Finnish Environment Institute SYKE, Finland

Natura 2000 Management Plan for Pelister National Park – potential Natura 2000 site

Twinning Project MK 13 IPA EN 02 17

Strengthening the capacities for effective implementation of the acquis in the field of nature protection

Report D1.1. - 1.

07.11.2019

Funded by the European Union

The Ministry of Environment and Physical Planning, Department of Nature,
Republic of North Macedonia
Metsähallitus (Parks and Wildlife Finland), Finland
The State Service for Protected Areas (SSPA), Lithuania

This project is funded by the European Union

This document has been produced with the financial support of the European Union. Its contents are the sole responsibility of the Twinning Project MK 13 IPA EN 02 17 and do not necessarily reflect the views of the European Union

Contents

Funded by the European Union

Funded by the European Union

Funded by the European Union

Foreword

The Management Plan for Pelister National Park (Pelister NP) is prepared as a part of Twinning project MK 13 IPA EN 02 17, Strengthening the capacities for effective implementation of the acquis in the field of nature protection. The project was implemented in a period 18.11.2017 – 17.11.2019. Beneficiary of the project is the Ministry of Environment and Physical Planning (MoEPP), Department of Nature of the Republic of North Macedonia and EU Member state executors are Finnish Environment Institute; (Suomen ympäristökeskus, SYKE); Metsähallitus, Parks and Wildlife Finland and the State Service for Protected Areas (SSPA), Lithuania. Among others, the aims of the project are to "Strengthen capacities for preparation of studies for valorisation of nature values" as well as "Strengthened capacities for preparation of draft management plans for natural protected areas which are of national and EU interest for conservation (potential future Natura 2000 sites)".

Pelister NP together with Prespa Lake Nature Monument was chosen as one of the target areas for the Twinning project. It was already identified as potential Natura 2000 site within the previous Natura 2000 project "Strengthening the capacities for implementation of NATURA 2000 – EUROPEAID/136609/IH/SER/MK".

Pelister NP has a management plan (Avramoski 2006a), but it needs to be renewed. Preparation of the existing management plan was based on national legislation and does not fully covers the requirements of EU Habitats and Birds Directives. There is no official status of this plan and thus its validity time is not regulated, however the plan is compiled for the ten years period.

The Management Plan is based on the data on habitats and species collected during the implementation of Twinning project MK 13 IPA EN 02 17, Strengthening the capacities for effective implementation of the acquis in the field of nature protection (period 18.11.2017 – 17.11.2019). As well as other information, collected by Macedonian Ecological Society (MES) and collected in previous projects and investigations, mentioned in literature was used.

The focus of this Management Plan of Pelister NP is on nature values related to Natura 2000: habitats of Habitats Directive Annex I and species of Annex II and IV as well as bird species of European Union Directive on the Conservation of Wild Birds (Council Directive 2009/147/EC). The most attention was paid on Birds Directive species of Annex I. Information on habitats and species distribution and general conservation measures needed to maintain these values are given in this Management Plan. It is prepared in a way that it or part of it should be integrated into the new official Management Plan of Pelister NP, which is now under preparation.

Available data and field observations of endemic species, nationally strictly protected and protected species, and Habitats Directive Annex V species inside Pelister NP are also evaluated, because they are important for establishment of Natura 2000 areas and databases of conservation values (including Standard Data Forms (SDF)). Typical and important species of different habitat types are listed in Fact Sheets which are included in Annexes of the Valorization Study of nature values of Pelister NP.

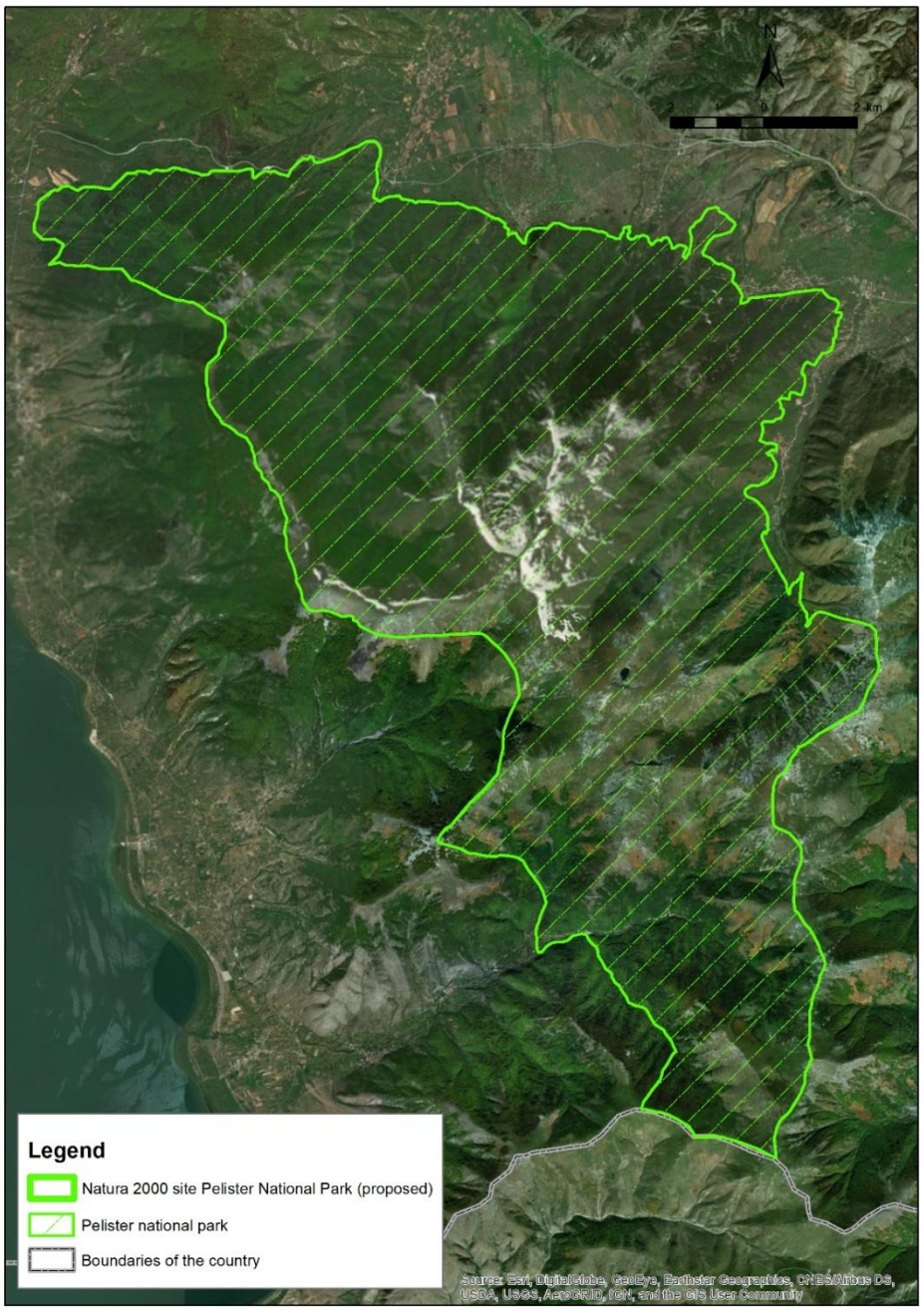
The structure of the Management Plan is mainly following the structure defined in the Rulebook on the content of the management plans for the protected areas and annual programs for nature protection (2012). In addition, to habitats and species protected under Habitats Directive special attention is also paid on invasive alien species of the area, because this data was not gathered before. Some of these species can alter ecosystems and need to be taken into account in management practices whenever possible.

Funded by the European Union

1. Introduction

1.1. Name of the area, its legal base, administrative status

The target area for the Management Plan is Pelister National Park (corresponds to IUCN category II) with a total area of 17 150 hectares (Figure 1). It is the oldest National Park in the Republic of North Macedonia as well as in the former Republic of Yugoslavia. Pelister NP is the second largest national park in the Republic of North Macedonia after Mavrovo NP.



Map 1. Borders of Pelister NP

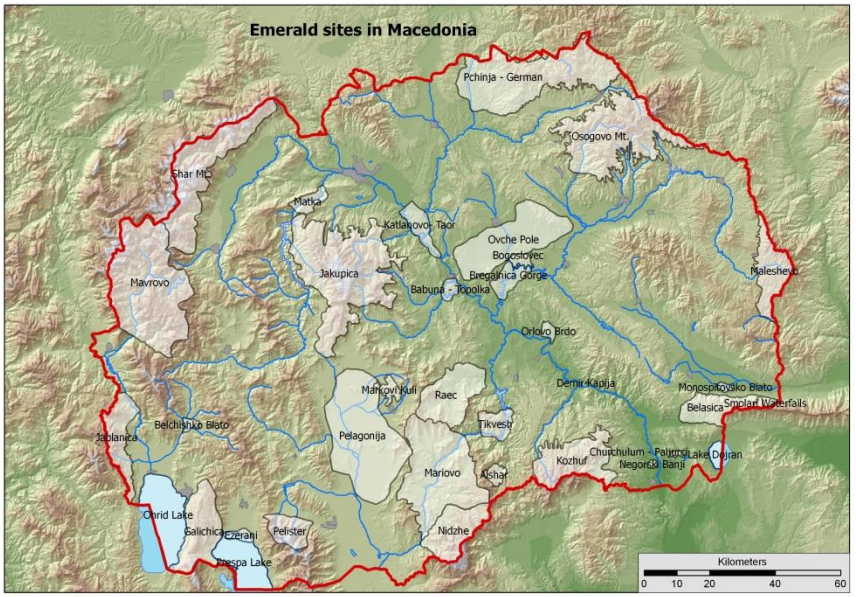
Funded by the European Union

The Pelister NP (12000 hectares) was proclaimed on November 30, 1948 by the law endorsed by the Presidium of the People's Republic of Macedonia (O.J. P.R.M. 38/48). The borders of Pelister NP were extended by additional 5.150 ha in accordance with the new Law on Proclamation of a part of Pelister Mountain for National Park (Official Gazette of the Republic of Macedonia No. 150/07).

According to the Law on Nature Protection Pelister NP administration is responsible for the protection and management of the National Park.

International designations and initiatives

Pelister NP was identified as an Emerald site (code MK0000004) in 2010 (Figure 2). The Emerald network is a network of areas of special conservation interest designated to preserve the network of natural habitats and it is developed on the territory of the Parties to Bern Convention. The main motive behind the development of this network is to contribute to the ecological network similar to Natura 2000 in countries that are not member states of the European Union, using as much as possible similar methodological approach. Pelister NP was identified as a potential Natura 2000 site in the project "Strengthening the capacities for implementation of NATURA 2000 – EUROPEAID/136609/IH/SER/MK" as Site of community interest (Natura 2000 network) in 2017. It is based on European Union Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.



Map 2. Emerald sites in Macedonia

Funded by the European Union

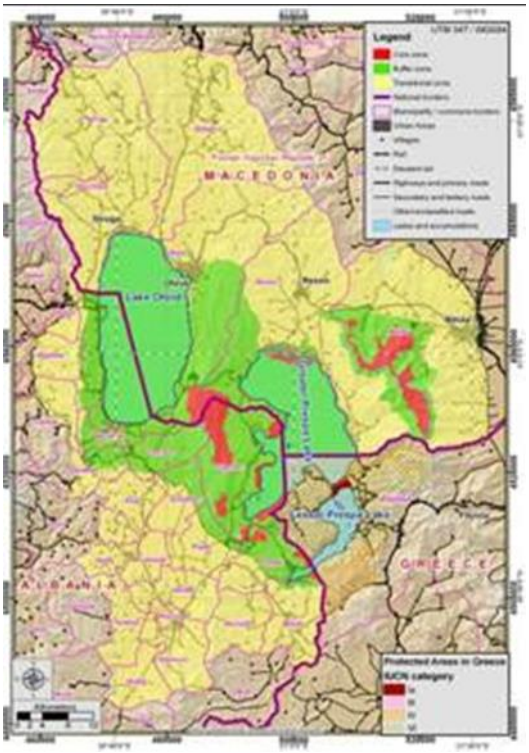
Pelister NP is also a part of the Balkan Green Belt (code MK002) initiative covering areas in the Republic of North Macedonia, Albania and Greece (Figure 3). Its vision is to conserve and restore the shared natural heritage along the former iron curtain as ecological network connecting high natural values and cultural landscapes, while taking into account economic, social and cultural needs of local communities. The Green Belt crosses 24 European countries (length of 12.500 km), starting from Barents Sea up to Black Sea and it is divided into three parts: Fennoscandian, Central European and Balkan Green Belt

Map 3. The Green Belt in the Republic of North Macedonia

The area of Baba Mountains within Pelister NP, is one of the most important butterfly areas on international level (code MAK-08).

Funded by the European Union

Transboundary designations and initiatives



The Pelister National Park is a part of the transboundary Ohrid-Prespa Biosphere Reserve (Figure 4) declared in 2014 by the UNESCO Man and the Biosphere Programme. It includes the mountain Galicica, the lakes Ohrid and Prespa, and comprises a balanced combination of water bodies and surrounding mountains, bordered by flat areas on its external boundaries. The total area is 446,244.52 hectares (386,915.21 ha terrestrial plus 59,329.31 ha aquatic) in the Republic of North Macedonia and Albania.

The zone of strict protection of Pelister NP is a part of the core zone in the transboundary biosphere reserve. The remaining area within the National Park is a buffer zone of the biosphere reserve. The activities there should be directed towards avoiding negative impact on the core zone and protecting its values.

Map 4. The Transboundary Ohrid-Prespa Biosphere Reserve

1.2. Preparation of the Management Plan

This Management Plan is prepared in the scope of the Twinning project MK 13 IPA EN 02 17, "Strengthening the capacities for effective implementation of the acquis in the field of nature protection" by Finnish Environment Institute (Suomen ympäristökeskus, SYKE), Metsähallitus, Parks and Wildlife Finland and the State Service for Protected Areas (SSPA), Lithuania in cooperation with the Beneficiary of the project – the Ministry of Environment and Physical Planning (MoEPP), Department of Nature of the Republic of North Macedonia.

Additionally, information and contribution has come from the projects implemented by EU/UNDP "Improving management of protected areas". In scope of this project special project "Consultancy support in establishment and implementation of monitoring program for priority selected amphibians and reptile species in the Pelister National Park" and "Consultancy support in establishment and implementation of monitoring program for priority selected habitats in the Pelister National Park" (September 2018 – August 2019) was implemented and additional data for the Twinning project was available. Further PONT (Prespa Ohrid Nature Fund) has supported Pelister NP with Grant Scheme and the MES expert from the project for preparing study for valorization of nature values of Pelister NP provided valuable information especially on bird species and habitat distribution.

Within the Twinning project the following Finish and Lithuanian experts participated in the work:	
Expert	**Role and responsibility**
Arto Ahokumpu	Overall coordination

Funded by the European Union

Rūta Baškytė	Main responsibility for compiling the plan
Arūnas Pranaitis	Management activities
Petri Ahlroth	Animals
Kimmo Syrjänen	Habitats, plants and animals
Arūnas Balsevičius	Habitats and vascular plants
Zydrunas Preiksa	Habitats, plants and animals
Pekka Rusanen	Birds
Markku Mikkola-Roos	Birds

Within the Twinning project the following Macedonian experts participated in the work:	
Expert	**Role and responsibility**
Vlado Matevski	Habitats and vascular plants
Renata Ćušterevska	Habitats and vascular plants
Dragan Arsovski	Reptiles and amphibians
Metodija Velevski	Birds

2. Description of the area

2.1. General information

Pelister NP is located in the southwestern part of the Republic of North Macedonia, between Prespa Valley and Pelagonia Valley. It covers parts of the northern and north eastern slopes of Baba Mountain. The altitude of the National Park varies between 927 and 2,601 m above the sea level with the highest peak – Pelister. Geographically, the territory of Pelister NP extends between 41°4'15.96" and 40°52'27.85" latitude and 21°3'15.29 "and 21°16'9.41" longitude.

Pelister is one of the most southern mountains in the Balkans with alpine characters. The Macedonian Pine *Pinus peuce* "Molika" is among the most known species values of Pelister NP. It is a Balkan endemic and a tertiary relic tree species with the largest European population in Pelister NP. Pelister is also known for its geological diversity, including stone rivers and glacial lakes. Golemo Ezero ("the Big Lake") is located 2,218 metres above the sea level and Malo Ezero ("the Small Lake") is located at 2,180 metres height.

Administratively, Pelister NP belongs to the municipalities of Bitola and Resen. Only one village, Maloviste, is located within the borders of the national park. Several larger settlements are located around the national park at distances of less than 1 km: Kazani, Rotino, Capari, Magarevo and Trnovo in the northern, i. e. Dihovo and Nizhepole on the eastern border. At the western slopes of Pelister NP we find the villages of Podmochani, Grnchari, Rajca, Kurbinovo, Slivnica, Krani, Arvati, Shtrbovo, Ljubojno, Brajchino and Dolno Dupeni.

The protection of nature and all activities related to protected area management are the responsibility of the Ministry of Environment and Physical Planning (MoEPP). According the Article 74 of the Law on Nature Protection, the National Park is managed integrally throughout the territory. The responsible institution for management of the Pelister NP is the administration of Pelister NP (Public Institution NP Pelister), established in 2006.

Funded by the European Union

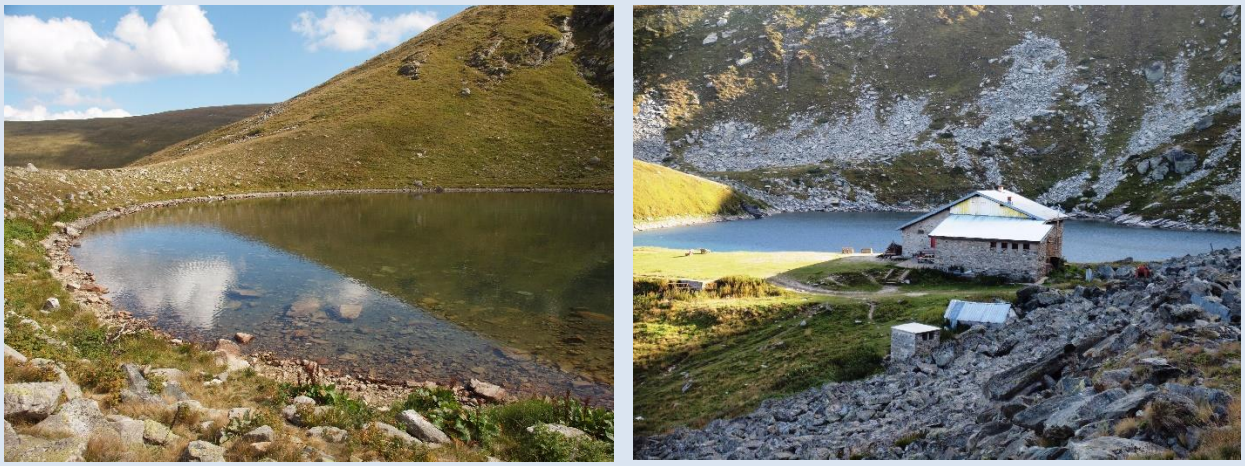
Accordingly, all activities that are carried out within the boundaries of Pelister NP by other entities (natural persons and legal entities) which can in any way affect the protection of nature, biodiversity and all natural heritage, should be previously announced, controlled and approved by Pelister NP administration.

2.2. Ecological information related to the Habitats and the Birds Directives

The data presented in this chapter is mainly based on the inventories carried out by the Twinning project team in 2018 – 2019, data provided by MoEPP which included e. g. former Plan of Management for Pelister National Park (Avramoski 2006 a, b) and collected by the national experts involved into implementation of the project "Improving management of protected areas". National experts participated in the field work and gave comments to the evaluation of the inventory data. Additionally, they provided their own data for the Valorization Study and Management Plan especially on Habitat types, vascular plants, birds, reptiles and amphibians as well as on some other species groups. List of the Annex I of the EU Habitats Directive habitat species is as an ANNEX 2 in this document and list of Habitats Directive Annex II or IV species as well as list of The Birds Directive Annex I bird species as an ANNEX 3 in this document.

2.2.1. Ecosystems and habitats

A total of 22 habitat types listed in the Annex I of the EU Habitats Directive have been found in the area.

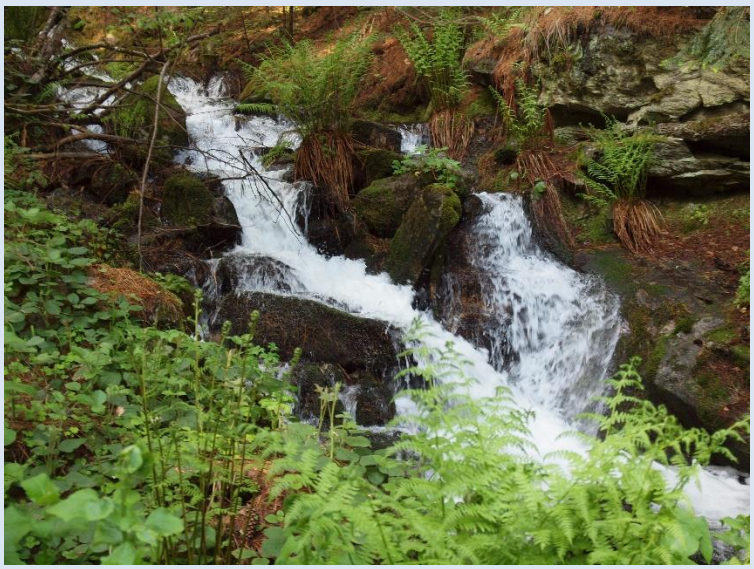


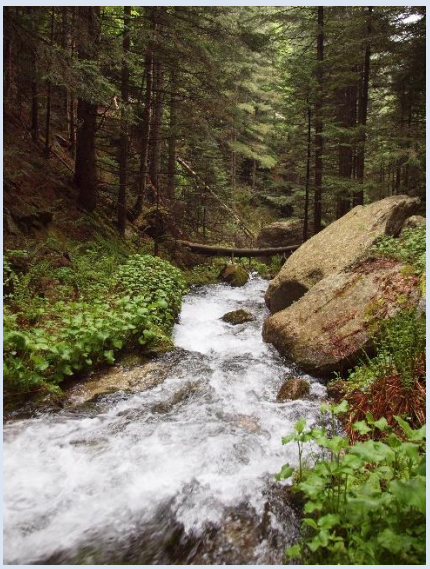
Malo Ezero (left) and Golemo Ezero (right) in Pelister NP are alpine lakes with glacial origin and they contain high conservation and recreational values. Photos: Kimmo Syrjänen

1. ***3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea.***

Two water bodies: the glacial lakes Golemo Ezero (3,7 ha) and Malo Ezero (0,66 ha) belongs to this habitat type, although they lack submerged vascular vegetation. The primary production in the lake ecosystem is based on algae. The endemic amphipode species *Niphargus pancici* subsp. *pancici* in Golemo Ezero, and the flatworm *Rhynchelmis komareki* subsp. *komareki*, are recorded from this habitat type in Pelister NP. In addition. other rare invertebrate species like *Chirocephalus diaphanus*, *Arctodiaptomus neithammeri* and *Artcodiaptomus osmanus* have been found in this habitat type at Pelister NP (Avramoski 2006 a). Shoreline vegetation of these lakes is typical for this habitat type.

Funded by the European Union





Magarevska river (left) and Rotino river (right) are clear water streams with species rich tall herb fringe on their shores. Habitat Directive plant species *Tozzia carpathica* grows on shores of small streams in a couple of sites in Pelister NP. Photo: Kimmo Syrjänen

2. *3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation.*

Most streams and rivers at Pelister NP belong to this habitat type with scattered submerged vegetation of the vascular plants (*Callitriche spp., Potamogeton spp., Ranunculus aquatilis* s. lat.) and more commonly water growing Willow Moss *Fontinalis antipyretica* growing on stones in river. Streams and brooks at Pelister NP are mainly characterized by clear oligotrophic waters. Their nature values are high also because of endemic trout species: Prespa Trout (*Salmo peristericus)* and Pelagonia Pelagonia Trout (*Salmo pelagonicus*).

Low growing alpine *Juniperus communis/Juniperus nana* heath at northern slope of Mt. Pelister (left). Heaths formed by Balkan spike heath *Bruchenthalia spiculifolia* and blueberry *Vaccinium myrtillus* are also characteristic for Pelister National Park. *Bruchenthalia* grows often mixed with blueberry (right). Photos: Kimmo Syrjänen

3. *4060 Alpine and Boreal heaths.*

Funded by the European Union

The habitat type 4060 is present at Pelister NP. It is fairly common and abundant at subalpine and alpine areas of the National Park at altitudes 1600 – 2300 m a. s. l. Most of occurrences are located in alpine areas above the natural upper forest boundary. At lower parts of the alpine zone there are low-growing *Juniperus communis* heaths (*Juniperus nana* / *sibirica*) which are changing to *Vaccinium myrtillus* and *Bruckenthalia spiculifolia* -dominated heaths upwards. Different subtypes of alpine and boreal heaths form often mosaics with each other and with alpine grasslands. The Habitats Directive Annex V vascular plant species *Gentiana lutea* is often found in this habitat.

Common juniper *Juniperus communis, Pinus peuce and deciduous scrub* are spreading to alpine heaths and grasslands above Nize Pole. Photo: Kimmo Syrjänen

4. ***5130 Juniperus communis formations on heaths or calcareous grasslands.***

The habitat type 5130 is common in Pelister NP. *Juniperus communis* is typical component of several habitat types of (dry) grasslands and rocky habitats. Description of this type is mainly based on the abundance of juniper. *Juniperus communis* formations with long continuity are often characterized by grazing sensitive herbs and ferns as well as mosses in undergrowth. Most sites of this habitat type are of rather recent origin. Cessation of traditional use (usually grazing and management of pastures by burning or removing junipers) has led on formation and overgrowth of these habitats by dense juniper stands.

5. ***6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites).***

Grasslands of this type are present in subalpine and lower parts of Pelister NP. Most sites are mainly small in area and they are growing over by junipers, bracken, tall herbs and grasses as well as trees and shrubs. This type is more representative on calcareous soils, but there are some species-rich sunny grassland slopes with

Funded by the European Union

Mesobromion species composition at Pelister NP. Further abandonment results in thermophile scrub with an intermediate stage of thermophile fringe vegetation (*Trifolio-Geranietea*).

Dry grassland between Magarevo and Rotino. This quite recently burned area is slowly changing into *Juniperus communis* formation and thicket with other srubs. It contains fragments of pseudo-steppe and provides possibilities do develop large pseudo-steppe inside Park with suitable management. Long horn beetles from the genus *Dorcadion* (s.l.) which may be endemic for Pelister National Park was met in this open site. Photo: Kimmo Syrjänen

6. *6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea.*

This type is met at lower parts of Pelister NP e. g. above Dihovo – Nize Pole and northeast of Golemo Livida between Magarevo and Rotino villages. There are large and representative pseudo-steppes at western slopes of Pelister NP between park and Prespa Lake, mainly outside of the National Park.

Funded by the European Union


Most alpine grasslands of the Pelister National Park belong to Oro-Moesian acidophilous grasslands (left). *Dianthus myrtinervius* (right) is low-growing tussock forming alpine plant. It is endemic for mountains of southwestern North Macedonia and northwest Greece. Photos: Kimmo Syrjänen

7. *62D0 Oro-Moesian acidophilous grasslands.*

This is a common and prevailing habitat type at alpine and subalpine parts of the Pelister NP. These alpine grasslands form mosaics of different grassland vegetation communities and with subalpine heaths. This habitat type is typical for central Balkan mountain areas and contains many species with high conservation value. There are local endemic species of vascular plants in this habitat type including *Crocus pelistericus*, *Dianthus myrtinervius* and *Sempervivum octopodes*. Habitats Directive Annex V vascular plant species *Gentiana lutea* is often met in lower parts of alpine grasslands.


Species-rich tall herb fringes are common along streams and springs of the Pelister NP (right). Heart-leaved Ox-eye *Telekia speciosa* is a typical native herb of this habitat type. Photos: Kimmo Syrjänen

8. *6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels.*

A typical habitat type along brooks and streams of Pelister NP. In montane and alpine areas there are species-rich habitats of this type with high representativity. At lowland fringes this has often changed due to human activities. Regarding vascular plants there are several Balkan endemics in this habitat type and *Alchemilla peristerica* is a local endemic.

Funded by the European Union

9. ***6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis).***

This type of vegetation is present in lower parts of Pelister NP. There are mowed meadows close to Maloviste village which belong either to this type or to *6520 Mountain hay meadows*. In Gjavato pass there is a grassland area inside Pelister NP with long history of overgrowth, but it may originally belong into this type 6510. Also, several small overgrown grasslands with dominating stands of *Asphodelus albus* and *Pteridium aquilinum* are originally meadows and may represent degraded hay meadows or type 6210.

Sphagnum spp. dominated transition mire close to Golemo Ezero. Large part of this habitat type represents rare "Pelagonide Macedonian sedge fens" –habitat with *Carex macedonica* as a characteristic species. Also Balkanian butterwort *Pinguicula balcanica* grows on these mires. Photo: Kimmo Syrjänen

10. ***7140 Transition mires and quaking bogs.***

This habitat type has high conservation value in the Republic of North Macedonia, because this type of habitat consists mainly of EUNIS habitat type "Pelagonide Macedonian sedge fens", which is endemic for the Balkans. In the study area this type is rare and local with few occurrences close to Golemo and Malo Ezero lakes. Habitats Directive Annex V *Sphagnum spp*. mosses are often dominant species in this habitat type. In addition, there are Balkan endemic species of vascular plants.

Funded by the European Union

Tall herb Balkan campion *Silene asterias* (left) and *Dactylorhiza cordigera* (right) a species of Spotted Orchid genus are both Balkan endemics those are often met along springs of the Pelister NP. Photos: Kimmo Syrjänen

11. *7160 Mineral-rich springs and spring fens.*

This habitat type is rather common especially at alpine zone of Pelister NP at outflow sites where mountain brooks and rivers start to run. There are also springs and spring brooks of this habitat type along slopes of Mt. Pelister and other peaks of Baba mountains inside forest zone. These habitats have specific flora with both boreal and alpine species and several Balkan endemics like *Dactylorhiza cordigera*, *Carex macedonica* and *Silene asterias*. Water-living invertebrates with high conservation value are also present in this habitat type.

Funded by the European Union

The habitat type 7220 is very rare in Pelister National Park. Localities are characterized by presence of *Cratoneuron filicinum* and/or *Palustriella spp.* moss species and hard alkaline water. Tufa formation is not strong or lacking and the sites are not highly representative. Picture showing springy slope in Sapundica river valley above Nize Pole (left) with *Cratoneuron filicinum* moss and *Silene asterias* (right). Photo: Kimmo Syrjänen

12. *7220* Petrifying springs with tufa formation (Cratoneurion).*

This habitat type is present with small and rather non-representative occurrences in seepage slope of Sapundiza (above Nize Pole), and at springy *Alnus glutinosa* wood close to Gjavato pass in Pelister NP.

Funded by the European Union

Rich fens are very rare in Pelister NP and usually present as small fragments in mineral rich springy sites. Small spring fen in valley of Ezerska river with *Eriophorum latifolium, Listera ovata* and *Gymnadenia conopsea*. Photo: Kimmo Syrjänen.

13. *7230 Alkaline fens.*

This is a small and rare habitat type at Pelister NP. It is present inside the forest zone, usually at mineral rich places with some trickling groundwater. The typical species composition are fen species of vascular plants including *Eriophorum latifolium*, *Blysmus compressus*, *Listera ovata* and fen mosses like *Campylium stellatum*, *Bryum psedotriquetrum* and *Sphagnum contortum*. The Balkan endemic vascular plants typical for habitat 7160 are also often present in this habitat type.

Funded by the European Union

Mountain scree in the Pelister NP in southern slope of Mt. Pelister. Siliceous screes are present both at alpine and forest vegetation zones. This habitat type is important for rare lichens and mosses of siliceous substrata, like nationally protected Black Rock-moss *Andreaea rupestris*. Photo: Kimmo Syrjänen

14. *8150 Medio-European upland siliceous scree.*

This is a common and characteristic habitat type for Pelister NP. All boulder scree habitats at the slopes and summit area of Baba mountains are included into this type. Also the famous “stone rivers” of Pelister NP belong to this habitat type. Boulder scree habitats are very important especially for lichens and bryophytes as well as for ferns including rare species with boreal and alpine distribution.

Funded by the European Union

Siliceous rocky slopes in Yorgov Kamen. This habitat type is common in Pelister NP. *Silene lerchenfeldiana* is Balkan endemic campion species that can be met on cliffs of Pelister NP and it is a characteristic for this habitat type. Photo: Kimmo Syrjänen

15. *8220 Siliceous rocky slopes with chasmophytic vegetation.*

A common habitat type at Pelister NP. Type 8220 is important for floral and vegetational biodiversity. The floral composition includes plant species and plant communities adapted to extreme environmental conditions. The limited genetic exchange between taxa from different mountains provide favourable conditions for endemic speciation, leading to the presence of the North Macedonian and Balkan endemic species within this habitat type. This habitat type is also important for birds like Red-billed chough *Pyrrhocorax pyrrhocorax* in alpine parts Pelister NP. The endemic vascular plant *Sempervivum octopodes* grow often in this habitat type at the alpine area of Pelister NP.

16. *9180* Tilio-Acerion forests of slopes, screes and ravines.*

A rare habitat type in Pelister NP. It is present along slopes of Semnica River between Kazan and Maloviste. Parts of the habitat are recently destroyed during construction of a hydropower plant road. It is also present along Brajcino River, but presence inside the National Park needs to be confirmed. This type can be found at the sides of river ravines in lower parts of Pelister NP and should be further observed.

Funded by the European Union

Alluvial forests with *Alnus glutinosa* are common as stripes along streams and rivers of Pelister NP, sometimes there are small Black alder woods surrounding springs and in other places where groundwater discharges to surface. Photo: Kimmo Syrjänen

17. *91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae).*

This priority habitat type is present here and there at slopes and lower part of Pelister NP. At slopes it usually forms corridors and stripes along spring brooks and streams. In some springy sites it forms small woods. This habitat type is important for amphibians, including *Rana dalmatina* and *R. graeca.*

Funded by the European Union

White oak woods in Pelister NP above Rotino village. Many oak woods have mixed oak species composition. White oak woods with sessile oak *Quercus petraea* are present mainly in lower parts of Pelister NP. Hungarian oak is more frequent in higher parts of oak zone below beech forests. Photo: Kimmo Syrjänen

18. *91AA *Eastern white oak woods.*

Especially when inhabited with old trees this habitat type have great importance for biodiversity conservation. White oak woods are located in lower altitudes and close to borders of Pelister NP. They are characterized by the presence of white oaks *Quercus pubescens* and *Quercus petraea*, but also Turkey oak/Austrian Oak (*Quercus cerris*) and Hungarian/Italian Oak (*Quercus frainetto*) often occur in these forests.

Funded by the European Union


Near to natural Silver fir forest above Rotino village in Pelister NP (left) and its bottom vegetation with typical forest species including *Prenanthes purpurea, Galium rotundifolium, Oxalis acetosella, Euphorbia amygdaloides, Geranium robertianum, Aremonia agrimonioides, Myosotis sylvatica* and *Rubus hirtus.* Photos: Kimmo Syrjänen

19. *91BA Moesian silver fir forests.*

This habitat type is present especially at northern slopes of Pelister NP. The Moesian Silver Fir (*Abies borisii-regis*) is spreading in Pelister NP and is competitively superior over *Pinus peuce*. There are some pure stands but silver fir grows often mixed with *Pinus peuce* and sometimes with Beech. Silver fir has been favoured by sowing and some stands are of planted origin. Old-growth Silver fir stands have high conservation value.

20. *9280 Quercus frainetto woods.*

In Pelister NP *Eastern white oak woods 91AA** are connected and partly mixed/overlapping with *9280 "Quercus frainetto woods"* those are mainly present at more upper parts of the oak zone just below and sometimes mixed with Moesian beech forests 91W0.

Funded by the European Union

Beech forest with old trees and coarse decaying wood above Brajzino village in Pelister NP. Huge old living and dead beech trees are important for many rare fungi, insects and other animal species as well as for epiphytic lichens and bryophytes.
Photo: Kimmo Syrjänen

21. *91W0 Moesian beech forests.*

This is probably the most common type of forest in Pelister NP. There are some scattered and fragmented stands with old trees and large decaying logs with characters of pristine forests. These stands have very high conservation value. However, main parts of beech forests in the National Park are managed by selective cuttings in order to produce firewood and timber. These forests are often monotypic and even sized / aged as a result of commercial management practices.

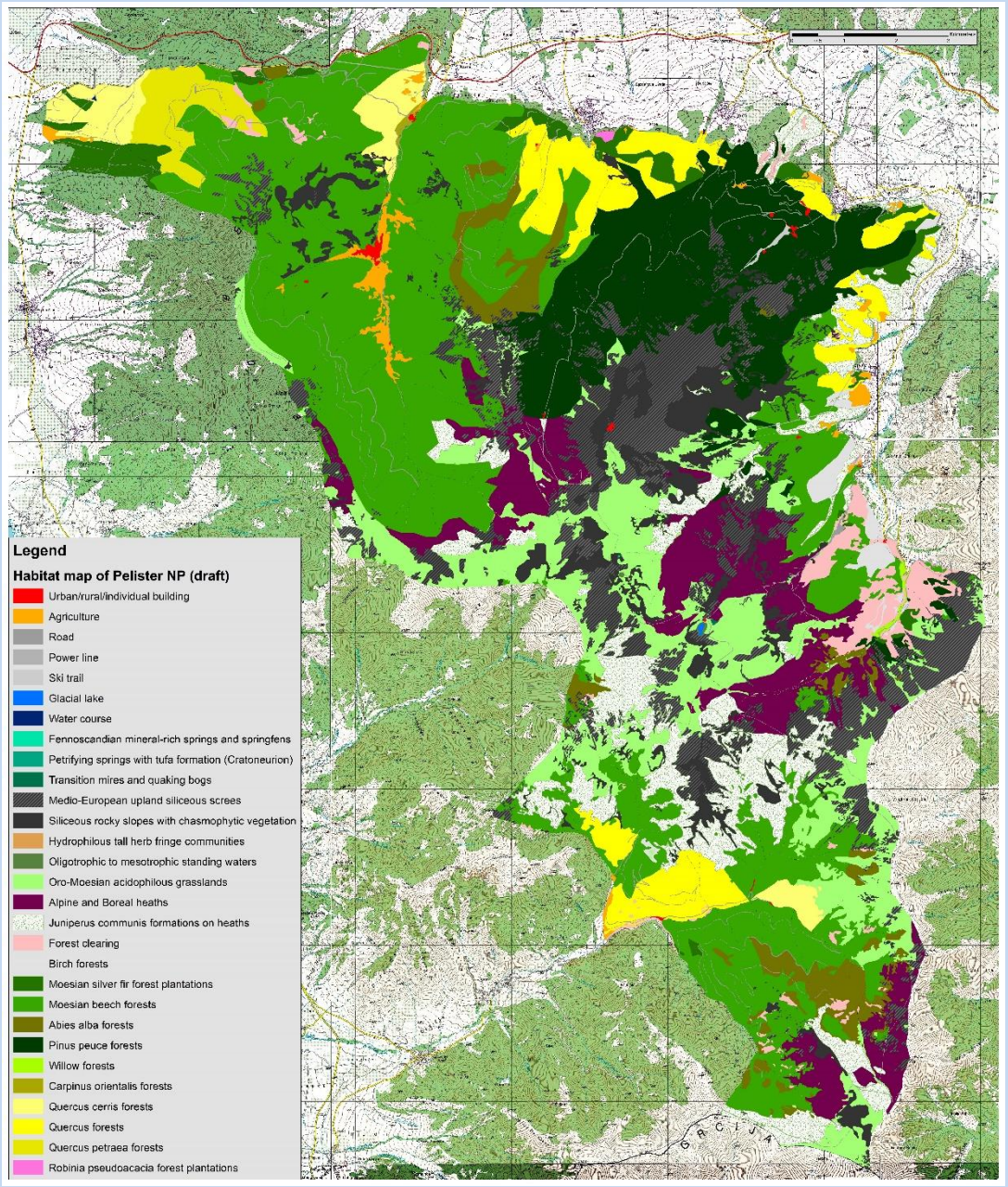
Funded by the European Union

Macedonian Pine forest with Bracken *Pteridium aquilinum* close to Molika hotel in Magerevo. This is a clear responsibility habitat type for Pelister NP with largest European occurrences of these forests being in the Park. Lower parts of *Pinus peuce* forests are characterized by temperate herbs at the bottom. In upper parts of forest zone undergrowth is mainly boreal with blueberry *Vaccinium myrtillus* as dominating species. Photo: Kimmo Syrjänen

22. *95A0 High oro-Mediterranean pine forests.*

A typical habitat type in Pelister NP. Conservation value of this habitat type with the Macedonian Pine *Pinus peuce* forests is very high. Strict conservation of all natural stands and stands with characteristics of old growth forests of 95A0 at Pelister NP is globally important. Many stands have long forestry history and several stands are regenerated at Yugoslavian time and managed afterward. Green shield moss *Buxbaumia viridis* of Annex II is sometimes present on decaying wood in this habitat type. Habitats Directive Annex V vascular plant species *Gentiana lutea* is often present in subalpine parts of this habitat.

Funded by the European Union



Map 5. Habitat types in Pelister National Park. This map is a draft prepared by Vasko Avukatov from MES. It is based on different remote sensing sources and field surveys by Twinning project and MES, but it is still under preparation.

2.2.2. Flora

Four plant species from Pelister NP are included into Habitats Directive Annex II or IV plant lists. Fresh observations have been made for *Tozzia carpathica*, *Fritillaria gussichiae* and *Buxbaumia viridis* which was found during the Twinning inventories 2018-2019. However, *Mannia triandra* was observed last time more than 50 years ago and the present situation is unknown. In addition to these there are also several other plant species in Pelister NP which are also rare nationally and protected by the Nature Conservation Act. The following protected vascular plants (V), bryophytes (B) and lichens (L) are met in Pelister NP: *Alchemilla peristerica* (V), *Andreaea rupestris* (B), *Buxbaumia viridis* (B), *Crataegus sericeus* (V), *Dianthus myrtinervius* (V), *Eryngium serbicum* (V), *Evernia divaricata* (L), *Fritillaria gussichiae* (V), *Malus florentina* (V), *Parmelina*

Funded by the European Union

exasperatula (L), *Pedicularis limnogena* (V), *Peltigera venosa* (L), *Pinus peuce* (V), *Ramalina carpathica* (L), *Soldanella pindicola* (V) and *Tozzia carpathica* (V). In strictly protected species list are following vascular plants: *Crocus pelistericus*, *Gentiana lutea symphyandra*, *Gentiana punctata*, *Sempervivum octopodes* and *Fritillaria gussichiae*.

Carpatian Tozzia is known in the Republic of North Macedonia only from Pelister NP, where it grows along moist shores of clear water streams in a couple of sites. Photo: Kimmo Syrjänen.

1. Carpathian Tozzia (*Tozzia carpathica*)

Habitats Directive Annex II and IV species (code **6244**). *Tozzia carpathica* is an annual hemiparasite that grows at shorelines of subalpine – alpine streams. In the Republic of North Macedonia it is restricted to Pelister NP, but has four known localities here.

2. *Fritillaria gussichiae*

Habitats Directive Annex IV species (code **1845**). It is a spring flowering perennial bulbous herb that grows on sun exposed grasslands and meadows at forest zone and lower parts of alpine zone in Pelister NP. It is a Balkan endemic species and probably considerable amount of European occurrences are in the Republic of North Macedonia.

3. Green Shield Moss (*Buxbaumia viridis*)

Funded by the European Union

Habitats Directive Annex II species (code **1386**). This is an epixylic moss that lives on soft decaying wood of fallen logs or stumps. In the Republic of North Macedonia there are a couple of both old and present records. In Pelister NP there is a large viable population in one Moesian Silver Fir forest at Pali Snopje, a site with abundant decaying wood.

4. ***Mannia triandra***

Habitats Directive Annex II species (code **1379**). This liverwort was observed in Pelister NP near the shoreline of Golemo Ezero, 2200 m alt, on wet rocks in 1960.

Invasive plant species at Pelister National Park

The False Acacia (*Robinia pseudacacia*) is the most common and spreading invasive tree species in the Republic of North Macedonia. This species is also the most common and harmful invasive species at Pelister NP. So far it is only present at least in lower parts of the National Park close to Magarevo and quite common along Semica river between Kazan – Maloviste as well as along village Nitze Pole.

Invasive herbs

There are few invasive herbs at Pelister NP. Tall Fleabane (*Erigeron annuus*) is observed by a hydropower plant close to Maloviste. In the same area e. g. *Phytolacca dioica* are also present. Hedge bindweed *Calystegia sepium* is common and spreading along streams close to villages and may also contain non-native intraspecific taxa of garden origin.

Other introduced species

At different parts of Pelister NP Scots pine (*Pinus sylvestris*) seems to be spreading. In northern parts of the national park there are plantations of introduced species like *Pinus sylvestris*, *Pseudotsuga menziesii*, *Pinus strobus*, *Larix sp*., *Picea abies*, *Pinus nigra* and others. These tree-stands should be removed and replaced with natural forest species, in this area this should mainly be oaks and Beech.

2.2.3. Fauna

Altogether **31 animal species** (other than birds) of the Habitats Directive Annex II and IV have been identified in the Pelister NP during inventories in 2018 – 2019 by the Twinning project, however, a total of **47 animal species** of Habitats Directive Annex II and IV have either presently been observed in the area or are documented through literature. In addition to observations done by the Twinning project 2018-2019, there are previous observations (Avramoski 2006 a, b) from certain species of Habitats Directive Annex II and IV, which were not observed during project activities. However, many of them are expected to be continuously present in the National Park.

In addition, there are several species of animals living in Pelister NP, which are not included in the Annexes of Habitats Directive, but which are species of both national and international conservation interest. For example, species of the Long horn beetles from the genus *Dorcadion* (s.l.) and grasshoppers from the genus *Poecilimon*, form small and in many cases endemic populations in the Pelister NP. In the case of *Poecilimon spp*., the taxonomic work is in process and only after more detailed taxonomic studies the level of endemism can be assessed properly. In addition to these species, some species of Coleoptera in the *Carabidae* family have been found only in the alpine areas of the Baba Mountains in the Balkans. In many areas of the Republic of North Macedonia habitats in caves maintain a diverse fauna, which is only partly studied and which may contain species which are not yet defined by taxonomists. In Pelister NP with siliceous bedrocks, however, no large caves have been identified, and the potential for finding endemic cave species is probably low. Still, also another animal species with both national and international value are found in the National Park, like large carnivores. In addition, there are a lot of invertebrate species with high national and international conservation value in the Pelister NP (Avramoski 2006 a, b): these include e.g.: *Deroceras turcicum* (a terrestrial

Funded by the European Union

pulmonate gastropod), *Duvalius macedonicus* (a Carabid beetle), *Duvalius peristericus* (a Carabid beetle) and *Eucypris kurtdiebeli* (a fresh water *Crustacean*).

Vertebrates

Mammals

In the Twinning project team no mammal expert has been available. However, tracks and faeces of especially brown bear and wolf have been observed during inventories. Marks after these large carnivores have been made in several parts of the National Park. Also, rangers of the Pelister NP have confirmed occurrences of these mammal species, and other. Photos taken with game cameras often allow identification of large carnivore individuals, especially if the photos are taken during a short time period. An estimation of age and sex is also possible in many cases.

1. Wolf (*Canis lupus*)

Habitats Directive Annex II, IV and V (code **1352**). Tracks of wolf can be found at different parts of Pelister NP from lowlands to subalpine and alpine areas. Within the Twinning project there have been observations on wolf up from Gjavato, Capari and Rotino villages. There are plenty of prey animals available for wolf and the only real threat is poaching. Wolf is a large carnivore with international interest and monitoring of the species should be started nationally. At Pelister NP rangers could do observation on the species. Methods can include game cameras and counting of tracks (including winter counts). The observations of wolf by the Twinning project in Ezerani Nature Park recalls, that there is dispersal corridor from Pelister NP through northern parts of Prespa Lake to Galicica National Park.

Funded by the European Union

The European Wildcat is a nocturnal and solitary cat species preferring areas with rocks and tall trees,dense thickets and abandoned burrows for shelter and hideaway. Photo: Petri Ahlroth.

2. European Wildcat (*Felis silvestris*)

Habitats Directive Annex IV (code **1363**; for *Felis silvestris silvestris* code **6110**). The European Wildcat has fragmented distribution through temperate broadleaf forests in Europe, because it has already become extinct from some countries. The European Wildcat is in the list of strictly protected species in the Republic of North Macedonia. There are still some pouching of the species and furs of wildcat can be bought easily. Within the Twinning project there was only one observations of wildcat in vicinity of Pelister Info Center at night, but the presence of a larger population in Pelister NP is evident.

Funded by the European Union

Otter *Lutra lutra swimming in Prespa Lake* Photo: Petri Ahlroth.

3. Otter (*Lutra lutra*)

Habitats Directive Annex II and IV (code **1355**). Otter can be found close to very different types of waterbodies. Otters occupy both standing and running waters and they can search food also along very small streams. Otters move in large areas and they have good dispersal ability. Within the Twinning project there were no observations on otter but it was observed at Prespa Lake and there are a lot of suitable stream habitats for the species in the Pelister NP. The otter is in the list of strictly protected species in the Republic of North Macedonia.

4. Lynx (*Lynx lynx*)

Habitats Directive Annex II, IV and V (syn. *Felis lynx*) (code **1361**). At Balkans there is living the Balkan Lynx (*Lynx lynx* subsp. *balcanicus*), being present in eastern Albania and western parts of the Republic of North Macedonia, with smaller populations in Kosovo and Montenegro. In Pelister NP the Lynx is very rare and there is no viable population presently in the National Park. However, there are single observations on wandering individual at game cameras (like in 2018). In principle there are suitable habitats and a lot of prey animals for the Lynx in the National Park.

5. Hazel Dormouse (*Muscardinus avellanarius*)

Habitats Directive Annex IV (code **1341**). This mammal is present through temperate broadleaf forests in Europe and mainly feed on nuts of *Corylus avellana* (and *C. colurna*) with other fruits, foliage, pollen and insects. It is given in the Plan of Management for Pelister National Park (Avramoski 2006b). Within the Twinning project there are no fresh observations, but the Hazel Dormouse spends a large proportion of its

Funded by the European Union

life sleeping and is not easy to find. There is a lot of suitable habitat with hazel dominated luxurious broadleaf and *Pinus peuce* forests for the Hazel Dormouse at lower parts of Pelister NP.

6. Balkan Chamois (*Rupicapra rupicapra* subsp. *balcanica*)

Habitats Directive Annex II and IV (code **1371**). This chamois inhabit steep, rocky areas in the mountains, utilizing a variety of habitats including alpine meadows, open rocky areas, and (especially during wintertime) forested areas, like mixed broadleaf forests and coniferous woodlands (Aulagnier et al. 2008). A locally small population of the Balkan Chamois in the Pelister NP is in principle directly connected to Greek (and more widely with other western Balkan) populations of the species. However, due to (rather recent) historical poaching of Balkan Chamois popolations in Pelister NP, the number of individuals has remained very low during the last decades. The Balkan Chamois has still been seen annually in the National Park during 2010's, but recent population is low and needs both monitoring and an action plan with real conservation measures to maintain and re-establish the population. At summertime scattered individuals of present flock of the Balkan Chamois can be seen around the Goat rock (коза камен) at alpine part of the Pelister NP. The species may also suffer from competition with other ungulates and in general predation pressure caused by large carnivores can decrease also the stand of Balkan chamois. Overgrowth of alpine heaths and grasslands can decrease an amount of suitable habitats. Management of low-growing alpine grasslands to produce pastures for the Balkan Chamois should be an important target in future management plans of the Pelister NP. Maintaining of alpine grasslands will support also of several other species groups

7. Brown Bear (*Ursus arctos*)

Habitats Directive Annex II and IV (code **1354**). There is a rather large population of Brown Bears at Balkans in Europe. The Dinaric-Pindos population of Balkans has remained relatively stable and consist of 2.500–3.000 individuals (continuing from northeast Italy, Slovenia, Croatia, Bosnia and Herzegovina, Serbia, Montenegro, North Macedonia, Albania and Bulgaria to Greece). The Brown Bear subpopulation of Pelister NP is important in the middle of Balkan distribution area. There are some traditions of poaching of bear within the surroundings of Pelister NP, which is harmful for the local population and to maintain continuous range of the species. Otherwise there are plenty of food (like blueberries and ants, etc.) as well as mammal prey for the Brown Bear in Pelister NP. The Brown Bear is in the list of strictly protected species in the Republic of North Macedonia. Like with wolf it would be important to maintain ecological connections/corridors to disperse north- and westwards through Gjavato pass and along northern shores of Prespa lake to Galicica mountains.

In addition to the mammals listed in the Habitats Directive there are also several other species of small mammals (Avramoski 2006 a, b) with conservation value in the Pelister NP like: the Lesser Mole Rat (*Nannospalax leucodon* syn. *Spalax leucodon*) (Kryštufek & Amori 2017), the Balkan Mole (*Talpa stankovici*) (Vohralík & Kryštufek 2016), the European Snow Vole (*Chionomys nivalis*) (Kryštufek 2016), the Mediterranean Vole (*Talpa caeca*) (Cassola 2016) and the Balkan Pine Vole (Mitsainas & Kryštufek 2008) as well as the Edible Dormouse (*Myoxus glis* syn. *Glis glis*) and the Forest Dormouse (*Dryomys nitedula*) (Batsaikhan et al. 2016) (ANNEX 3).

Mammals – Bats

With particular bat species also all *Microchiroptera* are listed in Habitats Directive Annex IV. The following bat species of Habitats Directive Annexes are recorded in the Pelister NP (Avramoski 2006 b): Lesser Mouse-eared

Funded by the European Union

Myotis (*Myotis blythii*) (Annex II and IV code **1307**) Least concern LC by IUCN (Juste & Paunović 2016), Long-fingered Bat (*Myotis capaccinii*) (Annex IV code **1307**) Vulnerable VU by IUCN (Paunović, M. 2016), Blasius's Horseshoe Bat (*Rhinolophus blasii*) (Annex II and IV, code **1306**) Least concern LC but decreasing by IUCN (Taylor 2016a), the Mediterranean Horseshoe Bat (*Rhinolophus euryale*) (Annex II and IV, code **1305**) Near threatened NT by IUCN (Juste & Alcaldé 2016), Greater Horseshoe Bat (*Rhinolophus ferrumequinum*) (Annex II and IV, code **1304**) Least concern LC by IUCN (Piraccini 2016) and Lesser Horseshoe Bat (*Rhinolophus hipposideros*) (Annex II and IV, code **1306**) Least concern LC by IUCN (Taylor 2016 b).

The species *Myotis capaccinii*, *Rhinolophus blasii* and *Rhinolophus euryale* are in the list of protected species of the Republic of North Macedonia. Within the Twinning project some bats were observed but species were not determined.

Mediterranean Horseshoe Bat *(Rhinolophus euryale).* Caves with a constant microclimate are chosen for winter roosts, old hollow trees and abandoned buildings are important especially during summer. Photo: Petri Ahlroth

Reptiles and amphibians

In the Management Plan for Pelister National Park (Avramoski 2006) the following amphibians were recorded for the National Park: *Bombina variegata*, *Bufo bufo*, *B. viridis*, *Hyla arborea*, *Rana dalmatina*, *R. graeca*, *R. ridibunda*, *Salamandra salamandra*, *Triturus carnifex* and *T. vulgaris*. On these *Bufo viridis* (syn. *Bufoides viridis* annex IV code **1201**), *Hyla arborea* (annex IV code **1203**), and *Triturus carnifex* (syn. *T. macedonicus* annex II and IV code **5364**), which are species of Habitats Directive Annexes were not observed

Funded by the European Union

within the inventories of the Twinning project, neither was *T. vulgaris*. All other amphibians of the list were observed.

Of reptiles the following species are listed in the Management Plan for Pelister National Park (2006): *Ablepharus kitaibelii*, *Anguis fragilis*, *Coluber caspius*, *Coronella austriaca*, *Elaphe longissima*, *Lacerta agilis*, *L. trilineata*, *L. viridis*, *Natrix natrix*, *N. tessellata*, *Podarcis erhardii*, *P. muralis*, *P. taurica*, *Testudo hermanni*, *Vipera ammodytes* and *V. berus*. *Coluber caspius* (syn. *Dolichophis caspius* Annex IV code **6138**), *Coronella austriaca* (Annex IV code **1283**), *Natrix natrix* and *N. tessellata* (Annex IV code **1292**) were not met during inventories within the Twinning project.

The European Copper Skink lives in sun exposed slopes with dry grasslands and scrub at lower part of Pelister NP. Photo: Petri Ahlroth.

14. European Copper Skink/ European Snake-eyed Skink (*Ablepharus kitaibelii*)

A reptile species of Habitats Directive Annex IV (code **1276**). It is small and slender dark copper coloured – with even more dark flanks – lizard in the family *Scincidae*. It is an endemic reptile of south-eastern Europe and Turkey. This species lives in dry areas including south facing slopes, meadows, scrubland and clearings in woodland (both deciduous and pine), and it is generally found close to ground cover such as leaf-litter, dead wood, stones, bushes and other vegetation (Böhme et al. 2017). In Pelister NP the European copper skink was found at dry grasslands – Juniper scrub close to Magarevo village within the Twinning project. Main threat is overgrowth and afforestation of suitable dry grasslands in the area.

Funded by the European Union

15. Yellow-bellied Toad (*Bombina variegata*)

An amphibian species of Habitats Directive Annex II and IV (code **1193**). It inhabits temporary ponds in different habitats ranging from forests, forest roads, open lowland and highland meadows and sides of lakes and rivers. It can also be found in slightly urbanized environments, such as ponds, ditches and water-filled road trails in small villages and their surroundings. The ponds that the Yellow-bellied Toad inhabits generally lack vegetation and are free of competing species and predators. Although highly adaptable and apparently resistant to extreme flooding events, the population growth of Yellow belied Toads can be sensitive to droughts (Cayuela et al. 2016 a) due to global climate change, or direct human activities (e. g. fires, tillage, etc.). Such unpredictable environments cause high variation in inter-annual fecundity and slightly lower annual survival probabilities of both adults and immatures (Cayuela et al. 2016b, c). Within the Twinning project the Yellow-bellied Toad was observed in Magarevo (Golema Livida), Kazan – Malovishte and a couple of sites along Sapundiza river valley above Nize Pole. Inventories and monitoring of the species should be continued in Pelister NP, because species can be sensitive to climate warming (habitats can dry out) and trend of population in uncertain..

16. Aesculapian Snake (*Elaphe longissima* syn. *Zamenis longissimus*)

A reptile species of Habitats Directive Annex IV (code **1281**). It is a nonvenomous snake of the family *Colubridae* and adults can reach length of 1-1,5 m., which makes it one of the longest snakes in Europe. It is typical at zone of broadleaved forests and it lives in forested hilly landscapes with varied humidity along river valleys. In suitable environments there are available also warm sun-exposed but not hot habitat patches. The Aesculapian Snake eats small mammals (mice, rats, shrews, moles) and birds (also eggs and nestlings). Within the Twinning project one individual of this species was observed in forested slope by the road close to Pelister NP Info Centre.

17. Sand lizard (*Lacerta agilis*)

A reptile species of Habitats Directive Annex IV (code **1261**). It can be found in a wide range of habitat types including meadows, heathland, coastal dunes, grassland, steppe, subalpine and alpine meadows, scrubland, hedgerows, open woodland, in alpine areas, traditionally managed agricultural land and rural garden (Agasyan et al. 2010). Sometimes it is present in sandy semi-desert areas. It is classified as Least concern LC by IUCN (Agasyan et al. 2010). The species was observed within the Twinning project at Magarevo, in skiing slope grassland close to Hotel Molika, and in alpine zone of south-west facing slope of Mt. Pelister at 2.300 m altitude.

18. Three Lined Lizard (*Lacerta trilineata*)

Habitats Directive Annex IV (code **1251**). It favours semi-open shrub areas, sunny forest edges, roadsides and rocky grasslands with mosaic of higher vegetation and open patches. In field this quick moving lizard is not easy to separate from closely related *L. viridis*. Both species are met in sun-exposed grasslands, Juniper scrub, rocky habitats and roadsides at lower parts of the Pelister NP.

19. Balkan Green Lizard (*Lacerta viridis*)

Habitats Directive Annex IV (code **1263**). The species favour semi-open shrub areas, sunny forest edges, roadsides and rocky grasslands with mosaic of higher vegetation and open patches. In field this quick

Funded by the European Union

moving lizard is not easy to separate from closely related *Lacerta trilineata*. Both species are met in sun-exposed grasslands, Juniper scrub, rocky habitats and roadsides at lower parts of the Pelister NP.

20. Erhard's Wall Lizard/Aegean Wall Lizard (*Podarcis erhardii*)

Habitats Directive Annex IV (code **1238**). It is an endemic species to Southeast Europe. The species lives in sunny rocky meadows, open cliffs and other stony habitats. In Pelister NP it was observed at dry grassland in Kazan.

21. Common Wall Lizard (*Podarcis muralis*)

Habitats Directive Annex IV (code **1256**). It is very common species and it lives in many types of habitats including warm forest slopes, forest edges, scrub areas, roadsides and many types of cultural habitats. In Pelister NP it is mainly met in lower areas in grasslands and open forests. This species was met at several sites in lower part of Pelister NP within the Twinning project.

22. Balkan Wall Lizard (*Podarcis taurica*)

Habitats Directive Annex IV (code **1248**). It favours dry meadows, often in sandy soils, scrub areas and rocky shores. It is rather common species in the region, but limited to lower altitudes and rare in the area of Pelister NP. It was observed in vicinity of Magarevo village.

The Agile Frog. Photo: Petri Ahlroth.

23. Agile Frog (*Rana dalmatina*)

Habitats Directive Annex IV (code **1209**). The Agile Frog is common species in the area. It can be found from many kinds of moist habitats like shores of lakes and ponds, wetlands, ditches, sides of rivers and small streams. Adult individuals move in moist forest areas and can be found far from the open water bodies. Adult individuals also visit moist caves. The Agile Frog is closely related to *Rana graeca* (code **1208**),

Funded by the European Union

the Greek stream frog. It is also very probably present in the area of Pelister NP, but occurrence of the species was not confirmed in the National Park within the Twinning project.

The Nose-horned Viper *Vipera ammodytes* is very venomous but a rare snake species in Pelister NP. Photo: Petri Ahlroth.

24. Nose-horned Viper (*Vipera ammodytes*)

Habitats Directive Annex IV (code **1295**). The Nose-Horned Viper is a rare snake species in Pelister NP. It occurs in many kinds of habitats, favouring sunny rocky slopes and other open and semi-open habitats but can be met in forests as well. In Europe it occurs through Balkan to the Middle East. It was found above Brajchino within the Twinning project. This viper is feared due to high toxicity of its venom, and it is considered to be the most dangerous snake in Europe.

25. Herman's Tortoise (*Testudo hermanni*)

Habitats Directive Annex II and IV (code **1217**). Herman's tortoise inhabits many types of natural habitats such as meadows, open oak forests and secondary growth forests mainly where the influence of the Mediterranean climate is present. Tortoises are mainly threatened by loss of habitat due to urbanization and agriculture. The limited locomotor capabilities of these armoured animals make them very susceptible to fires as well as vehicles, making roadkill tortoises a common site across roads in the Republic of North Macedonia. In Pelister NP Herman's Tortoise have been observed from lower parts of the National Park at oak forests and semi-natural open habitats close to villages of Magarevo and Capari.

Funded by the European Union

Fish Species

Two individuals of the Pelagonia Trout *Salmo pelagonicus ready for spawning* in river Sapundica in 2019. Photo: Kimmo Syrjänen.

26. Pelagonia Trout (*Salmo pelagonicus* syn. *S. macrostigma*)

Habitats Directive Annex II (code **5354**). *Salmo pelagonicus* is in the list of strictly protected species in the Republic of North Macedonia. The Pelagonia Trout is found at tributaries of the lower Vardar and Aliakmon (North Macedonia and Greece). In Pelister NP it has been observed in streams and rivers running at eastern the side of the Baba massif into the Pelagonian valley. This species is dependent on clear unpolluted water. It is threatened by water uptake and drying of streams due to climate warming.

27. Prespa Trout (*Salmo peristericus* syn. *S. macrostigma*)

Habitats Directive Annex II (code **5355**). The Prespa Trout is found in rivers running to Prespa Lake from western slopes of Baba mountains like Brajcinska river. Most occurrences are located below the area of the National Park. The trout is in the list of strictly protected species in the Republic of North Macedonia. Like Pelagonia Trout the Prespa Trout is dependent on clear unpolluted water. It is threatened by water uptake, pollution and drying of streams due to climate warming.

Funded by the European Union

Invertebrates

Crustaceans (*Crustacea*)

The Stone Crayfish from Brajchino river. Photo: Petri Ahlroth.

28. Stone Crayfish (*Austropotamobius torrentium**)

Habitats Directive Annex II and V (code **1093**). The Stone Crayfish is a prioritized species of the Habitats Directive. The Stone Crayfish occurs in the middle of Europe and Balkans. Its favourite habitat is the pristine running waters (springs, brooks) but it can also be found in rivers or even lakes in the mountain area (Pârvulescu 2010). Usually it prefers galleries that it digs in the ground banks but it lives very often hidden under submerse roots, stones or rocks. It is more active during the night eating almost everything, that's why it represents a truly sanitary of the waters. It is sensitive to low concentration of oxygen and chemical pollution (Pârvulescu 2010). In Pelister NP this species is found from Brajcinska and Stanishar rivers (at altitude of 1050-1200 asl; according to information of Macedonian Ecological Society). Within the Twinning project this species was observed in Brajcinska river just above the village.

Funded by the European Union

Insects

In addition to the insect species observed within the Twinning project, the following two Habitats Directive species have been observed previously in Pelister NP (Avramoski 2006a): The False Eros Blue butterfly (*Polyommatus eroides*) (Annex II and IV, code **4042**) and *Paracaloptenus caloptenoides*, a locust species (Orthoptera), (Annex II and IV, code **4053**). These were not observed within the Twinning project, but they both may still exist in the area.

Beetles (*Coleoptera*)

The Cerambyx Longicorn. Photo: Petri Ahlroth.

29. Cerambyx Longicorn/Great Capricorn Beetle (*Cerambyx cerdo*)

Habitats Directive Annex II and IV (code **1088**). The Cerambyx Longicorn is one of the largest European beetle species. The species lives in broad-leaved deciduous forests, parks and other semi-open habitats with large dead Oaks (*Quercus spp.*), it favours warm edges of forests, sun-exposed slopes and roadsides. It was met in Pelister NP above Capari on old oaks. Like in many other longhorn beetles with wings, adults are weak flyers and very rarely fly more than 500 meters from their tree (EU wildlife … 2009). The species normally selects old and decaying trees, such as oaks that are over 100 years old and have a diameter larger than 40 cm (EU wildlife … 2009). It is important to protect all old oaks at lower part of Pelister NP while trying to maintain this fauna species in the National Park.

Funded by the European Union

Cucujus cinnaberinus, one of the Flat Bark Beetles was found first time for the Republic of North Macedonia by twinning project. Photo: Petri Ahlroth

30. *Cucujus cinnaberinus*

Habitats Directive Annex II and IV (code **1086**). *C. cinnaberinus* is a species of the *Cucujidae* family, the Flat Bark Beetles. The species lives under the bark of dead trees. Both larvae and adults can be found under the bark of Aspen (*Populus*), Oak (*Quercus*), Birch (*Betula*) and sometimes also Pine (*Pinus*) (Nieto et al. 2010 a). Several forest habitat types with primeval or old-growth characteristics can be potential habitats for the species. The species is dependent on the continuum of dead wood in the site or immediate vicinity, where it lives. For this reason, the species has disappeared from large areas in Europe due to intensive forestry activities. However, in Hungary it has met also from Black Locust (*Robinia pseudacacia*) plantation from suitable trees. *C. cinnaberinus* was found first time in the Republic of North Macedonia within the Twinning project inventories in 2018. It was found during the field works in Pelister NP, under the bark of dead Macedonian Pine *Pinus peuce*. Forestry is also the main threat for the species in the only known living area of *C. cinnaberinus* in the Republic of North Macedonia at Pelister NP. Sanitary cuttings in the area do not allow habitats to evolve in a way suitable for the species. All saproxylic species (i.e. species those are dependent on coarse decaying wood) face the same problem in Pelister NP. Amount of dead trees should be increased in Pelister NP and valuable forest habitats with coarse woody debris should be left out of all forestry activities.

31. Stag Beetle (*Lucanus cervus*)

Habitats Directive Annex II (code **1083**). The Stag Beetle lives usually in forest habitats with large oak trees. Stag Beetles are famous because of very large horn-like mandibles of males those are used in the fight

Funded by the European Union

from the females. Male mandibles are harmless for people but females can give a painful bite for a too eager enthusiast. Larvae of the species use rotten wood of stumps, base of dead standing trees and other dead wood buried in soil with always decayed by white-rot fungi (Nieto et al. 2010). The larvae develop in moist decaying wood near or below the soil surface, and larval development takes about four to five years. The species needs big rotten trunks and stumps those maintain moisture, but it can also be met in the base of fence posts etc. Stag Beetle larvae lives typically on rotten wood of different oak species, but sometimes they are also found on other broad-leaved trees, including the genera *Castanea*, *Fraxinus*, *Populus*, *Quercus*, *Salix* and *Tilia* (Nieto et al. 2010b). The species has relatively good dispersal ability, but suitable habitats and patches of coarse woody debris are scattered in the landscape. All large decaying and dead oaks and decaying coarse woody debris at forest floor should not be cut or removed but left for the stag beetles and a large number of other rare saproxylic species. Within the Twinning project the Stag Beetle was found in oak forests above Capari, Magarevo and Brajcino. Both sexes were present and there seems to be a rather viable population of the Stag Beetle in the Pelister NP. It is important to ensure that there will be a continuum of old oaks and coarse woody debris in Pelister NP and nearby areas also in future.

32. ***Morimus funereus***

Habitats Directive Annex II (code **1089**). This saproxylic beetle is geographically very variable and represents a flagship species of old-growth deciduous forests in Eastern and South-eastern Europe (Solano et al. 2012). *M. funereus* favors old broad-leaved trees with thick bark. The species has been observed in a couple of places from Pelister NP, e. g. on old aspen and oak trees in three separate locations above Capari, on old oaks and beeches in a couple of sites above Brajcino. The species has poor dispersal ability and if local extinctions take place, the probability for recolonization is low. There may be presently a viable population at Pelister NP. Inventories should be done in the area in order to find figure out the size of population. All old large deciduous trees (and especially dead or dying trees) and stands with such trees should be left out from the forestry activities. In areas with lack of suitable trees, the volume of large dead trees should be increased artificially. Restoration activities should be concentrated close to known populations because of the restricted dispersal ability of the species.

Funded by the European Union

The Rosalia Longicorn is prioritized beetle in EU and rare in Pelister NP. It needs continuity of very old and dead beech trees to survive. Photo: Petri Ahlroth.

33. Rosalia Longicorn (*Rosalia alpina**)

A prioritized beetle of Habitats Directive Annex II and IV (code **1087**). This is inhabitant of beech forests with old-growth characteristics: large old dying or dead trees in more or less sun-exposed habitats (Campanaro et al. 2017). *R. alpina* suffers from fragmentation on suitable habitats in the whole Europe. The intensive use of the beech forests with sanitary cuttings and removal of any dead wood, have reduced the populations of the species in large parts of Europe, and brought it to the brink of extinction (Reißmann 2010). *R. alpina* seems to be rare in Pelister NP and was observed on two locations with old dying beeches above Brajcino within the Twinning project in 2018-2019. However, the habitat seems to be typical for the species and there are some suitable habitats for species especially along western slopes of Pelister NP. The Rosalia Longicorn is supposed to be an average flyer, like many other longhorn beetles, whose spreading is most probably low, in most cases the covered distance is below 1000 m (Reißmann 2010). The size and viability of the *R. alpina* population in Pelister NP needs to be evaluated. The Rosalia Longicorn is one of the most demanding insects of very old beech trees and forests in the National Park.

Dragonflies (Odonata)

Funded by the European Union

The Balkan Goldenring lives close to clear water streams in several sites in Pelister NP. Photo: Petri Ahlroth.

34. Balkan Goldenring (*Cordulegaster heros*)

Habitats Directive Annex II and IV (code **4046**). The species lives in small, swift streams, usually in the forested slope valleys at mountains (Boudot 2010). All dragonflies are sensitive to decreased water quality and use of pesticides. However, small mountain rivers and streams are mostly located in areas without pollution and eutrophication pressures, those are more common threats in lowland rivers and other water bodies. Uptake of water for irrigation and as drinking water in the Pelister NP can be a threat to this species. Especially climate warming will increase risks for maintenance of this species in Pelister NP in future decades. Within the Twinning project the Balkan Goldenring was observed at forests roads close to small clear water streams at Capari, Magarevo, Magarevo-Rotino and slopes above Gjavato. There is probably a viable population along streams of the National Park and inventories are needed at suitable sites and populations should be monitored.

Butterflies (Lepidoptera)

35. Eastern Eggar (*Eriogaster catax*)

Habitats Directive Annex II and IV (code **1074**). The species has wide distribution in the country. The Eastern Eggar is night active and it lives in semi-open habitats, at the edges of forests and sides of the roads. Strong fluctuation is typical for the populations, but as the species is not especially demanding with the habitat or food plants, it is able to recolonise potential habitats. Usually there is no need for active managements to maintain the habitats for this species. Use of pesticides should be avoided in areas with colonies. In

Funded by the European Union

Pelister NP colonies of *Eriogaster catax* were found in several places at vicinity of Magarevo village close to pastures.

36. Marsh Fritillary (*Euphydryas aurinia*)

Habitats Directive Annex II (code **1065**). The Marsh Fritillary lives in dry or relatively dry meadows. The larvae feed on different species of family Dipsacaceae (*Knautia spp*., *Succisa pratense*, *Scabiosa spp*. and *Dipsacus spp*.). The species is declining in many European countries due to lack of traditional keeping of animals in pastures. Old pasture areas have been overgrowing and food plants have been disappearing in many areas. Overgrowing of meadows is the main threat for this species. In Pelister NP this butterfly was observed at Magarevo and Capari and above Brajcino.

37. Jersey Tiger (*Gallimorpha quadripunctaria* syn. *Euplagia q., Panaxia q.*)

Habitats Directive Annex II (code **6199**). This butterfly species can be found in forests, semi-open areas, parks, gardens and shrub areas. Larvae are polyphagous. They favour nettle *Urtica dioica*, but may feed on *Plantago*, *Rubus*, *Epilobium*, *Coryllus*, *Ulmus* and many other food plants. The species is not very demanding for specific habitat and, at the moment, no major threats can be identified. In inventories within the Twinning project this species was met at Gjavato in the Pelister NP.

38. Large Copper (*Lycaena dispar*)

Habitats Directive Annex II and IV (code **1060**). The Large Copper can be found in many different types of grassland habitats. The larvae feed on *Rumex spp*. The species is not especially demanding and does not face any major threats except general overgrowth of grasslands. The species is adapted to relatively strong fluctuation in population dynamics, and local extinctions and re-colonisations are typical for the species. At the moment the species is relatively common. It inhabits open and semi-open habitats those are important also for other butterflies. Within the Twinning project the Large Copper was found at lower part of Pelister NP close to Capari and Magarevo villages.

39. Clouded Apollo (*Parnassius mnemosyne*)

Habitats Directive Annex IV (code **1056**) (van Swaay et al 2010). In the Pelister NP this butterfly species has several (small) local populations in different river valleys. The Clouded Apollo favours low-growing herb-rich grasslands and other open or semi-open habitats. Adult individuals can be seen during early and midsummer sucking nectar from flowering plants in different type of grasslands. Larvae feed on different *Corydalis* species in spring, usually they favouring *C. solida*. Both *C. solida* and *C. cava* subsp. *marschalliana* are rather common species in this genus in the Pelister NP. The Clouded Apollo has suffered from overgrowth of old pasture areas. The grazing of animals has been ceased already since 1950`s at Pelister NP (after establishment of the National Park). Also, about that time, after World War II, grazing of natural habitats has decreased over the whole Europe. However, especially adult butterflies can utilize also tall herb stands with nectar plants. In many sites with occurrences of the Clouded Apollo in Pelister NP there are still possibilities to restore these overgrown habitats.

40. Large Blue (*Phengaris arion* syn. *Maculinea arion*)

Funded by the European Union

Habitats Directive Annex IV (code **1058**). Typical habitats for Large Blue are open and warm meadows with *Thymus* and colonies of *Myrmica* ants. Young larvae feed on flowers of *Thymus spp*. but already at early stages drops down to ground. The larvae cheat ants with chemical compounds and as a result *Myrmica* ants start to treat young larva of the Large Blue as their own larvae. In the nest the young larvae turn to be a predator (or nest parasite) which feeds on the larvae of the host ant. The main threat for the species is overgrowth of suitable habitats, because low growing *Thymus* species are sensitive to competition with higher vegetation. Usually the most effective way to maintain the openness of the habitat is traditional animal keeping at the site. However, overgrazing should be avoided. In Pelister NP the Large Blue was found above Brajcino and there are several observations on species at border of the National Park in Magarevo – Dihovo area in dry grasslands slopes at both site of water pipeline.

Invasive Insects

Some alien species belonging to invertebrate fauna groups are common and abundant in Pelister NP. The Harlequin Ladybird (*Harmonia axyridis*), Western Conifer Seed-bug (*Leptoglossus occidentalis*) and Brown Marmorated Stink-bug (*Halymorpha halys*) are all very common in the area. All of these species have already colonized all Balkan countries and other large areas in the Central and Western Europe. In this situation there is no way to get rid of them anymore. Many invasive insects have good dispersal ability and reproduction potential. With these abilities and with the lack of their original, natural enemies they have shown amazing colonization ability. This is very typical for many invasive alien species. Western Conifer Seed-bug sucks seeds of conifers and can have at some extent a negative effect on the regeneration of Macedonian Pine *Pinus peuce* and Silver Fir *Abies borisii-regis*.

2.2.4. Birds (Aves)

The Birds Directive – Council Directive 79/409/EEC aims to protect all of the 500 wild bird species naturally occurring in the European Union. In the Birds Directive Annex 1 are listed 194 species and sub-species which are particularly threatened. Each Member States must preserve, maintain or re-establish a sufficient diversity and area of habitats for these species. In addition to the general habitat provisions laid down in Article 3, Member States must also classify the most suitable territories in number and size as Special Protection Areas (SPA) for these 194 particularly threatened species listed in the Annex I of the Birds Directive as well as for regularly occurring migratory species, paying particular attention to wetlands of international importance. These SPAs form an integral part of the Natura 2000 network. In the Annex 2 there are listed 82 bird species those can be hunted. However, the hunting periods are limited, and hunting is forbidden when birds are at their most vulnerable: during their return migration to nesting areas, reproduction and the raising of their chicks. All Member States have to submit reporting on the status and trend in bird populations (Article 12) as well as on derogations (Article 9) they may apply to the Directive's obligations.

Even if European bird species is not mentioned in the annexes, it is covered by the general protection regime provided by Article 1 of the Directive to all species of birds naturally occurring in the wild state in the European territory of the Member States to which the Treaty applies.

Following data on Annex I birds of Pelister NP is mainly based on observations of professor Metodija Velevsky of the Macedonian Ecological Society (MES). Additionally, some complementary field observations are done by the Twinning project experts.

Funded by the European Union

Bird species of Annex I in the Pelister NP

Raptors

1. **Golden Eagle (*Aquila chrysaetos*)**

Birds Directive Annex I (code **1560)**; IUCN ERL category – LC; Bern Convention Appendix II; Bonn Convention Appendix II; Status in Pelister NP: resident, breeding rare species in high mountain altitudes, 6200 Semi-natural dry grasslands and scrubland facies habitat types. Population size and trend: unknown. Golden Eagle, especially is typically a species of wilderness area. Raptors usually require areas without human disturbance (except lesser kestrel). If nesting sites are identified any disturbance should be avoided in the area during the nesting time.

2. **Short-toed Snake Eagle (*Circaetus gallicus*)**

Birds Directive Annex I (code **1490)**; IUCN ERL category – LC; Bern Convention Appendix II; A Bonn Convention appendix II. Status in the Pelister NP: possibly breeding. Population size and trend: unknown. The Short-toed Snake Eagle favours open areas with snakes and lizard. Traditional land use maintains habitats for snakes and lizards but intensive agriculture does not. For this reason, activities which may be targeted to support rare habitat types with open dry grasslands and their species (plants and butterflies, for example) may also improve living conditions for Short-toed Snake Eagle.

3. **Montagus Harrier (*Circus pygargus*)**

Birds Directive Annex I (code **1620)**; IUCN ERL category – LC; Bern Convention Appendix II; Bonn Convention Appendix II. Status in Pelister NP: possibly breeding in lowland hay meadows. Population size and trend: unknown. Similar features in the landscape those are important for the Short-toed Snake Eagle will also Montagus Harriers which feed on small mammals, lizards, small birds, frogs and even insects.

4. **Peregrine Falcon (*Falco peregrinus*)**

Birds Directive Annex I (code **2020)**; IUCN ERL category – LC; Bern Convention Appendix II; Bonn Convention Appendix II. Status in Pelister NP: resident rare species in high mountain altitudes, rocky areas and in 6200 Semi-natural dry grasslands and scrubland facies habitat types. Population size and trend: unknown.

Funded by the European Union

The Lesser Kestrel. Photo: Petri Ahlroth.

5. Lesser Kestrel (*Falco naumanni*)

Birds Directive Annex I (code **1940)**; IUCN ERL category – LC; Bern Convention Appendix II; Bonn Convention Appendices I, II; Status in Pelister NP: unknown. Possibly suitable breeding habitats – open areas on valleys or near sparse settlements. Population size and trend: unknown.

6. European Honey Buzzard (the Pern) (*Pernis apivorus*)

Birds Directive Annex I (code **1460)**; IUCN ERL category – LC; Bern Convention Appendix II; Bonn Convention Appendix II. Status in Pelister NP: possibly breeding species in all types of forest. Population size and trend: unknown. Populations of Honey Buzzards have been collapsing in many parts of the world. The reason is not fully understood, and there can be several reasons behind the collapse. In some case amount of food (bees and wasps) has been decreasing due to weather conditions for example, but in some area pesticides are additionally decreasing the numbers of insects they feed. Use of pesticides should be avoided inside the National Park and if possible close to the National Park as well.

Woodpeckers

7. Middle Spotted Woodpecker (*Dendrocopos medius*)

Birds Directive Annex I (code **1870)**; IUCN ERL category – LC; Bern Convention Appendix II. Status in Pelister NP: resident, sparse species in 9100 Forests of Temperate Europe habitat class. Abundance depends on amount of deadwood and old trees, especially oaks. Population size and trend: unknown.

Funded by the European Union

8. **White-backed Woodpecker (*Dendrocopos leucotos*)**

Birds Directive Annex I (code **1880)**; IUCN ERL category – LC; Bern Convention Appendix II. Status in Pelister NP: resident, sparse species in different forest habitats, especially broadleaf forests including following prioritized habitats:

- *9180* Tilio-Acerion forests of slopes, screes and ravines*
- *91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*

Abundance depends on amount of deadwood and old trees. Population size and trend: unknown.

9. **Syrian Woodpecker (*Dendrocopos syriacus*)**

Birds Directive Annex I (code **1890)**; IUCN ERL category – LC; Bern Convention Appendix II. Status in Pelister NP: resident, quite common species in open woodlands of 9100 Forests of Temperate Europe habitat class and gropes of old trees in villages. Abundance depends on amount of deadwood and old trees. Population size and trend: unknown.

10. **Black Woodpecker (*Dryocopus martius*)**

Birds Directive Annex I (code **1850)**; IUCN ERL category – LC; Bern Convention Appendix II. Status in Pelister NP: resident, sparse species in all types of forest, in Pelister NP both in broadleaf and coniferous forests:

- *91BA Moesian silver fir forests*
- *95A0 High oro-Mediterranean pine forests*

Abundance depends on amount of deadwood and old trees. Population size and trend: unknown.

All woodpeckers benefit from old and large trees. They use old and dead trees as feeding habitats. Saproxylic insects (i.e. insects those live in dead or dying trees) are the main food resource for many woodpeckers. In addition, they feed on ants and ant larvae and cocoons. Woodpeckers are also raptors on other bird species as they may prey on chicks of other (smaller) bird species. During winter-time woodpeckers may also eat meat and fat from dead mammals. Management activities like forest restoration should include measures to increase the volume of dead wood. Such activities would benefit both rare *saproxylic* insects (some of which are also Annex species of the Habitats Directive) and woodpeckers at the same time.

Other terrestrial birds

11. **Rock Partridge (*Alectoris graeca*)**

Birds Directive Annexes I, II/A (code **320)**; IUCN ERL category – NT; Bern Convention Appendix III. Status in Pelister NP: resident, breeding species. Population is probably decreasing because of overgrowth of suitable habitats – rocky areas and open semi-natural grasslands in high altitudes (*62D0 Oro-Moesian acidophilous grasslands*). However, population size and trend are unknown.

12. **European Nightjar (or the Common Goatsucker) (*Caprimulgus europaeus*)**

Funded by the European Union

Birds Directive Annex I (code **490)**; IUCN ERL category – LC. Status in Pelister NP: breeding migratory species; typical for 9500 Mediterranean and Macaronesian mountainous forests habitat class. Population size and trends unknown. Nightjar is breeding both is open semi-open and almost closed forest habitats. They hunt insects in open spots during night time. The species is not especially sensitive to human disturbance. However, birds are often killed by cars, because of their habit to rest in open habitats like on the roads. On roads of the National Park low speed limits might benefit nightjars.

13. Corn Crake (*Crex crex*)

Birds Directive Annex I (code **560)**; IUCN ERL category – LC; Bern Convention Appendix II; Bonn Convention Appendix II. Status in Pelister NP: possibly breeding or accidental breeding. Calling males were recorded in lowland hay meadows near Brajcino. Population size and trend: unknown. Corn Crake lives in grasslands, favouring higher hay vegetation which provides shelter from predators. Traditional hay meadows are good nesting habitats for the Corn Crake.

14. Red-backed Shrike (*Lanius collurio*)

Birds Directive Annex I (code **2040)**; IUCN ERL category – LC; Bern Convention Appendix II. Status in Pelister NP: breeding migratory species. Quite common species in open habitats partly overgrown with low trees and bushes. Population size and trend: unknown. All shrike species favour semi-open landscapes. Traditional keeping of animals typically maintains habitats suitable for the species.

15. Woodlark (*Lullula arborea*)

Birds Directive Annex I (code **2640)**; IUCN ERL category – LC; Bern Convention Appendix III. Status in Pelister NP: breeding species in semi-open forested areas, including 5100 Sub-Mediterranean and temperate scrub habitats. Population size and trend: unknown. The Woodlark favours semi-open habitats and young forests with small trees. It can be found also from clear cut areas, but those areas usually provide only temporary habitats for the species. The species can be found also from the lower parts of alpine habitats, close to edge of forest line.

16. Red-billed Chough (*Pyrrhocorax pyrrhocorax*)

Birds Directive Annex I (code **2090)**; IUCN ERL category – LC; Bern Convention Appendix II. Status in Pelister NP: rare resident, breeding species. Red-billed chough is nesting in rocky areas at alpine levels of the mountains. It uses open areas for looking for food. The species is social most time of the year. Population decrease is due to decrease of suitable feeding habitats – open semi-natural grasslands in high altitudes (*62D0 Oro-Moesian acidophilous grasslands*). Aging areas should be kept open. Further overgrowth of areas should be prevented by active management and restoration of overgrown open habitats is recommended.

17. Hazel Grouse (*Tetrastes bonasia*)

Birds Directive Annexes I, II/B (code **340)**; IUCN ERL category – LC; Status in Pelister NP: resident breeding resident species. Occurs typically in forest habitats, especially in mixed or broad- leaved forests (9100: Forests of Temperate Europe habitats class) but in Pelister NP the species can be seen to live also in the

Funded by the European Union

lower parts of alpine areas. It requires some trees or bushes which provide shelter from predators. Population size and trend: unknown.

18. **Lanner Falcon (*Falco biarmicus*)**

Birds Directive Annex I (code **2000)**; IUCN ERL category – EN; Bern Convention Appendix II; Bonn Convention Appendix II. Status in Pelister NP: extinct.

19. **Bearded Vulture (*Gypaetus barbatus*)**

Birds Directive Annex I (code 1470); IUCN ERL category – VU; Bern Convention Appendix II; Bonn Convention Appendix II. Status in Pelister NP: extinct.

Funded by the European Union

The Egyptian Vulture. Photo: Petri Ahlroth.

20. Egyptian Vulture (*Neophron percnopterus*)

Birds Directive Annex I (code 1480); IUCN ERL category – EN; Bern Convention Appendix II; Bonn Convention Appendices I; II. Status in the Pelister NP: extinct.

All the last three species which have disappeared from the area are raptors. Vultures especially are sensitive to poison baits which are used to kill carnivore species like foxes and wolves. Even if the poisons have not been used in the area large raptor birds do not easily recolonize areas from which they have disappeared. For this reason, re-introduction of vultures and other large raptors has been used in many countries. Many of these projects have been successful and populations have been recovering.

Funded by the European Union

3. Assessment of values

3.1. Values of the area

3.1.1. Natural values and importance in EU context

Nature values were evaluated in European Community Importance context. **22 habitat types** of the Habitats Directive Annex I and **44 species** (**4 plant and 40 animal species**) protected by Annex II and IV of the Habitats Directive (ANNEX 1 of the Management Plan) and **17 bird species** protected by the Birds Directive Annex I as well as several nationally protected and some endemic species with European Community interest have been identified during the implementation of the Twinning project (2018-2019) in field observations and based on recent literature information (ANNEX 5 of the Management Plan). These numbers indicate high conservation value of the area based on both directives. When assessing natural values and importance in EU context, the ecosystems approach is used in this Management Plan. The key values – habitats and species – were grouped according three key ecosystem types found in Pelister NP: forest ecosystems, open ecosystems as well as freshwater and wetland ecosystems.

The forest ecosystem:

Habitats (Habitats Directive, Annex I):

9180* Tilio-Acerion forests of slopes, screes and ravines
91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)
91AA *Eastern white oak woods
91BA Moesian silver fir forests
9280 Quercus frainetto woods
91W0 Moesian beech forests
95A0 High oro-Mediterranean pine forests

Flora (plant) species (Habitats Directive):

Buxbaumia viridis**,** (Annex II, code **1386**)

Fauna (animal) species (Habitats Directive):

Canis lupus (Annex II, IV and V, code **1352**)
Felis silvestris (Annex IV, code **1363**)
Muscardinus avellanarius (Annex IV, code **1341**)
Ursus arctos (Annex II and IV, code **1354**)
Rana dalmatina (Annex IV, code **1209**)
Cerambyx cerdo (Annex II and IV, code **1088**)
Cucujus cinnaberinus (Annex II and IV, code **1086**)
Lucanus cervus (Annex II, code **1083**)
Morimus funereus (Annex II, code **1089**)
Rosalia alpina* (Annex II and IV, code **1087**)

Birds Directive species (Habitats Directive):

Caprimulgus europaeus (code **490**)
Dendrocopos leucotos (code **1880**)
Dendrocopos medius (code **1870**)

Funded by the European Union

Dendrocopos syriacus (code **1890**)
Dryocopus martius (code **1850**)
Pernis apivorus (code **1460**)
Tetrastes bonasia (code **340**)

Assessment:
Diverse forest habitats occupy large part of Pelister NP up to 2000 m asl. In general, commercial forestry activities, such as selective/sanitary cuttings and/or replanting of forest with non-typical species, influence negatively to the conservation status of forest habitats. Lack of different aged coarse dead wood and old trees diminish the value of forest habitats, both in deciduous and coniferous forests. Pelister NP has special value in conserving Macedonian Pine "Molika" forests, which belongs to the habitat type 95A0 High oro-Mediterranean pine forests. However, as a whole there are still a lot of valuable forest habitats in the territory of Pelister NP both in coniferous and deciduous broad-leaf forests.

Conservation value assessment:

Broad-leaf forests: Conservation status is favourable, deteriorating.

Coniferous forests: Conservation status is favourable, deteriorating.

Funded by the European Union

The open ecosystems:

Habitats: (Habitats Directive, Annex I):

4060 Alpine and Boreal heaths,
5130 Juniperus communis formations on heaths or calcareous grasslands
62D0 Oro-Moesian acidophilous grasslands
6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)
6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea,
6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis
8150 Medio-European upland siliceous screes
8220 Siliceous rocky slopes with chasmophytic vegetation

Flora (plant) species (Habitats Directive):
Fritillaria gussichiae (Annex IV, code: **1845**)
Mannia triandra (Annex II, code **1379**)

Fauna (animal) species (Habitats Directive):
Euphydryas aurinia (Annex II, code **1065**)
Lycaena dispar (Annex II and IV, code: **1060**)
Rupicapra rupicapra* subsp. *balcanica (Annex II and IV, code **1371**)
Ablepharus kitaibelii (Annex IV, code **1276**)
Lacerta agilis (Annex IV, code **1261**)
Lacerta trilineata (Annex IV, code **1251**)
Lacerta viridis (Annex IV, code **1263**)
Podarcis erhardii (Annex IV, code **1238**)
Podarcis muralis (Annex IV, code **1256**)
Podarcis taurica (Annex IV, code **1248**)

Birds Directive species:
Alectoris graeca (code **320**)
Aquila chrysaetos (code **1560**)
Circaetus gallicus (code **1490**)
Circus pygargus (code **1620**)
Crex crex (code **560**)
Falco naumanni (code **1940**)
Falco peregrinus (code **2090**)
Lanius collurio (code **2040**)
Pyrrhocorax pyrrhocorax (code **2090**)

Assessment:

The area of habitats types related to open ecosystems is decreased, mainly due to overgrowth, but still these ecosystems cover a large part of Pelister NP, especially in alpine area above 2000 m asl. In lower areas overgrowing has reduced the area of all grasslands dramatically due to changes in grazing practises. In alpine area the habitats are still in moderate condition, even though overgrowth and climate change are

Funded by the European Union

threatening the values. Also, iconic stone rivers at slopes of Baba mountains, which belongs to habitat type *8150 Medio-European upland siliceous screes*, are suffering from overgrowth to some extent.

Conservation value assessment:

Alpine grasslands and heats: Conservation status is favourable, deteriorating.

Meadows in forest zone: Conservation status is unfavourable, deteriorating.

Rocky habitats: Conservation status is favourable, stable - decreasing.

Freshwater and wetlands ecosystems:

Habitats: (Habitats Directive, Annex I):

3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea.)

3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation

7140 Transition mires and quaking bogs

7160 Mineral-rich springs and springfens

7220* Petrifying springs with tufa formation (Cratoneurion)

Flora (plant) species (Habitats Directive):

Tozzia carpathica (Annex II and IV, code **6244**)

Fauna (animal) species (Habitats Directive):

Lutra lutra (Annex II and IV, code **1355**)

Bombina variegata (Annex II and IV, code **1193**)

Salmo peristericus (Annex II, code **5355**)

Salmo pelagonicus (Annex II, code **5354**)

Cordulegaster heros (Annex II and IV, code: **4046**)

Austropotamobius torrentium* (Annex II and V, code: **1093**)

Assessment:

Standing waters (lakes) occupy a very small area of the National Park, but they are very valuable in all aspects. Running waters, such as streams and rivers are typical for the Pelister NP and are vulnerable to several kind of human activities, e. g. water uptake and dams, construction of hydropower plants, roads, etc., even outside the National Park. Also, climate warming with increasing dry periods will affect negatively on this habitat type. However, main part of the running waters and their surroundings are considered to be in quite good condition so far.

Conservation value assessment: Conservation status is favourable, stable-decreasing.

Grouping of key nature values (particularly habitats and species typical for the habitats) in the key ecosystem types helps not only for proposing of common objectives and management measures, but helps to identify main values in the area. Particularly this is very helpful until real habitat mapping is conducted in exhaustive manner. Eight habitat types in Habitat Directive Annex I were identified in forest ecosystems, thirteen habitat types in open ecosystems and two habitat types in freshwater ecosystems. Pelister NP with 22 habitat types of the Habitats Directive Annex I, 44 species protected by Annex II and IV of the Habitats Directive and 17 bird species protected by the Birds Directive as well as large amount of endemic species makes Pelister unique mountain area in Europe with high conservation values. This valuable area is proposed to be protected by both EU directives – Habitats Directive and Birds Directive.

Funded by the European Union

3.2. Threats and pressures

The threat analysis is described in ecosystem approach, habitat types and associated species. The result for the analysis is partially based on the METT evaluation workshop held in Bitola November 2018. The codes used in the analysis are official codes for Natura 2000 Standard Data Forms.

3.2.1. Threats and pressures to forests ecosystems and species

Assessed threats to forests habitats of forest habitat types: *9180 * Tilio-Acerion forests of slopes, screes and ravines*, *91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*, *91AA *Eastern white oak woods*, *91BA Moesian silver fir forests*, *9280 Quercus frainetto woods*, *91W0 Moesian beech forests*, *95A0 High oro-Mediterranean pine forests*, and species: *Buxbaumia viridis*, *Muscardinus avellanarius*, *Cerambyx cerdo*, *Lucanus cervus*, *Morimus funereus*, *Rosalia alpina**, *Dendrocopos leucotos*, *Dendrocopos medius*, *Dendrocopos syriacus*, *Dryocopus martius* are:

B02.01.01	Forest replanting (native trees) in 9280, 91W0 and 91AA	medium
B02.01.02	Forest replanting and natural spreading (non-native trees)	medium
B02.04	Removal of dead and dying trees	high
B07	Selective/sanitary cuttings, including removing of old trees	high
D02.01.01	Suspended electricity and phone lines	low
F04.02	Collection (fungi, lichen, berries, etc.) (collecting of rare plant species)	low
I01	Invasive non-native species	medium
J01	Fire and fire suppression	low
J02.05.05	Small hydropower projects, weirs	low
	in *9180 * Tilio-Acerion forests of slopes, screes and ravines*	high
	in *91E0* Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae)*	low
M01	Changes in abiotic conditions (temperature changes)	low
M02	Changes in biotic conditions (habitat sifting and alteration)	medium

Forestry activities as selective/sanitary cuttings influence negatively the conservation quality of natural forest habitats. Now there is a lack of dead wood and old trees and some broad-leaved forests have been converted to coniferous forest. All forestry activities are implemented according to Pelister NP forest management plan. This document is prepared like commercial forestry plan and does not take into account the requirements of protection of nature values, habitats and species protection according the Habitats and Birds Directives, since the area is just identified as a potential Natura 2000 site. Some *95A0 High oro-Mediterranean pine forests* and *91AA *Eastern white oak woods* are slowly changing to *Abies borisii-regis* forests by natural succession without active management. In a conservational point of view, it would be worth favouring these two habitat types.

Parts of *9180 * Tilio-Acerion forests of slopes, screes and ravines* habitat is demolished recently by construction of a hydropower plant road close to Malovishte village.

In some area typical habitats for oak, beech and Macedonian Pine forest has been planted by non-native species, especially like *Pinus sylvestris* and *Pinus nigra*, but also with *Pseudotsuga menziesii*, *Picea abies*, *Larix spp.*, *Pinus strobus*, etc. The Black locust (*Robinia pseudacacia*) has been used as ornamental tree in villages and it is spreading locally at lower parts of Pelister NP into river valleys and forest slopes. It's very important to avoid plantings of invasive species and all non-native species should be removed from the whole territory of the National Park in a reasonable timeframe.

Funded by the European Union

3.2.2. Threats and pressures to open ecosystems and species

3.2.2.1. Assessed threats and pressures to temperate heath and scrub, to habitat types: *4060 Alpine and Boreal heaths*, *5130 Juniperus communis formations on heaths or calcareous grasslands*, and species: *Alectoris graeca*, *Aquila chrysaetos*, *Falco peregrinus*, *Pyrrhocorax pyrrhocorax*, *Lacerta agilis* are:

A04.01	Intensive grazing	low
A04.03	Abandonment of pastoral systems, lack of grazing	high
E04	Structures, buildings in the landscape	low
F04.02	Collection (fungi, lichen, berries, etc.) (collecting of rare plant species)	low
I02	Problematic native species	medium
J01	Fire and fire suppression	medium
K01.01	Erosion	low
K02	Biocenotic evolution, succession	medium
M02.01	Habitat shifting and alteration	medium

Overgrowth by trees is a threat in Pelister NP for both habitat types: *4060 Alpine and Boreal heaths* and *5130 Juniperus communis formations on heaths or calcareous grasslands*. They consist mainly of successional habitat types at Pelister NP. Lower growing subtypes are overgrown by higher ones, i. e. *Juniperus communis* is overgrowing *Vaccinium myrtillus* and *Bruckenthalia spiculifolia* -dominated heaths. At the same time wooded species are spreading in alpine heaths. At upper parts of forest zone there are overgrown heaths inside expansive forests and high juniper shrub. *Pinus peuce* seems to colonise alpine heaths and grasslands quickly at certain areas in the National Park. In addition to Common Juniper, deciduous trees and scrub (*Prunus spp*., *Betula pendula*, *Acer obtusum*, *Rubus spp*., *Rosa spp*.) are colonizing subalpine parts of heaths in certain parts of Mt. Pelister. Also, dense colonies of Bracken (*Pteridium aquilinum*) are spreading to mountain heaths at places. Probably climate warming will enhance these negative changes. Overgrazing in some cases could be a threat to this habitat type.

Uncontrolled large-scale fires can damage these habitats, as Alpine heaths rich in junipers are particularly susceptible to disturbance by fire. Also, for some animal species, especially invertebrates and reptiles, large-scale fires can make negative impact for local subpopulations. However, it has to be noted that in many cases fires contribute positively conservation of values and controlled burnings could be used as management measure.

Erosion can be a threat mainly due to rainwater at sites with open soil like at paths and roads. Steep slopes are more vulnerable to erosion, but natural erosion is a part of natural development of ecosystems. In principle overgrazing which leads to the disappearance of vegetation that anchor down the soil, will increase risk of erosion. However, at this moment grazing pressure is low in the area.

3.2.2.2. Assessed threats and pressures to ***semi-natural grassland formations***, to habitat types: *62D0 Oro-Moesian acidophilous grasslands*, *6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (* important orchid sites)*, *6220* Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea*, *6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels*, *6510 Lowland hay meadows (Alopecurus pratensis, Sanguisorba officinalis)*, and species: *Fritillaria gussichiae*, *Euphydryas aurinia*, *Lycaena dispar*, *Rupicapra rupicapra* subsp. *balcanica*, *Ablepharus kitaibelii Lacerta agilis*, *Lacerta trilineata*, *Lacerta viridis*, *Podarcis erhardii*, *Podarcis muralis*, *Vipera ammodytes*, *Alectoris graeca*, *Aquila chrysaetos*, *Circaetus gallicus*, *Circus pygargus*, *Crex crex*, *Falco naumanni*, *Falco peregrinus*, *Lanius collurio*, *Pyrrhocorax pyrrhocorax* are:

A04.01	Intensive grazing	low

Funded by the European Union

A04.03	Abandonment of pastoral systems, lack of grazing	high
E04	Structures, buildings in the landscape	low
I01	Invasive non-native species	medium
I02	Problematic native species	medium
J01	Fire and fire suppression	medium
K02	Biocenotic evolution, succession	medium
M01.01	Changes in abiotic conditions; temperature changes (e.g. rise of temperature & extremes)	medium

Lack of grazing is the main threat for the most of Pelister NP natural and semi-natural grassland formations. It is very likely that the grassland ecosystems had coexisted with grazing by large wild herbivores for millennia. As a result of decline in the old grazing traditions (mountain summer pasturing), at lower parts of alpine grasslands juniper bushes are spreading actively. Also, *Pinus peuce* is spreading to alpine grasslands, where individual trees remain stunted and dwarf due to wind exposed conditions.

However, overgrazing can be also a threat to this habitat and it can increase erosion. The organization of grazing in different localities may strongly affect the quality of the habitats. The concentration of animals on small patches of pasture (fenced areas, such as sheep-folds) may cause eutrophication and may destroy the grassland canopy and accelerate invasion by nitrophilous species of weeds.

Uncontrolled large-scale fires can damage alpine meadows, even if grasslands have some natural recovery ability on this kind of disturbance. For some fauna species, especially invertebrates and reptiles, large-scale fires can have negative impact particularly on local subpopulations. However, as stated earlier, controlled fire can be seen as a good management measure for these habitats.

Climate warming can increase change and degradation of the habitats.

Road constructions, buildings and tourism can cause some threat to this habitat type, but especially for associated animal species those are sensitive to human disturbance, as Balkan Chamois (*Rupicapra rupicapra* subsp. *balcanica*) and Golden Eagle (*Aquila chrysaetos*).

3.2.2.3. Assessed threats and pressures to screes and rocky habitats, to habitats *8150 Medio-European upland siliceous screes* and *8220 Siliceous rocky slopes with chasmophytic vegetation*, and species: *Pyrrhocorax pyrrhocorax* are:

G01.04	Mountaineering, rock climbing, speleology. Rock climbing and related activities have been recorded as pressures on some areas	low
M01	Changes in abiotic conditions (Climate change)	low

In Pelister NP at alpine area many siliceous screes are affected by World War I constructions. Chains of trenches with stony dugouts are running through summit screes. These constructions have not been affected much on species composition but provide more historical and cultural values to these habitats. Siliceous screes are in natural stage at alpine area and there are no pressures. At forest zone some scree are overgrowing by three species and may need management.

3.2.3. Threats and pressures to freshwater and wetlands ecosystems and species

3.2.3.1. Assessed threats to freshwater habitats *3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea*, *3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation*, and species: *Tozzia carpathica*,

Funded by the European Union

Lutra lutra Bombina variegata, *Salmo peristericus*, *Salmo pelagonicus*, *Cordulegaster heros*, *Austropotamobius torrentium** are:

B07	Forestry activities: soil erosion due to forest clearing	low
H01	Pollution to surface waters	low
I02	Problematic native species	low
J02.05.05	Small hydropower projects, weirs	low
J02.06	Water abstractions from surface waters	medium
K01.01	Erosion	medium
M01	Changes in abiotic conditions (Climate change)	low
M02.01	Habitat shifting and alteration	low

In principle there are no severe threats to standing waters in Pelister NP, because both lakes are inside the strictly protected zone of the National Park. Visitors around Golemo Ezero (Lake) and other small lakes can cause some eutrophication threats. Introduced fish into Golemo Ezero (Lake) may have affected negatively the lake ecosystem and its species composition, including population of endemic amphipode *Niphargus pancici* subsp. *pancici*. Shore of Golemo Ezero (Lake) and active visits by jeeps and other off-road vehicles can increase possibility of oil or gasoline emission risk to the lake.

For the rivers and streams of Pelister NP, there are several threats and pressures over this habitat type including erosion related with sedimentation caused by forest cutting and road construction inside and outside of protected area. Eutrophication and pollution due to waste waters (coming mainly outside of protected areas) are severe threats on a lower part of rivers. Dredging of water courses and construction of hydropower plants (river Semnica inside Pelister NP, river Brajcinska outside of borders of the National Park) has caused deterioration of habitat and these negative impacts are continuing in certain extent. Any dam that is an obstacle to fish migration divides the trout population and prevent its full functioning. There is considerable water abstraction and dams to direct water inside the National Park, which is a threat for biodiversity values of Pelister NP and also to this habitat outside of the Park. Increase of tourism can cause threat to water quality and cases of illegal fishing of salmon species. Introduced fish species of Prespa Lake and Vardar river valley will cause a threat to natural fauna of Pelister NP rivers. Climate warming will probably have negative impacts on this habitat type currently and during future decades due to prolonged drought periods.

3.2.3.2. Assessed threats to wetlands ecosystem cowering small patches of different habitat types, belonging to class Raised bogs and mires and fens: *7140 Transition mires and quaking bogs*, *7160 Mineral-rich springs and springfens*, *7220* Petrifying springs with tufa formation (Cratoneurion)* are:

E04	Structures, buildings in the landscape	low
K02	Biocenotic evolution, succession	medium
M01	Changes in abiotic conditions (Climate change)	low
M02.01	Habitat shifting and alteration	medium

Inside Pelister NP there are no severe threats to this habitat class. In several places there are constructed structures for water uptake for hikers and other people moving in the National Park. These well structures are in principle not harmful for the habitat, however some surveillance is recommended. In small springs trampling can cause some decrease in quality. Wild boars (*Sus scrofa*) groups may cause some damage to springs, especially for drinking water for humans but also disturbance to typical vegetation including bryophytes. So far uptake of ground water is not done at alpine part of Pelister NP. Warming climate can

Funded by the European Union

cause warming of ground water and decrease of outflow during summertime. Construction of local roads or buildings can be harmful.

3.3. Management effectiveness and competences

The Management Effectiveness Tracking Tool (METT) is one of the two most widely used/adapted globally applicable generic systems developed to assess protected area management effectiveness. It is used to report progress towards the Convention on Biological Diversity. The methodology is a rapid assessment based on a scorecard questionnaire. The scorecard includes all six elements of management identified in the IUCN-WCPA. Framework (context, planning, inputs, process, outputs and outcomes), but has an emphasis on context, planning, inputs and processes. It is basic and simple to use and provides a mechanism for monitoring progress towards more effective management over time. It is used to enable protected area (PA) managers and donors to identify needs, constraints and priority actions to improve the effectiveness of protected area management.

Results of METT discussed and agreed at the workshop with personnel of Pelister NP administration and stakeholders supported by PONT (Prespa Ohrid Nature Trust).

According to the METT evaluation (ANNEX 4) the total score for Pelister NP was 47 points out of 99 point which is the maximum. When evaluating result, the context has the highest ranking 3/3 due to clear legal status of the area. Other key elements (planning, input, processes) has evaluation level of app. 40 % of the maximum level. As an outcome the evaluation indicates that “Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted”.

However, it is important to give a remark, that this evaluation is not based on fully understanding of the requirement of implementing EU’s Habitats and Birds Directives in Pelister NP. It mainly refers the requirements of the management of the area as the National Park with existing working environment. The need for sustainable funding from government is not adequately addressed. Additionally, the capacity in law enforcement and handling ecological issues by the administration has to be strengthened.

4. Strategy

Pelister NP with **22 habitats** of Annex I and at least **44 species** of Annexes II and IV of the Habitats Directive and **17 bird species** protected by the Birds Directive being important at European Community level should be protected by the EU Habitats Directive and the EU Birds Directive. This area fulfils the requirements of Habitats Directive as Site of Community Importance (SCIs) because the presence of **28 species of Annex II** of the Habitats Directive, in terrestrial and aquatic habitats, and several endemic species of Pelister NP. This strongly support that Pelister NP should upon the agreement with the European Commission be established as a Special Area of Conservation (SAC) under Habitats Directive and as a Specially Protected Area (SPA) under the Birds Directive.

4.1. Common Vision for the future of the potential “Pelister NP” Natura 2000 site

The vision is:

> Pelister National Park is an area with a high nature value for European Community. Conservation status of all natural and semi-natural habitats and species protected by Habitats and Birds Directives is favourable. Human activities are in harmony with natural processes, visitors enjoy different tourism activities and a healthy environment. Natura 2000 site create additional socioeconomic benefits for local people and communities existing in line with nature values.

Moreover:

Funded by the European Union

Geodiversity based biodiversity *– nature values of national and European Community Importance naturally coexists in the same area. Natural habitats and populations of protected species are stable and vital. Invasive species do not any longer cause harm for natural species and habitats.*

Pelister NP is considered as a nature school, where ***visitors*** *can learn and understand the necessity to protect all types of habitats and species, together with a possibility to stay and enjoy a clean, healthy and quiet environment. The number of visitors does not exceed its capacity and they respect the natural values of the area. Basic visitor facilities are available.*

Pelister NP is a source of pride and appreciation. The area offers opportunities for traditional grazing and production of ecologically friendly food products. ***Local communities*** *are directly involved in the management of the Natura 2000 site and its values. EU funding for management activities are available for farmers. Eco-tourism together with a clean and healthy environment create additional economic benefits for local people and communities.*

Pelister NP administration *has both motivated and professional staff managing the area effectively. Scientific and education activities are established, giving a possibility for deeper understanding and appreciation of Natura 2000 site values. Forestry is based on a natural habitat management approach. All stakeholders share the common vision and are involved in protection and management of habitats and species.*

Funded by the European Union

4.2. Mission of Pelister NP administration and other involved institutions

Pelister NP administration – the managing authority of Pelister NP / potential "Pelister NP Natura 2000 site" of European Community Importance ***ensures*** that:

> Protected nature values of the area are used and enjoyed by the community in a good manner, ensuring that such approach will be applied by future generations, and;
>
> Protected nature values of the area create benefits or visitors of the National Park.

The other institutions using the resources of potential "Pelister NP" Natura 2000 site ***understand*** the values of European Community Importance and ***cooperate*** with Pelister NP administration, supporting the activities necessary for protection of nature values, creating a clean and healthy environment and additional economic benefit for the local people, communities and visitors.

4.3. Protection and management goal and objectives

Goal: To protect biodiversity – nature values of European Community Importance taking into account the needs of local communities and visitors.

Objectives for protection of Pelister NP biodiversity – nature values of European Community importance are presented in a table below.

Goal	Ecosystem	Objectives
To protect nature values of EU Importance taking into account the needs of local communities and visitors	***Forest ecosystems, habitats and species***	To ensure good habitat conditions for target forest fauna (animal) and flora (plant) species.
		To eliminate invasive and non-native species in Pelister NP.
		To ensure protection of old forest stand and single old trees.
		To increase forest values by creating a multi-layered and uneven-aged forest.
		To ensure maintenance of the forest and surface water ecosystem integrity.
	Open ecosystems, habitats and species	To maintain good condition of semi-natural grassland habitats.
		To stabilize succession of *Juniperus* shrub and heath habitats.
	Freshwater and wetland ecosystems, habitats and species	To reduce fragmentation of populations of *Salmo peristericus* and *S. pelagonicus*, and improve migration conditions by restoring longitudinal connectivity in streams.
		To improve habitat quality in running waters.

Proposed goal and objectives are applicable for the protected species under the National List as well.

Funded by the European Union

4.4. Prerequisites necessary for protection of biodiversity – nature values of European Community Importance

Prerequisites (conditions) are necessary for management of the area in order to achieve the Vision and the management goals and objectives as well as to be able to implement measures identified in the management plan. Some of the issues listed below can be seen as functions of Pelister NP administration where some are describing the working approach and practises of the administration and its personnel. Prerequisites help to identify additional management measures if needed for management of Natura 2000 site. The most important prerequisites are:

Permanent funding sources are available from state budget, municipalities, PONT and other funds, additional funding by national and international projects, donors and programs are available as well.
Data necessary for management of the site are collected, a GIS databases exists.

The Ministry of Environment and Physical Planning (MoEPP), Ministry of Agriculture, Forestry and Water Economy (MAFWE) and other relevant ministers support activities of Pelister NP administration in management of Pelister NP.

National Park management is based on participatory approach. Council of Stakeholders supports the implementation of the management measures. Continuous cooperation and communication with different stakeholders ensured:

- Municipality of Bitola, municipality of Resen;
- the competent inspection bodies, authorities responsible for the protection and use of forests (Public Enterprise Macedonian Forests, etc.), pastures (Agency of Pastures, Agency for Support and Development of Agriculture), Association for Nature Protection and other natural resources and for planning and for creation of public infrastructure;
- professional and scientific organizations at international, national, regional and local levels;
- local organizations, farmers, citizens, NGO's (MES, FRONT, Ecosvest, etc.);
- planners preparing detail and other plans;
- tourism organizations (Agency for Promotion of Tourism/Ministry of Economy, Tourism development associations) and operators or local sports associations, clubs (Mountain sports Association Club Pelister, Mountaineering Club, hotels, etc.), etc.

Scientific council is functioning giving proposals for protection/management of habitats and species.

Pelister NP administration:

- reorganises forestry according the main management principle – forest management is based on habitat conservation approach;
- influences the agriculture (pastures management), land use and water management practices in the National Park, maintaining open areas, diminishing possible negative impact.

Practises for appropriate assessment of plans and projects possibly having negative impact for the values is applied and continuous monitoring of the impact is going on with sufficient capacity within the National Park administration.

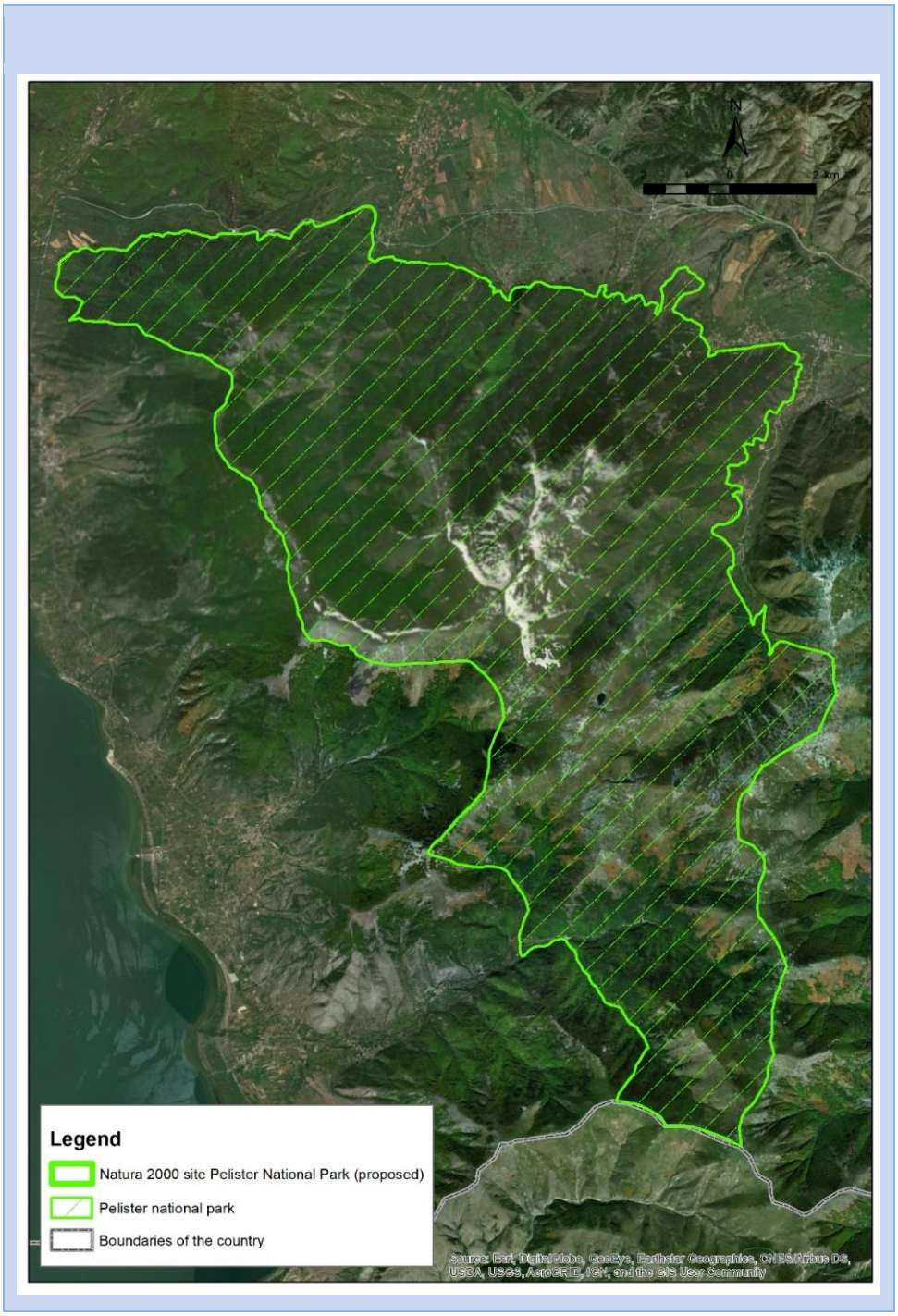
Law enforcement is guaranteed, effective patrolling, control of illegal cutting of trees, usage of river waters, recreation, sports activities, visiting of lakes as well as fire control is in place.

Awareness of visitors, farmers and local communities on the importance of protection of nature values of European Community Importance, on benefits of Natura 2000 site is raised; information on possibilities to join the protection and management of the site is shared.

Funded by the European Union

4.5. Proposals on borders of the potential "Pelister NP" Natura 2000 site

As it was stated in chapter 3.1.1. Pelister NP with 22 habitat of the Habitats Directive Annex I, 44 species protected by Annex II and IV of the Habitats Directive, and 17 bird species protected by the Birds Directive Annex I and II, as well as large amount of endemic species of aquatic ecosystem, makes Pelister NP a unique mountainous area in Europe with high conservation values. Therefore an adequate decision for protection should be taken and suitable borders for a Natura 2000 site to needs to be established in order to preserve its nature values. During this Twinning project it was proposed to establish the Pelister NP Natura 2000 site using the existing borders of the national park. The Standard Data Form (SDF) for Pelister NP Natura 2000 site can be found in ANNEX 1.



Funded by the European Union

Map 6. Proposed borders of potential "Pelister NP" Natura 2000 site. In future more inventories of Habitat Directive Annex I habitats and Annex II and IV species -especially priority habitats and species- inside and in vicinity of Pelister NP including whole Baba mountain area are recommended to define final borders for Natura 2000 site.

Funded by the European Union

The Borders of the potential "Pelister NP" Natura 2000 site could be the same as borders as the present Pelister NP. Later on the borders of Pelister NP could be improved preparing Pelister NP Management Plan using this approach: borders of the Pelister NP should be based on geological – geomorphological structures (for example all mountains, not a third part of it or a quarter of it) should belong in the National Park. The same principle could be applied for delineating of zones (borders of zones should be logical and clearly defined).

After collection more data on habitats and species of European Community Importance the borders of "Pelister NP" Natura 2000 site (the same for Pelister NP) could be extended. Observations of Habitats Directive Annex II and IV species and habitat types of Annex I, by the Twinning project shows that there are many previously unknown sites having high conservation value inside the present borders of Pelister NP. Several habitat types of Annex I and species of Annexes II and IV were also met in immediate vicinity outside of Pelister NP border. There is a good reason to expect that same values are present in much wider area of Baba mountain massif. Before defining final borders of Pelister NP Natura 2000 area, more inventories on biodiversity values should be done in whole area of Baba Mountains and between Pelister NP and Prespa Lake proposed Natura 2000 area.

The present zonation of Pelister NP does not play an important role in implementation of the requirements of Habitats and Birds Directives. In all cases it is important to define concrete management principles for each of the habitat types, which secure that the habitats and species of European Community Importance are maintained in a favourable conservation status. This approach should be integrated into the regulation and description of different management zones. Biodiversity values (habitats and species) are of primary importance in management inside Natura 2000 area without depending on present zonation of Pelister NP. If there would be a threat to conservation of habitats or species, urgent active measures should be implemented not only in active management zone, but in zone of sustainable use and even in strict protection zone. And in opposite: the negative development should be prohibited also in zone of sustainable use where habitats might exist in small fragments – for example: habitats of running rivers and of open areas.

If the borders of the National Park will not be enlarged, it is recommended to establish **buffer zone** for Pelister NP including all massif of Baba mountains (mountains between the road going along Prespa Lake and the road Bitola – Greece border). Settlements can be excluded. It would support protection of values of Natura 2000 site.

In future it should be important to plan and construct **ecological corridors** between potential "Pelister NP" and "Prespa Lake" Natura 2000 sites through river valleys including riparian habitats, oak forests and grazed grasslands with high biodiversity value. Restoration, management and preservation on riparian habitats is important for biodiversity values both for Pelister and Prespa Lake conservation values and natural ecosystem functions.

5. Management of the ecosystems of Pelister NP

5.1. Management principles and recommendations

Management principles are general guidelines for proper management of the areas and its nature values helping to achieve favorable conservation status of habitats and species. It is the most practical way to achieve goals. Some habitats and species do not need any intervention, some of them need quite active management and some deteriorated areas need restoration activities. Management principles are different for different values (habitats, species). Activities, measures for protection, maintenance or restoration should be based on management principles.

5.1.1. Forests ecosystem, habitats and species management principles

General forest management principles for biodiversity protection are as follows: (1) maintenance of connectivity; (2) maintenance of landscape heterogeneity; (3) maintenance of stand structural complexity; (4)

Funded by the European Union

maintenance of freshwater ecosystem integrity; (5) usage of natural development processes (dynamics, natural successions) as guiding measures to be implemented by humans (for restoration or maintenance of habitats). Concrete forest ecosystem, habitats and species management principles are as follows:

- Changing forest management (i. e. sanitary cuttings) towards habitat conservation approach. It is the main management principle to be applied for all forest habitats following natural specific conditions in the site.
- Leaving of dead wood, including trunks, in all types of forests. It is necessary for increasing quality of forest habitats. In coniferous forest stands must be left no less than 20 m^3 per hectare and in broad-leaved forest no less than 25 m^3 per hectare of dead wood. The diameter of dead wood must be no less than 20 cm. Sufficient amount of dead wood is very important for invertebrates *Lucanus cervus, Rosalia alpina* and for moss *Buxbaumia viridis*, as well as for birds: Black woodpecker (*Dryocopus martius)*, Middle spotted woodpecker (*Dendrocopos medius)*, White-backed woodpecker (Dendrocopos leucotos), Syrian woodpecker (*Dendrocopos syriacus).*
- Leaving old, big trees. It is particularly valuable for biodiversity conservation.
- Leaving retention tree groups and producing deadwood (i. e. by cutting high stumps or girdling of some trees) in stands with selective cuttings without old big trees and deadwood.
- Supporting succession of oak woods with old big trees, maintaining and increasing amount of decaying wood. All forestry action in oak woods should be based on increasing of biodiversity values.
- Removing non-native tree species from the whole Pelister NP (*Pinus sylvestris, Pinus nigra, Robinia pseudoacacia, Pseudotsuga mentziesii, Pinus strobus, Larix spp., Picea abies etc.*). It's necessary to pay enough attention for taking out these tree species from the National Park and also its surroundings. For restoration of habitats clear cuttings can be used in no native tree stands in order to stimulate natural regrowth by native tree species suitable for each habitat.
- Managing actively Macedonian Pine forests (cutting part of dense *Abies borisii-regis* stands and other shade tolerant species) in all zones of Pelister NP where Moesian silver fir (*Abies borisii-regis*) trees are regenerating under *Pinus peuce* and slowly replacing *Pinus peuce* stands in succession.
- However, old Silver fir forests with plenty of dead wood and old-growth characteristics should be protected and left outside of forestry.
- Also, improving forests age structure by cutting and natural regeneration of even-aged and -sized younger stands; same approach can be used in beech and oak forests to support regeneration and maintenance of stands of the broadleaf forests.
- Stop sowing coniferous tree species into broadleaf forests and remove dense undergrowth of *Abies borisii-regis* in degradated broad-leaved forest.
- Leaving broad-leaved forest for natural regeneration after selective/sanitary cuttings or developing their structure with gap cuttings and by producing dead wood and by leaving large enough retention trees and retention tree groups.
- Planning small-scale felling (especially in coniferous stands and beech forests) in order to increase stand structural complexity and heterogeneity of forest habitats.
- Leaving aside all kind of forest management in Black alder (*Alnus glutinosa*) stands. If structure and/or hydrology of these forests has been altered, it needs to be restored.
- Stopping of cuttings of trees in a protection belts (around at least 25 m in widths, adjusted to natural conditions) along water courses (brooks and rivers) within and outside Pelister NP.
- Re-establishing of forests in these belts if they were cut there earlier is necessary.

5.1.2. Open ecosystem, habitats and species management principles:

For heath and scrub habitats:

- Management approach needs to be based on understanding of relations and links of different components of landscape. Alpine and Boreal heaths exist in dynamic and often fragile environment. Biodiversity and conservation values are closely linked to geodiversity, geomorphological processes

Funded by the European Union

and soils as well as a history of human use and impacts from deforestation, pasturing, grazing, recreational activities. Landscape change therefore involves a complex interplay between natural and anthropogenic factors.

- Maintenance of *Juniperus communis* (5130) formations on heaths or calcareous grasslands habitat can be a solution at sites where heath or junipers grow for a long time and there are no possibilities to organize (re-establish) sustainable management and grazing regimes. This principle can be applied for rocks and rocky slopes with junipers as well as for other sites where overgrowth process is slow.
- Restoration of sustainable grazing regime in heath and junipers stands is essential. Clearing of trees and part of junipers followed by moderate grazing is needed for maintenance of habitats at their present status. Carefully planned controlled heath burning, that has been used for centuries to manage 4060 Alpine and Boreal heaths vegetation, may be used as the appropriate management tool.

For natural and semi-natural grassland formations:

- Grazing is beneficial for management of highlands ecosystems including alpine grasslands and heaths. Large scale habitats of open grasslands at alpine areas are essential to create ecological links between local populations of fauna species (*Rupicapra rupicapra subsp. balcanica, Alectoris grecca*) between the Republic of North Macedonia and Greece.
- Sustainable grazing regime should be established and maintained in the most of the open grasslands habitat types.
- In addition to razing, other management measures are needed: clearing of bushes (especially junipers) and young trees from overgrowing grasslands and heaths of all semi-natural open habitat types.
- Prescribed burning of overgrown grasslands and former meadows in small treatment plots can be a possible management action both in highlands and lowlands. These actions of controlled burning need careful planning.
- At species rich sites habitat types in 6430 “Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels” there is no need for management, whereas in “6510 Lowland hay meadows” mowing and raking in combination with grazing is essential to maintain this habitat type.

For rocky slopes and siliceous screes habitat does not normally need management. In some cases, visiting to particular cliffs should be restricted in order to reduce the disturbance of bird species during breeding time. Also, in some localities overgrowing is ongoing and clearing of junipers, young trees and litter could be implemented.

5.1.3. Freshwater ecosystems, habitats and species management principles:

For freshwater habitats and species:

- There is no need of any treatment if these habitats are intact. Habitats in bad condition should be restored.
- Maintenance of the Lakes of Pelister NP does not require management actions but their status should be monitored.
- Brooks and rivers running to Prespa Lake and toward Pelagonia Valley should be left intact. Excavation, road construction and forest cutting, other activities at river banks should be avoided. Management actions preventing accumulation of sediments in natural brooks and streams and decrease eutrophication should be implemented.
- The influence of dams for drinking water uptake and irrigation should be evaluated and negative effects mitigated.
- Water quality and conservation status of running rivers habitat has to be improved, especially at streams between Pelister NP and Prespa Lake where *Salmo peristericus* and *Salmo pelaganicus* spawns. Protection belts (at least around 25 m in widths, adjusted to natural conditions) along of water courses (brooks and rivers) within and outside Pelister NP needs to be established. Forests can’t be cut in these belts, but should be re-established instead if there have been cuttings earlier.

Funded by the European Union

- Negative impact for biodiversity of hydropower plants should be analysed and compensated by companies. Status of protected fish species has to be improved by constructing fish ladders. The required water level biological minimum should be restored in the rivers. The current biological minimum that is set at 10 % of the average of the annual flow should be reassessed considering the high ecological sensitivity of the area.

Wetlands ecosystem habitats should be left intact for natural development.

5.2. Management objectives and corresponding measures

All measures and guidelines in different documents for the management of Pelister NP should be aimed at protection of nature values. In all cases economic and other social interests should be harmonized with the interests of nature conservation. Recreational activities or economic development should not threaten the natural values of the area or disturb natural balance. The proposed management measures are aimed to be implemented during a ten years' time-frame.

Objectives for protection of Pelister NP – potential Natura 2000 site biodiversity – nature values – habitats and species of European Community importance and corresponding measures.

Ecosystem	Objectives	Measures
Forest ecosystems, habitats and species.	To ensure good habitat conditions for target forest species.	1. Increasing the volume of deadwood for protected species.
	To eliminate invasive and non-native species in Pelister NP.	2. Removing invasive and non-native tree species.
	To ensure protection of old forest stand and single old trees.	3. Implementing measures to improve living conditions of old forest stands and old trees.
	To increase forest values by creating a multi-layered and uneven-aged forest.	4. Renewing forestry management plans and management approach favouring conservation of natural habitats.
		5. Implementing measures for increasing multi-layered and uneven-aged Macedonian Pine forests.
	To ensure maintenance of forest and surface water ecosystem integrity.	6. Establishing *surface water protection belts* in forest habitats.
Open ecosystems, habitats and species.	To maintain good condition of semi-natural grassland habitats.	7. Preparing special plan for grazing.
		8. Entering into grazing agreements with farmers.
		9. Preparing and approving rules for controlled heath and grassland burning requirements.
		10. Removing surplus shrubs and trees in areas used for grazing.
	To stabilize succession of *Juniperus* shrub and heath habitats.	11. Active management of *Juniperus communis* stands.
Freshwater ecosystems, habitats and species.	To diminish *Salmon peristericus* and *S. pelagonicus* population fragmentation and improve migration conditions by restoring stream longitudinal connectivity.	12. Installing fish ladders / passages on Brajcino river hydroplant dams.
	To improve habitat quality in running waters.	13. Implementing river garbage cleaning activities. Mitigating negative effects of Malovishte hydropower plant and wastewaters in river Semnica.

Funded by the European Union

Improving the trails and marking the significant geomorphological and cultural values and other landmarks of the National Park can significantly contribute to the educational potential of the area. Also, the development of web pages and functional maps support the achievement of the same goal.

5.3. Proposed measures specified

Including (sub-measures) and indicators (according table above).

5.3.1. Increasing the volume of deadwood for protected species

Explanation of proposed measure: Achieving a minimum amount of dead-wood, like standing dead trees, lying trunks ≥ Ø 20 cm, in different decaying stages, by active management. The minimum amount of dead wood in full grown coniferous forest stands should be ≥ 20 m^3 per hectare, and in broad-leaved forest ≥ 25 m^3 per hectare, with exception areas near the roads and other places with high risk of forest fires. Measure is appointed to various species, dependant on dead wood-stands or decaying wood, as Annex II invertebrates Stag beetle (*Lucanus cervus)*, Birds Directive species Black woodpecker (*Dryocopus martius)*, Middle spotted woodpecker (*Dendrocopos medius)*, White-backed woodpecker (*Dendrocopos leucotos)*, Syrian woodpecker (*Dendrocopos syriacus)*.

Indicator of implementation: Monitoring results on the amount of the dead wood in coniferous and broad leaved forests are available.

5.3.2. Removing invasive and non-native tree species

Explanation of proposed measure: Removing all invasive non-native tree species, like *Pinus sylvestris, Pinus nigra, Robinia pseudoacacia, Pseudotsuga mentziesii, Pinus strobus* and *Larix spp.*, in the whole Pelister NP area. The cleared space after tree-felling has to be planted or sown with native species, typical for natural habitats to stimulate natural succession, or the sites can be left for natural regeneration.

Indicators of implementation: Annual statistics for the removal activity of invasive species and non-native tree species, and documentation on the regeneration area of native species is available.

5.3.3. Implementing measures for improving living conditions of old forest stands and old trees

Explanation of proposed measure:

- Strictly protected areas of old growth stands should be established based on forestry management plans.
- Inventory of biodiversity values of all forest habitats more than 100 years old should be done.
- Mapping of old (> 100 years), very old (>200 years) and large (>40 cm diam.) tree individuals in Pelister NP using GPS.
- Old trees and their surroundings should be managed by thinning stands of other tree species growing near old trees, in order to improve growth conditions and to decrease mortality rate. These trees produce high quality dead wood and thereby provide suitable habitats for species depending on the age of the tree.

Indicators of implementation: Strictly protected areas of old forest stands exists in forestry management plans. Old stands are registered in forestry management plans and their protection is ensured. A data base for

Funded by the European Union

inventory of old trees and their species value is created and required management of tree-stands is implemented.

5.3.4. Renewing forestry management plans and management approach favouring conservation of natural habitats

Explanation of proposed measure:

- Existing forest management regulations and practises should be changed according to the conservation requirements of natural habitats.
- Instead of "sanitary felling" forest regeneration and nature management felling should be practiced Implementation of this would form forest gaps, and increase structural complexity in the stands and tree species heterogeneity.
- Small-scale felling should be planned, especially in coniferous stands and in beech forests. https://www.researchgate.net/publication/278070270_A_review_of_the_roles_of_forest_canopy_gaps

Indicators of implementation: Forestry management plans are renewed; areas of small scale cuttings are selected annually.

5.3.5. Implementing measures for increasing multi-layered and uneven-aged Macedonian Pine forests

Explanation of proposed measure: Prepare a special plan for management of Macedonian Pine forests and integrate the principles into the Forestry Management Plan. Implementation should be started with pilot actions. Implement special forest regeneration cuttings, aimed at increasing multi-layered structure in Macedonian Pine forests, and support natural regeneration processes. Reduce stands of Moesian Silver Fir (*Abies borisii-regis*) undergrowth and competition from this species.

Indicators of implementation: A special plan for conservation of Macedonian Pine forests is prepared, taking into account the area of regeneration cuttings and the area of removing undergrowth of Moesian Silver Fir.

5.3.6. Establishing surface water protection belts in forest habitats

Explanation of proposed measure: Set up a special protection measure in Pelister NP forestry management plan for integrated surface water protection, with basic requirements for such belts:

- width of the belt has to exceed 25 m, which can be adjusted to local conditions such as soil type, topography, vegetation and discharge areas;
- for restoring forest in surface water protection belt should be used typical natural tree species composition;
- Forest stands at shrolines and wet sites, including Black alder (*Alnus glutinosa*) stands should be left aside from all kind of cuttings and ditching.
- While building and reparing forests roads drainage should be organized so that sediments does not flow to water cources along road with rainwaters but are instead directed to vegetated slopes without this risk.

Indicators of implementation: Requirements for surface water protection belts are included into Pelister NP Forest Management Plan, restoration area of damaged habitats near water courses exist, water protection of forest roads is properly organized.

Funded by the European Union

5.3.7. Preparing special plan for grazing

Explanation of proposed measure: Preparation of a special plan to identify priority areas for grazing and regulate grazing activities, taking into account traditional pasture management practices and the protection of habitats and species. Provide regulations for grazing densities, including e.g. maximum grazing stock, earliest/latest grazing dates, as well as control methods for other elements needed for pasture management, such as needs for eliminating of shrubs and trees, heath cutting and controlled burnings. Describe action control mechanisms and prepare a plan together with the Agency for Pastures, and approve the resulting plan.

Indicators of implementation: Special plan describing grazing in Pelister NP prepared and approved.

5.3.8. Enter into grazing agreements with farmers

Explanation of proposed measure: Discuss and prepare agreements with farmers. Grazing must be carried out on the basis of a long-term agreement. Farmers must be responsible for complying with these grazing requirements, including informing the National Park administration about unplanned fires and other illegal activities.

Indicators of implementation: Number and coverage of signed agreements on grazing in priority areas. Monitoring results of grazed area coverage (ha) and grazing intensity.

5.3.9. Preparing and approving rules for controlled heath and grassland burning requirements

Explanation of proposed measure: Special regulations and methodology for controlled burning of alpine heaths and grasslands need to be developed. These regulations have to be prepared in close co-operation with all stakeholders, because uncontrolled burnings in the area is a big threat for the nature values of the National Park. Implementation of this should be started on small scale pilot sites.

Regulations should be based on traditional knowledge and follow best practice documents:
https://www2.gov.scot/resource/doc/355571/0120116.pdf
http://adlib.ac.uk/resources/000/252/722/DEF-BPG-3.pdf

Indicators of implementation: Regulations and methodology for controlled burning of alpine heaths and grasslands is approved by the responsible authority.

5.3.10. Removing surplus shrubs and trees in areas used for grazing

Explanation of proposed measure: Remove shrubs and trees, including young Macedonian Pines (especially at alpine heaths and grasslands), to stop the forest spreading into the most valuable areas of meadows, pastures and heath vegetation.

Indicators of implementation: Estimation of the area where management actions should be done (ha). As well as documenting the area where shrubs and trees have been removed (ha).

Funded by the European Union

5.3.11. Active management of *Juniperus communis* stands

Explanation of proposed measure: The measure identifies areas where burning would be impossible due to safety reasons. Tree-felling is necessary to stop forest expansion into the heath and stands of *Juniperus communis*. On the same time active thinning of *Juniperus communis* stands could be executed where the density is has negative effects on biodiversity (like stands with presence insects and plants requiring open habitats).

Indicators of implementation: The area (ha and percentage of the actual need) where shrubs and trees have been removed.

5.3.12. Installing fish ladders / passages on Brajcino river hydroplant dams and other watercourses affected by water uptake.

Explanation of proposed measure: The design of the fish ladder on Brajcino river must ensure the improvement of the status of the *Salmo peristericus* population and to be based on specific experience from the Republic of North Macedonia and other countries. An evaluation on the influence of water uptake dams in all rivers and streams should be made, and mitigating measures planned and implemented.
See: https://www.sciencedirect.com/topics/agricultural-and-biological-sciences/fish-ladders

Indicators of implementation: Fish ladder installed. A special study prepared on the influence of water uptake dams, mitigating measures identified, and pilot actions implemented.

5.3.13. Implementing river garbage cleaning actions

Including information campaigns, stands, to set higher priorities for protected areas in municipality waste disposal projects.

Indicators of implementation: Implemented concrete river garbage cleaning actions (information campaigns, stands, established higher priority for protected areas in municipality for waste disposal projects).

Funded by the European Union

Priority actions, implementing institutions and timetable for implementation of proposed management measures (years can be added after approval of the document):

Management measures	Implementing institutions	Year									
		1	2	3	4	5	6	7	8	9	10
*** Increasing the volume of deadwood for protected species**	Pelister NP administration										
*** Removing invasive and non-native tree species**	Pelister NP administeration										
*** Implementing measures for improving living conditions of old forest stands and old trees**	Pelister NP administration										
*** Renewing forestry management plans and management approach favouring conservation of natural habitats**	MAFWE, MoEPP										
*** Implementing measures for increasing multi-layered and uneven-aged Macedonian Pine forests**	Pelister NP administration										
Establishing surface water protection belts in forest habitats	MAFWE, MoEPP										
Preparing special plan for grazing	MoEPP, Pelister NP administration, Agency of Pastures										
Entering into grazing agreements with farmers	Pelister NP administration										
Preparing and approving rules for controlled heath and grassland burning requirements	MoEPP										
Removing surplus shrubs and trees in areas used for grazing	Pelister NP administration										
Active management of *Juniperus communis* stands	Pelister NP administration										
Installing fish ladders/passings on Brajcino river hydroplant dams and other watercourses affected by water uptake.	Pelister NP administration										
Implementing river garbage cleaning actions	Pelister NP administration, Bitola municipality										

***** Priority measures

5.3.7. Other important measures to be implemented

Rangers could take part in the regular monitoring of mammals at the Pelister NP. Methods can include game cameras and observation of different kind of tracks (including winter counts of footprints). In the management plans for Pelister NP and nearby areas, it would be important to maintain and improve ecological connections/corridors for large carnivores and other mammals, facilitating dispersal north through the Gjavato pass, and westwards along northern shores of Prespa lake to Galicica mountains. Also all connectivity of habitats with Greek populations of different species groups, including many mammals like Balkan chamois, should be maintained and extended.

The European Commission has ordered several reports on large carnivores. The recent and updated large carnivore report (Boitani et al. 2015) proposes several actions to be taken into consideration in the Member States. *Action 7* in the report concerns standardization of monitoring methods in Member States. However, the methods mentioned are rather a proposal to collect all relevant and available data with different methods

Funded by the European Union

than true recommendations to standardized methods. According to the report, the system will be based on: (1) the on-going natal den surveys (2) line transects (Finland) and (3) the development of new monitoring methods (e. g. camera trapping and DNA-sampling), especially in areas without stable snow conditions.

According to the report, "robust monitoring is a part of adaptive management". Common reports on the status of the population (abundance and distribution) should be published every year. The report also encourages sharing data between neighbouring countries.

In some countries NGOs have created systems to strengthen data gathering. One example is "*Large carnivore monitoring in the West Carpathians"* (http://www.carnivores.cz/large-carnivore-monitoring-in-the-west-carpathians/). In many countries, however the effort of volunteers comes from the observations they have made and saved in open databases. Kojola et al. (2018) have recently published a scientific paper on "Balancing costs and confidence: volunteer-provided point observations, GPS telemetry and the genetic monitoring of Finland's wolves" (https://doi.org/10.1007/s13364-018-0371-3).

Timetable for implementation of other important measures (years can be added after approval of the document):

Management measures	Implementing institutions	Year									
		1	2	3	4	5	6	7	8	9	10
Setting boundaries											
*** Setting the exact borders of the Pelister NP in GIS and marking them**	MoEPP										
Establishing borders for development of the settlements around Pelister NP in scope of detailed spatial plans (to be in line with protection with habitats and species around the National Park)											
Reserch, monitoring, databases											
*** Making habitats mapping**	MoEPP										
Creating data base on Natura 2000 habitats and species											
Monitoring of habitats and species of EU importance	Pelister NP administration										
*** Creating data base on borders of ownerships and rights of the area with layers of habitats and species**	MoEPP										
Awareness raising and education											
*** Implementing special educational programmes for local people and visitors**	Pelister NP administration										
Creating special info stands (putting information on nature values of European Community Importance), observation points, marking trails											

***** Priority measures

Funded by the European Union

ANNEXES

ANNEX 1. Standard Data Form for proposed Pelister NP Natura 2000 site

NATURA 2000 - STANDARD DATA FORM

For Special Protection Areas (SPA),
Proposed Sites for Community Importance (pSCI),
Sites of Community Importance (SCI) and
for Special Areas of Conservation (SAC)

SITE **MK0000010**

SITENAME **Pelister**

TABLE OF CONTENTS

1. SITE IDENTIFICATION

Back to top

1.1 Type	1.2 Site code
B	MK0000010

1.3 Site name

Pelister

1.4 First Compilation date	1.5 Update date

1.6 Respondent:

Name/Organisation:	Ministry of environment and physical planning
Address:	Bul. Goce Delcev no. 18, Skopje, R. Macedonia
Email:	

1.7 Site indication and designation / classification dates

Date site classified as SPA:	0002-12
National legal reference of SPA designation	No data

2. SITE LOCATION

Back to top

2.1 Site-centre location [decimal degrees]:

Funded by the European Union

Longitude
21.1893

Latitude
40.9675

2.2 Area [ha]:

17176,74 ha

2.3 Marine area [%]

2.4 Site length [km]: 25 km

2.5 Administrative region code and name

NUTS level 2 code	Region Name
MK00	Macedonia

2.6 Biogeographical Region(s)

Alpine (100.0 %)

3. ECOLOGICAL INFORMATION

Back to top

3.1 Habitat types present on the site and assessment for them

Annex I Habitat types						Site assessment			
Code	PF	NP	Cover [ha]	Cave [number]	Data quality	A|B|C|D	A|B|C		
						Representativity	Relative Surface	Conservation	Global
3130			5		G	A	C	A	A
3260			60		G	A	C	A	B
4060			1900		M	B	B	B	B
5130			450		M	B	C	B	B
6210			35		M	B	C	B	B
6220	*		100		M	B	C	B	B
6230	*		10		M	A	C	B	B
62D0			1500		M	A	B	B	B

Funded by the European Union

6430			60		M	B	B	B	B
6510			35		M	B	C	A	B
7140			10		M	A	C	A	B
7160			2		M	A	C	A	A
7220	*		0,1		M	B	C	B	B
7230			10		M	A	C	B	B
8150			3000		M	A	B	A	B
8220			900		M	B	C	B	B
9180	*		20		M	B	C	B	B
91E0	*		100		M	A	C	A	B
91W0			4400		M	A/B	B	B	B
91AA	*		1000		M	B	C	B	B
91BA			710		M	A	B	A	B
9260			0,5		M	C	C	B	B
9280			200		M	B	C	B	B
92A0			2130		M	A	A	A	A

Funded by the European Union

- **PF:** for the habitat types that can have a non-priority as well as a priority form (6210, 7130, 9430) enter "X" in the column PF to indicate the priority form.
- **NP:** in case that a habitat type no longer exists in the site enter: x (optional)
- **Cover:** decimal values can be entered
- **Caves:** for habitat types 8310, 8330 (caves) enter the number of caves if estimated surface is not available.
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation)

3.2 Species referred to in Article 4 of Directive 2009/147/EC and listed in Annex II of Directive 92/43/EEC and site evaluation for them

Species					Population in the site						Site assessment			
G	Code	Scientific Name	S	NP	T	Size		Unit	Cat.	D.qual.	A|B|C|D	A|B|C		
						Min	Max				Pop.	Con.	Iso.	Glo.
B	320	Alectoris graeca			p				R	M				
B	1560	Aquila chrysaetos			p				V	M				
I	1093	Austropotamobius torrentium*			P				R	M	B	A	C	C
F	5261	Barbus balcanicus			P				DD	P				
A	1193	Bombina variegata			P				R	M	C	B	C	C
P	1386	Buxbaumia viridis			P				R	M	A	B	A	B
I	1078	Callimorpha quadripunctaria			P				R	M	C	B	B	C
M	1352	Canis lupus			P				R	M	C	A	C	C
B	490	Caprimulgus europaeus			p				R	M				
I	1088	Cerambyx cerdo			P				R	M	C	B	C	C
B	1490	Circaetus gallicus			p				V	M				
B	1620	Circus pygargus			p				V	M				
I	4046	Cordulegaster heros			P				R	M	C	C	C	C
B	560	Crex crex			p				R	M				
I	1086	Cucujus cinnaberinus			P				R	M	A	C	C	C
B	1870	Dendrocopos medius			p				R	M				
B	1880	Dendrocopos leucotos			p				R	M				

Funded by the European Union

B	1890	Dendrocopos syriacus			p				C	M				
B	1850	Dryocopus martius			p				R	M				
I	1074	Eriogaster catax			P				R	M	C	B	C	C
I	1065	Euphydryas aurinia			P				R	M	B	B	C	C
B	1940	Falco naumanni			p				V	M				
B	2020	Falco peregrinus			p				V	M				
P	1845	Fritillaria gussichiae			p				R	M	C	B	C	B
B	2040	Lanius collurio			p				C	M				
I	1083	Lucanus cervus			P				C	M	C	B	C	B
B	2640	Lullula arborea			p				C	M				
M	1355	Lutra lutra			P				R	M	C	C	C	C
I	1060	Lycaena dispar			P				R	M	B	B	C	C
M	1361	Lynx lynx			p				V	M	D	A	B	C
P	1379	Mannia triandra			p				DD	P				
I	1089	Morimus funereus			p				R	M	C	B	C	C
M	1307	Myotis blythii			p				DD	P				
M	1316	Myotis capaccinii			p				DD	P				
I	4053	Paracaloptenus caloptenoides			p				DD	P				
B	1460	Pernis apivorus			p				R	M				
I	4042	Polyommatus eroides			p				DD	P				
B	2090	Pyrrhocorax pyrrhocorax			p				R	M				
M	1306	Rhinolophus blasii			p				DD	P				
M	1304	Rhinolophus ferrumequinum			p				DD	P				
M	1303	Rhinolophus hipposideros			p				DD	P				
I	1087	Rosalia alpina*			p				R	M	B	B	C	C
M	1371	Rupicapra rupicapra balcanica			p				R	M	C	A	B	C
		Salmo												

Funded by the European Union

F	5354	pelagonicus			p				P	M	B	C	A	B
F	5355	Salmo peristericus			p				P	M	A	C	A	B
R	1217	Testudo hermanni			p				R	M	C	C	C	C
B	340	Tetrastes bonasia			p				C	M				
P	6244	Tozzia carpathica			P	100	5000	I	R	M	A	A/B	A	A
R	5364	Triturus macedonicus			p				V	P				
M	1354	Ursus arctos			p				R	M	B	A	B	C

- **Group:** A = Amphibians, B = Birds, F = Fish, I = Invertebrates, M = Mammals, P = Plants, R = Reptiles
- **S:** in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
- **NP:** in case that a species is no longer present in the site enter: x (optional)
- **Type:** p = permanent, r = reproducing, c = concentration, w = wintering (for plant and non-migratory species use permanent)
- **Unit:** i = individuals, p = pairs or other units according to the Standard list of population units and codes in accordance with Article 12 and 17 reporting (see reference portal)
- **Abundance categories (Cat.):** C = common, R = rare, V = very rare, P = present - to fill if data are deficient (DD) or in addition to population size information
- **Data quality:** G = 'Good' (e.g. based on surveys); M = 'Moderate' (e.g. based on partial data with some extrapolation); P = 'Poor' (e.g. rough estimation); VP = 'Very poor' (use this category only, if not even a rough estimation of the population size can be made, in this case the fields for population size can remain empty, but the field "Abundance categories" has to be filled in)

3.3 Other important species of flora and fauna (optional)

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
R	1276	Ablepharus kitaibelii						R	x					x
P		Alchemilla peristerica						R				x		
P		Andreaea rupestris						R						x
Fu		Boletus regius						R						x
R	6138	Coluber caspius						V	x					
R	1283	Coronella austriaca						V	x					
P		Crataegus sericeus						R				x		
P		Crocus pelistericus						R				x		
F		Chroogomphus helveticus												x

Funded by the European Union

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
A	1201	Bufo viridis						V	x					
P		Dianthus myrtinervius						R				x		
I		Dorcadion sp.						R				x		
P		Heracleum orphanidis						R				x		
P		Viola velutina						R				x		
P		Dianthus stenopetalus						R						x
I		Duvalius macedonicus						DD					x	
I		Duvalius peristericus						DD					x	
R	1281	Elaphe longissima						R	x					x
I		Eucypris kurtdiebeli						DD				x		
M	6110	Felis silvestris						R	x					
P	1845	Fritillaria gussichiae						R	x					x
P	1657	Gentiana lutea						R		x				
P		Gentiana punctata						R						x
P		Knautia magnifica						R						x
R	1261	Lacerta agilis						R	x					
R	1251	Lacerta trilineata						R	x					
R	1263	Lacerta viridis						R	x					
M	1341	Muscicardinus avellanarius						R	x					
M		Nannospalax leucodon						DD						x
R	1292	Natrix tessellata						DD	x					
I		Nebria aetolica macedonica						DD						x
I		Niphargus pancici pancici						DD				x		x
I	6265	Phengaris arion (Maculinea						R	x					

Funded by the European Union

Species					Population in the site				Motivation					
Group	CODE	Scientific Name	S	NP	Size		Unit	Cat.	Species Annex		Other categories			
					Min	Max		C|R|V|P	IV	V	A	B	C	D
		arion)												
P		Pinguicula balcanica						R						x
I	1056	Parnassius mnemosyne						R	x					
R	1238	Podarcis erhardii						R	x					
R	1256	Podarcis muralis						R	x					x
R	1248	Podarcis taurica						R	x					
A	1209	Rana dalmatina						C	x					
A	1208	Rana graeca						DD	x					
P		Saxifraga pedemontana ssp. cymosa						R						x
P		Saxifraga stellaris ssp. alpigena						R						x
P		Sempervivum octopodes						R					x	
P		Sempervivum marmoreum						R						x
Fu		Suillus sibiricus ssp. helvetica						DD						x
P		Soldanella pindicola						R						x
I		Tapinopterus comita						DD						x
I		Tapinopterus monastirensis monastirensis						DD						x
I		Trechus goebli goebli						DD						x
P		Viola parvula						V						x
R	1295	Vipera ammodytes						V	x					
I		Winklerites moraveci						DD						

Group: A = Amphibians, B = Birds, F = Fish, Fu = Fungi, I = Invertebrates, L = Lichens, M = Mammals, P = Plants, R = Reptiles
CODE: for Birds, Annex IV and V species the code as provided in the reference portal should be used in

Funded by the European Union

addition to the scientific name
S: in case that the data on species are sensitive and therefore have to be blocked for any public access enter: yes
NP: in case that a species is no longer present in the site enter: x (optional)
Unit: i = individuals, p = pairs or other units according to the standard list of population units and codes in accordance with Article 12 and 17 reporting, (see reference portal)
Cat.: Abundance categories: C = common, R = rare, V = very rare, P = present
Motivation categories: IV, V: Annex Species (Habitats Directive), A: National Red List data; B: Endemics; C: International Conventions; D: other reasons

4. SITE DESCRIPTION

Back to top

4.1 General site character

Habitat class	% Cover
N06	0,5
N07	0,5
N08	13
N09	1
N10	0,5
N11	9
N15	0,5
N16	32
N17	16,5
N19	0,5
N20	2
N21	0,01
N22	24
N23	0,01
Total Habitat Cover	100,0

Other Site Characteristics

Pelister National Park (17176 ha) is located between Prespa valley to the west and the Pelagonian Valley to the east. It is a part of Baba mountain massif with highest peak Mt. Pelister (2601 m asl.), To the north it is bordered by the (small) Capari valley and Gjavato pass (at 1169 m alt.). In the south Pelister National Park is in directly connected to Greek border and to Ori Varnounta mountain (Site Code: GR1340003) Natura 2000 area of the same mountain chain, also Ethnikos Drymos Prespon Natura 2000 area (Site Code: GR1340001) is in immediate vicinity of the Pelister National Park, and all these sites are integrated as a part of the Green Belt of Balkans. On territory of the Republic of North Macedonia Baba Mountain massif covers an area of about 367,5 km², of which 39,7 km² is over 2000 m. This area provides alpine habitats and species in their southernmost localities at Balkan Peninsula and the whole Europe with remarkable occurrences of the Balkan Tertiary relicts in several habitat types and species groups. A meridian direction of Pelister Natipnal Park obtains a length of 25 km. The Baba mountain has 24 peaks higher than 2,000 m. Except the highest, Pelister (2601 m), prominent peak consist of Stiv (2468 m), Veternica (2420 m), Muza (2351 m) and, Visoka Chuka (2182 m), Vrteshka (2010 m) etc. .

Funded by the European Union

In geological structure Baba mountains is a typical horst formation which consist of Paleozoic schists and granites in the central parts of Pelister National park. These rocks have been transformed by tectonic and erosive forces over millenia. The central mountain ridge of the Baba mountains starts from north at the top of Vrteska 2010 m, and continuing on the territory of Northern Greece. To the east and to the west of it are located parallel ridges, which are separated by river valleys. In relief forms of Pelister National Park, the stone rivers (Medio European boulder scree) at a height of 1300 to 2000 m altitude, are among the most remarkable screes of the Balkan Peninsula. Alluvial fans are also an important geomorphological feature of the relief, used to occur in a long belt along the eastern, northern and western foot and slopes of the Baba mountain massif. The highland parts of Pelister National Park were affected during the Pleistocene several glaciations that left their marks in today's relief in the form of fossil glacial forms: cirques and moraines. Some traces of the circus has diameter over 2000 m, two of which are constantly filled with water: Golemo and Malo Lake. Their basins are enclosed by moraines.

Pelister National Park includes following HD habitats: 3130 Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae and/or Isoeto-Nanojuncetea; 3160 Natural dystrophic lakes and ponds; 3260 Water courses of plain to montane levels with the Ranunculion fluitantis and Callitricho-Batrachion vegetation; 4060 Alpine and Boreal heaths; 5130 Juniperus communis formations on heaths or calcareous grasslands; 6220 * Pseudo-steppe with grasses and annuals of the Thero-Brachypodietea; 6230 * Species-rich Nardus grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe); 62D0 Oro-Moesian acidophilous grasslands; 6420 Mediterranean tall humid herb grasslands of the Molinio-Holoschoenion; 6430 Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels; 6510 Lowland hay meadows; 6520 Mountain hay meadows; 7140 Transition mires and quaking bogs; 7160 Fennoscandian mineral-rich springs and springfens; 7220 * Petrifying springs with tufa formation (Cratoneurion); 7230 Alkaline fens; 8150-Medio-European upland siliceous screes; 8220 Siliceous rocky slopes with chasmophytic vegetation; 9180 * Tilio-Acerion forests of slopes, screes and ravines; 91E0 * Alluvial forests with Alnus glutinosa and Fraxinus excelsior (Alno-Padion, Alnion incanae, Salicion albae); 91W0 Moesian beech forests; 91AA *Eastern white oak woods; 91BA Moesian silver fir forests; 9260 Castanea sativa woods; 9280 Quercus frainetto woods; 92A0 Salix alba and Populus alba galleries;

Very large area of Pelsiter National Park consist of habitats of Habitats Directive Annex 1. In addition there are some plantations of coniferous woods (about 340 ha). There are also representative sites of priority habitats outside of the park in immendiate vicinity.

4.2 Quality and importance

In addition to Annex I habitats Pelister National Park hosts following Habitat Directive species and other important species: Mammals include large Carnivores: Canis lupus, Lynx lynx, Ursus arctos. On these Pelister NP is important to maintain stands of wolf and brown bear. Lynx is nowadays more casual strider at the Park. Mammals also include: Rupicapra rupicapra subsp. balcanica with very small population at the Park and European wildcat Felis silvestris.. Amphibia: Bombina variegata, Bufoides viridis, Rana dalmatina, Rana graeca, Triturus macedonicus. Reptiles:

Funded by the European Union

Ablepharus kitaibelii, Coluber caspius, Coronella austriaca, Elaphe longissima, Lacerta agilis, Lacerta trilineata, Lagerta viridisa, Podarcis erhardii, Podarcis muralis, Podarcis taurica, Testudo hermanni, Vibera ammodytes. Land Invertebrates: Cerambyx cerdo, Cordulegaster heros, Cucujus cinnaberinus, Eriogaster gatax, Euphydryas aurinia, Lucanus cervus, Paracaloptenus caloptenoides, Parnassius pnemosyne, Phengaris arion, Polyommatus eroides, Rosalia alpina Plant: Buxbaumia viridis, Mannia triandra, Tozzia carpathica, Fritillaria gussichiae; in addition following narrow range (N-Greece – SW North Macedonia) endemic plant species: Alchemilla peristerica, Crocus pelistericus, Dianthus myrtinervius, Heracleum orphanidis, Sempervivum octopodes, Viola velutina are met especially at alpine parts of Baba mountains. Following endemic insects have been recorded from the Park: Winklerites moraveci, Nebria macedonica macedonica, Duvalius macedonicus, Duvalius peristericus, Deltomerus sterbai, Tapinopterus comita, Tapinopterus monastirensis monastirensis, Trechus goebli goebli and Trechus hajeki. In addition to these two Dorcadion spp. longhorn beetle species and Poecilimon spp. grasshoppers which may be endemic for Baba mountains have observed from the Park. In addition there are about 20 species of Bird directive Annex I met from the area. Watercourses inside and at slopes and base of Pelister National Park are important for two endemic trout species Salmo pelagonicus and Salmo peristericus. Also prioritized crustacean Autropotamobius torrentium* is met at rivers on western side of Baba mountains,

Pelister is registered as Important Plant Area (IPA). For NATURA 2000 the whole area contains values of both Habitat directive Annex I habitat types and species of Annexes II and IV (and V) as well as several Balkan and more local endemics and Nationally protected and strictly protected species on several species groups.

4.3 Threats, pressures and activities with impacts on the site

The most important impacts and activities with high effect on the site

Negative Impacts			
Rank	Threats and pressures [code]	Pollution (optional) [code]	inside/outside [i|o|b]
L	A04.01		i
H	A04.03		i
M	B02.01.01		i
M	B02.01.02		i
H	B02.04		b
H	B07		i
L	D02.01.01		i
L	E04		i
L	F04.02		i
M	F34		b
L	G01.04		i
L	H01		i
M	I02		b
M	J01		b
L	J02.05.05		i
L	K01.01		i
M	K02		b
L	M01		b
M	M02		i
M	M02.01		i

Positive Impacts			
Rank	Activities, management [code]	Pollution (optional) [code]	inside/outside [i|o|b]

Rank: H = high, M = medium, L = low
Pollution: N = Nitrogen input, P = Phosphor/Phosphate input, A = Acid input/acidification,
T = toxic inorganic chemicals, O = toxic organic chemicals, X = Mixed pollutions
i = inside, o = outside, b = both

Funded by the European Union

4.4 Ownership (optional)

4.5 Documentation

5. SITE PROTECTION STATUS (optional)

Back to top

5.1 Designation types at national and regional level:

Funded by the European Union

Code	Cover [%]	Code	Cover [%]	Code	Cover [%]
MK02	100.0				

5.2 Relation of the described site with other sites:

5.3 Site designation (optional)

6. SITE MANAGEMENT

Back to top

6.1 Body(ies) responsible for the site management:

6.2 Management Plan(s):
An actual management plan does exist:

- [ ] Yes
- [ ] No, but in preparation
- [X] No

6.3 Conservation measures (optional)

7. MAP OF THE SITES

Back to top

INSPIRE ID: MK0000010

Map delivered as PDF in electronic format (optional)

- [ ] Yes
- [X] No

Reference(s) to the original map used for the digitalisation of the electronic boundaries (optional).

Funded by the European Union

ANNEX 2. List of habitats under Habitats Directive

Habitats classes	Habitats types (Habitats Directive, Annex 1)
3100 Standing water	3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletalea uniflorae* and/or *Isoeto-Nanojuncetea*
3200 Running water - sections of water courses with natural or semi-natural dynamics	3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation
4000 Temperate heath and scrub	4060 Alpine and Boreal heaths
5100 Sub-Mediterranean and temperate scrub	5130 *Juniperus communis* formations on heaths or calcareous grasslands
6200 Semi-natural dry grasslands and scrubland facies	62D0 *Oro-Moesian acidophilous* grasslands
	6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)
	6220 * Pseudo-steppe with grasses and annuals of the *Thero-Brachypodietea*
6400 Semi-natural tall-herb humid meadows	6430 *Hydrophilous* tall herb fringe communities of plains and of the montane to alpine levels
	6510 Lowland hay meadows (*Alopecurus pratensis, Sanguisorba officinalis*)
7100 Sphagnum acid bogs	7140 Transition mires and quagingbogs
	7160 Mineral-rich springs and springfens
7200 Calcareous fens	7220* Petrifying springs with tufa formation (*Cratoneurion*)
	7230 Alkaline fens
8100 Scree	8150 Medio-European upland siliceous screes
8200 Rocky slopes with chasmophytic vegetation	8220 Siliceous rocky slopes with *chasmophytic* vegetation
9100 Forests of Temperate Europe	9180 * *Tilio-Acerion* forests of slopes, screes and ravines
	91AA *Eastern white oak woods
	91BA Moesian silver fir
	91E0 * Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-Padion, Alnion incanae, Salicion albae*)
	91W0 *Moesian* beech forests
9200 Mediterranean deciduous forests	9280 *Quercus frainetto* woods
9500 Mediterranean and Macaronesian mountainous coniferous forests	95A0 High oro-Mediterranean pine forests

Funded by the European Union

ANNEX 3. List of species protected by the Habitats and Birds Directive

Species name	Directive, Annex	Species code
Flora (plant) species		
1. Mannia triandra	Habitats Directive, Annex II	**1379**
2. Green shield moss *(Buxbaumia viridis)*	Habitats Directive, Annex II	**1386**
3. Fritillaria gussichiae	Habitats Directive, Annex IV	**1845**
4. Carpathian Tozzia (*Tozzia carpathica)*	Habitats Directive, Annex II, IV	**6244**
Fauna ex. Aves (animals other than birds) species		
1. Wolf *(Canis lupus)*	Habitats Directive, Annex II, IV, V	**1352**
2. European wildcat (*Felis silvestris)*	Habitats Directive, Annex IV	**1363**
3. Otter *(Lutra lutra)*	Habitats Directive, Annex II, IV	**1355**
4. Lynx (*Lynx lynx)*	Habitats Directive, Annex II, IV, V	**1361**
5. Hazel dormouse (*Muscardinus avellanarius)*	Habitats Directive, Annex IV	**1341**
6. Balkan chamois (*Rupicapra rupicapra subsp. Balcanica)*	Habitats Directive, Annex II, IV	**1371**
7. Brown bear (*Ursus arctos)*	Habitats Directive, Annex II, IV	**1354**
8. Lesser mouse-eared myotis (*Myotis blythii)*	Habitats Directive, Annex II and IV	**1307**
9. Long-fingered bat (*Myotis capaccinii)*	Habitats Directive, Annex IV	**1316**
10. Blasius's horseshoe bat (*Rhinolophus blasii)*	Habitats Directive, Annex II, IV	**1306**
11. Mediterranean horseshoe bat (*Rhinolophus euryale)*	Habitats Directive, Annex II, IV	**1305**
12. Greater horseshoe bat (*Rhinolophus ferrumequinum)*	Habitats Directive, Annex II, IV	**1304**
13. Lesser horseshoe bat (*Rhinolophus hipposideros)*	Habitats Directive, Annex II, IV	**1303**
14. European copper skink (*Ablepharus kitaibelii)*	Habitats Directive, Annex IV	**1276**
15. Yellow-bellied toad (*Bombina variegata)*	Habitats Directive, Annex II, IV	**1193**
16. Aesculapian snake (*Elaphe longissima)*	Habitats Directive, Annex IV	**1281**
17. Sand lizard (*Lacerta agilis)*	Habitats Directive, Annex IV	**1261**
18. Three Lined Lizard *(Lacerta trilineata)*	Habitats Directive, Annex IV	**1251**
19. Balkan Green Lizard *(Lacerta viridis)*	Habitats Directive, Annex IV	**1263**
20. Erhard's wall lizard *(Podarcis erhardii)*	Habitats Directive, Annex IV	**1238**
21. Common Wall Lizard *(Podarcis muralis)*	Habitats Directive, Annex IV	**1256**
22. Balkan Wall Lizard *(Podarcis taurica)*	Habitats Directive, Annex IV	**1248**
23. Agile Frog *(Rana dalmatina)*	Habitats Directive, Annex IV	**1209**
24. Herman's Tortoise *(Testudo hermanni)*	Habitats Directive, Annex II, IV	**1217**
25. Nose-Horned viper (*Vipera ammodytes*)	Habitats Directive, Annex IV	**1295**
26. Pelagonia trout (*Salmo pelagonicus)*	Habitats Directive, Annex II	**5354**
27. Prespa trout (*Salmo peristericus)*	Habitats Directive, Annex II	**5355**
28. Stone crayfish *(Austropotamobius torrentium *)*	Habitats Directive, Annex II, V	**1093**
29. Cerambyx Longicorn *(Cerambyx cerdo)*	Habitats Directive, Annex II, IV	**1088**
30. *Cucujus cinnaberinus*	Habitats Directive, Annex II, IV	**1086**
31. Stag beetle *(Lucanus cervus)*	Habitats Directive, Annex II	**1083**
32. *Morimus funereus*	Habitats Directive, Annex II	**1089**
33. Rosalia longicorn (*Rosalia alpina* *)	Habitats Directive, Annex II, IV	**1087**
34. Balkan goldenring (*Cordulegaster heros)*	Habitats Directive, Annex II, IV	**4046**
35. Eastern Eggar (*Eriogaster catax)*	Habitats Directive, Annex II, IV	**1074**
36. Marsh Fritillary (*Euphydryas aurinia)*	Habitats Directive, Annex II	**1065**
37. Jersey Tiger (*Gallimorpha quadripunctaria)*	Habitats Directive, Annex II	**6199**

Funded by the European Union

38. Large copper (*Lycaena dispar)*	Habitats Directive, Annex II, IV	**1060**
39. Clouded Apollo (*Parnassius mnemosyne)*	Habitats Directive, Annex IV	**1056**
40. Large blue butterfly *(Phengaris arion)*	Habitats Directive, Annex IV	**1058**
Bird species		
1. Golden eagle *(Aquila chrysaetos)*	Birds Directive, Annex 1	**1560**
2. Short-toed snake eagle *(Circaetus gallicus)*	Birds Directive, Annex 1	**1490**
3. Montagus harrier *(Circus pygargus)*	Birds Directive, Annex 1	**1620**
4. Peregrine falcon *(Falco peregrinus)*	Birds Directive, Annex 1	**2020**
5. Lesser kestrel *(Falco naumanni)*	Birds Directive, Annex 1	**1940**
6. European honey buzzard *(Pernis apivorus)*	Birds Directive, Annex 1	**1460**
7. Middle spotted woodpecker *(Dendrocopos medius)*	Birds Directive, Annex 1	**1870**
8. White-backed woodpecker *(Dendrocopos leucotos)*	Birds Directive, Annex 1	**1880**
9. Syrian woodpecker *(Dendrocopos syriacus)*	Birds Directive, Annex 1	**1890**
10. Black woodpecker *(Dryocopus martius)*	Birds Directive, Annex 1	**1850**
11. Rock partridge *(Alectoris graeca)*	Birds Directive, Annexes I, II/A	**320**
12. European nightjar *(Caprimulgus europaeus)*	Birds Directive, Annex 1	**490**
13. Corn crake *(Crex crex)*	Birds Directive, Annex 1	**560**
14. Red-backed shrike *(Lanius collurio)*	Birds Directive, Annex 1	**2040**
15. Woodlark *(Lullula arborea)*	Birds Directive, Annex 1	**2640**
16. Red-billed chough *(Pyrrhocorax pyrrhocorax)*	Birds Directive, Annex 1	**2090**
17. Hazel grouse (*Tetrastes bonasia)*	Birds Directive Annexes I, II/B	**340**
18. Lanner falcon *(Falco biarmicus)* (*)	Birds Directive, Annex 1	**2000**
19. Bearded vulture *(Gypaetus barbatus)* (*)	Birds Directive, Annex 1	**1470**
20. Egyptian vulture *(Neophron percnopterus)* (*)	Birds Directive, Annex 1	**1480**
(*) = Being extinct in Pelister National Park		

Funded by the European Union

ANNEX 4. The results of METT analysis for Pelister NP

QUESTION		Agreed points	Comments/ Explanation - Group 1
1. Legal status: Does the protected area have legal status (or in the case of private reserves is covered by a covenant or similar)?, Context		**3**	
Points	**Description**		
0	The protected area is not gazetted/covenanted		
1	There is agreement that the protected area should be gazetted/covenanted but the process has not yet begun		
2	The protected area is in the process of being gazetted/covenanted but the process is still incomplete (includes sites designated under international conventions, such as Ramsar, or local/traditional law such as community conserved areas, which do not yet have national legal status or covenant)		
3	The protected area has been formally gazetted/covenanted		
2. Protected area regulations: Are appropriate regulations in place to control land use and activities (e.g. hunting)?, Planning		**2**	
Points	**Description**		
0	There are no regulations for controlling land use and activities in the protected area		
1	Some regulations for controlling land use and activities in the protected area exist but these are major weaknesses		
2	Regulations for controlling land use and activities in the protected area exist but there are some weaknesses or gaps		
3	Regulations for controlling inappropriate land use and activities in the protected area exist and provide an excellent basis for management		
3. Law enforcement: Can staff (i.e. those with responsibility for managing the site)enforce protected area rules well enough?, Inputs		**2**	
Points	**Description**		
0	The staff have no effective capacity/resources to enforce protected area legislation and regulations		
1	There are major deficiencies in staff capacity/resources to enforce protected area legislation and regulations (e.g. lack of skills, no patrol budget, lack of institutional support)		
2	The staff have acceptable capacity/resources to enforce protected area legislation and regulations but some deficiencies remain		
3	The staff have excellent capacity/resources to enforce protected area legislation and regulations		
4. Protected area objectives: Is management undertaken according to agreed objectives?, Planning		**2**	
Points	**Description**		
0	No firm objectives have been agreed for the protected area		
1	The protected area has agreed objectives, but is not managed according to these objectives		
2	The protected area has agreed objectives, but is only partially managed according to these objectives		
3	The protected area has agreed objectives and is managed to meet these objectives		
5. Protected area design: Is the protected area the right size and shape to protect species, habitats, ecological processes and water catchments of key conservation concern?, Planning		**2**	
Points	**Description**		
0	Inadequacies in protected area design mean achieving the major objectives of the protected area is very difficult		
1	Inadequacies in protected area design mean that achievement of major objectives is difficult but some mitigating actions are being taken (e.g. agreements with adjacent land owners for wildlife corridors or introduction of appropriate catchment management)		
2	Protected area design is not significantly constraining achievement of objectives, but could be improved (e.g. with respect to larger scale ecological processes)		
3	Protected area design helps achievement of objectives; it is appropriate for species and habitat conservation; and maintains ecological processes such as surface and groundwater flows at a catchment scale, natural disturbance patterns etc.		

Funded by the European Union

6. Protected area boundary demarcation: Is the boundary known and demarcated., Process		**2**	
Points	**Description**		
0	The boundary of the protected area is not known by the management authority or local residents/neighbouring land users		
1	The boundary of the protected area is known by the management authority but is not known by local residents/neighbouring land users		
2	The boundary of the protected area is known by both the management authority and local residents/neighbouring land users but is not appropriately demarcated		**Proper visual marking should be performed in accordance with the new Rulebook on marking of borders**
3	The boundary of the protected area is known by the management authority and local residents/neighbouring land users and is appropriately demarcated		
7. Management plan: Is there a management plan and is it being implemented?, Planning		**1**	
Points	**Description**		
0	There is no management plan for the protected area		
1	A management plan is being prepared or has been prepared but is not being implemented		**A new management plan is under development**
2	A management plan exists but it is only being partially implemented because of funding constraints or other problems		
3	A management plan exists and is being implemented		
7a. Planning process (Additional Points, Planning)		**1**	**There is a stakeholder council and it is envisaged to establish a Scientific Council**
Points	**Description**		
1	The planning process allows adequate opportunity for key stakeholders to influence the management plan		
7b. Planning process (Additional Points, Planning)		**0**	
Points	**Description**		
1	There is an established schedule and process for periodic review and updating of the management plan		
7c. Planning process (Additional Points, Planning)		**0**	
Points	**Description**		
1	The results of monitoring, research and evaluation are routinely incorporated into planning		
8. Regular work plan: Is there a regular work plan and is it being implemented, Planning/Outputs		**3**	
Points	**Description**		
0	No regular work plan exists		
1	A regular work plan exists but few of the activities are implemented		
2	A regular work plan exists and many activities are implemented		
3	A regular work plan exists and all activities are implemented		
9. Resource inventory: Do you have enough information to manage the area?, Inputs		**1**	**No regular monitoring has been established and there are still no protocols for collecting data on habitats and species**
Points	**Description**		
0	There is little or no information available on the critical habitats, species and cultural values of the protected area		
1	Information on the critical habitats, species, ecological processes and cultural values of the protected area is not sufficient to support planning and decision making		
2	Information on the critical habitats, species, ecological processes and cultural values of the protected area is sufficient for most key areas of planning and decision making		
3	Information on the critical habitats, species, ecological processes and cultural values of the protected area is sufficient to support all areas of planning and decision making		

Funded by the European Union

10. Protection systems: Are systems in place to control access/resource use in the protected area?, Process/Outcome		2	
Points	**Description**		
0	Protection systems (patrols, permits etc) do not exist or are not effective in controlling access/resource use		
1	Protection systems are only partially effective in controlling access/resource use		
2	Protection systems are moderately effective in controlling access/resource use		
3	Protection systems are largely or wholly effective in controlling access/ resource use		
11. Research: Is there a programme of management oriented survey and research work?, Process		1	
Points	**Description**		
0	There is no survey or research work taking place in the protected area		
1	There is a small amount of survey and research work but it is not directed towards the needs of protected area management		
2	There is considerable survey and research work but it is not directed towards the needs of protected area management		
3	There is a comprehensive, integrated programme of survey and research work, which is relevant to management needs		
12. Resource management: Is active resource management being undertaken?, Process		**2**	
Points	**Description**		
0	Active resource management is not being undertaken		
1	Very few of the requirements for active management of critical habitats, species, ecological processes and cultural values are being implemented		
2	Many of the requirements for active management of critical habitats, species, ecological processes and, cultural values are being implemented but some key issues are not being addressed		
3	Requirements for active management of critical habitats, species, ecological processes and, cultural values are being substantially or fully implemented		
13. Staff numbers: Are there enough people employed to manage the protected area?, Inputs		**1**	**There is no competent staff to do the activities related to biodiversity and monitoring of habitats and species**
Points	**Description**		
0	There are no staff		
1	Staff numbers are inadequate for critical management activities		
2	Staff numbers are below optimum level for critical management activities		
3	Staff numbers are adequate for the management needs of the protected area		
14. Staff training: Are staff adequately trained to fulfil management objectives?, Inputs/Process		**1**	**Education and training is needed**
Points	**Description**		
0	Staff lack the skills needed for protected area management		
1	Staff training and skills are low relative to the needs of the protected area		**To be trained on monitoring**
2	Staff training and skills are adequate, but could be further improved to fully achieve the objectives of management		
3	Staff training and skills are aligned with the management needs of the protected area		
15. Current budget: Is the current budget sufficient?, Inputs		**1**	
Points	**Description**		
0	There is no budget for management of the protected area		
1	The available budget is inadequate for basic management needs and presents a serious constraint to the capacity to manage		
2	The available budget is acceptable but could be further improved to fully achieve effective management		
3	The available budget is sufficient and meets the full management needs of the protected area		

Funded by the European Union

16. Security of budget: Is the budget secure?, Inputs		**1**	
Points	**Description**		
0	There is no secure budget for the protected area and management is wholly reliant on outside or highly variable funding		
1	There is very little secure budget and the protected area could not function adequately without outside funding		
2	There is a reasonably secure core budget for regular operation of the protected area but many innovations and initiatives are reliant on outside funding		
3	There is a secure budget for the protected area and its management needs		
17. Management of budget: Is the budget managed to meet critical management needs?, Process		**2**	
Points	**Description**		
0	Budget management is very poor and significantly undermines effectiveness (e.g. late release of budget in financial year)		
1	Budget management is poor and constrains effectiveness		
2	Budget management is adequate but could be improved		
3	Budget management is excellent and meets management needs		
18. Equipment: Is equipment sufficient for management needs?, Inputs		**1**	
Points	**Description**		
0	There are little or no equipment and facilities for management needs		
1	There are some equipment and facilities but these are inadequate for most management needs		
2	There are equipment and facilities, but still some gaps that constrain management		
3	There are adequate equipment and facilities		
19. Maintenance of equipment: Is equipment adequately maintained?, Process		**1**	
Points	**Description**		
0	There is little or no maintenance of equipment and facilities		
1	There is some ad hoc maintenance of equipment and facilities		
2	There is basic maintenance of equipment and facilities		
3	Equipment and facilities are well maintained		
20. Education and awareness: Is there a planned education programme linked to the objectives and needs?, Process		**0**	**There is no separate program which would be implemented continuously**
Points	**Description**		
0	There is no education and awareness programme		
1	There is a limited and ad hoc education and awareness programme		
2	There is an education and awareness programme but it only partly meets needs and could be improved		
3	There is an appropriate and fully implemented education and awareness programme		
21. Planning for land and water use: Does land and water use planning recognise the protected area and aid the achievement of objectives?, Planning		**2**	
Points	**Description**		
0	Adjacent land and water use planning does not take into account the needs of the protected area and activities/policies are detrimental to the survival of the area		
1	Adjacent land and water use planning does not takes into account the long term needs of the protected area, but activities are not detrimental the area		
2	Adjacent land and water use planning partially takes into account the long term needs of the protected area		
3	Adjacent land and water use planning fully takes into account the long term needs of the protected area		

Funded by the European Union

21a: Land and water planning for habitat conservation (Additional Points, Planning)		0	**Depending on the weather conditions**
Points	**Description**		
1	Planning and management in the catchment or landscape containing the protected area incorporates provision for adequate environmental conditions (e.g. volume, quality and timing of water flow, air pollution levels etc) to sustain relevant habitats.		
21b: Land and water planning for connectivity (Additional Points, Planning)		0	
Points	**Description**		
1	Management of corridors linking the protected area provides for wildlife passage to key habitats outside the protected area (e.g. to allow migratory fish to travel between freshwater spawning sites and the sea, or to allow animal migration)		
21c: Land and water planning for ecosystem services & species conservation (Additional Points, Planning)		**0**	
Points	**Description**		
1	Planning adresses ecosystem-specific needs and/or the needs of particular species of concern at an ecosystem scale (e.g. volume, quality and timing of freshwater flow to sustain particular species, fire management to maintain savannah habitats etc.)		
22. State and commercial neighbours: Is there co-operation with adjacent land and water users?, Process		**1**	
Points	**Description**		
0	There is no contact between managers and neighbouring official or corporate land and water users		
1	There is contact between managers and neighbouring official or corporate land and water users but little or no cooperation		
2	There is contact between managers and neighbouring official or corporate land and water users, but only some co-operation		
3	There is regular contact between managers and neighbouring official or corporate land and water users, and substantial co-operation on management		
23. Indigenous people: Do indigenous and traditional peoples resident or regularly using the protected area have input to management decisions?, Process			
Points	**Description**		
0	Indigenous and traditional peoples have no input into decisions relating to the management of the protected area		
1	Indigenous and traditional peoples have some input into discussions relating to management but no direct role in management		
2	Indigenous and traditional peoples directly contribute to some relevant decisions relating to management but their involvement could be improved		
3	Indigenous and traditional peoples directly participate in all relevant decisions relating to management, e.g. co-management		
24. Local communities: Do local communities resident or near the protected area have input to management decisions?, Process		**1**	
Points	**Description**		
0	Local communities have no input into decisions relating to the management of the protected area		
1	Local communities have some input into discussions relating to management but no direct role in management		
2	Local communities directly contribute to some relevant decisions relating to management but their involvement could be improved		
3	Local communities directly participate in all relevant decisions relating to management, e.g. co-management		
24a. Impact on communities (Additional points Local communities/indigenous people)		**1**	
Points	**Description**		
1	There is open communication and trust between local and/or indigenous people, stakeholders and protected area managers		
24b. Impact on communities (Additional points Local communities/indigenous people)		**1**	
Points	**Description**		
1	Programmes to enhance community welfare, while conserving protected area resources, are being implemented		
24c. Impact on communities (Additional points Local communities/indigenous people)		**1**	
Points	**Description**		
1	Local and/or indigenous people actively support the protected area		

Funded by the European Union

25. Economic benefit: Is the protected area providing economic benefits to local communities, e.g. income, employment, payment for environmental services?, Outcomes		**2**	
Points	**Description**		
0	The protected area does not deliver any economic benefits to local communities		
1	Potential economic benefits are recognised and plans to realise these are being developed		
2	There is some flow of economic benefits to local communities		
3	There is a major flow of economic benefits to local communities from activities associated with the protected area		
26. Monitoring and evaluation: Are management activities monitored against performance?, Planning/Process		**1**	
Points	**Description**		
0	There is no monitoring and evaluation in the protected area		
1	There is some ad hoc monitoring and evaluation, but no overall strategy and/or no regular collection of results		
2	There is an agreed and implemented monitoring and evaluation system but results do not feed back into management		
3	A good monitoring and evaluation system exists, is well implemented and used in adaptive management		
27. Visitor facilities: Are visitor facilities adequate?, Outputs		**1**	
Points	**Description**		
0	There are no visitor facilities and services despite an identified need		
1	Visitor facilities and services are inappropriate for current levels of visitation		
2	Visitor facilities and services are adequate for current levels of visitation but could be improved		
3	Visitor facilities and services are excellent for current levels of visitation		
28. Commercial tourism operators: Do commercial tour operators contribute to protected area management?, Process		0	
Points	**Description**		
0	There is little or no contact between managers and tourism operators using the protected area		
1	There is contact between managers and tourism operators but this is largely confined to administrative or regulatory matters		
2	There is limited co-operation between managers and tourism operators to enhance visitor experiences and maintain protected area values		
3	There is good co-operation between managers and tourism operators to enhance visitor experiences, and maintain protected area values		
29. Fees: If fees (i.e. entry fees or fines) are applied, do they help protected area management?, Inputs/Process		0	**Funds are insufficient. There were no revenues from penalties. The small entrance fees will not be charged at the request of the Municipality of Bitola, which will compensate those incomes of the Park through a different program**
Points	**Description**		
0	Although fees are theoretically applied, they are not collected		
1	Fees are collected, but make no contribution to the protected area or its environs		
2	Fees are collected, and make some contribution to the protected area and its environs		
3	Fees are collected and make a substantial contribution to the protected area and its environs		

Funded by the European Union

30. Condition of values: What is the condition of the important values of the protected area as compared to when it was first designated?, Outcomes		**2**	
Points	**Description**		
0	Many important biodiversity, ecological or cultural values are being severely degraded		
1	Some biodiversity, ecological or cultural values are being severely degraded		
2	Some biodiversity, ecological and cultural values are being partially degraded but the most important values have not been significantly impacted		
3	Biodiversity, ecological and cultural values are predominantly intact		
30a: Condition of values (Additional Points: Condition of values)		**1**	
Points	**Description**		
1	The assessment of the condition of values is based on research and/or monitoring		
30b: Condition of values (Additional Points: Condition of values)		**1**	
Points	**Description**		
1	Specific management programmes are being implemented to address threats to biodiversity, ecological and cultural values		
30c: Condition of values (Additional Points: Condition of values)		**0**	
Points	**Description**		
1	Activities to maintain key biodiversity, ecological and cultural values are a routine part of park management		
	TOTAL SCORE	**47**	

Funded by the European Union

ANNEX 5. List of literature

Agasyan, A., Avci, A., Tuniyev, B., Lymberakis, P., Andrén, C., Cogalniceanu, D., Wilkinson, J., Ananjeva, N., Üzüm, N., Orlov, N., Podloucky, R., Tuniyev, S., Kaya, U., Crnobrnja Isailovic, J., Vogrin, M., Corti, C., Pérez Mellado, V., Sá-Sousa, P., Cheylan, M., Pleguezuelos, J., Kyek, M., Westerström, A., Nettmann, H.K., Borczyk, B., Sterijovski, B. & Schmidt, B. (2010). *Lacerta agilis. The IUCN Red List of Threatened Species 2010*: e.T157288A5071439. http://dx.doi.org/10.2305/IUCN.UK.2010-4.RLTS.T157288A5071439.en. Downloaded on 02 July 2019.

Avramoski, O. (ed.) (2006a). *The Plan of Management for Pelister National Park. – Pelister National Park & Pelister Mountain Conservation Project*. Swiss Agency for Development and Cooperation (SDC) through the Pelister Mountain Conservation Project. 67 pp.

Avramoski, O. (ed.) (2006b). *The Plan of Management for Pelister National Park - Supplement. – Pelister National Park & Pelister Mountain Conservation Project*. Swiss Agency for Development and Cooperation (SDC) through the Pelister Mountain Conservation Project. 112 pp.

Aulagnier, S., Giannatos, G. & Herrero, J. (2008). *Rupicapra rupicapra. The IUCN Red List of Threatened Species 2008*: e.T39255A10179647. http://dx.doi.org/10.2305/IUCN.UK.2008.RLTS.T39255A10179647.en. Downloaded on 02 July 2019.

Boitani, L., F. Alvarez, O. Anders, H. Andren, E. Avanzinelli, V. Balys, J. C. Blanco, U. Breitenmoser, G. Chapron, P. Ciucci, A. Dutsov, C. Groff, D. Huber, O. Ionescu, F. Knauer, I. Kojola, J. Kubala, M. Kutal, J. Linnell, A. Majic, P. Mannil, R. Manz, F. Marucco, D. Melovski, A. Molinari, H. Norberg, S. Nowak, J. Ozolins, S. Palazon, H. Potocnik, P.-Y. Quenette, I. Reinhardt, R. Rigg, N. Selva, A. Sergiel, M. Shkvyria, J. Swenson, A. Trajce, M. Von Arx, M. Wolfl, U. Wotschikowsky, D. Zlatanova, (2015). *Key actions for Large Carnivore populations in Europe*. Institute of Applied Ecology (Rome, Italy). Report to DG Environment, European Commission, Bruxelles. Contract no. 07.0307/2013/654446/SER/B3.
http://ec.europa.eu/environment/nature/conservation/species/carnivores/pdf/key_actions_large_carnivores_2015.pdf

Boudot, J.-P. (2010). *Cordulegaster heros. The IUCN Red List of Threatened Species 2010*: e.T158700A5263990. http://dx.doi.org/10.2305/IUCN.UK.2010-1.RLTS.T158700A5263990.en. Downloaded on 31 August 2018.

Böhme, W., Lymberakis, P., Ajtic, R., Tok, V., Ugurtas, I.H., Sevinç, M., Crochet, P.-A., Haxhiu, I,, Sterijovski, B., Krecsák, L., Crnobrnja-Isailović, J., Kaska, Y., Kumlutaş, Y., Avci, A. & Jelić, D. (2017). *Ablepharus kitaibelii (amended version of 2009 assessment). The IUCN Red List of Threatened Species 2017*: e.T29691A115767606. http://dx.doi.org/10.2305/IUCN.UK.2017-2.RLTS.T29691A115767606.en. Downloaded on 30 June 2019

Campanaro, A., Redolfi De Zan, L., Hardersen, S., Antonini, G., Chiari, S., Cini, A., Mancini, E., Mosconi, F., Rossi de Gasperis, S., Solano, E., Bologna, M.A., Sabbatini Peverieri, G. (2017). *Guidelines for the monitoring of Rosalia alpina*. In: Carpaneto, G.M., Audisio, P., Bologna, M.A., Roversi, P.F., Mason, F. (Eds): *Guidelines for the Monitoring of the Saproxylic Beetles protected in Europe*. Nature Conservation 20: 165–203.
https://doi.org/10.3897/natureconservation.20.12728
https://www.researchgate.net/publication/319663834_Guidelines_for_the_monitoring_of_Rosalia_alpina

Cayuela, H., Arsovski, D., Bonnaire, E., Duguet, R., Joly, P., & Besnard, A. (2016a). *The impact of severe drought on survival, fecundity, and population persistence in an endangered amphibian*. Ecosphere 7(2). https://doi.org/10.1002/ecs2.1246

Cayuela, H., Arsovski, D., Thirion, J.-M., Bonnaire, E., Pichenot, J., Boitaud, S., Besnard, A. (2016b). *Contrasting patterns of environmental fluctuation contribute to divergent life histories among amphibian populations*. Ecology 97(4): 980–991. https://doi.org/10.1890/15-0693.

Cayuela, H., Arsovski, D., Thirion, J.-M., Bonnaire, E., Pichenot, J., Boitaud, S., Besnard, A. (2016c). *Demographic responses to weather fluctuations are context dependent in a long-lived amphibian*. Global Change Biology 22(8): 2676–2687. https://doi.org/10.1111/gcb.13290

EU Wildlife and Sustainable Farming project (2009). *Great Capricorn beetle – Cerambyx cerdo factsheet*. http://ec.europa.eu/environment/nature/natura2000/management/docs/Cerambyx%20cerdo%20factsheet%

20-%

Gimenez Dixon, M. (1996). *Phengaris arion. The IUCN Red List of Threatened Species 1996*: e.T12659A3371159. http://dx.doi.org/10.2305/IUCN.UK.1996.RLTS.T12659A3371159.en. Downloaded on 31 August 2018

Juste, J. & Alcaldé, J. (2016). *Rhinolophus euryale. The IUCN Red List of Threatened Species 2016*: e.T19516A21971185. http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T19516A21971185.en. Downloaded on 02 July 2019.

Juste, J. & Paunović, M. (2016). *Myotis blythii. The IUCN Red List of Threatened Species 2016*: e.T14124A22053297. http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T14124A22053297.en. Downloaded on 02 July 2019.

Kojola, I., Heikkinen, S. & Holmala, K. (2018). *Balancing costs and confidence: volunteer-provided point observations, GPS telemetry and the genetic monitoring of Finland's wolves*. Mammal Research 63(4): 415-423.

Nieto, A., Mannerkoski, I., Putchkov, A., Tykarski, P., Mason, F., Dodelin, B., Horák, J. & Tezcan, S. (2010a). *Cucujus cinnaberinus. The IUCN Red List of Threatened Species 2010*: e.T5935A11921415. http://dx.doi.org/10.2305/IUCN.UK.2010-1.RLTS.T5935A11921415.en. Downloaded on 29 June 2019.

Nieto, A. Mannerkoski, I., Pettersson, R., Mason, F., Méndez, M. & Schmidl, J. (2010b). *Lucanus cervus. The IUCN Red List of Threatened Species 2010*: e.T157554A5094499. Downloaded on 05 September 2018.

Pârvulescu, L. (2010). *Crayfish field guide of Romania*. Editura Bioflux, Cluj-Napoca.Austropotamobius torrentium (Schrank 1803). Crayfish of Romania. http://crayfish.ro/torrentium.html

Paunović, M. (2016). *Myotis capaccinii. The IUCN Red List of Threatened Species 2016*: e.T14126A22054131. http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T14126A22054131.en. Downloaded on 02 July 2019.

Piraccini, R. (2016). *Rhinolophus ferrumequinum. The IUCN Red List of Threatened Species 2016*: e.T19517A21973253. http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T19517A21973253.en. Downloaded on 02 July 2019.

Solano, E., Mancini, E., Ciucci, P., Mason, F., Audisio, P. & Antonini, G. (2013). *The EU protected taxon Morimus funereus Mulsant, 1862 (Coleoptera: Cerambycidae) and its western Palaearctic allies: systematics and conservation outcomes*. Conserv. Genet. 14: 683–694. DOI 10.1007/s10592-013-0461-3

Reißmann, K. (2010). *The Rosalia longicorn Rosalia alpina (LINNAEUS, 1758)* – In: *Beetle Fauna of Germany*. https://www.kerbtier.de/Pages/Themenseiten/enRosalia.html

Taylor, P. (2016a). *Rhinolophus blasii. The IUCN Red List of Threatened Species 2016*: e.T19515A21972073. http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T19515A21972073.en. Downloaded on 02 July 2019.

Taylor, P. (2016b). *Rhinolophus hipposideros. The IUCN Red List of Threatened Species 2016*: e.T19518A21972794. http://dx.doi.org/10.2305/IUCN.UK.2016-2.RLTS.T19518A21972794.en. Downloaded on 02 July 2019.

van Swaay, C., Wynhoff, I., Verovnik, R., Wiemers, M., López Munguira, M., Maes, D., Sasic, M., Verstrael, T., Warren, M. & Settele, J. (2010). *Parnassius mnemosyne. The IUCN Red List of Threatened Species 2010*: e.T174210A7029050. Downloaded on 31 August 2018.

Funded by the European Union

References

- EU IPA project “Strengthening the capacities for implementation of NATURA 2000 – EUROPEAID/136609/IH/SER/MK” (2016-2017)
- Standard Data Form (SDF) for Natura 2000 sites (http://cdr.eionet.europa.eu/help/natura2000)
- Plan of Management for Pelister National Park (2006)
- Draft Spatial Plan of Pelister National Park (2018)
- The Law of Nature Protection (2004-2016, Gazzette 67/07, 14/06, 84/07, 35/10, 41/11, 148/11, 59/12, 13/13, 163/13, 41/14, 149/15, 39/16)
- The Rulebook on the content of the management plans for the protected areas and annual programs for nature protection (2012, Gazette 26/11)
-

Funded by the European Union