

## Interspecific relationships within Romania's protected areas. Case study: the cohabitation *Homo sapiens sapiens* - *Ursus arctos arctos*, in Harghita Mountains

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### Abstract

The official assessments of the European Commission tell that Carpathian brown bear is a vulnerable species. The man-bear relationship must take into account three aspects of the bears' behavior: feeding, protection and aggressiveness. The aim of the study is to analyze the typology of the relation between *Ursus arctos arctos* and *Homo sapiens sapiens* within the protected areas in the Harghita County (the Eastern Carpathians). The research methodology was the following: surveying the literature dealing with brown bear's ecology and ethology; undertaking field research; running questionnaires; monitoring the online environment. The results show that the shrinkage of the brown bear's habitat is directly proportional with forest shrinkage. The typology of the man-bear relationships includes **commensalism, food competition and individual intolerance**.

### Keywords

*Homo sapiens sapiens*, *Ursus arctos arctos*, Carpathian brown bear, relationships

### Introduction

Unlike the wild species, which compete for food and habitat under the influence of natural laws, which in their turn regulate the inputs and outputs of the ecosystems, the contemporary man may be considered today the most numerous mammal species on Earth, having the largest biogeographical area. Practically, *Homo sapiens sapiens* is the only species of the animal kingdom capable of surviving and perpetuating, through cultural adjustments, in various environments (RICHERSON et al. 1996). Maker of artefacts and having consumerist behavior, man succeeded to unbalance the food chain by hindering particular species (like the brown bear) in finding the necessary food exclusively on the territory of their natural habitat. The direct effect of this dysfunctionality lies in the conflict situations arising more and more often between the two species, namely *Homo sapiens sapiens* and *Ursus arctos arctos*. The amplitude of these conflicts is directly proportional with the extension of the human habitat to the detriment of the one belonging to the bear. The dense human settlements may jeopardize the wild fauna, not necessarily directly, but through the human pressure exerted in different forms on the habitats, leading to topographic, hydrological and soil artificialization (<http://marinebio.org/oceans/conservation/moyle/ch1/>).

This attitude might have its origin in the *Homo sapiens sapiens*, 'armed' with a number of artificial means by which he fights against his competitors, produces his subsistence means by extracting the natural resources from the environment. This represents an insurmountable ecological barrier for the large mammals, which try to regain their lost habitat. In the mountain habitats of Romania, one of the biggest losers of this conflict is the Carpathian brown bear (*Ursus arctos arctos*). The species *Ursus arctos arctos* L. has become, over the last decade, a real country brand, confirmed, among others, by the numerous (eco)touristic promotion sites in Romania. According to the official assessments of the European Commission, the Carpathian brown bear is a vulnerable species, because of the continuous degradation of its habitat following the socio-economic development of Romania (LINNELL et al., 2008). The studies on the ecology, ethology and conflict situations between men and bears have drawn the attention of domestic and foreign researchers, especially because the brown bear (*Ursus arctos arctos* – the Eurasian species) has been included on the Red List of IUCN as a species threatened with extinction (<http://www.iucnredlist.org/details/41688/0>). At present, the European biogeographical area of the species is very fragmented, and the most numerous specimens (according to the Red List of IUCN, 2016) are spread on the Romania's territory, specifically in the Carpathians, where the number of brown bears is estimated at about 6,000 (of the approximately 8,100 encountered in Europe). The encouraging factors for this specie, are the extension (for how long?!) of forested areas (SALVATORI et al. 2002; ROZYLOWICZ et al. 2011), some of them having a high degree of naturalness. According to the official data, in selected counties (e.g. Vrancea and Harghita), where the number of hunted bears is very high, the population increase (on paper) has been in some cases even 50%, i.e. four times higher than elsewhere in Europe or North America ([http://www.ccmesi.ro/?page\\_id=1643](http://www.ccmesi.ro/?page_id=1643)).

In the man-bear relationship, one has to take into account the three sides of the bear's behavior: feeding, defense and aggressiveness. **The study area** is centered on the alignment of community interest defined by Nature 2000, for the Harghita Mountains (the Central Division of the Eastern Carpathians), namely Piatra Șoimilor (natural reserve on the administrative territory of Băile Tușnad, covered by mixed forest vegetation broadleaf and coniferous trees, as well as grasslands with high floristic biodiversity; Lacul Sf. Ana (geological, flora and fauna reserve lying in the Ciomatu massif, Harghita County) and Tinovul [peat-bog] Mohoș (or the Mossy Lake), which is a flora and fauna reserve, situated in the Cozmeni commune, Harghita County (Fig. 1). According to the statistical data, provided by Environmental Protection Agency (APM) Harghita, the county's forests shelter between 900 and 1000 bears.

The aim of the study is to answer the following research question:

What are the types of relationships between *Ursus arctos arctos* and *Homo sapiens sapiens* in the protected areas found in Harghita County?

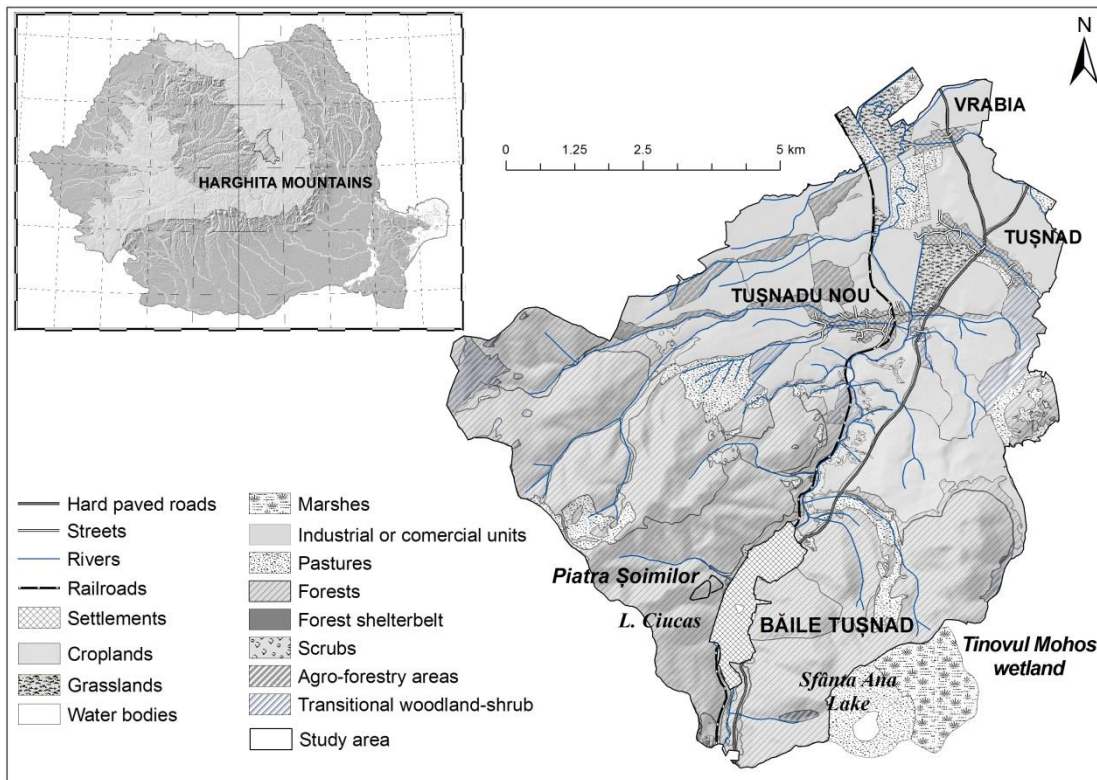


Figure 1: The study area

## Research methodology

The research methodology was based on the following: reviewing the previous studies concerning the ecological and ethological features of the Carpathian brown bear; direct observations in the field, made by the authors in July 2016, in the natural reserves Piatra Șoimilor, Lacul Sfânta Ana and Tinovul Mohoș; indirect observations, made with cameras, which caught the presence of the bears in the built-up area of Băile Tușnad spa resort (lying next to the Piatra Șoimilor reserve); the survey method, specifically the semi-structured interview, applied in the Băile Tușnad spa resort; monitoring the online environment, by searching the keywords 'bears', 'bear', 'Romanian bears', and *Ursus arctos*, in order to highlight the level of interest on this subject; defining the man-bear interspecific relationships and gathering testimonials about man-bear conflict situations, occurring in the investigated territory.

## Results and discussion

The shrinkage of the brown bear's habitat is directly proportional to the reduction of forest areas and the extension of human habitat. This environmental transformation has produced a paradigm change concerning the man-bear relationships, which has inevitably led to a conflict situation with negative effects for both species.

Under the circumstances, the relationships are the following:

1. **Competition for food and habitat.** This type of competition is harsher in the buffer area between the artificialized habitat of the human communities and the natural habitat of the brown bear, given that the first one is on the increase. The competition for food and habitat puts pressure on both species, as man competes for wild berries and shows individual intolerance, while bears are predators and come for food in the people's households.
2. **Commensalism.** The diminishing of the habitat's resources corroborated with the foul smell exhaled by the food scraps produced by human communities have turned the brown bear into a commensal, which at the same time can be an unannounced enemy. For the people in the area, this embarrassing and stressful situation is a good reason for securing the urban and rural habitats at all costs (Fig. 2). The feeding behavior is accompanied by exploratory habits, consisting in analyzing all the information that might lead to food sources.
3. **Individual intolerance relationships.** The bears spotted in the people's households can be aggressed or even killed by the property owners. Man-bear conflicts cannot be attributed to particular people or particular bears. PĂRĂU , 2006, has identified six professional categories that are prone to have problems with the bears. These are the following: animal breeders (39.8%), people living in the rural environment, having no permanent occupation (14.9%), forestry specialists (13.4%), hunters (7.3%), and beaters (6.7%), as well as fruit, mushroom and wood gatherers (6.1%). In theory, the main method for mitigating the interspecific conflict situations is the preventive management, because reactive management is less efficient. At present, in Romania the pyramid is reversed, as reactive management is still the main action tool (Pop, 2011). The previously mentioned relationships, which have developed on such a long time, may lead to behavioral changes both in man and bears. Thus, after repeated contacts with man and after enough positive experiences, the bear may learn to accept human presence (Fig. 3). Under the circumstances, the bear gradually becomes accustomed to human presence, being able to anticipate people's reactions (DOLSON, 2010).



2.1. commensalism



2.2. predation



2.3. Passive defense of human being

Figure 2: Interspecific relationships (Băile Tușnad)  
Source: Adrian Tișcovschi, 2016



Figure 3: Unusual encounter in the Lacul Sfânta Ana natural reserve  
Source: <http://www.ziuanews.ro/stiri/ursii-de-la-lacul-sf-nta-ana-turistii-se-pun-n-pericol-de-moarte-471838>. Accessed 17.03.2017

The level of interest of the local communities on this topic; testimonials about man-bear conflicts, in the study area.

The discussions that we had with the representatives of the local community in Băile Tușnad in the summer of 2016 led to the following conclusions regarding the man-bear cohabitation: in the warm season, especially during the night, the bears 'storm' the garbage sites in the spa resort in search for supplementary food, which gradually changes their feeding behavior, turning them into 'scavenger bears'; the bears also appear frequently in the perimeter of the mineral springs (Sfânta Ana Alley), which represent tourist attractions ; over the past 8-10 years, people have also noticed (usually in summer, at dusk) mother bears with cubs, behaving aggressively towards people.

The wandering bears create panic among the local population, compelling the people to stay indoors after dark. Every year, the residents blame the bears for the damage they have caused to their households and for the animal loss; for this reason, the Town Hall of the Băile Tuşnad spa resort decided to replace the classical garbage containers, made of plastic, with secure ones, inaccessible for the animals (Fig. 2, right side). Searching the online environment by using keywords like 'bears', 'bear', 'Romanian bears' and *Ursus arctos* allowed us to have access to an impressive number of sites, which proves that the level of interest of the human communities for the 'bear' phenomenon is high, although the points of view are different. The above-mentioned keywords returned the following results: 'bears' – 101,000 links, 'bear' - 1,630,000 links; 'Romanian bear' – 13,200,000 links.

## Conclusion

The interspecific man-bear relationships are still in the attention of the Romanian researchers, because of the tensions that seem to persist in the study area and generally, in similar mountain territories. Even though frustrating for the time being for both species, the man-bear cohabitation within the study area will certainly continue for a long time. Therefore, by a wise management of conflict situations, it is possible that on a medium and long term *Homo sapiens sapiens* and *Ursus arctos arctos* will be able to build a relationship based on tolerance.

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