Managing human-bear conflicts in Brașov and Harghita counties, Romania

Gînscă Camelia, Stoica Beatricia, Neruja L. Mirabela

Faculty of Environmental Science and Engineering, Babeș-Bolyai University, Cluj-Napoca, Romania. Corresponding author: C. Gînscă, camelia.ginsca@stud.ubbcluj.ro

Abstract. In the last decades, interactions between people and bears have become common due to population growth. Many anthropic activities are damaging the natural habitat of bears. These large carnivores look for non-natural food (garbage) and, thus, they are present more and more often around people. In its search for food, the brown bear (*Ursus arctos*) encounters residents from counties located in the Romanian Carpathians, for example, Brașov and Harghita. Such circumstances can lead to human-bear conflicts. The main reasons are certain human practices (the use of supplementary feeding points, tourism bear watching, inadequate waste storage) that change the typical behavior of bears. The main objective of this paper is to draw attention to a critical environmental issue in Romania: the need to protect the brown bear population, judged as an issue of animal welfare. The study advances that the Romanian authorities should consider the best management actions to improve coexistence and mitigate conflicts. It is recommended to apply proactive measures instead of reactive ones, because they offer long-term solutions to prevent future clashes.
Key Words: bear-resistant containers, brown bear, proactive measures, Romania.

Introduction. For thousands of years, humans have co-existed with predators, whereas in recent decades, the conflicts among them have escalated (Woodroffe 2000). Socio-economic and political aspects are the main reasons for human-predators conflicts. Thus, the clashes between the two parties come up mainly due to the competition for shared resources, such as land, livestock, crops, and prey animals, and also because of the massive growth in the human population and the spread of their activities (Graham et al 2005). Because of this, the environment has been severely affected by anthropic factors and has become uninhabitable or at least unfriendly to many wild species. Dramatic environmental changes make large carnivores, for example the brown bear (*Ursus arctos*), vulnerable to the growing human population (Woodroffe 2000). According to the Habitats Directive (Annex IV) (1992), the brown bear is "a species of community interest in need of strict protection". The species accounts for 6000 individuals in Romania (Stăncioiu et al 2019) and the most numerous bear-populated counties are Harghita, Covasna, Vrancea and Brașov (Domokos & Kecskés 2005).

The present paper is based on a group of students' (from Babeș-Bolyai University, Faculty of Environmental Science and Engineering, Romania) initiative to launch a petition to the European Parliament. The petition was titled "The Brown Bear does not live in the hamlet" (entitled originally in Romanian: "Ursul Brun nu stă-n cătun!") to the European Parliament (EP). Practically, the petition should have raised awareness of the negative consequences of people's habit of feeding the brown bear.

Every petition must meet some requirements to be in line with the EU procedure. One of them states that the authors should ignore sensitive subjects already brought before the EU Court of Justice. Thus, the EP cannot conclude if there are certain disputes for which the European Commission (EC) has initiated the infringement procedure against a European Union Member State. On 12 February 2020, the EC has sent a letter of formal notice to Romania, commencing the infringement procedure against Romania. The decision was based on the failure to evaluate the anthropic impact on sensitive habitats before giving authorization for logging, as mentioned in The Habitats Directive (Council

Directive 92/43/EEC 1992). Moreover, irresponsible deforestation resulted in the loss of strictly protected forests, which were part of Natura 2000 sites (February infringements package: key decisions, 2020). Considering this requisite, it was safer that the petition could not mention The Habitats Directive, as a result of a serious accusation of illegal logging – an activity that accelerates the destruction of the forest, the natural home of the brown bear. Therefore, in bringing this project to life, the legislative focal point was article 13 from The Treaty on the Functioning of the European Union (TFEU). Article 13 states that all activities occurring on European land are obliged to "pay full regard to the welfare requirements of animals". The petition gravitates around the topic of "nuisance" bears and their altering behavior. Also, some possible solutions are advanced to better protect the brown bear and its habitat. Consequently, the main objective of this paper is to draw attention to a critical environmental issue in Romania: the need to protect the brown bear population, valued as an issue of animal welfare. The argumentation was based on desk research.

The Frame of Debate. In Romania, the brown bear population has varied over time due to anthropic activities (e.g., deforestation, hunting) and habitat fragmentation (Straka et al 2012). The bear population located in the forests of the Carpathians has increased from about 1000 to 6000 individuals in the last 50 years (Linnell et al 2008). The optimum number is considered 4000, but recent estimations show that the population consists of around 6000 bears (Ministry of Agriculture, Forestry and Rural Development & Ministry of Environment and Water Management 2005; Kaczensky et al 2012). However, according to data analyzed by researchers (Pop 2012; Popescu et al 2017), the brown bear population is overestimated.

As estimated by the studies carried out by the National Institute for Research and Development in Forestry "Marin Drăcea" (INCDS/ICAS 2018), at the Laboratory of Management and Biology of Venison (a financed project by PIN MATRA), the brown bear needs a territory of at least 50-270 km^2 (5000-27000 ha) in the Carpathians. This area is divided in two regions: a temporary zone and one for reproduction. In the Brașov-Valea Prahovei area, the density of bears is between 50-60 specimens 10000 ha^{-1} of habitat. The zones populated by such large carnivores represent 70% of all forests in the Carpathians Mountains. The studies made by INCDS show that the distribution of the Brown Bear has been constant in the last few years. Compared with other countries (Italy, Austria, France - Pyrenees Mountains), the distribution range favors the reproduction of the species (Ionescu et al 2013).

In Romania, the increase of anthropogenic activities with negative effects on the environment (agriculture, water pollution, deforestation, overgrazing) and the human population growth are the main reasons why carnivores and their prey have been gradually excluded from more and more habitats (Manea et al 2018). Based on a study conducted by INCDS/ICAS (National Institute for Research and Development in Forestry "Marin Drăcea"), within the "LIFE FOR BEAR" project (INCDS 2018), the territorial expansion of anthropogenic factors in the area of Brașov–Prahova Valley creates conflicts between the locals and the animals. One of the problems that arise is the competition for food and territory. People pick berries (which is also one of the brown bear's foods), and the carnivores are forced to look for food in people's homes and gardens (Manea et al 2018).

A study conducted in 2000-2015 concluded that most human-bear conflicts in Europe (45%, 131 cases) occurred in Romania (Bombieri et al 2019). The plans and measures taken by local authorities proved to be inefficient, as the number of human-bear interactions in the last decade has increased. The human-bear conflicts represent a significant problem because of the poor management of "nuisance" bears in some counties such as Brașov and Harghita.

In the Brașov area, practices such as the use of observatories (additional feeding points), feeding and photographing bears by tourists, inadequate storage of household waste cause the alteration of the typical behavioral pattern of bears. These methods, when put into practice, are against reducing conflicts because bears have memorized the places where they can easily find food that is of human origin. They are aware of the

presence of man due to human odors that accompany the food (Pop et al 2013). The animals fed by tourists visit the places they have become accustomed to even after the end of the tourist season, because they begin to associate man with the receipt of food, thus endangering the locals in the Harghita area (Manea et al 2018). Thus, the bears have gotten comfortable with the community and its inhabitants, increasing their tolerance for them. The phenomenon has conditioned the intensification of risk (conflict) situations caused by the appearance of bears both in the city of Brașov and in its vicinity (Pop et al 2013).

The greatest risk is posed by bears which have understood that household waste is an accessible food source. Bears have excellent smell, and, therefore, food debris from waste bins can attract them. Under these conditions, bears are extremely dangerous, because the distance between man and bear becomes smaller and smaller, and the bear can attack the person if it thinks he is trying to take its food. Lately, this phenomenon is quite common in the Harghita area, threatening human safety (Pop et al 2013). To avoid encountering a bear, WWF recommends the use of "anti-bear" waste storage containers, which block the smell and access to food scraps, thus discouraging this behavior (WWF 2019).

A group of researchers (Barrett et al 2014) from the USA published a study about bear-resistant trash cans. Its objective was to test and evaluate bear-proof rubbish containers in two residential communities of Florida. For that purpose, the Florida Fish and Wildlife Conservation Commission (FWC) conducted phone surveys to gauge the efficacy of implementing two types of garbage bins: commercially bear-resistant polycarts and customized residential trash cans. The survey results suggested that fewer bears interacted with garbage in both areas of the study. Therefore, these bear-resistant containers can be considered an effective solution in reducing the conflicts between humans and bears (Barrett et al 2014).

It is essential for garbage containers to be safely sealed to keep out bears and other potential intruders. Bear-resistant containers vary in price and measurements, starting from 100 USD and reaching over 500 USD for enormous dumpster sizes. Buying such bins will ensure the safety of the residents and wild animals' health. Consuming trash from unsecured bins, bears can undergo terrible deaths due to ingesting poisonous substances or having a perforated intestine (Masterson 2006).

Diminishing human-bear conflicts implies two types of methods: proactive, such as education or the use of bear-resistant trash containers, and reactive actions like relocation or euthanasia. While the first type focuses on prevention, the latter highlights the idea of managing problematic individuals. Proactive measures offer long-term solutions in addressing such conflicts because they entail modifying human behavior, which is more accessible than changing the instincts of large carnivores such as the brown bear (Baruch-Mordo et al 2009). Not all bears cause trouble in human communities because some are just used to being around people; this idea can be amplified by educating individuals (Hopkins et al 2010). Practically, the proactive measures prevent future risk situations by simply educating people and using bear-resistant trash bins. In contrast, the reactive measures are based on managing conflicts with techniques such as relocation or euthanasia (Baruch-Mordo et al 2009). In a study conducted by Florida Fish and Wildlife Conservation Commission (FWC), anti-bear garbage containers were proved to be an effective proactive measure, as the number of such large carnivores has decreased in both studied areas (Barrett et al 2014).

The majority of human-bear conflicts do not lead to the death of the victim, but to their injury. The attacks are purely instinctive, with the purpose of defence and prevention, as the animal and its cubs sense the potential peril. One such attack happened to M.D. and his two friends on 14 July 2004. According to him, outside his residential building, on Molidului Street in Brașov, the three men saw a bear with two cubs. The animal ambushed M.D., hitting him in the leg. Consequently, the victim fell on the stairs and suffered severe injuries (hip dislocation and spinal lesions). Afterwards, the bear attacked his friend, I.S., hitting him in the head, while the third person escaped unharmed. The incident did not occur due to the victim's behavior, but because of the

bears that are used to visiting the garbage bins in the Răcădău neighborhood of Brașov for 20 years (Domokos & Kecskés 2005).

Conclusions. In Brașov and Harghita areas, the human-bear relationship gradually deteriorates as locals and tourists behave inadequately. The actions/inactions of the national authorities failed to deliver proper managing solutions. Despite this, some measures would be efficient: using bear-proof containers in areas frequented by bears; banning the use of wildlife observatories; introducing legal penalties for feeding and filming the bears.

Because of the proliferation of the human-bear conflicts, the local authorities from Brașov and Harghita areas should always consider proactive measures instead of reactive ones. Nevertheless, measures must be taken, not only for the safety of human society but also for conserving the brown bear's habitat, a species of Community interest mentioned in The Habitats Directive (Annex IV).

Finally, this study should be valued as an argumentation for a future petition to the European authorities that aimed to highlight several particular environmental problems connected to the brown bear population in Romania.

Acknowledgements. The authors thank Assoc. Prof. Ruxandra Malina Petrescu-Mag, Babeș-Bolyai University, Faculty of Environmental Science and Engineering (Cluj-Napoca), for the constructive comments and advice.

Conflict of Interest. The authors declare that there is no conflict of interest.

References

Barrett M. A., Telesco D. J., Barrett S. E., Widness K. M., Leone E. H., 2014 Testing bear-resistant trash cans in residential areas of Florida. Southeastern Naturalist 13(1):26-39.

Baruch-Mordo S., Breck S. W., Wilson K. R., Broderick J., 2009 A tool box half full: how social science can help solve human–wildlife conflict. Human Dimensions of Wildlife 14(3):219-223.

Bombieri G., Naves J., Penteriani V., Selva N., Fernández-Gil A., López-Bao J. V., Ambarli H., Bautista C., Bespalova T., Bobrov V., Bolshakov V., Bondarchuck S., Camarra J. J., Chiriac S., Ciucci P., Dutsov A., Dykyy I., Fedriani J. M., 2019 Brown bear attacks on humans: a worldwide perspective. Scientific Reports 9(1):8573, 10 p.

Domokos C., Kecskés A., 2005 [Carnivores and humans - is their peaceful cohabitation possible in Romania?]. Milvus Group, 91 p. [In Romanian].

Graham K., Beckerman A. P., Thirgood S., 2005 Human–predator–prey conflicts: ecological correlates, prey losses and patterns of management. Biological Conservation 122(2):159-171.

Hopkins J. B., Herrero S., Shideler R. T., Gunther K. A., Schwartz C. C., Kalinowski S. T., 2010 A proposed lexicon of terms and concepts for human–bear management in North America. Ursus 21(2):154-168.

Ionescu O., Ionescu G., Jurj R., Cazacu C., Adamescu M. C., Cotovelea A., Pasca C., Popa M., Mirea I., Sirbu G., Chiriac S., Pop M., Attilla S., Deju R., 2013 [Synthetic guide for monitoring mammal species of Community interest]. Silvica Publishing House, 237 p. [In Romanian].

Kaczensky P., Chapron G., Von Arx M., Huber D., Andrén H., Linnell J., 2012 Status, management and distribution of large carnivores – bear, lynx, wolf & wolverine – in Europe. Part 2. Prepared for the European Commission, 200 p.

Linnell J., Salvatori V., Boitani L., 2008 Guidelines for population level management plans for large carnivores in Europe. A Large Carnivore Initiative for Europe Report prepared for the European Commission (contract 070501/2005/424162/MAR/B2), 85 p.

Manea G., Tișcovschi A., Vijulie I., Matei E., Cuculici R., Preda M., Cocoș O., 2018 Inter-specific relationships within protected areas of Romania-Case study: the

cohabitation between *Homo sapiens sapiens* and *Ursus arctos arctos* in Harghita Mountains. Journal of Environmental and Tourism Analyses 5(1):5-18.
Masterson L., 2006 Living with bears: A practical guide to bear country. PixyJack Press, 256 p.
Pop I. M., Chiriac S., Bereczky L., Berde L., Sandu R. M., 2013 [Methodology for risk assessment raised by the presence of bears in inhabited areas. Risk Assessment Team (RAT). LIFE08/NAT/RO/000500 - LIFEURSUS, Green Steps, Brașov, 93 p. [In Romanian].
Stăncioiu P. T., Dutcă I., Bălăcescu M. C., Ungurean Ș. V., 2019 Coexistence with bears in Romania: A local community perspective. Sustainability 11(24):7167, 16 p.
Straka M., Paule L., Ionescu O., Štofík J., Adamec M., 2012 Microsatellite diversity and structure of Carpathian brown bears (*Ursus arctos*): consequences of human caused fragmentation. Conservation Genetics 13(1):153-164.
Woodroffe R., 2000 Predators and people: using human densities to interpret declines of large carnivores. Animal Conservation 3(2):165-173.
*** Consolidated Versions of The Treaty on European Union and The Treaty on The Functioning of The European Union, 2012 2012/C 326/01.
*** Council of The European Communities, 1992 Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora.
*** European Commission, 2020 February infringements package: key decisions.
*** INCDS (”Marin Drăcea” National Institute of research and development in silviculture), 2018 [Action plan for conserving the brown bear population in Romania]. Brașov, 82 p. [In Romanian].
*** Ministry of Agriculture, Forestry and Rural Development, Ministry of Environment and Water Management, 2005 [Management and action plan for the bear population in Romania]. Bucharest, 79 p. [In Romanian].
*** Pop I. M., 2012 [Report on the current situation of the brown bear population and management]. For WWF DCP Maramureș. [In Romanian].
*** Popescu V. D., Rozylowicz L., Iosif R., Pop M. I., Miu I. V., 2017 [Incorporating sources of uncertainty in the management and protection of large carnivores in Romania]. Bucharest University, Center for Environmental Research and Conducting Impact Studies (CCMESI). [In Romanian].
*** WWF Romania, 2019 [Recommendations for inhabitants of bear populated areas]. Available at: https://wwf.ro/noutati/blog/recomandari-pentru-locuitorii-zonelor-populate-de-ursi/. Accessed: December, 2020. [In Romanian].

Received: 25 February 2021. Accepted: 04 March 2021. Published online: 17 March 2021.
Authors:
Camelia Gînscă, Faculty of Environmental Science and Engineering, Babeș-Bolyai University, 30 Fântânele Street, 400294 Cluj-Napoca, Romania, European Union, e-mail: camelia.ginsca@stud.ubbcluj.ro
Beatricia Stoica, Faculty of Environmental Science and Engineering, Babeș-Bolyai University, 30 Fântânele Street, 400294 Cluj-Napoca, Romania, European Union, e-mail: beatricia.stoica@stud.ubbcluj.ro
Liliana-Mirabela Neruja, Faculty of Environmental Science and Engineering, Babeș-Bolyai University, 30 Fântânele Street, 400294 Cluj-Napoca, Romania, European Union, e-mail: liliana.neruja@stud.ubbcluj.ro

How to cite this article:
Gînscă C., Stoica B., Neruja L. M., 2021 Managing human-bear conflicts in Brașov and Harghita counties, Romania. AES Bioflux 13(1):21-25.