

The Northern Goşmani Mountains (Romania): An Important Herpetofaunal Area requiring urgent protection

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Abstract. Identifying areas in which protected and threatened species occur represents the first step in establishing a proper management plan. The aim of the present paper is to present our preliminary observations on the herpetofauna and its habitats from the Northern Goşmani Mountains together with arguments in favor of urgently designating it an official and legal strictly protected area. In the target area we have identified 12 species of amphibians (*Salamandra salamandra*, *Triturus cristatus*, *Lissotriton vulgaris*, *Lissotriton montandoni*, *Mesotriton alpestris*, *Bombina variegata*, *Bufo bufo*, *Bufo viridis*, *Rana dalmatina*, *Rana temporaria*, *Pelophylax ridibundus* and *Pelophylax kl. esculentus*) and 6 species of reptiles (*Anguis fragilis*, *Lacerta agilis*, *Lacerta viridis*, *Zootoca vivipara*, *Natrix natrix* and *Vipera berus*). Since all these species are protected by the national and European legislation, we strongly recommend that they be urgently protected.

Key Words: Conservation, reptiles, amphibians, Carpathian Mountains.

Identifying areas in which protected and threatened species occur represents the first step in establishing a proper management plan. In Romania, numerous papers have been published on the distribution of the herpetofauna (e.g. Fuhn 1960, Fuhn & Vancea 1961, Cogalniceanu 2000, Iftime 2005, Covaciu-Marcov et al. 2006, Strugariu et al. 2008, Gherghel et al. 2008). However, very few of these studies have clearly identified areas which require protection measures for their amphibian and reptile populations. The first proposal for a protected area specifically for the herpetofauna was made by Fuhn (1964, 1974). Iftime (2005) and Torok (1999) have also proposed the protection of some areas in their publications but they only cited the locations and did not make a proper documentation for the respective areas. Strugariu et al. (2007) published a paper in which 6 sites from Suceava county are designated as Important Herpetofaunal Areas and the protection of those areas for the amphibian and reptile species is proposed, following their long-term assessment. Another publication, by Strugariu & Gherghel (2008), identifies 2 further Important Herpetofaunal Areas from the lower Prut river basin, establishing thus the basis for future protected areas.

Identifying Important Herpetofaunal Areas is very important. This, together with a thorough documentation establish the background for designating new protected areas, both of a national interest as well as of community interest through the Natura 2000 network. Thus, the aim of the present

paper is to present our preliminary observations on the herpetofauna and its habitats from the Northern Goşmani Mountains together with arguments in favor of urgently designating it an official and legal strictly protected area.

Our study was carried out between the years 2004 and 2008 and was focused on the northern area of the Goşmani Mountains (Fig. 1). This is an area located south of the Piatra Neamţ town, covered by large forests and forest openings and by a dense hydrographical network. We used the transects method (Cogalniceanu 1997), each transect being searched several times per year in order to identify as many species of fauna and flora.

In the Northern Goşmani Mountains we have identified 12 species of amphibians (*Salamandra salamandra*, *Triturus cristatus*, *Lissotriton vulgaris*, *Lissotriton montandoni*, *Mesotriton alpestris*, *Bombina variegata*, *Bufo bufo*, *Bufo viridis*, *Rana dalmatina*, *Rana temporaria*, *Pelophylax ridibundus* and *Pelophylax kl. esculentus*) and 6 species of reptiles (*Anguis fragilis*, *Lacerta agilis*, *Lacerta viridis*, *Zootoca vivipara*, *Natrix natrix* and *Vipera berus*). All the identified species are protected by the national (OUG 57/2007) and European (Bern Convention, Habitats Directive 92/43 EEC).

From the amphibian species, in the study area, the most abundant species are *Lissotriton montandoni*, *Lissotriton vulgaris* and *Bombina variegata* (Gherghel et al. *in prep.*). These species have been observed in almost every pond investigated and, in some cases, hundreds of individuals could have

been observed in a single small-sized pond. Other very abundant amphibian species in the area are *Triturus cristatus*, *Mesotriton alpestris*, *Rana temporaria*, *Salamandra salamandra* and *Bufo bufo*. *Rana dalmatina*, *Bufo biridis* and the *Pelophylax* complex are also present but are less abundant, their

presence in the area being restricted to several streams, the Bâta Doamnei dam-lake and the northern part of the area, towards the town of Piatra Neamț (Ghiurcă et al. 2005, Gherghel et al. 2008).

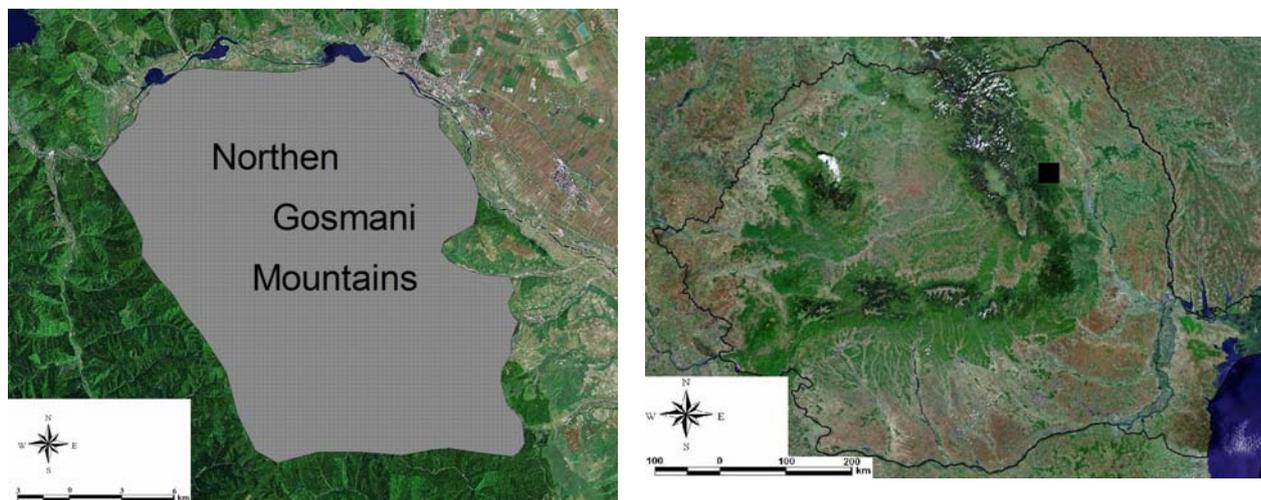


Figure 1. Location of studied area

The most abundant reptile species is *Lacerta agilis* with population numbers of hundreds of individuals in the forest openings and forest skirts from the studied area (Gherghel et al. *in prep.*). Other species, such as *Anguis fragilis*, *Zootoca vivipara*, *Lacerta viridis*, *Vipera berus* and *Natrix natrix* are also present in the area (Ghiurcă et al. 2005, Gherghel et al. 2008).

Our target area is covered by vast forests, dominated by mixed coniferous and deciduous forests. The dominant species is *Fagus sylvatica*, in combination with *Picea abies*, *Pinus sylvestris* and *Abies alba* (Ciocârlan 2000).

The wetland habitats from the area are of a great importance, representing amphibian breeding habitats. These are represented by temporary and permanent ponds which are present both inside the forested areas as well as in the open areas. These habitats have a rich floristic composition, comprising of species such as: *Alisma plantago-aquatica*, *Caltha palustris*, *Carex appropinquata*, *C. acutiformis*, *C. caryophylla*, *C. digitata*, *C. distans*, *C. divulsa*, *C. hirta*, *C. humilis*, *C. ovalis*, *C. michelii*, *C. pairaei*, *C. pendula*, *C. pilosa*, *C. praecox*, *C. remota*, *C. riparia*, *C. sylvatica*, *C. tomentosa*, *C. vulparia*, *Lysimachia nummularia*, *Cladophora* sp., *Epilobium* sp., *Galium palustre*, *Juncus thomasi*, *Juncus* sp., *Lythrum salicaria*, *Lycopus europaeus*, *Mentha aquatica*, *M. x*

verticillata, *M. longifolia*, *M. pulegium*, *Pedicularis palustris*, *Phragmites australis*, *Spyrogira* sp., *Veronica anagalis-aquatica*, *V. beccabunga*, *Typha angustifolia*, *T. Latifolia* (Mititelu et al. 1986, Ciocârlan 2000).

From these plant species, *Gymnodenia conopsea*, *Hepatica transsilvanica*, *Lythrum salicaria*, *Lycopus europaeus*, *Mentha x verticillata*, *Nigritella rubra*, *Epilobium* sp. Have now been identified for the first time in the area. Other protected and endemic plant species which can be found in the area are *Arnica montana* and *Hieracium pojoritense* (Pricop, unpublished data).

As a conclusion, we can say that the Northern Gosmani Mountains represent an area of special interest for the herpetofauna through the presence of several species of community interest which are strictly protected at a national level which are present in the area in a very high abundance. This is especially important in the case of *Lissotriton montandoni*, and endemic species of the Carpathian basin.

The presence of the hybrids between *L. montandoni* and *L. vulgaris* also make the area a very important one from a scientific perspective, being a natural landscape in which several aspects concerning the phylogeny and speciation of the two species could be studied.



Figure 2. *Lissotriton montandoni* in a pond



Figure 3. *Bombina variegata* in amplexus



Figure 4. An endemic plant species for Romania from our studied area, *Hepatica transsilvanica*



Figure 5. Typical pasture from the target area: habitat of *Zootoca vivipara*, *Lacerta agilis* and *Lacerta viridis*



Figure 6. The anthropogenic impact of deforestation in the area

The diverse flora described in the literature and in the present study includes species which are endemic to the research area and is another strong argument for the necessity of its protection.

The isolation of the area and its location, in an unpolluted area, impose the adoption of several urgent protection measures. These measures must be well documented and based on thorough studies with regard to the evolution of the fauna and of the modifications of the biotopes from adjacent areas. Also, other anthropogenic interventions (clear cutting, making forest roads) can lead to the demise of the local herpetofauna populations by destroying numerous, especially breeding, habitats (Gherghel & Ile 2006).

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- ***** Directiva Consiliului European 92/43 EEC, referitoare la conservarea habitatelor naturale și a florei și faunei salbatice adoptată la 21 mai 1992. Anexa nr. 4: Specii de animale și plante de interes comunitar care necesită o protecție strictă. (in Romanian)
- ***** OUG nr. 57 din 20/06/2007, privind regimul ariilor naturale protejate, conservarea habitatelor naturale, a florei și faunei sălbatice, Anexa Nr. 4A, Specii de Interes Comunitar. Specii de animale și de plante care necesită o protecție strictă. (in Romanian)