Conservation of Large Carnivores in FR Yugoslavia

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Brown bear, Eurasian lynx and the wolf are three of 102 species of mammals and 20 species of carnivores in FR Yugoslavia. Although activity in nature and mere presence in Yugoslav fauna cannot pass unnoticed, it may be said that they are least studied mammal species.

Distribution of Large Carnivores in FR Yugoslavia

Data on they abundance and distribution in FR Yugoslavia are based on hunting statistics, reports and plans, while research and scientific papers on this species are very rare.

There is a large gap in range of all three species in lowlands and valleys, such as Vojvodina and central part of Serbia known as Šumadija, with valleys of R. Morava and its tributaries, in central and coastal part of Montenegro. These regions do not allow for optimal conditions for large carnivores life, and causes are all anthropogenic in origin, most important being lack of suitable relief, cultivation of soil and high concentration of humans.

Large carnivores distribution maps in FR Yugoslavia were made according to data of Hunting Unions of Serbia, Yugoslavia and Montenegro, voucher specimens kept at Natural History Museum in Belgrade, shot specimens (wolf), literature data, as well as expert estimates (Map 1-3). Darkly shaded surfaces represent areas of higher density, permanent presence and reproduction, while lightly shaded surfaces represent areas where individual specimens were recorded and observed, and/or density in lower.

As is visible from the Maps, ranges of large carnivore species in Yugoslavia are very fragmented. Largest specimen concentrations are recorded in these parts where the range is less fragmented, partly continuous and along the border of neighbouring countries where large carnivores exists in larger number.

In general the distribution range can be descript as less settled forested hilly-mountain areas, where there is extensive livestock farming, where there is pronounced human depopulation process and where there are connections with range parts in other countries.

In Serbian province of Vojvodina only wolf and lynx are present, on a very small area of Deliblatska peščara Sands and Vršačke Planine Mts., which are connected with a very numerous populations in neighbouring Romania. Recently several specimens of wolf were shot in northwestern Vojvodina, and it is assumed that they immigrated from neigh boring Hungary.

LARGE CARNIVORES POPULATION ESTIMATES

Brown Bear

Present population status of bears in FR Yugoslavia can be estimated at about 285 specimens, 125 of which are in Montenegro. The remaining number of about 160 specimens is calculated based on abundance trend in previous years, as data for Kosovo and Metohija are lacking since 1998. Existing data show rapid decrease in population number of brown bear in Yugoslavia. This trend is present in both republics, starting in mid 90-ties.

Eurasian Lynx

The actual status of the lynx in FR Yugoslavia is very complicated, as its range has a disjunctive character, comprised of an autochthonous population of Balkan lynx in the south and southwest and the population with lynx from the Carpathian Mts. in the northeast, north and west of the country.

The population trend of the Balkan lynx in Yugoslavia is regressive. On the other hand, recent data on the lynx population in North-eastern and Eastern Serbia are getting more numerous and point to an increasing population trend. The distribution of the data also implies a rather quick range expansion. Latest records point to the occurrence of lynx in Deliblatska peščara sands, Vojvodina, i.e. South-eastern Banat, which also borders Romania on the east.

There must be pointed the other potential direction of lynx immigration into Serbia - the western way, and the specimens derives from the initial reintroduced specimens in Kočevje, Slovenia. With certain reservation, it may be estimated that the Balkans lynx population is about 30 specimens. The Carpathian population has about 40 specimens. The population in Western Serbia is estimated to be 3-6 specimens.

Population trends in these two main populations are diametrically opposite. Therefore, total present population status in FR Yugoslavia, including specimens from western Serbia, may be estimated on 75 specimens.

Wolf

Present population status in FR Yugoslavia may be estimated at about 1.000 individuals, of which 700-800 are in Serbia and 200-300 in Montenegro. The estimate is done, same as for distribution, based on proof material (shot specimens), hunting statistics, reports and plans, questionnaires and reports of damage on livestock.

HABITAT

Brown bear

It is recorded in FR Yugoslavia in altitudes from 900 to 2600 m a.s.l. (above sea level), that is, in hilly-mountain areas in broadleaf mesophilous forests. It is especially abundant at altitudes between 1000 and 1500 m a.s.l. Habitats are mostly old deciduous or mixed forests of primeval type, where tranquillity rules and where human presence is minimal. Bear is less often recorded in coniferous forests, as it is present usually during migration from lower forest zones to high mountain pastures and shrub, which are rich in suitable food sources.

Presence of trophical base has a significant influence on presence of bears within the area. They are common in areas of summer residences of shepherds and cattle keepers. Change of habitats, including movement to lower altitudes, was noted in summer and autumn period, when families and young individuals usually show more immense dispersion. Then bears are more often found near agricultural areas, orchards and other human-altered areas with easily available trophical base.

Eurasian Lynx

The members of Balkan lynx population are mostly found in hill and mountain regions at altitude range from 550-2.500 m a.s.l. in scarcely populated forest and rocky-forest areas. The Carpathian

lynx population members are mostly found in forest and forest-rocky-hill-mountain areas at altitude range from 100-1.000 m a.s.l (incl. the records in Deliblatska peščara sands). Both populations live often in beech, oak and other deciduous forests, but also in thickets, gorges and rocky terrain. Members of the new lynx population in Western Serbia are found in similar habitats in altitude range from 350-1.200 m a.s.l.

Wolf

In FR Yugoslavia, wolf lives in hilly and hilly-mountain areas. Sometimes, when hunting and during dispersal, it was registered at lower altitudes, lowlands and river valleys. Population in Deliblatska peščara Sands dwells in forest-steppe and steppe habitats at altitudes of 100-200 m a.s.l. It is especially abundant in hills in broadleaf mesophillous forests strewn with glades and meadows with immense but not complete depopulation of humans are present. There should be some summer residences of shepherds and cattle keepers, with flocks of extensively bred livestock, mostly sheep and goats but also cattle.

In Montenegro there is almost no overlapping zone of wolf and jackal *Canis aureus* ranges, and therefore it may be concluded that the wolf, as larger and stronger species, is the limiting factor for jackal distribution. Therefore in Montenegro, jackal occupies southern Mediterranean and sub Mediterranean areas, while wolf occupies northern hilly-mountain continental areas. The overlapping zone is almost linear and records of species outside their range borders are almost nonexistent. This situation is explained by syntopy of these two species in Eastern Serbia, where they are differentiated by altitude (however, here there are many exceptional records).

CONFLICT WITH HUMANS

Public attitudes

Due to relatively hidden way of living those species are relatively poorly known representatives of national fauna, even in areas where they presence is known. Media in Yugoslavia extremely rarely report on population and conservation status and way of life of large carnivores in FR Yugoslavia. This is understandable as there are no absolute data and there was no systematic research on this species. For public, large carnivores are still little known animals, clouded in veil of secrets and unusual circumstances.

In the villages and towns within the range of large carnivores or its border areas, there is a tendency for human population to decline. This tendency may be important for return and/or revitalization of populations of large carnivores.

Threat to humans

In Yugoslavia were registered attacks of mostly female bear on people, when she had cubs. Last case of bear attack in FR Yugoslavia involved a female with a cub on July 14th, 2001, in Dačići village in Rožaje municipality in Montenegro. The attacks of lynx can be stated as unknown. Such cases are extremely rare but play a large role in forming of public opinion. There are no trustworthy data on wolf attacks on people, except those infested with the rabies. Rabid wolves occasionally were present, but its number in comparison with the number of infested foxes, dogs and other carnivores is insignificant.

Damage to livestock and compensation system

The localities where contact with humans happens are those where large carnivores are abundant, and in such cases there may occur a significant damage on crops (bear) and livestock (all three

species, but mostly wolf), leading to further increase of negative attitudes of local people toward the large carnivores. Effective measurements of care and protection of livestock, necessary for coexistence of flocks and the large carnivores, have disappeared long time ago, partly due to economic, social and political changes. Extensively bred livestock is mostly attacked on pastures, although there are cases of attacks on pens and stables. It is a fact that all such objects into which a large carnivore can penetrate are either insufficiently protected or are not protected at all. Utilization of modern methods of care and protection of livestock in hilly-mountain areas is insignificant. Most damage is on smaller livestock (sheep, goats, calves and steers), and few on larger (cows, donkeys and horses). In areas of syntopy of wolf, lynx and jackal and areas where stray and domestic dogs are present, all damage is usually attributed to wolves.

According to data by Hunting Unions, it may be concluded that the compensation system is not effective although damages are estimated. Competence and training of staff estimated damage are often obscure and not well defined. In extremely rare cases when compensation is paid, the amount is very small and in recent times was devalued by inflation. During 80-ies there were a few cases when the regional authorities paid compensation of damaged livestock. Institutions in charge for damage to livestock are hunting departments of Republic Ministries for agriculture, forestry and water resources.

Due to status of unprotected species, there is an intern decision of Hunting Union of Serbia that for wolf specimens shot in areas of hunting societies compensation fees are paid. This practice is going on since the end of 1997, and compensation fees have varied between 10 and 50 EUR (presently they are about 25 EUR). Official reports from hunting societies and skulls are considered proofs.

THREATS

Proposing a status of vulnerable species in FR Yugoslavia is caused by sensitivity of large carnivores on human-caused mortality. On one hand, there is negative altering of living conditions through forest clearing, disturbance and range fragmentation, as indirect human activities. On other hand, there are direct human influences, where the most important is poaching (bear and lynx) followed by bad and inadequate management resulting in insufficient abundance of main prey species, overshooting (wolf), lack of carrying out the legal norms of protection, trapping and road killing (lynx) and poisoning (wolf), lack of knowledge of species' biology and ecology as well as almost complete lack of research. Especially important (negatively) is taking alive bear cubs and wolf pups to present to public in various ways. Indirect factors include political and economic instability in country and its surroundings, that significantly influence carrying out the measurements of management, protection and conservation. Existing abundance data, although they are not based on solid proofs or conducted research but only on estimates, speak enough about status and fate of large carnivores in FR Yugoslavia.

Poaching

According to the official data of Hunting Union of Serbia, 18 specimens of bear were illegally shot in 1996. In last 10 years, (according to a Hunting Union of Montenegro) about 45 bears have been shot, but no data are given which could indicate if this was legal or illegal shooting. The Hunting Union of Montenegro owns data on 13 illegally shot specimens within the period 1990 - 1995. For Serbia, data have not been available for Kosovo since 1998, but is known that poaching was always present there and that it represented a large part of total.

Table 1 presents the scarce data on annual loose and captive bears in FR Yugoslavia. It is obvious that illegal shooting is dominant for a long time, while legal shooting in Yugoslavia is stopped in

recent time as a consequence of intern agreement of hunters within the Hunting Union of Serbia, who noticed decrease of bear population in nature.

Table 1 - Comparative review of kills in different periods of time, and captive brown bears *Ursus arctos* in Serbia, Montenegro and FR Yugoslavia.

Country	Year/Period	Annual poaching*	Annual legal kills*	Number in captivity	Actual protection*
Serbia	1988	?	4	23	CS
	1996	18	0		
	1998	?	0		
Montenegro	1988	?	20	2(?)	CS
	1990-1995	13	-		
	1990-2000	45			

* – Data from Hunting Unions of Serbia and Montenegro
CS – Closed season

The questionnaire given to local people living within lynx range revealed that about 5 specimens are killed illegally each year. This can be considered a total estimate for population in Eastern Serbia, Deliblatska peščara sands and Montenegro, while estimates for Kosovo are unavailable after 1998. As an important part of Balkan population always existed in Kosovo, and as poaching was always done in this province in numbers significant for total area, it is clear why this population is considered extremely threatened.

Shooting

Yearly rate of shooting wolves in Serbia and Montenegro is shown in Table 2. For the period 1954-1979 an average rate is given for both republics. Seasons 1960/61 and 1998 present a significant contrast, but they are however specially picked because of extremely values in both directions.

Table 2 - Annual shooting of wolves *Canis lupus* in FR Yugoslavia in the previous periods.

Region/Country	1954-1979	1960/61	1988
Serbia	152	47	376
Montenegro	65	15	300
FR Yugoslavia	216	62	676

Long-term data on yearly shooting rate were available only from the territory of Serbia. Results for last five years are presented in Table 3. They vary from year to year, but is usually about 150-200 specimens. Shooting in season 1998/99 was indisputably lowest due to war activities throughout the country, while data for 2000/01 are still not complete and do not include data for province of Kosovo and Metohija.

Table 3 - Annual shooting of wolves in Serbia, 1996-2001

Region/Country	1996/97	1997/98	1998/99	1999/00	2000/01
Serbia	173	202	124	256	137

Poisoning

Well known and administered for ages, use of poison (mostly strychnine and cyanide) to reduce number of wolves, was especially common in FR Yugoslavia just after WWII, and most results were yielded in 1960-ties. This method was used until the middle of 1980-ties, when it was officially forbidden. The ban was not erected because of wolves but because it represented a public hazard, as well as danger for other carnivorous and necrophagous species. However, there are still cases of illegal poisoning, although it is nowadays very difficult to get the poison.

Keeping in captivity and showing in public

"Most useful" individuals of bear and wolf for keeping in society are those snatched from the nature at youngest age, when 3-5 months old. Local people who well know habitats, movements and dens of large carnivores do such things. After such illegal acquiring of cubs and pups, they are further illegally distributed to circuses, zoos and estates of individuals or companies. However, most of bear cubs end up at so called “keepers of dancing bears”. These people live by cruel training and public displaying of bears. Smuggling of cubs is an omnipresent situation on borders of Balkan countries that is very rarely sanctioned, and rules of quarantine when transporting animals across borders are never applied.

In Serbia presently there are 23 specimens of bears, while fate of two bears kept in captivity in Montenegro is poorly known. Exact number of wolves in captivity is not known, as there are no data on number of wolves in private property.

LEGISLATION

All three species in Yugoslavia are placed in a category of vulnerable species and they are also on list of species recommended for Red Book of Vertebrates of Serbia. However, in country’s legislation, large carnivores have a quite different legal positions and statuses.

Order on Protection of Natural Rarities of Serbia and Decree on Proclaiming Legal Protection of Rare, Scarce, Endemic and Threatened Plant and Animal Species of Montenegro "…forbid persecution, disturbing, catching or killing …" of rare, scarce, threatened and useful animal species. Unfortunately these Orders do not include brown bear, as it was never included into any of these categories. The wolf is included partially, e.g. in the Serbian province of Vojvodina, while lynx is in both federal units of Yugoslavia placed in category of permanently protected rare species.

While this study is prepared, the changes and improvements of Order on Protection of Natural Rarities in Serbia are in legal procedure. The proposed changes include inclusion of large carnivores on list of protected animal species – natural rarities, with a suggestion that adequate national programs should manage populations of this species.

In Hunting Law of Serbia and Ordinance on Close Season for Game Animals in Serbia, as well as in Hunting Law of Montenegro, the large carnivores also have a quite different legal positions

and statuses. The adult bears are protected by the close season from May 16th to September 30th, while bear cubs throughout the year (in Montenegro female with her cubs up to age of 2 years). Both hunting laws consider lynx a permanently protected game species, and shooting is severely punishable by law. According to the Hunting Law of Serbia wolf is protected by the close season whole year on territory of province of Vojvodina. On the rest territory of FR Yugoslavia the wolf is consider as unprotected game species.

Ministry of agriculture, forestry and water resources, including the opinion of Hunting Unions and Institutes for Protection of Nature of both federal units, determines close season. Shooting is approved by Ministries of agriculture, forestry and water resources on demand of Hunting Societies and/or managers of a hunting area. In special occasions additional shooting is permitted if individual specimens present large activity, that is, cause damages.

The Hunting Law in Serbia since 1976 in Act 6 forbids "…**catching of protected game animals or their keeping in closed or fenced areas**". Act 15 of Hunting Law of Montenegro "…forbids destroying, catching and usurping young of … game animals." Both this orders include bears. Law on Environment Protection of Republic of Serbia, Act 37, forbids "... **to wantonly disrupt, abuse, harm and kill wild animals**." This includes bear and lynx. This also includes destroying game animals through poisoning, which was especially commonplace after WWII, and it is important for the wolf. The existing compensation quotas are going to be changed, as they were devalued by inflation.

In national parks and other protected areas lynxes do not have any special status and they are not under any special regimen. Institutions in charge for hunting and forestry concerning management of large carnivores are Ministries for Agriculture, Forestry and Water Resources of Republic of Serbia and Republic of Montenegro, whereas for natural protection Ministries of Environment Protection of Serbia and Montenegro.

CONSERVATION ACTIONS

In FR Yugoslavia, so far very little is done in field of protection and conservation of large carnivores. Only in 1990-ties NGOs became active in more visible actions and campaigns, which were available to broader public. Public was informed on catastrophic situation and results of keeping bears for public displays as well as on alarming estimates on state of wild populations of large carnivores in FR Yugoslavia.

In Serbia was made study on estimates of necessity and conditions for building shelters for released captive bears. Also at the beginning of 1999, initiative was held to change and improve law order on proclaiming protection of rare and endangered species. Part of national team that prepared chapter on mammals had special suggestions, including increase of degree of bear protection and measurements necessary for its conservation. Especially pointed out is the need to make a national Action plan and a strategy of population revitalization, which would be complemented by basic zoogeographically ecological and later also population and other research. New Act is anticipated at the end of 2001 or beginning of 2002.

Hunting law should also be drastically changed due to dynamics of changes in nature and hunting areas. Important change should be a moratorium on bear shooting and application on measurements of more efficient applying of punitive orders for poaching, illegal catching and displaying (bear and wolf) of all large carnivore species. Real way to achieve that would be a national Action plans for conservation of each species and its habitats, the initial phase of which should include forming of national expert teams (according to the European Action Plans), basic

zoogeographically-ecological, population and other ecological research. Later on, constant population monitoring would be important for timely and adequate reaction on changes in any direction.

Major problems for implementation of cited conservation activities are chronic lack of financial support and political-economic crisis in which Yugoslavia and surrounding countries are for a long time.