Management Plan for
Shar Mountains National Park
for the Period 2022-2031

November 2022, Skopje

Project: "Achieving Biodiversity Conservation through the Creation and Efficient Management of Protected Areas and Integrating the Biodiversity into Land Use Planning", funded by the Global Environment Fund (GEF), and implemented by the United Nations Environment Program (UNEP), Vienna Regional Office and the Ministry of Environment and Physical Planning of North Macedonia as the main partner and beneficiary.

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Abbreviations

CBD	Convention on Biological Diversity
ESS	Ecosystem Services
EU	European Union
EU IPA	European Union Instrument for Pre-Accession Assistance
GEF	Global Environmental Facility
GIZ	Deutsche Gesellschaft für Internationale Zusammenarbeit
HD	EU Habitats Directive
IUCN	International Union for Conservation of Nature
METT	Management Effectiveness Tracking Tool
MoEPP	Ministry of Environment and Physical Planning
MP	Management Plan
MTC	Ministry for Transport and Communication
NP	National Park
PA	Protected Area
PONT	Conservation Trust Fund
PI	Public Institution
RNM	Republic of North Macedonia
SIDA	Swedish International Development Cooperation Agency
SMNP	Shar Mountains National Park
UNDP	United Nations Development Programme
UNEP	United Nations Environment Programme
USAID	United States Agency for International Development

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Cover photo: Anela Stavrevska-Panajotova

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This Management Plan is based on the experience and work of many experts who were in charge of preparation the Study of Valorization and the Socio-economic study for Shar Mountains. Further details about natural and socio-economic facts and values are widely explored in those documents.

During the process of elaborating this Management Plan, numerous actors involved from different sectors contributed to the design of programs and activities during the consultation meetings that were held in person and online.

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The United Nations Environment Program UNEP is the leading executive and implementing agency and helps the country to have sustainable environmental policies and practices.

The International Union for Conservation of Nature IUCN as a local partner has supported the coordination of this special project activity and has contributed to the knowledge base related to nature conservation and sustainable use of natural resources.

The next table enlists stakeholders that have actively contributed to the preparation of the MP:

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1. Executive summary

Shar Mountains is a European biodiversity hotspot and an area with outstanding natural values in the border area of North Macedonia and Kosovo). On the Kosovo side, a National Park has been proclaimed more than a decade ago, whereas on the Macedonian side, there have been several initiatives for protection of the Mountain over the past three decades.

The last and successful initiative was taken through the GEF funded project "Achieving Biodiversity Conservation through Creation and Effective Management of Protected Areas and Mainstreaming Biodiversity into Land Use Planning", financed by GEF, implemented by UNEP, with the Ministry of Environment and Physical Planning of North Macedonia as main partner and beneficiary. Over 70 national experts were included in the development of the Valorization Study, as the key document for the proclamation process. After the extensive stakeholders' consultation process, and with additional international expert support, the proposal for National Park has reached consensus with unanimous voting of the National Assembly for proclamation of the Shar Mountain National Park on June 30, 2021. The initiative is among the latest to offer the world a new protected area of 62 705 ha following IUCN criteria of category II, national park, with more than 75% of its territory in high protection. This Management Plan is drafted in the scope of the same GEF/UNEP/MOEPP project, with expert support by IUCN.

Protected areas nowadays face the challenge to do far more than only conserving natural values. They have the task of improving human wellbeing and providing economic benefits across multiple sectors, especially in protected areas with many mountain villages, such as the Shar Mountain national park. To fulfil such an ambitious mission, the new established Public Institution Shar National Park is facing a responsible task to close the process for adoption of this draft management plan. What is even more important is to ensure that the management plan is successfully implemented in the period of 2022 - 2031.

The management plan is a tool for the management of the national park to meet the different needs in the area while following legal obligations. This document is designed with an inter-disciplinary approach, bringing together experts and interested parties to discuss the future management of the protected area and was developed in a wide consultation process with the intention to ensure ownership among the management authority and other stakeholders.

This document follows the requirements of the Rulebook on the content of management plans of protected areas and annual nature protection programs (Official Gazette No. 67/04).

The Shar Mountains are a large highland massif extending over an area of north-western North Macedonia and southern Kosovo with a total area of about 2,500 square kilometers. The area is characterized by a large number of peaks above 2,000 m elevation with a rich geological diversity and it is formed through glacial and fluvial processes.

Within the boundaries of the National Park Shar Mountains there are 27 villages that in many cases have declining population and poor infrastructure. In administrative aspects the national park is situated in seven municipalities: Jegunovce, Tearce, Tetovo, Bogovinje, Vrapciste, Gostivar, Mavrovo and Rostusha. Most of the land is in state property.

The fauna in Shar mountains is rich with all kinds of taxonomic groups. In the areas freshwater habitats, 5 species of fish, 11 amphibians and 17 reptiles have been confirmed. Birds are the most diverse class of vertebrates with 128 species and 51 species of mammals are present.

Currently 662 species of diatoms, 1,260 species of vascular plants, more than 260 species of moss, 500 fungi and 160 lichens are known in the area of the national park.

Dominant tree species in area's forests are beech, hornbeam and oaks, accompanied by fir, elm, pine, spruce, alder and willow. Non-forest plant communities present in the area are: alpine and boreal areas, oromesic acidophilic pastures, eastern Mediterranean crushers, alkaline peatlands, hydrangea lowland and montane to alpine belts, alpine and subalpine limestone pastures, silicate rocky slopes with chasmophytic vegetation and silicate alpine and boreal pastures. The area's wetland habitats are: standing waters, surface runoff waters, littoral zone of terrestrial surface water bodies, valley peatlands, and different types of peat bogs.

The landscapes of the Shar Mountains are shaped by geological, fluvial and glacial processes and finally by human influence through the centuries. The different traditions and ethnic and cultural backgrounds of the local population have contributed to the diversity of ten different types of landscapes.

In terms of the socio-economic conditions, in the last census in the country in 2002 about 17,000 inhabitants were counted in the 27 villages of the park. This number is highly uncertain due to the recent trends of abandonment of rural areas.

Traditional agriculture has created a diverse and richly-structured landscape around villages, characterized by a mosaic of fields and meadows, usually with small plots and extensive use which has undergone massive changes through abandonment. Summer grazing is still present in the region but also strongly declining.

Most of the forests are state property and managed by the Public Enterprise National Forests based on 10-year special forest management plans. It will be a task for the Management authority to take over the management of the forests in the national park according to nature conservation objectives.

Seven hunting areas are established in the area. Six of these were managed by concessioners, while the state hunting ground was managed by the Public Enterprise National Forests. With the proclamation of the area as a national park, the new management authority is responsible to protect and manage the wild animals, including sanitary shooting. The national park should prepare a special wildlife management plan for protection and management of wild animals following principles of nature conservation.

Collection of wild plants and fruits, including medicinal plants and fungi, is a traditional practice and widely present activity in the Shar Mountains. There are at least 51 species of plants (e.g. *Sideritis scardica*) and a number of fungi that are collected for commercial purposes. The national park will have the responsibility also to manage these activities.

In one part of the area there is the well-known ski resort "Popova Shapka" with 4 small/ medium ski lifts and in the surroundings the construction of weekend houses is growing fast, which leads to problems with waste, wastewater, traffic and others.

Tourism is considered to be an important sector for economic development. At the moment some facilities for accommodation are existing. Mass tourism is present in the ski resort "Popova Shapka", while different types of alternative or adventure tourism are developing. These activities include summer and winter mountain sports like hiking, horse riding,

mountain biking, free ride skiing, ski touring and snow shoeing. Pressure on the natural values is identified from use of motorized vehicles.

Numerous species of plants were identified that are on IUCN Red lists, Annex II of the EU habitats directive, on the list of (strict) protected species in the country or other regimes of protection. Examples are: *Mannia triandra* and *Buxbaumia viridis* (mosses)*, Crocus scardicus, Gentiana lutea and Gentiana punctata, Lilium albanicum, Pinguicula balcanica, Pinus heldreichii, Pinus peuce, Potentilla doerfleri, Sempervivum kosaninii, Sideritis scardica* or *Silene schmuckeri* (vascular plants).

Numerous species of animals were identified that are on IUCN Red lists, Annex II of the EU habitats directive, on the list of (strict) protected species in the country or other regimes of protection.

Examples are: *Canis lupus, Lynx lynx balcanicus, Miniopterus schreibersii, Myotis blythii, Myotis myotis, Rupicapra rupicapra* or *Ursus arctos* (mammals);

Accipiter nisus, Aquila chrysaetos, Bubo bubo, Corvus corax, Coturnix coturnix, Crex crex, Falco peregrinus, Falco Subbuteo, Falco tinnunculus, Gyps fulvus, Oriolus oriolus, Otus scops, Pernis apivorus, Pyrrhocorax graculus, Pyrrhocorax pyrrhocorax, Tetrao urogallus or *Tetrastes bonasia* (birds);

Bombina variegate, Bufotes viridis, Coronella austriaca, Dolichophis caspius, Hyla arborea, Lacerta agilis, Lacerta trilineata, Lacerta viridis, Natrix tessellate, Podarcis erhardii, Podarcis muralis, Rana dalmatina, Rana graeca, Testudo graeca, Testudo hermanni, Triturus macedonicus, Vipera ammodytes, Vipera ursinii or *Zamenis longissimus* (reptiles and amphibia);

Aricia anteros, Carcharodus floccifera, Coenonympha tullia, Cupido decoloratus, Erebia (epiphron) roossi, Euphydryas aurinia, Euphydryas maturna, Hipparchia statilinus, Iolana iolas, Lycaena dispar, Melitaea aurelia, Parnassius apollo, Parnassius mnemosyne, Phengaris (Maculinea) arion, Plebejus pylaon, Polyommatus damon, Polyommatus dorylas, Polyommatus eros eroides, Pseudophilotes vicrama, Thymelicus action or Zerynthia cerisy (butterflies);

More than 20 habitats from EU Habitats Directive Annex I were identified in the area, among them rivers and wetlands, grasslands, forests and chasmophytic habitats.

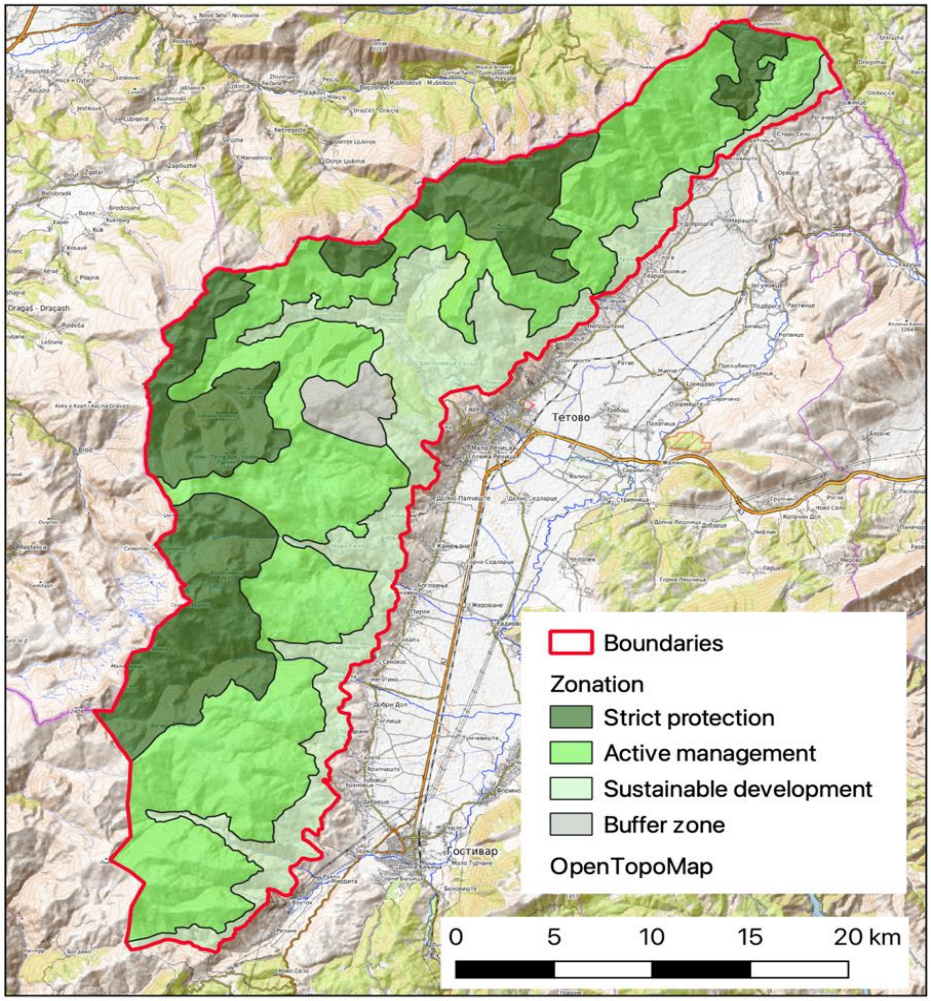
Due to changes in society, the Shar Mountains have come under anthropogenic pressure. This causes threats to natural values:

- Abandonment of traditional land use practices and the use of natural resources, altering and reducing the area in terms of diversity
- Unregulated building, and construction of infrastructure (opening of roads, weekend houses, catering facilities, tourism infrastructure, etc.)
- Illegal and uncontrolled felling, hunting and fishing
- Unsustainable use of certain medicinal and aromatic plants and fungi
- Unsustainable use of water resources (especially for electricity production)
- Unregulated use of motorized vehicles.

The main negative impacts on the natural values of Shar Mountains are:

- Conversion of habitats caused by the threat of abandoning traditional practices in the use of natural resources. For example, the overgrowth of agricultural land with bushes and ferns leads to a decrease of biological diversity.
- Conversion of habitats through the threat of illegal logging.
- Disruption of ecological processes in river ecosystems which is caused by construction of infrastructure for energy production with hydro power plants.
- Loss and destruction of habitats through unregulated urbanization and construction of infrastructure, like for example the building of roads, of houses and other facilities.
- Changes in the abundance of plant species through the threat of reckless collection of certain medical and aromatic plants.
- disturbance, reduction of populations or even loss of species through the threat of illegal hunting of wildlife.
- disturbance of species through tourism.

According to the Law of Nature Protection, 4 zones are designed and described: strict protection, active management, sustainable development and a buffer zone for the ski resort. A detailed list of restrictions of activities for each zone is presented in the management plan.



Picture 1: Borders and zonation of the park

The management plan presents a vision for the national park which expresses the importance of the need for protection of natural values and at the same time proposes the involvement of local population and shows the potential for touristic opportunities to bring sustainable economic development into the region.

The core of the management plan are 8 programs with subprograms and detailed activities in a 5-year operational plan. The 8 programs are:

1. Natural Heritage Conservation and Monitoring,
2. Sustainable Management of Natural Resources,
3. Management of Habitats and Ecosystems,
4. Management of Cultural Heritage,
5. Development of Sustainable Tourism,
6. Local Development,
7. Information, Raising Public Awareness and Education,
8. Governance, Management, Work Organization and Financing.

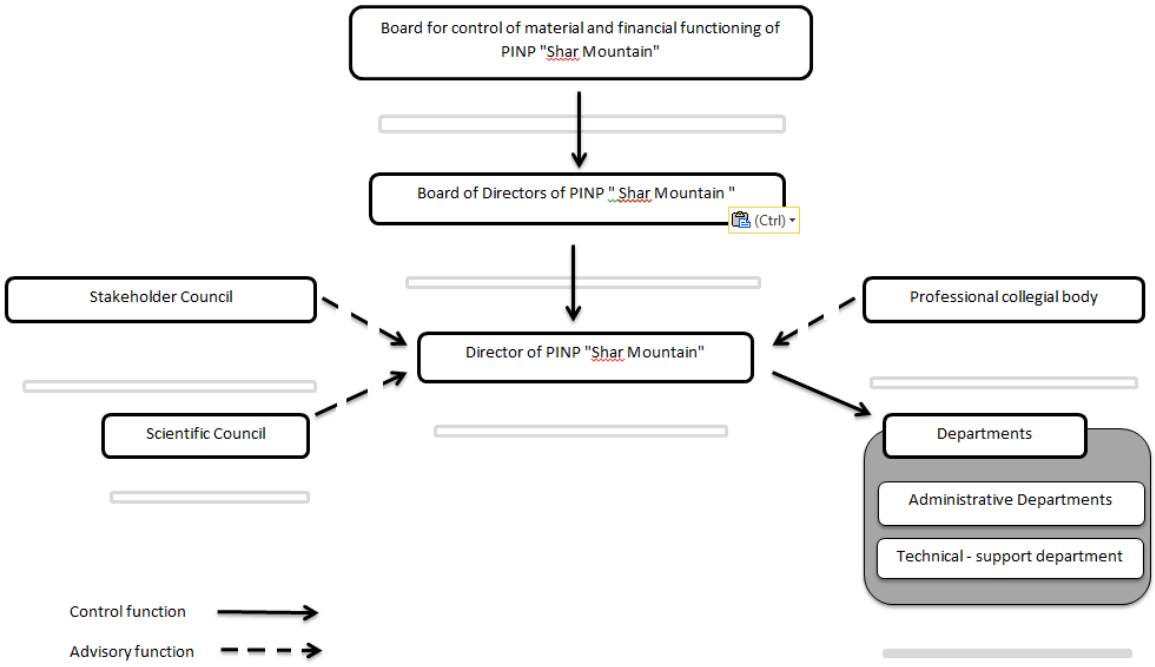
The Public Institution National Park Shar Mountains was established with a governmental decision (Official Gazette 175/2021). According to this decision, the management structure includes the following bodies:

- Management board,
- Operational board director,
- Expert board,
- Board for control of the physical and financial implementation.

The competences, structure, organization, and the responsibilities of these bodies will have to be defined in the statute of the PI (2021), in accordance with the Law on Nature protection and the Proclamation Law for Shar Mountains National Park.

Several mechanisms for consultation with stakeholders are presented in the management plan to achieve strong support from interested parties in the future. Some important advantages for public involvement in SMNP are in monitoring and research, fighting illegal activities, access to community knowledge or improved decision making by the national park. Examples for such mechanisms are regular platforms for exchange and collaboration, study trips, conferences and fairs on international level or transboundary collaboration with other protected areas.

The management plan presents a proposal for a structure of the Public Institution with several departments and staff, including detailed description of tasks and training needs of staff.



Picture 2: Organogram of the Public Institution

According to the Regulation on internal organization of Public Institution National Park Sar Mountain, the institution has four organizational units - Departments, as follows:

1. Department for Legal, Economic and General Affairs,
2. Department of nature protection,
3. Department for sustainable use of natural resources,
4. Department for Alternative Activities and Environmental Education.

Each department has a manager and employees. The foreseen number of executors, the special conditions necessary for the performance of certain works and tasks, as well as the job descriptions according to the tasks and organizational parts are determined by the Regulation on the systematization of jobs in the PI.

From here in the department for legal, economic and general affairs are foreseen 12 jobs, in the department for nature protection 19 jobs, in the department for sustainable use of natural resources are provided 13 jobs while in the department for alternative activities and ecological a total of 5 jobs are foreseen. Given the lack of previous experience in the required number of employees for whom at the same time the institution will be able to provide permanent funding, as a start the PI will operate with fifty employees. If, during the work, there is a need to increase the number of employees for whom the institution will be able to provide adequate funding, this number may increase.

Related to this proposed structure a budget was prepared.

Overview of costs within the regular operations:

Positions in regular operations	Amount	Cost per unit MKD	Total cost MKD / year	Total cost EUR / year
Salary / staff * month (900 EUR)	50	60,000	36,000,000	585,365
Office workspace 12m^2 + PC + etc. (300 EUR/month)	40	20,000	9,600,000	156,097
Cars (600 EUR/month)	15	36,000	6,480,000	105,365
Uniforms + equipment rangers (30 EUR/month)	20	2,000	480,000	7,804
Other costs (3000 EUR/ month)	1	180,000	2,160,000	35,121
Total / year			**54,720,000**	**889,752**

Table 1: Overview of regular operating expenses

Estimation of costs for collaboration with external experts for operational programs:

Projects with external collaboration	No. of Activities	Average cost EUR/ year	Total cost MKD / year	Total cost EUR / year
Projects priority 1 with external support	35	15,000	32.287,500	525,000
Projects priority 2 with external support	70	15,000	64.575,000	1,050,000
Projects priority 3 with external support	25	15,000	23.062,500	375,000
Total / year				**1,950,000**

Table 2: Estimation of the expenses for external experts for operational programs

*This amount will be provided by international and national donor programs, through activities implemented by other legal entities or individuals.

Several sources / donors / organizations should be considered for support of the operations of the national park:

- National funds (government);
- Ecosystem services payments: Fees collected from sustainable use of natural resources according to MP as well as fees from entities that provide services in the NP territory (tour operators, small hydro power plants, power lines, hotels, tour operators, show cat free ride skiing, etc.);
- PONT;
- EU IPA;
- EU cross-border program;
- GIZ;
- GEF;
- UNDP;
- UNEP;
- SIDA;
- USAID;
- Swiss cooperation;
- Other international donors;
- Private sector sponsorship;

2. Introduction

The Shar Mountains are a mountain range spanning north-western North Macedonia and southern Kosovo. The area has a wealth of natural values and biological diversity. It is rich in forests, pastures, glacial lakes, watercourses, and diverse geomorphology. The Macedonian part of the range covers 840.2 km², and its highest peak is Titov Vrv, at 2,748 m above sea level. The northern part, located in Kosovo, was declared a national park more than ten years ago.

Pressures on biodiversity, however, are mounting. The country is at a crossroads between intensive economic development (intense exploitation of natural resources, expansion of land under agriculture, uncontrolled construction and urban development, etc.) and the continuous destruction of natural values.

In response, the expansion of the national network of protected areas and the strengthening of capacity for its effective management are being pursued as an approach to protect biodiversity.

In order to protect the natural values present in the Shar Mountains, the Government of the Republic of North Macedonia requested the United Nations Environment Program (UNEP) to support an initiative to declare the Shar Mountains a protected area in the category 'National Park'.

Funding was provided through the Global Environment Facility, under of the project: "Achieving Biodiversity Conservation through Creation and Effective Management of Protected Areas and Mainstreaming Biodiversity into Land Use Planning", implemented by UNEP, in partnership with the Ministry of Environment and Physical Planning as the main beneficiary. The process for proclaiming the Shar Mountains as a national park was carried out within this project and encompassed the preparation of the necessary documentation, consultations, and promotional activities.

As a result, on 30th of June 2021, a decision was made by the Assembly of North Macedonia to proclaim a national park in the Shar Mountains. The Law for the proclamation of part of the Shar Mountains as a national park requires that a management plan be adopted, by the public institution governing the protected area, within one year of the law's date of enactment (6th July 2021).

As such, the following step is the preparation of a draft management plan. The Shar Mountains National Park Management Plan will support three main results: (1) Expansion of the national network of protected areas, (2) Increased effectiveness in biodiversity management and (3) Inclusion of biodiversity in land use planning.

The overall aim of the management plan is to systematically preserve natural values, by carefully analyzing direct and indirect pressures and threats, and addressing them by implementing appropriate policies. The management plan also includes various approaches to support sustainable social and economic development and increase benefits to the local population.

The Shar Mountains National Park Management Plan has been prepared by drawing on two studies completed by a multidisciplinary team of experts and with the involvement of MoEPP and UNEP:

- Study of Valorization for the Shar Mountains (2020)
- Socio-economic study for the proposed Shar Mountains National Park (2020)

The expected results of the management plan are improved conservation of natural values in North Macedoniaby expanding the national network of protected areas and improving governance by creating sound policies and strengthening relevant capacity, and improved land use planning and management, with the full inclusion of local stakeholders in the overall process.

2.1. Legal Background

2.1.1. National legislation

The highest legal document in the country is the Constitution of the Republic of (North) Macedonia ("Official Gazette of the Republic of Macedonia" no. 52/91, as amended), which sets out the basic principles of environmental protection. The need to protect nature and the environment is one of its fundamental principles.

All natural resources in the Republic of North Macedonia, including flora, fauna, and natural heritage are of public interest and enjoy special protection. The Republic guarantees the protection, promotion and enrichment of the historical and artistic wealth of the country.

Two laws in particular concern the conservation and management of the country's natural resources:

The Law on the Environment ("Official Gazette of the Republic of Macedonia" no. 53/05, as amended) is a framework law in the field of the environment. This law, together with relevant bylaws, regulates the implementation of environmental and strategic environmental impact assessment procedures.

The Law on Nature Protection ("Official Gazette of the Republic of Macedonia", 67/04, as amended) is one of the most important components of national environmental legislation. It regulates the conservation of nature through the protection of biological and landscape diversity and the protection of natural heritage, within and outside protected areas, as well as the protection of natural rarities.

2.1.2. Law for Proclamation of Shar Mountains National Park

The Law for the Proclamation of Shar Mountains National Park was published on 6 July 2021 in the Official Gazette (151/2021). The proclamation of the national park also calls for the establishment of a management body, responsible for the management of the protected area based on a management plan. This plan will define measures and activities for the protection of the characteristic natural values within the park, as well as the planning and management of its area.

According to Article 17 of the law, this newly-established management institution must prepare an annual programme within three months of the date of proclamation, and a management plan within one year of the same date.

2.1.3. Relevant international agreements

The Republic of North Macedonia is a signatory to the UN Convention on Biological Diversity (with Cartagena and Nagoya Protocols) which sets out three goals: the conservation of

biodiversity, sustainable use of its components and fair and equal sharing of the benefits of the use of genetic resources. In addition to the CBD, North Macedonia has also ratified the following relevant international agreements:

- Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention);
- Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention);
- Treaty on the Conservation of European Bat Populations (EUROBATS);
- Convention for the Protection of the World Cultural and Natural Heritage (UNESCO World Heritage Convention);
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, the Washington Convention);
- European Landscape Convention;
- United Nations Framework Convention on Climate Change (UNFCCC).

2.2. Preface

According to the Law for Nature Protection, a protected area's management body is responsible for the preparation and adoption of a management plan, with the prior consent of MoEPP.

The management plan shall be the result of an efficient, streamlined process that includes the participation of all relevant and interested stakeholders, and will enable the management body to effectively and efficiently manage the protected area.

The management plan contains an operational component, which identifies activities in programs and subprograms, together with defined timeframes and required competencies. The plan defines measures and activities for the protection of the characteristic natural values of the protected area, as well as the management of the area within its boundaries.

3. Description of the Area

3.1. General Information

The Shar Mountains are a large highland massif extending over an area of north-western North Macedonia and southern Kosovo. Within its natural borders it covers an area of 2,480 km^2 of which 881 km^2 or 35.5% fall within the Republic of North Macedonia. The part of the Shar Mountains that is subject to this management plan has an area of 627 km^2.

The mountains are characterized by a large number of peaks above 2000 m elevation. The glacial and fluvial relief has produced an area with a high density of valleys and gorges, including short canyons cut into limestone, quartzite and granitoid rock, as well as outstanding geological diversity.

Many of the rivers on the Macedonian side descend steeply with great longitudinal fall, giving rise to numerous rapids. These include the Rivers Vratnicka, Belovishka, Gabrovnica, Tearechka and Bistrica, and tributaries of the Pena including the Rivers Skakalska, Lesnicka

and Krivoshijska, some of which have impressive waterfalls (including Belovishka, Vratnicka, Krivoshijka, Leshnicka and Bogovinska).

More than 10% of the Shar Mountains are composed of carbonate rocks (mainly marble and limestone). In these areas, especially in the limestones of the Pena Valley, numerous caves have been identified and larger speleological structures are to be expected.

There are more than 25 villages within the boundaries of the national park, which can be reached on asphalt roads. Many roads in the area are unpaved or in poor condition, and suitable only for four-wheel drive vehicles. All villages in the area have declining populations due to rural to urban migration. There is significant room for improvement in local infrastructure and services.

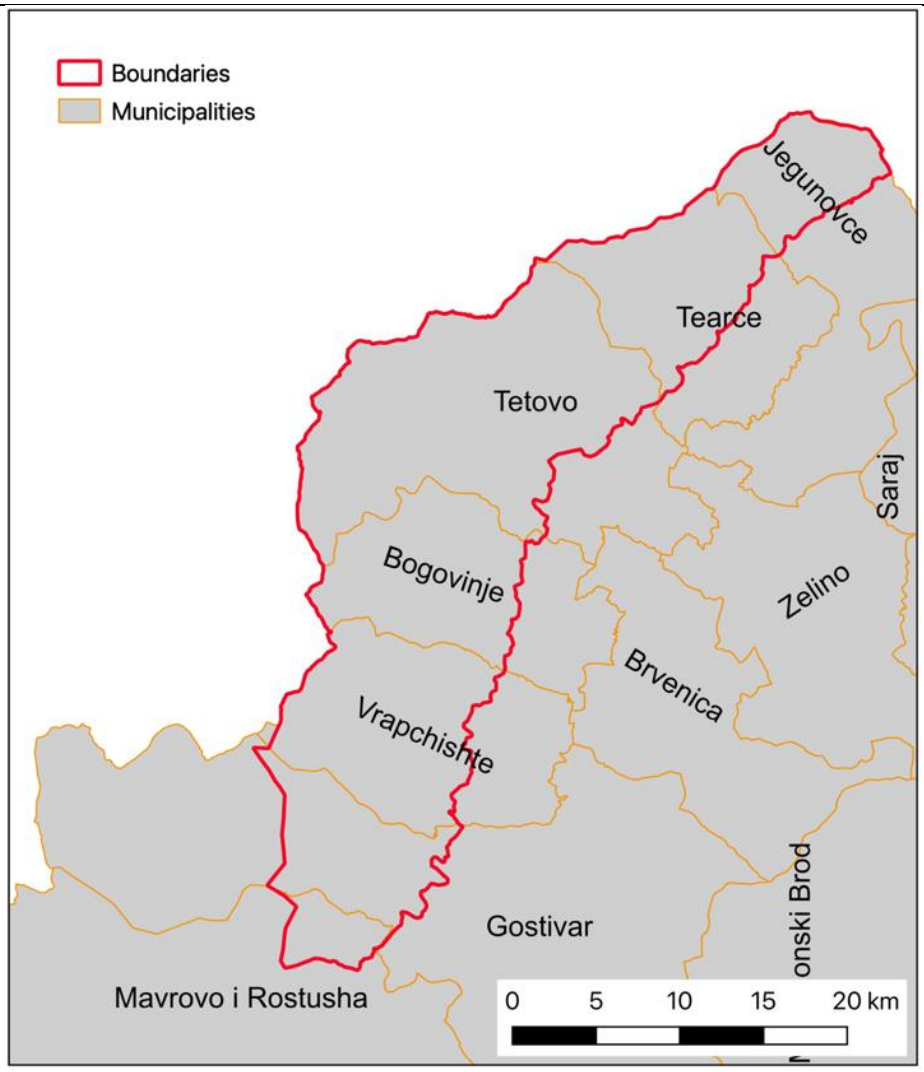
3.1.1. Geographic Location and Administrative Boundaries

The Shar Mountains are a massif straddling the border between north-western North Macedonia and southern Kosovo.

The mountain range extends from Luboten peak (2,498 m above sea level) in the northeast, to the ridge of Mount Nichpurska and the Bunec Pass (towards the Mavrovo Valley) in the southwest, more than 60 km as the crow flies. To the east and southeast, the range descends to the Polog Valley. The closest major cities are Tetovo and Gostivar.

SMNP'S borders are detailed in the Law of Proclamation, approved on 7 July 2021 (Official Gazette 151/21).

The Macedonian part of the Shar Mountains fall under the administration of seven municipalities: Jegunovce, Tearce, Tetovo, Bogovinje, Vrapciste, Gostivar, Mavrovo and Rostusha. The largest portion is in the Municipality of Tetovo (220 km^2), and the smallest (26.4 km^2) in Mavrovo and Rostusha.



Map of boundaries of municipalities in the Shar Mountains

Picture 3: Map of the borders of the Municipalities which are located in the territory of Sar Mountain

3.1.2. Land Ownership

The land within the borders of SMNP is under state and private ownership. Accurate land registry data are owned and maintained by the Agency for Real Estate Cadastre. The NP management body should gather data on land ownership, as this will be important for the future operations.

Most of the land within the park is state-owned and leased under concession, especially pastures, fishing grounds, hunting grounds, surface mines for the extraction of mineral resources, as well as small hydro power plants. With the proclamation of the national park, the protected area management body is responsible for the management of entire territory of the protected area, in accordance with Article 135, paragraph 6, and Article 135a of the Law on Nature Protection (Official Gazette of RM no. 67/04, as amended).

The area's forests are under both state and private ownership (which also includes land owned by religious groups). State-owned forests are managed by entities appointed by the government, in this case the national park Management Authority. Privately owned forests

are managed by their owners, on the basis of predefined criteria and adopted management plans.

3.2. Environment

3.2.1. Geology and Geomorphology

The Shar Mountains' geological structure is dominated by Paleozoic metamorphic rocks with low resistance, which influences their relief characteristics. In some places, metamorphites (quartzites, marbles) appear into the relief (e.g. Leshnica). in others there are breakthroughs of harder granitoid rocks. Carbonate rocks occur on about 11% of the mountains' surface and are affected by karstification. The Shar Mountains are characterized by a very complex tectonic structure. It is compressed by the Adriatic Plate and the Albanids in the west, as well as by the Pelagonian from the east (as a craton zone). Geological relief indications show that the most intense scattering and uplift occurred at the end of the Miocene and through the Pliocene, and the same continues today, with an average elevation of about 1-2 mm / year.

In terms of morphometric characteristics, the mountains vary in altitude between 470 m (Polog Valley) and 2,747 m (Titov Vrv). The Shar Mountains have an average slope of approximately 25° and extend in a NE-SSW-S direction, over a length of 75 km.

From the relief types, fossil and recent forms are present in the Shar Mountains. One of the characteristic morphological elements of the Shar Mountains is fluvial reliefs. There are many V-shaped valleys, formed by intensive vertical cutting, and numerous gorges, some with short canyon segments cut into very solid rocks (limestones, quartzites, granitoids). Some valleys have a fluvio-glacial character.

Due to the large altitudinal difference between the mountains and the Polog Valley, the longitudinal fall of the rivers is significant, creating rivers with numerous rapids and waterfalls.

The occurrence of karst relief in the Shar Mountains is due to the 11% of the range is composed of carbonate rocks (mainly marble and limestone). Between 2017 and 2019, the entrances of 10 caves and several precipices were recorded, mainly in the limestones of the Pena valley, and larger speleological objects are to be expected.

The Shar Mountains have many glacial traces. Research so far has identified over 50 cirques, of which 8 are mega-cirques and 28 valleys including U-shaped valleys (some of which have glacial shoulders), numerous front and side moraines, terminal basins, drums, sea urchins, mutonated rocks, etc.

3.2.2. Hydrology

The Shar Mountains have numerous hydrological features which contribute to its geodiversity and biodiversity. The area features more than 100 springs, and 20 river basins including their main watercourses and tributaries, as well as many glacial lakes.

The major river basins are the Dufska, Vrutnicka, Jelovjanska, Kamenjska, Uliverichka, and Pena, all of which flow into the River Vardar. The larger glacial lakes are Lakes Bozovacko, Belo Ezero, Bogovinsko, Karanikolichko, Krivoshisko, and Crno Ezero.

3.2.3. Climate

The average annual air temperature at Popova Shapka (1,780 m MSL) is 4.8 °C. The average maximum and minimum are 30.6 °C and -23.0 °C.

The park's average annual precipitation is about 700 mm, reaching up to 1,250 mm in the mountains.

3.2.4. Soils

In the Polog Valley, the lowest lying land in the area, fluvisols are the dominant soil type. In hilly terrain, regosols and cinnamon soils are common, and in mountainous terrain, leptosols, brown soils on limestones and dolomites, brown forest soils, limestone-dolomite mulberries and rankers are found. The following soil complexes also occur in the park: limestone-dolomite mulberry and leptosol, brown forest soil and ranker, brown forest soil ranker and leptosol, ranker and regosol, regosol and leptosol.

3.2.5. Erosion

Considering the area's topography, in the high mountain, subalpine and alpine zone, several processes of erosion are present: avalanches, landslides, decays, glacial and karst forms of erosion.

Surface erosion often occurs in the vicinity of settlements, generally on opposite side of the settlements, as well as inside the catchment areas, where vegetation is affected.

Rock decay (decay erosion) are present in all analyzed mountain massifs, especially in the mountainous, high mountain, subalpine and alpine areas.

Landslides are episodic processes of movement of large land masses on the slopes of hilly or mountainous regions or riverbanks and have been recorded in most of the catchment areas.

Fluvial-river erosion is present in the riverbeds of watercourses and is a result of the erosion caused by flowing waters. It causes the kinetic-erosive energy of the flowing waters of the watercourses. The sedimentation process generally begins in the highest parts of the basin and riverbed, where the largest sediments are deposited, while the smallest fractions reach the final recipient, the Vardar River.

3.2.6. Fauna

The Shar Mountains are home to a large variety of invertebrates including Platyhelminthes, Nematoda, Nematomorpha and Annelida. 56 species of Mollusca have been recorded, including 4 endemic species, as well as also almost 300 species of Pseudoscorpiones, Arachnida and Crustacea, including several endemics. A total of 1,847 species of insect have so far been recorded, including more than 900 butterfly species, mostly Nocturna, and about 160 Carabidae species.

In the areas freshwater habitats, 5 species of fish, 11 amphibians and 17 reptiles have been confirmed.

Birds are the area's most abundant class of vertebrates, represented by 128 species. In particular, various birds of prey are found: Golden eagle, White-headed vulture, Egyptian vulture.

51 species of mammals are present, including brown bear, Eurasian (Balkan) lynx, wild cat, Eurasian otter, wild boar, chamois, roe deer, wolf, red fox, European badger, and species of marten.

3.2.7. Flora

Currently 662 species of diatoms, 1,260 species of vascular plants, more than 260 species of moss, 500 fungi and 160 lichens are known in the Shar Mountains.

3.2.8. Habitats

Due to the diversity of geological formations and historical geological development, as well as the continuous presence of humans over millennia, the area has rich flora and diverse habitats.

Dominant tree species in area's forests are beech, hornbeam and oaks, accompanied by fir, elm, pines, spruce, alder and willow.

Non-forest plant communities present are: alpine and boreal areas, oromesic acidophilic pastures, eastern Mediterranean crushers, alkaline peatlands, hydrangea lowland and montane to alpine belts, alpine and subalpine limestone pastures, silicate rocky slopes with chasmophytic vegetation and silicate alpine and boreal pastures.

The area's wetland habitats are: standing waters, surface runoff waters, littoral zone of terrestrial surface water bodies, valley peatlands, different types of peat bog.

3.2.9. Ecosystems

The following natural ecosystems are found in the Shar Mountains:

1. Lake ecosystems (surface standing water ecosystems, including reservoirs, larger ponds and glacial lakes);
2. River ecosystems (surface running water ecosystems, including streams);
3. Mountain peat ecosystems (acid fens);
4. Mountain swamp ecosystems (base fens);
5. Mire and swamp ecosystems (including saline swamps);
6. Ecosystems of mesophilic and seasonally wet pastures and meadows;
7. Mountain pasture ecosystems (including subalpine and alpine pastures, as well as rocky pastures);
8. High-mountain dwarf shrub ecosystems;
9. Mountain shrub ecosystems;
10. Degraded forest ecosystems (including pseudomaquis, woody matorral, thermo-Mediterranean heaths-garrigues);
11. Riparian and marshy shrub ecosystems;
12. Deciduous forest ecosystems (deciduous forests);
13. Coniferous forest ecosystems;
14. Mixed deciduous and coniferous forest ecosystems;
15. Cave ecosystems (including water bodies in them);
16. Rocky and stony ecosystems (including rocks, rocky terrain and screes);
17. Ecosystems with or without very sparse vegetation (including eroded regions);
18. Agricultural agroecosystems;
19. Aquatic agro-ecosystems (fisheries);

20. Urban ecosystems;
21. Ecological systems of rural settlements;
22. Ecological systems of mining and industrial excavations;
23. Ecological systems of completely artificial water bodies;
24. Environmental systems of waste deposits and landfills.

A comprehensive description of Ecosystem Servcies (ESS) is presented in the Socio-Economic Study for the National Park. Three different types are described and financially assessed: supplying, regulatory and cultural.

Supplying ecosystem services refer to biomass and other resources derived from various ecosystems that meet human needs for everyday life, more specifically food, raw materials, fresh water, genetic resources and medicines. Examples are agricultural production, animal production or forest production.

Regulatory ecosystem services refer to the regulation of various ecological processes that contribute to a functional ecosystem, more specifically climate and air quality regulation, carbon storage, natural disaster control, wastewater treatment, erosion protection and soil fertility maintenance, pollination and biological control.

Cultural and ecosystem services refer to natural ecosystems that are vital and culturally important to humans because they provide places for recreation, spiritual enjoyment, and aesthetic value. These services are valuable for recreation and health of the population and tourists. They include aesthetic values and inspiration for culture, art and design, spiritual experience.

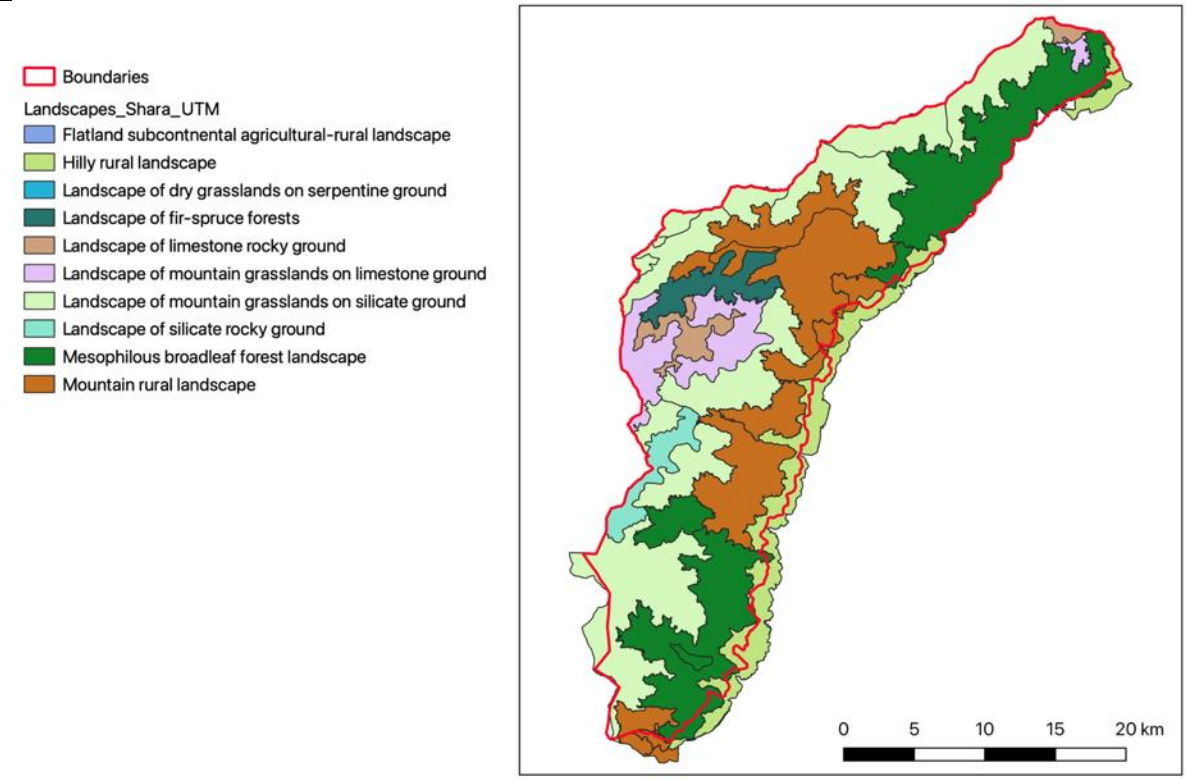
The ESS are relevant for the future financing of the National Park Administration.

3.2.10. Landscapes

The landscapes of the Shar Mountains are shaped by geological, fluvial and glacial processes and finally by human influence through the centuries. The different traditions and ethnic and cultural backgrounds of the local population have contributed to the diversity of landscapes.

Melovski et al. (2010) defined the types of landscapes in the Shar Mountains:

- Flatland subcontinental agricultural-rural landscape;
- Hilly rural landscape;
- Landscape of dry grasslands on silicate ground;
- Landscape of fir-spruce forests;
- Landscape of limestone rocky ground;
- Landscape of mountains grasslands on limestone ground;
- Landscape of mountains grasslands on silicate ground;
- Landscape of silicate rocky ground;
- Mesophilous broadleaf forest landscape;
- Mountain rural landscape.



Landscapes of the Shar Mountains (Melovski et al. (2010)

Picture 4: Landscapes which are located in Shar Mountain (Melovski and others (2010)

3.3. Socio-economic Characteristics

3.3.1. Local Communities and Populations

Shar Mountains National Park falls within seven municipalities in the Polog Region: Bogovinje, Gostivar, Jegunovce, Mavrovo and Rostushe, Tearce, Tetovo, and Vrapchishte. Gostivar and Tetovo are the main population centers.

The population in the seven municipalities:

Municipality	Total resident population
Bogovinje	22 906
Gostivar	59 770
Jegunovce	8 895
Mavrovo and Rostusha	5 042
Tearce	17 694
Tetovo	84 770
Vrapchishte	19 842

The following table lists the villages in SMNP by municipality:

Municipality	Populations of villages in SMNP
Bogovinje	Gorno Palchishte, Jelovjane, Novo Selo, Rakovec, Selce Kech, Urvich
Gostivar	Brodec, Dolno Jelovce, Gorno Jelovce, Pechkovo
Jegunovce	No villages in the NP
Mavrovo and Rostushe	Duf
Tearce	Brezno, Prvce
Tetovo	Bozovce, Lavce, Lisec, Gjermo, Selce, Setole, Shipkovica, Vejce, Veshala
Vrapchishte	Gjurgjevishte, Gorjane, Kalishte, Lomnica, Pozarane

Table 3: Municipalities and villages in the park

3.3.2. Land Use

3.3.2.1. Farming and livestock grazing

Farming is characterized mainly by the cultivation of agricultural, horticultural, cereal and other crops for domestic use. Depending on sectoral definitions, approximately 10% of the NP area is agricultural land. Traditional agriculture has created a diverse and richly structured landscape around villages, characterized by a mosaic of fields and meadows, usually with small plots and extensive use.

Mountain pastures, used in summer (transhumance), cover approximately 45% of the area. They are found in the alpine and subalpine zones and include wetlands, rivers and rocky areas. These pastures are traditionally used for sheep grazing and rearing. Sheepfolds are common in high mountainous areas. Cattle rearing is practiced in the immediate vicinity of villages. As a result of continuing rural to urban migration, the intensity of use of mountain pastures is strongly decreasing. There are around 2,500 head of cattle 50,000 sheep and 1,500 goats in the farms and smallholdings around the mountain villages. The average flock size is around 200 sheep.

3.3.2.2. Forest Management

Forests, as natural resources and providers of ecosystem services, provide highly valuable economic, social and environmental functions. Though most forests are state-owned, there are also privately owned forests that are used by their owners primarily for fuelwood production. Unsustainable practices in the past have led to visible overuse in some areas of SMNP. Illegal harvesting of timber occurs in SMNP and prevention measures are required.

SMNP has diverse forest types, which are predominantly deciduous. About 75% of the park's forests are single tree species forests, mostly beech or oak. These beech and oak forests form two distinct zones or belts, at different elevations. Other tree species present include fir, chestnut, spruce, mountain maple, hornbeam, hop-hornbeam, as well as endemics, including Macedonian pine - *Pinus peuce* Griseb., Bosnian pine - *Pinus heldreichii* Christ and Heldreich's maple - *Acer heldreichii* Orph. Ex Boiss.

Mixed forests, though accounting for less of the park's area, are important as they are highly biodiverse. The mixed forest, comprised of more than six tree species in the strictly protected zone of Mazdracha, is a rare and important example that deserves protection.

There are 13 forest associations described in the Shar Mountains, their distributions related to altitude, climatic and site conditions. Calimintho grandiflorae – Fagetum accounts for 41.5% of the forest area, while Festuco heterophyllae-Fagetum occupies 25.3%. The ass. Orno-Quercetum petreae is the third most common, with 13.4% of the total forest area.

The hornbeam forests are of relict and endemic origin and should be protected in order to preserve their natural state. Many economically non-important forests and tree species have great environmental significance and contribute to the biodiversity of the NP. Their management should be appropriate to their environmental roles.

In other forests such as the ass. Abieti-Piceetum scardicum, a unique type of forest association with special scientific significance, no management measures should be taken except for scientific research.

Other areas of the national park have been planted, some with autochthonous species such as white pine, other with allochthone species such as black pine and black locust tree.

These allochthone species cover a very limited area, and succession of autochthonous species is noticeable in the undergrowth. Such areas should be closely monitored, to inform future decisions as to whether they should be left in their current state, or converted to forests of autochthonous tree species. Past forest management and overuse practices have led to 75.2% of the forests in the NP today being coppice forests, mainly oak, hornbeam, as well as some beech and chestnut forests. This ratio is extremely unfavorable and has greatly disrupted the naturalness and quality structure of forests. Therefore, in the future, measures should be taken for more intensive cultivation, care and revitalization of forests in order to create conditions for improving their structure and translation into natural tall tree form, or in forests of generative origin.

The average annual growth is 1.86 m^3/ha while the average total annual growth is estimated to be 34,123 m^3. With such relatively low annual growth and wood mass production, the forests in the national park are in great need of habitat restoration. At the same time, they have an important social function as a resource of economic interest to the local population. About 90% of the annual harvest is supplied as firewood to the of the Polog Region, as well as an unknown additional amount extracted through illegal logging.

The management and sustainable use of the forests for economic purposes is done in accordance with the Law on Forests and 10-year special forest management plans. The current management plans focus on the economic use of the forest as a resource, while future management practices should focus on forest conservation or the management of forest habitats. The total area under forests is 18,332.11 ha, divided into five forest management units, each with its own 10-year special forest management plan.

The table below shows the extent of forest management units and their management plans' validity periods.

Forest Management Unit	Forest area (ha)	Forest management plan validity
Novo Selo 2 - Popova Shapka	1,925.70	2026
Shar Planina - Bistrica	5,653.10	2029
Lesnichka Shuma	2,287.03	2028
Ljubotenska Reka	1,519.58	2026
Duf - Mazdracha	6,946.70	2023
Total	**18,332.11**	

Table 4: Преглед на површините под шума и важност на плановите на ШСЕ

In previous years, the annual harvest was around 18,388 m^3. This should be significantly reduced in the NP.

After the national park is established, a full forest inventory should be conducted and a new forest management plan should be prepared following the principles of nature conservation and according to PA's zonation:

- No intervention in the strictly protected zone, except in exceptional cases, with the approval of MoEPP;
- Forest interventions in the active management zone may be performed if they are planned and approved in the special forest management plan. Such operations should be permitted when necessary for habitat management and when in line with conservation objectives. They include intensive cultivation, care and revitalization of forests in order to create conditions for improving their structure and translation from low into high forests;
- Operations in the sustainable zone may be performed if planned and approved in the special forest management plan.

Clear cuts are not allowed in any zone of protection.

Until special forest management plans are prepared, intermediate measures should be adopted. These should take into consideration the fuelwood needs of the local population.

In parallel to these efforts, well-developed tourism services will allow the national park management to focus on other sources of income, instead of logging.

The prevention and management of forest fires is another important aspect of forestry. Fires can spread, for example, from areas of pasture with ferns and juniper bushes to forests. They can pose a serious threat to forest ecosystems, and deserve high priority in the future management of the national park.

3.3.2.3. Wildlife

Game in the Shar Mountains belongs to the state. As a good of public interest in the Republic of North Macedonia, wildlife enjoys special protection, in a manner and under conditions determined in the Laws on Hunting and on Nature Protection.

51 species of mammals occur in SMNP (58% of all those present in RNM), along with 128 species of birds. Some of these are considered game, and distinctions are made between large and small game and game birds.

The table below shows the variety of most common wildlife in the Shar Mountains (full list is available in chapter 3.4.1):

Protection status	Large mammals	Small mammals	Birds
Protected species	Brown bear, Eurasian (Balkan) lynx	European wildcat, Eurasian otter, European badger, dormouse, red squirrel	Golden eagle, eastern imperial eagle, Eurasian eagle-owl, long-eared owl, griffon vulture, red-billed chough, alpine chough
Species with temporary hunting protection	Roe deer, wild boar, mountain goat	European rabbit	Hazel grouse, rock partridge, common pigeon, Eurasian woodcock
Species with no protection	Wolf	Red fox, European pine marten, beech marten, European polecat	Northern goshawk, hooded crow, western jackdaw, Eurasian magpie

Table 5: Wildlife in the park and the status of protection

The territory which includes the national park is divided into seven hunting areas. Until 2021 six of these were managed by concessioners, while the state hunting ground was managed by the Public Enterprise National Forests. Each of the hunting grounds is still managed according to a 10-year special hunting management plan annually prepared program. The validity periods of six of the special hunting management plans expires at the end of 2021, while that of the state hunting ground expired at the end of 2018.

The table below shows the number of game in these hunting areas counted in 2018, according to the Study of Valorization:

Game under protection		**Number of animals counted**
1.	Roe deer	482
2.	Chamois	394
3.	Wild boar	185
4.	Bear	36
5.	Balkan lynx	5
Counted game without protection		**Number of animals**
1.	Wolf	37

Table 6: Population of wildlife in the park

With the proclamation of the area as a national park, the new management authority is responsible for managing wildlife, including through culling. The national park authority should prepare a special wildlife management plan following the principles of nature conservation and with respect to zonation:

- No interventions in the strictly protected zone.
- Interventions in the active management zone should be considered as acceptable when they are necessary for species management and when in line with the conservation objectives (winter feeding, establishment of breeding centercenter, sanitary shooting in case of diseases, etc.).
- In the zone of sustainable use, sanitary shooting will be carried out in case of diseases. In addition, the number of wild animals that can cause damage to agricultural land and villages will be controlled.

Some activities including yearly counts, winter feeding, disease monitoring and control of illegal activities should be prioritized in the transitional period until a new wildlife management plan is prepared.

Despite potentially favorable breeding conditions for some of the species mentioned, compared to other national parks in Europe their population densities are low. Illegal hunting is likely to be the leading cause and its control should be a high priority for the park management. Park rangers experienced in wildlife management, in cooperation with forest police, should be responsible for this. Wildlife numbers should have the chance to increase to natural levels. Some stakeholders proposed the establishment of a chamois breeding center in Leshnica.

3.3.2.4. Collection of wild plants and fruits

Collecting wild plants and fruits, including medicinal plants and fungi, is a traditional practice still very much alive in the Shar Mountains. There are at least 51 species of plants and numerous fungi that are collected for commercial purposes within the park.

Collection of data about the populations of wild species, as well as monitoring of the populations of the wild species that are being harvested, should be done regularly, thus enabling evidence-based decisions on the future use of these species.

Several species (some of them protected under national law) require **permanent monitoring** to prevent endangering populations through collection:

- Plants: *Achillea millefolium, Artemisia absinthium, Chamomilla recutita, Cornus mas, Corylus avellana, Galium verum, Gentiana lutea, Juglans regia, Juniperus communis, Origanum vulgare, Primula veris, Sideritis scardica (protected)* and *Vaccinium myrtillus.*
- Fungi: *Agaricus campestris, Amanita cesarea* (protected), *Boletus edulis, Calocube gambosa, Cantharellus cibarius* and *Macrolepiota procera* (protected).

Wild plants and fruits are collected for personal and commercial use. Collection for personal consumption, of less than 1 kg per person, should be allowed without a permit. However, permits for collection for commercial purposes should be issued by the management authority.

Harvesting quotas for all commercially harvested species should be determined based on resource assessments and monitoring. Harvesters are primarily from lower-income households and have fewer economic opportunities. Only in rare cases are collected products processed in order to command a higher price.

Local companies based in adjacent towns buy, trade in and process collected plants and fungi, and have corresponding networks and organizational structures. These should be taken into

consideration when delimiting harvesting concessions. Another option mentioned during stakeholder consultation meetings was that the national park authority could organize purchasing, processing, marketing and sale of these products, to ensure a stable market for the harvesters as well as income for the national park.

Most collectors operate without a harvesting permit, and it is doubtful whether they have any knowledge of sustainable collection. The national park should provide training on this topic to collectors and should assure monitoring of wild populations of harvested species, especially since there are indications that some collectors enter SMNP from Kosovo to harvest wild plants and fruits. Cooperation between SMNP and Sharri NP, with the involvement of border and forest police, will be a precondition for effective management.

Collection of wild plants, fruits and fungi is allowed in the sustainable use and active management zones, and prohibited in the strict protection zone, except for personal consumption. Local cultivation should also be supported, as part of conservation efforts for those plants that are wild collected in large quantities but can be cultivated.

3.3.2.5. Beekeeping

Information on beekeeping is available for the seven municipalities within which the NP is located. In this area there are 422 registered beekeepers with 11,684 beehives, which accounts for around 11% of the hives in North Macedonia.

Considering that beekeeping provides both income to the local economy and valuable ecosystem services, support should be provided to local beekeepers. This could be through branding of apicultural products, support for events promoting such products from the park, etc. There is also the potential to develop api-tourism and promote it through the national park, which would be a source of income to both the local economy and the park. Since the beehives are located on private property, compensation measures for damage caused by wildlife should be in place in the sustainable use and active management zones.

3.3.2.6. Fishing

The presence of the Macedonian Trout, *Salmo macedonicus*, in the mountain streams and rivers of SMNP provides for the possibility of fishing tourism. Since little is known about the species in this area, careful monitoring should be conducted to provide the information necessary for future evidence-based decisions.

Concession holders are responsible for the implementation of the Special Management Plan for Fishing in the Upper Vardar Basin, during its validity (2016-2022). Upon expiry of this plan, the national park should prepare a new special management plan for fishing for the period 2022-2032, in line with allowed and forbidden activities by zone of protection. Fishing can be allowed only on those rivers in the sustainable management zone, and then only catch and release. Introduction of fish in the rivers and lakes of SMNP is prohibited.

3.3.3. Infrastructure and Development

3.3.3.1. Road Infrastructure

The increased population within the wider area that now comprises the park over the last 20 years has resulted in increased construction. Although the main population settlements are dispersed and cover relatively small areas, future development should take place according to established zonation, in order to avoid adverse consequences for biodiversity.

Most settlements in the Shar Mountains are part of a network of paved (asphalt) roads, which connects cities and remote villages. Some of the roads between, and in rare cases within, villages, are unpaved.

Most of these unpaved roads are in remote areas, especially close to the border with Kosovo, and are used mainly for transporting wood, accessing high mountain sheepfolds, and tourism. These areas can be hard to reach during most of the year, while in winter local mountain roads can become blocked by snow.

Road maintenance is carried out by a public enterprise responsible for the national road network, with its own funds and revenues. Maintenance of rural roads in winter is not currently a high priority and the national park management should support year-round road access for the local population.

The urban areas, Tetovo and Gostivar, are connected by highway A27, part of the national road network. The old Tetovo-Gostivar road, R12068, connects Tetovo, Bogovinje, Vrapciste and Gostivar. Road R12039 connects Tetovo with the municipalities of Tearce and Jegunovce, as well as with the border crossing with the Republic of Kosovo. Tearce is connected to Jegunovce via road R2234.

The “Popova Shapka” ski resort is well-connected to Tetovo by regional road 1209. The existence of railway and airport connections are also important in the context of tourism.

The railway network in the region consists of a local line linking Kichevo, Gostivar and Tetovo with Skopje, and part of the international railway corridor linking Skopje with Prishtina. The nearest airports are in Skopje, Ohrid and Kosovo Polje near Prishtina. Despite the well-developed road network, limited parking at the “Popova Shapka” ski resort restricts the resort’s possibilities for development. There is an urgent need for development of transport infrastructure (for example a modern cable car) from Tetovo to the Ski resort.

Development of infrastructure is a potential threat to the parks’ natural values. Adverse effects of such development can include the destruction and fragmentation of habitats, through the expansion of existing and construction of new infrastructure (roads, electricity, water and telecommunications installations, etc.), increased capture of natural resources (especially water) and pollution (construction waste, wastewater, air and noise pollution, eutrophication, etc.). It is strongly advised that any future road development is carried out in accordance with the park’s zonation.

3.3.3.2. Electricity Supply

Based on research conducted for the Socio-Economic Analysis in 2020, all villages in Shar Mountains National Park are connected to the electric energy grid.

3.3.3.3. Water Supply

Most villages in SMNP have access to running water. This is primarily from springs, though some villages use surface water or underground wells to access drinking water.

The town of Tetovo also obtains drinking water from the Shar Mountains, from Draga Voda, Golemi, Vakufski and Uliverichki springs. Draga Voda spring also provides drinking water for the village of Gajre.

3.3.3.4. Wastewater and Sewage

The villages and settlements in SMNP are not connected to sewage infrastructure and mainly use septic tanks. Construction of sewerage and wastewater treatment infrastructure is of urgent importance, and priority should be given to the larger settlements including the ski resort, weekend settlements and larger villages.

The towns of Tetovo and Gostivar have a sewerage system, from which wastewater and sewage enter the River Vardar untreated.

3.3.3.5. Water Quality

The topic of water quality has been raised at several meetings with local residents and municipality representatives, even though the Shar Mountains have abundant clean running water.

The national park management should support mountain villages in improving their water supply, in close cooperation with the relevant municipalities and related public enterprises

3.3.3.6. Solid Waste

Uncontrolled and illegal disposal of solid waste is a problem of immediate and pressing concern for the environment, as well as in the context of the development of tourism in the national park. Of the 27 villages within the park, only seven have organized collection of solid (domestic) waste. In addition, rubbish is seldom collected from the main picnic and tourist areas, including the ski resort, Belovishte and Tri Vode.

Each of the seven municipalities within the park (Bogovinje, Gostivar, Jegunovce, Mavrovo and Rostushe, Tearce, Tetovo, and Vrapchishte) is responsible for waste management within its boundaries, by contracting specialised companies. During stakeholder consultations, inhabitants from mountain villages complained about poor performance of these companies.

Support should be provided by the national park to improve this situation, especially in remote mountain villages.

3.3.3.7. Social Infrastructure

There are no kindergartens within the NP, though primary schools are present in most of the villages. High schools are found in Tetovo and Gostivar, as well as one in Vrapchiste Municipality. The municipalities organize transport for pupils from villages which do not have schools.

There are universities in Tetovo and Gostivar. The two universities in Tetovo are both state-funded, the one in Gostivar is a private institution.

Healthcare facilities are concentrated in Tetovo and Gostivar. There is a general hospital in Gostivar, and a clinic, a healthcare institute and a hospital for respiratory diseases in Tetovo.

First aid facilities are available in larger villages within the national park, including in Vejce, Novo Selo, Shipkovica.

Dentists are concentrated in the towns of Tetovo and Gostivar, and also found in the Municipalities of Bogovinje, Tearce and Jegunovce.

Social welfare is provided through the municipal and inter-municipal social centers in Gostivar and Tetovo.

There are no arts or culture facilities in SMNP, and sports facilities are scarce, found only in the villages of Selce and Shipkovica.

3.3.3.8. Industrial, Energy and Mining Infrastructure

Since the 1970s, the rivers of the Shar Mountains have been utilized for electricity production through the Sharski Vodi water collection system, which collects water from a number of rivers and transports it to the Mavrovo reservoir and the Vrutok, Raven and Vrben hydro power plants. This infrastructure provides around 12% of North Macedonia's electricity.

It is especially important in case of blackouts, as it is independent of electrical power and can produce electricity only based on water flow. Given that the functioning of the Sharski Vodi system is of national interest, access for maintenance is allowed in all zones with a permission of the National Park administration..

The national park has to establish a mechanism for cooperating with AD ESM, the Sharski Vodi system's management body, including the definition of rules that will ensure the maintenance of infrastructure regardless of zonation.

On the national park territory, there are 11 built small hydro power plants. Few more that are located in the zone for sustainable use are in process of construction with a one-year period to complete their activities, starting from June 30, 2021, when the Government approved the proclamation law for the national park. Construction of any new small hydro power plants in the national park will not be permitted.

The national park authority will regularly monitor the impact of the small hydro power plants on the environment and local communities, through the program for monitoring minimum ecological flow.

A list of constructed and planned small hydro power plants with Status from January 2021 is attached in Annex 7.3.

At the time of redaction of this document, the Government of the Republic of North Macedonia, is in the process of review and amendment of the hydropower-plant concessions granted within the PA boundaries.
Completed the review process, it is expected that the PA Management Authority, in coordination with the Ministry of Environment and Physical Planning will reflect any change within the list of Hydropower facilities legally recognized within the PA and apply and enforce the relevant PA regulations to all concessioners in line with what is prescribed in the PA regulations and national laws.

3.3.4. Cultural Heritage

The cultural heritage within SMNP adds value to the protected area and can benefit the development of sustainable tourism, or even contribute to the development of SMNP's tourism brand.

Macedonian law defines three types of cultural heritage: immovable, movable and intangible cultural heritage, out of which immovable and intangible cultural heritage have been identified within the PA, though movable cultural heritage should not be excluded at present.

The immovable cultural heritage identified within SMNP is mainly: 1. Archaeological sites, such as settlements and necropolises from antiquity or the medieval period; and 2. Temples and places of worship, both Christian and Muslim. Cultural landscapes are also included in

this category, though they have not yet been officially identified and valued. Mountain pastures are a type of cultural landscape that deserves protection and maintenance, in recognition of their inextricable connection to traditional, extensive sheep farming.

A specific architectural style is evident in all mountain villages, characterized by the use of traditional building materials such as stone, wood, hay and mud. To preserve the authentic character of the national park it is advised to use traditionalstyle and construction materials wherever possible.

Although many intangible cultural heritage elements are present in SMNP, only one has been officially registered: male two-part singing from the area of Dolni Polog, known locally as *Glasoechko*. This, together with other intangible cultural elements such as traditional and religious customs, can be valuable in promoting the PA as a tourist destination.

The preservation and continuation of the PA's cultural heritage should be approached in cooperation with institutions responsible for the protection of cultural heritage. Support and encouragement to further research on cultural heritage, and even activities to increase its visibility, could also be considered.

There is a long history of local and regional cultural events in the park and the wider region. Each of the municipalities, and almost every village, has its own festivals and events related to religious holidays and traditions. These can be a foundation for rich cultural offerings for visitors. In cooperation with the local population, the national park will support the identification, organization and promotion of events/ festivals and traditional activities that can attract more tourists.

Specific measures are required for the preservation of cultural heritage sites, e.g., temples. Details about these sites are presented in the Study of Valorization and in the socio-economic study. This management plan includes a special program that will map, identify and define protection measures.

3.3.5. Recreation and Tourism

The rich nature, geography, and landscapes, paired with cultural heritage, traditions and cultural events of SMNP provide a sound basis for the development of tourism and attractions for visitors. The area is already a popular all-seasons destination for diverse activities. There are a number of existing accommodation facilities, as well as tourism service providers, and the area has seen a trend of increasing visitor numbers over recent years.

Tourism is considered to be the primary sector for economic development, and the one with the greatest potential. Considering existing infrastructure, two main forms of tourism can be defined within the NP: mass tourism and alternative tourism. Mass tourism facilities are concentrated in the buffer zone, while alternative forms of tourism are practiced within the park, in all three zones. Alternative tourism (adventure, rural, nature experience, geo-tourism and wildlife watching tourism) are becoming increasingly popular. Supporting the development of any of the these will benefit local livelihoods and help distribute the impacts of tourism more evenly.

All forms of tourism should strive toward sustainability and responsibility in respect to the defined zonation and regulations. However, the long-term vision of the national park is to support any form of tourism that has low environmental impact, and maintains a balance between mass and alternative tourism. For both main forms of tourism to be possible, nature

conservation is crucial. Preserving nature will only be possible if all tourist operators establish good cooperation with the national park.

3.3.5.1. Mass tourism

The ski resort in the Popova Shapka area is a mass tourism destination, including a high density of weekend houses and a number of hotels.

To allow for the future development of the ski resort and other already-existing economic activities, a buffer zone has been created around the resort's potential development area (based on the 2012 masterplan).

Any further development of the Ski Center Popova Shapka needs a solution for transport of skiing tourists from Tetovo to the ski center, because in the are of the ski center there is far too little space for parking of cars of tourists.

Also, any further development of the ski center needs improvement of wastewater and solid waste collection.

3.3.5.2. Alternative tourism – Adventure

Many different types of adventure tourism activityies have been identified in the national park, in the Study of Valorization and the Socio-Economic Study. Some of these are very popular, while others are practiced only by a small number of people.

The following table presents an overview of the currently observed adventure sports, where they are practiced, their estimated environmental impact and interest in their future development.

Legend for impact: 1 = Low; 2 = Medium; 3 = High

Activity	Popularity/ interest	Season	Location	Estimated impact on environment
Alpine skiing	High	Winter	Specific locations	1
Ski touring	High	Winter	Wide area and specific locations	1
Hiking	High	All seasons	Wide area and specific locations	1
Horse riding	Moderate, with potential to grow	Spring, summer and autumn	Specific locations	1
Mountain biking	Moderate, with potential to grow	Spring, summer and autumn	Specific locations	1

Activity	Popularity/ interest	Season	Location	Estimated impact on environment
Mountain running	Moderate, with potential to grow	Spring, summer and autumn	Specific locations	1
Motorized snow sledges	High	Winter	Wide area	3
Off road driving with motorized vehicles	High	All seasons	Wide area	3
Paragliding	Low, with potential to grow	Mainly summer	Wide area	1
Snowcat / free ride skiing	High	Winter	Specific locations	3
Snowshoeing	Low	Winter	Wide area	1
Speleology	Low	Mainly summer	Specific locations	1
Alpine climbing	Low	Mainly winter	Specific locations	1

Table 7: Adventure activities in the park

Activities with high environmental impact, such as snow mobile and off-road driving, require constant monitoring and regulation and should take place within defined constraints, including measures to reduce damage to nature, as part of a sustainable tourism program. Activities with a high impact should be operated under defined rules and control mechanisms, including measures to reduce damages to the nature, within a program for sustainable tourism.

Some winter activities like ski touring and snowshoeing take place over a large area and have a low environmental impact. Popular summer activities like hiking, mountain biking and horse riding need to follow marked and maintained trails and roads. A system of trails needs to be developed as part of a tourism program in order to avoid possible risks, and conflicts between the different users.

Activities conducted at specific locations are usually nature-based, where a particular geological feature is used for a specific purpose. Such activities, which include speleology (caving), alpine climbing and rock climbing may pose threats to certain habitats, and careful assessment should be made before permitting them. Paragliding can also be considered a spot location activity, where the take-off point is in the active management zone.

Cross-border tourism activities with Sharri NP in Kosovo should be coordinated with border police, and in accordance with the activities permitted in the different zones of SMNP. Some such cross-border tourism activities require accommodation facilities following the basic international rules of a safety hut within four hours walk.

Promotion of the new protected area should go hand in hand with efforts to increase its reputation as a safe tourist destination. One of the main concerns for the further development of adventure tourism is the need for a functioning rescue service, not only in the ski resort but covering the whole park.

3.3.5.3. Alternative Tourism – Rural, Eco and Geo-tourism

The 27 villages within the national park, all located in the sustainable management zone, offer great potential for rural tourism development. This is even more important for those with declining populations.

Rural and eco-tourism can help counterbalance mass tourism, and reduce the environmental pressures caused by the “Popova Shapka” ski resort.

Also, geo-tourism is becoming a modern and increasingly significant tourism branch in protected areas with valuable geo heritage.

Those who seek out this kind of tourism are in search of fresh air, peaceful surroundings and locally produced food and services. The villages of the Shar Mountains offer plentiful eco-tourism opportunities, however, the local industry is in an early stage of development with only a limited number of families providing accommodation and tourism services.

3.3.5.4. Alternative tourism – wildlife

Wildlife is the major travel motive for a small but well-established group of tourists, centered around observing animals and plants in their natural habitats. The diversity of wild animals in SMNP means there is potential for developing wildlife watching tourism.

Some hunting tourism currently takes place. Replacing this with wildlife watching tourism would enable the park to create attractive experiences for visitors, and educate and involve them in wildlife monitoring while generating income.

Another form of tourism could be fly fishing on rivers in the sustainable zone in accordance with a special management plan for fishing in the rivers of the national park.

3.3.5.5. Tourism infrastructure

Accommodation Facilities in SMNP are mainly concentrated in Popova Shapka. This resort has seven hotels, with comfort ratings from one to four stars. Mountain huts, hostels and family houses are also found, scattered throughout the national park.

Camping Facilities in SMNP have no official designation, however, there are several popular (wild) camping sites that locals, mainly mountaineers and hikers, use. These campsites are active when events are organized. There are also small, improvised summer campsites in high mountain areas, mainly close to mountain lakes and springs, often in the strictly protected zone. Camps also take place in winter, related to winter sports activities. Designated and maintained campgrounds would allow a better management of already established places of wild camping in SMNP.

Dirt Roads in SMNP are unmanaged, and many were created without authorization, for various activities. These roads can be used for various tourism activities, though erosion control and maintenance should be foreseen.

Hiking Trails in SMNP are the only official trails developed and marked in accordance with the Law on Mountain Trails. There are 24 official hiking trails with a total length of 303 km. New trails are foreseen in municipal development plans, such as that of the Municipality of Bogovinje, which plans to build three additional trails. The maintenance of these would help encourage hikers to remain on designated paths and not wander into areas where they could disturb natural processes and wildlife.

Mountain Bicycle Trails in SMNP are not designated. However, mountain bikers usually use several routes that can be considered multi-user routes. These mainly follow wide dirt roads, but also narrow mountain paths. Providing designated trails for mountain biking in the sense of visitor management and visitor guidance will minimize distrurbance oif wild life in the NP.

3.4. Values of the Area

3.4.1. Species

The following sections present species known to occur in the Shar Mountains, with their level of protection and conservation status.

Extensive descriptions of the area's fauna and flora are presented in the Study of Valorization. Numerous experts dedicated their knowledge to this study in order to contribute to the conservation of species, habitats and landscapes.

Protection is presented in terms of national and international laws, conventions and red lists:

- Law on Nature Protection in North Macedonia, based on the national List of (strictly) protected wild species (2011);
- Bern convention;
- CITES (Convention on International Trade in Endangered Species of Wild Fauna and Flora, the Washington Convention);
- IUCN Red List of Threatened Species;
- National Red List of North Macedonia;
- Red list of diatoms of Central and Eastern Europe;
- EU Habitats Directive (HD);
- EU Birds Directive.

Species highlighted in green are proposed to be included in mapping and monitoring programs in the national park. The same species also **should be considered as crucial for defining conservation measures** in the national park.

Once established, the Management Authority of the NP, in coordination with the Ministry of Environment and Physical Planning, with technical and scientific support from national expert authorities and from the Scientific Board, should review and amend key species identified here, if necessary.

3.4.1.1. Diatoms

Legend for the Diatom Red List of Central and Eastern Europe: 1 - strongly affected species, 2 - affected species, 3 – weakly affected species, G – almost affected species, V – declining populations, R - extremely rare species

Species name	Red list of diatoms of Central and Eastern Europe	Preliminary Macedonian red list
Achnanthidium gracillimum **(F. Meister) Lange-Bertalot**	3	
Achnanthidium linearioide **Lange-Bertalot**	3	Rare
Adlafia detenta **(Hustedt) Heudre, C.E.Wetzel & Ector**	1	Rare
Adlafia suchlandtii **(Hustedt) Monnier & Ector**	V	Rare
Boreozonacola hustedtii **Lange-Bertalot, Kulikovskiy & Witkowski**	2	Rare
Caloneis lauta **Carter & Bailey-Watts**	G	Rare
Caloneis leptosoma **(Grunow) Krammer**	G	Rare
Cavinula mollicula **(Hustedt) Lange-Bertalot**	3	Rare
Cavinula variostriata **(Krasske) D.G. Mann**	3	
Chamaepinnularia hassiaca **(Krasske) Cantonati & Lange-Bertalot**	3	
Cymbella proxima **Reimer**	V	Rare
Cymbopleura similis **(Krasske) Krammer**	3	
Encyonema gaeumannii **(Meister) Krammer**	3	Rare
Encyonema hebridicum **Grunow ex Cleve**	3	Rare
Encyonema norvegicum **(Grunow) Mayer**	3	Rare
Eucocconeis alpestris **(Brun) Lange-Bertalot**	3	Rare
Eucocconeis flexella **(Kützing) Cleve**	3	
Eunotia arcubus **var. *bidens*** **(Grunow) Lange-Bertalot**	G	Rare
Eunotia flexuosa **(Brébisson ex Kützing) Kützing**	2	
Eunotia maior **(W. Smith) Rabenhorst**	2	Rare
Eunotiany manniana **Grunow**	3	
Geissleria similis **(Krasske) Lange-Bertalot & Metzeltin**	V	Rare
Genkalia digitulus **(Hustedt) Lange-Bertalot & Kulikovskiy**	3	Rare
Gomphonema amoenum **Lange-Bertalot**	3	
Gomphonema parvulius **(Lange-Bertalot & E.Reichardt) Lange-Bertalot &**	3	
Gomphonema pseudobohemicum **Lange-Bertalot & E Reichardt**	3	
Hygropetra balfouriana **(Grunow) Krammer & Lange-Bertalot**	R	Rare
Mastogloia grevillei **W. Smith**	G	Rare
Muelleria gibbula **(Cleve) Spaulding & Stoermer**	G	Rare
Navicula absoluta **Hustedt**	2	
Navicula angusta **Grunow**	3	
Navicula concentrica **Carter**	2	Rare
Navicula densilineolata **(Lange-Bertalot) Lange-Bertalot**	3	Rare
Navicula pseudolanceolata **Lange-Bertalot**	3	Rare
Navicula vulpina **Kützing**	3	Rare
Neidium alpinum **Hustedt**	3	Rare
Neidium bergii **(Cleve-Euler) Krammer**	3	
Neidium distinctepunctatum **Hustedt**	R	Rare
Neidium kozlowi var. parva **Mereschkowsky**	R	Rare
Pinnularia borealis **var. *scalaris*** **(Ehrenberg) Rabenhorst**	R	

Species name	Red list of diatoms of Central and Eastern Europe	Preliminary Macedonian red list
Pinnularia cuneola **Reichardt**	R	Rare
Pinnularia decrescens **(Grunow) Krammer**	D	Rare
Pinnularia divergens **W.Smith**	V	Rare
Pinnularia infirma **Krammer**	R	Rare
Placoneis amphibola **(Cleve) E.J. Cox**	3	Rare
Placoneis opportuna **(Hustedt) Chudaev & Gololobova**	2	Rare
Planothidium joursacense **(Héribaud) Lange-Bertalot**	3	Rare
Psammothidium rossii **(Hustedt) Bukhtiyarova & F.E. Round**	2	Rare
Skabitschewskia oestrupii **(A.Cleve) Kuliskovskiy & Lange-Bertalot**	D	Rare
Skabitschewskia pergalloi **(Brun & Héribaud-Joseph) Kuliskovskiy & Lange-Bertalot**	3	Rare
Staurone isacuta **W. Smith**	V	Rare
Stephanodiscus alpinus **Hustedt**	V	Rare

Table 8: List of diatoms in the park

3.4.1.2. Mosses

There are a large number of species of liverworts and mosses found in the Shar Mountains, that are very rare in North Macedonia.

For example, 52 species of bryophytes are not found elsewhere in North Macedonia, outside the Shar Mountains. These are mainly cold-loving species that characterize the Arctic-Alpine, Subarctic-Alpine/Subalpine, Alpine and Boreal biogeographical element (Martinčič 2009).

Another 37 species are present, in North Macedonia, in only a few other sites apart from the Shar Mountains: Korab, Pelister, Jakupica/Karadzica, Deshat, Kajmakchalan or Jablanica (which in terms of bryophytes is almost completely unexplored). This is unsurprising, as most of these Arctic or Boreal species reach the southern limits of their ranges in the high peaks of the Shar Mountains (or possibly Pelister and Kajmakchalan).

Many other bryophytes found in the Shar Mountains are also rare: 31 species occur in only three regions of the country and 22 only in four regions.

Liverworts and mosses are a cosmopolitan group of organisms, and there are no endemic bryophytes in North Macedonia.

The European Red Book of Bryophytes (ECCB 1995) lists three of the species found in the Shar Mountains as “rare”:

- *Mannia triandra* (Scop.) Grolle,
- *Amblystegium radicale* (P. Beauv.) Grout;
- *Brachythecium geheebii* Milde (Martinčič 2009).

Besides those found in the European Red Book are *Leskurea saviana* (De Not.) E. Lawton and *Buxbaumia viridis* (Moug. Ex Lam. & DC.) Brid. ex Moug. & Nestl. (Papp & Erzberger 2012).

Other species occurring in the Shar Mountains are also very rare in North Macedonia. *Lescurea savina* and *Brachythecium geheebii* are found in only three regions (Shar Mountains, Pelister and Kajmakchalan), while *Amblystegium radicale* is known in only two regions

(including the Shar Mountains). *Grimmia sessitana* De Not which is found in the Shar mountains is also on the European Red Book of Bryophytes.

Two species present are listed in Annex II of the EU Habitats Directive:

- *Mannia triandra* (Scop.) Grolle
- *Buxbaumia viridis* (Moug. Ex Lam. & DC.) Brid. ex Moug. & Nestl.

Both of these are very rare in North Macedonia. Besides the Shar Mountains, they are found only in Pelister (*M. triandra*), and Kajmakchalan (*B. viridis*). All peat mosses (*Sphagnum* L. spp.) are listed in Annex V (HD).

Species name	List of (strictly) protected wild species RNM	IUCN Red list	EU HD Annexes
Amblystegium radicale (Pseudocampylium radicale)		LC Europe	
Brachythecium geheebii		VU Europe	
Buxbaumia viridis	Protected	LC Europe	II
Grimmia sessitana		LC Europe	
Lescurea savina			
Mannia triandra		VU Europe	II

Table 9: List of mosses in the park

3.4.1.3. Fungi

13 species of fungi appear on North Macedonia's list of strictly protected species. On the Red List of fungi for North Macedonia, 3 species are critically endangered, 5 are endangered and 4 are vulnerable.

Legend for categories of threatened species: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD).

Species name	List of (strictly) protected wild species RNM	Red List of Fungi in RNM
Agaricus macrosporus	Protected	
Amanita caesarea	Protected	LC
Auricularia auricula-judae		
Boletus pinophilus		
Boletus satanas	Protected	
Botryobasidium danicum		
Bovista paludosa		CR
Brevicellicium olivascens		
Butyriboletus fechtneri		
Clavulina coralloides		
Coprinus tergiversans		
Cortinarius odorifer		
Craterellus cornucopioides	Protected	

Species name	List of (strictly) protected wild species RNM	Red List of Fungi in RNM
Cudonia circinans		VU
Dasyscyphus acuum		
Dentipellis fragilis		VU
Diatrypella favacea		
Discina parma		
Entoloma conferendum cf.		
Entoloma querquedula cf.		
Entoloma sericatum		
Entoloma venosum		
Exidia pithya	Protected	
Exobasidium myrtilli cf.		
Galerina clavata		
Galerina jaapii		EN
Galerina sphagnorum		CR
Galerina tibiicystis		CR
Globulicium hiemale		
Gloeocystidiellum ochraceum	Protected	
Guepinia helvelloides		EN
Gyrodon lividus		EN
Helvella subglabra		
Hericium coralloides		EN
Hydnellum peckii		EN
Hymenogaster griseus		
Hyphodontia juniperi		
Inocybe flocculosa		
Inocybe nitidiuscula		
Inocybe petiginosa		
Inocybe queletii		
Inocybe subnudipes		
Inocybe umbrinofusca cf.		
Inocybe vaccina		
Lactarius deterrimus		
Lopharia spadicea		
Macrolepiota procera	Protected	
Macrotyphula fistulosa		
Marasmius epiphylloides		
Melanogaster broomeanus		

Species name	List of (strictly) protected wild species RNM	Red List of Fungi in RNM
Melanoleuca brevipes		
Melanoleuca oreina		
Melastiza chateri		
Mutinus caninus	Protected	
Mycena capillaris		
Mycena pseudoalnicola		
Mycena pseudocorticola		
Mycena strobilicola		
Myxomphalia maura		
Omphalina grossula		
Otidea alutacea		
Pachyphloeus conglomeratus		
Peniophora junipericola	Protected	
Peniophora polygonia		
Phlebia ochraceofulva		
Phyllotopsis nidulans		
Pleurotus dryinus	Protected	
Pluteus hispidulus		
Psathyrella sphagnicola		
Psilocybe merdaria		
Psilocybe serbica		VU
Rozites caperatus		
Rutstroemia echinophila		
Sarcodon imbricatus	Protected	
Sarcosphaera coronaria	Strictly Protected	VU
Sarcosphaera crassa		
Simocybe centunculus		
Suillellus rodoxanthus		
Thelephora anthocephala		
Tremella foliacea	Protected	
Tremiscus helvelloides		
Tuber bellonae		
Typhula erythropus		
Volvariella bombycyna	Protected	
Vuilleminia macrospora		

Table 10: List of fundi in the park

3.4.1.4. Vascular plants

The majority of the vascular plant species listed below are endemic to the Shar Mountains. *Gentiana lutea* is listed in the Annex V of the EU Habitat Directive and 16 species appear on the IUCN Red List. 5 species are strictly protected and 9 are protected, according to the national list of protected wild species.

Species name	List of (strictly) protected wild species RNM	IUCN Red List	EU HD Annexes	Endemic
Acer heldreichii subsp. macropterum		LC Europe		Yes
Alkanna scardica				Yes
Alyssum scardicum				Yes
Antennaria dioica		LC Europe		
Asperula doerfleri				Yes
Aster alpinus				
Aubrietia gracilis subsp. scardica				Yes
Campanula spathulata subsp. abietina				
Cirsium appendiculatum				Yes
Cirsium candelabrum				Yes
Cephalaria pastricensis				Yes
Crepis macedonica				Yes
Crocus scardicus		NT Mediterr.		Yes
Dactylorhiza sambucina		LC Europe		
Dactylorhiza viridis		LC Europe		
Dianthus scardicus				Yes
Draba doerfleri				Yes
Draba scardica				
Dryas octopetala				
Festuca horvatiana				Yes
Gentiana albanica				Yes
Gentianella ciliata				
Gentiana lutea		LC Europe	Annex V	
Gentiana punctata	Strictly Protected	LC Europe		
Geranium sylvaticum				
Gymnadenia nigra		LC Europe		
Hieracium andrasovszky subsp. kobilicanum				Yes
Hieracium scardicum				Yes
Jacobaea abrotanifolia subsp. carpathica				
Kobresia myosuroides				
Lilium albanicum		LC Mediterr.		Yes
Linaria alpina				

Species name	List of (strictly) protected wild species RNM	IUCN Red List	EU HD Annexes	Endemic
Lycopodium alpinum		LC Europe		
Melampyrum scardicum				Yes
Minuartia juniperina subsp. kosaninii				Yes
Moneses uniflora				
Narthecium scardicum	Protected			
Neottia cordata		LC Europe		
Noccaea bellidifolia				Yes
Onobrychis montana subsp. scardica				Yes
Oxytropis halleri subsp. korabensis				Yes
Paronychia albanica subsp. albanica				Yes
Pedicularis brachyodonta subsp. grisebachii				Yes
Pedicularis leucodon				Yes
Pimpinella serbica				Yes
Pinguicula balcanica				Yes
Pinus heldreichii	Protected	LC Europe		Yes
Pinus peuce	Protected	NT Europe		Yes
Potentilla doerfleri	Strictly Protected			Yes
Primula minima				
Pulsatilla vernalis		LC Europe		
Ranunculus degenii	Strictly Protected			Yes
Ranunculus seguieri subsp. montenegrinus				Yes
Salix alpina				
Salix herbacea				
Salix reticulata				
Salix retusa				
Saxifraga aizoides				
Saxifraga scardica				Yes
Selaginella selaginoides		LC Europe		
Sempervivum kosanininii	Protected			Yes
Sempervivum thompsonianum	Strictly Protected			
Sesleria wettsteinii				Yes
Sideritis scardica	Protected	NT Europe		Yes
Silene acaulis				
Silene schmuckeri	Strictly Protected			Yes
Silene waldsteinii				Yes
Soldanella pindicola	Protected			Yes
Solenanthus scardicus	Protected			Yes

Species name	List of (strictly) protected wild species RNM	IUCN Red List	EU HD Annexes	Endemic
Stachys scardica				Yes
Thymus praecox subsp. zygiformis				Yes
Trollius europaeus				
Verbascum scardicola				Yes
Veronica bellidioides				
Veronica thessalica				Yes
Viola allcharensis subsp. gostivarensis	Strictly Protected			Yes
Viola ivonis	Protected			Yes
Viola latisepala				Yes
Viola schariensis	Protected			Yes
Willemetia stipitata subsp. albanica				Yes
Wulfenia carinthiaca				

Table 11: List of vascular plants in the park

3.4.1.5. Mammals

Many of the mammal species are relevant to a number of national and international nature protection lists, directives and conventions.

On the national list of protected wild species, 3 species are protected while 5 are strictly protected.

Legend for categories of threatened species: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD).

Species name	IUCN European Red List	IUCN Global Red	Red List Macedonia	EU HD Annexes	Emerald Network	Bern Convention	Bonn Conv-ention	List of (strictly) protected wild species NMK
Apodemus agrarius	LC	LC						
Apodemus epimelas	LC	LC						
Apodemus flavicollis	LC	LC						
Apodemus sylvaticus	LC	LC						
Arvicola amphibius	LC	LC						
Canis aureus	LC	LC	DD	V				
Canis lupus	LC	LC	NT	II; IV; V	yes	II		
Capreolus capreolus	LC	LC				III		
Chionomys nivalis	LC	LC				III		
Crocidura leucodon	LC	LC				III		
Dinaromys bogdanovi	VU	VU		II; IV				SP
Erinaceus roumanicus	LC	LC						
Felis silvestris	LC	LC		IV		II		SP
Glis glis	LC	LC				III		
Lutra lutra	NT	NT	VU	II; IV	yes	II		SP

Species name	IUCN European Red List	IUCN Global Red	Red List Macedonia	EU HD Annexes	Emerald Network	Bern Convention	Bonn Conv-ention	List of (strictly) protected wild species NMK
Lynx lynx balcanicus	CR	CR	CR	II; IV	yes	II		SP
Martes foina	LC	LC				III		
Martes	LC	LC		V		III		
Meles meles	LC	LC				III		P
Micromys minutus	LC	LC						
Microtus subterraneus	LC	LC						
Miniopterus schreibersii	NT	NT		II; IV		II	II	P
Mus musculus	LC	LC						
Muscardinus avellanarius	LC	LC		IV		III		
Mustela nivalis	LC	LC				III		
Mustela putorius	LC	LC		V		III		
Mycrotus arvalis	LC	LC						
Mycrotus levis	LC	LC						
Myodes glareolus	LC	LC						
Myotis blythii	LC	NT		II; IV	yes	II	II	
Myotis myotis	LC	LC		II; IV	yes	II	II	
Myotis nattereri	LC	LC		IV		II	II	
Nannospalax leucodon	LC	DD						
Neomys anomalus	LC	LC				III		
Neomys fodiens	LC	LC				III		
Nyctalus noctula	LC	LC		IV		II	II	
Pipistrellus kuhlii	LC	LC		IV		II	II	
Pipistrellus nathusii	LC	LC		IV		II	II	

Species name	IUCN European Red List	IUCN Global Red	Red List Macedonia	EU HD Annexes	Emerald Network	Bern Convention	Bonn Conv-ention	List of (strictly) protected wild species NMK
Plecotus auritus	LC	LC		IV		II	II	
Rattus rattus	LC	LC						
Rupicapra rupicapra	LC	LC		II; IV	yes	III		
Sciurus vulgaris	LC	LC				III		P
Sorex araneus	LC	LC				III		
Sorex minutus	LC	LC				III		
Sus scrofa	LC	LC						
Talpa caeca	LC	LC						
Talpa europaea	LC	LC						
Talpa stankovici	DD	DD						
Ursus arctos	LC	LC	VU	II; IV	yes	II		SP
Vulpes vulpes	LC	LC						

Table 12: List of mammals in the park

3.4.1.6. Birds

Of the enormous variety of bird species found in the Shar Mountains, 22 species are strictly protected and 9 are protected, on the list of protected species of North Macedonia.

Legend for categories of threatened species: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD).

Species name	IUCN Global Red List	IUCN European Red List	EU Birds Directive Annexes	Bern Convention	Emerald Network	Bonn Convention	CITES	List of (strictly) protected wild species RNM
Accipiter gentilis	LC	LC		II		II	II	
Accipiter nisus	LC	LC		II		II	II	Strictly Protected
Aegithalos caudatus	LC	LC		III				

Species name	IUCN Global Red List	IUCN European Red List	EU Birds Directive Annexes	Bern Convention	Emerald Network	Bonn Convention	CITES	List of (strictly) protected wild species RNM
Aegolius funereus	LC	LC	I	II	+		II	
Aegypius monachus	LC	NT	I	II	+	II	II	Strictly Protected
Alauda arvensis	LC	LC	IIB	III				
Alectoris graeca	NT	NT	I & IIA	III	+			Protected
Anas crecca	LC	LC	IIA & IIIB	III		II		Protected
Anas platyrhynchos	LC	LC	IIA & IIIA	III		II		Protected
Anthus campestris	LC	LC	I	II	+			
Anthus spinoletta	LC	LC		II				
Anthus trivialis	LC	LC		II				
Apus apus	LC	LC		III				
Apus pallidus	LC	LC		II				
Aquila chrysaetos	LC	LC	I	II	+	II	II	Strictly Protected
Bubo bubo	LC	LC	I	II	+		II	Strictly Protected
Buteo buteo	LC	LC		II		II	II	Strictly Protected
Caprimulgus europaeus	LC	LC	I	II	+			
Carduelis carduelis	LC	LC		II				
Cecropis daurica	LC	LC		II				
Certhia brachydactyla	LC	LC		II				
Certhia familiaris	LC	LC		II				
Chloris chloris	LC	LC		II				
Cinclus cinclus	LC	LC		II				
Circaetus gallicus	LC	LC	I	II	+	II	II	Strictly Protected
Circus cyaneus	NT	LC	I	II	+	II	II	Strictly Protected
Coccothraustes coccothraustes	LC	LC		II				
Columba livia	LC	LC	IIA	III				Protected
Columba oenas	LC	LC	IIB	III				Protected

Species name	IUCN Global Red List	IUCN European Red List	EU Birds Directive Annexes	Bern Convention	Emerald Network	Bonn Convention	CITES	List of (strictly) protected wild species RNM
Columba palumbus	LC	LC	IIA & IIIA					Protected
Corvus corax	LC	LC		III				Strictly Protected
Corvus corone	LC	LC	IIB					
Coturnix coturnix	LC	LC	IIB	III		II		Protected
Crex crex	LC	LC	I	II	+	II		Strictly Protected
Cuculus canorus	LC	LC		III				
Curruca communis	LC	LC		II		II		
Curruca curruca	LC	LC		II		II		
Cyanistes caeruleus	LC	LC		II				
Delichon urbicum	LC	LC		II				
Dendrocopos leucotos	LC	LC	I	II	+			
Dendrocopos major	LC	LC		II				
Dendrocopos minor	LC	LC		II				
Dendrocopos syriacus	LC	LC	I	II	+			
Dryocopus martius	LC	LC	I	II	+			
Emberiza calandra	LC	LC		III				
Emberiza cia	LC	LC		II				
Emberiza cirlus	LC	LC		II				
Emberiza citrinella	LC	LC		II				
Emberiza hortulana	LC	LC	I	III	+			
Eremophila alpestris	LC	LC		II				
Erithacus rubecula	LC	LC		II		II		
Falco peregrinus	LC	LC	I	II	+	II	I	Strictly Protected
Falco subbuteo	LC	LC		II		II	II	Strictly Protected
Falco tinnunculus	LC	LC		II		II	II	Strictly Protected
Ficedula albicollis	LC	LC	I	II	+	II		

Species name	IUCN Global Red List	IUCN European Red List	EU Birds Directive Annexes	Bern Convention	Emerald Network	Bonn Convention	CITES	List of (strictly) protected wild species RNM
Ficedula semitorquata	LC	LC	I	II	+	II		
Fringilla coelebs	LC	LC		III				
Fringilla montifringilla	LC	LC		III				
Gallinago gallinago	LC	LC	IIA & IIIB	III		II		
Garrulus glandarius	LC	LC	IIB					Strictly Protected
Gypaetus barbatus	VU	NT	I	II	+	II	II	Strictly Protected
Gyps fulvus	LC	LC	I	II	+	II	II	Strictly Protected
Hippolais icterina	LC	LC		II		II		
Hirundo rustica	LC	LC		II				
Jynx torquilla	LC	LC		II				
Lanius collurio	LC	LC	I	II	+			
Lanius senator	LC	LC		II				
Linaria cannabina	LC	LC		II				
Loxia curvirostra	LC	LC		II				
Lullula arborea	LC	LC	I	III	+			
Luscinia megarhynchos	LC	LC		II		II		
Merops apiaster	LC	LC		II		II		
Monticola saxatilis	LC	LC		II		II		
Montifringilla nivalis	LC	LC		II				
Motacilla alba	LC	LC		II				
Motacilla cinerea	LC	LC		II				
Muscicapa striata	LC	LC		II		II		
Neophron percnopterus	EN	EN	I	II	+	I & II	II	Strictly Protected
Nucifraga caryocatactes	LC	LC		II				
Oenanthe hispanica	LC	LC		II		II		
Oenanthe oenanthe	LC	LC		II		II		

Species name	IUCN Global Red List	IUCN European Red List	EU Birds Directive Annexes	Bern Convention	Emerald Network	Bonn Convention	CITES	List of (strictly) protected wild species RNM
Oriolus oriolus	LC	LC		II				Strictly Protected
Otus scops	LC	LC		II			II	Strictly Protected
Parus major	LC	LC		II				
Passer domesticus	LC	LC						
Passer montanus	LC	LC		III				
Perdix perdix	LC	LC	IIA & IIIA	III				Protected
Periparus ater	LC	LC		II				
Pernis apivorus	LC	LC	I	II	+	II	II	Strictly Protected
Phoenicurus ochruros	LC	LC		II		II		
Phylloscopus collybita	LC	LC		II		II		
Phylloscopus trochilus	LC	LC		II		II		
Pica pica	LC	LC	IIB					
Picus viridis	LC	LC		II				
Poecile lugubris	LC	LC		II				
Poecile montanus	LC	LC		II				
Poecile palustris	LC	LC		II				
Prunella collaris	LC	LC		II				
Prunella modularis	LC	LC		II				
Ptyonoprogne rupestris	LC	LC		II				
Pyrrhocorax graculus	LC	LC		II				Strictly Protected
Pyrrhocorax pyrrhocorax	LC	LC	I	II	+			Strictly Protected
Pyrrhula pyrrhula	LC	LC		III				
Regulus ignicapilla	LC	LC		II		II		
Regulus regulus	LC	LC		II		II		
Rhadina orientalis	LC	LC		II		II		
Rhadina sibilatrix	LC	LC		II		II		

Species name	IUCN Global Red List	IUCN European Red List	EU Birds Directive Annexes	Bern Convention	Emerald Network	Bonn Convention	CITES	List of (strictly) protected wild species RNM
Saxicola rubetra	LC	LC		II		II		
Saxicola rubicola	LC	LC		II		II		
Serinus serinus	LC	LC		II				
Sitta europaea	LC	LC		II				
Spinus spinus	LC	LC		II				
Streptopelia turtur	VU	VU	IIB	III		II		Protected
Strix aluco	LC	LC		II			II	Strictly Protected
Sturnus vulgaris	LC	LC	IIB					
Sylvia atricapilla	LC	LC		II		II		
Tetrao urogallus	LC	LC	I & IIB & IIIB	III	+			
Tetrastes bonasia	LC	LC	I & IIB	III	+			
Tichodroma muraria	LC	LC		II				
Tringa ochropus	LC	LC		II		II		
Troglodytes troglodytes	LC	LC		II				
Turdus merula	LC	LC	IIB	III		II		
Turdus philomelos	LC	LC	IIB	III		II		
Turdus pilaris	LC	LC	IIB	III		II		
Turdus torquatus	LC	LC		II		II		
Turdus viscivorus	LC	LC	IIB	III		II		
Upupa epops	LC	LC		II				

Table 13: List of birds inside the park

3.4.1.7. Fish

In the rivers of the Shar Mountains, the only fish species of note is *Salmo macedonicus*, a Balkan endemic whose natural distribution includes the Rivers Vardar and Nestos in Greece, the Struma catchment, as well as in the River Maritsa, Bulgaria (Stefanov 2007). Habitat degradation, excessive water use, pollution, and inadequate stocking are the main threats to this species.

Species name	EU HD Annexes	IUCN Red List	List of (strictly) protected wild species NMK
Salmo macedonicus		DD Europe	Protected

Table 14: List of fish in the park

3.4.1.8. Herpetofauna

Fourteen of the herpetofauna species listed are strictly protected wild species in North Macedonia, out of which three are endemic. The presence of *Testudo graeca* and *Vipera ursinii*, which are Vulnerable (VU) according to the IUCN Red List and Preliminary National Red List of amphibians and reptiles, is of particular importance for the Shar Mountains.

Legend for categories of threatened species: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD)

Species name	EU HD Annexes	Bern Convention	CITES	Emerald Network	IUCN World Red List	IUCN European Red list	National Red List	List of (strictly) protected wild species RNM	Endemic
Anguis fragilis		III			LC		LC		
Bombina variegata	II; IV	II		yes	LC	LC	LC	Protected	Yes
Bufo bufo		III			LC	LC	LC		
Bufotes viridis	IV	II			LC	LC	LC	Protected	
Coronella austriaca	IV	II			LC	LC	LC	Protected	
Dolichophis caspius	IV	II			LC	LC	LC	Protected	
Hyla arborea	IV	II			LC	LC	NT	Protected	
Ichthyosaura alpestris		III			LC	LC	EN		
Lacerta agilis	IV	II			LC	LC	EN	Protected	
Lacerta trilineata	IV	II			LC	LC	LC	Protected	
Lacerta viridis	IV	II			LC	LC	LC	Protected	
Natrix natrix		III			LC	LC	LC		

Species name	EU HD Annexes	Bern Convention	CITES	Emerald Network	IUCN World Red List	IUCN European Red list	National Red List	List of (strictly) protected wild species RNM	Endemic
Natrix tessellata	IV	II			LC	LC	NT	Protected	
Pelophylax ridibundus	V	III			LC	LC	LC		
Podarcis erhardii	IV	II			LC	LC	LC	Protected	Yes
Podarcis muralis	IV	II			LC	LC	LC	Protected	
Rana dalmatina	IV	II			LC	LC	NT	Protected	
Rana graeca	IV	III			LC	LC	NT	Protected	Yes
Rana temporaria		III			LC	LC	EN		
Salamandra salamandra		III			LC	LC	LC		
Testudo graeca	II; IV	II	II	yes	VU	VU	VU	Protected	
Testudo hermanni	II; IV	II	II	yes	NT	NT	VU	Protected	
Triturus macedonicus	II; IV	II					VU	Protected	
Vipera ammodytes	IV	II			LC	LC	LC	Protected	
Vipera berus		III					EN		
Vipera ursinii	II; IV	II	I	yes	VU	VU	EN	Strictly Protected	
Zamenis longissimus	IV	II			LC	LC	LC	Protected	
Zootoca vivipara		III			LC	LC	EN		

Table 15: Herpetofauna in the park

3.4.1.9. Butterflies (Lepidoptera)

Many of the butterfly species found in the Shar Mountains are listed in the IUCN Red List. Three species appear in the List of strictly protected species in North Macedonia.

Legend for categories of threatened species: Critically Endangered (CR), Endangered (EN), Vulnerable (VU), Near Threatened (NT), Least Concern (LC), Data Deficient (DD)

Species name	Family	Bern Convention	Bonn Convention	EU HD Annexes	CITES	Endemic in Europe	IUCN Global Red List	IUCN European Red List	List of (strictly) protected wild species RNM
Araschnia levana	Nymphalidae							LC	
Aricia anteros	Lycaenidae							NT	
Boloria graeca	Nymphalidae							LC	
Boloria pales	Nymphalidae							LC	
Brenthis ino	Nymphalidae							LC	
Carcharodus floccifera	Hesperiidae							NT	
Carterocephalus palaemon	Hesperiidae							LC	
Coenonympha tullia	Nymphalidae							VU	
Colias caucasica balcanica	Pieridae							LC	
Cupido decoloratus	Lycaenidae							NT	
Erebia (epiphron) roossi	Nymphalidae							NT	
Erebia pandrose	Nymphalidae							LC	
Erebia pronoe	Nymphalidae					Yes		LC	
Erebia rhodopensis	Nymphalidae					Yes		LC	
Erynnis marloyi	Hesperiidae							LC	
Euphydryas aurinia	Nymphalidae	II	IV					LC	Strictly Protected
Euphydryas maturna	Nymphalidae	II						VU	

Species name	Family	Bern Convention	Bonn Convention	EU HD Annexes	CITES	Endemic in Europe	IUCN Global Red List	IUCN European Red List	List of (strictly) protected wild species RNM
Hipparchia statilinus	Nymphalidae							NT	
Iolana iolas	Lycaenidae							NT	
Limenitis populi	Nymphalidae							LC	
Lycaena dispar	Lycaenidae	II	IV	Annex II+IV			NT	LC	Strictly Protected
Melitaea aurelia	Nymphalidae							NT	
Neptis rivularis	Nymphalidae							LC	
Parnassius apollo	Papilionidae	II	IV	Annex IV	+		VU	NT	Strictly Protected
Parnassius mnemosyne	Papilionidae	II	IV	Annex IV				NT	
Phengaris (Maculinea) alcon	Lycaenidae							LC	
Phengaris (Maculinea) arion	Lycaenidae	II	IV	Annex IV				EN	
Plebejus pylaon	Lycaenidae							NT	
Polyommatus damon	Lycaenidae							NT	
Polyommatus dorylas	Lycaenidae							NT	
Polyommatus eros eroides	Lycaenidae							NT	
Polyommatus ripartii	Lycaenidae							LC	
Pseudophilotes vicrama	Lycaenidae							NT	
Pyrgus andromedae	Hesperiidae					Yes			
Thecla betulae	Lycaenidae							LC	
Thymelicus acteon	Hesperiidae							NT	
Zerynthia cerisy	Papilionidae							NT	
Zerynthia polyxena	Papilionidae	II	IV					LC	

Table 16: List of butterflies in the park

3.4.1.10. Orthoptera

Among the 54 species of Orthoptera recorded on the Macedonian side of the Shar Mountains, four are protected or considered endangered:

- *Odontopodisma albanica*, VU (Vulnerable) in the Red List of the Republic of North Macedonia (Lemonnier-Darcemont et al., 2015), mainly found in dense, undisturbed vegetation.
- *Odontopodisma albanica*, VU (Vulnerable) on the IUCN Red List, is fairly well distributed in the area, including in the intensive grazing zone, where there are still shrubs of *Vaccinium myrtillus* and *Juniperus nana*.
- *Psorodonotus macedonicus*, NT (Near Threatened) on the IUCN Red List, is fairly-well distributed in the area, including in intensively grazed areas, where shrubs of *Vaccinium myrtillus* and *Juniperus nana* still persist.
- *Paracaloptenus caloptenoides* appears in Annex IV of the Habitats Directive and has been found in two mesophilic mountain sites, but never in large numbers.

Species name	EU HD Annexes	IUCN Red List	List of (strictly) protected wild species NMK
Odontopodisma albanica		VU	
Odontopodisma albanica		VU	
Psorodonotus macedonicus		NT	
Paracaloptenus caloptenoides	IV		

Table 17: List of orthopteran in the park

A survey of Orthoptera populations shows that species' average recorded altitude (compared to their distribution throughout the country) is concentrated at higher elevations. Species richness was found to be higher in mountainous areas (12) than subalpine sites (8), which probably reflects respective climatic conditions.

Human activities in the area are mostly low-impact and traditional, with only a moderate influence. Meadows and cropland with little or no use of chemicals and low grazing are favored micro-habitats, suitable for a wide range of entomofauna.

In the subalpine zone, especially the area around Popova Shapka, pressure from cattle grazing, and in some places intensive blueberry collection has a strongly negative impact on insects.

The highly seasonal activity, which involves a large number of berry pickers, probably contributes to the degradation and homogenization of these fragile mountain ecosystems, resulting in loss of shrubs and the damage to blueberry plants through combing, trampling and intensive use of motor vehicles.

Common Orthoptera species are *Omocestus viridulus* and *Pseudochorthippus paralelus tenuis*.

3.4.1.11. Snails (Gastropoda)

Valorization of terrestrial gastropods (Mollusca, Gastropoda) in the Shar Mountains showed the presence of 29 species of interest. These include Shar Mountains local endemics (4 species) - *Carinigera pellucida* Dedov & Neubert, 2002, *Cattania trizona ljubetenensis* (A. J. Wagner, 1914), *Orcula wagneri ljubetenensis* Sturany, 1915 and *Triloba thaumasia talevi*

Dedov & Neubert, 2002; a Macedonian endemic (1 species) - *Gyralina mirabilis* (Pintér & Riedel, 1973), as well as 20 Balkan endemics.

According to the European Red List of Threatened Species, *Carinigera pellucida* Dedov & Neubert, 2002 is endangered (EN) and of European and international significance. *Orcula wagneri* Sturany, 1914 is Nearly Threatened (NT).

Species Name	EU HD Annexes	IUCN	List of (strictly) protected wild species NMK
Carinigera pellucida		EN Europe	Protected
Cattania trizona ljubetenensis		LC Europe	
Gyralina mirabilis		LC Europe	Protected
Orcula wagneri ljubetenensis		NT Europe	Protected
Triloba thaumasia talevi		LC Europe	Protected

Table 18: List of snails in the park

3.4.1.12. Aquatic molluscs, higher crustaceans and aquatic insects

Assessment of aquatic molluscs, higher crustaceans and certain groups of aquatic insects showed the presence of 58 species of international and national conservation importance. Special attention should be paid to the local endemics *Nemoura zwicki* Sivec, 1980 and *Isoperla breviptera* Ikonomov, 1980 which are found only in the waters of the sources of the Rivers Uleverichi and Popova Shapka, the streams of Ceripashina, the River Pena above Tetovo and the River Lisechka.

Besides these, *Taeniopteryx fusca* Ikonomov, 1980 and *Taeniopteryx stankovitchi* Ikonomov, 1978 together with the water moth *Drusus krpachi* Kucinic, Graf & Vitecek, 2015 are Macedonian endemics. There are also 16 Balkan endemics, as well as four sub-endemics.

Many species with limited distributions in North Macedonia are abundant in the aquatic ecosystems of the Shar Mountains. As such, 7 species are rare in the country, 12 can be found only in two or three regions, while the distribution of 27 is limited to mountainous areas. 7 species are included in the National List of Protected Wild Species in the Republic of North Macedonia (SVRM No. 139/2011).

According to the IUCN Red List of Threatened Species, the IUCN European Red List of Threatened Odonata (Kalkman et al., 2010) and the IUCN Mediterranean Red List of Threatened Species (Riservato et al., 2009) the odonata *Cordulegaster bidentata* Selys, 1843 is Near Threatened (NT).

Within SMNP, the localities of special importance for the preservation of priority species are the sources of the River Uleverichi (9 species) and Popova Shapka (8); the River Pena above Tetovo (6), above the nearby hydro power plant (8), near the villages of Bozovci and v. Banja (7), and its tributary in Leshnica (6); as well as the spring near the village of Lisec (6),

The identification of these hotspots of species of conservation importance emphasises the natural values and importance of the aquatic ecosystems of the Shar Mountains, as well as the need for their conservation and protection.

Species name	Taxonomic Group	EU HD Annexes	IUCN European Red List	List of (strictly) protected wild species RNM
Cordulegaster bidentata	Odonata		NT	
Drusus krpachi	Trichoptera			
Isoperla breviptera	Plecoptera			Protected
Nemoura zwicki	Plecoptera			Protected
Taeniopteryx fusca	Plecoptera			Protected
Taeniopteryx stankovitchi	Plecoptera			Protected

Table 19: List of aquatic molluscs, higher crustaceans and aquatic insects in the park

3.4.2. Habitats

The following is a list of habitats according to the classification in Annex I of the Habitats Directive of the European Union which are present in the Shar Mountains. (Sources: Strengthening the Capacities for implementation of Natura 2000 in Macedonia on central and local level (2016-2017). EU-IPA Project and UNEP Regional Office in Vienna (2020): Valorization Study on Sharr Mountain).

Habitat Code	Habitat name
3130	Oligotrophic to mesotrophic standing waters with vegetation of the Littorelletea uniflorae
3160	Natural dystrophic lakes and ponds
3220	Alpine rivers
3230	Alpine rivers with Myricaria germanica
3240	Alpine rivers with Salix eleagnos
3260	Water courses with Ranunculion fluitantis
4060	Alpine and Boreal heaths
6150	Siliceous alpine and boreal grasslands
6170	Alpine and subalpine limestone pastures
6210	Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco Brometalia)* important orchid sites
6230	Pastures rich in Nardus stricta
62D0	Oro-Moesian acidophilous grasslands
6430	Hydrophilous tall herb fringe communities of plains and of the montane to alpine levels
7140	Transition mires and quaking bogs
7210 *	Calcareous fens with Cladium mariscus and species of the Caricion davallianae
7220 *	Petrifying springs with tufa formation (Cratoneurion)
7230	Alkaline fens
8140	Eastern Mediterranean screes
8210	Limestone rocky slopes with chasmophytic vegetation
8220	Silicate rocky slopes with chasmophytic vegetation
9260	Castanea sativa woods
9270	Hellenic beech forests Abies borisii-regis
9410	Acidophilous Picea forests

Habitat Code	Habitat name
95A0	High oro-Mediterranean pine forests

Table 20: List of habitats in the park

3.4.3. Landscape and Geology

The Shar Mountains are characterized by a very complex tectonic structure and a rich geo-diversity; also there are numerous periglacial phenomena like glacier lakes, waterfalls, caves, glacial circuses and others.

Some of these features are important for monitoring climate change (solifluction terraces, sliding blocks, rock currents, rock seas, stone polygons, etc.).

Main threats to the landscape are different types of infrastructure like ski lifts, electric power lines or buildings.

3.5. Threats

Due to changes in traditional ways of life in the region, the Shar Mountains have come under greater anthropogenic pressure. This causes numerous threats that can lead to the degradation or destruction of all natural values. The main threats and their impacts on natural values are:

Threat	Impact on natural values
Abandonment of traditional land use practices (e.g. summer pasturing);	conversion of grassland habitats (transformation of a habitat into another habitat) caused by the threat of abandoning traditional practices (pasturing). For example the overgrowth of agricultural land with bushes and ferns leads to a decrease of biological diversity. The number of plant species decreases, which causes a decrease of invertebrate species, which again causes the abundance of bird species. The main reason for abandoning the traditional agricultural practices lies in the changes of trends in society, mainly the process of emigration of the inhabitants from the mountain villages to cities.
Unsustainable use of forests, including illegal and uncontrolled felling, fires, hunting and fishing;	conversion of forest habitats through the threat of illegal logging: Many forest associations have been degraded due to inappropriate harvesting practices in the past and by illegal logging. The driving force behind illegal logging is the need for fuel wood in mountain villages or commercial purposes. disturbance, reduction of populations or even loss of species through the threat of uncontrolled hunting of wildlife. These threats are caused by socio-economic moments (growing poverty, for example, hunting and fishing for meat), economic moments (national

Threat	Impact on natural values
	and international markets of hunting tourism), social moments (increased need for recreation in conditions of low awareness of the rules of behaviour in nature). Examples for species that are endangered or even extinct: Balkan lynx, bearded vulture and griffon vulture, the small and the big grouse
Unsustainable use of certain medicinal and aromatic plants and fungi;	changes in the abundance of plant species through the threat of reckless collection of certain medical and aromatic plants; examples are Sideritis scardica, Primula veris or Gentiana lutea. While the collection of plants is a century old tradition, which is perceived as suistainable, in recent decades the overuse of certain species for commercial purposes can be observed. Another aspect is the collecting tourism from Kosovo, where collectors cross the border and are collecting big amounts of plants.
Unsustainable use of water resources (especially for electricity production);	Disruption of ecological processes and erosion in river ecosystems which is caused by construction of infrastructure for energy production with hydro power plants. It leads to fragmentation of habitats, disruption of constant flow, changes in geo-formations, changes in chemical parameters of the water in the river, changes in water depths and flow velocities. All these effects have a negative impact on flora and especially on the fauna in and along the rivers. Another aspect is the negative impact on the natural landscape.
Unregulated building, and construction of infrastructure (construction of roads, houses, restaurants and other touristic infrastructure, etc);	Disturbance of wildlife and destruction of habitats through construction activities
Insufficient waste management and wastewater treatment;	Both leads directly to pollution of habitats, ecosystems and landscapes.
Unsustainable development of touristic activities;	Disturbance of species through tourism. Negative impact on wildlife is expected from the use of motorized vehicles in summer and winter (All Terrain Vehicles ATV, moto-cross bikes, motorized snow sledges or snow cat). Hiking and mountaineering during the whole year usually have small impact on wildlife and nature. As long as tourists stay on marked trails the impact is minimized because wildlife gets used to visitors

Threat	Impact on natural values
	and avoids them. Touristic infrastructure could have negative impact on the landscape.
Introduction of non-native invasive species;	Negative effects on habitats and ecosystems can be caused by the introduction of non-native species
Climate change causing severe weather and geological events.	More frequent storms and heavy rainfalls, forest fires can appear and cause erosion and landslides

Table 21: Main threats and impact on natural values

The following table provides an overview of pressures and threats to the natural values in the area of the national park, following the METT classification (2018). An assessment of threats was also done during METT4 Assessment in a workshop with key stakeholders on 17.11.2021 and the results presented are in Annex 4.

Legend for Value: 0 = N/A; 1 = Low; 2 = Medium; 3 = High

Threats	Value	Comments
1. Residential and commercial development within a protected area: Threats from human settlements or other non-agricultural land uses with a substantial footprint		
1.1 Housing and settlement	1	Urbanization needs to be controlled according to zonation and planning documents
1.2 Commercial and industrial areas	1	Not a major threat
1.3 Tourism and recreation infrastructure	3	Snowcats, motorized snow sledges and off-road vehicles are major threats that need to be controlled according to zonation
2. Agriculture and aquaculture within a protected area: Threats from farming and grazing as a result of agricultural expansion and intensification, including silviculture, mariculture and aquaculture		
2.1 Annual and perennial non-timber crop cultivation	0	N/A
2.2 Wood and pulp plantations	0	N/A
2.3 Livestock farming and grazing	2	Not a major threat as livestock farming and grazing are declining; the effects of abandonment of agriculture are more important
2.4 Marine and freshwater aquaculture	0	N/A
2.5 Drug cultivation	0	N/A
3. Energy production and mining within a protected area: Threats from production of non-biological resources		
3.1 Oil and gas drilling	0	N/A
3.2 Mining and quarrying	1	Almost non-existent, should be limited to sustainable development zone

Threats	Value	Comments
3.3 Energy generation, including from hydropower dams	3	Small hydropower plants are existing in the area of the NP and it is important to monitor the ecological minimum flow and to have a mechanism to react when the minimum flow is not sufficient; the small hydro power plants also affect valleyws, gorges, riverbeds etc.;
4. Transportation and service corridors within a protected area: Threats from long narrow transport corridors and the vehicles that use them including associated wildlife mortality		
4.1 Roads and railroads (including as a direct threat to animals)	2	
4.2 Utility and service lines (e.g., electricity cables, telephone lines,)	1	To be carefully planned and monitored in the active management zone, especially for development of areas identified for tourism
4.3 Shipping lanes and canals	0	N/A
4.4 Flight paths	0	N/A
5. Biological resource use and harm within a protected area: Threats from consumptive use of "wild" biological resources including both deliberate and unintentional harvesting effects; also, persecution or control of specific species (note this includes hunting and killing of animals)		
5.1 Hunting, killing and collecting terrestrial animals (including killing of animals as a result of human/wildlife conflict)	3	It will be important to maintain effective control of illegal hunting in cooperation with police and relevant inspectorates (law enforcement)
5.2 Gathering terrestrial plants or plant products (non-timber)	2	For species of commercial interest, resource assessments, regular monitoring and control of collecting needs to be established, including regulation between the NP and collectors based on permits
5.3 Logging and wood harvesting	3	Regular monitoring and control of implementation of forest habitat management plans in cooperation with police and relevant inspectorates
5.4 Fishing, killing and harvesting aquatic resources	1	In some of the glacier lakes fishing was observed
6. Human intrusions and disturbance within a protected area: Threats from human activities that alter, destroy or disturb habitats and species associated with non-consumptive uses of biological resources		
6.1 Recreational activities and tourism	3	Ranger services are responsible for monitoring, managing and educating visitors
6.2 War, civil unrest and military exercises	0	N/A
6.3 Research, education and other work-related	0	N/A

Threats	Value	Comments
activities in protected areas		
6.4 Activities of protected area managers (e.g., construction or vehicle use, artificial watering points and dams)	0	N/A
6.5 Deliberate vandalism, destructive activities or threats to protected area staff and visitors	1	Ranger service should be present and exercise management in all areas of the park
7. Natural system modifications: Threats from other actions that convert or degrade habitat or change the way the ecosystem functions		
7.1 Fire and fire suppression (including arson)	3	An efficient firefighting system for early detection and intervention in all areas of the park needs to be established
7.2 Dams, hydrological modification and water management/use	3	Biological minimum water flow, physical condition, erosion need to be monitored in rivers with small hydro power plants
7.3a Increased fragmentation within protected area	1	Habitat fragmentation should be monitored
7.3b Isolation from other natural habitat (e.g., deforestation, dams without effective aquatic wildlife passages)	0	N/A
7.3c Other 'edge effects' on park values	0	N/A
7.3d Loss of keystone species (e.g., top predators, pollinators etc)	1	Populations of key species will be part of regular monitoring
8. Invasive and other problematic species and genes: Threats from terrestrial and aquatic non-native and native plants, animals, pathogens/microbes or genetic materials that have or are predicted to have harmful effects on biodiversity following introduction, spread and/or increase		
8.1 Invasive non-native/alien plants (weeds)	1	Populations of invasive species will be part of regular monitoring
8.1a Invasive non-native/alien animals	1	Populations of invasive species will be part of regular monitoring
8.1b Pathogens (non-native or native but creating new/increased problems)	0	N/A
8.2 Introduced genetic material (e.g., genetically modified organisms)	0	N/A
9. Pollution entering or generated within protected area Threats from introduction of exotic and/or excess materials or energy from point and non-point sources		
9.1 Household sewage and urban wastewater	2	Improvement of wastewater management by municipalities is needed, especially in developing tourist destinations

Threats	Value	Comments
9.2 Industrial, mining and military effluents and discharges (e.g., poor water quality discharge from dams, e.g., unnatural temperatures, de-oxygenated, other pollution)	0	N/A
9.3 Agricultural and forestry effluents (e.g., excess fertilizers or pesticides)	1	Not a major threat but ranger service should monitor
9.4 Garbage and solid waste	3	Very high threat; urgent need of immediate intervention from relevant municipalities to clean up illegal dumping sites in cooperation with waste management companies and ranger service
9.5 Air-borne pollutants	0	N/A
9.6 Excess energy (e.g., heat pollution, lights etc.)	0	N/A
10. Geological events Geological events may be part of natural disturbance regimes in many ecosystems. But they can be a threat if a species or habitat is damaged and has lost its resilience and is vulnerable to disturbance. Management capacity to respond to some of these changes may be limited.		
10.1 Volcanoes	0	N/A
10.2 Earthquakes/Tsunamis	1	N/A
10.3 Avalanches/ Landslides	2	Landslides are critical on steep slopes; avalanche mitigation and control system based on weather conditions, avalanche probability assessment and issuing alerts should be established
10.4 Erosion and siltation/ deposition (e.g., shoreline or riverbed changes)	2	Regular monitoring of erosion and an erosion management plan with proposals for nature-based solutions for torrent control should be implemented
11. Climate change and severe weather Threats from long-term climatic changes which may be linked to global warming and other severe climatic/weather events outside of the natural range of variation		
11.1 Habitat shifting and alteration	1	Regular monitoring of climate change effects on habitats should be established
11.2 Droughts	0	N/A
11.3 Temperature extremes	0	N/A
11.4 Storms and flooding	2	Regular monitoring of storms and floods with special focus on steep slopes and drainage of excess water should be implemented

Threats	Value	Comments
12. Specific cultural and social threats		
12.1 Loss of cultural links, traditional knowledge and/or management practices	3	There is a trend of abandonment of traditional land use practices and the use of natural resources, altering and reducing the area's diversity
12.2 Natural deterioration of important cultural site values	1	Important cultural values are being lost due to abandonment of rural areas
12.3 Destruction of cultural heritage buildings, gardens, sites etc.	0	N/A

Table 22: Overview of the threats and pressure for nature values

3.6. Effectiveness and efficiency of management and management capacities

The effectiveness and efficiency of the management of a protected area are most commonly assessed using the Management Effectiveness Tracking Tool, following the methodology of: Stolton, S. and N. Dudley. 2016. METT Handbook: A guide to using the Management Effectiveness Tracking Tool (METT), WWF-UK.

This contains a series of questions related to a protected area's management, and can be applied to any kind of protected area. Due to the recent establishment of the protected area, no active management is yet in place, so a METT assessment cannot be completed at this time.

4. Strategy

4.1. Vision

Shar Mountains National Park, with its exceptional natural values, where species, habitats and exosystems are properly managed to conserve them for future generations. The local community is informed and actively involved in nature conservation, and enjoys the benefits of ecosystem services and tourism, which encourages the development of the local communities through respect for their economics, social and cultural diversity. Visitors enjoy the opportunities for ecotourism, and tourist activities are in harmony with the goals of preservation of the nature values. Shar Mountain National Park is a desired destination for domestic and foreign tourists and is in the 20 most desired tourist destinations in Europe.

4.2. Objectives

The objectives of the national park are:

- To maintain and enhance as well as to monitor biodiversity and natural values. This includes wild species, habitats and ecosystems, physical (geological, geomorphological, pedological and hydrological) characteristics and landscapes;
- To ensure that the natural resources of SMNP are used sustainably. Their use provides income for local communities and contributes to funding the SMNP Public Institution
- To ensure that habitat and ecosystem management are in accordance with conservation goals at national and international levels;
- To protect and promote the landscape diversity and cultural heritage of the park, including various types of landscapes formed by nature and types of landscapes that have evolved through the interactions between humans and nature over centuries;
- The Shar Mountains welcome tourists from all over the world who appreciate and enjoy the beauty and diversity of the area. Visitors help finance the national park through tourist fees, and eco-tourism contributes to the incomes of local people who are actively involved in providing tourism services (guiding, accommodation and traditional food);
- The national park actively supports the sustainable development of mountain villages;
- To provide information and raise awareness about the area's natural and cultural values, the objectives of the protected area and its zonation, restrictions and conservation measures, as well as the benefits of the park for the local population. To offer educational activities so that all types of visitors and target groups can experience the values of the national park;
- To implement effective management, planning and strategic development, and have strong capacity and secure, sustainable financial resources.

4.3. Boundaries and Zoning

4.3.1. Proposed External Boundaries of the Protected Area

The total area of the Sharr Mountain National Park is 62,705 hectares.

The border of Shar Planina National Park in the southwest starts from the peak Mala Planina at an elevation of 1,798 meters and follows the border of Mavrovo National Park in a northwesterly direction, and then in the western, northwestern, northern and northeastern part follows the national borders, all the way to the location northeast of the Bogljac peak,

where a non-permanent stream crosses the state border, near the villages Kodralji and Globocica in Kosovo. From this point, all the way to the village Dzepciste the border moves generally in a southwestern direction, first passing through the dry valley north of the peak Bogljac, descends to the stream Proi and Spatit, cuts across it and climbs the ridge at an elevation of 1,000 m. Then it follows the isohypse, all the way to the forest road, above the Popov Dub elevation point, all the way to Kalugjer, above Rogachevo. Then it climbs to an elevation of 1,000 m and follows the isohypse all the way to the forest road west of Rogachevo, along which it climbs to 1,040 meters, and then along the dry valley descends to the road above Staro Selo at 920 m above sea level near the Church of St. George. From there it continues briefly along the forest toad and in front of the locality Cerje descends to the south along the ridge towards the village Vratnica at an elevation of 800 m. It crosses the Vratnicka River, passes directly above the church of St. Petka and folows the isohypse at an elevation of 780 m. At the same height, the border bypasses the village of Belovishte on its northeastern side, and on the western border it descends to the main road and follows it to an elevation of 650 m, then at the village of Odri it rises again above the village, in places up to an elevation of 750 m. On the west side of Odri, the border descends to the main road and follows it to 600 meters above sea level, and then follows the isohypse all the way to the river Gabrovica, after which it climbs to an elevation of 650 m, briefly follows the isohypse, then descends to the village of Dobroshte and follows its upper limits along the isohypse at 600 m. Following the same isohypse, the border passes above the villages of Glogi, Tearce and Slatino, all the way to the village of Leshok, where the border rises to 650 meters above sea level and passes above the monastery of St. Athanasius and the Old Monastery. Here the border crosses the Leshochka River and descends along a dry valley west of Leshok to an elevation of 550 m, after which it follows this isohypse above the village of Neprosteno, after which it climbs to 700 m and follows this isohypse between Jedoarce and Dzepciste. At the locality Padina the border descends to the River Brza, shorty climbs towards south to an elevation of 900 meters above sea level and then in a southwesterly direction climbs to the locality Vtosina, intersecting the road that leads to the village of Germo. It continues in a southwesterly direction, following the road and intersects the intermittent stream Lavchanski Dol. Then it continues to follow the dirt road, under Strmol, to the village of Lavce and descends to Tetovo Kale bypassing the village of Lavce on its southern side to the westernmost point of the village by the road and then moves towards the west under the village of Banjice and crosses the river Pena. From this point between the sites Shipkovo Teke and Dupnik the border rises up to an elevation of 1,020 m and in continuation follows the main asphalt road for Popova Shapka to the locality Bel Kamen (west of the village Gajre). It leaves the asphalt road and then the border moves along an isohypse at 1,100 meters above sea level bypassing the village of Lisec on the east and south side, intersecting the intermittent watercourse that comes from Popova Shapka all the way to the locality Piv. From here the border moves in a southeast direction up to an elevation of 900 m where it comes to the road that leads from Tetovo to the village of Gorno Palchishte and follows it briefly to the locality Jurgovica. The border is then descends to 750 meters above sea level and then follows the isohypse all the way to the Palchishka River, climbs in a southerly direction to an elevation of 900 m at the locality Tupovica. Then along the same isohypse passes the locality Kutlica and the locality Gumnishte, descends to 850 meters above sea level intersecting the road that leads to the village of Jelovjane. From this point the border continues along an isohypse at an elevation of 850 m and at the locality Golema Liska comes the road that leads to the villages Urvich and Novo Selo, follows it briefly in westerly direction and then descends towards the south to Bogovinska River where it intersects the river and from here in the southwestern

direction climbs to 700 meters above sea level to the locality Lisaja. Moving along an isohypse at an elevation of 700 m it bypasses the village Rakovec on its eastern side and after crossing the road that leads to the village, it goes shortly in a westerly direction to the locality Strmec. From here it climbs to 750 meters above sea level and follows the isohypse through the locality Stari Zabelj to the top Vnesht at 756 m, crosses the road to the village Gorjane and along the road towards the south descends to the river Svinjska Bara, crosses it and climbs to an elevation of 800 m, intersects the road to the village of Djurdjeviste following the isohypse to the locality Brenica. The border descends towards the south to the river Mazdracha, crosses it and continues in the direction of the locality Kalishte up to 750 meters above sea level, previously crossing the river Mavrica. Then briefly follows the isohypse at an elevation of 750 m and climbs to 800 m in the area between the locality Polostina, and Guri and Ayres, from where it continues along an isohypse at 800 meters above sea level all the way to the road leading to the village of Pozarane at the locality Zabel. Then it continues in a southwesterly direction, descends to the Proshovska River, intersects it and continues to climb to an elevation of 950 m west of the monastery of St. Nikola. Continues along the isohypse at 950 m and passes west of Novo Selo and on the north side of the locality Debonja continues along the valley west of the village Vranovci until the last house at the end of the road at the locality Debreshe (above the village Debreshe) up to an elevation of 700 m. From this point the border climbs the ridge through the locality Chuka to 1,000 meters above sea level and the locality Veljo Strnishte, and then towards the south descends to an elevation of 800 meters and continues to follow the isohypse through the locality Osmanova Livada, between the villages Dolno Jelovce and Lesnica, intersecting the road that leads to the village Dolno Jelovce and passes through the locality Dushk. The border briefly continues in a westerly direction and then southwest to the village of Pechkovo descends to Jelovjanska Reka (Ravenska Reka), crosses it and climbs again at an elevation of 800 m, intersects the road to the village of Pechkovo and continues after an isohypse at 850 m to the northern side of the village Vrutok, passes over HPP Vrutok and climbs along the Vrutochka River to an elevation of 850 m. From that point the border ascends in a northerly direction, intersects the road leading from Sharski Vodi to Vrutok and continues up to an elevation of 1,300 m, and then along the isohypse continues in a southwesterly direction and runs parallel to the road leading to the village of Duf and at the locality Shula it descends to the south, crosses the Dufska River and then climbs towards the northwest to the main road leading from Mavrovo to the village of Duf. It runs parallel to the road through the villages of Duf and Chajane and then along the valley climbs to the peak Mala Planina.

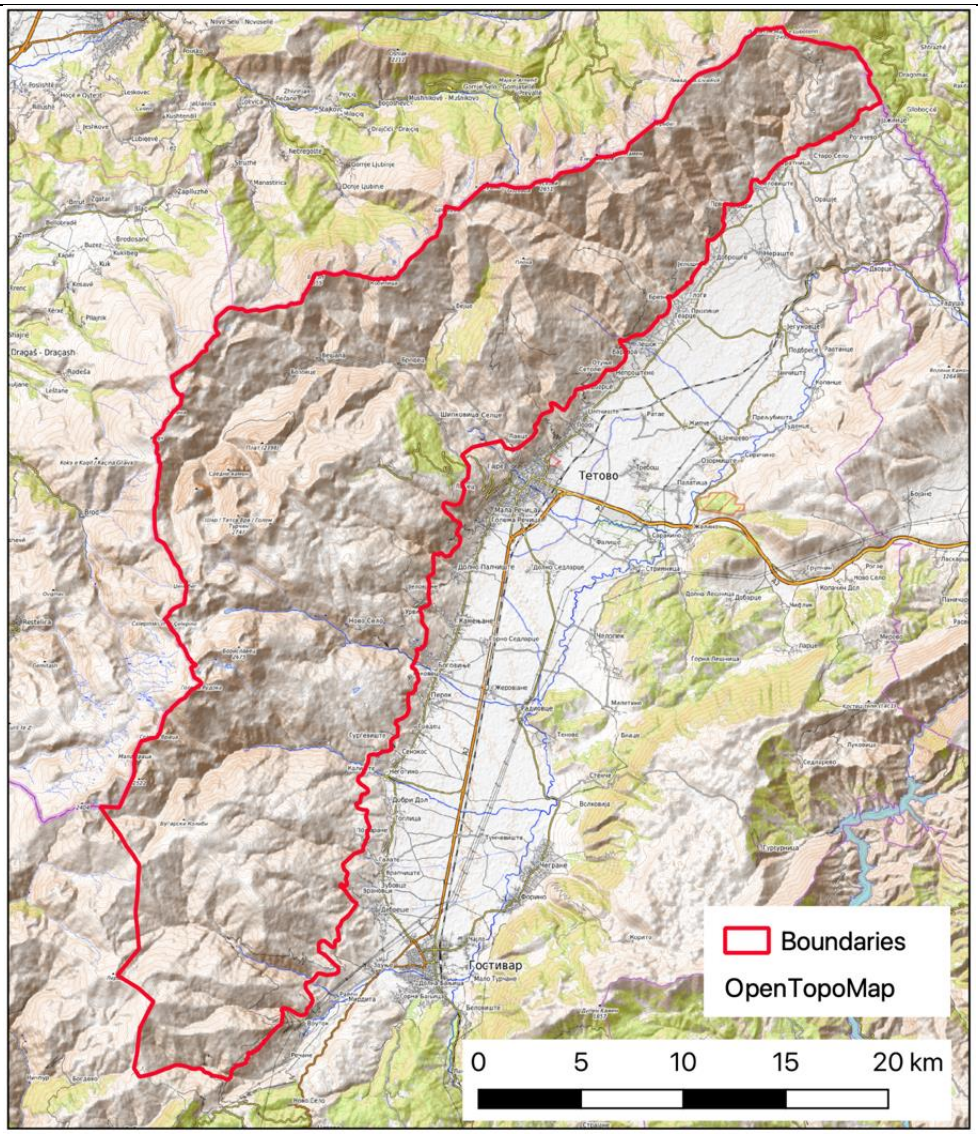


Figure 1: Boundaries of the protected area

Picture 5: Boundaries of the protected area

4.3.2. Proposed Zonation Boundaries of the Protected Area

Zone	Area (ha)	Km ^{2}	(%)
Strict Protection (SP)	16,651	166.51	26.56
Active Management (AM)	30,763	307.63	49.06
Sustainable Development (SD)	13,805	138, 05	22.02
Buffer Zone (BZ)	1,484	14.84	2.37
Total	62,705	627.05	100.00

Table 23: Proposed borders for the zonation of the park

Name	Area (ha)	Description / Meaning
SP - 01 Ljuboten	1,057	This is the area with the highest interest in protection, which is characterized by original, unchanged characteristics of ecosystems or has very little change as a result of traditional management practices. The zone for strict protection is composed of 5 special units, and it covers the highest parts of Shar Mountain bordering Republic of Kosovo, ie. Shara National Park in Kosovo. In this zone are located the most important ecosystems and habitats: glacial lakes, peatlands, high mountain pastures, alpine rocky areas, blueberry heaths, spruce and Empetrum, the most important forest ecosystems; as well as significant areas and most of the important species, especially vascular plants, diatoms, diurnal butterflies, etc.
SP - 02 Bistrica	3,756	
SP - 03 Kobilica	558	
SP - 04 Leshnica	4,559	
SP - 05 Mazdracha	6,722	
AM	30,763	It is a zone of high interest for protection, in which management interventions are needed in order to restore and maintain, revitalize or rehabilitate habitats, ecosystems and other elements of the landscape. The active management zone includes natural and semi-natural pastures on which traditional grazing takes place, and important forest ecosystems on Shar Planina, primarily preserved beech forests, spruce and fir forests or mixed forests of evergreen and deciduous species, as well as chestnuts forests and some refugial forest structures.
SD	13,805	It is a significant part of the protected area that does not have high values for protection, which includes infrastructure facilities, cultural heritage sites, types of forests that are affected by human activities and mountainous settlements with the surrounding agricultural land. This zone has a high potential for habitat revitalization.
BZ	1,484	The buffer zone is located around the “Popova Shapka” Ski Center. It aims to enable controlled development of the Ski Center in the future, and at the same time to mitigate the impact of infrastructure facilities on the National Park.

Table 24: Description and area of the zones in the park

4.3.2.1. Strict protection zone

The zone of strict protection (SP) is divided into 5 separate units: Ljuboten, Bistrica, Kobilica, Leshnica and Mazdracha.

The total area of the strict protection zone of the Sharr Mountain National Park is 16,651 hectares or 26.56% of the total area of the park.

SP - 01 Ljuboten

The area of SP Ljuboten is 1,057 hectares.

The border of the first zone around Ljuboten starts at an elevation of 2,200 m from the starting point which is located on the border with Kosovo between the peaks Kule and Ljuboten. On the northwest, north and northeast side, the zone is defined by the state border, completely covers the locality called Ljuboten and extends along the border to an elevation of 1750 m at the locality Ljak and Zanetes, from where it leaves the border and continues to move along the isohypse in the immediate vicinity of the upper border of the forest, through the locality of Shpat and Med. The border continues along the isohypse, intersecting the road that leads to the locality Kjafa e Kejlit, all the way to the locality Zandarska Buka where it continues down to the southwest along one of the streams of Ljubotenska Reka to an elevation of 1,600 m. From this point, the border moves through a forest belt and descends to the south to 1550 m above sea level, bypassing the mountain lodge and villa Ljuboten on its west and south side, and then continue along the isohypse to the locality Staroselski Bacila where it intersects again one the streams of Ljubotenska Reka and climbs northeast to the road leading to the mountain lodge. In continuation, the border moves to the south, parallel to the road to Staro Selo until the sheepfold on the west side of the locality Elezova Rupa from where it deviates from the road to the west up to 1,300 m and again continues to follow the road to an elevation of 1,000 m near the locality Lanishta. From this point, the border descends in a southwesterly direction to Vratnicka Reka at 900 m where it crosses the river and continues to climb along the course of one of the streams of Vratnicka Reka until an elevation of 1,000 m, and then continues the climb through the locality Prisoj to 1,400 m above sea level. The border here comes out of the forest belt and continues to climb along the ridge to the west and northwest following the forest border through the locality Shopko to an elevation of 1,600 m, near the sheepfolds located at the locality Kamche. From here the border briefly follows the isohypse at 1,600 m above sea level and then continues to the northeast, descends to the Livadicka River, intersects it and continues to climb again to an elevation of 1,600 m and moves towards the north through pastures through the locality Vratnicki Bacila, passing by the sheepfold in the locality Vratnicka Livadica. After the sheepfold, the border continues to the northeast, again crossing the Vratnicka River, to an elevation of 1780 m from where it starts to descend to the southeast through the pastures to an elevation of 1,500 m and then continues to climb to the north following the upper border of the forest to Ljubotenska River and the end of the forest belt near the site Gradska Livadica. Then the border moves again to the north along one of the streams that form the river to an elevation of 1,700 m where it changes direction to the northwest and climbs to the starting point of SP Ljuboten at an elevation of 2,200 m.

SP - 02 Bistrica

The area of SP Bistrica is 3,756 hectares.

The border of the second zone in the municipality of Tearce starts at the border with Kosovo, at the locality Jovin Kamen which is located southwest of the peak Jovin Kamen (2,312 m), at an elevation of 2,220 m. On the western side, as well as on the northwestern and northern sides, the zone is defined by the state border with Kosovo, all the way to the top of Crni Kamen, which is located at an elevation of 2,536 m. From this point, the border moves south along the ridge to 2,350 m above sea level and then descends to the southwest to an elevation of 2,100 m, intersects Ezerska Reka, climbs again towards the locality Chaushicki Srt to an elevation of 2,300 m and then descends along the valley of the locality Chaushica to

Chaushicka Reka at an elevation of 1,650 m. In continuation, the border follows the course of Chaushicka River, at 1,500 m above sea level enters the forest belt and continues to the entrance of the river Bistrica at 1,220 m from where it climbs to the southwest along the valley near the locality Tri Vode to 1,450 m above sea level and then follows the isohypse towards east and northeast to the locality Golema Dupka. From this point the border moves to the northwest to 1,700 m near the locality Brezanske Livade from where it descends to the locality Vrtishte, bypassing it in the direction west-northwest-northeast by following the forest border up to 1,100 m above sea level. The border briefly follows the isohypse in a northeasterly direction and descends to a point of 950 m above sea level from where it changes its direction to the northwest, descends to the Leshochka River at 860 m and climbs again in the direction northwest-west-southwest through the locality Osoj to 1,600 m. From this place, the border of the zone briefly follows the forest border to the southwest, and in continuation goes beyond the upper border of the forest belt and along the pastures to the west, and climbs to the peak Vrchik at 2,094 m above sea level. After the peak, the border continues in the northwest direction along the ridge through the locality Plocha to the peak with an elevation of 2,375 m from where it descends in the direction to the west and northwest along the ridge to the river Kupinica at 1,600m above sea level, above the village Vejce. From here the border ascends to the north and northwest along the valley of the river Kupinica through the locality Rokolech to an elevation of 2,000 m and then follows the isohypse towards the west moving through pastures to the locality Hodzina Livada where the ridge descends to the Dojranska River and the upper border in the forest above the village of Vejce at an elevation of 1,700 m. From here the border crosses the river and moves upwards to the northwest along the course of one of the streams of the Dojranska River all the way to the starting point of the zone.

SP - 03 Kobilica

The area of SP Kobilica is 558 hectares.

The border of the third zone starts on the border with Kosovo, on the mountain peak which is located at an elevation of 2,473 m, between the saddle Carevo Gumno and the crossing Ljubinski Ushi. On the north side, the zone is defined by the state border that moves from the starting point, through the ridge Treskavec and the peak Kobilica to the valley between the localities Kuchbeg and Serdarica at an elevation of 2,179 m. From this point, the border descends to the southeast in the direction of the village Vejce, along the valley of one of the intermittent springs that flow into the Dojranska River an elevation of 1,850 m and then continues along the isohypse in a southwesterly direction through the locality Golem Kamen, towards the peak Guri and Epr and moves through the pastures. At the pass in front of the peak, the border climbs to 1,900 m above sea level and turns westwards, descending to an elevation of 1,550 m, briefly entering the upper forest belt near the locality Sheliche. From this point, the border moves upwards in a southwesterly direction through the locality Sheliche, and along the river Sheliche to an elevation of 1900 m, and then turns along the valley in a southeast direction and climbs to the starting point of this zone.

SP - 04 Lesnica

The area of SP Lesnica is 4,559 hectares.

The border of the fourth zone starts at the border with Kosovo, on the mountain peak Brdalevo which is located at an elevation of 2,369 m on the western part of the proposed border of the Shara National Park. The zone on its western, northwestern and northern side

is defined by the state border with Kosovo, from the peak Brdalevo, through the peaks Klech, Maja and the pass Kara Nikola from where a dirt road leads to the village Vesala. The border in the first part descends and moves to the south following the road to Vesala to an elevation of 1,900 m where it reaches the Karanikolos River and follows it to 1,770 m above sea level from where it turns to the southwest towards the Sheremetica peak through the locality Karanikolica and climbs to an elevation of 2,000 m. From this point, the border moves towards the southwest following the isohypse at 2,000 m all the way to the locality Strga where it descends to the south along the course of one of the streams which flows into Skakalichka Reka to an elevation of 1,700 m where the border crosses Skakalicka Reka and then climbs along the ridge to the west to 1,800 m above sea level and the locality Gajrina. In continuation, the border follows the isophypse at 1,800 m and moves through pastures along several sheepfolds to the locality Babasanica, a hundred plus meters above the road that leads from the village Bozovce to the locality Dolna Leshnica. At the locality Babasanica, the border moves shortly to the south through one of the streams that flow into the river Pena and then in the southwest direction climbs the ridge to the highest point of the locality Kjepenovo with an elevation of 2,208 m, from where it descends to the south to the locality Sadere at 1,800 m above sea level. From this point, the border enters the forest belt and in the southeast direction descends to the river Pena at 1,500 m, then follows it to the locality Dolna Leshnica where it crosses the river in the northeast direction, briefly climbs and follows the isohypse at an elevation of 1,550 m to Leshnicka River. In continuation, the border briefly moves towards the northwest to the road that leads from Dolna Leshnica to Popova Shapka and follows the road bypassing the peak Plat to the sheepfold 1 Maj at an elevation of 1,850 m where the border exits the forest belt. From here the border leaves the road and moves upwards along a non-permanent stream towards the locality Gorna Leshnica up to an elevation of 2,100 m from where it moves to the south along the ridge between the localities Gorna Leshnica and Kazani to the top at 2,589 m above sea level. From this peak the border moves to the west along the ridge towards the peak Sin Vrv (2,554 m) near the locality Orlova Stena and then descends to the south towards the valley of Vakuf, crosses the river, towards the southwest briefly follows the summer hiking trail to the peak Bakardan and then along the ridge towards the west reaches the peak at an elevation of 2,704 m. The border continues along the ridge in the southwest-west direction, following the winter hiking trail from the peak Bakardan to the peak Titov Vrv, up until the saddle at an elevation of 2,490 m, from where it moves in the southwest direction towards the peak Turchin to an elevation of 2,450 m above sea level. The border then continues along the isohypse at 2,450 m bypassing the Turchin peak on its southern side to the western side of the peak from where the border moves westwards along the ridge and then descends to the locality Dzinibeg at an elevation of 2,200 m. From this point the border follows the isohypse at 2,200 m in the southwest direction and in the immediate vicinity of the river sources of the river Pena changes the direction to the northwest and continues along the old dirt road to the foot of the Brdalevo peak where in the west direction it climbs again to the peak which is the starting point of this zone.

SP - 05 Mazdracha

The area of SP Mazdracha is 6,722 hectares.

The border of the fifth zone starts at the peak Mal Crn Kamen (2,230 m) which is located on the border with the National Park Mavrovo, and continues along the ridge in a northwest direction following the border of the National Park Mavrovo to the state border with Kosovo through the locality Mazdracha. In continuation, the border in the western part of the zone

is defined from the state border with Kosovo to the locality Trpeznica, near the peak Dzinibeg (2,610 m), on its northwestern side. From this point the border moves east-northeast-east towards the locality Velika Spreka at an elevation of 2,020 m where it comes to Slapska Reka and in continuation follows the flow of the river to the southeast and to the locality Slap at 1,420 m above sea level where Slapska Reka flows into Bogovinjska Reka. The border then continues to the southwest to the locality Vojvodina at an elevation of 2,000 m from where it briefly moves along the isohypse in the southwest direction, and then to the west climbs and reaches the locality Crn Kamen at an elevation of 2,300 m. From here, the border goes down to the south to 2,200 m and then to the southeast towards the locality Matene, and at an elevation of 1,500 m it enters the upper forest belt and in continuation to the south follows the dirt road Sharski Vodi to the locality Trla where it moves along the upper border of the forest in the direction southwest-south-southeast up to an elevation of 800 m. At this point the border crosses the river Mazdracha and moves up to the south along the valley of an intermittent stream, through the locality Crna Voda, then between the localities Crn Kamen and Kodra e Made where at an elevation of 1,300 m again crosses the road Sharski Vodi and continues to the upper limit of the forest at 1,550 m above sea level. Then the border follows the upper border of the forest in the northwest direction to an elevation of 1,650 m near the locality Zendelova Cesma, and then to change the direction to the southwest and then to the west again along the upper border of the forest to the peak Chuka (1,715 m). From this point the upper border of the forest belt is left and the border of the zone continues to the south, climbs to the next peak at an elevation of 2,000 m and through the locality Kuchi Baba in the southwest-west direction reaches the peak Bugarski Kolibi at 2,180 m above sea level. From here the border continues to climb in a southwesterly direction to the starting point of the zone, the peak Mal Crn Kamen.

4.3.2.2. Active management zone

The active management zone (AM) covers a total area of 30,763 hectares or 49.06% of the total area of the park.

The border of this zone starts in the valley which is located between the peak Mala Planina and the locality Dingova Crkva at an elevation of 1,670 m. The western, north-western and a part of the northern boundary of the zone is defined by the boundary of the entire Sharr Mountain National Park and the five strict protection zones. From the point where the zone of strict protection of Ljuboten ends, the border of the zone for active management continues along the state border with Kosovo in the direction east-northeast to the lower border of the forest belt at an elevation of 1,170 m at the locality Kodra e Bunari. From that point, in the direction south-west-south, it briefly follows the border of the forest and climbs to 1,200 m above sea level where it enters the forest belt and continues to move along the isohypse through the locality Beli Kamen and continues to the southwest along the same isohypse at 1,200 m to the locality Lanishta below the peak Kosmatica. From that point it descends in a southwesterly direction, crosses the road that leads to the mountain lodge Ljuboten, through the locality Cerje to Vratnicka Reka at an elevation of 750 m. Then the border briefly ascends in a westerly direction to 900 m and along the isohypse continues to the southwest through the localities Gjelev Niva and Klagje, descends to Belovishka Reka, crosses it and climbs to an elevation of 800 m. The border continues along the isohypse at 800 m above the village Belovishte and the locality Papradica, intersects the river Valaec and continues along the same isohypse to the Odranska River. From that point the border crosses the Odranska River and in the southwest direction climbs to an elevation of 1,200 m above sea level and then descends to 900 m, and briefly follows the river Gabrovnica towards the south to one of the

intermittent streams at the locality Padina and then to the west climbs one of the intermittent streams to an elevation of 1,200 m. Then the border follows the isohypse to the river Ponika, crosses it and continues along the isohypse towards the south and to the locality Reshetka from where along the same isohypse continues to the locality Pekj and descends in a southwest direction to the river Bistrica at an elevation of 850 m. From this point the border continues across the river Bistrica to the southwest and climbs to an elevation of 1,100 m and then continues parallel to the road leading from Tri Vode to the village Leshok, moving in the direction southeast-south-southwest, passing the village Brezno up to an elevation of 800 m near the church Stari Manastir in the village of Leshok. From this point the border leaves the road and descends to the Leshochka River in a northwesterly direction, crosses the river at an elevation of 750 m and continues to climb in a southwesterly direction up to 1,000 m and then along the isohypse to the locality Papradnik from where in the direction of southwest it moves along the same isohypse at 1,000 m above sea level, then crosses the river Ludi Potok, passes by the village of Setole to the dirt road and follows it briefly in a southwesterly direction, and then climbs north to an elevation of 1,400 m. From this point to the northwest direction, the border continuously follows the road that ascends to 1,700 m, and then descends to the south along the road to the locality Isti Kamen at an elevation of 1,400 m, where the border deviates to the west to the locality Orlica and climbs on another dirt road in a northwest-north direction up to an elevation of 1600 m and towards the west descends to the river Kupinica at an elevation of 1,400 m. From this point the border moves briefly along the isohypse of 1,400 m above sea level to the village of Vejce and then along the ridge in the northern direction and along the upper border of the forest climbs to an elevation of 1,700 m and from that point towards the west, through the forest belt descends to Dojranska Reka at 1,300 m, crosses it and continues to climb to an elevation of 1,550 m. The border then briefly moves along the isohypse in a southwesterly direction to the locality Karakol from where towards the west it climbs to an elevation of 1,650 m and then to the south it descends through the locality Gornovica where it briefly exits the forest belt and descends to the river Proi i Brodecit at 1400 m. From this point it crosses the river and moves along the isohypse in the south-west direction through the locality Kobilichka Shuma, then it crosses the river Sheliche and continues along the same isohypse at 1,400 m through the locality Koshica to the locality Malji i Bacheles from where it descends to Reka e Kepit at an elevation of 1,350 m briefly following the river in the southern direction and above the locality Vores above the village Vesala in the western direction climbs to an elevation of 1,400 m, in continuation briefly follows the Karanikolos River up to 1,500 m from where to the south it descends to the locality Probozovce e Epr. From this place it continues briefly in a southwesterly direction along the isohypse above the village of Bozovce where it climbs up to 1,500 m and along the same isohypse it continues to the locality Rafsha where it crosses the road that leads from Dolna Leshnica to the village Bozovce and descends in the southeast direction to Reka Pena river at an elevation of 1,300 m. Then it follows the river Pena to an elevation of 1,050 m where the border moves along the forest border, towards the south to the locality Crni Vrv to an elevation of 1,200 m from where it briefly follows the isohypse to the east to the road leading to the village Brodec, further short follows the road to the village of Brodec to 1,100 m above sea level, crosses Studena Reka and briefly continues in the northeast direction from where in the south it climbs to the locality Drven and continues to climb to the locality Stana Bara at an elevation of 1700 m. From this point, along the border of the forest it moves in a south-west direction and passes over the mountain lodge Jelak towards the locality Guri i Brezit where it climbs to an elevation of 2,000 m. From this point in the southwest and south direction the border intersects the road that leads from Popova Shapka to Dolna Lesnica and

climbs to the peak Anteni at 2,531 m. From this point it moves southeast through the locality Bare to the peak at an elevation of 1,690 m located between the localities Aerodrom and Kepato e Gjolit and then along the ridge it descends in the southeast-south direction through the locality Guranova Karpa all the way to Palchishka Reka at 800 m above sea level. From this point it briefly enters the forest and in the western direction climbs along an intermittent stream through the locality Uica up to 1,350 m where it intersects the road and in the southern direction briefly follows it to Jelovjane, then continues along the road to the locality Orlovec from where it briefly continues along the road to Novo Selo and in the northwest direction climbs to an elevation of 1,550 m from where along the isohypse it moves briefly to the locality Fisnik and to the south descends above Novo Selo at 1,400 m and continues to run parallel to the road of the Sharski Vodi system in a westerly direction to an elevation of 1,360 m. From this point the border continues in a northwesterly direction to an elevation of 1,440 m where in the direction of the locality Sturnica intersects the Bogovinska River and climbs to 1,450 m, moves briefly along the isohypse bypassing the water catchment above Novo Selo and continues to descend in the southeast direction again to the road of Sharski Vodi at 1,340 m. From the road it descends in a northeast direction to Bogovinska River at 1,230 m above sea level and follows the river down to an elevation of 650 m from where in the southwest direction it climbs to the peak Shavar at 1,050 m, then moves along the isohypse towards the south to the locality Shevar and then to the west enters the forest belt where it climbs to 1,100 m above sea level and continues to move west towards the village of Lomnica to the river Matene. From here the border descends along the river Matene to its inflow into Mazdracha and then continues to descend along the river Mazdracha to an elevation of 700 m from where in the southwestern direction it climbs to 1,050 m, bypasses the village Kalishte and continues along the isohypse to the south, intersecting the road that connects the village Pozarane with Sharski Vodi at the locality Rakovec. Then the border continues again along isohypse at 1,050 m in the southwest direction through Proshovska Reka and continues through the localities Bastenci and Glauch from where in the southwest direction it climbs to an elevation of 1,300 m where it crosses the road Sharski Vodi again and follows it all the way to the mountain lodge Sharski Vodi, passes over it and climbs to Petkovi Mlaki at 1,500 m and then descends along an intermittent stream above the village of Gorno Jelovce to an elevation of 1,300 m and then follows the dirt road in a northwest direction to an elevation of 1,350 m from where it continues in a westerly direction to the locality Shkalski Rid to an elevation of 1,570 m from where briefly moves along the isohypse to the locality Dedel-Beg, crosses the river Jelovjanska Reka and again moves briefly along the isohypse at 1,500 m in direction towards east. From this point the border continues to descend in the direction east-northeast to the water catchment above the village of Gorno Jelovce at an elevation of 1,300 m and continues to move parallel to the road Sharski Vodi. The border further follows the road to the locality Pivoj where it separates from the road in the southwest direction, intersects the Vrutochka Reka at an elevation of 1,250 m in a direction towards the south and from that point moves in a southeast direction passing through the locality Stog, and at the locality Orlov Kamenchanges the direction and continues southwest to the village of Toljane. From here it continues along the isohypse at 1,350 m, passes over the village Brezovec and continues in the western direction to the locality Lenishte and along the same isohypse briefly goes in the southern direction to the village Chajane from where it continues parallel to the outer border of the National Park in the southwest direction, descends to the river Melca at 1,300 m from where through the locality Sotka it climbs to the starting point of the zone.

4.3.2.3. Sustainable development zone

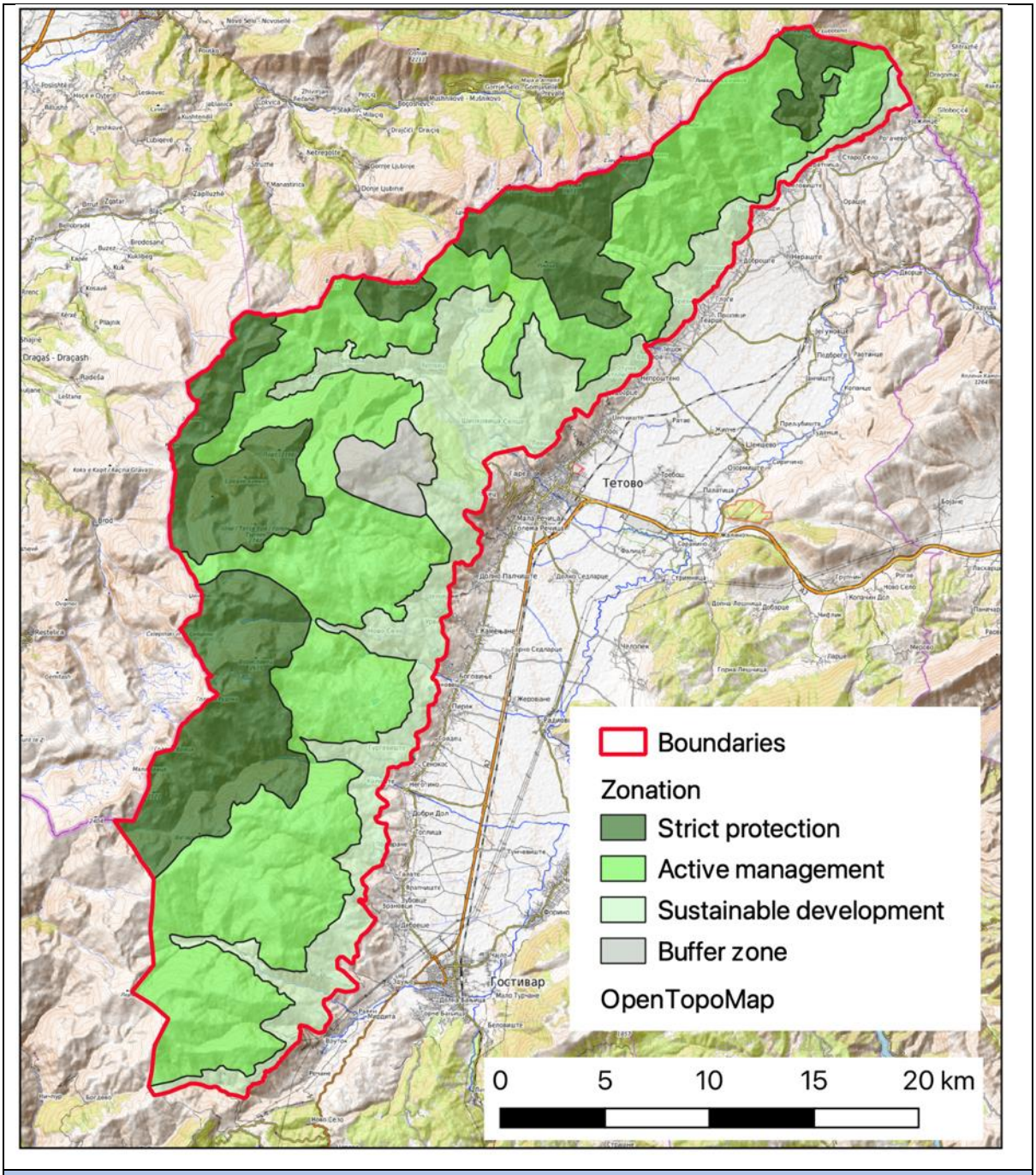
The zone for sustainable development (SD) covers an area of 13,805 hectares or 22.02% of the total area of the park.

The border of the zone for sustainable development starts at the southernmost point of the national park and continuously follows the border of the zone for active management up to the buffer zone of the ski center "Popova Shapka". From this point it continues along the eastern border of the buffer zone to the locality Stana Bara where it continues to the state border in the northwestern part from where it continues to follow the border of the national park to the southernmost starting point.

4.3.2.4. Buffer zone around the "Popova Shapka Ski" Center

The buffer zone (BZ) covers an area of 1,484 hectares or 2.37% of the total area of the park.

The buffer zone (protection belt) around the ski center "Popova Shapka" starts from the peak Anteni at 2,531 m and briefly moves along the ridge towards Ceripashina in the southern direction, and from 2,450 m above sea level in the northern direction it descends all the way to the road that leads from Popova Shapka to Dolna Leshnica and then turns in a northeasterly direction to the highest peak in the locality Guri i Brezit at 2,002 m. From this point it continues to descend to the east to an elevation of 1,850 m and follows the isohypse above the mountain lodge Jelak from where it climbs to 1,950 m to the place where it joins again on the road to Popova Shapka and from that place along the ridge follows the upper border of the forest and descends to 1,650 m above sea level. From this place the border moves in a southeast direction to the locality Przhalj, follows the forest road which to the south join the main asphalt road Tetovo-Popova Shapka at an elevation of 1,550 m, and then follows the road to Popova Shapka to 1,700 m where it intersects the road and continues along the isohypse at 1,650 m all the way to the peak at 1,690 m. From the peak, the buffer zone follows the boundary of the sustainable development zone in a northwesterly direction through locality Bare to the starting point of the peak Anteni.



Zonation of the National Park

Table 25: Zonation of the National Park

4.3.3. Zone Definitions, Permitted and Restricted Activities

The aim of zoning and the integrated management of protected areas is to ensure the conditions necessary for the maintenance of ecological processes and biological diversity, through the permanent preservation of representative physical-geographical regions, ecological communities, genetic resources and species under natural conditions; creating the conditions for tourism development in accordance with the principle of sustainable development and achieving cultural, scientific, educational and recreational goals, which at the same time maintains the natural state of the area.

As such, activities which endanger the natural values of the national park are forbidden. Tourism and recreational activities, and the sustainable use of natural resources, practiced in a way that does not endanger habitats and species and their natural balance, are permitted.

The following table lists the activities that may/may not be carried out in the established zones of the national park.

		Zones			
Category	**Activities**	**Strict protection**	**Active management**	**Sustainable use**	**Buffer**
Agriculture Forestry	Traditional livestock grazing with shepherds on special designated places defined by the management authority	YES	YES	YES	YES
Agriculture Forestry	Maintenance of existing shelters (made of natural materials) in alpine areas for traditional livestock grazing, on areas designated by the management authority	YES	YES	YES	YES
Agriculture Forestry	Collecting fungi, plants or their parts (blueberries, mushrooms, tea, etc.) for commercial use, with a license/the prior permission of MoEPP in cooperation with the PA management body, on the basis of a an assessment of natural production	NO	YES	YES	YES
Agriculture Forestry	Establishment of new shelters (made of natural materials) for traditional livestock grazing	NO	YES	YES	YES
Agriculture Forestry	Traditional extensive agriculture (unmechanised tilling)	NO	YES	YES	YES
Agriculture Forestry	Beekeeping	NO	YES	YES	YES
Agriculture Forestry	Sustainable forest habitat management (in the active management zone - only measures and activities aimed at maintaining habitats and species, with the prior consent of MoEPP)	NO	YES	YES	YES
Agriculture Forestry	New agricultural facilities (barns, stables, etc.)	NO	NO	YES	YES
Agriculture Forestry	Cultivation/breeding of non-native (including genetically modified) or invasive plant and animal species	NO	NO	NO	NO
Education	Video recording or photography, for non-personal (commercial, journalistic, educational, etc.) purposes - In the strict protection zone, only with prior permission from MoEPP and management body, and accompanied by park rangers	YES	YES	YES	YES
Education	Organised events related to nature protection with prior approval from the management body	NO	YES	YES	YES
Fishing	Opening of new fish ponds	NO	NO	YES	YES
Fishing	Recreational sport fishing	NO	NO	YES	YES
Hunting	Hunting of wild fauna species	NO	NO	NO	NO

		Zones			
Category	**Activities**	**Strict protection**	**Active management**	**Sustainable use**	**Buffer**
Infrastructure	New infrastructure for erosion control (natural solutions)	NO	YES	YES	YES
Infrastructure	Maintenance of existing water intakes / pipelines for water supply from springs and watercourses	NO	YES	YES	YES
Infrastructure	New hydro power plants	NO	NO	NO	NO
Infrastructure	New telecommunications infrastructure (base stations for mobile telephony, TV relays and repeaters, overhead and underground telephone lines) for safety reasons and management activities, with opinions of management authority and MoEPP	NO	YES	YES	YES
Infrastructure	Maintenance of existing buildings and roads, with opinions of management authority and MoEPP (sheepfolds and shelters are defined separately)	NO	YES	YES	YES
Infrastructure	New road infrastructure *exception for unpaved roads to sheepfolds, with assessment and approval of MoEPP and management authority	NO	NO *	YES	YES
Infrastructure	New power transmission infrastructure (with preference for underground cables)	NO	NO	YES	YES
Infrastructure	New infrastructure for energy generation (gas pipelines, photovoltaic plants, wind turbines) in the landscape	NO	NO	NO	YES
Infrastructure	New sewage network and wastewater treatment infrastructure *exception for tourism facilities, with approval of MoEPP and management body	NO	NO*	YES	YES
Infrastructure	Placement of billboards	NO	NO	YES	YES
Infrastructure	Establishment of car parks for motor vehicles * exception for areas defined for tourism development, with approval by MoEPP and management body	NO	NO*	YES	YES
Infrastructure	New tourist settlements / cottages	NO	NO	YES	YES
Infrastructure	Ski lifts and bike parks	NO	NO	NO	YES
Infrastructure	Reconstruction of the old or builfing a new Gondola from Tetovo to Popova Sapka	NO	NO	YES	YES
Infrastructure/ Management	Installation and maintenance of info-boards and signs (made of natural materials) by management authority (e.g., hiking trail markers)	YES	YES	YES	YES
Infrastructure/ Management	Observatories and viewpoints (made of natural materials), managed by the management body	YES	YES	YES	YES

		Zones			
Category	**Activities**	**Strict protection**	**Active management**	**Sustainable use**	**Buffer**
Infrastructure/ Management	Rest places (tables, benches, rubbish bins) made of natural materials	NO	YES	YES	YES
Infrastructure/ Management	Construction and maintenance of information centers	NO	NO	YES	YES
Management	Scientific research/monitoring in accordance with the Law on Nature Protection, only with prior permission from MoEPP and accompanied by rangers	YES	YES	YES	YES
Management	Sanitary shooting of wild animals, with prior permission of MoEPP and MAFWE.	NO	YES	YES	YES
Management	Movement of motor vehicles from the managing entity on existing / defined jeep-roads * Exception in part of Sharski Vodi system and rescue operations.	NO*	YES	YES	YES
Management	Construction of repro centers for wild animals	NO	YES	YES	YES
Management	Construction of arboretums for endemic and rare species	NO	NO	YES	YES
Mining	Conducting new detailed geological research and exploitation of mineral resources	NO	NO	NO	NO
Tourism	Hiking, mountaineering and mountain biking (in strict protection zone, only on marked trails and guided by rangers, or guides registered with the management body)	YES	YES	YES	YES
Tourism	Marking and editing of hiking and mountain biking trails	NO	YES	YES	YES
Tourism	Horse riding (in strict protection zone, only on marked trails and guided by rangers, or guides registered with the management body)	YES	YES	YES	YES
Tourism	Skiing with snowcats, according to a plan of restricted areas	NO	YES	YES	YES
Tourism	Natural airstrips for paragliders (in the active management zone, only in certain locations allowed by the management entity)	NO	YES	YES	YES
Tourism	Reconstruction of existing accommodation facilities, according to MP and respecting restrictions on height, design and materials, with opinions from management authority and MoEPP	NO	YES	YES	YES
Tourism	New tourism facilities (hotels, restaurants, motels, cafes, camps, etc.)	NO	NO	YES	YES
Tourism	Movement of motor vehicles on existing roads *exception for limited number of vehicles based on assessment and with a fee	NO	NO*	YES	YES
Tourism	Camping in certain locations	NO	NO*	YES	YES

		Zones			
Category	**Activities**	**Strict protection**	**Active management**	**Sustainable use**	**Buffer**
	*exception for campsites managed by management body				
Tourism	Lighting of fires, in picknick locations defined by management body, with rangers' supervision	NO	NO	YES	YES
Tourism	Organized sports events (trail running, mountain biking, ski touring), with approval from the management body	YES	YES	YES	YES

Table 26: Allowed and restricted activities in the zones of the park

Exceptions:

- Motor vehicles and snowcats may move to any area in case of emergency, when there is danger to human life
- Motor vehicles may move to any area in case of emergency for wildfire control

4.3.4. Categorization of the area with justification

The Shar Mountains are proposed for protection as a national park. Article 72 of the Law on Nature Protection defines protected areas in this category as large areas of land or water with multiple, special natural values including one or more ecosystems that are in a natural or close to natural state. This designation is primarily intended for preserving natural, cultural and spiritual treasures.

The following table lists IUCN criteria that characterizes protected areas in Category II - National Park and comments on how well these criteria correspond to the situation of the Shar Mountains.

Criteria	**Comments**
Primary objective	
● To protect natural biodiversity along with its underlying ecological structure and supporting environmental processes, and to promote education and recreation.	Good match
Other objectives:	
● To manage the area in order to perpetuate, in as natural a state as possible, representative examples of physiographic regions, biotic communities, genetic resources and unimpaired natural processes;	Good match
● To maintain viable and ecologically functional populations and assemblages of native species at densities sufficient to conserve ecosystem integrity and resilience in the long term;	Good match
● To contribute in particular to conservation of wide-ranging species, regional ecological processes and migration routes;	Good match
● To manage visitor's use for inspirational, educational, cultural and recreational purposes at a level which will not cause significant biological or ecological degradation to the natural resources;	Good match
● To take into account the needs of indigenous people and local communities, including subsistence resource use, in so far as these will not adversely affect the primary management objective;	Not relevant

Criteria	Comments
Primary objective	
● To contribute to local economies through tourism.	Good match
Distinguishing features	
Category II areas are typically large and conserve a functioning "ecosystem", although to be able to achieve this, the protected area may need to be complemented by sympathetic management in surrounding areas.	Good match
● The area should contain representative examples of major natural regions, and biological and environmental features or scenery, where native plant and animal species, habitats and geodiversity sites are of special spiritual, scientific, educational, recreational or tourist significance.	Good match
● The area should be of sufficient size and ecological quality so as to maintain ecological functions and processes that will allow the native species and communities to persist for the long term with minimal management intervention.	Good match
● The composition, structure and function of biodiversity should be to a great degree in a "natural" state or have the potential to be restored to such a state, with relatively low risk of successful invasions by non-native species.	Good match
Role in the landscape	
Category II provides large-scale conservation opportunities where natural ecological processes can continue in perpetuity, allowing space for continuing evolution. **They are often key stepping- stones for designing and developing large-scale biological corridors or other connectivity conservation initiatives required for those species (wide-ranging and/or migratory) that cannot be conserved entirely within a single protected area.** Their key roles are therefore:	Good match
● Protecting larger-scale ecological processes that will be missed by smaller protected areas or in cultural landscapes;	Good match
● Protecting compatible ecosystem services;	Good match
● Protecting particular species and communities that require relatively large areas of undisturbed habitat;	Partial match
● Providing a "pool" of such species to help populate sustainably managed areas surrounding the protected area;	Good match
● To be integrated with surrounding land uses to contribute to large-scale conservation plans;	Good match
● To inform and excite visitors about the need for and potential of conservation programmes;	Good match
● To support compatible economic development, mostly through recreation and tourism, that can contribute to local and national economies and in particular to local communities.	Good match

Table 27: Matching the criteria for the park according to IUCN

Conclusion: Shar Mountains National Park meets the criteria for IUCN Category II.

4.4. Management Programs

4.4.1. Natural Heritage Conservation and Monitoring

Shar Mountains National Park possesses important natural heritage that needs to be conserved. The natural heritage conservation and monitoring program is directly linked to fulfilling the park's vision to remain a biodiversity hotspot. The program's main objective is to monitor, maintain and enhance natural values, including wild species, physical (geological, geomorphological, pedological and hydrological) characteristics and landscapes.

The program contains seven sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific Objectives
Natural Heritage Conservation and Monitoring	To monitor, maintain and enhance natural values, including wild species, physical (geological, geomorphological, pedological and hydrological) characteristics and landscapes.	1.1 Natural heritage objectives (habitats, species and landscapes)	To define objectives for maintenance and improvement of the status of natural values
		1.2 Mapping key species	To provide sufficient knowledge and data for further conservation and monitoring
		1.3 Conservation measures for key species	To ensure long-term protection of natural values (favorable conservation status in line with national and international standards)
		1.4 Monitoring key species	To develop and implement a practical, cost-efficient, results orientated, easily communicable system of monitoring of key species and landscapes as a basis for future management of natural values
		1.5 Research on natural values	To provide a scientific knowledge base about species and habitats and to define favorable conservation status for relevant natural values
		1.6 Citizen science monitoring	To train and involve locals and visitors in monitoring of key species and landscapes
		1.7 Evaluation of conservation measures for species and landscapes	To provide a systematic methodology for assessing the effects and effectiveness of

Program	Objective	Sub-program	Specific Objectives
			conservation programs, including to inform improvements

4.4.2. Sustainable Management of Natural Resources

The many natural resources found in Shar Mountains National Park need to be managed sustainably. The program for the sustainable management of natural resources will contribute to fulfilling the park's vision of establishing balance between nature conservation and profit, in a way that does not endanger the survival of species.

The program's main objective is that the natural resources of SMNP are used sustainably, their use provides income for local communities and contributes to funding the SMNP PI.

The program contains seven sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific Objectives
Sustainable Management of Natural Resources	The natural resources of SMNP are used sustainably, their use provides income for local communities and contributes to funding the SMNP PI.	2.1 Sustainable use of forests in accordance with special forest management plans	The use of forests in the park is managed in line with conservation-friendly forestry principles
		2.2 Sustainable use of pastures and seminatural grasslands	The use of pastures is supervised and sustainable; cooperation with PE Pastures and local farmers
		2.3 Sustainable use of agricultural land around villages	In cooperation with local population
		2.4 Sustainable use of wild plants and fruits	In cooperation with local population
		2.5 Sustainable management of wildlife	To increase wildlife populations and ensure regular wildlife monitoring
		2.6 Sustainable use of water	Regular monitoring, and measures to minimise detrimental effects on environment
		2.7 Establishment of forest fire prevention system	Monitoring, early intervention and effective fire prevention

4.4.3. Management of Habitats and Ecosystems

Shar Mountains National Park is rich in habitats and ecosystems which have to be managed according to conservation goals. The program for the management of habitats and ecosystems will contribute to fulfilling the park's vision of establishing a balance between nature conservation and traditional activities, in a way that does not endanger the survival of balanced populations of wild species.

The program's main objective is to manage habitats and ecosystems in accordance with conservation goals at national and international levels.

The program contains five sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific Objectives
Management of Habitats and Ecosystems	Habitat and ecosystem management in accordance with conservation goals at national and international levels.	3.1 Mapping of habitats	Mapping of habitats as basis for future management of natural values
		3.2 Habitat management measures according to conservation goals	To maintain and improve (or restore) habitats with suitable measures defined for each of the protected zones
		3.3 Monitoring of habitats	To develop and implement a practical, cost-efficient, results orientated, easily communicable system of habitat monitoring as basis for future management of natural values
		3.4 Management of data on natural values	To develop a practical and efficient database that will be used for nature conservation purposes and for reporting to institutions and donors. Staff will be trained in collecting, uploading and processing data.
		3.5 Evaluation of habitat conservation measures	To provide a systematic methodology for assessing the effects and effectiveness of conservation programs, including to inform improvements

4.4.4. Management of Cultural Heritage

The area of SMNP has a rich cultural heritage. The program for management of cultural heritage directly contributes to fulfilling the park's vision of establishing balance between nature conservation and the protection/preservation of important cultural heritage, including landscapes, architecture and other cultural values.

The program's main objective is to protect and promote the diverse landscapes and cultural heritage of the park, including traditional landscapes that have evolved through the interactions of people and nature over the centuries.

The program contains two sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific objectives
Management of Cultural Heritage	To protect and promote the diverse landscapes and cultural heritage of the park, including traditional landscapes that have evolved through the interactions of people and nature over the centuries	4.1 Measures for maintenance of typical landscapes	To develop a practical system for mapping, conservation, monitoring and promotion of landscapes and glacial formations. To implement a pilot program for restoration of degraded landscapes in order that typical man-made landscapes are preserved, and natural resource use practices are adapted to avoid further landscape degradation
		4.2 Measures for maintenance of cultural values	Promotion of cultural heritage, through art, cultural events, publication of monographs and scientific articles related to cultural history

4.4.5. Development of Sustainable Tourism

Shar Mountains National Park offers great potential for the development of sustainable tourism. The sustainable tourism development program directly contributes to the fulfilment of the park's vision of establishing balance between nature conservation and tourism development.

The program's main objective is that the Shar Mountains welcome tourists from all over the world who appreciate and enjoy the beauty and diversity of the area. Visitors help finance the national park through tourist fees, and eco-tourism contributes to the incomes of local people who are actively involved in providing tourism services (guiding, accommodation and traditional food)

The program contains four sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific Objectives
Development of Sustainable Tourism	The Shar Mountains welcome tourists from all over the world who appreciate and enjoy the beauty and diversity of the area. Visitors help finance the national park through tourist fees, and eco-tourism contributes to the incomes of local people who are actively involved in providing tourism services (guiding, accommodation and traditional food)	5.1 Development of SMNP tourism strategy	To develop an overall tourism strategy, a tourism brand with logo and 'destination identity' to be used in the whole region; to implement program to support sustainable tourism
		5.2 System of cooperation with tourism actors	To ensure that tourism services are conducted in line with nature protection principles. Support local population in development of tourism services. Services are provided by licensed guides. Ensure that fees are charged for each service.
		5.3 Establishment and maintenance of visitor infrastructure	To develop and maintain necessary visitor infrastructure (roads, trails, huts, info points, visitor center) and involve local population (inclusive tourism). Develop mobile application with information about zones and the values of the area
		5.4 Visitor management system	To establish a modern, functional system for record-keeping on visitor numbers, entrance fees, service fees, electronic payments.

4.4.6. Local Development

The local development program will contribute to fulfilling the park's vision that the protected area brings economic benefits to the local population and contributes to the development of a green economy. The national park authority supports the development of communal infrastructure and strengthens the role of women in local development.

The program's main objective is that the national park actively supports the sustainable development of mountain villages

The program contains four sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific Objectives
Local Development	SMNP actively supports the development of mountain villages	6.1 Framework for financing local development	To establish programs to enable local participation in the development of mountain villages
		6.2 Maintenance and improvement of physical infrastructure and communal services	To improve communal services in mountain villages in collaboration municipalities: waste collection (solid and liquid), waste treatment, clean-up of illegal tips, improved wastewater management. Ensure year-round access to all mountain villages by permanent residents
		6.3 Maintenance and renovation of traditional architecture	To ensure that unique, traditional architecture is preserved, and renovation is done according to traditional styles
		6.4 Reporting and monitoring of urban development	To establish a regular monitoring and reporting system that will contribute to regulation of urban development in accordance with NP zonation

4.4.7. Information, Raising Public Awareness and Education

The program for information, awareness-raising and education will contribute to fulfilling the park's vision by actively raising awareness and providing information about the values of the area among the local population and visitors, through educational programs and events about the need to protect habitats, species, ecosystems and landscapes, and the benefits of a healthy environment.

The program's main objective is to provide information and raise awareness about the area's natural and cultural values, the objectives of the protected area and its zonation, restrictions and conservation measures, as well as the benefits of the park for the local population. It will offer educational activities so that all types of visitors and target groups can experience the values of the national park.

The program contains three sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Specific Objectives
Information, Raising Public Awareness and Education	To provide information and raise awareness about the area's natural and cultural values, the objectives of the protected area and its zonation, restrictions and conservation measures, as well as the benefits of the park for the local population; To offer educational activities so that all types of visitors and target groups can experience the values of the NP.	7.1 Development of infrastructure for environmental education	To establish indoor and outdoor interactive facilities for the education of tourists and children. To establish environmental educational programs with staff trained to implement them.
		7.2 Communication program including social media	To establish a full PR package for the park, including website, social media, communication campaign, promotional materials.
		7.3 Educational programs for different target groups	To provide educational programs to different target groups, especially children.

4.4.8. Governance, Management, Work Organization and Financing

The program for governance, management, work organization and financing directly contributes to fulfilling the park's vision that the national park authority manages the protected area based on strategic planning, secures different sources of financing, leads and manages the organization's human resources, provides state-of-the-art staff training, collaborates with neighbouring and transboundary protected areas and builds good relations with stakeholders inside and outside the park.

The program's main objective is to implement effective management, planning and strategic development, and have strong capacity and secure, sustainable financial resources

The program contains six sub-programs, each with its own objective. For each sub-program, detailed activities, indicators, priority levels and associated partners are defined for a five-year period.

Program	Objective	Sub-program	Objective
Governance, Management, Work Organization and Financing	Implement effective management, planning and strategic development; secure, sustainable financial resources (Source: Appleton, M.R. (2016). A Global Register of Competences for Protected Area Practitioners. IUCN)	8.1 Institutional strengthening of the protected area	Providing a strategic and well-planned PA management framework
		8.2 Organizational leadership and development	Establishing and sustaining well-governed, -managed and -led organizations for PA management
		8.3 Human resources management	Establish an adequate, competent, well-managed and -supported workforce for the PA. Provide staff training on relevant skills
		8.4 Financial management	Ensuring that the PA is adequately financed and resourced, and that resources are effectively and efficiently allocated and used. Approach to international donors. Relation to Natura 2000 and LIFE; transboundary cooperation (Mavrovo, Kosovo, Albania).
		8.5 Administrative reporting and documentation	Establishing and implementing procedures for information management, documentation and reporting
		8.6 Communication and collaboration	Building and using the skills required to communicate and collaborate effectively. Establishment of working groups and local stakeholder council

5. Operational Plan

In accordance with the rulebook on the content of protected area management plans and the annual programs for nature protection, below are activities that the SMNP Public Institution is responsible for implementing in the first five-year period (2021 to 2026). After this period, in accordance with Article 99 of the Law on Nature Protection, the responsible institution shall review the management plan.

The activities are organized in eight programs, designed to meet the protected area's identified conservation objectives (Chapter 4.2). Each program contains several subprograms, each with an operational plan and activities, priorities, indicators, a timeline and responsibilities.

Priorities:

- Priority 1: Activities that are mandatory for the implementation of the plan;
- Priority 2: Activities that are important in order to achieve the plan's goals. Such activities may only remain incomplete under exceptional circumstances;
- Priority 3: Activities that are beneficial but not critical to achieving the plan's goals. Investments in these activities should be made only when Priority 1 and 2 activities have been completed.

Completion indicators facilitate monitoring by defining measurable outcomes.

The time frame for implementation indicates the years, within the next five, in which the activities need to be completed.

The 'carrier' refers to the entity responsible for the delivery of the activity, or to one or more possible partners with whom the responsible entity will implement it.

The SMNP Public Institution will monitor the implementation of the operational plan.

In accordance with the Law on Nature Protection, after the first five-year period the management plan will be revised and renewed for the following period.

5.1. Natural Heritage Conservation and Monitoring

5.1.1. Objectives for Natural heritage

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
1.1.1 Identification of short term and long-term objectives for conservation of natural values (Lynx lynx as priority species)	1	Objectives for conservation of natural values defined in a report	1					PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.1.2. Mapping of Key species

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
1.2.1 Mapping of distribution of Key species (proposed in chapter 3.3.2.4 collection of wild plants and 3.4.1 Species)	2	Distribution maps of key species in GIS		1	1	1		PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
1.2.2 Assessment of status of conservation of key species	2	Study on status of conservation of key species				1		PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
1.2.3 Inventory and mapping of allochthone tree species	3	Inventory and distribution maps and action plan for allochthone tree species in a study and in GIS			1	1		PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
1.2.4 Mapping of key species most affected by climate change	3	Identified priority species				1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.1.3. Conservation measures for species

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
1.3.1 Development and implementation of conservation measures for Key Species	2	Conservation program for Key species is established		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
1.3.2 Preparation of special management plan for fishing in the rivers in the national park	2	Prepared and approved special fishing management plan		1				PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.1.4. Monitoring of Key Species

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
1.4.1 Monitoring of key species of invertebrata	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
1.4.2 Monitoring of key species of mammals (except bats)	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
1.4.3 Monitoring of key species of bats	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
1.4.4 Monitoring of key species of birds	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
1.4.5 Monitoring of key plant, fungi and mosses species	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
1.4.6 Monitoring of key species of amphibians, reptiles, fish, algea and mollusca	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
1.4.7 Monitoring of identified species under threat from climate change	2	Conducted monitoring of selected species from the list of the third national report for UNFCCC		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
1.4.8 Monitoring of invasive and allochthone tree species in NP Shar	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
1.4.9 Monitoring of population of Macedonian Trout in the rivers with human interventions (above and below the intervention)	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.1.5. Research on natural values

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
1.5.1 Develop a priority list of research topics	2	List of priorities for research topics		1				PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
1.5.2 Research on Bogovinkso Ezero on Eutrophication	3	Prepared research report on eutrophication of Bogovinsko ezero			1	1		PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
1.5.3 Research on invasive species	3	Prepared research report on invasive species			1	1		PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.1.6. Citizen Science for Monitoring

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
1.6.1 Development and implementation of a Citizen Science Monitoring program	2	Minimum 20 people from local villages participating in the Citizen Science Monitoring program; annual reports and final report in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.1.7. Evaluation of conservation measures for species and landscapes

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
1.7.1 Evaluation of efficiency of conservation measures for Key species	2	Report on effect of conservation measures for key species in 2026					1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert non-governmental organizations.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
1.7.2 Evaluation of efficiency of conservation measures for landscapes	3	Report on effect of conservation measures for landscapes 2026					1	PA Management Entity in cooperation with MoEPP, scientific and professional institutions, national experts and expert	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance ofRelevance of external support
								non-governmental organizations.		

5.2. Sustainable Management of Natural Resources

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	relevance of external support
2.1.0 Development of an overall Ecosystem services payment scheme	1	Study on ESS payment scheme	1	1				PA Management Entity in cooperation with MoEPP and experts	Budget of NP management, UNEP, UNDP, EU, GIZ and others	high

5.2.1. Sustainable use of the forests

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.1.1 Preparation of special forest habitats management plan	1	Prepared and approved special forest management plan	1	1	1			PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.1.2 Preparation and implementation of annual plans for all forest habitat management operations (including planting, maintaining forest roads, etc.)	1	Regularly prepared and implemented plans	1	1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.1.3 Preparation of internal rulebooks and procedures for use of wood in private ownership	1	Prepared documents for use of woods in private properties	1	1				PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.2.2. Sustainable use of mountain grasslands

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.2.1 Inventory of pastures and sheepfolds performed and available in GIS	1	Prepared inventory with all sheepfolds in the area in GIS; including grazing capacity, status of sheepfolds and related infrastructure, impact on sensitive habitats	1					PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.2.2 Identification of the need for measures for conservation of threatened habitats and species that are related to pasturing	2	Prepared assessment for conservation of threatened habitats and species in pastures with focus on strict protected zones		1				PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
2.2.3 Prepared plan for sustainable use of the pastures in the national park including cooperation with PE Pastures	2	Prepared plan for sustainable use of pastures; contracts with shepherds and farmers for maintenance of grasslands		1				PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.2.4 Training of Shepherds on natural values, touristic development and improvement of quality of products	1	Implemented training program for shepherds	1	1	1			PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
2.2.5 Improvement of huts, roads and other infrastructure for sheepfolds	2	Report on improvement of huts and related infrastructure		1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.2.6 Program for support of the traditional way of shepherding (incl. shepherd dogs)	2	Number of shepherds and sheep supported by the program		1	1	1		PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.2.3. Sustainable use of agricultural land in the surroundings of villages

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.3.1 Development and implementation of agri-environmental measures for management of agricultural plots especially for abandoned land	3	Number of developed measures; size of area where the measures are implemented; number of pilot areas selected and pilot program to support farmers for implementation of measures for degraded landscapes			1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
2.3.2 Evaluation of effects of agri-environmental pilot programs	3	Evaluation study on effects of agri-environmental pilot programs					1	PA Management Entity in cooperation with MoEPP, MAFWE, PE pastures, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.2.4. Sustainable use of wild plants and fruits

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.4.1 Development of internal procedures and rulebooks for collection permits and control system in the park	1	Developed procedures, rules, system for permits.	1					PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
2.4.2 Program for resource assessment and monitoring of minimum 3 species collected for commercial use	2	Resource assessment for species that are collected has been conducted; monitoring for same species of economic interest conducted		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
2.4.3 Establishing system for registration of collectors	2	Established system; issued licenses; educated collectors		1				PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
2.4.4 Established controlling mechanism for collection of wild plants and fruits	2	Number of controls in the areas of the National Park		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
2.4.5 Program for cultivation of critical wild plants	3	Prepared plan and implemented 3 pilot cultivation sites			1	1		PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.4.6 Program for piloting in processing, branding and selling of wild plants and related products	2	Developed value chain pilot mechanism		1	1			PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.4.7 Program to support beekeeping, prevention of damages and compensation measures for wildlife damages	2	Program for support of beekeeping implemented and prepared report about results in 2026		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
2.4.8 Development of cross border controlling program with Sharri NP from Kosovo, including training of rangers for monitoring purposes	2	Established mechanism for a cross border controlling program; annual reports on controls		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.2.5. Sustainable management of wildlife

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.5.1 Program and plan for wildlife management and sanitary shooting for all game species	1	Prepared program and plans for wildlife management for all zones Increase of populations of game	1					PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.5.2 Development and implementation of monitoring of wildlife	1	Annual reports from wildlife monitoring	1	1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
2.5.3 Establishment and mainteneance of a repro center for wildlife in Leshnica	2	Repro center established and documented		1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.5.4 Building and maintenance of facilities for wildlife feeding	3	Report on facilities for feeding established and maintained			1	1		PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.2.6. Sustainable use of waters

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.6.1 Establishment of a database for water management and monitoring	2	Established and maintained database for management and monitoring		1				PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.6.2 Preparation of a program to ensure clean water supply for villages	1	Prepared and implemented program for support of water supply of villages with annual reports	1	1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
2.6.3 Establish a program for monitoring of environmental flow in rivers with small hydropower plants	1	Prepared program, regular monitoring of environmental flow and annual reports	1	1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
2.6.4 Establish a mechanism for reporting and penalties of violations of environmental flow in rivers with small hydropower plants	1	Established and implemented mechanism for reporting of environmental flow	1					PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.6.5 Assessment of cumulative effects on nature conservation from the small hydro power plants	2	Prepared study on assessment of impact of hydro powerplants		1	1			PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.2.7. Establishment of Forest Fire Protection System

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.7.1 Prepare strategy and program for fire protection, fire prevention and fast interventions (synchronized with National Strategy and with Sharri NP)	1	Prepared forest fire protection strategy and program	1					PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
2.7.2 Implement program for fire prevention including establishment of monitoring system, education of rangers, local people	2	Implemented number of fire prevention actions, annual reports		1	1	1	1	PA Management Entity in cooperation with MoEPP, MAFWE, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
2.7.3 Program for maintenance of fire protection roads, purchase of equipment and vehicles for the ranger service, equipment for fast intervention	2	Purchased equipment, maintained fire roads and placed water reservoirs		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.3. Management of Habitats and Ecosystems

5.3.1. Mapping of habitats

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.1.1 Mapping of EU Natura 2000 habitats in the area of the NP	1	Prepared study on distribution of EU Natura 2000 habitats in the National Park	1	1				PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
3.1.2 Mapping of threatened habitats that are not part of Annex I of EU Habitat Directive	2	Report on conservation measures for habitats		1	1			PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.3.2. Habitat management measures according to conservation goals

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.2.1 Establishment of conservation measures for threatened habitats	2	Implemented program for conservation measures of threatened habitats			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.2.2 Establishment of conservation measures for High Nature Value Forests habitats	2	Implemented program for conservation measures of High Nature Value Forests habitats			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.2.3 Program that will conduct need assessment for rehabilitation measures and conduct 5 pilot actions to transform coppice forest in high forests measuring the environmental, social and economic impacts	2	Study on need assessment for transformation of forests in 5 pilot actions		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.2.4 Phytosanitary sylvicultural interventions against diseases and pests	2	Study on phytosanitary sylvicultural interventions and their effects		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.3.3. Monitoring of habitats

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.3.1 Monitoring of EU Habitats Directive Annex I habitats according to the EU HD standards	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.3.2 Filling informational gaps and identification of other types of habitats (not in EU HD)	3	Cartographic overview of other than EU habitats in GIS			1	1		PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.3.3 Assessment of conservation status of habitats	3	Report on status of conservation of all EU habitats				1		PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
3.3.4 Monitoring of ass. Abieti-Piceetum scardicum	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.3.5 Monitoring of glacial lakes and mountain swamps	3	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.3.6 Monitoring of forests with high biodiversity	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.3.7 Monitoring of habitats that are sensitive to climate change effects	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.3.4. Management of data about natural values

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.4.1 Establishment of a data management system for habitats and species including systems for reporting on natural values	2	Web based and mobile database and GIS system established and operative		1				PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
3.4.2 Prepared and maintained GIS data for habitats in the national park	2	Data from mapping and monitoring of habitats are available in GIS			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.4.3 Prepared and maintained GIS data for species in the national park	2	Data from mapping and monitoring of species are available in GIS			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.4.4 Prepared and maintained GIS data for geological heritage and landscapes in the national park	2	Data from mapping and monitoring of geological values and landscapes are available in GIS			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
3.4.5 Establish joint monitoring mechanisms and data sharing for habitats, species (incl. large carnivores), as well as activities of illegal hunting and fishing	3	Mechanism for sharing data established and selected data are available on the website of the NP			1	1		PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.3.5. Evaluation of conservation measures for habitats

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
3.5.1 Evaluation of effectiveness of conservation measures for habitats	3	Report on effects of conservation measures for habitats in 2026					1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.4. Management of Cultural Heritage

5.4.1. Measures for maintenance of typical landscapes

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
4.1.1 Development and implementation of a monitoring program for landscapes including climate change effects	3	Prepared monitoring program, collected data from the monitoring in GIS, final report about results in 2026			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.4.2. Measures for maintenance of cultural values

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
4.2.1 Conduct research on the present cultural heritage in the park	2	Report on cultural heritage		1	1			PA Management Entity in cooperation with MoEPP, Ministry of Culture, related institutions and universities and experts,	Budget of NP management, UNEP, UNDP, EU, GIZ and others,	High
4.2.2 Valorization of movable and immovable cultural heritage in the park	3	Number of prepared reports			1	1		PA Management Entity in cooperation with MoEPP, Ministry of Culture, related institutions and universities and experts,	Budget of NP management, UNEP, UNDP, EU, GIZ and others,	High
4.2.3 Prepare calendar of events, festivals, traditional activities on the park territory and cooperation with local villages in organizing the events	3	Prepared calendar of events that is annually updated and promoted on the national park website			1	1	1	PA Management Entity,	Budget of NP management, UNEP, UNDP, EU, GIZ and others,	Low

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
4.2.4 Promotion of the cultural heritage through organisation of promotional events such as art and folklore exhibitions	3	Number of prepared documentary videos, exhibitions, concerts and other promotional events			1	1	1	PA Management Entity, related institutions and universities and experts,	Budget of NP management, UNEP, UNDP, EU, GIZ and others,	Medium

5.5. Development of Sustainable Tourism

5.5.1. Development of NP Shar touristic strategy

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.1.1 Development of a touristic strategy and portfolio of activities that are supported by the national park (Wildlife observation, ski touring etc...)	1	Touristic strategy with portfolio prepared	1					PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
5.1.2 Development of a touristic brand	1	Touristic brand established	1					PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.1.3 Design of park logo and branding of promotional materials such as, souvenirs and other visibility material with the park logo	1	Park logo developed and used	1					PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
5.1.4 Preparation of marketing program for touristic services on regional, national and international level	2	Marketing program prepared and implemented		1	1			PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.1.5 Program for support of development of alternative tourism package	2	Number of informative events and materials for local people, prepared promotional materials		1	1	1	1	PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.1.6 Promotion of traditions and customs on the NP territory	2	Prepared materials for promotion of local traditions and customs		1	1	1		PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.1.7 Granting program that will support organization of annual promotional sports events	3	Prepared granting program and annual report on number of events			1	1	1	PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.5.2. System of cooperation with local actors and tourism

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.2.1 Establishment of a cooperation with tour operators and touristic agencies for promotion of the park	1	Memorandum of cooperation with touristic actors signed	1					PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
5.2.2 Establishment of a program to support cross border touristic activities with Kosovo such as marking, maintenance, promotion of joint touristic products, safety issues	2	Prepared program and annual reports on touristic cross border activities		1	1	1	1	PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.2.3 Program for regular communication among touristic actors for cooperation and joint efforts for nature conservation	2	Annual reports on meetings and cooperation with touristic actors		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
5.2.4 Education of local people on Shara Mountain biodiversity, allowed and forbidden activities as well as on safety	2	Educational program for local people implemented and annual reports about activities including number of participants		1	1	1	1	PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
5.2.5 Program for communication training of rangers, shepherds and other local people how to communicate with tourists	2	Training programs for rangers, shepherds, collectors and other local people implemented and annual reports about activities including number of participants		1	1	1	1	PA Management Entity, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
5.2.6 Program for mountain guides to educate them on Shar Mountain biodiversity, rules and allowed and forbidden activities	2	Training programs for guides implemented and annual reports about activities including number of participants		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.5.3. Establishment and maintenance of visitor infrastructure

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.3.1 Masterplan for visitor infrastructure including visitor centers, touristic localities, snowcat corridors, hiking routes, roads for movement of motorized vehicles etc.	1	Strategic masterplan for visitor infrastructure (incl. visitor centers, entrance points, touristic localities, viewpoints, main hiking routes, snowcat corridors, etc) developed	1					PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.3.2 Establishment of entrance points to the NP or zones with entry fees (incl. use of roads in certain areas)	2	Developed plan and established check points, including establishment of entry signs on few most visited locations		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.3.3 Inventory of existing mountain huts and abandoned mountain huts and plan for reconstruction of abandoned huts	2	Prepared inventory and plan for reconstruction of mountain huts. Prepared project proposals for reconstruction of huts		1				PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.3.4 Inventory of existing roads, trails, signs, purpose of use, including their condition, need assessment for maintenance and implementation of measures	2	Prepared inventory of road/trail infrastructure. Maintenance to 100 km of roads and trails.		1				PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.3.5 Development and maintenance of visitor infrastructure (huts, roads, signs, trails, bridges, etc.)	2	A detailed plan for visitor infrastructure prepared		1	1	1		PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.3.6 Program for development of tourism on outdoor localities in active management zone	2	Assessment of capacities and prepared plan for development of areas like Dolna Lesnica, Bogovinje Lake, Tri Vode, Belovishte, Ljuboten		1	1			PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.3.7 Development of a mobile phone application for touristic use including a map with zonation and other information on restrictions and on species and habitats	1	Developed mobile app describing park boundaries, zones and allowed and restricted activities within zones.	1	1				PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.5.4. Visitor management system

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.4.1 Establishment and maintenance of a system for monitoring visitors	2	Visitor monitoring system designed and implemented		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
5.4.2 Establishment and maintenance of a payment system with proposal for charging fees for visitors	2	Prepared report based on which the park management will start charging visitors and users of park services		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
5.4.3 Education of visitors based on a prepared code of conduct with informative materials for visitors	3	Prepared materials for education of visitors			1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.4.4 Program for need assessment, requirements and consolidating rescue service for interventions on all territory of Shar Mountain	2	Prepared plan and consolidated rescue service		1				PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.4.5 Contracting and equipping of mountain rescue service	3	Purchased equipment; trained people; contracted rescue service		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.4.6 Monitoring of impact from tourism activities on the environment in the NP (including the Ski Center)	2	Prepared monitoring protocols, collected data from the monitoring in GIS, annual reports and final report about results in 2026		1	1	1	1	PA Management Entity in cooperation with MoEPP, related institutions and universities and experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
5.4.7 Evaluation of visitor impact	2	Report on impact of visitors on the environment and					1	PA Management Entity in cooperation with MoEPP, related	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
		socio-economy prepared in 2026						institutions and universities and experts.		

5.6. Local Development Programme

5.6.1. Framework for financing of local development

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.1.1 Establishment of an overall framework program for financial support of development and infrastructure in villages	1	Framework program for support of villages established and operative; annual reports and 5-years report in 2026	1	1	1	1	1	PA Entity for management, MOEPP, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.1.2 Feasibility study for use of wood residues (collection, production and storage of wood chips, support in preparation of applications for wood biomass appliances, organized heating in schools and municipal buildings)	1	Prepared feasibility study for heating on wood residues	1					PA Entity for management, MOEPP, MAFWE, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.1.3 Implementation of a small grant scheme to use wood residues for heating	2	Implemented grant scheme and report on number of applied and realized projects in 2026		1	1	1	1	PA Entity for management, MOEPP, MAFWE, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.1.4 Prepared and implemented program to support local small and medium enterprises that generate local products	2	Prepared program; report on implemented contracts and number of generated local products in 2026		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.1.5 Creating product origin designation and geographical indication "Shar Mountain"	2	Designed and registered brand; Defined criteria for use and evaluation		1	1			PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
6.1.6 Program to stimulate use of locally produced food in hotels and restaurants	2	Report on number of hotels and restaurants using local food with the brand of the NP		1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.1.7 Program to stimulate creation of green jobs for young people (energy efficiency, nature conservation activities, monitoring, horse transport, hiking guides, processing local products, etc.)	2	Report in 2026 on number of initiatives that are successfully established		1	1	1	1	PA Entity for management, MOEPP, Ministry of Economy, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.6.2. Maintenance and improvement of infrastructure and communal services

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.2.1 Maintenance of roads in winter to remote mountain villages	1	Annual reports on maintenance of roads in winter	1	1	1	1	1	PA Entity for management, MOEPP, MTC, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.2.2 Maintenance and improvement of electricity and internet in the NP	1	Annual reports on electricity and internet	1	1	1	1	1	PA Entity for management, MOEPP, MTC, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.2.3 Program to support mountain villages with asphalt roads	1	Number and length of newly paved roads	1	1	1	1	1	PA Entity for management, MOEPP, MTC, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.2.4 Program for improvement of parking spaces in villages, touristic settlements and the Ski Center	2	Plan for parking system prepared and number of parking areas and lots implemented		1	1			PA Entity for management, MOEPP, MTC, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
6.2.5 Program to improve the solid waste collection in the park	1	Quarterly reports on waste collection	1	1	1	1	1	PA Entity for management, MOEPP, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
6.2.6 Developed and implemented program for waste recycling	1	Established number of recycling posts;	1	1	1	1	1	PA Entity for management, MOEPP, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.2.7 Connecting the houses and buildings on Popova Shapka and Tri Vode to a waste water treatment plant and construction of sewage system for Popova Shapka	2	Number of informed inhabitants; Number of contracts with waste recycling companies; Feasibility study; Number of connected facilities to the system; Built treatment plant.		1	1	1		PA Entity for management, MOEPP, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
6.2.8 Program for assessment and monitoring of the critical erosion points	3	Annual report on monitoring of erosion			1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
6.2.9 Program for application of nature-based solutions in 3 areas to reduce erosion and flash flood events	3	Reports about 3 pilot projects with nature based solutions				1	1	PA Entity for management, MOEPP, MAFWE, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.6.3. Maintenance and adaptation of traditional architecture

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.3.1 Inventory of characteristics of traditional architecture	2	Prepared study on characteristics of traditional architecture in the NP		1				PA Entity for management, MOEPP, Ministry of Culture, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.3.2 Development of guidelines for revitalization of traditional architecture	2	Developed guidelines defining materials for reconstruction of traditional architecture			1			PA Entity for management, MOEPP, Ministry of Culture, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
6.3.3 Establishment of a program for revitalization of traditional architecture	3	Prepared and implemented program for monitoring of reconstruction activities; Report on number of reconstructed houses			1	1	1	PA Entity for management, MOEPP, Ministry of Culture, municipalities.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.6.4. Reporting and monitoring of urbanization

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.4.1 Monitoring of development of villages and touristic settlements (illegal houses), in cooperation with Municipalities	2	Prepared and implemented monitoring program on development of construction for touristic purposes; prepared annual report		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
6.4.2. Program for monitoring of the development of the Ski Center and the urbanization in the buffer zone	2	Prepared and implemented monitoring program on the ski center; prepared annual report		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
6.4.3 Inventory of private accommodation and restaurant services	3	Prepared register of private accommodation and restaurant services on the territory of the park			1			PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.7. Information, Raising Public Awareness and Education Programme

5.7.1. Development of infrastructure for environmental education

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
7.1.1 Marking of zones, establishing limited number of entry signs and info boards,	2	Park boundaries and most visited sites are marked with info boards	1	1	1			PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
7.1.2 Preparation and distribution of educational materials (species, allowed and forbidden activities, code of conduct, etc.	1	Printed and distributed number of informative materials	1	1	1			PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
7.1.3 Build educational infrastructure for children and people with disabilities	3	Number of infrastructures built			1	1		PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.7.2. Communication program including activities on social media

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
7.2.1 Preparation and maintenance of website, opening email addresses for employees, establishing profile of the park on the social media	1	Functional website that is linked with GIS; number of email accounts of NP institution staff; active social media profile	1	1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
7.2.2 Providing regular information about the park on website and social media	1	Number of postings; Number of members	1	1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
7.2.3 Preparation of promotional informative material about the natural values for the local population	2	Prepared and distributed material		1	1	1	1	PA Management Entity, MOEPP, experts..	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.7.3. Educational programs for different target groups

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
7.3.1 Prepare strategy and plan for engagement of volunteers	3	Prepared volunteer strategy			1			PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
7.3.2 Educate group of park staff to work with organized groups of children (primary and secondary schools)	2	Number of educated staff for work with children			1	1		PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
7.3.3 Establish nature academy for children	3	Established nature academy with an educational program and number of seminars			1	1	1	PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
7.3.4 Develop different educational packages for different target groups and different ages	2	Developed number of implemented educational packages			1	1	1	PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.8. Governance, Management, Work Organization and Financing Programme

5.8.1. Institutional strengthening of the Protected Area

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.1.1 Development of an overall strategy for the NP with staff including vision, goals, priorities and tasks for conservation, research, management of species and habitats, touristic development, local development	1	Strategy document developed and shared among staff	1					PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
8.1.2 Providing adequate working premises for employees PA Management Entity	1	Offices with sufficient working spaces for staff of the NP established	1					PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
8.1.3 Provision of computer IT and GIS equipment, equipment for monitoring and fire protection, off-road vehicles, research	1	State of the art equipment is provided to NP staff and is functional	1					PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.1.4 Development of a list of priority projects to be implemented in the next 5 years	2	Project list developed		1				PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.8.2. Leadership Program

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.2.1 Development of a leadership program including working processes, management structures, supervision and guidance of staff	1	Leadership program developed and implemented in the Public institution	1	1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

5.8.3. Human Resource Management

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.3.1 Development of a register of competences needed for an effective management of the park including levels and appropriate systematization	1	Register of competences developed for the Public institution and implemented with staff	1					PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High
8.3.2 Recruitment of qualified and motivated staff based on previously defined Terms of References within the register of competences	1	Qualified staff recruited according to the register of competences	1	1				PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
8.3.3 Development and implementation of a HR program	1	Human resources program prepared and implemented in the Public institution; number of trainings; number of participants in trainings	1	1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
8.3.4 Training for preparation of annual programs, reports from the monitoring protocols	1	Annual reports on prepared	1	1		1		PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.3.5 Certification and equipping of guards in the protected area - Ranger Service	1	Ranger service is operative	1	1				PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
8.3.6 Development of a program for assessment of performance, working conditions and remuneration schemes	1	Annual performance assessment reports prepared	1	1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.8.4. Financial Management

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.4.1 Development and implementation of a strategy for financial sustainability including business plan, international donors, cross border programs, tourist fees and alternative funding sources	1	Strategy for financial sustainability prepared and implemented	1	1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	High

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.4.2 Establishment of an ongoing permanent program for financing planning and management	1	Annual financial reports	1	1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

5.8.5. Administrative Reporting and Documentation

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.5.1 Reporting on national level including auditing and monitoring the implementation of the annual plan, the management plan and yearly METT	1	Annual reports prepared; METT prepared	1	1	1	1	1	PA Management Entity, MOEPP, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
8.5.2 Preparation of a new Five-Year Operational Plan for the next five-year period of implementation of the Management Plan	1	Five Year Operational Plan prepared and adopted					1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
8.5.3 Reporting on progress on international level	2	Reports prepared in 2024 and 2026			1		1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium

5.8.6. Communication and Collaboration

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.6.1 Establishment of a permanent program for communication and collaboration in the region	1	Responsibilities for permanent collaboration program in the region defined and implemented		1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
8.6.2 Establishment of a permanent program for communication and collaboration with institutions on national level	1	Responsibilities for permanent collaboration program with institutions on national level defined and implemented	1	1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
8.6.3 Establish cooperation with non-governmental organizations, universities, academia, other expert institutions and other stakeholders to support research efforts and projects	1	Responsibilities for permanent collaboration program with academia and NGOs defined and implemented	1	1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low
8.6.4 Program for efficient cooperation with private forest owners	1	Responsibilities for permanent collaboration program with private forest owners defined and implemented	1	1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

Activity	Priority	Indicator	Y 2022	Y 2023	Y 2024	Y 2025	Y 2026	Responsible implementation	Possible source of funding	Relevance of external support
8.6.5 Establishment of a permanent program for communication and collaboration with institutions and partnerships on cross border and international level	2	Responsibilities for permanent collaboration program with institutions and partnerships on cross border and international level defined and implemented		1	1	1	1	PA Management Entity, experts.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Medium
8.6.6 Establishment of a communication and collaboration with AD ESM for management of Sharski Vodi System	1	Responsibilities for permanent collaboration program with AD ESM defined and implemented	1	1	1	1	1	PA Management Entity.	Budget of NP management, UNEP, UNDP, EU, GIZ and others.	Low

6. Management and Governance

6.1. Plan for Management and Governance

The Ministry of Environment and Physical Planning is responsible for all protected areas in the Republic of North Macedonia.

According to the Law on the proclamation of part of the Shar Mountains as a national park (Official Gazette of RM no. 175/2021), the protected area will be managed by the Shar Mountains National Park Public Institution.

A precondition for the successful management of a national park is strong cooperation between and active involvement of the designated governing body, all relevant municipalities, local inhabitants and all affected stakeholders. All of these groups need to adopt the proposed management plan and jointly contribute to its implementation.

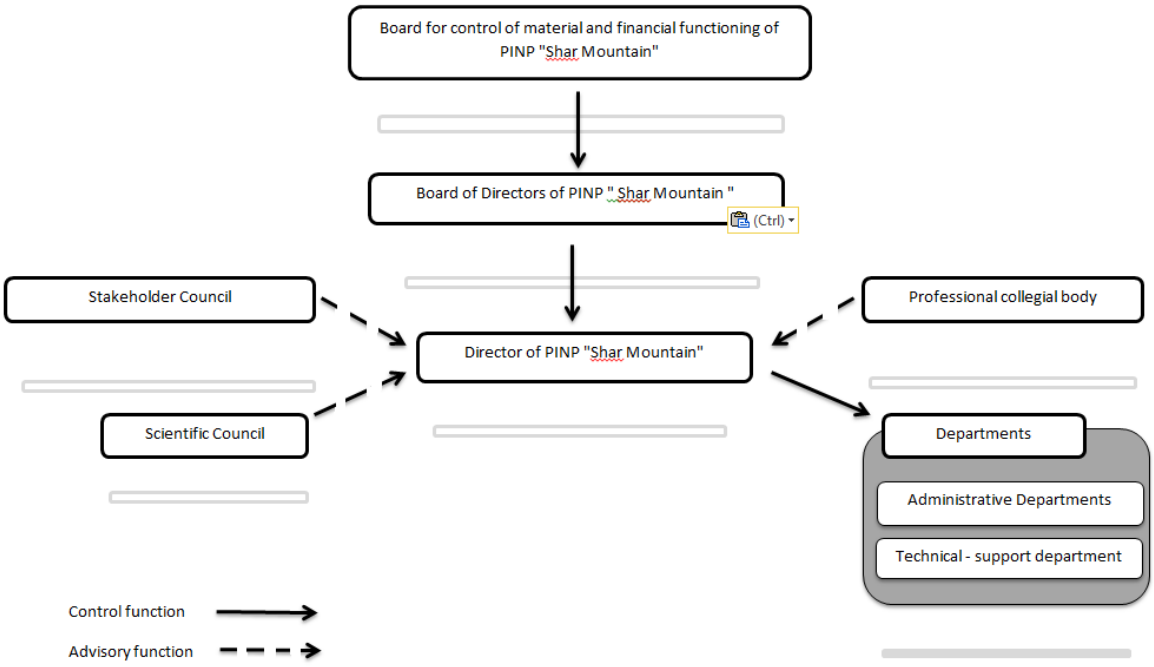
6.1.1. Management structure

The SMNP Public Institution was established by a government decision (Official Gazette 175/2021), according to which the management and governance structure includes the following bodies:

- Management board;
- Operational board director;
- Expert board;
- Board for operational and financial management.

The competences, structures, organization, and responsibilities of these bodies are to be defined in the SMNP PI Statute (2021), in accordance with the Law on Nature Protection and the Law of Proclamation of Shar Mountains National Park.

The SMNP PI is managed by an operational board director, who manages the work of the institution, takes decisions, presents and represents the institution and is responsible for the legal aspects of the NP. This director is appointed by the government according to criteria defined by the Law on Nature Protection and the SMNP PI Statute, and has a four-year mandate.



Picture 6: Organogram of the Public Institution

The SMNP PI establishes an expert board consisting of a number of members (to be decided by the government), the Director and one representative from each sector, appointed or dismissed by the Director. This expert board is responsible for the following tasks:

1. The expert work of the public institution;
2. decisions regarding expert issues in accordance with the criteria defined in the Law on Nature Protection, the national park statute and other legal documents;
3. defines expert ground for the annual program and its development;
4. advises the director regarding the organization of work, working conditions and planned future developments;
5. proposes members to the management board according to required competences and expertise;
6. proposes extraordinary measures in emergency situations;
7. organizes and implements training for the ranger service, and for firefighting and natural disasters;
8. implements other actions defined by law and the SMNP PI Statute.

The SMNP PI will establish scientific and stakeholder councils. These have advisory roles in the management of the protected area and decision making on operational issues, and are important in fostering and maintaining good cooperation between all relevant stakeholders.

6.1.2. Mechanisms and procedures for stakeholder participation

Protected areas are public assets, and as such public participation is essential to ensuring they are properly managed and enjoy strong public support. A desire for greater public involvement in government decision-making has been clearly expressed in public consultation discussions in the region of SMNP.

Ensuring collaborative public participation is a two-way process from which both national park management and stakeholders can learn and benefit.

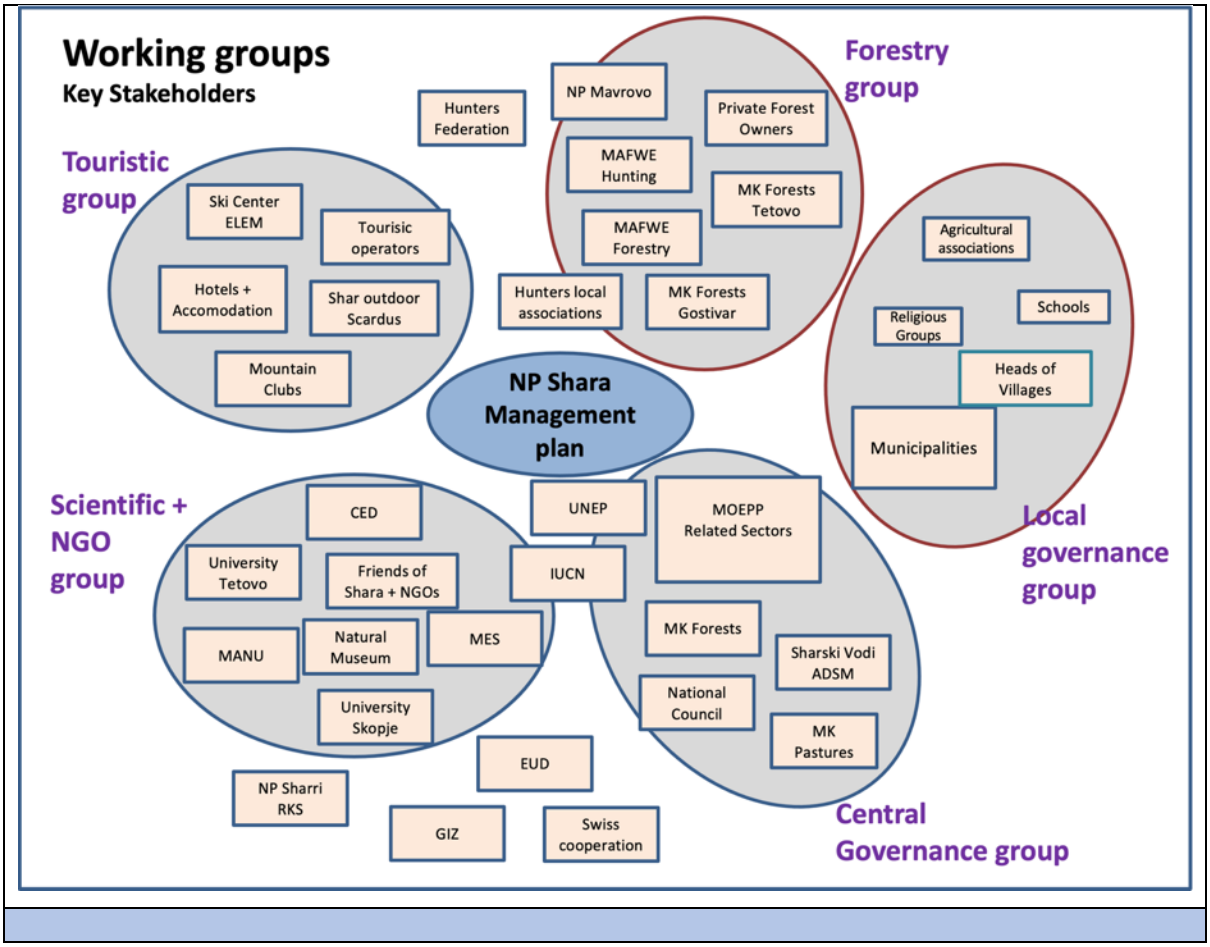
Some important advantages of public involvement in the management and governance of SMNP:

- Improved understanding of tourists' expectations and user groups' needs;
- Improved understanding of conservation issues;
- Support in monitoring, and advocacy for the protection of biodiversity;
- Support in fighting illegal activities;
- Rapid firefighting interventions;
- Increased technical knowledge of NP staff and community members;
- Increased credibility of NP management within the community;
- Improved quality of NP management decision making;
- Greater compliance of community through increased ownership of solutions;
- Greater access to community skills and knowledge.

Potential disadvantages of public involvement:

- Potentially time-consuming;
- Need for training and capacity building of NP management staff for communication;
- Challenging to reach constructive debate when interest groups have entrenched positions.

The area of SMNP hosts a wide variety of different interest groups. The following graph presents an overview of the key stakeholders who were invited and/or involved in the process of drafting this management plan, through several consultations:



Picture 7: Overview of key stakeholders who were invited and/or involved in the process of drafting this management plan, structured in 5 working groups

An overview of the stakeholder groups that may have direct or indirect involvement in the implementation of the SMNP Management Plan:

- Ministry of Environment and Physical Planning (MoEPP);
- Ministry for Agriculture Forestry and Water Economy (MAFWE);
- Ministry of Culture;
- EU Delegation (EUD);
- GIZ (Deutsche Gesellschaft für International Zusammenarbeit);
- Sharri National Park, Kosovo;
- Center for Education and Development in Tetovo (CED);
- Public Enterprise National Forests;
- Public Enterprise for the Management of Pastures;
- AD ESM (Sharski Vodi);
- ELEM Macedonia and “Popova Shapka” ski resort;
- Local tour operators;
- Municipality of Tetovo;
- Municipality of Gostivar;
- Municipality of Bogovinje;
- Municipality of Tearce;
- Municipality of Vrapcishte;

- Municipality of Mavrovo and Rostusha;
- Municipality of Jegunovce;
- Local communities;
- Hunting concession holders;
- Hotel owners;
- Universities and scientific institutions;
- Mountaineering clubs;
- Civil society organizations.

It is highly recommended that the Shar Mountains National Park Public Institution develops a clear stakeholder engagement strategy to guide public participation and monitor cooperation between stakeholders and the national park.

Proposed topics and mechanisms for stakeholder consultation and participation (non-exhaustive):

Stakeholder group	Stakeholders to be involved	Topics	Frequency	Mechanisms
Tourism	• Tour operators • Tourism service providers • Hiking and other sports clubs • Ski resort management • Wildlife management	• Promotion of NP to visitors • Visitor monitoring system and impact of tourism • Development of ski resort	Twice a year	• Platform for collaboration • Annual international tourism fair in NP
Municipalities and local community representatives	• All municipalities • Representatives of villages in NP	• Prevention of illegal activities • Waste management • Road maintenance • Maintenance of electrical supply • Use of natural resources (wood, plants, water, etc.) • Risk management (erosion, fires, flash floods, avalanches, etc.)	Quarterly	• Platform for collaboration • Working group on innovative heating solutions • Study trips on innovative heating systems in other countries
Maintenance of Sharski Vodi system	• AD ESM	• Regular maintenance, monitoring and interventions	Quarterly	• Platform for collaboration
Scientific community and NGOs	• Universities • NGOs • Consultants	• Scientific research • Monitoring of species and habitats • Education and awareness	Once a year	• Scientific conference on specific topics
Neighboring national parks	• Mavrovo NP • Sharri NP (Kosovo) • Korab Koritnik NP (Albania)	• Establish regular cross-border collaboration • Transboundary financing • Prevention of illegal activities	Twice a year	• Platform for collaboration • Transboundary PA status • Exchange study trips with other transboundary PAs

Stakeholder group	Stakeholders to be involved	Topics	Frequency	Mechanisms
Livestock grazing, farming and collecting wild plants	• PI Pastures • Pasture concession holders • Wild plant collectors • Farmers	• Use of pastures and development of sheepfolds • Dairy production • Grazing and tourism • Marketing products	Twice a year	• Platform for collaboration • Study trips to other PAs with similar conditions and activities • Active participation in yearly tourism fair
Cultural associations and groups	• Local groups involved in maintaining traditions	• Promoting local traditions and culture in the region • Organizing cultural events	Twice a year	• Platform for collaboration • Organizing yearly event on local traditions with partners from other regions

6.1.3. Administering the management plan

According to Article 98, paragraph (7) of the Law on Nature Protection, the Shar Mountains National Park Public Institution is responsible for evaluating the implementation of the management plan and presenting its conclusions in an annual report. The report should be submitted to the Ministry of Environment and Physical Planning by 31st January the following year. The management authority provides the following reports:

- Half-yearly reports on activities;
- Report on implementation of annual work plan activities.

According to Article 99, paragraph (2) of the same law, at the end of the fifth and final year of the management plan's implementation, an assessment of results should be conducted. Based on this assessment, the SMNP Public Institution will revise and amend the management plan and consult the public. The procedure of preparing the new MP has to start at least one year before the current plan expires.

6.2. Plan for human and other resources

6.2.1. Human resources

For the implementation of the overall management of the national park and its operational programs, the SMNP PI needs to be equipped with adequate human resources. Organizational structure of the Public Institution Shar Mountain National Park is established in accordance with the

nature of the activity for which it was established and which it carries out, in order to achieve effective management and organization of the functioning and realization of public interest in management.

Pursuant to Article 17, paragraph 7, of the Law on Public Employees (Official Gazette of the Republic of North Macedonia no. 27/14, 199/14 and 27/16) and Article 15 of the Statute of the public institution "National Park Shar Mountain '', Tetovo, Republic of North Macedonia, the director of the institution on 05.05.2022 has approved the Regulation on the systematization of jobs in SMNP PI.

According to the Regulation on internal organization of Public Institution National Park, the institution has four organizational units - Departments, as follows:

1. Department for Legal, Economic and General Affairs;

2. Department of nature protection;

3. Department for sustainable use of natural resources;

4. Department for Alternative Activities and Environmental Education.

Each department has a manager and employees. The foreseen number of executors, the special conditions necessary for the performance of certain works and tasks, as well as the job descriptions according to the tasks and organizational parts are determined by the Regulation on the systematization of jobs in the PI.

As such, in the department for legal, economic and general affairs are foreseen 12 jobs, in the department for nature protection 19 jobs, in the department for sustainable use of natural resources are provided 13 jobs while in the department for alternative activities and ecological a total of 5 jobs are foreseen. Given the lack of previous experience in the required number of employees for whom at the same time the institution will be able to provide permanent funding, as a start the PI will operate with fifty employees. If during the work there is a need to increase the number of employees for whom the institution will be able to provide adequate funding, this number may increase.

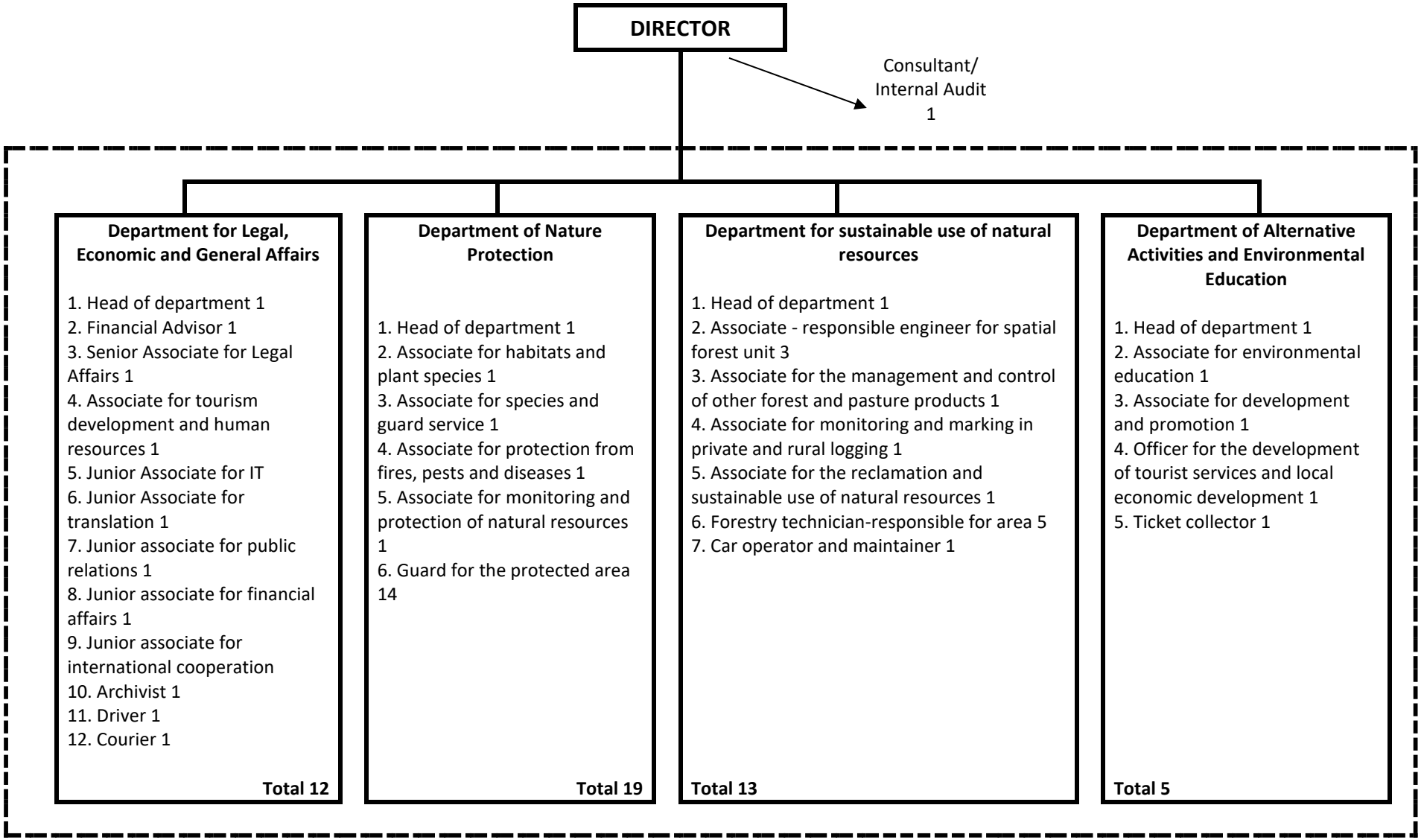


Table 29: Overview of departments and number of employees

The following activities are performed in the department for legal, economic and general issues:

- Legal issues;
- Financial and economic issues;
- Public procurement and commercial works;
- General works ().

The Department of Nature Protection includes:

- Professional technical supervision and conservation of the park.

The Department for Sustainable Use of Natural Resources is organized in:

- Forest spatial units (six sh.p.e.);
- auxiliary-technical works (mechanization).

The Department of Alternative Activities and Environmental Education includes:

- Environmental education;
- Tourism;
- Marketing.

According to the Law on Nature Protection (Article 136), employees in the professional services of the public institution - national park who perform activities of public interest related to the protection of wild species, protection of biodiversity and landscapes, management of protected areas, as and carrying out all activities arising from the laws in the field of environment, and are relevant to the protected area defined in accordance with the same law, have the status of civil servant.

Scope of work of the organizational parts

The following activities are performed within the department for legal, economic and general issues:

- Legal issues;
    - Monitoring and implementation of normative-legal regulations, laws, bylaws, regulations and procedures for the functioning of SMNP IP;
    - Preparation of legal documentation and reports;
    - Organizes and implements the procedures for awarding public procurement contracts;
    - Provides professional and operational support in carrying out procedures for determining disciplinary and material responsibility.

- Financial and accounting issues;
    - Following and implementing laws, bylaws, regulations and accounting and financial procedures,
    - Organizes and prepares and is responsible for financial documentation - accounting and SMNP reports.

- The department is responsible for all financial matters as well as for the control of financial affairs through the respective performers according to the jobs as well as for the management of SMNP IP funds through the management of SMNP IP budget,
- Makes all payments and receipts related to the treasury,
- Presents monthly, semi-annual and annual reports
- Evidences and payment of compensations,
- Cooperates with other departments for the collection of liabilities,
- Calculates and pays salaries and regular work of the treasury and makes regular registration of assets and equipment in stock.

- Public procurement and commercial works;
- Occupational safety and health and general work
  - Takes care of safety and health at work through the implementation of relevant regulations, professional assistance and guidance and other general issues;
  - Insurance of employees and business facilities;
  - Maintenance of hygiene in business facilities and in other premises and areas.

In the department for nature protection the works are performed through:

- Professional technical supervision and conservation of the park,
  - Performs the protection of PINP Shar Mountain as a protected area through continuous planning activities, organizations, taking measures, monitoring and analysis of activities in the field of nature protection provided by the Management Plan, laws and other acts of SMNP;
  - Performs continuous monitoring and monitoring of conditions in the territory of the national park and performs activities that are the competence of the park in relation to the protection of flora and fauna in accordance with nature protection programs and supervises the implementation of permitted activities in the protected area;
  - Is responsible for keeping records and documenting natural and other values and beauties in the park, establishing a protection regime and taking care of the protection, breeding and hunting of wild animals, protection and collection of wild species of plants and fungi, and other forest fruits as well as quantitative fish farming and traditional fishing.

In the Department for sustainable use of natural resources of PINP Shar Mountain, the work is done through:

- Forest-spatial units;
  - organization of PINP Shar Mountain activities related to the use of natural resources in the protected area through continuous planning activities, organization, follow-up and analysis of works in the field of nature protection provided by the Management Plan and other acts of PINP Shar Mountain;
  - performs continuous monitoring and monitoring of the situation in the territory of the national park and performs activities that are the competence

of the park in accordance with the programs and supervises the implementation of long-term and short-term programs within the activities allowed in the protected area to carry out the plan;
- takes care of the sustainable use of natural resources in the interest of current and future development without damaging the nature and natural balance in PINP Shar Mountain.

- Auxiliary-technical works (mechanical)
  - Maintenance and care for machinery and vehicles;
  - Data on servicing and consumption of fuel and lubricants;
  - Regular maintenance of infrastructure in the park.

In the Department for alternative activities and environmental education the work is done through:

- Creating conditions for the development of ecotourism in accordance with the principle of sustainable development. At the same time, through cultural, scientific, educational and recreational activities, it preserves the natural state of the National Park and creates conditions for the development of tourism and visitor recreation, organizes activities for raising public awareness and the educational process for the protection of SMNP IP. The Department organizes and implements the promotion of SMNP IP and coordinates the publication of brochures, leaflets and the like.
- Development of tourist services;
  - Creates conditions for the development of tourism in accordance with the principle of sustainable development.
  - Through cultural, scientific, educational and recreational activities preserves the natural state of the National Park and creates conditions for the development of tourism and recreation of visitors;
  - Maintains the park infrastructure.
- Development of marketing and communication services;
  - Organizes activities for public awareness and educational process for the protection of SMNP IP;
  - Organizes and implements the promotion of SMNP IP and coordinates the publication of publications, brochures, etc.;
  - The department, in addition to educational and training purposes, organizes recreational activities taking care of the sustainability of the natural state of the national park;
  - Builds and maintains the infrastructure and facilities in the park.

The need for specific knowledge and skills for area management

The new public institution Sharr Mountain National Park has a unique opportunity to hire suitable staff who will respond to all responsibilities and fully respond to the tasks set for the respective job described in the Regulation on the systematization of jobs in SMNP IP. The institution formally prepares the necessary training plan for employees at the request of the MoISA and refers to administrative staff according to the relevant law. Also, in the Annual

Program that the park prepares and sends for approval to the MOEPP, various trainings for monitoring, fire management, etc. are provided, which are usually realized within the various project activities. Part of the various trainings planned for the employees, both professional and those related to the daily functioning of the Institution are:

- Basic training (computer, English or other languages, accounting, job security);
- Vocational training (GIS, stakeholder communication, use / maintenance of websites and social media, monitoring of important species and habitats, planning and management monitoring, conservation measures for certain habitats and species, education for H2000).

6.2.2. Equipment and infrastructure

To be fully functional, the public institution National Park must be supplied with at least:

- Central building of the national park, with spaces and facilities suitable for employees. Consequently, in relation to the administrative building, the possibility of erecting a building with suitable conditions should be considered - sufficient offices for employees, meeting room, etc. For a smooth running of the work, it is necessary to purchase a server and computer equipment for the employees in the administrative building, which will be connected to the network and will provide the appropriate conditions for the storage / information of the data and their protection.
- Visitor Information Center, which would be better to hire people during the busiest periods;
- Some field facilities for staff in different areas that will serve as shelter, control and storage;
- Warehouses with equipment for: management, monitoring, prevention and extinguishing of fires, as well as the possibility of placing water tanks in several locations;
- Equipment with at least 10 suitable off-road vehicles, most of which must be permanently on the ground in the protected area. Procurement should be done gradually over a period of several years. Appropriate funds should be allocated for their maintenance, but their regular renovation and procurement of additional equipment is also necessary. In this way, field activities for species and habitat monitoring, implementation of direct park protection, conservation and fire protection will be carried out smoothly. Some vehicles need to be able to adapt to fire protection.
- Other field equipment includes: personal security equipment, uniforms for all employees, suitable firefighting equipment, regular monitoring cameras, drones with special sensors for early warning of fire and software provided for the analysis of fire, binoculars, fixed observation telescopes for tourist use, meteorological and other small measuring stations that would be easy to maintain, etc.

6.2.3. Funds and financing plan for the implementation of the management plan

The following table presents an overview of the proposed staff (based on programs, / sub-programs and / proposed activities) and their monthly salaries, based on the assumption that the public institution is developed and operational:

Overview of regular operational costs:

Positions in regular operations	Amount	Cost per unit MKD	Total cost MKD / year	Total cost EUR / year
Salary / staff * month (900 EUR)	50	60,000	36,000,000	585,365
Office workspace 12m^2 + PC + etc. (300 EUR/month)	40	20,000	9,600,000	156,097
Cars (600 EUR/month)	15	36,000	6,480,000	105,365
Uniforms + equipment rangers (30 EUR/month)	20	2,000	480,000	7,804
Other costs (3000 EUR/ month)	1	180,000	2,160,000	35,121
Total / year			**54,720,000**	**889,752**

Table 30: Overview of regular operational costs

Estimation of costs for external experts:

Projects with external collaboration	No. of Activities	Average cost EUR/ year	Total cost MKD / year	Total cost EUR / year
Priority 1 project with external support	35	15,000	32,287,500	525,000
Priority 2 projects with external support	70	15,000	64,575,000	1,050,000
Priority 3 projects with external support	25	15,000	23,062,500	375,000
Total / year				**1,950,000**

Table 31: Estimation of costs for external experts

*This amount will be provided by international and national donor programs, through activities implemented by other legal entities or individuals:

Additional activities for which no costs are calculated but related to the park's obligations are as follows:

- Costs for maintenance of local roads;
- Maintenance of mountain trails, etc. picnic places;
- Costs related to the safety of visitors (construction of shelters, their maintenance and rescue of visitors);
- Fire protection and management;
- Waste management (especially solid waste in the most visited tourist sites, placement of containers with protection from wildlife).

In order to provide adequate access for tourists and visitors to the park, the administration will often need to use an excavator to clean them. Also, for the maintenance of walking paths, attention should be paid to the purchase of heavy machinery (tractor, excavator, etc.) where regular cleaning, mowing, snow removal, etc. would be performed. If the institution does not have the necessary heavy machinery, it can be rented if necessary.

Existing visitor infrastructure needs to be upgraded and regularly maintained. It includes various shelters, watchtowers, benches, resorts, etc., along mountain and cycling trails as well as other places for visitors.

The national park should have clearly marked boundaries and information boards placed at all entry points, an explanation of permitted and prohibited activities by area as well as a marked network of trails for various activities.

Sources of funding for national park operations:

- National funds (Government);
- Ecosystem services payments: Fees collected from sustainable use of natural resources according to MP as well as fees from entities that provide services in the NP territory (tour operators, small hydro power plants, power lines, hotels, tour operators, show cat free ride skiing, etc.);
- PONT;
- EU IPA;
- EU cross-border program;
- GIZ;
- GEF;
- UNDP;
- UNEP;
- SIDA;
- USAID;
- Swiss cooperation;
- Other international donors;
- Private sector sponsorship.

6.3. Annual program for nature protection

The annual programs need to be prepared by the management of the national park.

6.4. Preparation of the following management plan

In accordance with the Law on Nature Protection, after the first five-year period the management plan will be revised and renewed for the following period.

7. Documentation / Annex

7.1. Map views in GIS format

7.2. References

Melovski L., Jovanovska D. and Hristovski S. (2019): Landscape diversity in North Macedonia, Macedonian Journal of Ecology and Environment (http://www.mjee.org.mk/).

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UNEP Regional Office in Vienna (2020): Valorization Study on Sharr Mountain.

Appleton, M.R. (2016). A Global Register of Competences for Protected Area Practitioners. Gland, Switzerland: IUCN

DEKONS-EMA Skopje. Socio-economic Study for the proposed protected area National Park Shar Mountains. 2020. Italian Ministry of Environment, land and sea project: "Support to the Western Balkan countries for the implementation of multilateral environmental agreements by strengthening the institutional framework and capacity building" and supported implementation through GEF/UNEP/MOEPP project “Achieving Biodiversity Conservation through Creation and Effective Management of Protected Areas and Mainstreaming Biodiversity into Land Use Planning”.

UNEP Regional Office in Vienna. Shar Mountains Valorization Study, harmonized version. p. 688. 2020. GEF/UNEP/MOEPP project “Achieving Biodiversity Conservation through Creation and Effective Management of Protected Areas and Mainstreaming Biodiversity into Land Use Planning”.

7.3. List of small hydro power plants (status January 2021)

Separate document: Annex 3 - 2020-12-20 Analysis SHPP.pdf

7.4. METT4 Assessment

Separate document: METT4MasterFile V4-1 NP Shar mountains 2021-11-17.xlsm