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## PROBLEMS OF THE PROTECTION OF LARGE CARNIVORES IN THE UKRAINIAN CARPATHIANS

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Field studies and collection of material on the present state of wolf, bear and lynx populations in the Ukrainian Carpathians were conducted during January–August 2001. Fifteen wolf's lairs and twenty-four individual territories of wolf's packs were recorded. Eight individual territories of lynx and fifteen of bear were mapped. Taking into consideration own observations, we consider the number of wolves to be stable on the territory of Lvivska province, even considering permanent hunting. The state of lynx population in Lvivska province is not satisfactory and comprises only 15-20 specimens. Recent studies show the vulnerable state of the bear population, which could disappear within next 5–7 years. It is highly necessary to create new protected areas and provide a long-termed monitoring in order to conserve aborigines populations of lynx and bear.

*Key words:* wolf, lynx, brown bear, number, Ukrainian Carpathians.

The priority of conservation and renewal of the populations of large predator mammals grows during last years in the Europe. The "Pan-European Biological and Landscape Diversity Strategy" (PEBLDS) is directed towards conservation of European biodiversity. The necessity of beneficial and strong partnership with official persons, scientists, governments, international organizations, citizens is generally accepted.

Nearly 2000 specimens of wolf (*Canis lupus* L.) inhabit now the territory of Ukraine. Method of study is trapping. Status is hunting animal. Responsible organization is the Ministry of Environment. From 7 to 800 specimens is killed every year. No special conservational programs [8].

Lynx (*Lynx lynx* L.) was widely distributed in the Europe in the past. The decrease of its number is mainly connected with forest management, agriculture, decrease of feeding habitats and persecution by the human. Lynx more strongly depends from the availability of the territories covered by the forest and from the hunting territories than the

wolf or bear. Therefore, lynx became extinct in those territories of Central and South Europe, where other large predator mammals could survive. Renewal of the forests and increase in number of Cervidae, as well as the species protection gave the chance to lynx to resume already existing populations and create new ones. The lynx survival in Europe is connected with ecological factors to a lesser extent than with the coexistence with the human. Therefore, each protection strategy should include human influence as a prime aspect [6].

Brown bear (*Ursus arctos* L.) was widely distributed on the whole European territory, but later became extinct on the most of its part because of the increase of human influence. The present-day number of brown bear in Europe is about 50000 specimens on the territory of about 2,5 million kilometers. There are several populations of brown bear: two large (more than 5000 specimens), three medium-sized (500–5000 specimens), one small (100–500 specimens) and six very small (less than 100 specimens) populations. Populations in some countries are of great vitality, in other – near extinction.

Conservation and renewal of the population of certain species need to be based on the global approach, which will include consideration of all European large predator mammals (wolf, lynx, and brown bear) and will be directed towards the protection of the whole ecosystem.

Field studies and collection of the materials regarding the present state of the wolf, bear and lynx populations were conducted within the project on the territory of Ukrainian Carpathians (Lvivska, Ivano-Frankivska and Zakarpatska provinces). Prime collection of information was conducted with using questionnaires. In particular, we created special questionnaires on all large predators mammals and distribute them among the hunters, zoologists and employers of the forestry. 364 questionnaires were distributed, while only 31 of them came back with information (8,5%).

The detailed analysis of the questionnaire's data was conducted mainly due to the possibility of double counting of mass aggregation of animals. Accordingly, we made mapping of individual territories of wolf packs and single specimens of brown bear and wolf, their lairs location, places of their records, their signs of life. Questionnaires data were checked in field studies within the territory of Lvivska, Ivano-Frankivska and Zakarpatska provinces. Own field data were recorded in the field-journal and with using of tape-recorder. Signs of life and habitats were photographed.

The database, which includes data about the state of the carpathian populations of large predator mammals, was created. The real state of the populations of large predator mammals within the Carpathians was evaluated and preliminary conclusions were made.

**Wolf (*Canis lupus*)** occurs in all Carpathians. 15 lairs and 24 individual territories of the wolf packs were mapped within the limits of Ukrainian Carpathians: 11 lairs on the territory of Lvivska province, 2 in Zakarpatska, and 1 in Ivano-Frankivska province. Moreover we received information about 3 lairs in Luboml district of the Volynska province. Most of the lairs were found in the mountainous areas of Lvivska province, in particular: six on the territory of Turka district, and four in Skole district. In most cases, the animals in made lairs less accessible for human and well-masked places but nearly the

human settlements. Individual territories of the wolf packs were identified on the base of the following data: presence of a lair, frequent visual contacts with human, frequent attacks on the domestic animals. We noted 16 such territories in Lvivska province, 5 ones in Zakarpatska, and 3 in Ivano-Frankivska province.

Animals were most often noted in Turka and Skole districts of the Lvivska province. Totally wolves were recorded 24 times as single animals or packs. The highest pack with 15 specimens were recorded in Yavoriv district during winter (2001 yr.). In both Ivano-Frankivska and Zakarpatska provinces wolves were noted only four times.

Worth mention about the high number of wolf attacks on the domestic animals. 16 cases were recorded in Lvivska province, and 5 in Zakarpatska. Following animals were killed: 46 dogs, 16 foals, 15 cows, 7 sheep, 1 goat and 1 pig. Only in the Lybokhora village (Skole district, Lvivska province) 33 dogs were killed during the summer period of 2001. Animals were killed near the human settlements during the night. We also recorded wolves' attacks on wild animals: 6 females and one male of deer and one – wild boar. Attacks of wolves being infected by fury on human were recorded in Turka district.

**Lynx (*Lynx lynx*)** inhabit now only three mountainous districts of the Lvivska province, namely Turka, Skole, Stry-Sambir districts. Worth mention about very low number of data on this species. With using questionnaires we received data on only 12 visual observations of this predator: 8 in Lvivska province, 3 in Zakarpatska and one in Ivano-Frankivska. One specimen of lynx was shot near the Turka village (Lvivska province). Single lair was documentally recorded in 1996 near the Korostiv village (Skole district, Lvivska province). Lynx footprints were noted only 12 times during last 10 years: 5 in Lvivska, 5 in Zakarpatska and 2 in Ivano-Frankivska provinces. There is no information about lynx attacks on wild and domestic animals. Only one attack on human was recorded in 1995 near the Krasne village (Skole district, Lvivska province).

Totally we mapped and identified 8 territories of individual lynx specimens: 3 in Lvivska, 3 in Zakarpatska and 2 in Ivano-Frankivska provinces. When identifying the individual territories we took into consideration that fact that the hunting territory of this species in the Carpathians covers 20–30 thousands of hectares. It is necessary to mention that this predator prefer places in Carpathians with low anthropogenous influence (distant valleys, forest massifs along the state frontier and on the boundaries of different provinces). The size of such habitats decreases considerably now. They are the valleys of the Skolivsky Beskydy National Natural Park near the Parashka mountain, some forest massifs of the Turka district, Shypot Reserve, neighborhood of the Osmoloda village (Arshytsa ridge and Ihrovets and Syvula mountains), some territories of the old beech forest of the Carpathian biosphere reserve and Carpathian national natural park.

**Brown bear (*Ursus arctos*)** was noted only in two mountainous districts (Turka and Skole) of Lvivska province. Questionnaires note only four records of the animal by human: one in 2000 near the Kortchyn village (Skole district), the second in 2001 on the boundary between Lvivska and Zakarpatska provinces, the third in the forest massive near the Romanian frontier and the fourth on the territory of Ust-Chornansky forestry of the Zakarpatska province. 12 signs of live were recorded in questionnaires, mostly footprints.

They were found five times in Zakarpatska, four times in Lvivska, and three times in Ivano-Frankivska provinces. Four attacks on animals were recorded, include with attacks on domestic dog and female *Bison bonasus*. We also found four lairs of bear in Lvivska province (three in Turka and one in Scole districts). Fifteen territories of individual specimens were identified and mapped, among them 7 in Lvivska, 6 in Zakarpatska, 2 in Ivano-Frankivska provinces.

When making an analysis of the Carpathian wolf population we should take into consideration rather high index of the daily migration of wolf packs, especially in the summer-autumn period. This causes the problem of the double counting of animal groups. The best way to analyze the number of species is with using individual territories of wolf packs the way of mapping them together with lairs. Wolf lairs are usually located at a distance of no less than 10 kilometers from each other, while the hunting territory comprise about 15000 hectares [5]. Sixteen mapped territories cover only 13 % of total hunting territories of the Lvivska province. The most confident index of the wolf presence and number is the number of hunted specimens.

According to official data of "Lvivlis" (Lviv Forestry Department), 40 specimens were killed in 1999, 46 in 2000, and 10 in 2001. Number of wolves in Lvivska province is stable if consider the official data of "Lvivlis" (Fig. 1). High frequency of wolves' attacks on domestic animals is probably due to the low number of wild animals (*Artiodactyla*) — main feeding habitat of the wolf. Dogs are the easiest prey for wolves, to the contrary with other domesticated animals, which are often under the care of human.

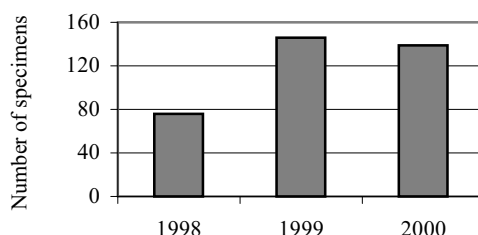


Fig. 1. Wolf number dynamics on the territory of Lvivska province (data of the "Lvivlis" company)

Nevertheless, it is necessary to continue permanent observations on this predator, in order to prepare scientific grounds of ruling the population of this species. It is impossible to make any conclusions about the state of wolf in Zakarpatska and Ivano-Frankivska provinces due to the lack of data. Not only the low number of species can explain small amount of data on lynx, but also by high caution of this animal against the contacts with human. We should note also low fecundity of the species. Lynx give birth to 2–3 offspring per year, which becomes mature on the 3-year of the life. Fecundity rate is 2.1, comparing to value 4 in wolf [1].

When analyzing the number of species we should consider official data of “Lvivlis” and Zakarpatsky provincial Forestry Department. 67 specimens were recorded until 2000 in Lvivska province and 120 specimens were recorded until 01.02.2001 in Zakarpatska province. Small increase of the number of the species in Carpathian region was noted during 1998–2000, according to the official data (Fig. 2).

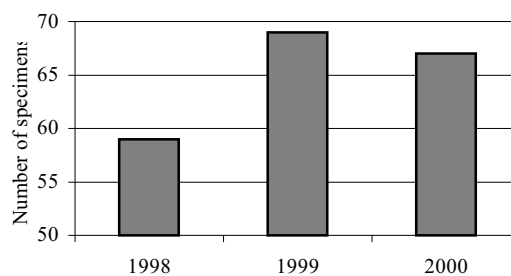


Fig. 2. Lynx number dynamics on the territory of Lvivska province (data of "Lvivlis")

Official data of Forestry Department “Dynamo” gives the number of lynx exactly and always 6 specimens on the boundary of Lvivska and Zakarpatska provinces. Necessary to note the specific “boundary” way in choosing the individual territories by animals, e.g.: location of lairs on the province and state boundaries [3]. Taking into consideration data obtained with using questionnaires and own field observations we consider the official number of lynx too high. We think that the number of lynx in Lvivska province is no more than 15–20 specimens. Thus, it is necessary to increase the protection of this species in the way of creation of reserves along the frontier between Ukraine and Poland or Ukraine and Romania, and in places where the species is recorded permanently. Also, it is really necessary to continue permanent observations of the species, in order to create scientific grounds of protection of the local population of this predator.

Low number of brown bear is mainly conducted with the biological peculiarities of the species. Bear become mature on the 3<sup>rd</sup> or 4<sup>th</sup> year of life. Female usually give birth to 1–3 (rarely 5) offspring per year. The fecundity index is only 1.2 [2].

Until the middle of the XX century the number of brown bear in Carpathians was rather high, however after the Second World War (1939–1945) only few specimens left [7]. 74 specimens were recorded in 1947, 484 in 1950, 800 in 1960, 1000 in 1964, 1236 in 1968. Nearly 1300 bears were recorded in seventieth in Carpathians. Among them 400 adult males, same number of adult females and the rest – young animals with less than 3 year age. Population density was nearly 0.5–0.7 specimens per 1000 hectares of the forest. Licensed hunting was started from sixtieth. 594 bears were noted on the beginning of 90<sup>th</sup> in the Carpathians. Analysis of the state statistic service shows that the number of brown bear in the Carpathians decrease 3.3 times during the period from 70<sup>th</sup> and till 2001, that is 30 specimens per year (Fig. 3).

When the noted tendency will remain the same further, the bear will become extinct in Carpathians during next 10–15 years [4]. Taking into consideration that present number of the bear in Carpathians (about 400 specimens) is 1.5–2.0 times higher according to official data comparing to data obtained with using questionnaires and personal data, the species could become extinct during forthcoming 5–7 years.

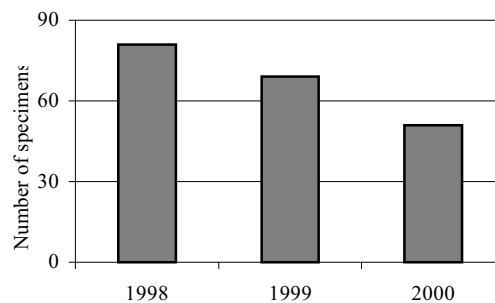


Fig. 3. Brown bear number dynamics on the territory of Lvivska province ("Lvivlis" data)

The main reasons for the changes in number are changes in habitats due to the active human use, rejuvenation of forests and strong recreations loading, hunting and illegal hunting, cattle grazing, high disturbing, decrease of feeding resources, diseases, high youth mortality.

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## ПРОБЛЕМИ ЗБЕРЕЖЕННЯ ВЕЛИКИХ ХИЖИХ ССАВЦІВ В УКРАЇНСЬКИХ КАРПАТАХ

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Протягом січня–серпня 2001 р. проведено експедиційні дослідження та збір матеріалу стосовно сучасного стану популяції вовка, ведмеда і рисі в межах регіону Українських Карпат. Локалізовано 15 вовчих лігв та 24 індивідуальних території вовчих зграй. Закартовано вісім індивідуальних територій рисі та 15 – ведмеда. За власними спостереженнями, чисельність вовка на території Львівської області є стабільною, враховуючи постійний відстріл. Стан популяції рисі в межах Львівщини є незадовільний, вона налічує лише 15–20 особин виду. Дані дослідження свідчать про загрозливий стан популяції ведмеда, яка через п'ять–сім років на даній території може зникнути. Виникає нагальна потреба у створенні транскордонних заповідних територій і проведення постійного моніторингу для збереження аборигенних популяцій рисі та ведмеда.

*Ключові слова:* вовк, рись, ведмідь, чисельність, Українські Карпати.

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