Feasibility study on enhancing connectivity conservation in the PONT Focus Region: Albania and North Macedonia

Scoping Report

June, 2022

Cover photo: Ilinska-Plakenska Mts – important corridor connecting Mavrovo NP with Galichica and Pelister parks. © Dime Melovski
Content

1. Introduction ......................................................................................................................... 4
2. Study area .............................................................................................................................. 5
3. Protected areas governance and management ................................................................. 8
4. Connectivity ........................................................................................................................ 13
   3.1 Types of connectivity ........................................................................................................ 13
      3.1.1 Habitat connectivity .................................................................................................... 13
      3.1.2 Landscape connectivity ............................................................................................... 15
      3.1.3 Evolutionary process connectivity ............................................................................. 16
      3.1.4 Ecological process connectivity .................................................................................. 16
   3.2 Threats to biodiversity in relation to connectivity ........................................................... 18
   3.3 Recommendation ........................................................................................................... 19
5. Target species ...................................................................................................................... 19
   5.1 Mammals ....................................................................................................................... 20
      5.1.1 Brown bear .................................................................................................................. 20
      5.1.2 Balkan lynx ................................................................................................................ 23
      5.1.3 Balkan chamois ......................................................................................................... 26
   5.2 Birds ................................................................................................................................ 26
      5.2.1 Alpine Cough (Pyrrhocorax graculus) ........................................................................ 26
      5.2.2 Black Woodpecker (Dryocopus martius) ................................................................... 26
      5.2.3 Rock Partridge (Alectoris graeca) ............................................................................ 27
   5.3 Fish .................................................................................................................................. 27
6. Selection of corridors ............................................................................................................ 28
   6.1 Ilinska-Plakenska ............................................................................................................. 28
   6.2 Bukovikj ........................................................................................................................... 28
   6.3 Korrab-Koritnik-Albanian Alps ...................................................................................... 29
   6.4 Munella-Zeba ................................................................................................................... 29
   6.5 Polis-Sopot-Valamara-Ostrovica-Gramoz ...................................................................... 30
   6.6 Water connectivity .......................................................................................................... 32
7. Conclusion..................................................................................................................................................32
8. References ..................................................................................................................................................34
Annex 1 – Workplan for the next phase.........................................................................................................36.0
1. Introduction

Since its establishment in 2015, the PONT (Prespa Ohrid Nature Trust) focus region (Fig. 1) has expanded north and now encompasses three large transboundary protected areas (PA) in North Macedonia and Albania: Jablanica–Shebenik, Mavrovo–Shara–Korabi and Albanian Alps. Considering the size of the two countries, the area under protection is noteworthy. Their effectiveness in species conservation largely depends on the effectiveness of nature protection and management inside the PAs. However, the effectiveness of protected areas also depends on their connectedness outside of the protected area’s borders. Aiming to maintain the integrity of ecological processes in the fragmented landscapes surrounding the core habitats sustained within the protected areas, conservationists have developed and promoted the concept of ecological networks (Gimona et al. 2021). This exerts the need of identifying, establishing and managing functional corridors so that protected areas act as essential nodes of large landscape conservation networks. Sustained connectivity secures ecosystem functioning and hence reduces the risk of biodiversity loss whilst securing the provision of a range of interrelated nature’s benefits that sustain peoples’ livelihoods and well-being. This is especially important in the context of continuous environmental changes and challenges we face today, including climate change.

The need for putting an accent on ecological connectivity between the existing PAs is getting more and more relevant in the 21st century transitioning countries such as N. Macedonia and Albania. The alterations that the landscapes are facing by the anthropogenic pressure is affecting all strata of terrestrial ecosystems (Boivin et al., 2016). The negative impact can be visible on multiple scales stretching from communities to genes causing connectivity disruption in both its physical (structural) and its functional dimension (Gagnaire, 2020).

To support biodiversity and ecological processes within and between the “islands” of protected areas, in time where establishment and successful management of protected areas is challenging, this study aims to assess connectivity gaps and identify ecological corridors that have the largest contribution in securing structural and functional connectivity in the region.

In this regard, this scoping report aims at providing information on different approaches for connectivity while considering PONT’s capacity and role. It also aims at identifying priority ecological corridors between the already established network of protected areas.

First part of the report looks into the study area and the potential corridors between the abovementioned protected areas in both countries while taking into consideration the national and international levels of protection. The third chapter gives an overview of the national and international system of protected areas in both countries whilst providing a brief outline of the wildlife management system outside the protected areas in both countries. The fourth chapter provides a summary of the four types of connectivity considered and with consideration to data availability, provides a rationale for the selection of the connectivity assessment approach that is most relevant in sustaining and enhancing the viability of populations of conservation important species in the PONT Focus Region. The fifth chapter provides arguments on the
selection of target species most relevant for assessing connectivity. In this chapter, and based on the presented work, we selected eight target species to delineate the corridor zones in the study area. Next chapter is focused on the five corridors zones selected for their importance in connecting the main clusters of protected areas in the study region. Finally, the report provides a rationale for selection of the focus corridors.

2. Study area

The south-western Balkans are one of the most biologically diverse areas in Europe. The high biodiversity present in this region is mostly due to the geographic position and climate - with continental, Mediterranean and oriental elements. Predominantly mountainous relief of both countries with several high mountain ranges and steep gorges provide microclimatic conditions for specialized, often endemic species (Melovski & Bozhinovska, 2014). Preservation of species diversity was aided by the highly restrictive post-WWII management along the “iron curtain” set to divide East and West. Since 1999, the Europe-wide initiative called the Green Belt set to prompt nature conservation and sustainable development along the former “iron curtain” was broadened to create the Balkan Green Belt that includes the natural areas of Montenegrin-Albanian-North Macedonian-Greek borders (Schwaderer et al., 2008) (Fig. 1).

The following three clusters of protected areas are in the focus of expanded PONT financing (Fig. 1):

Wider Prespa-Ohrid Area

The biggest cluster of protected areas covers four national parks that are the Prespa and Shebenik (33,927.66 ha) National Parks in Albania and Pelister and Galicica National Parks in N. Macedonia; three monuments of nature in North Macedonia that are the Lake Prespa and Vevchani Springs and Lake Ohrid that needs to pass the re-proclamation procedure; one Nature Park Ezerani (N. Macedonia) as well as Pogradec Terrestrial/Aquatic Territory Protected Landscape (in Albania) and Prespa National Park in Greece including the protected areas on Gramos Mountain (Fig. 1). This cluster is very diverse in terms of categories of PAs it embeds and differences in management history (some of the protected areas are very old such as Pelister National Park proclaimed in 1948, while the others are newly proclaimed). However, all of them (except Lake Ohrid Monument of Nature) have established management authorities with different levels of management effectiveness. Potentially this cluster will involve Jablanica National Park in North Macedonia (once it is proclaimed).

Korab-Shara-Koritnik

This cluster includes several protected areas two of which are in North Macedonia: Mavrovo National Park (proclaimed in 1949 but has not passed the re-proclamation process) that is the largest protected area (73,088 hectares) in the country with an established management body but insufficient capacities for
management and conservation, as well as lacking a Management Plan; and the newly proclaimed Shar
Mountain National Park in 2021, which is in the initial phase of establishment of the management body and
in the process of formal approval of its first Management Plan (Fig. 1).

Sharri National Park in Kosovo was proclaimed in 1984 and together with the Mavrovo and Shar
Mountain National Parks form one of the largest Category II protected areas in Europe – 188,900 hectares.

Korab-Koritnik Nature Park or Managed Natural Reserve (MNR) in Albania has high biodiversity,
represented by a large number of endemic and rare flora and fauna species covering 55,417 ha (Fig. 1). Due
to these high natural values, this area was established as Nature Park, category IV according to the Albanian
laws, in 2011. Since 2015, the area has been managed by the National Agency for Protected Areas (NAPA).

Albanian Alps National Park

Proclaimed in January 2022, the new park includes entirely the former Lumi i Gashit Strict Nature
Reserve, Lugina e Valbonës National Park and Thethi National Park in Albania, as well as the adjacent areas,
becoming the largest protected area of Albania to date with 82,844 hectares. It is part of a larger
transboundary conservation area, including Bjeshket e Nemuna National Park in Kosovo and Prokletie
National Park in Montenegro (Fig. 1).

Other protected areas in North Macedonia (e.g., Jasen Multipurpose area), Kosovo (Sharr National
Park), Albania (Lure-Deje National Park, Bjeshket e Oroshit Protected Landscape, Munella Nature Park,
Bize-Martanesh Protected Landscape and Shala Valley Nature Park) and Greece (Prespa National Park) will
also benefit from establishment and effective management of corridors and connectivity between the
aforementioned clusters (Fig. 1). Added consideration of Zagori Nature Park, Bredhi i Hotoves-Dangelli
National Park, Tomorri National Park, Dajti National and Mali me Gropa - Bizë-Martanesh Protected
Landscape in Albania will further aid the conservation connectivity to PAs along the Albanian-Greek border,
ultimately connecting Pindos Mountains. All these mountain areas of northern Greece, eastern Albania and
south-west North Macedonia constitute a terrestrial ecoregion of Europe belonging to the Mediterranean
forests, woodlands, and scrub biome.
Figure 1. Study area in the PONT extended region and national protected area system with possibility for connection between them (black arrows).
3. Protected areas governance and management

International community has committed to conserving effectively 17% of terrestrial areas and inland waters, and 10% of coastal and marine areas by 2020 as protected areas (CBD, 2010) that will represent the fundamental building blocks of nature conservation strategies. The post-2020 biodiversity framework\(^1\) goes further in enlarging the EU wide network of protected areas on land (at least 30%) and seas (at least 30%) while ensuring strict protection for areas of very high biodiversity and climate value. Together with the restoration of ecosystems, these steps would put the Europe biodiversity on the path to recovery.

The importance of PA connectivity is also recognized in global biodiversity targets adopted by the world's governments (Saura et al., 2017). In 2010, the parties to the United Nations Convention on Biological Diversity (CBD) adopted a Strategic Plan for Biodiversity for the 2011–2020 periods, including the twenty Aichi Biodiversity Targets (CBD, 2010). Apart from increasing the PA network to at least 17% it refers to ‘effectively and equitably managed, ecologically representative and well-connected systems of protected areas’ (CBD, 2010). However, the CBD has neither provided a clear definition of the term ‘well-connected’, nor guidance on how to measure PA connectivity (Butchart et al., 2016), which has made it difficult to stimulate and track progress towards the Aichi Target 11 connectivity element. In 2017, Saura et al. (2017) used ProtConn to examine the connectivity of PA systems for all terrestrial ecoregions, but a country-level evaluation can provide a more policy-relevant assessment since most political decisions on development and management of PA networks are taken at the national level.

North Macedonia and Albania have a long history of proclamation of protected areas which represent a fundamental building blocks of nature conservation strategies. Their establishment is encouraged by the Convention of Biodiversity as well as other international and EU policy to which both countries are Parties or candidates for EU accession. However, the protected areas networks are still in a transitional phase and much more efforts are needed to establish effective management and improve connectivity.

The Albanian trends in terms of protected areas coverage is in line with that of international community. Recent analyses (APA, 2019) reveal that the Government of Albania has approved a System of Environmentally Protected Areas. Currently the area of the Network of Protected Areas (NPA) of Albania reaches 504,826.3 ha, or 21% of the total area of the country. Of the total area, 98,180 ha, are with the status of Ramsar areas, which cover 3.42% of the total area of the country.

The basis of this system consists mainly of: two Strict Nature Reserves; 14 National Parks; 721 units with the status of Nature Monument; 24 Managed Nature Reserves/Nature Park; six Protected Landscape

---

\(^1\) EC 2021. EU 2030 Biodiversity Strategy
and four Protected Area of Managed Resources. Planning and management process has been facilitated via different projects implemented so far2,3,4,5.

The National Agency of the Protected Areas (NAPA) and the structures at the local level have a great responsibility and challenge to face the current situation and the perspective related to protected areas and their management. This is also due to the fact that protected areas in Albania are evidenced in various shapes and sizes (land, water, sea, local and cross-border); in public, municipal and private ownership; in 6 categories of administration; Ramsar wetland area of international importance; Biosphere Reserves and as UNESCO World Heritage Sites, i.e., a complexity and natural heritage that should be clearly reflected in the NAPA program.

Establishment of Albanian Ecological Network i.e., NPAs is based on the fact that networks of connected areas have formed the basis for establishing corridors that extend across regional to even wider country contexts and trans-boundary one.

Designation of protected areas in the Republic of North Macedonia started 1948 when the first National Park “Pelister” was proclaimed. Most of the other protected areas were proclaimed during 1960s, 1970s and 1980s and included different bigger and smaller size areas covering different types of habitats, but also different rare, endemic and relict species (status of threat to habitats and species was not considered seriously), and some of the protected areas were proclaimed for the purpose of geodiversity or fossils preservation6. Protected areas coverage increased drastically from 8.9 to 13.5 % in the last two years with proclamation of three new protected areas: Protected Landscape Osogovo Mts, Shar Mountain National Park and Protected Landscape Maleshevo. The protected areas network consists of: two Strict Nature Reserves (7,787 ha); four National Parks (169,085 ha); 67 areas as Monuments of Nature (78,967.5 ha); 12 Nature Parks (3,045 ha); three Protected Landscapes (60,376 ha) and one Multipurpose area covering the area of 25,305 ha. Although there has been continuous growth in the overall number and area of protected areas, the network of protected areas is still insufficient. Representative national network of protected areas7 was developed in 2011 based on the analysis of values of existing protected areas, areas proposed for protection, internationally designated/protected areas and considering national assessments (or assumptions) of

2Project “Transboundary Biosphere Reserve Prespa” Phase I (2011-2016) and Phase II (2018-2022). The both project phase’s focuses on two interrelated objectives: Conservation of biological diversity and reduction of the pressure on natural resources, and poverty reduction and improvement of the living conditions of the local population.
4Project “Technical Assistance for Strengthening the Capacity of the Ministry of Environment in Albania for Law Drafting and Enforcement of National Environmental Legislation” Europe Aid/130987/C/SER/AL (2010-2013); This project was supporting elaboration of management plan for Nature Park Korab-Koritnik and Albanian Alps.
5Project “Balkan Lynx Recovery Programme Phase I” 2008-2011, implemented by PPNEA and supported by MAVA. The contribution was towards nature values assessment and proclamation of Korab-Koritnik as a Nature Park in December 2011.
6MoEPP (2014) Fifth National Report to CBD
7UNEP/GEF/MoEPP project on protected area (2010-2011)
populations and natural ranges of selected priority species and habitats. It includes 99 areas and covers nearly 20% of the territory of the country.

However, the fact remains that the network of protected areas is still in transition because it includes areas that have been proclaimed under the old categorization system (since 1973), areas that have not been re-proclaimed under the new IUCN-compliant categorization (prescribed in the Law on Nature Protection, 2004), areas for which re-proclamation procedures have been conducted for many years by the Ministry of Environment and Physical Planning, Nature Sector. Many of the protected areas do not yet have nominated management entities designated by the promulgation act and most of the existing management bodies have very weak capacities for preparation of management plans and implementation of necessary protection and management measures. No funds are allocated from the Budget of RN Macedonia, i.e., they are self-financed through various sources.

The National Ecological Network (MAK-NEN) was proposed based on the needs of large carnivores (in particular brown bear) aiming to establish functional connectivity between protected areas and support biodiversity conservation and sustainable use of natural resources in the country. A total of 26 corridors have been identified, divided by their shape as linear (12), landscape (11) corridors and three stepping stones.

Different internationally important areas have been proclaimed/designated in the country that need improvement of their management such as Dojran and Prespa lakes as Ramsar sites, UNESCO World heritage site Ohrid Lake, Transboundary biosphere reserve Ohrid-Prespa, UNESCO old beech forests on Dlaboka Reka (Fig. 2 & 3). Additionally, with regard to identified important bird, plant and butterfly areas, it is recommendable to monitor their status and provide conservation of their core areas in order to preserve their values. Finally, establishment of Natura 2000 network is undeniable part of the process of accession of the Republic of North Macedonia to the European Union. So far, only 12 Natura 2000 sites (mainly through two IPA projects and Swiss Nature Conservation Programme in the country) have been identified and proposed but compared to the number and coverage of designated National Emerald sites (35 ASCIs covering around 29% of the county territory) this number needs to raise substantially in the following years.

Outside PAs, the land is mostly state-owned and the wildlife management is in the hands of the Ministry of Agriculture, Forestry and Water Management (Hunting Sector) in N. Macedonia and National Inspectorate for the Territory Control in Albania. The hunting grounds are responsible for the survival, breeding, protection and organizing hunt of the game species not included as strictly protected according to the Law on Hunting in N. Macedonia. In Albania, however, the Hunting Moratorium prevents any wildlife hunting since March 2014 and was intended to remain effective for two years until March 2016 (law no. 7/2014 “proclaiming the moratorium of hunting in the republic of Albania”). Further on, the government did not manage to put a functional hunting system into place or to completely fulfil their objectives set in their Action Plan (MoE 2016). Therefore, the ban was extended for five more years until 2021 (law no. 61/2016 "On the Pro"On the Promulgation of the Moratorium in the Republic of Albania"). The decision for a complete hunting ban was not based on a solid monitoring of wildlife or a proper analysis of the problems relating to the hunting of game.
Figure 2. Study area and other internationally important areas for protection
Figure 3. Emerald sites and the hydrology of the study area
4. Connectivity

Ecological connectivity refers to the degree of connection between the natural environments within a landscape over a large extent. It defines the extent to which the landscape facilitates or impedes the movement of species. As humans’ aspirations for development and economic growth intensify, the landscapes of our surroundings become more modified and fragmented. This is especially relevant for the developing countries of south-western Balkans with economic and development priorities being placed before conserving the natural environment. Within a fragmented natural environment, increasing connectivity between habitats is crucial to offset the negative effects of fragmentation of natural habitats, sustain biological diversity and to ensure sustainability in the supply of ecological services.

3.1 Types of connectivity

3.1.1 Habitat connectivity

Habitat connectivity provides insights into the connectedness between patches of suitable habitat for a target species. Habitat connectivity can influence the distribution, diversity and resilience of species and processes and is considered as crucial in counteracting many of the negative impacts within the increasingly fragmented natural environment. Assessing habitat connectivity for tailoring conservation and management actions on a large scale typically requires an “umbrella” species expected to confer conservation to a large number of naturally co-occurring species. Habitat specifics and species requirements are necessary for an effective habitat connectivity assessment and subsequent restoration and revitalisation management actions and plans. For the purpose of this study, we opted for the EUNIS habitat classification as the most comprehensive pan-European system for habitat classification (Fig. 4).
Figure 4. Habitat connectivity in the study area represented by the EUNIS habitat classification
3.1.2 Landscape connectivity

Landscape connectivity is primarily defined as “the degree to which the landscape facilitates or impedes movement among resource patches (Taylor et al. 1993 in Taylor et al., 2006). In practice, landscape connectivity is the most easily manageable aspect of connectivity because it does not require detailed understanding of individual species’ habitat requirements or ecological processes and hence it is most feasible for large highly diverse areas (Fischer & Lindenmayer, 2007). Landscape connectivity provides insight into the connectedness of patches of natural vegetation on a large scale (Mimet et al., 2013), whilst accounting for the land use specifics and settlement patterns with reference to landscape cultural specifics and historicity in management and use of natural resources that contribute to the landscape character. It therefore differs from the habitat connectivity that is defined from a (target) “species perspective”.

Comprehensive landscape classification is a prerequisite for integral systematic environmental and socio-economic assessment (Blankson & Green, 1991) that allows (i) to monitor environmental change (De Pablo et al., 2012; Hunziker et al., 2008); (ii) provides a broad scale perception of the conservation challenges and requirements; and (iii) provides an effective framework for land management and planning with consideration to nature conservation, cultural heritage and human development (Melovski et al., 2019).

The importance of landscape characterisation for landscape management and nature conservation in this part of Europe where humans have continuously and extensively changed and altered the natural environment to support their livelihoods drew researchers to apply the conservational principles of landscape ecology. Initial trials for landscape identification in North Macedonia were done as part of expert reports submitted within the frame of various conservation projects in the Country, most focused on mountain ranges of high conservational importance like Jablanica (Melovski, 2008b), and the mountain Osogovo (Eastern Macedonia) (Melovski, 2008a, 2010). In the following period, project-oriented activities enabled for more data in the frame of landscape ecology to be produced for the landscapes in Eastern Macedonia. The most comprehensive data on landscapes identification including methodology and spatial delineation of identified landscape types are presented in Melovski (2010) for Osogovo and later in 2015, for Bregalnica watershed (Melovski et al., 2015a). A number of studies have raised the matter of land use/land cover changes and reflected on the importance of landscape composition and structure with regards to habitat connectivity and wildlife conservation. These data are presented in various theses (Redzovik, 2011; Slavkovik, 2011), publications (Despodovska et al., 2012; Jovanovska et al., 2017; Jovanovska & Melovski, 2012) and conference presentations (Avukatov et al., 2016). The latter being much relevant to the project aim as it aimed at assessing the relative importance of rural landscapes in Bregalnica watershed (eastern /north Macedonia) as a wildlife habitat and corridor in terms of European Wildcat (*Felis silvestris silvestris* Schreber, 1775).

Later in 2016, in the frame of Nature Strategy of Republic of Macedonia, Melovski et al. (2016) build upon the previous landscape assessments and identify and characterise the overall landscape diversity in the Country. Considering the importance of these results as a background for implementation of other conservational and scientific projects in the country, and recognising the limited availability and robustness of project reports, the results initially presented within the Nature Strategy of Republic of Macedonia were
updated and published by Melovski et al. (2019). The study provides (i) overview of the landscape diversity in North Macedonia on both local and regional scale; (ii) landscape valorisation (considering natural, conservational and cultural-historic value) and; (iii) indicate the most relevant threats to landscape diversity in North Macedonia.

To our knowledge, this is the first and only available comprehensive published data on landscape diversity in Southeast Europe.

3.1.3 Evolutionary process connectivity

Enhancing knowledge on genetic diversity and evolutionary history is much relevant for conservation management aimed at preserving evolutionary processes (Liddell et al., 2020; Rodger et al., 2021).

While tools are becoming increasingly available, and the know-how for data collection is advancing, the potential for evidence-based conservation decision making that rests on evolutionary processes in the Balkans is still low. Studies focused on gene sampling within the area of interest are limited.

Background knowledge on species’ distribution and population structure is available. Although available genetic data in the area of interest provides an insight into historical connectivity it is insufficient to understand how best to reconnect fragmented populations, support the assessment of evolutionary process connectivity and develop appropriate species-wide genetic management actions.

3.1.4 Ecological process connectivity

Understanding the principles of ecological processes and how these are affected by a range of natural factors and anthropogenic disturbances is crucial in developing appropriate management actions to secure their connectedness and enhance ecosystem integrity.

However, bearing in mind the time and effort need to gather data on ecological processes, as well as the complexity of their interpretation depending on method applied and ecosystem of focus background knowledge on ecological processes in the area of interest is practically lacking. The limited available data on ecological processes is area restricted, scattered and hence, insufficient to support the assessment of ecological processes connectivity (Fig. 5).
Figure 5. Ecological processes study areas and genetic sampling locations in Albania and N.Macedonia
3.2 Threats to biodiversity in relation to connectivity

Particularly within last three decades the intensification of land-use poses significant threats to biodiversity directly through both the alteration and fragmentation of ecosystems and habitat loss, and indirectly through the disruption of supporting ecological processes. Further on, the protected areas offer refuges for species and ecosystems; they do not function in isolation from surrounding natural or human-dominated landscapes. In Albania the PAs review process\(^9\) was completed recently and was getting guidance by previously implemented large scale project on NATURA 2000 in Albania\(^10\).

Even fragmented, the analysis of threats conducted by using different methodologies, such as the Management Effectiveness Tracking Tool (IUCN/ECARO, 2016); World Heritage Outlook assessment (Shumka \textit{et al.}, 2022) or BirdLife International's Important Bird and Biodiversity Area (IBA) monitoring protocol (BirdLife International, 2017), have identified a range of threats affecting the integrity of the PAs in the study area.

Major threats noted to affect habitat and species connectivity at the north-eastern part of Albania are:
(i) Dam construction, energy and mining projects; (ii) Transportation and service corridors; (iii) Residential and commercial development; (iv) Tourism; (v) Natural systems modification; (vi) Biological resources use; (vii) Alien and invasive species; (viii) Pollution; (ix) Climate change and severe weather; (x) Agriculture and aquaculture; (xi) Deforestation; (x) Forest Fires etc. The energy infrastructure such as constructions of dams and mining are among the frequently present threats to PAs and with a high impact, compared to other threats. For the most frequent level one threat, i.e. biological resource use threats, natural system modifications, etc., seems to have again a high impact.

Similar threats, to biodiversity in general and protected areas connectivity, have been identified in North Macedonia, as detailed in the NBSAP (2018-2023). Also, a number of potential bottlenecks have been identified for different corridors during MAK-NEN development, mainly related to development of transport and energy infrastructure, that were addressed with relevant recommendations in the proposed Management plan\(^11\).

Many socio-economic studies note that the richness of habitats and species is under threat by human activities such as urbanization, pollution and infrastructure development for transport, energy and tourism (EPPA Secretariat), therefore there is a need to consider upfront the key stakeholders not only in each

\(^9\) Project: “\textit{Review of the National Network of Protected Areas in Albania (1991-2019)}”, supported by UNDP. The project supported the process that initiated in August 2019 and led by NAPA, was finalized in February 2020 as one of the achievements of the Ministry of Tourism and Environment that would specify and identify in a final and mapped way the entire network of Protected Areas.

\(^10\) Project: “\textit{Strengthening national capacities in nature protection-preparation for Natura 2000 network}”, financed by EU and Italian Agency for the Development Cooperation. The running period of the project was 2015-2019. The project aims were: (i) implementing at least five Management Plans for the many existing protected areas; (ii) prepare a preliminary list of Natura 2000 sites, in view of their future submission to the European Commission by the competent Albanian authorities, contributing to the alignment process of the country’s regulatory framework with the EU environmental \textit{acquis}.

defined area/country but also those that have a stake in the development of transport, economy, cultural, tourism etc. cross border initiatives. At the same time though, the need for continuous livestock-breeding practices is required in order to sustain open habitats in the mountain pastures. State governance on pastures and forestry in both countries are facing challenges related to lack of finances and capacity and are unable to improve the management on pastures and forests respectively. The role of the civil society organizations is to find good practices for forest and grazing but they are faced by corruption in the system on a scale too large to cope with. At the same time, local government lack human capacities, funding and motivation (as they work on 4-year mandates) to start a long-term, sustainable projects on habitat and landscape restorations.

3.3 Recommendation

Each of the four types of connectivity interrelates with all the others. Hence, integrating aspects of the different types of connectivity is crucial to sustain species diversity and secure population stability in the long run. However, with due consideration of the very limited research focused on ecosystem process, the scarcity of available genetic data in the area of interest as well as the scope and scale of assessment accounting for ecological process connectivity and evolutionary processes connectivity is not feasible. Assessing habitat suitability and connectivity whilst considering corridor functionality on a landscape level will account for both the historical and concurrent land management practices and challenges along the Albanian-North Macedonian border and allow us to adequately tailor joint conservation actions ultimately supporting connectivity in ecological processes. However, available data linked to landscape characterisation, structure and function is limited to North Macedonia. With consideration to data gap on landscapes in the overall target area, the sole feasible approach to assessing connectivity in the target area is to focus on assessing habitat suitability and habitat connectivity whilst providing landscape scale interpretation of results where feasible; hence hoping to outline potential joint management actions for effectively addressing shared threats on a large scale.

5. Target species

Neighbouring countries in the project area have a common interest in preserving the populations of number of conservation important species, whose survival is primarily determined by availability of suitable habitat. The project area is particularly important for sustaining populations of large mammals, particularly large carnivores, brown bears (Ursus arctos), grey wolves (Canis lupus) and the critically endangered Balkan lynx (Lynx lynx balcanicus). These mountain areas also sustain significant communities of ungulates including the threatened Balkan chamois (Rupicapra rupicapra balcanica). Large mammals’ populations require vast and connected areas to survive and hence confer conservation to a large number of naturally co-occurring species. However, the focus area provides suitable habitat for range of other conservation
important species like the Black Woodpecker (*Dryocopus martius*), the Alpine Cough (*Pyrrhocorax graculus*) and the Rock Partridge (*Alectoris graeca*). Moreover, we consider two fish species Scadar gudgon (*Gobio scadarensis*) and Ohrid spirlin (*Albumoides ochridanus*) in order to account for the fresh-water connectivity in the study areas.

We identified a total of eight target species for the selected connectivity approach. We think that the chosen species will best represent the needs for connectivity in the study area. We also considered the amount of available data that each country has on selection of the target species. Lastly, we considered representatives from mammals, birds and fish in order to encompass terrestrial, migratory and water elements of this connectivity study.

5.1 Mammals

5.1.1 Brown bear

Because of its spatial and feeding ecology, the brown bear is a perfect candidate for delineating corridors. Male bears roam over vast areas and usually tolerate a number of habitats found both in the lowlands and alpine pastures. Its diet is consistent of many different food types stretching from meat scavenging and sporadic hunting, to grass, fruit, roots and ants.

Perhaps the most important project on the Brown bear connectivity was the “Development of the National Ecological Network in the Republic of Macedonia (MAK-NEN)”. The MAK-NEN project was implemented by the Macedonian Ecological Society in cooperation with the European Centre for Nature Conservation in the period 2008-2011, with the main goal to develop the national ecological network in Republic of North Macedonia using the brown bear as an umbrella and flagship species. A map of the Macedonian National Ecological Network was produced (Fig. 6), showing the identified core areas, corridors, and restoration areas, as well as the existing and potential bottlenecks for connectivity. In the PONT focus areas, Shar Planina, Mavrovo, Stogovo-Karaorman, Jablanica, Galicica and Pelister were identified as core areas for the brown bear (Fig. 1). Following relevant corridors connecting the core areas in the PONT focus areas were identified: linear corridor Bukovikj (Sretkovo) and landscape corridor Bukovikj (Kolari) - connecting CA Mavrovo with RA Cheloica-Suva Gora; linear corridor Drimkol - connecting the two CA Jablanica and CA Stogovo/Karaorman; linear corridor Treska (Podvis) - connecting CA Ilinska/Plakenska/Bigla Mts. with the CA Mavrovo; linear corridor Ilinska Planina-Stogovo - connecting CA Ilinska/Plakenska/Bigla Mts. with the CA Stogovo/Karaorman; landscape corridor Debarca (Slatino) and linear corridor Debarca (Botun) - connecting CA Ilinska/Plakenska/Bigla Mts. with the CA Stogovo/Karaorman and linear corridor Istok Planina - connecting CA Galichica and CA Ilinska/Plakenska/Bigla. A Management Plan for Ecological Corridors of the Brown Bear was also prepared with detailed description of each corridor with the identified threats, bottlenecks and proposed measures for protection/maintenance. However, the developed national ecological network is still not adopted/endorsed by the relevant authorities.
The study within the MAK-NEN project and the development of the national ecological network belongs to the habitat and landscape connectivity approach. The outputs of the project are of great importance for the PONT focus areas as they show the ecological network within these areas and provide a tool for better understanding of ecological functions of core areas and corridors, connection of habitats and the concept of ecological networks in general. While MAK-NEN does provide specifics on the connectedness of suitable corridors for the brown bear, it does not provide data on corridor functionality.

Figure 6. Macedonian National Ecological Network based on the needs of the brown bear. Part of the MAK-NEN project, 2008-2011.

Furthermore, the estimation of the brown bear's food habits, distribution and abundance at the transboundary level were carried out as part of the project “Strengthening NGO-led Conservation in the Transboundary Prespa Basin” implemented by PrespaNet (2018-2021) and supported by PONT. This project continued in the following period, called “Prespa's Project- Biodiversity Protection in Transboundary Prespa”. One of the programmes in this continuation focuses on the monitoring and conservation of brown bear and bats in the transboundary level while otter and chamois at the national level. The study used non-invasive genetic sampling which allowed individual "tagging" of bears through genotypes obtained from fresh scats. The broader scope of the study was to estimate the dietary habits and habitat use of the brown bear (Gonev 2020) through scat collection, while using the fresh samples to genotype the individuals. Besides estimating
the brown bear abundance in the area, the secondary goal was also to get empirical data on the genetic diversity of these bears.

The study revealed a minimum of 51 individuals, 19 females and 32 males in the entire study area. Recaptures enable the possibility of connecting the sampling locations of the same individual, giving insight into their movement and use of corridors (Fig. 1, Fig. 7). While this study did not achieve a detailed mark-recapture estimate of bear abundance in the area due to the somewhat poor quality of the samples, it did manage to produce some preliminary results of spatial patterns of bears in the region. Notably, some of the bears cross the borders between the countries, with two male individuals observed to make longer excursions throughout the study area (Fig. 1). Results like these highlight the importance of good habitat connectivity and the use of bears as flagship species to enforce a better protection of biodiversity hotspots such as Prespa.
5.1.2 Balkan lynx

The Balkan lynx is a critically endangered subspecies of the Eurasian lynx (Melovski et al., 2015b). Because of its dire status, a joint transboundary project was launched in 2006 called *The Balkan Lynx Recovery Programme*. The Programme is based on three major conservation pillars: research & monitoring of the Balkan lynx and its prey, protected area establishment and effectiveness, and human dimension (education, local stakeholder involvement etc.). In the Protected area component, several important areas have been delineated which go hand in hand with PONT’s extended area of interest. These are: Jablanica, Ilinska-Plakenska and Shar Mountain in N. Macedonia, and Albanian Alps, Shebenic NP, Munella with surroundings, Korab-Koritnik Nature Park and Polis-Guri I Zi-Vallamara region.

In respect to this study, the Programme finished several theses on density and abundance (Stojanov, 2020), occupancy (Melovski et al., 2018), spatial and foraging ecology (Melovski et al., 2020). In the latter study, a total of 12 lynx (5 females and 7 males) were captured and fitted with radio-collars. Part of the results are published in the paper “First insight into the spatial and foraging ecology of the critically endangered Balkan lynx (*Lynx lynx balcanicus*, Buresh 1941)”. The paper gave the first ever investigation into the spatial and foraging ecology of the critically endangered Balkan lynx, by applying the GPS telemetry methodology in known lynx ranges in western parts of the country within the period 2010 – 2018 (Fig. 8).
Figure 8 Radio-collared Balkan lynx individuals and their home rages in the area around Mavrovo NP (MNP). M01-06 are males, while F01 is the female wearing GPS/GSM collars.

Schwaderer et al. (2008) emphasized the importance of protected area in species conservation, focusing on the Balkan Green Belt Initiative. Perhaps the most relevant study, however, is the one of Ivanov (2014) in which a spatially explicit model for the recovery of the Balkan lynx was made. The model identifies suitable habitats and discloses fragmentation and connectivity of distinct habitat patches with the "source" population in Mavrovo National Park. Given that top predators such as the Balkan lynx occur at low densities in the nature and require large and relatively undisturbed areas with sufficient prey, their distribution can offer a hint of current connectivity across land territories. In that respect, 20 distinct habitat patches were identified.

12 https://www.europeangreenbelt.org/european-green-belt/balkan/
three of which spread over the current project’s study area – western North Macedonia, and the central eastern and the northern parts of Albania (Fig. 9). The Macedonian side includes a single patch spreading over Shar Mountain, Korab, Deshat, Stogovo, Bistra, Jablanica, Ilinska-Plakenska, Pelister and Galichica mountains. This patch encompasses three protected areas – Mavrovo National Park, known population nucleus with reproduction, but also Galichica and Pelister National Parks. The Albanian side is represented through several mountains, including Shebenik and Jablanica to the east, Munella Mountain, in the central east, and Albanian Alps, in the north. Several protected areas are included within this stretch, namely, Shebenik National Park, Luzni Bulac Nature Reserve, Lurë-Dejë National Park, Bjeshka Oroshit Multipurpose Area, Mali me Gropë-Bizë-Martanesh Protected Landscape, Dajti National Park, Korab-Koritnik Nature Park, and the Valbona Valley National Park. Using least-cost path analysis, defined were potential linkages connecting all suitable patches with the source area, Mavrovo NP. The analysis shows a two-kilometre linkage between Korab-Koritnik and Munella Mountains (habitat patch 1 and 2), and another one connecting habitat patches 2 and 6 in a two-kilometre stretch, bridging the central east to the Albanian Alps in the north (Fig. 9).
Figure 9. Different phases of Balkan lynx recovery starting from Mavrovo NP as a stronghold of the population (1). Colours represent different patches of suitable habitats for the lynx, while the green lines are corridors between the patches.

The model within this thesis belongs to the habitat and landscape connectivity approach and provides insightful information about lynx movement, casting light on the connectivity within the study area. However, there are some shortcomings related to the insufficient presence data and lack of some environmental data like distribution of prey, level of habitat degradation, disturbance and poaching etc.

5.1.3 Balkan chamois

The Balkan chamois’ distribution stretches throughout the mountainous region of the Balkan Peninsula. Because of the enormous human hunting pressure over the last couple of centuries, the distribution of the Balkan chamois shrunk and it is now restricted to the mountainous protected areas with few exceptions. It is obvious that a connectivity between these areas needs to be established if healthy metapopulation of the Balkan chamois is to survive in the future. Habitat suitability and connectivity assessments are lacking. Modelling the connectivity of this animal will show us the biggest challenge in securing viability of species – connecting fragmented populations of high-mountain specialist. Because of the relatively well-known areas of chamois distribution, we assume that modelling its connectivity will be feasible.

5.2 Birds

5.2.1 Alpine Cough (*Pyrrhocorax graculus*)

The Alpine Cough is connected to karstic alpine habitats, thus potentially model species for other taxa as well. Due to connection to livestock (dependent on grazing), potential sensitivity to climate change and disturbance, it is thought to be good model species also for now extinct Bearded Vulture, which might be flagship and umbrella species, and which is expected to spread south from Alps (now self-sustaining reintroduced population) to the Balkans, using islands of alpine landscape as stepping stones to recolonize its former range. Diverse possible projects are ongoing to restore this species in Europe, including reintroduction plans in Bulgaria and other Balkan countries.

5.2.2 Black Woodpecker (*Dryocopus martius*)

This species prefers old-growth forest, although has recently spread also in younger stands. Still, compared to other woodpeckers which are potentially better indicators (Whit-backed, Grey-headed), bigger data-set exists, thus, we think it will be better model species.
5.2.3 Rock Partridge (Alectoris graeca)

High-mountain populations might be substitute for the Alpine chough in case not good data are available for the latter species, although the Rock Partridge is more of a generalist and therefore not the best model species.

Bearing in mind the conservational importance of these bird species, assessing habitat suitability and connectivity would largely contribute to planning management actions to secure unimpeded movement of these species and increase interactions between isolated populations.

5.3 Fish

The freshwater fish fauna along the basins of the project focus area is of particular importance as an integral part of countries heritage, especially due to its diversity and high degree of endemicity. This is mainly the result of the complex geological and climatic history of the Balkan Peninsula, which has allowed different colonization from outside the area and long periods of isolation of fish populations leading to speciation. Further on the “PONT Focus Region” is spread at the crossroads among the major biogeographical realms of south-eastern Europe, western Asia and the Mediterranean Basin (Barbieri et al., 2015).

Movements of organisms including fish species comprise a fundamental aspect of coastal and continental habitat connectivity. The best example of this statement was the connectivity of Lake Ohrid-River Drini-River Buna-Adriatic coast. The catadromic and anadromic species were the strong part of fish biodiversity, but unfortunately the fragmentation through numerous dams in both Albania and North Macedonia has disrupted the connectivity.

In case of different basins within systems of River Drin – Lake Ohrid; River Drini and its tributaries; Lake Prespa and its tributaries and tributaries with River Shkumbini, the role of physical and biotic connectivity in these freshwater ecosystems is essential for maintaining habitat dynamics and species responses. This has been widely acknowledged to be essential one (Lowe et al. 2006). For different trout species, the importance of movement to fulfil life-cycle requirements is a key component of the species' biology. In our case, connectivity includes migratory pathways along rivers and their tributary systems as well as unimpeded lateral connections between main channels, secondary channels, and floodplains. Ecological connectivity is similarly critical for processes essential to the function of freshwater ecosystems, including a wide variety of complex aquatic and terrestrial interactions that regulate channel dynamics, food webs, and water quality (Power and Dietrich 2002).

For the purpose of the study and given the amount of data we have, but also the biology of the species, we selected two targeted species for further modelling: the Ohrid spirlin (Alburnoides ochridanus Karaman, 1928 – IUCN VU) and the Scadar gudgeon (Gobio scadarenis Karaman, 1937 – IUCN EN).
6. Selection of corridors

Five different terrestrial corridors are selected in both countries that represent the most important connectivity pathway between the clusters of protected areas in the new study region of PONT. In N. Macedonia, Ilinska-Plakenska Mts and Bukovikj area have been well known for their importance acting as bio-corridors connecting the protected areas in the western and central part of the country (in order of relevance) (Fig 11). In Albania three corridors stand out as being of particular importance to birds and mammals (in order of relevance): Korrab-Koritnik-Albanian Alps, Munella-Zeba and Polis-Sopot-Valamara-Ostrovica-Gramoz (Fig 11). It is note mentioning that all of these five corridors are of great importance to wildlife in the study area and their relevance does not exclude one another, but rather support it.

6.1 Ilinska-Plakenska-Bigla-Mazatar-Istok

According to the sole available assessment on connectedness of natural habitats (MAK-NEN), few interconnected corridors surrounding Ilinska-Plakenska core area (Treska (Podvis); Ilinska Mt-Stogovo; Debarca (Slatino); Debarca (Botun); Baba Sac; Luben; Sopotnica) should be prioritized due to their relevance for securing connection between the PAs in the north and the southwest, whilst also connecting the islands of PAs in the central part of the country. However, Ilinska-Plakenska core area should also be considered since it is highly relevant for securing suitable habitats for large mammals (Fig. 11) (as part of MAK-NEN, Brajanoska et al., 2011).

Providing detailed assessment of habitat suitability and connectivity within this core area is particularly relevant for outlining specific conservation activities and nature management actions for the “islands and pathways” that will potentially be assessed as valuable for securing unimpeded movement of species and linking populations of conservation important species, providing that establishing a protected area is not feasible.

6.2 Bukovikj-Poreche

Bukovikj Mt represents one of the most significant bio-corridors for the Balkan lynx and other large mammals. It connects Mavrovo NP (Balkan lynx’ stronghold), through Suva Gora-Cheloica Mts. (Poreche region), and Jasen PA in central region (Fig. 1, 10, 11). Bukovikj enables suitable habitat for both forest and open-habitat species.
It is also noteworthy, that although there is a longstanding initiative for establishing a protected area on Mt. Jablanica (accounted as a core area) this region strives for economic and tourism development continuously add to the existing pressures on its natural habitats, valued for supporting a great portion of biodiversity. Hence, assessing habitat suitability and connectivity would allow tailoring focused management actions and conservation activities to sustain its natural values until the valorisation and the PA establishment takes place.

6.3 Korrab-Koritnik-Albanian Alps

This corridor is of a great importance for the entire large mammal fauna, while also being relevant for forest-specialized birds. Korab-Koritnik Mts. are part of the Scardo-Pindic mountain system whereas the Albanian Alps are the southern-most stretch of the Dinaric Mts. (Fig. 11).

6.4 Munella-Mali Zebes-Bjeshket e Terbunit

Stretching in the central-north part of Albania, bordering the districts of Puka and Mirdita (Fig. 11). The highest limestone part of the mountain has an alpine-like character with very steep slopes; however, the top of the mountain is a plateau with many karstic holes and funnels (Trajce, Hoxha, Mersini, 2016). Until recently, the Munella-Zeba-Krabbi Mountain chain hosted the only documented reproducing population of
the Balkan lynx and with that, this corridor stretching in south-west to north-east direction is by itself of immense importance for the unimpeded movement of the Balkan lynx.

6.5 Polis-Sopot-Valamare-Gramoz

This mountain corridor is found in the south-western part of Albania, stretching in the north-south direction and ultimately reaching the Greek-Albanian border and the Gramoz Mountain (Fig. 11). Relevant and important corridor for establishing genetically healthy mammal population all the while connecting the Pindos Mts in Greece and the central mountain system in the country. Furthermore, the Valamara-Polis Mountain is perhaps the second area in Albania with confirm reproduction of the Balkan lynx.
Figure 11. Target corridors in the study area
6.6 Water connectivity

As defended by Karr (1995) the freshwater ecosystem mosaics in case of three of the five selected conservation corridors include rivers, streams together with lakes, ponds, and other freshwater habitats, that are the diverse collection of integrated freshwater habitats needed to sustain aquatic life and the ecological integrity of these systems (Karr and Dudley, 1981). The most significant mosaic is that of Drini watershed that connects at the transboundary scale incredible number of aquatic bodies. Long time ago the natural freshwater connectivity Adriatic Sea-Lake Ohrid and adjacent wider area has been affected. The fragmentations/dam and impoundments establishment created massive reservoirs that flooded large parts of the Drini valley and altered the natural habitats. The Albanian Alps region was partly disconnected from the mountain ranges further south due to the creation of three massive wide and deep lakes that were not present before the dams.

Therefore, the water connectivity within three selected terrestrial corridors is secured via River Drini and it large network of streams (Korrab – Koritnik); streams/tributaries of Rivers Drini and Mati (Munella-Zeba) and streams/tributaries of Rivers Shkumbini, Osumi, Devoll, Vjosa (Polis-Sopot-Valamara-Gramoz).

7. Conclusion

- In the last 15 years the biggest efforts have been put on proclamation of national protected areas, adjustment to IUCN categorization and designation of international important areas. Representativeness of protected areas was assessed in both countries;
- Even though national ecological network was developed in North Macedonia, connectivity was not recognized as important topic and not really addressed in national legislation; In this regard, providing a landscape scale interpretation of habitat suitability and connectivity assessment can play a significant role in identifying bundles of area-specific challenges for nature conservation and outlining conservation most relevant sites. This will allow to identify opportunities for supporting individually governed nature-friendly management actions and subsequently tailor communication and coordination strategies with local stakeholders.
- National strategic documents in both countries, which were developed following the CBD and EU recommendations, include the ‘connectivity’ in the national targets but without clear steps towards establishment of corridors and their management;
- Indicators referring to the entire connectivity, coverage or isolation of PAs in the countries are not developed;
- Concerning that very limited research is focused on ecosystem process, the scarcity of available genetic data in the area of interest as well as the scope and scale of assessment accounting for ecological process connectivity and evolutionary processes connectivity, it is recommended to mainly
concentrate on habitat connectivity and provide landscape scale interpretation of results where feasible; However, it is noteworthy that assessing habitat suitability and connectivity without accounting for landscape connectivity hinders opportunities for drafting integrated conservation actions at a ‘landscape scale’ that allows for broader social, economic, and policy factors that are critical to sustainable livelihoods and ecosystems to be addressed more effectively.

- Balkan lynx, brown bear, Balkan chamois, Alpine Cough, Black Woodpecker, Rock Parttrige, Ohrid spirlin and the Scadar gudgeon are proposed to be used as target species for identification and detailed description of corridors in the second report;

- Upon a general pre-assessment the area is very important for forest communities. There is an evident gap of knowledge related to habitats present in the study area, however we are expecting more detailed analyses of habitats present in the proposed corridors that will be elaborated in the second report. Furthermore, the area’s water resources are under immense pressure for electricity acquisition and irrigation. Artificial lakes for hydro-power plans do not only hinder the connectivity of the water species, but fragment the habitat of the terrestrial species too;

- Five bio-corridors have been pinpointed as the most significant for the wildlife conservation in general and the targeted species in particular. These corridors are: Ilinska-Plakenska Mts and Bukovikj in N. Macedonia and Korrab-Koritnik-Albanian Alps, Munella-Zeba and Polis-Sopot-Valamara-Ostrovica-Gramoz in Albania. Water connectivity is being addressed within three selected terrestrial bio-corridors in Albania.

- In the next period, the team will focus on producing a report containing descriptions of the five selected, priority ecological corridors between the three main clusters of protected areas in the PONT Focus Region. Small knowledge gaps on the target species selected will be filled with field work foreseen in the Annex 1.
8. References


CBD, (2010). Strategic Plan for Biodiversity 2011–2020 - COP 10, Decision X/2


Redzovik, E. (2011). Land use changes on Osogovo Mts. University St Cyril and Methodius, Faculty of Natural Sciences and Mathematics, Institute of Biology


Stojanov, A. (2020). The use of the camera-trapping method as a tool for determining the abundance and density of the Balkan lynx population (Lynx lynx balcanicus Bureš, 1941) in Mavrovo National Park. MSc thesis. St Ciryll and Methodius University, Skopje, N. Macedonia. [in Macedonian].


## Annex 1 – Workplan for the next phase

### Albania

<table>
<thead>
<tr>
<th>x</th>
<th>Corridor: Korab_Koritnik→AAAlps</th>
<th>Munella-Zeba</th>
<th>Polis-Sopot-Valamara-Ostrovica→Gramoz→Pindos</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Week 1</td>
<td>Week 2</td>
<td>Week 3</td>
</tr>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>3</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>4</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>12,13 Jun</td>
<td>1,2 Jul</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>24-Jun</td>
<td></td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>23-26 Jun</td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>x</th>
<th>Expert/Component/issue</th>
<th>Experts</th>
</tr>
</thead>
</table>
| 1 | AT, BH_Mammals group_Field Investigation ( Mali i Koshices-corridor Valamara-Tomorr; Pylli i Dusharit-Mali i Bofkes-corridor Valamara-Ostrovica; Moglica Dam | Ajola Mesiti_AM  
Aleksander Trajçe-AT  
Bledi Hoxha-BH  
Cveta Trajçe-CT  
Eldisa Lloshi-EL  
Ermelinda Mahmutaj-EM |
|   | (barrier between Valamara and Ostrovica). | Kaludja Koci-KK  
Mirjan Topi-MT  
Spase Shumka-SS |
<table>
<thead>
<tr>
<th></th>
<th></th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td>2</td>
<td>AT, BH_Mammals group_Field Investigation: corridor Prespa-Morava-Gramoz; Qarri pass/Rungaja mountain (Corridor Ostrovica-Rungaja-Gramoz)</td>
<td></td>
</tr>
<tr>
<td>3</td>
<td>AT, BH_Mammals group_Field Investigation: Mali i Terbunit - corridor Munella-Albanian Alps; Kunore Dardhe - Corridor Munella-Albanian Alps; corridor Shebenik-Korab-Munella)</td>
<td></td>
</tr>
<tr>
<td>5</td>
<td>MT_Birds_Survey_Field investigation</td>
<td></td>
</tr>
<tr>
<td>6</td>
<td>SS/Protected Areas/Meetings with NAPA employes and local RAPA, gaining fresh information on different aspects of PAs (management plans/planning; funding instruments, new projects)</td>
<td></td>
</tr>
<tr>
<td>7</td>
<td>SS/Fish and Fishery_Field investigation</td>
<td></td>
</tr>
<tr>
<td>Experts</td>
<td>Corridor/area</td>
<td>Objectives</td>
</tr>
<tr>
<td>---------</td>
<td>--------------</td>
<td>------------</td>
</tr>
<tr>
<td>SH</td>
<td>Shar Planina-Korab-Bistra-Jablanica (NP Mavrovo)</td>
<td>Field study of alpine ecosystems (diversity of beetles, genetics of <em>Calosoma relictum</em>)</td>
</tr>
<tr>
<td>SH</td>
<td>Belcista wetland</td>
<td>Initial activity towards a study of flight dispersal ability of <em>Carabus granulatus</em></td>
</tr>
<tr>
<td>SH, RK, DJ</td>
<td>Shar Planina-Korab-Jablanica (NP Mavrovo)</td>
<td>Field study of mountain wetlands (phytosociology, diversity, fragmentation)</td>
</tr>
<tr>
<td>DM, AS, AP</td>
<td>Ilinska-Plakenska Mts.</td>
<td>Check the chamois status</td>
</tr>
</tbody>
</table>

Daniela Jovanovska  
Renata Kjusterevska  
Slavcho Hristovski  
DM  Dime Melovski  
AS  Aleksandar Stojanov  
AP  Aleksandar Pavlov