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STATUS AND CONSERVATION MEASURES OF BROWN BEARS (*URSUS ARCTOS* L.) EASTERN BALKAN POPULATION

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ABSTRACT

The brown bear (*Ursus arctos* L.) is a part of the genetically unique population of the species on the Balkan Peninsula and has key importance for the balance of local ecosystems, which makes the theme about the management of the species exceptionally important. Using overview analysis and meta-analysis to compare data from the public sources and official species monitoring, this work has goal to determine the effectiveness of the measures applied for the protection of the species and to contribute valuable and useful information about the following steps in the management of the brown bear. Accentuation is placed on the Eastern Balkan population, represented in Bulgaria, Greece, and Serbia. Bulgaria is one of the Balkan countries with the strictest and long-term ambitious policy on brown bear management. Despite that, in the last 25 years, there have been no records of a sustained increase in population in the country. Disturbance, poaching, conflicts with humans, segmentation, prejudices, and insufficient awareness, depopulation of populated places, cause a chaotic decrease in the numbers of specimens and are the reason for the appearance of so-called "problem bears". The phenomenon of disturbance of the natural hibernation of female bears by climate change is difficult to control and may be the potential main reason for the extinction of the species in the future, caused by the gradual aging of the population. Future complex measures at the supranational level and permanent campaigns to promote the problems and the ecological significance of brown bears are indicated as recommended.

Key words: *Ursus arctos*, brown bear, species management, Balkan ecosystems.

Introduction

This publication is dedicated to the management of the species *Ursus arctos* Linnaeus, 1758 (brown bear) which represents the Holarctic species in Bulgaria and is one of the most significant representatives of the fauna of the Balkan Peninsula. This species is important for protecting the balance of local ecosystems and is a part of the genetically unique population of the species in this area (Serbezov & Spassov, 2023). Literary data establish that around one third of continental Europe is home of at least one type of large carnivore, with stable or increasing numbers in most cases, according to data of the 21st century (Chapron *et al.* 2014). According to the 2018 species assessment, in EU member countries there are less than ten thousand sexually mature bears. The habitat network of the brown bear on the Balkans is the basis for the cration of Trans European wildlife networks (TEWNs) in the region, as the biggest population of the species inhabit Romania and Bulgaria. Their total population is estimated at 600 – 800 individuals (Frosch *et al.*, 2014; Wordostats, 2025). In the past, brown bears were widespread. However, in the last couple of centuries, the species has dissapeared in a large part of Western and Central Europe. Many of the remaining populations are small and fragmented. According to the "Red Book of the Republic of Bulgaria," the species number in the country has decreased (Golemanski *et al.*, 2015) and its habitat area in the country has significantly shrunk. While in the 19th century in Bulgaria it inhabited all the mountains and the Ludogorie area, today it has

survived only in the Central Stara Planina and the Rila-Rhodope massif. (Zlatanova *et al.*, 2009; Chapron *et al.* 2014; Spiridonov *et al.*, 2015; Lucas *et al.*, 2019; Todorov *et al.*, 2020; Lucas *et al.* 2023; Spassov *et al.*, 2023; Kaczensky *et al.*, 2024; Lucas *et al.*, 2025).

Brown bears are subjected to serious dangers, including loss of habitat, climate change and poaching, therefore the conservation of the species is of critical importance. According to data from the Executive Agency for the Environment (EAE) and species management research, the number of brown bears in Bulgaria is about 450-500 individuals, remaining at these levels since the mid-20th century (Serbezov & Spassov, 2023; Todorov *et al.*, 2020; Lucas *et al.* 2023). If conservation activities are discontinued, it is expected that the population would decrease significantly in a short period (Spassov *et al.*, 2023) with estimated values of 99% (Lucas *et al.*, 2023). Because of these reasons, different protective measures are being adopted, on both national and international level, such as legislative initiatives, restauration of habitats, improvement of social awareness on the topic, etc. These measures include the combined effort of wildlife protection organizations, local communities, government bodies.

Despite that, the population of Brown bears remains endangered. According to Spassov *et al.* (2023), in order to secure its ongoing recovery, the population needs continuous protection. Any assessment of the current conditions for the protection of the species would identify opportunities for their improvement in order to increase the number of brown bears in the region.

Materials and methods

Based on the above, this work analyses monitoring data, compares conservation measures and explores the influence of risk factors and the status of the species in different countries of the region.

Accentuation is placed on the Eastern Balkan population, represented in Bulgaria, Greece, and Serbia. We believe that the present work will contribute to publicizing the problems facing this unique and valuable biological species, as well as to engage a wider range of public attention in solving them. In this article, in the most synthesized form possible, key determinants for the management of the species are identified and visualized in tabular and graphical form. The analysis was carried out according to the methodology of overview analysis and meta-analysis of data mainly for Bulgaria – from the species monitoring, the species protection measures taken by the Ministry of Environment and Water, Environment Executive Agency, National Biodeversity Monitoring System and monitoring of brown bears. Scientific articles were explored, including studies on Bulgaria, the Balkans, and Europe. Major risk factors for the Eastern Balkan brown bear population have been identified. Official data was sought on incidents involving bears in Bulgaria and Serbia in recent years. National plans and strategies for managing the species of the EU, Bulgaria, Serbia, Bosnia and Herzegovina, Croatia, Montenegro, Romania and Greece were compared. Systematized information about the protected zones and priority habitats of brown bears in Bulgaria and Serbia is presented. To finalize, the article provides conclusions in regards to future developments of the conservation of the species.

Results and discussion

1. Brief general information about the species Ursus arctos Linnaeus, 1758

The brown bear, common in Bulgaria (*Ursus arctos* L.), is part of the Balkan population of the species and belongs to the Bear family (Ursidae). According to the official taxonomy, the representatives of the Ursidae family belong to the Suborder Caniformia and include three subfamilies

– Ailuropodinae, Tremarctinae, and Ursinae, distributed in Europe, Asia, and America. The brown bear (*Ursus arctos*) is part of the subfamily Ursinae, genus Ursus, and includes more than 10 subspecies. The global conservation status of the *Ursus arctos* was assessed (2017) as Least Concern (LC) (Huber, 2018). It has been reported that although its range has decreased significantly and it has long been destroyed in North Africa, the species remains widespread in Europe, Asia, and North America and is today one of the most common species of large terrestrial mammals. A global population of approximately 200,000 individuals has been established with a stable trend. The largest numbers of brown bears are found in Russia (120,000), the USA (40-55,000), and Canada (15-25,000) (Kaczensky *et al.*, 2024; Worldostats, 2025). In Europe, excluding Russia, the species is distributed in 22 countries, it includes about 15,000 bears, and is represented by ten subpopulations: Scandinavian, Karelian, Baltic, Carpathian, Dinaric-Pindian, East Balkan, Alpine, Abruzzo, Cantabrian, and Pyrenean (Kaczensky *et al.*, 2024; Spassov *et al.*, 2023; Worldostats, 2025).

Inhabiting a vast area, brown bears differ in appearance, biology, and behavior depending on their adaptation to their specific lifestyles (Yordanov, 2011). Bears on the Balkan Peninsula show peculiarities in their habitus (a set of external signs – height, body mass, fur color, etc.), characterized by a massive body with small, round eyes and ears, a concave muzzle, a pronounced hump on the shoulder, varying fur color from pale brown to almost black and gray. Light, golden individuals are common, predominantly in females. The weight of sexually mature males in Stara Planina ranges from 150 to 250 kg, and that of females – from 90 to 130 kg. (Spassov et al, 2023; Yordanov, 2011; Todorov *et al.*, 2020).

The species is territorial, with individuals living mostly in isolation from other individuals, although it is possible to form small groups to search for food. In such cases, the group follows a strict hierarchy based on age and size. Brown bears have an excellent sense of smell and hearing, but poor eyesight. They are adaptable and their diet is diverse, including both vegetarian (berries, grasses, roots) and meat (small forest inhabitants, fish, carrion) food. Sometimes they also attack ungulate mammals – wild boars and domestic animals, and can carry their prey for a considerable distance. However, this is not a typical way of hunting for them. It is usually associated with insufficient food, and they rarely get used to it. Bears can be attracted near settlements by improperly stored food and waste, domestic animals, and accessible beehives. Females reach sexual maturity at 3–4 years, and males usually mate for the first time at 5–6 years. For the development of the embryos, the mother must hibernate. The pregnancy is about 200 days. The female gives birth once every two to three years, usually two cubs. They raise the cubs for about two years. Newborn cubs have only a 50% survival rate in the first year. They are born blind and hairless, weighing about 200 – 300 grams. If the mother is killed soon after or during birth, the cubs die within 20 minutes (Spiridonov *et al.*, 2015; Spassov *et al.*, 2023; Yordanov, 2011; Botetzagias & Evaggelia, 2018).

2. Balkan brown bear populations and distribution in Bulgaria

The Balkan population of the brown bear is genetically unique and one of the largest in Europe, with representatives in almost all countries of the region (Fig. 1).

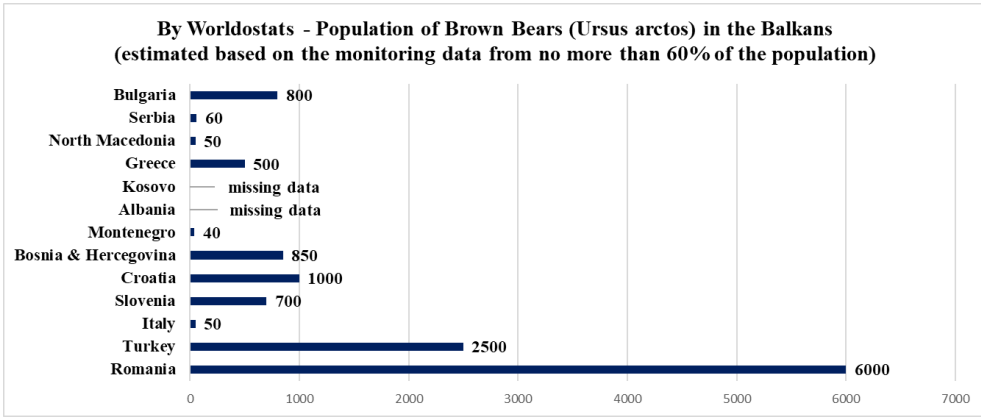

Figure 1: Distribution of the Balkan brown bear (*Ursus arctos*) population by countries in the region, according to Worldostats data (2025)

It is represented by two populations: the Eastern Balkan and the Dinaro-Pdinsk.) A connection between the two populations is assumed (Spassov *et al.*, 2023; Lucas *et al.*, 2019).

The Eastern Balkan population is considered stable, with a total population of approximately 613 individuals (468-665) (Kaczensky *et al.*, 2024). The main part of it is located on the territory of Bulgaria (420 bears) and occupies an area of about 39,000 km2, which is also represented in Greece and Serbia (IUCN, 2025). In Serbia, brown bears inhabit the western part of the country – the Dinaric population; in the east – the Carpathian population, and in the south, they constitute a small part of the Eastern Balkan population. The brown bear population represented in Greece, including the Eastern Balkan population, is fragmented by the many highways – a fact considered to be a risk for brown bears in the country. Bears are found only in remote areas of the Pindos and Rodopi Mountain Ranges, forming two small population nuclei with no spatial communication between them. The Dinaric-Pdinian population is large, represented by approximately 3940 bears, spread over 115,300 km2. Its main part is located in Slovenia, but also includes Croatia, Bosnia and Herzegovina, Montenegro, North Macedonia, Albania, Serbia, Kosovo, and Greece (Serbezov & Spassov, 2023; Psaralexi *et al.*, 2022; Kaczensky *et al.*, 2024; IUCN, 2025).

Since the mid-twentieth century, there have been two populations of brown bears in Bulgaria, incompletely isolated from each other: Rila-Rhodope and Stara Planina. Most of the representatives of the species inhabit the national parks in the Central Balkans, Rila and Pirin mountains, and many nature zones. Single individuals have also been found in the Western Stara Planina and the Fore-Balkans (Serbezov & Spassov, 2023; Spassov *et al.*, 2023). The general trend for the period 2011-2025 is towards a decrease in the population in 2018 and remains at constant levels (about 500 specimens) for the period. A minimum was registered in 2018 (313 individuals), and a maximum in 2013 (523 individuals) (Fig. 2).

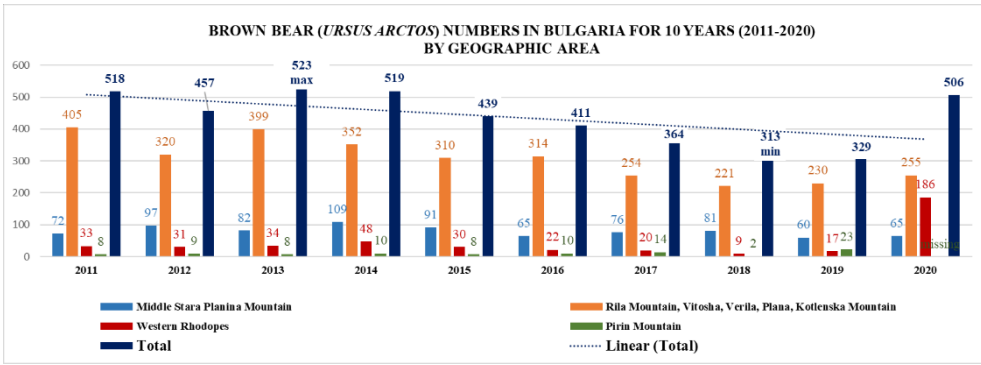

Figure 2: Distribution and abundance of the brown bear (*Ursus arctos*) population on the territory of the Republic of Bulgaria in the period 2011-2020 (according to data from the Executive Environmental Agency (2019) and Serbezov & Spassov (2023)

We did not find similar public data on the brown bear population in Bulgaria after 2020. Their procurement can be ensured by submitting an application to the Ministry of Environment and Water, and in particular to the Executive Agency for the Environment. In any occasion, author's opinions are united in maintaining a steady trend of about 500 to 600 monitored specimens for the period from 2011 to the present (EAE, 2019; Serbezov & Spassov, 2023; Lucas *et al.*, 2023; Lucas *et al.*, 2025; Worldostats, 2025). The data on the number of brown bear population in Bulgaria vary significantly among different authors, both as results of recent censuses and retrospectively. The differences in the reported data are due to the imperfect census methods, which do not exclude the possibility of double-counting of the same specimens (Spassov *et al.*, 2023; Serbezov & Spassov, 2023; EAE, 2025), as well as the impossibility of monitoring to cover 100% of the population (Worldostats, 2025). The current methology used in Bulgaria for the monitoring of brown bears is based on year-round observations and data collection by area by well-trained specialists, staff and hunters or by the tracking of specific bears, as individual bear territories are established by radio telemetry (Gavrilov *et al.*, 2015). There is no established practice for comparing data of neighboring administrative units and districts. Usually, the possibility that the same animals may inhabit neighboring territories is not taken into account. This could lead to the accumulation of significant mistakes. It is accepted that for the management of the bear population it is not necessary to establish the exact number of specimens, much less, as it is practically impossible for it to be properly counted. It is sufficient to follow trends in the population (stable, decreasing or increasing) with scientifically recognized methods allowing statistical processing of the information and comparison of the data (EAE, 2025). However, sources agree on the existence of a downtrend in the number of brown bear specimens in Bulgaria since the beginning of the 20th century, but also of maintaining the number of bears within the same limits after the 1980s (Boev, 2020).

To avoid errors, the most accurate method for determining the number and density of mammals with a hidden lifestyle is the method of randomly capturing a certain number of animals, marking and then recapturing. Nowadays, this method has been refined to genetic monitoring, as it is no longer necessary to capture the animal itself, but to secure a DNA sample. Using the DNA sample, it is possible to determine the individual code, the sex of the animal, to identify new animals and to compare with previously obtained samples of the animal for place and time of collection. Bear DNA is contained in hair follicles and droppings. The method is identical to the one used in forensics to determine the genotype of people and the probability of error is insignificant (about 1

in 1 million) (Frosch *et al.*, 2014; EAE, 2025). In Bulgaria, for the first time in 2025, a procedure was launched to carry out initial genetic monitoring of the brown bear species (*Ursus arctos* Linnaeus, 1758) throughout the territory of its distribution, as well as to establish the size of the population in the country with a deadline of 31.12.2029 (Sandeva, 2025; Spassov *et al.*, 2023).

3. Risk factors affecting the brown bear population and threats to the species

The main risk factor for the brown bear today is identified as human activity, as bears have no natural enemies in the wild. In various sources, the registered threats to the species are listed as several main groups: disturbance, hunting, conflicts (EAE, 2019), environmental, prejudice (Serbezov & Spassov, 2023; Huber *et al.*, 2008; Čurović *et al.*, 2021, Zlatanova *et al.*, 2009; Chapron *et al.* 2014; Spiridonov *et al.*, 2015; Lucas *et al.*, 2019; Todorov *et al.*, 2020; Lucas *et al.* 2023; Spassov *et al.*, 2023; Kaczensky *et al.*, 2024; Lucas *et al.*, 2025), and others (Table 1).

Table 1: Main groups of threats to the brown bear population and risk factors for the species

Risk factor group	*Threat types by group*
Restlessness	logging and other economic activities in bear areas; habitat destruction; deforestation; reduction of natural habitat, unwise or illegal mushroom and fruit picking
Hunting	**legal hunting** and game management - reducing food sources for bears, feeding game near bear habitats; **poaching** - illegal hunting, trading in hunting trophies, poisoning
Conflicts with people – farmers, ranchers, local population	bears approach settlements in search of new territories; improperly storing food and waste (easily accessible food); destroying domestic animals or apiaries due to a lack of security and/or protection of the same; etc.
Ecological	climate change and warming; warm winters and hibernation problems; reduction of natural food for bears during dry summers
Prejudice, Lack of information	ignorance of the characteristics and behavior of the species; fear and misunderstanding on part of the people living near the bear habitats; unintentional poisoning of bears with plant protection products
Other	depopulation of settlements – a reason for bears to come down in search of fruit in deserted orchards

In connection with the breeding season, or when a mother bear chases away her cubs, in search of food or new territories, bears approach and become more visible to people, often entering populated areas. This usually leads to conflicts between people and bears, often with adverse consequences for the latter. The frequent contacts and conflicts of a given bear with people turn it into the so-called "problem bear" depending on the manifestation of some of the following signs, in order of increasing importance (Spassov *et al.*, 2024): systematically approaches populated areas; damages orchards and/or agricultural crops; attacks and kills domestic animals or destroys beehives outside, near to or inside of populated places; makes a false attack on a person (people); assaults a person and causes injury or death; feeds on garbage disposal sites near populated areas; violates the integrity of buildings. Although the anthropogenic impact in Bulgaria is estimated to be relatively low due to the small population size (66 inhabitants/km^2) and the low level of infrastructure (road density of 0.293 km/km^2) (Frosch *et al.*, 2014), according to data of the Ministry of Environment and Water, since 2018, every year in Bulgaria, there are on average 60 cases of conflicts with bears. These cases are the reason why more than 50 permits to shoot problem bears have been issued by the Ministry of Environment and Water and the Ministry of Agriculture and Food since 2008 (only

in the period 2008 – 2018, 37 permits were issued) (Spassov *et al.*, 2024; MEW 1, 2025). Most often, such cases in Bulgaria are registered in the Smolyan region. For example, only in April 2025, in Smolyan region, regional structures of the Ministry of Environment and Water carried out 14 checks for damages, caused by brown bears (MEW 2, 2025). Similar cases have been reported every year, not only in Bulgaria, but also in neighboring countries. Data on some reported incidents with brown bears in the period 2021–2025 in Bulgaria and Serbia are presented in Table 2. The figures presented are far from the actual amount of reported incidents with brown bears in the two countries, but it is evident from the data that the reasons for conflicts with people in both Bulgaria and Serbia, as well as damage caused by bears, are primarily based on food search.

An extremely important risk factor for the species is climate change and the resulting disruptions to the natural life cycle of bears – difficult hibernation in warm winters, scarce food in dry and hot summers. These conditions can also provoke the animals to enter settlements in search of food.

Bears that become accustomed to entering settlements and/or systematically harm people become so-called “problem bears”. Problem bears, however, are often the result of the animals being disturbed in their natural habitats and their way of life being disrupted (Spassov *et al.*, 2023). Such bear behavior can be provoked by unsecured apiaries and orchards, landfills without reliable security, feeding game near settlements, and raising farm animals without security by electric shepherds or trained shepherd dogs.

A serious threat to the brown bear on the Balkan Peninsula for many years has been poaching. An important reason for the decline in the number of bears in the region is the captive breeding of the so-called "dancing bears" – a problem that has now been eradicated. Nowadays, bears with such a past have long been confiscated and placed in specially designated protected areas, or are institutionalized. Poaching, however, remains a current problem, despite the efforts of governments and conservation organizations to limit it. Forms of poaching include the direct destruction or killing of wild animals; the collection of eggs, seeds, or parts of plants and animals; the illegal keeping, breeding, or trading of protected species and the collection of stuffed specimens of them (WA Balkani, 2014). It continues to be practiced for economic (the price of trophies from the skin and skull of bears, but also the price of meat as a delicacy) or other reasons. Every year, bears are reported to be victims of poachers (Engel, 2023). In Bulgaria, by 2009, about 50 bears died for similar reasons per year (Spassov *et al.*, 2023), and in 2023, their number had increased to about 100 (WWF-Bulgaria, 2023).

In Bulgaria, poaching was criminalized in 2011, along with any form of intentional capture or killing of a protected species, including brown bears. In addition to violating the Biodiversity Act, according to the Criminal Code (Article 278d), poaching is also a crime. The legal shooting of a brown bear is permissible for regulating the population in a certain area or for eliminating problem bears, but only under a special regulation by the Minister of Environment and Water. Individual permits for shooting problem bears are issued to licensed hunters after an unsuccessful attempt to relocate the problem bear to a new territory. To reduce the risk of illegal killing of bears, a simplified procedure for compensating injured farmers has been introduced in Bulgaria, which has been applied since 2003 (WWF-Bulgaria, 2023; Council of Europe, 2019).

Table 2: Some cases of incidents with material damage caused by brown bears reported from the Ministries of Environment of both countries – Bulgaria and Serbia in the period 2021–2025

Year / Country			Brown bear incidents - some reported cases (according to unofficial media reports)
Bulgaria	**2021**	03 June	**Chuipetlovo village, Pernik region:** *a young bear destroys beehives at night, residents scare it with a pyrotechnic device*
		13 October	**Lovcha village, Hadzhidimovo municipality:** *female bear with cubs attacks apiaries and orchards*
		10 December	**around Teteven and around Gabrovo:** *a bear destroys domestic chickens as it moves between the two areas*
	2022	16 May	**Chepelare town:** *a bear enters a settlement and attacks the beehives, residents attack it with pirotechnics, after which the bear shows aggression*
	2023	29 May	**Kastel village, Smolyan region:** *bear attacks beehives on a property and is not afraid of the dog inside*
		10 September	**Slaveyno village, Smolyan region:** *bear visits properties, killing a sheep in one of the farms*
		21 September	**Arda village, Smolyan region** *a bear destroys ten calves and eleven sheep*
		15 November	**Glogino village, Smolyan region** *a bear visits a property and kills five sheep*
	2024	26 February	**Mogilitsa village, Smolyan region:** *a bear visits a village and destroys one cow, and also kills four calves in another village nearby*
	2025	06 March	**Trigrad village, Smolyan region:** *a bear attacks and kills a goat*
Serbia	**2021**	23 July	**Rastište village, Tara mountain:** *a bear enters a secured apiary, destroys hives, and eats honey from five of them*
		14 October	**Brusnik village, Golia mountain:** *group of at least two bears destroy a sheep pen and kill two sheep*
		21 October	**Plesin village, Golia mountain:** *a group of bears enters an orchard once again and destroys 56 plum trees*
	2023	21 September	**Zaovina village, Tara mountain:** *bear attacks sheep while grazing once again and kills one animal, and earlier, in August, the same bear destroyed a barn and killed a lamb*
	2024	26 April	**Between Krupnjë, Ljubovija, and Osečina villages, Sokolski mountains:** *two bears attack a barn and kill three sheep, carrying off two lambs*
		20 May	**Between Krupnjë, Ljubovija, and Osečina villages, Sokolski mountains:** *a bear kills sheep in several farms and destroys a barn*
		28 July	**Braneshtsi village, Zlatibor mountain:** *a female bear with two cubs enters the village and kills 5 sheep in a sheepfold*
		23 December	**Village of Ribarichi, Bosilegrad region:** *A bear with cubs attacks a gamekeeper and causes him serious injuries*
	2025	07 April	**Village of Zaguline, Pčina District :** *A bear with cubs attacks a man, inflicting minor injuries*

Poison baiting is also often used as a method for the illegal removal of unwanted wild animals (mainly bears, wolves, jackals). In many cases, people put poison on the animal carcasses (attractants) and place these baits in places accessible to the animals. Poisoning indiscriminately

reduces the population of wild animals and is one of the most difficult problems to solve in Bulgaria, Serbia, Croatia, and other countries in the region. In addition to the target animals, vultures, eagles, crows, and other rare or protected species also fall victim to poisoning. Cases of unintentional poisoning of wild animals with pesticides due to insufficient awareness of farmers are not uncommon (Huber *et al.*, 2008; Čurović *et al.*, 2021; Zubic *et al.*, 2022; Spassov *et al.*, 2023; Engel, 2023). Various forms of illegal killing of brown bears have been cited as a likely reason for the almost unchanged population of the species in Bulgaria over the past 25 years. The expected natural increase of about 200 bears per year in the country is not happening, mainly due to poaching. This disrupts the normal ratio of the number of cubs, young, and adult bears and reduces the chance of resuming and maintaining the population, undoubtedly contributing to the extinction of the species in the wild nature of Europe. Often, the victims of poaching are females raising cubs, which is a prerequisite for the creation of future problem bears (WWF-Bulgaria, 2023).

4. Conservation status of the brown bear (Ursus arctos) in Bulgaria and some of the countries on the Balkan Peninsula

In Bulgaria, according to the Biological Diversity Act, the brown bear is a protected species. The species is included in Appendix 3 of the Act and is marked by „*", which prohibits all forms of intentional capture or killing of specimens by any equipment, means and methods as well as tracking and disturbing the animals, especially during the breeding, rearing, hibernation and migration periods. Violations against the brown bear are also criminalized (effective from 27.05.2011), and the provisions of Art. 278d of the Criminal Code are enforced. Brown bear is also a part of the priority species in Appendix 2 of the Biological Diversity Act, for which priority action plans are developed. According to the Law on Hunting and Game Protection, in Bulgaria, bear hunting is prohibited (since 2010). Exceptions are admissible with a permit issued by the Minister of Agriculture, who is authorized to issue an individual permit for shooting a bear under the condition, that all environmental protection activities for the protection of problem specimens have been exhausted (expulsion, relocation to another habitat and measures for the protection of property, farm, domestic animals, etc. have been implemented). For damage caused by bears, the Ministry of Environment and Water pays compensation in an amount established by a commission appointed by order of the director of the relevant regional forest directorate.

The protected status of the species in Bulgaria is in fulfillment of the commitments undertaken by the country in an international aspect and originating from its membership in the EU. Nowadays the country's policy on wildlife conservation and poaching reduction is consistent and in line with the Rome Strategic Plan 2020–2030 (Council of Europe, 2019) and the wildlife legislation of the European Community requiring protection of the species: the European Habitats Directive (Directive 92/43), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES). The Executive Environmental Agency conducts annual monitoring of the status of the species.

The bear is included in appendix II (Strictly protected fauna species) of the Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention). The goal of the convention is the preservation of wild flora and fauna and their habitats and especially the protection of endangered and vulnerable species. Bulgaria ratified the Convention in 1991 and because of that, it makes a commitment to protect the brown bear and to plan the national policy of the country regarding the management of the species.

In 1992, the brown bear was included in Appendix II of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) for controlled trade with representatives of wild flora and fauna. The same year, Bulgaria ratified CITES.

The accession of Bulgaria to the European Community in 2007. sets serious requirements for legal changes and fulfillment of obligations to comply with European standards. One of the most important recommendations for each European Community country with brown bear populations is to prepare a national bear management plan that complies with Community and local laws. In 2005 started the implementation of a project to fill the gaps in knowledge and management for the protection of the brown bear in Bulgaria. In 2007, a management plan has been prepared with the active participation of all interested groups and supported by critical data on distribution, habitat quality, connectivity and corridors, management practices, human treatment and poaching, etc., collected through active fieldwork and collaboration with forest administrative structures. Because of that, since 2008, Bulgaria has had an action plan for the brown bear, which is periodically updated and upgraded, taking into account monitoring data (Zlatanova *et al.*, 2007; Dutsov *et al.*, 2008; Spassov *et al.*, 2023).

According to EU legislation and especially to the European Council Directive on the conservation of natural habitats and of wild fauna and flora (Directive 92/43), the brown bear is designated as one of the animal species of importance and interest for the Community. The conservation of the species requires the establishment of special protected zones and is in need of strict protection, becoming part of the network of Natura 2000. The trade of bears is regulated, according to Council Regulation (EC) № 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade therein. Since 2000, the Action Plan for the conservation of the Brown Bear (*Ursus arctos*) in Europe has been enforced. The plan is focused on the management of the species throughout Europe, arguing the need for a continental approach and coordinated national efforts.

According to Article 16 of Directive 92/43, Member States may obtain approval to shoot a certain number of bears for various reasons: in the interests of public health and safety; where there are no other options to prevent serious damage to crops, livestock, forests, fisheries, waters; other important reasons of public interest. This rule has been fully implemented in Bulgaria. Similar policies are in place for the brown bear in other countries hosting the Balkan population. In most Balkan countries, bear hunting is permitted but regulated (Table 3).

Table 3: Protection status of the brown bear (*Ursus arctos*) in some countries on the Balkan Peninsula

Country	Measures introduced and the protection status of the species		
	endangered protected	*regulated hunting*	*special conditions*
Bulgaria	Yes	**No, complete ban**	Individual permit for shooting sick, problematic bears
Serbia	Yes	Yes	Individual permit for shooting sick, problematic bears
Croatia	Yes	Yes	Individual permit for shooting sick, problematic bears
Montenegro	Yes	Yes	Individual permit for shooting sick, problematic bears
Romania	Yes	Yes	**Culling quota**
Greece	Yes	**No, complete ban**	Individual permit for shooting sick, problematic bears

In Greece, similar to Bulgaria, the brown bear is fully protected by national legislation. The country's conservation efforts are aimed at reducing the territorial segmentation of the population – one of the main tasks of the ARCTOS Project, established to protect the species. Hunting is completely prohibited (Psaralexi *et al.*, 2022; Botetzagias & Evaggelia, 2018).

In Serbia, the brown bear has a protected status as a potentially endangered species. Hunting is regulated and allowed only in the period from 1 October to 15 May (Zubic *et al.*, 2022).

In Croatia, brown bear hunting is also regulated. It is prohibited from 1 May to 30 September and from 16 December to 1 March, and bear hunting is legal only during the remaining 4.5 months of the year. Outside of the hunting season, only wounded, sick, or problem individuals are allowed to be shot after an individual permit from the Minister of Regional Development, Forests, and Waters. Live capture is allowed for relocation to other hunting territories, as follows: males throughout the year, and females during the period when they are not pregnant, when it is not the breeding season, and if they do not have cubs (Huber, 2008).

Montenegro introduced rules for regulated brown bear hunting in 2008. Female bears with cubs up to two years old are completely prohibited from hunting. Male specimens are allowed for hunting in the short period from 1 October to 30 November. During the rest of the year (ten months), brown bear hunting is prohibited. Emergency shooting of problem and sick animals is subject to a similar regime of individual permission from the competent authority (Čurović *et al.*, 2021).

In line with European legislation, the brown bear is also listed as an endangered species in Romania, although the country is home to 60% of the brown bears in Europe. The Romanian Carpathians are home to around 7,800 (according to the national species assessment from 2023). Trophy hunting is permitted. The country has adopted a measure to regulate the population of the species – a culling quota. After a tragic incident with a tourist fatally attacked by a bear in the Carpathians in July 2024, the Romanian Parliament approved an increased preventive quota (to cull 220 bears per year) with the authorization to cull another 962 bears in the following years (EC CINEA, 2021; WWF – Romania, 2024).

5. Other measures for the protection of the brown bear population in the Balkans. Protected territories and zones

To limit the negative impact of human activity on the population of the brown bear (*Ursus arctos*), priority sites and habitats of the species in Bulgaria have been declared as protected areas (in the sense of the Protected Areas and Territories Act and the Biological Diversity Act). These include: Rila National Park (since 1992); Central Balkan National Park (since 1991); Pirin National Park (since 1996); Rila Monastery Nature Park; Bulgarka Nature Park (since 2002); Vitosha Nature Park (since 1934) (Serbezov & Spassov, 2023). In 2000, in a joint project between the Brigitte Bardot Foundation and the Four Paws organization, the Belitsa Bear Park was established with the status of a protected, specialized territory for housing bears that have suffered from human intervention. These are confiscated dancing bears or bears bred in captivity under unfavorable conditions. In addition to 25 registered "dancing bears" from Bulgaria, the park houses three bears from Serbia, and one from Albania.

Protected areas of the Balkan brown bear population have also been established in other countries in the region (Kaczensky *et al.*, 2024; Paunović & Ćirović, 2006). In Serbia, such areas are: Kopaonik National Park (since 1981); Tara National Park (since 1981); Stara Planina Nature Park (since 1997); Golia Nature Park (since 2001); Zlatibor Nature Park (since 2017); and Shar-planina

National Park (since 1993). The Uvac Special Nature Reserve (since 1995) and the Yerma Special Nature Reserve also have a protected status.

The "Pristina Bear Park" in Kosovo, established in 2013 under a project by the "Four Paws" organization, also has a similar status and functions to the Belitsa Bear Park. The park aims to provide a safe and suitable environment for the so-called "restaurant bears" in Kosovo, who were kept in small, dilapidated cages next to restaurants as an attraction to attract customers. The park is also home to some of the bears rescued from Albania.

Conclusion and recommendations

1. The comparative analysis shows that in the countries of the Balkan Peninsula, on whose territory the Eastern Balkan population of the brown bear (*Ursus arctos* L.) is located, significant measures have been taken to protect and conserve the species. Bulgaria is among the countries with the strictest protection measures.
2. In the territories of Bulgaria and Serbia, a significant number of priority sites and habitats of the brown bear have been declared protected areas, which undoubtedly has a huge positive impact on the conservation of the species' population in the region.
3. Although Bulgaria has demonstrated a long-term, strict targeted policy for the conservation of the brown bear on its territory, no sustained increase in the population has been recorded in the last 25 years. The most likely reason for this is the illegal direct and indirect destruction of brown bears through poaching, poisoning, deforestation, disturbance, and disturbance of the animals' natural habitat.
4. Poaching and poisoning are particularly risky for the species. They cause a chaotic decline in the number of specimens and create prerequisites for the emergence of "problem bears" with all the resulting negative consequences – both for bears and for people.
5. The data on the violation of the natural hibernation regime of female bears can be identified as a potential main reason for the extinction of the species over time. Based on the violations in the natural reproduction, the reduction of cubs and young bears, and the gradual aging of the population. This phenomenon, considered a consequence of climate change with the appearance of warm winters and dry hot summers, is difficult to control.

There is a significant amount of information about the brown bear in general and in particular, on the Balkan Peninsula, while there is a lack of data on targeted comprehensive measures taken for monitoring and control of the brown bear population at a supranational regional level. Given the established similar policies of the individual countries in the region regarding the protection of the brown bear population, initiatives on such measures are advisable and an expected strong positive effect for the species. We assume that the active promotion of the issues of wild flora and fauna, and in particular the brown bear, in the conditions of increasingly intensified urbanization and climate change, would contribute to the reduction of incidents with the animals. Such events with a target group of kids and young people would have a lasting strategic effect.

References

1. Boev Z., (2020). *Past distribution of Ursus arctos in Bulgaria: fossil and subfossil records (Carnivora: Ursidae)*. Lynx, 51: 5–18.
2. Botetzagias I. & K. Evaggelia, (2018). *Bear management in Greece as a 'problem orientation' policy issue: A Q-methodology approach*, Aegean Journal of Environmental Science: 3: 1–36.

3. Chapron G., P. Kaczensky, J. DC Linnell *et al.*, (2014). *Recovery of large carnivores in Europe's modern human-dominated landscapes.* Science 346, 1517 (2014), DOI: 10.1126/science.1257553
4. Council of Europe, (1982). *Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention)*. Bern 19.IX.1979, 21979A0919(01), OJ L 38, 10.2.1982, p. 3–32.
5. Council of Europe, (2019). *Rome Strategic Plan 2020-2030: Eradicating Illegal Killing, Taking and Trade in Wild Birds in Europe and the Mediterranean region.* CCEWH Standing Committee.
6. Čurović M., M. Janković, M. Ćabak *et al.*, (2021). *Plan gazdovanja mrkim medvjedom (Ursus arctos L.) u Crnoj gori (Nacrt).* Savjet za izradu Planova gazdovanja za mrkog medvjeda i vuka u Crnoj Gori, MPŠV: 324-9/19-3, Podgorica.
7. Dutsov A. *et al.*, (2008). *Action Plan for the Brown Bear in Bulgaria*. Ministry of Environment and Water, Sofia.
8. EAE, (2019). *Assessment of the number of brown bears (Ursus arctos) in Bulgaria for the period 2011–2019.* Ministry of Environment and Water, Executive Agency for the Environment, National Report on the State and Protection of the Environment.
9. EAE, (2025). *Brown Bear Monitoring according to the National Biodiversity Monitoring System (NBMS) and the Brown Bear Action Plan.* Ministry of Environment and Water, Executive Agency for the Environment (accessed 12 June 2025).
10. EC CINEA, (2021). *Conservation of Brown Bear (Ursus arctos) population in Romania*. CINEA LIFE Programme, LIFE Public Database (accessed 14 April 2025).
11. EC EEC, (1992), *Council Directive 92/43/EEC of 21 May 1992 on the conservation of natural habitats and of wild fauna and flora, 31992L0043*. OJ L 206, 22.7.1992, p. 7–50.
12. Engel, K. (2023). *Uncovering the Invisible: Successes and Challenges for Wildlife Crime Prosecution in Europe: EU Summ. Rep*. Successful Wildlife Crime Prosecution in Europe, WWF.
13. EU, (2015). *Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES, 1973), 22015A0319(01).* OJ L 75, 19.3.2015, p. 4–15.
14. Frosch Ch., A. Dutsov, D. Zlatanova, K. Valchev, E. Reiners, K. Steyer, M. Pfenninger & C. Nowak, (2014). *Noninvasive genetic assessment of brown bear population structure in Bulgarian mountain regions.* Mammalian Biology 79 (4): 268–276.
15. Gavrilov G., D. Zlatanova, V. Spasova, K. Valchev & A. Dutsov, (2015). *Home Range and Habitat Use of Brown Bear in Bulgaria: The First Data Based on GPS-Telemetry*. Acta Zoologica Bulgarica, 67 (4): 493–499.
16. Golemanski V. *et al.* (ed.), (2015). *Red Book of the Republic of Bulgaria. Volume 2. Animals*. Bulgarian Academy of Science & Ministry of Environment and Water, Sofia.
17. Huber D., Z. Jakšić, A. Frković *et al.*, (2008). *Brown Bear Management Plan in the Republic of Croatia.* MRDFW, Directorate for Hunting & MC, Directorate for Nature Protection, Zagreb.
18. Huber, D. (2018). *Ursus arctos (Europe assessment) (errata version published in 2019).* The IUCN Red List of Threatened Species 2018: eT41688A144339998 (accessed 11 April 2025).
19. IUCN, (2025). *Brown bear (Ursus arctos) – UICN RED LIST of threatened species™*. The International Union for Conservation of Nature (IUCN).
20. Kaczensky, P., Ranc, N., Hatlauf, J., Payne, J.C. *et al.*, (2024). *Large carnivore distribution maps and population updates 2017 – 2022/23*. Report to the European Commission
21. Lucas P., J. Albrecht, M. De Barba *et al.*, (2019). *Direct and indirect impacts of climate change and land use change over biodiversity: a case of study with the brown bear in Europe*. CroRIS, 9th Biennial Conference of the International Biogeography Society, Málaga, Spain: 96–97.

22. Lucas P., W. Thuiller, L. Talluto *et al.*, (2025). *Trophic Interactions Are Key to Understanding the Effects of Global Change on the Distribution and Functional Role of the Brown Bear*. Global Change Biology 31 (6): e70252, https://doi.org/10.1111/gcb.70252.

23. Lucas P., W. Thuiller, M. Talluto *et al.*, (2023). *Including biotic interactions in species distribution models improves the understanding of species niche: a case of study with the brown bear in Europe*. BioRxiv, Posted March 12, 2023, doi: https://doi.org/10.1101/2023.03.10.532098.

24. MEW 1, (2025). *Ministry of Environment and Water works to reduce the conditions for bear-human conflict*. official website of the Ministry of Environment and Water, press center (accessed 12 June, 2025).

25. MEW 2, (2025). *Ministry of Environment and Water Monthly report on the control activity of the Regional Inspectorate for Environment and Water - April, official website of the Ministry of Environment and Water, control activity.* (accessed 12 June, 2025).

26. National Assembly, (1968). *Penal Code*, Promulgated in the *State Gazette* No. 26 of 2 April 1968, in force from 01.05.1968, last amended in the State Gazette No. 42 of 14 May 2024.

27. National Assembly, (2000). *Hunting and Game Conservation Act*, Promulgated in the *State Gazette* No. 78 of 26 September 2000, last amended in the State Gazette No. 102 of 8 December 2023.

28. National Assembly, (2002). *Biodiversity Act*, Promulgated by the *State Gazette* No. 77 of 9 August 2002, amended by the State Gazette No. 102 of 8 December 2023, last amended by the State Gazette No. 70 of 20 August 2024.

29. Paunović M., D. Ćirović, (2006). *Viability increase and recovery of brown bear population in northeastern Serbia – a feasibility study*. Faculty of Biology, University of Belgrade & Ministry of Science and Environment Protection of Republic of Serbia.

30. Psaralexi M., M. Lazarina, Y. Mertzanis, D. Michaelidou, S. Sgardelis, (2022). *Exploring 15 years of brown bear (Ursus arctos)-vehicle collisions in northwestern Greece*. Nature Conservation 47: 105–119, DOI: 10.3897/natureconservation.47.71348.

31. Sandeva T., (2025). *With 1.6 million BGN the population of the brown bear species will be monitored.* EU Funds. Everything about European projects in one place, Environment and Climate (accessed 12 June, 2025).

32. Serbezov R., N. Spassov, (2023). *Status and Numbers of the Brown Bear (Ursus arctos L.) in Bulgaria.* Animals (Basel) 13(8):1412, doi: 10.3390/ani13081412.

33. Spassov N., R. Serbezov, A. Dutsov, K. Georgiev, B. Mihova, A. Ignatov, (2023). *Action Plan for the Conservation of Brown Bears (Ursus arctos Linnaeus, 1758) in Bulgaria 2024–2033.* MEW, Four Paws Foundation, MAF, ECF, ERDF, Sofia.

34. Spassov N., R. Serbezov, A. Dutsov, K. Georgiev, B. Mihova, A. Ignatov, (2024). *Updated National Action Plan for the Brown Bear Species (Ursus arctos Linnaeus, 1758*) 2022 – 2032. MEW, Four Paws Foundation, Sofia.

35. Todorov Vl., D. Zlatanova, K. Valchinkova, (2020). *Home range, mobility and hibernation of brown bears (Ursus Arctos, Ursidae) in areas with supplementary feeding*. Nature Conservation Research 5 (4): 1–15.

36. WA Balkani, (2014). *Poaching, project ""We are not alone on the rocks"*. Wildlife Association Balkani, https://balkani.org/skali/ (accessed 13 April, 2025).

37. Worldostats, (2025), *Brown Bear Population by Country – 2025 Biodiversity Stats*. https://worldostats.com/country-stats/brown-bear-population-by-country/ (accessed 11 April 2025)

38. WWF Bulgaria, (2023). *Is the population increasing, and are there other important issues affecting bears in Bulgaria?* Bear damage - causes, precautions, compensation, World Wildlife Fund, Bulgaria (accessed 11 April, 2025).

39. WWF Romania, (2024). *Romania's Bear Dilemma: A Call for Thoughtful Management*. Not Panic (accessed 11 April 2025).

40. Yordanov K., (2011). *Family Bears (Ursidae).* Science BG, Biology.

41. Zlatanova D., A. Dutsov, K. Valchev, P. Genov & M. Voeten, (2008). *Bulgarian Brown bear management plan - process of creation, necessary level of knowledge and challenges*. Special issues of Macedonian Ecological Society, Vol. 8, Skopje: 235–241.

42. Zlatanova D., Racheva V. & Fremuth W, (2009), *Habitatverbund für den Braunbären in Bulgarien - Grundlage für die Schaffung Transeuropäischer Wildtiernetze (TEWN) auf dem Balkan*. Naturschutz und Landschaftsplanung 41, (4): 114–122.

43. Zubić G., B. Marković, D. Mrđenović *et al.*, (2022). *Draft management plan for brown bears (Ursus arctos L.) in the Republic of Srpska.* Ministry of Forestry and Maritime Affairs, Center for the Environment, Belgrade.