other side of the border (Bosnia and Herzegovina) the Nature protection in the area follows the decentralized administration model of the country. Another difference is the absence of NATURA 2000 network in Bosnia Herzogovina. The Public Institution Natura Jadera is in charge of administering and managing for Slovenian part of the pilot area while the public company Una National Park d.o.o. Bihać has a legal obligation to manage the Una National Park.

Natura Jadera – Public institution for management of protected areas in the County of Zadar is responsible for administering and managing the pilot region nature protection area Lisac while the Public company Una National Park d.o.o. Bihać has a legal obligation to manage this protected area.

In the National park of Bredhi i Hotoves – National Park of Northern Pindos pilot area, the protection area has been established at state level but the management plan has been established at local level for Albania. For Greece the protection area has been established at regional level and still there is no management plan. The management body of Northern Pindos is administrating and managing the national park located in the Greek part of the pilot area while in Albania these tasks are implemented by Regional Agency for Protected Areas.
Financing sources are variable for Albania while in the case of Greece only the state contributes to financing of nature protection. Natura 2000 network is not yet established in Albania but the National park of Bredhi i Hotoves is included in the list of Natura 2000 sites that has been prepared and approved.

A public body is always in charge of administrating and managing the protected areas in pilot regions. The natural resources are managed by the central state or by the region while there is a local agency, usually part of a national organism or agency, for protected areas management.

5.2 Italy – Slovenia pilot area

The pilot area of Italy and Slovenia covers totally or partially fourteen Natura 2000 network site on the Italian side and four sites on the Slovenian side.

The Transboundary Pilot Region for Ecological Connectivity of the Alpine Convention between Prealpi Giulie Nature Park (part of the pilot region) and Triglav National Park (TNP) was officially nominated in 2014 at the XIII Alpine Conference.

Within TNP protected area, only 10% of the land is agricultural land which covered 8.209 ha according to our latest information from 2017 of which the predominant land use was grassland (80-100% depending on the area).

Average size of farm within TNP was 12 ha in 2017 which larger than the average farm size for Slovenia (7 ha).

Only approximately half of all the farms within TNP were registered within the national register of farms in 2017 and were consequently entitled to received subsidies from CAP (this is approximately 3.895 ha of agricultural land within TNP).Out of these 46% (1.778 ha) of the area was under conventional production and 54% (2.117 ha) under agri-environment schemes or organic production.

The most popular agri-environment scheme within TNP was “high alpine pasture grazing” which was carried out on 1526 ha in 2017.

Organic production was used on 471 ha in 2017.

We do not have information on the type of farming on the remaining half of agricultural areas as they do not receive subsidies.

In the Italian part of the pilot area, the agricultural activities have a great conservation value with concrete favourable effects enhancing biodiversity and respecting the naturalness of the area. In the Slovenian part, two opposite trends can be recognized as factors for connectivity decrease, that is intensification of agricultural land use on one and on the other hand, their abandonment. There’s also a question if combining the primal agricultural practice with other activities (e.g. tourism) is the best way to keep traditional use of land and its nature conservation importance on a long term.”

Forestry management within the Slovenia protected area is managed accordingly to protection regimes prescribed by the TNP Act (2010) and the TNP Management Plan (2016). However, the planning and performing silviculture practice are more or less equal as outside the protected area. In the Italian side of pilot region, forestry management is applied following regional laws and directives.

The ecological connectivity concept is recognized as a management priority in both sides of the border, inside both the Prealpi Giulie Nature Park and the Triglav National Park

In principle all human activities should be planned and conducted by respecting nature conservation objectives, and can be done after a specific procedure followed by the public institutions.

Furthermore, some sites of conservation importance, in particular forests, are purchased by the TNP Public Authority and excluded from further use by humans.

For some species as chamois and alpine ibex, a transboundary management vision and strategy (SI/IT) were prepared and agreed with competent stakeholders.

There's been also a strong communication campaign with relevant stakeholders and general public through implementation of several EU funded projects (e.g. LIFE NaturaViva, ERDF VrH Julijcev, Interreg SI/IT Nat2Care, Interreg ASP AlpBioNet2030, etc)."

Some measures to improve ecological connectivity which are already or will be in place in the near future, are referred by the Slovenian Interviewees: establishment of quiet zones for selected species or habitat types, such as capercaillie, black grouse, rock ptarmigan, chamois, golden eagle, peregrine falcon, raised bogs.

The "naturalist forest management" has been applied at regional level for a long time in order to ensure a real ecosystem feature in line with nature conservation in Italy but also in Slovenia forestry respects multifunctional role, sustainability and close-to-nature management.

However, some silviculture practices can be recognized as problematic, such as intensive use of forests, forestry infrastructure and use of modern silviculture technologies

In the Italian part of the pilot area, the agricultural activities have a great conservation value with concrete favourable effects enhancing biodiversity and respecting the naturalness of the area. In the Slovenian part, two opposite trends can be recognized as factors for connectivity decrease, that is intensification of agricultural land use on one and on the other hand, their abandonment. There's also a question if combining the primal agricultural practice with other activities (e.g. tourism) is the best way to keep traditional use of land and its nature conservation importance on a long term."

5.3 Slovenia – Croatia pilot area

The Slovenia - Croatia pilot area includes the KRAS Natura 2000 site on the Slovenian side (the relatively small area of Škocjan Caves Regional Park is located within KRAS) and the Nature park Učka on the Croatian side, consisted of three Natura 2000 sites.

On the Slovenian part, most of the farmers are winegrowers, there are also a lot of livestock breeders (e.g. sheep breeders), and some farmers are also engaged in vegetable production. Fertilization and pesticide use are sustainable, as most farmers are very aware of biodiversity conservation.

The share of land in organic production is relatively small. There are also two farmers who farm according to the principles of biodynamics.

Irrigation is carried out with the help of the Kras water supply system.

There is quite a lot of grazing in the Pilot Region, but it is difficult due to frequent attacks by large carnivores. Pastures need to be fenced off, and livestock moved to the barn overnight, causing farmers additional work and costs.

As far as it concerns agricultural practices decreasing ecological connectivity, in Slovenia part of the pilot area, the overgrowing of agricultural land is the biggest problem. Fencing pastures due to frequent attacks by large carnivores and fencing gardens and fields due to game (especially wild pigs) could also be a problem. For the Croatian part the use of pesticides in agriculture and the reduction of the local people population engaged in agriculture may decrease ecological connectivity.

In Slovenia ecological connectivity is implemented through Rural Development Program, which is popular in the Kras. A good example is the late first mowing (after 31st of May), which contributes to ecological connectivity. Various projects are also carried out, e.g. ENGREEN Interreg Italia - Slovenija, or projects funded by the European Cohesion Fund."

A practice favoring ecological connectivity has been implemented in the Croatian part of the pilot area. Wildlife crossing points in the pilot region have been identified and free migration of wild animals is allowed.

In the Slovenian part forest is spreading due to abandonment of agricultural land. In some areas the invasive alien tree species such as *Robinia pseudoacacia* and *Ailanthus altissima* and the lack of management plan for their removal affect ecological connectivity. In the Croatian part the forestry practices, decreasing ecological connectivity are Illegal forest devastation and landscape changes.

5.4 Croatia – Bosnia Herzegovina pilot area

The Croatia Bosnia Herzegovina pilot area includes the Natura 2000 site LIsac on the Croatian part and the National park Una on the Bosnia and Herzegovina part.

The main agricultural practice at the Croatian side of the pilot region is the extensive grazing system; sheep breading represents approximately 85%, goat breeding 2 -5% and cattle breeding the rest. Among perennials, plum plantations are somewhat represented. In the area of the Municipality of Gračac, which consists the Croatian part of the pilot region, in 2020, there were 2394.48 ha of area under organic production. The total used agricultural area in the Municipality of Gračac was 9743.36 ha. Of that, 0.32 ha was used for flower growing, 163.26 ha for fodder plants, 7564.17 ha for grazing, 1831.57 ha for meadows, 0.3 ha for growing medicinal plants, 0.86 ha for growing olives, 13,83 ha for growing vegetables, 136,59 for fruit growing and 22.34 ha ware used for cereal cultivation while 10.12 ha were fallow land. In the municipality of Gračac there is not a single land parcel with recorded irrigation.

In Bosnia Herzegovina part the agricultural production in this area it is much worse comparing to the period before 1992. Many people from these areas migrated, leaving their homes behind. It is assumed that only 30% of agriculture production is reached compared to the period before 1992. Public Company Una National Park is supporting local communities in agricultural production, promotion of products with ecological and geographical origin, making traditional dishes, etc. Public Company Una National Park is also supporting small businesses and agricultural producers. In cooperation with city of Bihać and cantonal government agricultural plots were allocated to the local people for the purpose of use and maintenance. In Una National Park in Bosnia Herzegovina the law of the park encourages additional activities in agriculture that are associated with organic agricultural production.

Una NP is an area of strict protection, hunting is strongly forbidden. The scope and management measures for each buffer zone are determined and harmonized according to the Management Plan in the annual plans of hunting and breeding activities derived from hunting-economic bases for hunting grounds in the area of the National Park. In the area of the National Park Una, hunting areas are established together with their conditions and terms of use and the areas of strict protection with an appropriate safety (buffer) zone are designated as a non-hunting areas.

According to the Law on Una NP forest management for commercial purposes is strictly forbidden. Decreased ecological connectivity caused by forestry practices has not been reported in the pilot area so far.

Given that the forests in the Lisac area are managed by a diverse management method that involves one intervention of foresters in 10 years (one felling - thinning or partial or complete regeneration of forests), i.e. one "entry" into the forest in 10 years, such management does not reduce ecological connection (free flow of genes and organisms) in the Lisac area.

Forestry practices performed in the Lisac area managed by Croatian Forest Ltd. can be reduced to two separate groups:

A) Protective - performed in all the areas managed by Croatian Forest Ltd. (both commercial and protective forests), which are: 1. field patrol in order to protect the forests, forest land, forest infrastructure and markings from damage, destruction and illegal appropriation, use and other illegal actions; 2. monitoring and preventing, control, recording and report on all impacts that cause changes in habitat conditions: drying and decay of trees, burning of stands, wetting or drying of habitats, damage to forest soil; 3. preventing any disposal of waste and harmful substances in the forest or on forest land; 4. taking care of maintaining the economic division and boundary signs (mounds, culverts, ditches); 5. to monitor, prevent and report poaching; 6. taking care of cleaning and maintenance of the skid trails, fire trails and observation posts, installation of warning signs and prohibitions; 7. implementing the

fire protection measures determined by the plan and in case of forest fires or open fires closer than 200 m from the edge of the forest immediately starting to extinguish and to inform the superior and competent services (information center, police station, regional firefighters); 8. to report on damages caused by biotic and abiotic factors; 9. to report on the construction of lime kilns, field brickyards and other facilities with an open fireplace; 10. to report on the maintenance of forest order in fellings.

B) Economic activities - performed only in commercial forests, and these are: felling and production of wood and growing works in forests and silvicultural works

Total area of forests and forest land in the area of Lisac is 1266.41 ha or 13.55% of the area. Of this area, only 170.73 ha or 1.83% is accounted for by commercial forests (in which wood mass is cut), and the rest (1095.68 ha or 11, 72%) are protective forests (clearings, shrubs, thickets, non-productive stumps) in which there is no felling and cultivation work but only a guard service (protection against theft, detection of changes of all kinds, fire service…).

5.5 Albania – Greece

The Albania – Greece pilot area includes on the Albanian side the Bredhi I Hotoves (cat II) National Pak and the Managed Nature Reserve Germenj-Shelegure-Leskovik-Piskal. Both areas are foreseen for inclusion in Natura 2000 network and they are candidates for the Emerald network. On the Greek side, pilot area includes part of National Park of Northern Pindos (GR2130009, GR2130011 and GR2130001 overlapped with GR2130004) and the Natura 2000 site GR2130010 which is attached to the border.

On the Albanian side, the quasi-totality of the farms in the pilot area are not specialized, with a core activity consisting in small ruminant breeding and secondary activity in annual plant production, managed in conventional production regime (i.e. not organic production)

Small ruminants' breeding regime of local farmers is based on the use of pastures near to the settlements for seven-eight months per year. Local small ruminants' breeders integrate their income through wild Medicinal and Aromatic Plants collection, which is a major business in Albania; in fall they also collect other non-timber forestry products, such as nuts. Some of the high pastures in Permet are used for long-distance transhumance from coastal areas. In the municipality of Permet (one of the two involved municipalities) there is a strong but declining tradition in grape growing. Fruit growing is also declining. Plots are mostly quite small (0.1-0.2 ha) and usually have an elongated rectangular shape, laying parallel to the river (see image attached). There are no fences, or hedges set as separation between plots.

On the Greek side of the pilot region a limited area is cultivated. Conventional production and traditional methods are practiced both. There is no quantitative information on land under organic production and on the use of fertilizers. The most of agricultural land in the

pilot area is used for grazing. Pastoral system where the flocks are moved in the uplands during the summer and in the lowlands during the winter is practiced in some cases.

Ecological connectivity is implemented in practice in the Albanian part of the Pilot area, through relevant agro-environmental actions, through pasture maintenance and through provisions for forestry preservation. World Bank grants were given for provide support for afforestation, prevention of fires and restoration of forests affected by fires. Ecological Connectivity is favoured also by actions applied at national level as organic farming, small-scale beekeeping and traditional transhumant small ruminants breeding management.

Possible barriers on Ecological connectivity for Albanian pilot area are agro-processing and other industries like mining, tourism and other services, settlements, transport and dams.

On the Greek side the management body of Northern Pindos National Park is responsible for guarding the National Park, for scientific monitoring and data collection in the Protected Area and for implementing a public awareness program.

In addition the management body implements management actions on:

- the reduction of human-wildlife conflicts,
- tackling the phenomenon of the use of poisoned baits,
- the protection of the Brown Bear through the reduction of mortality due to its approach in settlements,
- the protection of the fish fauna in the Artificial Lake of the Aoos springs from alien species,
- the monitoring of the bird fauna and the possibility of reproduction of the Silver Pelican in the Artificial Lake of the Aoos springs,
- the conservation status of the Macedonian Triton (*Triturus macedonicus*) and
- the marking of the main entrances of the National Park and the Nature Protection Zones of the protected area.

On both parts of the Pilot area support to the farmers have been distributed by the national payment agency but no more data are available.

The main forestry practices, decreasing ecological connectivity on the Albanian part are:

- Collection of firewood. Firewood remains the main source of energy in rural areas and contributes to the bad state of forests in areas near to settlements.
- Illegal logging is an issue which has never been completely addressed. However there are no recent studies on illegal logging in the pilot area.
- Inadequate pasture management (some pastures abandoned and gradually taken over by forest, other overgrazed, lack of maintenance of watering points) is negatively affecting forest biodiversity.

In the pilot areas, the establishment of active Forest Users Associations both in Permet and Kolonje could improve the situation. In particular, these two associations (together with a private forest owner) benefitted from the IPARD.

On the Greek side the main forestry practice decreasing ecological connectivity is the deforestation logging of oak forests which is still practiced

On the Albanian side, collection of firewood occurs in common forestry areas and in practice is not regulated: as a result common part (the communal forests owned by municipalities) are neglected and in bad conditions. Illegal logging is quite common, especially in the areas near to the roads and in state forests.

The use of Plant Protection Products and fertilisers is low. There are no edges and few trees rows among the land parcels, but land parcels are small and localized near to the settlements and along the water bodies. There are no major food processing industries. Some parts of Permet have a certain degree of specialization in vineyards growing. This increases the overall biodiversity of cultivated areas, as compared to areas devoted to rotation between annual crops and fallow land;

On the Greek side the main agricultural practices decreasing ecological connectivity are:

- the use of Poisoned bait against the wolves which has dramatic result in wild fauna especially on vultures and
- the abandonment of grazing in some areas which has negative effects on biodiversity while overgrazing in other areas mainly by cows has also negative effects.

Some practices aiming at improving ecological connectivity in pilot areas are described below:

Italy - Slovenia	Italy	• Land purchased by the TNP Public Authority and excluded from further use by humans. • Transboundary management vision and strategy for chamois and alpine ibex
	Slovenia	• Land purchased by the TNP Public Authority and excluded from further use by humans. • Transboundary management vision and strategy for chamois and alpine ibex • Establishment of quiet zones for capercaillie, black grouse, rock ptarmigan, chamois, golden eagle, peregrine falcon, raised bogs.
Slovenia - Croatia	Slovenia	• Late first mowing (after 31st of May)
	Croatia	• Wildlife crossing points in the pilot region have been identified and free migration of wild animals is allowed
Croatia – Bosnia and Hercegovina	Croatia	• Measure 10 – Agri-environment-climate • Measure 11 - Organic farming
	Bosnia and Hercegovina	• In the area of strict protection hunting is strongly forbidden. • an appropriate safety (buffer) zone are designated as a non-hunting areas
Albania - Greece	Albania	• Agro-environmental actions, • pasture maintenance • provisions for forestry preservation • organic farming • small-scale beekeeping • traditional transhumant small ruminants breeding management.
	Greece	• the reduction of human-wildlife conflicts, • tackling the phenomenon of the use of poisoned baits, • the protection of the Brown Bear through the reduction of mortality due to its approach in settlements, • the protection of the fish fauna in the Artificial Lake of the Aoos springs from alien species, • the monitoring of the bird fauna and the possibility of reproduction of the Silver Pelican in the Artificial Lake of the Aoos springs, • the conservation status of the Macedonian Triton (*Triturus macedonicus*) and • the marking of the main entrances of the National Park and the Nature Protection Zones of the protected area.

Annex I

Experts on the fields of biodiversity, agriculture and forestry

Country	Experts	Organization
Slovenia	Blanka Bartol	Ministry of Environment and Spatial Planning
	Miloš Bartol	Park Škocjanske jame
	Milena Štolfa	KGZS Sežana
	Aleš Poljanec	Slovenia Forest Service
	Matija Stergar	Slovenia Forest Service
	Andreja Nève Repe	Slovenia Forest Service
Italy	Serena D' Ambrogi	ISPRA
	Simone Sabiane	Settore Urbanistica E Mobilita - Provincia di Belluno
	Alessandro Wolynski	Ufficio Pianifocazione Selvicoltura ed Economia Forestale - Provincia Autonoma dei Trento
	Natalia Bragalanti	Servizio Foreste E Fauna - Provincia Autonoma di Trento
	Luigi Spagniolli	Ufficio Caccia e Pesca - Provincia Autonoma di Bolzano
	Christian Pichler	Ufficio Sistemi Informativi Agricoli - Provincia Autonoma di Bolzano
Croatia	Nives Rogoznica	NATURA -JADERA public institution for management of protected areas in the County of Zadar
		Ministry of Agriculture, Directorate for Forestry, Hunting and Wood Industry (Organization didn't provide a name)
	Matej Mikulić	Agency for rural development of Zadar County
	Ramona Topić	Ministry of economy and sustainable development/Institute for Environment and Nature
	Luka Škunca	Association BIOM
Bosnia and Herzegovina	Maja Jaćimovska	External expert
Montenegro	Miloš Janković	Ministry of Agriculture, Forestry and Water Management
Albania	G. Kromidha	INCA
	K. Mersinaj	PPNEA
	E. Skreli	ISTN
	K. Marika	Ministry of Tourism and Environment
Greece	Georgios Politis	Attorney-At-Law, M.Sc. Former member of administrative council of Hellenic Society for Nature protection
	Ioannis Mitsopoulos	Ministry of Environment and Energy

	Costas Apostolopoulos	Managing Authority for Rural Development Program 2014-2020
	Konstadina Demiri	Hellenic Ornithological Society
	Mixalis Vakkas	Management Agency of the Northern Pindos National Park

Annex II

Biodiversity main targets related to ecological connectivity

ITALY	Species, habitats. - Promote programs and initiatives aimed at increasing the knowledge. - Programs for the in - and ex situ conservation. - Actions to improve and restore the ecological functionality of habitats with particular reference to agricultural, forest, coastal, river and small island areas	Landscape - promote the updating of national legislation on the use, transformation and protection of the territory. - promote the use of the methodology for the design of ecological networks of large areas as an integral and prescriptive part in landscape planning	Agriculture Promote the maintenance of ecosystems and the rural landscape through a targeted management of agricultural land to create and/or maintain a sort of "green infrastructure"	Forests Protecting the diversity and complexity of the landscape as well as biological complexity of forest ecosystems by enhancing their ecological connectivity, also through reforestation interventions carried out according to modern criteria and respectful of genetic diversity as regards the choice of forest reproductive material.	Infrastructures - redevelopment of natural habitats on the edge of linear and punctual infrastructures - integration of infrastructure into the ecological network.	Urban areas - to encourage the ecological requalification of urban areas, promoting integrated projects for the recovery of built areas and natural habitats. - preserving and implementing ecological corridors in urban areas.
SLOVENIA	To maintain all indigenous animal and plant species at a favorable status	To conserve and, where appropriate, establish ecological links which facilitate gene exchange among populations				

CROATIA	Raise the effectiveness of the basic nature protection mechanisms	Decrease direct pressures on nature and stimulate a sustainable use of natural resources (Specific target 2.5 Conserve unfragmented natural areas and restore the most endangered degraded habitats)	Strengthen the capacities of the nature protection system	Increase knowledge and data availability about nature	Raise the level of public knowledge, understanding and support for nature protection	
BOSNIA AND HERZEGOVINA	By 2020, map and urgently protect the specific biological diversity of BiH in compliance with the applicable spatial planning documents	By 2020, complete the inventory of: (i) flora, fauna and fungi in BiH; (ii) ecosystems and types of habitats in BiH	By 2020, map and evaluate the benefits from forest, agricultural and water ecosystems, and strengthen the environmental permit mechanism and supervisory inspection within protected area spaces, areas of special interest and areas from the Natura 2000 ecological network plan	By 2020, restore 30 strip-mine lakes into wetland habitats, increase the productivity of all categories of forests, preserve the existing area of flood alder and willow forests, and increase the regulated urban green areas by 20 %.		

MONTENEGRO						
ALBANIA	Maintain or Restore Biodiversity and Ecosystem Services in Albania to a Favorable Conservation Status					
GREECE	Increasing knowledge about the assessment of biodiversity status	Conservation of national natural capital and ecosystem restoration	Organization and operation of a National System of Protected Areas and enhancement of benefits from their management. Sub target 3.3. Points out the design, and possible integration, of ecological corridors of special designation status and their effective management	Conservation of the genetic resources of Greece – Facilitating access to genetic resources – Fair and equitable sharing of the benefits arising from their utilization		