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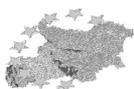
Final Report - Summary

FORESTRY

Feasibility Study for Trans-border Biosphere Reserve Osogovo

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The Osogovo mountain range is located in the northeastern part of Republic of Macedonia and continues in the western part of Republic of Bulgaria.

It is a quite wooded mountain range that develops different types of forest ecosystems, characterized by its natural values. The forests cover a high percentage of the total area of the territory, and their structure, composition, age and other characteristics increase the forest diversity and contribute for diversity of other natural values that distinguish this region.

These ecosystems have a big role in preserving the biodiversity of the area and therefore require the application of appropriate practices for their promotion and protection. In this context a greater degree of protection is essential to be applied to old forests, riverside forests, mesophilic oak and beech forests, relict forest communities and for all forests that have high conservation value.

The mountain range is characterized by big natural diversity and significant differences in climate, vegetation and soil. The great altitude differences contributed to clear differentiation of six climate-vegetation-soil zones (according to Filipovski and others. 1996).

The lowest southeastern parts of Osogovo Mountains are under influence of continental-sub-Mediterranean area. It is under thermophilic vegetation dominated by forests of downy oak and white hornbeam under the community (ass. *Quercus-Carpinetum orientalis*). Above the continental-sub-Mediterranean area, the hot continental area starts building up which covers a wide range of southwest, west and north side of Osogovo Mountains. Dominant forest community in this area is Italian-Austrian oak forests from the community (ass. *Quercetum frainetto-cerris*). The cold continental area builds over the warm continental area and it covers the space from 850-1150 m (up to 1300 m on the southern exposures). In this part the sessile oak forests are mostly widespread, which are under the community (ass. *Orno-Quercetum petraeae*). Above the cold continental area, the submontane continental mountain range starts to build up. It covers an elevation belt of about 300 meters between 1000-1300 m of altitude. In this area, mainly dominated by beech forests, most of them are of vegetative origin and are covered in the forest communities (ass. *Festucoheterophylae-Fagetum*).

The continental mountain forest area is spread above the submontane continental mountain range on altitude belt between 1200 and 1650m. It is dominated by quality tall beech forests covered by forest community (ass. *Calamntho grandiflorae-Fagetum*). In the highest parts of Osogovo Mountains above 1650 m altitude, a sub-alpine mountain area is widespread. This highest area represents a transition to mountain pastures. The upper limit of the forest

vegetation at an altitude between 1600-1800 meters encounters the foothills (subalpine) beech forest described in the community (*ass. Fagetum subalpinum scardo-pindicum*).

Some relict forest communities can be found on the Osogovo Mountains such as: *ass. Colurno-Ostryetum carpinifoliae Bleč 57* - forest community of Turkish filbert (hazel) and black hornbeam *ass. Quercus - Ostryetum carpinifoliae (Ht. 1938)* – a community of oak and black hornbeam. Of particular conservation significance are the small forests with white willow and white poplar (92A0), as well as the riverside forests with alder and white ash (91E0)

In the frame of forest ecosystems in both countries the forest communities are described in more details. However it should be said that there is still no commonly harmonized classification for the whole area because of the different classifications used in the past and alignment towards the classification scheme EUNIS is still not fully completed and described, in particular by the Macedonian side, although there are 18 registered residences according EUNIS classification system for habitats, where five of them are important for conservation under the Habitats Directive (Council Directive 92/43 / EEC on the conservation of natural habitats and of wild fauna and flora) (Matevski, 2012). On the Bulgarian part of Osogovo there are 15 registered such residences, according to EUNIS classification system for habitats.

It is very specific for the entire Osogovo mountain range that in the frame of the oak and beech forest belt, there are numerous forest plantations of coniferous tree species such as black pine, white pine, spruce, larch, fir, acacia, douglas fir and other.

Most widespread and also the most important forest ecosystems on Osogovo mountain are beech, which cover the majority of the mountain range. They prevail at an altitude between 600 and 1800 m and cover area of about 4300 ha.

However, the oak forest belt is of great importance too for the conservation of biodiversity in the area because it contains a number of native species, which differ in their characteristics and peculiarities.

Conifer forest ecosystems are largely created by afforestation activities replacing the sites of the destroyed and degraded oak or beech forest parts. They are distributed at an altitude of 480 to 1800 m and cover area of about 19000 ha.

The area of Osogovo Mountains today belongs to several municipalities, which in terms of activity are separate and don't have jurisdiction over forest management and forest resources.

The management of forests and forest resources from the Macedonian side is the responsibility of the Public Enterprise "Macedonian Forests" Skopje, which through its

subsidiaries in Kocani, Delcevo, Kratovo and Kriva Palanka manage the entire region of forests, with the exception of forests that are privately owned, operated by private owners themselves.

The management of forests and forest resources from the Bulgarian side is under responsibility of several entities. The state forests are managed by Territorial unit (TA) National Hunting Enterprise (DLS) "Osogovo" based in Kyustendil. Private forest owners manage their own forest, and the forest owned by religious organizations are managed by themselves. Some proportions of forests are allocated to municipalities under their management, as well as some small size forests owned by legal entities that they manage.

According to the ownership, the forests in Osogovo on the Bulgarian side are allocated to multiple owners, such as: 68% state, 9% private, 15% municipal and another 8% are given to municipal management. On Macedonian side, 90% of forests are state-owned and 10 private.

Forests and forest resources on Osogovo mountains are a significant natural resource, which has long been a subject of interest and use by the people. Over time during the historical development, the relationships have changed as well as the needs of the forests and forest resources.

In the distant past, forests of Osogovo Mountains were much more exploited as per the needs of the local population for firewood and other forest products, and the expansion of agricultural areas and areas under grassland at the expense of forests. Because of that, much of the area had been degraded and turned into forests of izdankovo origin, shrubs or other degradation forms. In order to improve the situation of forests, in the second half of the last century on both sides of the Osogovo Mountains are performed mass afforestation primarily with coniferous tree species to cover large areas that were previously deforested or were barren. In the last few decades in all parts of Osogovo Mountains, a planned forest management is performed, which constantly improves the quality and structure of the forests. The increase in forest area due to afforestation and natural reforestation is obvious, which nowadays is done on abandoned fields and other farmland in the mountainous areas.

The improvement of the attitude towards the forest and the application of planning, protective cultivating and other useful forest practices contributed to preserve a significant part of forests that today is characterized by high natural values (HNV).

Such natural values in Osogovo Mountains are already recognized in national and international documents. Biodiversity in this area is represented by a very large variety. Numerous species of flora and fauna that can be found in Osogovo region are internationally and nationally significant species and are included in the European Red List; European Habitats

Directive and other relevant documents; species that are found only in Osogovo (endemic) or species with restricted distribution in the Republic of Macedonia (rare). The natural beech forests, sub-alpine pastures and peat bogs of Osogovo are particularly important to be preserved. The protection of important habitats is an obligation of the Republic of Macedonia and the Republic of Bulgaria to meet their obligations to many international treaties and conventions on biodiversity (Convention on Biological Diversity, Ramsar Convention, Bern Convention, Bonn Convention, European Landscape Convention, etc.).

According to the Spatial Plan of the Republic of Macedonia in Osogovo Mountains, several sites of natural significance are recorded / proposed for protection (Dab - Beli, Karshi Bavchi - Kratovo, Crna Dudinka - Lesново and other individual trees) and two natural reserves (Zletovska Reka and Crvena Reka) . In September 2009 the Ministry of Environment and Physical Planning launched an initiative for declaring the area "Ratkova Skala" in the category of natural monuments (an area about 11,500 ha). The project for establishing a representative network of protected areas in the country (which is the amendment and revision of the sectorial study on natural heritage of the Spatial Plan), proposes establishment of more protected areas on Osogovo Mountains where forests have significant participation.

On Osogovo Mountains from Macedonian side are identified three Natura 2000 sites, but are not officially declared yet. Parts of Osogovo Mountains based on international criteria and standards were identified as:

- Significant plants area "Osogovo Mountains";
- Significant Ornithological Sites - There are three separate sites proposed: "Osogovo", "Zletovska River Valley" and "Kocani rice fields";
- Pan-European Ecological Network - Osogovo Mountains have been identified as an important corridor for the movement of wild plant and animal species;
- Macedonian Ecological Network (MAK-NEN) - part of Osogovo Mountains has been identified as a core area and other parts as corridors (connection) with the neighboring mountainous areas.

The area also possesses other important local and national social and economic values such as developed mining; developed livestock raising; water and forest resources that provide numerous ecosystem services and direct economic benefits.

On the other hand, in Osogovo Mountains an unsustainable use of natural resources is observed (illegal logging and hunting, inadequate collection of mushrooms and plants, inappropriate forestry practices, etc.). Other serious threats to biodiversity in the area are related

to irreconcilable existing development plans or improperly granted concessions. Therefore, there is need for imposing serious approach to harmonize the policies for management of forest development resources and reduce the negative impact of activities on biodiversity.

In a transboundary context, the Osogovo Mountains are priority border region between Bulgaria and Macedonia. A bilateral agreement is signed on cooperation between the ministries of environment of the two neighboring countries (Sofia, 06/09/2000). The agreement obliges both sides to advocate for the protection of natural values, sustainable use of natural resources, establishment of transboundary protected areas and strengthen cross-border cooperation.

Macedonia and Bulgaria are part of the European Green Belt, or more specific the regional branch "*Balkan Green Belt*". This initiative includes conservation of biological diversity and resources through the creation of transboundary protected areas along the border of the former *Iron Curtain*.

The natural values of the Osogovo Mountains are seen in Bulgaria too, where have already been established two major Natura 2000 sites: "Osogovo", according to the Birds Directive (24125,09 ha) and "Osogovo Mountain" according to the Habitats Directive (34513.24 ha). There are several smaller or larger protected areas in several categories. In addition to the territory of Osogovo Mountains managed by TP DLS "Osogovo" - Kjustendil, the forests with high conservation value are allocated.

The exploitation of forests of Osogovo Mountains in both countries is carried out according to planning documents. The total possible (permitted) volume of use of state forests under management plans (for 10 years) in the two countries amounted to 1,351,488 m³, of which in the Macedonian part there are 868 822 m³ or 64%, and in the Bulgarian part 482 666m³ or 34%. Average annual permitted use is 135 149 m³, but in the average about 71% from planned are utilized.

The total number of direct employees in the forestry sector in 2015 in Osogovo Mountains is around 300 people. In addition about 250 people through firms operating with logging, delivery and transport of forest products are recruited in average. The gathering of other forest fruits is mainly done by persons not employed in the forestry sector, who deliver the fruits to the collection points.

In terms of applied practices for forest management in the Osogovo region from the Macedonian side, mainly are performed three basic types of cuttings for renovation: Fertilizing cutting, selective cutting, clean cutting and thinning as cultivating measure. Therefore we can say

that they only partly due nature-like and do not substantially affect the disruption of naturalness of forest ecosystems. It occurs in the area where group selection cuttings and selective cuttings for spacing are used. By applying fertilizing cutting in significant extent affect the condition and structure of the forest ecosystem, but intensive renovation processes are encouraged in the forest. The application of pure logging fully affects the situation and structure of the entire forest ecosystem and creates unfavorable processes regarding the conservation of biodiversity, protection of land erosion, preserving the area values and more.

According to past practices in forest management and the choice of the cutting, the population growth, structure and condition of the forest are taken into consideration without taking other natural values such as animal and plant species wealth, the impact of cutting forest on them, area values, etc. This is due to the existing concept of organization of the forestry sector, which is lagging behind in the implementation of ecological principles in forest management. Regarding the Macedonian side there are no allocated forests with high conservation value. Certification of forests are not done and areas according NATURA 2000 are not established (although there are three Natura 2000 sites identified in Osogovo Mountain), because there are certain threats to biodiversity values of forest ecosystems.

Certain especially valuable forest ecosystems such as the old beech forests with virgin forest character are not adequately protected and are subject to regular business activities due to which most of them have lost their high natural value. A particular problem is still large-scale application of clean cutting a large area in the forests of vegetative origin, which has a negative impact on forest ecosystems as well as on the overall biodiversity of the area.

In the management of forests on the Bulgarian side there are certain measures implemented that bring it on a more contemporary level. So the forests with high conservation values are separated and for all of them provided measures in accordance with their value contributing to the conservation of other values available to the forest ecosystem. Clean cutting of large area are not applied. prevailing management measures are: thinnings, fertilizing and selective cuttings. The main activity of TP DLS "Osogovo" - Kjustendil is hunting forest management, where the forest management mainly produces firewood to meet the needs of local people.

In both countries the legislation, strategies and other planning documents have a trend of implementation of the principles and concepts of modern forestry which aims to preserve biodiversity and other values of the forest ecosystems and areas. There is a need for their full implementation in practice, which will significantly improve the situation of forest resources and natural values.

Although the planned management contributed to improving the structure and enlargement of the forests areas, yet not sufficiently preserved natural and untouched Rainforest ecosystems that the region was known for. Many of them in the past were exploited in traditional, unplanned or improper manner, causing considerable complexes of extremely valuable forest ecosystems to be converted into commercial forests. In 1959, (according to data from the Yugoslav Encyclopedia, 1960) there were 482 ha recorded ancient beech forests, which were later subjected to economic exploitation.

Insufficient recognition of their natural value and economic interest was the reason they were turned into commercial forests. Such a trend of losing high natural values can be prevented only by changing the way of operation and management of forest resources, introduction of criteria for sustainable forest management and application of adequate protection by declaring protected areas.

In this context, it is important to continue the research on forest resources and to register and protect the important forest ecosystems. Besides that, there is a need for taking appropriate measures to protect and promote the principles of sustainable and nature-like forest management. The creation of biosphere reservation will help in conservation and promotion of the natural values in the area and the application of more modern and more "Eco" standards in conservation and management of forest ecosystems, thus preserve biodiversity.

Besides the forest management in the Osogovo region, the management of wild animals is quite popular. For this purpose in the Bulgarian side of Osogovo is formed a State Hunting Enterprise "Osogovo" with management of game as a core business. From the Macedonian side, a State Hunting Area "Polaki" is formed for the same purpose. The entire territory on both sides of the border is divided in territorial units (hunting areas) that are awarded by the concession to legal entities and hunting associations under the laws of hunting in both states. By getting the game by way of concession, the concessionaire continues to take responsibility for the care, protection and management of the game.

The natural conditions in Osogovo Mountains are favorable for existence of different types of game. In the Macedonian side, mammals with high international conservation interest (lynx, bear) can not be found, while the same ones live on the Bulgarian part of the Osogovo Mountains. Both types can be expected to occur in the Macedonian part of the Osogovo Mountains too. The same case is with the great grouse. Hunting affects the population size of different species (deer, rabbit, wolf, marten etc.) and is one of the main reasons for the small populations of deer and wild hare. Also, the impact of hunting is important (directly or indirectly) on game species for which there is a permanent protection under the Law on Hunting: squirrel, wild cat, badger, otter and others.

The forest and game management are based on the previously developed planning documents. Because of the size of the area, as well as various authorizations by large number of subjects, conflicts of interest are frequent.

The gathering of other forest products (strawberries, raspberries, blackberries, blueberries, tea, etc.) is also developed on Osogovo Mountains, as per individual needs and for commercial purposes. The utilization of these resources is done without knowing the basic environmental parameters (surface, biomass and production, capacity and so on.).

Certain improper practices and phenomena, such as illegal logging, clear cutting, non-methodical and intensive building near forest ecosystems and more, contribute to the endangerment of natural values, as well as the occurrence of erosive processes.

With the establishment of a transboundary biosphere reservation in the territory of Osogovo Mountains, other benefits will be achieved such as:

- Improved knowledge on the natural values of Osogovo Mountains, especially in terms of specific biological diversity for the forest ecosystems;
- Valorization of natural values of forest ecosystems in the region in accordance with national and international criteria, providing effective protection of priority species and habitats and the creation or improvement of the system of protected areas in the region;
- Improve the effectiveness of integrated management and sustainable use of forest resources in the region;

- Supporting cross-border projects for the preservation of nature and creation of efficient and responsible use of forest and other resources as a key element for sustainable development in the border region.

The proclamation of protected area Biosphere Reservation will significantly contribute to the removal of certain threats to biodiversity that the area is facing.

Different, often inadequate practices applied in and around the forest ecosystems in some parts of the area should be adjusted to the concept of sustainable forest management taking into accounts both the economic and the environmental and social functions of forests.

A special attention should be paid to the planning and performing forest practices and activities in the territories where there are endangered, endemic or species in extinction. The activities should be conducted in a manner and to the extent that will not disrupt natural habitats and with intensity that will not jeopardize their development. In certain parts that have special meaning it is necessary to exclude all activities in order to preserve the natural environment and be able to follow the dynamics of successive natural processes.

With the establishment of transboundary protected areas, it is possible to provide more effective protection of biodiversity and the sustainable use of natural resources in Osogovo, as well as to provide conditions for sustainable economic development in the region, since the region of Osogovo meets the criteria of the Program „ Man and Biosphere "created by UNESCO (United Nations Organization for Education, Science and Culture). This appropriate form of protection of nature and support and nurturing of human activities in the region under the "umbrella" of UNESCO is of utmost importance in a transboundary context. Especially because this type of conservation of natural and cultural values inevitably leads to improving the social and economic development in the region and providing conditions for the use of funds from various national and European funds and programs.

Large values of the Osogovo region, and the need for their preservation and promotion covered by this study, suggest that the prospects of the area will increase with declaring it as a Biosphere Reserve. In this way, it will be a transboundary protected area and will create conditions for the preservation and sustainable use of forest and other natural resources, as well as conditions for sustainable economic development.