

MAMMALIAN FAUNA OF OSOGOVO MOUNTAIN

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ABSTRACT. Osogovo mountain is located at the border area with R Macedonia and till the end of 80-ties was part of restricted border zone. This is a reason for the nowadays relatively well conserved habitats and low anthropogenic pressure, but on the other side determines Osogovo as one of the least studied mountains in Bulgaria.

This study aims delivery of new information on the status and distribution of the mammalian fauna in Osogovo mountain. It includes data survey on the large and medium game species census for the period between 1999 and 2003, provided by the State Game-Breeding Station „Osogovo“ and the local hunting unit areas surrounding the Station as also data collected through a field study done between March and December 2003. During the field work we had found and identified the presence of totally 19 mammal species, as additionally 7 more are listed according different literature sources. One species (snow vole *Microtus nivalis* M.) was recorded for the first time for the mountain during our field work. Bats are not included in this study.

KEY WORDS. *Osogovo, mammals, game species,*

INTRODUCTION

Osogovo mountain is part of Osogovo– Belasitza mountain range, in broader view – part of the Rilo-Rhodopean massifs. Its total area covers 4223 km², of which only 996 km² are located in Bulgaria (all of it in Kjustendil region). The Bulgarian part of the mountain is medium to low in altitude. It situated in protected border area, which is a reason for the relatively well conserved habitats and low anthropogenic pressure. On the other side the strict border control till the end of 80-ties determines Osogovo as one of the least studied mountains in Bulgaria.

The big socioeconomic changes in Bulgaria in the beginning of 90-ties led to overall decrease of the numbers of large and medium sized mammal species, including these in Osogovo mountain. The main causes were intensive loss or change of habitats, active legal and illegal persecution from the people. In case of Osogovo the changes withdrew the local people out in the mountain in search of jobs and today it is almost totally uninhabited (only some 3-4 old people living there all-year round). The loss of previously big grazing herds of livestock changed the sub-alpine areas, converting large amount of them from alpine meadows into a bushy areas overgrown with *Juniperus* and low *Pinus sylvestris* sprouts.

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FIELD, METHODS AND MATERIALS

The Osogovo mountain forms a boundary line between the moderate climate on north and the Mediterranean influence on south which comes through the Strouma and Vardar river valleys. The water sources' richness is significant. It is due to the heavy rains, the water-resistant rock base and the relatively low average temperatures. The forests, which once had covered the whole mountain are now significantly decreased. Nowadays the north and north-east slopes of Osogovo are covered mainly with young, artificially planted coniferous and deciduous forests. The vegetation of the mountain shows certain vertical zoning. The boundaries between the three vegetation zones – sub-mountain, mountain and sub-alpine are 1000 and 1800 m. respectively. The sub-mountain zone is prevailed by *Quercus* – *Q. robur*, *Q. frainetto*, *Q. cerris*, *Q. petraea*, etc sometime mixed with *Ulmus sp.*, *Carpinus sp.*, *Fraxinus sp.*, *Corylus avellana*, etc. The mountain zone in Osogovo is covered mainly by beech forest. Almost everywhere the beech delineates the upper border of the forest. The highest parts of the mountain (above 1800 m. a.s.l.) are covered with *Juniperus* shrubs and grass vegetation mixed with *Vaccinium*.

The study on the mammal distribution in Osogovo was done between March and December 2003. We used both transect methods for locating tracks and signs of animal presence and direct observation of the animals themselves. All signs and observations were recorded in standard field forms.

The data for the status of the game species were acquired from the databases of State Game-Breeding Station (SGBS) „Osogovo“ and the local hunting units.

RESULTS AND DISCUSSION

Analyzing the data on the game status, received from SGBS „Osogovo“ and the hunting units, it is clear that the last years show positive trend and growing numbers of roe deer, wild boar and hare (Table 1). Same trend is observed in the areas surrounding SGBS „Osogovo“ and managed by the hunting units. (Table 2). This is a good proof for the fact that one of the basic limiting factors – poaching, is minimized not only on the grounds of the SGBS „Osogovo“ but also in the areas surrounding it.

Bear (*Ursus arctos* L.) Considered to be extinct from the mountain many years ago. Still, in March 2003 we had found fresh footprints on the snow along the Bistritza river near the mine „Ruen“. The mine was closed more than 10 years ago. In August the same year we had also found a fresh bear scat in the locality of Begbunar. The scat was full of blueberry seeds, a plant which covers large areas around. In October and November 2003 we had found again bear signs around the mine, including a broken door of one of the dry and relatively isolated galleries, situated in a remote area. The straw bedding inside spoke for activities connected to the preparation for hibernation. The bear presence in Garljano region of the mountain should be considered as seasonal or occasional as the food availability cannot support all year round sustain but the abandoned galleries in remote areas are suitable places for hibernation. The guards of the mine had detected signs of bear presence near the galleries two subsequent years (late autumn 2003 and 2004) which is the last data collected so far. In the spring 2005 all wooden doors of the galleries' entrances in the mine were replaced with metal ones, as a result of which the possible access of bears to them was terminated.

Wolf (*Canis lupus* L.) The review on the distribution and numbers of wolves in this region in the past shows a good deal of quality trophies (GOTZEVSKI, 1983), one of the best in Bulgaria. The studies of GENOV (1987, 1989) confirm the conclusions of Gotzevski. Genov emphasizes on the fact, that nevertheless the fluctuations in the numbers of this predator, it had always been present in Kjustendil region (GENOV and KOSTOVA 1993). During the field work we had analyzed data on found footprints, scats (collected and analyzed) and marking posts. We had also made two direct observations – first, of young, around two years old wolf crossing the road in locality Begbunar and seconds, of adult male observed on the road going between the mountain hostel „Prophilactorium Tri Buki“ and Radoiska river. During our field work in 2003 we were studying the activity of two wolf packs – one consisting of 4 wolves occupying the South-East part of the mountain and another also consisting of 4 wolves occupying the North-West part of Osogovo. The border area between the two packs was following the east slopes of Begbunar valley, locality of Begbubar, the two peaks Mala and Goljama chuka and ending at Mlatchka river as a natural border. The main crossing and migration points for the packs were: 1). On the border between R Macedonia and Bulgaria – the ridge of Ruen peak (we had found scats there) and 2). Two sites in the Bulgarian part of the mountain: the locality of Begbunar as key crossing point and the plateau between peak Tchoveka and the locality Tzarnotrav. During the field work we had also collected data for suitable places for breeding, giving birth and raising pups. These were usually places, highly inaccessible for people – the valley and the upper course of Tzarna river, the upper course of Mlatchka river and Begbunar valley, which were fully overgrown with *Juniperus* shrubs and low sprouts of *Pinus silvestris*.

At the moment wolf numbers are positively influenced by the increase of the areas covered by *Juniperus*, which provides a perfect hide-out for the species. On the other hand, these shrubs enhance the wolves in catching their main prey in the mountain – the roe deer.

Jackal (*Canis aureus* L.) This is a species which although present in the mountain is still not listed in the database and reports of the game breeding station and the hunting units. This is due to the fact that the jackal is not a well known species to them and thus not hunted intensively. During our field work we had found several footprints, all of them along the river beds (mainly along Mlatchka and Bistritza rivers). No jackal tracks were recorded elsewhere. Based on our findings we had concluded, that this species enter the mountain following the course of rivers. In March 2003 we had registered a jackal footprint along Bistritza river, near the mine „Ruen“ on the altitude of 1200 m. This is not typical for the vertical distribution of the species in the country. Yet, jackal presence had been registered on the same altitude also in the National park of Risnjak in Croatia in March 2003 (ZLATANOVA, D. – *pers. comm.*). This speaks for a good plasticity of this predator on the Balkans in the sense of its vertical distribution . It is probably due to the competition with the wolf and the fox.

Red fox (*Vulpes vulpes* L.) We had found numerous tracks, in all kinds of biotopes and analyzed many scats, which proved that this species abundant and common for Osogovo mountain as it is for the whole country. Being a very adaptive, the fox could seriously affect the efforts of the game breeding station and the hunting units to breed and release for hunting purposes pheasants and other fowl species, as also could harm the sporadic appearance of the capercaillie (*Tetrao urogallus* L.) registered by us in the mountain.

Stone marten (*Martes foina* Erx.) We had found numerous footprints and scats, which as with the fox speaks for the species abundance.

During our study we had also found two interesting cases of fox / stone marten scats laid on pellets left by birds of prey, demonstrating their food competition: first, at the foot of Tchoveka peak and second, on the road between Bistritza river and the galleries of mine „Ruen“. We had also found scat marking left from stone marten and fox on the same place, as display of indirect competitive behaviour, most probably due to the common food resource.

Wild Cat (*Felis silvestris* Sch.) We had found tracks along Mlatchka river, as also observed directly one animal. We collected information for damages caused by a wild cat on domestic fowl in Karakashka mahala (hamlet). The wild cat is most probably one of the reasons for capercaillie extinction in the past. Currently, the influence of this species on the game birds and small mammals cannot be identified as there is scarce data about its distribution and numbers in the mountain. More profound research on its distribution and prey spectrum is needed, to evaluate its role in the mountain. This is specially required for the feasibility phase for the contemporary and future fowl breeding and releasing activities of the game breeding station and the hunting units.

Badger (*Meles meles* L.) We had found footprints and den entrances along and around forest roads leading to the hunting stands around the peak Tcherni vrah. The role of the badger in the mountain is not clear as it is little known about the biology and interspecific relations of this species in Bulgaria as a whole.

Red deer (*Cervus elaphus* L.) Initially it was considered that this species does not exist in the mountain or is rather rare. During the current study we had found footprints of a female red deer in the locality of Tzarnotrav; young male footprints in the area of mine „Ruen“ (the valley of river Bistritza) as well as male and female footprints along the path from mountain hostel „Prophilactorium Tri buki“ to Mlatchka river. We supposed that their appearance was due to the existence of game breeding station and fence in the Macedonian part of Osogovo through which the animals have probably come from. In the past this area and especially the Osogovo Mountain had been famous with high valuable trophies of red deer, roe deer and wild boar. This prove that the mountain had and still has suitable habitats for those kinds of game. However nowadays limiting factors exists like the replacement of mountain meadows with blueberry, blackberry and other plants necessary for the sustain of the large numbers of species, with vast areas of *Juniperus*.

Wild boar (*Sus scrofa* L.) We had concluded, based on variety of direct observations and track and signs found that the species is numerous in this mountain, especially along the rivers Mlatchka, Tzarna and Eleshnitza. The wild boar is common and abundant in Osogovo due to good food base and species high breeding potential, preserved during the last decade. In order improve the age structure of the herds it is necessary to reduce the hunting of this species. The existence of elite matured individuals increases the growth of the population and trophy values.

Roe deer (*Capreolus capreolus* L.) Only 15 years ago the population density of the roe deer throughout Osogovo mountain has been very high. The forest guards then had observed as many as 15 individuals in a heard. Nowadays there are no longer high quality habitats for the species, mainly due to the reduced selective cuttings. The planted games fields during the last years had positively but slowly influenced the growth of the population. Roe deer still could be observed mainly on the level of *Juniperus* areas, where it becomes easy prey for the wolf. The analyses of wolf's scats confirm that the roe deer consists 63.9% of their food.

Hare (*Lepus europeus* P.) We had found numerous tracks and excrements and made few direct observations of hares throughout the forest areas of the mountain, as well as along the paths and ridges, including the highest peak Ruen (2251 m.). The species is common and abundant for the mountain.

Weasel (*Mustela nivalis* L.) We had found footprints and other tracks throughout the forest biotopes around the peak Tcherni vrah.

Otter (*Lutra lutra* L.) We could not make any direct findings for otter presence but had collected information from the local people along Garljansko gorge down in the valley of river Bistritza. They have confirmed observations of otters in the fall of 2002, hunting trout in a small basin near the village of Garljano.

Red squirrel (*Sciurus vulgaris* L.) From May to December 2003 we had made direct observations of several individuals and found footprints in typical forest biotopes along the road between the hostel „Prophilactorium Tri buki“ and Mlatchka river.

Fat Dormouse (*Glis glis* L.) We had found food activity signs left of fat dormice in the basement of abandoned frontier post along the Garljansko gorge (Bistritza river).

Common Dormouse (*Muscardinus avellanarius* L.) In September 2003 we had made one direct observation in proximity to river Tzarna - a nest on a hazel bush (*Corylus avellana*) with the animal inside.

Forest Mice (*Apodemus* sp.) **We had captured six individuals with killing traps placed around hunting stands in the localities Begbunar and Jurushki grobishta.**

Common Pine Vole (*Microtus subterraneus* de S.) Two individuals has been captured with killing traps placed around the hunting stands in the locality Jurushki grobishta.

Snow Vole (*Microtus nivalis* M.) During the field work we had captured one individual with a killing trap placed in the locality Jurushki grobishta. This is the first record for the presence of snow vole in this region.

According to MARKOV (1974) in Osogovo mountain are recorded also: **European Souslik** (*Citellus citellus* L.), listed as rare species; **House Mouse** (*Mus musculus* L.); **Black rat** (*Rattus rattus* L.) and **Brown rat** (*Rattus norvegicus* B.) – the last is mentioned as rare species, which could be found near peoples settlements; **Common Vole** (*Microtus arvalis* P.); **Bank Vole** (*Clethrionomys glareolus* Sch.) and **Lesser Mole-rat** (*Nannospalax leucodon* Nord.).

The influence of the changes in the last decade upon the representatives of *Micromammalia* is understudied or not studied at all.

Undefined signs – There is evidence for the presence of a new predator in the region, namely the **lynx** (*Lynx lynx* L.). During the field work we had observed a wounded cow with fresh symmetrical scars on both sides of the back left from cat-like claws. At that time the cow was accompanied with her one week old calf, which could be the real target of the predator. There is a little probability these scars to be left from a wild cat, as this species won't dare to attack such a big prey. Moreover, there are some records dated back to the beginning of 20th century, for observed lynx attacks on domestic livestock (also a cow) in Bulgaria, done in the same way by „riding“ the prey. The suggestions for lynx presence in Osogovo mountain are also supported by the fact that in March 2003 lynx tracks were found and photographed in Kraishte (Dutsov, A. – *pers. comm.*), some 50 km. from the place of our finding in Osogovo. The settling down of this new predator in the mountain is only a question in time, as there are already suitable habitats and prey base (increasing population of roe deer) and at the same time low level of poaching. The lynx recolonization is also favoured by the fact that being a „new“ and little known species for Bulgaria as a whole and leading a secretive life it could be easily settled before being targeted by humans. More research is needed to collect enough data for the potential presence of this species in the mountain and its influence on the population of the game and other animals.

CONCLUSIONS AND RECCOMENDATIONS

SGBS „Osogovo“ is situated on the Bulgarian boarder with Macedonia and the access to it is possible by two roads only. This provides good opportunity for the forest guards to protect the game very well. The significance of Osogovo Game-Breeding Station established by National Forestry Board is obvious - it ensures protection and undisturbed areas for the game and other species thus leads to the preservation and enrichment of the biodiversity in the mountain. Evaluating the natural particularities of SGBS „Osogovo“ as well preserved area we recommend to the game-breeding station to concentrate mainly on breeding game to disperse it in other game stations and regions of the country rather than providing an open hunting season. To manage the game sustainably for the next 10 year we recommend the use of selective hunting mainly and as exception trophy hunting. To enhance the productivity of the game habitats on the territory of the SGBS „Osogovo“ and the surrounding hunting units, there is a need of enlarging the numbers of the small clear-cut areas (up to 10 ha) and planted game fields as improvement of the food base for the large game.

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Table 1. Status of the game species in SGBS „Osogovo“ between 1999-2003

Year	<i>Roe deer</i>	Wild boar	Hare	Wolf	Red fox
1999	32	29	76	6	20
2000	36	48	86	9	22
2001	46	96	90	6	20
2002	50	90	100	10	25
2003	54	86	125	10	35

Table 2. Status of the game species in the hunting units Lozno, Granitza, Zhilintzi, Ranentzi-Osogovo and Savoiski, bordering SGBS „Osogovo“ for the period 1999-2003

Year	Roe deer	Wild boar	Hare	Wolf *	Red fox *
1999	179	156	760	2	55
2000	190	174	760	2	50
2001	193	181	770	2	52
2002	201	193	780	4	48
2003	212	210	810	4	44

* Shot