



The botanical reservation „Pădurea din Șes” from Orheiul Bistriței (Bistrița-Năsăud, Romania): status and threats

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Abstract. Botanical reservation „Pădurea din Șes” from Orheiul Bistriței, Bistrița-Năsăud county, Romania is listed as one of the protected areas from the county; it has a complex of habitats which provide a proper environment for numerous plant and animal species. The area is especially well known due to the presence of the chess-flower (*Fritillaria meleagris*), which is a protected species. Although the area is classified as botanical reservation, there is a considerable negative impact due to some human activities.

Key Words: environment, bird species, protected area, human impact, oak, habitat.

Introduction. Nine km south-east of Bistrița city (Bistrița-Năsăud county, Romania) lies Orheiul Bistriței plain near Cetate village (47°5'46"N - 24°35'40"E; 47°5'46"N - 24°35'40"E), covering an area of 1500 hectares (Figure 1); this plain is formed at the contact zone between Bistrița hills and Călimani piedmont. The area is crossed by the Budac rivulet and its tributaries, having a sinuous flow, which determined the formation of numerous humid areas. These areas have also formed due to the slow sloping of precipitation, caused by the absence of slopes or very low slopes (Chintăuan et al 2004).

Orheiului plain is characterized by the presence of the crop fields and pastures, the only wooded area being an oak forest which is called „Pădurea din Șes” (in English translation this mean „The Forest in the Plain”), being a protected area (Figure 2), having a surface of 79 ha (<https://povestisasesti.com>; <http://laleauapestrita.w.pw>; <http://apmbn.anpm.ro>; <http://www.bistritza.ro>). This forest dates back to the beginning of the 20th century (Gavriloaie et al 2016). The forest has a rare consistency, the trees representing around 30% from the entire surface of the Orheiului plain and it is a small fragment of an old forest which used to cover the whole surface of the Orheiului plain. So, from a dense forest during the period between the two world wars, it became almost a pasture with trees, due to the abusive or illegal tree cuttings (Rusu et al 2012). Though, we have to mention the fact that some afforestation activities were done in the area: 5000 oak seedlings were planted in 2009 by a group of 200 volunteers (Tășuleasa Social 2011), and other 2000 oak and beech seedlings were planted in 2011 by a group of 116 volunteers (Maximinian 2011).

The biodiversity of the botanical reservation is remarkable due to the existence of various microclimates within (swamps, sunny surfaces in the middle of the forest, shaded surfaces in the wooded part, small humid zones around some small rabbits, and a rivulet). The most remarkable species is chess-flower (*Fritillaria meleagris*) included in Liliaceae family (Figure 3), which can be found only in few other places in Romania: Cordăreni village, Botoșani county; Turda Gorge; Zau de Câmpie, Mureș county; Dănești

village, Gorj county; Oltului meadow; Comana forest, Giurgiu county; Sălajului Valley; "Silver Forest" from Săcărâmb, Hunedoara county; Pogănişului meadow, Timiş county (<http://bramburaprinromania.weebly.com>; <http://bistritaonline.ro>). It is enlisted as protected species by few Romanian regulations (Şerban 2015). It needs wet lands to prosper, its blooming period lasting only 10-14 days in April-May, depending on local weather conditions (<http://laleauapestrita.w.pw/>; <http://www.holland.ro>).

Besides the chess-flower which made the reservation well known, there are many other plant species in the area. The main species are *Quercus robur* and *Quercus petraea* of 60-80 years old (Figure 4), surrounded by *Juncus effusus* and *Juncus conglomeratus* (Chintăuan et al 2004; <http://www.scribub.com>). There is also a dense population of *Rosa canina*. In the present, on the forest substratum there are grassy species which are much more common for pasture, not for forest. Concerning the animals, there are many birds species, and some mammals (Gavriloaie et al 2016).

Only few studies were made in this area: Radulovici (2004) and Gavriloaie et al (2016) focused mainly on bird species, Rusu et al (2012) highlighted some aspects concerning the anthropic impact in the forest. In the present paper we bring new data concerning the biodiversity and also about some threats due to human activities, with few remarks concerning the concerns of the local authorities regarding the preservation of the area.

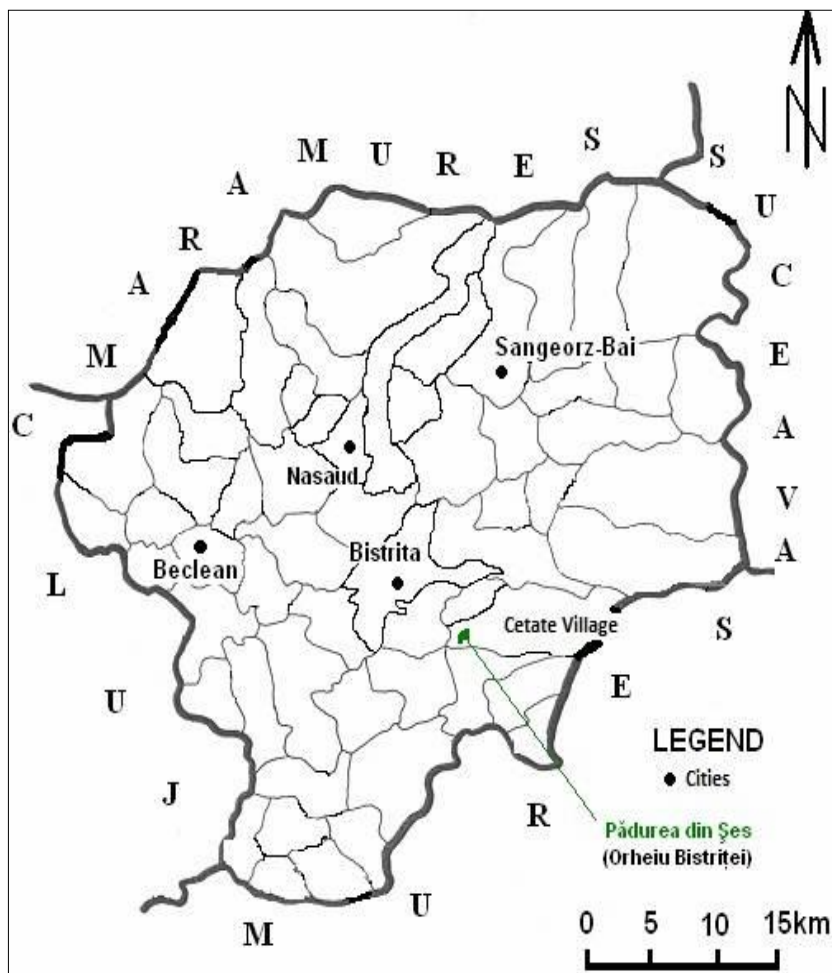


Figure 1. Cetate village, Bistrița-Năsăud county.



Figure 2. The location of Pădurea din Șes area (Google Maps).



Figure 3. Specimens of *Fritillaria meleagris* in Pădurea din Șes.



Figure 4. Pădurea din Șes (*Quercus robur* and *Quercus petraea*).

Material and Method. We have made several trips in the area, starting from April 2012 to September 2016, excepting the periods between October and March each year. We have used the direct observation on the field, a small digital camera (Technika SH-Z625 6MP) for taking photos and a field guide for birds (Bărbulescu et al 1980). We focused on the faunistic aspects, so, the research does not comprise the populational densities of observed organisms, both plants and animals. We also made some observations regarding the human activities and their impact on the area.

Results and Discussion

The biodiversity within the area. As we have also mentioned, the forest consists of two tree species only, *Quercus robur* and *Quercus petraea*, with few other plant species: *Juncus effusus*, *Juncus conglomeratus* and *Rosa canina*. There are many grassy species as well, the most important being *F. meleagris*. This plant is the reason for the Pădurea din Șes area is classified as protected area.

Due to the presence of relatively old trees (oaks), there are many places for nesting and feeding, hence the presence of various bird species. We were able to spot 16 bird species in 12 families and 6 orders (Table 1). In a previous study there were observed 20 bird species (Radulovici 2004).

Table 1

Bird species observed in „Pădurea de la Șes” (Orheiul Bistriței)

<i>Order</i>	<i>Family</i>	<i>Species</i>
Ciconiiformes	Ardeidae	<i>Ardea cinerea</i>
	Ciconiidae	<i>Ciconia ciconia</i> * <i>Ciconia nigra</i>
Galliformes	Phasianidae	<i>Phasianus colchicus</i>
Columbiformes	Columbidae	<i>Columba palumbus</i>
Falconiformes	Accipitridae	<i>Accipiter sp.</i>
	Falconidae	<i>Falco sp.</i>
Cuculiformes	Cuculidae	<i>Cuculus canorus</i>
Passeriformes	Turdidae	<i>Turdus merula</i>
	Laniidae	<i>Lanius collurio</i>
	Paridae	<i>Parus major</i>
	Sturnidae	<i>Sturnus vulgaris</i>
	Corvidae	<i>Corvus corax</i> <i>Corvus frugilegus</i> <i>Corvus cornix</i> <i>Pica pica</i>

* The first report in Bistrița-Năsăud county.

Concerning the black stork (*Ciconia nigra*) it was observed on June 2013, being the first observation in our county (and the single one so far) (Figure 5). We suppose it was only transiting the area, because we spotted it only once and we were not able to find any nest around the area. The species lives on continental climate, especially in large muddy forests, crossed by rivers, rivulets, lakes and humid meadows. Occasionally it also feeds on lakes borders and river shores, on floodable lands and wild humid pastures. It nests on high trees, in old and wide forests near swamps and humid areas (<http://www.dunare-oltenita.ro/html/lap/ro/specii-protejate>).



Figure 5. The black stork (*Ciconia nigra*) close to the forest, which is on the left side (the forest is not visible in the photos).

Some bird species were more common than others, the following species being observed every time we went in the area: *Phasianus colchicus*, *Columba palumbus*, *Accipiter* sp., *Falco* sp., *Turdus merula*, *Sturnus vulgaris*, *Corvus frugilegus* and *Pica pica*.

We have also observed the presence of some small mammals as the European hedgehog (*Erinaceus europaeus*) (Figure 6), the red squirrel (*Sciurus vulgaris*) and some other small rodents. The red fox (*Vulpes vulpes*) also searches for food inside the wood. A villager has told us about the presence of wolves (*Canis lupus*) near the forest during the winter. This is not an unexpected fact, because the area is very close to Călimani mountains. The villagers also speak about the presence, from time to time, of the European roe deer (*Capreolus capreolus*) within the wood, or more often, at the edge of the wood.



Figure 6. The European hedgehog (*Erinaceus europaeus*) in Pădurea din Șes.

Human activities. Although Pădurea din Șes is a natural botanical reservation, there is a quite increased anthropic impact in the area. Thus, in the forest were abusive and illegal tree cuttings, especially after 1990. Nowadays the cuttings are very rare though (Rusu et al 2012). Especially in summer, we observed sheep flocks and cattle herds grazing within the forest, degrading the soil and destroying the chess flower bulbs (Figure 7). Inside the forest we often observed ash and burnt woods, plastic wastes, used cans (Figure 8). Right after the flowering period of chess-flower, there is an so-called artistic manifestation named „Festivalul lalelei peștrite” („Chess-flower festival”) (Rusu et al 2012; Sara 2015; Gavrioloaie et al 2016; <http://laleauapeștrita.w.pw/>), when hundreds of

cars are parked on the grass, even inside the protected area, many horses graze on the forest soil (Figure 9); there are also dozens of booths and terraces where food and drinks are sold, right near the protected area (Figure 10) (Rusu et al 2012; Gavrioloaie et al 2016). In 2011, the local town hall of Cetate village received a penalty of 1,000 RON from the county environmental protection authority (www.gardademediubn.ro) for disturbing the protected area during the „Chess-flower festival”. This is a good thing, but the amount of the penalty was very small though. Since then, there was no much publicity related with the so-called cultural event „Chess-flower festival”, but it took place each year anyway.



Figure 7. Cattles grazing inside Pădurea din Șes area.



Figure 8. Burnt woods and wastes inside the protected area.



Figure 9. Horses grazing in the forest during the „Chess-flower festival”.



Figure 10. Booths and terraces on the grass inside the protected area.

Overall, the animals inside the area (especially the birds) are not directly affected by all these anthropic actions, with the exception of the high level of noise during the manifestation called „Chess-flower Festival”. Due to the tree cuttings some nesting and hiding places disappeared in the past, but in the present days the tree cutting stopped. But the main threat is upon the *F. meleagris* species, its bulbs being heavily damaged during the festival. Also some visitors simply pick up hundreds of specimens during the flowering season, thus reducing its population from one year to another.

We think there is a need for a fence around the protected area, so the cattles, horses, sheep flocks will not be able to enter the area anymore. A positive aspect is that the local authorities set up a barrier at the entrance of the area so the cars cannot enter on the protected zone. The local authorities should be much more involved in the area, taking some real protection measures and applying penalties when needed for all those who do not take into consideration the status of the area as a protected one.

Conclusions. The biodiversity of the botanical reservation is remarkable, though the protected surface is quite small. There are many birds and mammal species, along with plant species, mainly oaks and grassy species. The most important one is *Fritillaria meleagris*, which is the reason for the protected area status of Pădurea din Șes. There is a quite increased anthropic impact in the area, but the forest is still a stable zone. An increased involvement of the local authorities in taking real protection measures of the area is highly needed.

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