

ACTION PLAN FOR THE BROWN BEAR IN BULGARIA



MINISTRY OF ENVIRONMENT AND WATERS

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Action plan for the Brown bear in Bulgaria

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Abbreviations

BAS	Bulgarian Academy of Science
BA	Biodiversity Act
DNA	Deoxyribonucleic Acid
EEA	Executive Environmental Agency (structure of MoEW)
EEC	European economic community
EFACA	Explosives, Firearms and Ammunitions Control Act
EMPA	Enterprise for Management of Environmental Protection Activities
FU	Forestry Unit (structure of SFA)
GBS	Game Breeding Stations
GIS	Geographic Information Systems
GMP	Game Management Plan
HA	Hunting Association
HGCA	Hunting and Game Conservation Act
IUCN	The world conservation union (Световен съюз за защита на природата)
MIA	Ministry of Internal Affairs
MoEW	Ministry of Environment and Water
NFA	National Forestry Board
NGO	Non Governmental Organization
NHC	National Hunting Council
NP	National park
NPD	National Park Directorate
N-re. P	Nature Park
N-re. PD	Nature Park Directorate
NRSWMBP	National Research Station of Wildlife Management, Biology and Pathology
PA	Protected Area
PAA	Protected Areas Act
RFB	Regional Forestry Administration
RHGCA	Regulation of Hunting and Game Conservation Act
RIEW	Regional Inspection of Environment and Water
SFA	State Forest Agency
SG	State Gazette
SGBS	State Game Breeding Stations
UHAB	Union of Hunters and Anglers in Bulgaria

INTRODUCTION

PART 1 BACKGROUND

This action plan is not solid and final, but adaptive and flexible tool. It can be changed after a revisions made in certain periods of time.

1. Aims of the plan

WHY ACTION PLAN IN THIS MOMENT?

Since Bulgaria is a member of EU, the importance of large carnivores' conservations becomes clearer. In that moment all interested parties feel that the existing situation can be changed to better. All groups think that the situation of the bears in Bulgaria should be improved, but the different groups show different values for achievement that goal. With the increase of the number of large carnivores in Europe, many interested parties have faced the challenge to live along these species, which appear to be competitive to the humans.

All the principles for bear management in Bulgaria were achieved with consensus between the groups with different interests. The participants in the workshops (list in Appendix 3) know that the bear management can be done only with compromises. Common duty for the future is to be ensured the bears survival in its natural habitats in Bulgaria, along with the local people, according to the tendencies in the European Union, in which we are part.

The aim of this Action Plan is to lie the base on which the future decisions for the bear management can be made. The effective Action Plan is based on the knowledge about the area of bear distribution, their number and the trend in the population, but also the ecology of the bear, its behavior, the quality of its habitats and the rate of anthropogenic influence.

The Action Plan will form the main principles for the collection of that data and will form the criteria for taking fundamental decisions about the problems like hunting and compensation of the damages.

The Action Plan is not only for bear management. It is important for determining the human problems and needs in the regions inhabited by bears. Only through cooperation and agreement between the all interested parties can be defined all necessary actions needed for efficient conservation of the brown bear in Bulgaria.

2. Methodology of the plan

2.1 PROCESS

- Working in a group based on cooperation and interactive model
- Eight working group meetings

2.2 ROLES AND RESPONSIBILITIES

- To discuss on the topic directly
- Patience while listening
- Tolerance while listening
- Understanding and acceptance of the new ideas
- All the problems openly presented
- Participation in the activities to be included in the plan
- To speak only in one's area of competence
- To have in mind the "broad" experience – in Bulgaria and abroad

2.3 VISION

Preservation of the vital Brown bear population in Bulgaria based on scientific methods on monitoring, where the populations of bears develop naturally and are managed by the people for damage reduction.

2.4 VALUES – WHAT WE WOULD LIKE TO ACHIEVE WITH THE MANAGEMENT PLAN?

Workgroup members during the workshops defined the main values and directions for the brown bear management in Bulgaria:

- Long term preservation of vital Brown bear population in Bulgarian.
- Supporting the lifestyle and local practices in the rural areas of the country.
- Conflict resolution among different interested parties through mutual understanding and cooperation.

- Public awareness rising among concerning bears and their importance.
- Build flexible and creative model for population management.
- Future planning – activities in case bears appear in new territories not present at the moment.
- In the regions with accidental bear appearance, efforts are needed to preserve them there, except in the cases of animals causing damages and conflicts with the local population.
- Involvement of the local interested parties and communities.
- Decision making on the base of the real scientific facts.
- International cooperation in brown bear management with the neighboring countries sharing the brown bear population.

2.5 INITIAL STEPS FOR BROWN BEAR MANAGEMENT PLAN CREATION – KEY PROBLEMS

- Lack of proper implementation of the existing legislation.
- There is no practical protection of bears against poaching.
- Lack of coordination between different responsible institutions.
- Lack of knowledge for species biology, ecology and human-bear interactions in Bulgaria.
- Lack of funding for scientific research and protection (guarding)
- Lack of reliable monitoring methods.
- Lack of trust between biologists and hunting managers.
- Lack of hunting staff outside of the SGBSs
- Slow reaction and not complete compensation measures, which create base for negative public attitude against bears.
- Lack of harvesting in the regions with high bear density
- Conflict of interests: hunting, tourism, livestock breeding (agriculture)

3. Legal base

This management plan is created according to the Bulgarian Biodiversity Act and Regulation No 5 of the above mentioned act. It is also harmonized with EU Directive 92/43 (Habitat directive) and European Brown Bear Action Plan.

PART 2 STATUS OF THE SPECIES IN BULGARIA

1. Historical review of brown bear's status in Bulgaria.

Skeletons and bones finds from pre-historic archaeological objects show that in the early and the middle holocen –8000-4000 years ago, the bear (*Ursus arctos* L., 1758.) was widely spread and inhabited practically the whole country. It has been found in Duran Kulak (Varna district), Malo Pole (Vratza district), Yasa Tepe (Plovdiv district), Kovachevo and Topolnitsa (Petrich district), the eneolith of Golyamo Delchevo (Varna district), Ovcharovo (Targovishte), Dolnoslav (Plovdiv district), Kovachevo (Stara Zagora district), the early bronze epoch of Ezero (Nova Zagora district), Urdoviza (Burgas district) etc.

The gathered data about the late 19th and early 20th century, shows distribution of the species generally close to the nowadays one, but bears inhabited also Ludogorie region and Strandhza mountain, they were found also along the west border and in the East Rhodope mountain. The Balkan mountain population was not isolated and had been in contact with these of Rila and the Rhodopi Mountains through peak Eledjik and Ihtiman Sredna Gora mountain.

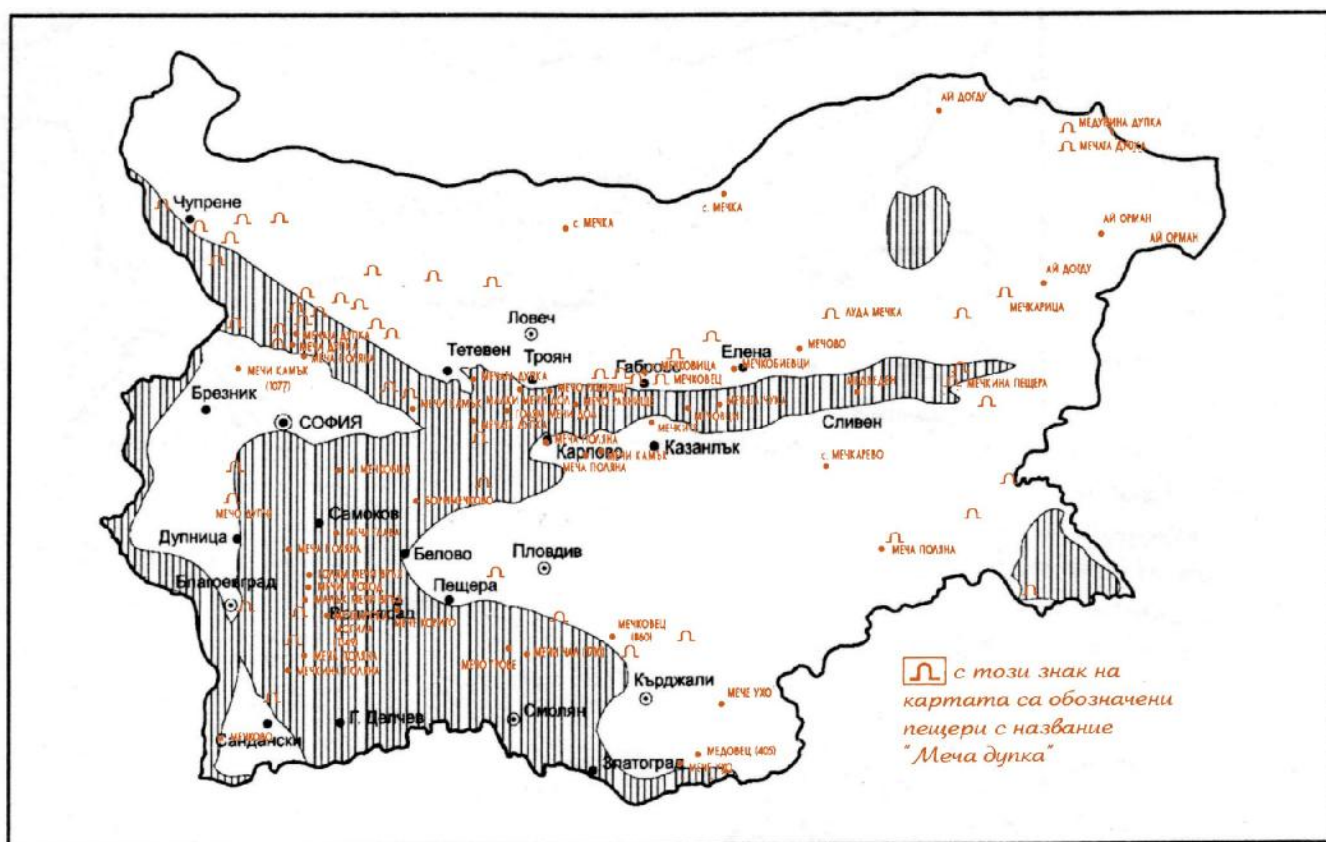


Fig. 1 Map of historical distribution of Brown bear in Bulgaria from the beginning of the 20th century. Included settlements, caves and localities containing “bear” in their names.

According to the first special research of the species' status conducted by an inquiry in 1934 the number of bears was estimated 300 – 366, and annually were hunted about 32 bears (Katzarov, 1935). Around the middle of the last century the distribution was very similar to the present one, according to the inquiry data there were about 450 bears during 1959 (Ruskov, 1961; Ruskov, Markov, 1974), i.e. the possible increase of the number could be a result of measures, taken for conservation of the species and limitation of the shooting. Since then until recent time a slow increase of the population has been observed. Analyses from the late 1970s and the middle of 1980s show that the distribution area decreased about 3 times for the last 100 years. Probable maximum number of about 600 bears was reached in 1979 (Spiridonov, Spasov, 1985; Genov, Gancev, 1987; Genov Yordanov 1990). In the 1980s the first researches of ecology and the habitats of species in Bulgaria were carried out.

During the 1980s bears started to be considered as a game species. The breeding in artificial conditions began in Kormisosh (the Rhodopes). Bears from Bulgaria as well as from the Carpathian Mountains have been bred and the offspring released in the wild (1,5 years old) in West Rhodopes and Central Balkan Mountain. Even though most of the released young bears did not survive this gave an impetus for number increase, but at the same time led to potential danger of contamination of the population: according to some researches bears from South Europe represent autochthon European element from the pleistocen. The Balkan and mostly the Bulgarian population preserved the main part of this ancient, local branch of the European population. On the other hand, the bears from the north-east part of Europe (including Romania) are settlers from a late, Holocene wave of migration on the continent from the east (Spasov, 2003). This explains the very different genetic characteristic of the pointed geographic differentiated branches of the population on the continent (Taberlet, Bouvet, 1992; 1994). It is believed, however, that the Carpathian bears that existed here for a very short time in a wild condition, practically did not manage to affect the gene fund of the local bear. The increased number during the 1980s leads also to increase of damages

done by bears (Genov and others, 1990). The dissents in the number data started namely in 1980s, when the bear became again a game species, and two points of view about protection and management of its population were formed: hunting and environmental. The number of the species in 1986 was estimated to be 700-750 and it reached its maximum in the late 1980s and the early 1990s its number was estimated to above 750 (Spiridonov, Spassov, 1990; 1998; Spassov, Spiridonov, 1999). The continued in this direction field examinations, with application of Bulgarian methods for individual recognition according to the track size (Gunchev, 1990), shows the trend of bear number during the 1990s was relatively stable with slight decrease. That decrease had been expected due to the intensified poaching at that time, due to the destruction of centralized hunting-reserve structures (example: 35 bears killed in the region of Cherni Osam river from 1989 until 1997). These researches explain the “hipper–population” in separate regions of Middle Balkan mountain with supplementary feeding in the hunting management structures and the high concentration of bears there and low density in the contiguous regions (Spassov et al., 2000). According to another data, based on an official census, presented by the Ministry of agriculture and forest, as early as 1983 the number reached almost 850 individuals (Genov, Gancev, 1987), and between 2001 and 2004 it varied between 800 and 900 with an obvious tendency towards constant increase (Genov and others., 2005).

Even that there is an official data about the number of the bears; the working group agreed that it is not based on appropriate scientific methods and it is not reliable.

Table 1. Number and shooting of the bear for the period 1991-2006, according to the official data of the Ministry of agriculture and forest

year	1991	1992	1993	1994	1995	1996	1997	1998	1999	2000	2001	2002	2003	2004	2005	2006	2007
reserve	841	769	806	854	852	880	880	870	876	834	812	861	868	904	1030	1083	1046
shooting	-	10	6	9	9	10	13	13	8	-	6	5	5	4	2	2	?

2. Ecological characteristics

2.1 ORIGIN AND TAXONOMY

The brown bear in Bulgaria belongs to the subspecies *Ursus arctos arctos* L., in which take place all European population (Ruskov, Markov, 1974). DNA analyses shows that the Balkans bears and the one in the East Alps are genetically similar and are very close to the Apennine and Pyrenean bears (Taberlet and Bouvet, 1994). South-European bears are relicts from the late Pleistocene, phylogenetically connected with the sub-species *U. arctos syriacus* from Asia Minor, adapted for life in the mountains (limited space for living) in contrast to the northeast European population that had spread widely in Europe in the early Holocene (Spasov, 1997).

2.2 PHYSICAL DESCRIPTION OF THE SPECIES

The bears on the Balkan Peninsula show obvious differences from the Carpathian ones, even in their behavior, which is less aggressive. There are lots of lightly colored individuals (light brown, fawn, drab, blond), and in Greece – even lighter (Spasov, 1990). In Stara Planina Mountain adult females have body weight of 90 – 130 kg. and rarely exceed 150 kg. After the 5th year males weigh 150 – 250 kg. A male with record weight is measured in 1939 – over 350 kg. (Gunchev, 1990). The data for the Rhodopi Mountain is similar: 103 – 142 kg. females and 141 – 249 kg. males (Boyan Kirov, 1992). The length of the hind foot of the females is between 19 and 22 cm. and 21 – 26 for the males, with measured even 27 – 30 cm. feet (Gunchev, 1990; Spasov et al. 2000a; Spiridonov G. unpublished).

2.3 REPRODUCTION AND DEN SITES

The mating in Bulgaria is observed in the end of May (Rhodopi Mountain) and during June (Stara Planina Mountain), when few males can follow one female.

The birth dens and that of the females with cubs are positioned in inaccessible places, usually on the upper tree line (in Central Stara Planina Mountain – above 1000-1800 m. altitude). Mainly they are placed in caves, 2 - 3 m. deep, covered with grass, moss, branches and leaves in lair thick up to 25 cm. The pregnant and the mothers with cubs den relatively early, sometimes in the beginning of December. The cubs (1-3,

mainly 2) are born during January, weigh between 250 and 500 g., and leave the dens in April (Stara Planina). At that time they weigh 2,5 – 4 kg. In the autumn they reach 25 – 30 kg. and have 7 x 5 cm. hind foot measures. At the second year the young weigh 45 - 60 kg., and at the third – 50 - 90 kg. with hind foot measures – 16 x 11 cm. (Ganchev, 1987;1989; Spiridonov, Mileva, 1987; Spiridonov, 1987; Spassov et al., 2000a;).

2.4 FEEDING

Food of the bear varies by seasons. The percentage proportion of the used food changes greatly, depending on geographic conditions and the inhabited biotope. So, in the Slovakian's Carpathian Mountains there are 96 plant species found in the diet of the bears but 25-30 of are most often used (Jakubiec, 1993).

In Stara planaina Mountain 75 % of the food is from plant origin. In the beginning of the spring, in regions with thin snow coverage, bears search for acorns, leaves, roots and bulb plants. In search of invertebrates and rodents, they turn rocks, tear down bark, and dig holes and ant-hills. At this period bears also search for carcass or other meet sources.

In FU and SGBS the bears utilize the forage delivered for wild ungulates. They feed with carcasses of animals that have died during winter (Ganchev, 1988; Spiridonov, Mileva, 1987). There are observations for successful preying upon wild boar in places for supplemental feeding. Anyway, few bears hunt for animals year round.

In the spring and beginning of the summer, the bears stay near the pastures and attack sheep, horses and even cattle. It's probably because of insufficient natural food.

With increasing of the plant variety, the interest to meet food, usually – decreases. The preferences are given to the berries, as they can reach up to 83 % of the diet. During the summer and autumn the bears eat also fruits of cornel-tree, oak acorns and the beech nuts. When the orchards bear fruits, bears can travel great distance toward them, and to concentrate on small territories (Ganchev, 1989).

Main food during late fall are beech nuts and oak acorns. In the mast years bears go down to the relatively low parts of the mountains and have relatively small home-

range. Appropriate food for that season are also the lush grass, sappy roots, the dog rose's fruits and many others. In scarce years the bears can migrate in search of food.

The meet can take place in the diet of some bears even in late autumn, even though the plant food is abundant (Spasov et al., 2000a). Because of the bear's hunting habits and behavior, it leaves standard marks on its pray. The strong predator kills even the large pray with one or few strokes in the neck, the spine or the head and they are left broken (the skull – crushed). Often there are deep scars from claws on the skin. Sometimes the carcass is moved and covered with tree branches. The bear begins to eat from the chest or the abdomen, and the inner organs (data collected from Greek NGO Arcturos, Thessaloniki).

2.5 SEASONAL AND ROUND-O-CLOCK ACTIVITY. INDIVIDUAL TERRITORY.

According to reports from 1990 to 1998, from the border guard's posts, the bears cross the Bulgarian-Greek border with high intensity between 20 and 24 o'clock (Spasov, 2003). According other data for the attacks on livestock, the attacks are also at evening or at night, but the peak is between 22 and 04 o'clock (Genov, Wanev, 1992). The Bulgarian-Greek border is crossed by bears mainly at the end of the spring (May – June) and at the beginning of the autumn (August – October) (Spasov et al., in press). Maybe it's related with the ripe of some fruits. The seasonal activity, researched according the found tracks in Stara Planina Mountain, shows similar results, as one mentioned above: the peak of the activity is also in the spring (April, but also June) and also one in November. It probably is weigh build-up correlated activity.

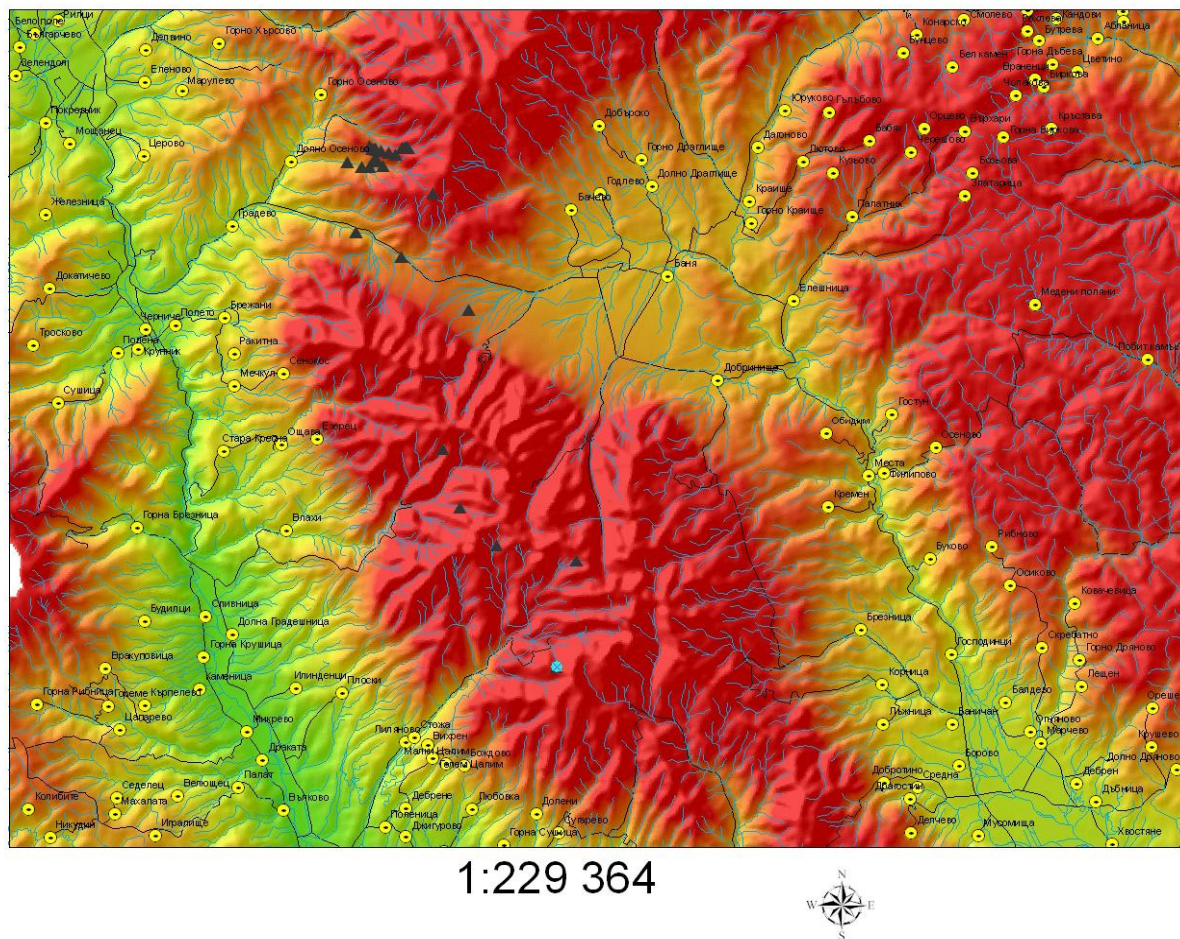
The livestock in Stara Planina Mountain is attacked most frequently in late spring and in the summer, which is related to the free-range pasture of the domestic animals. The peak of the attacks is in June (ГЪНЧЕВ Райчев, 1989). Summarized for the country, the bears are mainly in the summer (August) and the beginning of the fall (Genov, Wanev, 1992). There is a similar data for Greece (Mertzanis, 1999).

In our country (data from R. Gunchev for Stara Planina Mountain and from B. Kirov – for Rhodopi Mountain) the bears hibernate from December to January. Not all of the bears hibernate for long period. The males often do not prepare winter den, but just sleep in a rocky niche. There are observations of males lying on the snow, under

that kind of niches. When the weather is soft and the snow coverage is thin, some bears are active even in mid-winter. On 18th of January, 1997 in “Rositsa” FU, were found the tracks of 4 bears, between them – female with cub.

The home-range of the bears in Croatia determined by radio-telemetry is between 6000 and 22 400 ha. (Huber, Roth, 1993), and for the Greece – up to 41 000 ha. for female with cubs (Mertzanis et al. 2004). For the brief period of radio-telemetry of the first Bulgarian collared bear, it passed through 2 National Parks (“Rila” and “Pirin” National Parks) and 2 FUs.

Figure 2 Movement of the collared bear from January to June, 2006.



According to some researches, in one of the best habitats – these in Central Stara Planina Mountain, the adult bears have average home-range of 3 000 ha. (ГЪНЧЕВ, 1989).

2.6 SIGNS OF BEAR ACTIVITIES

The bear tracks give a chance for individual, age and sex identifications of the animals, as well as fixing the places where they live, the view for the structure of the population (Кудактин, Честин, 1987). By the size of the footprint can be proved presence and the individual can be determined as sub-adults, adult females and adult males. The statistical analysis of the size of bear's paws and the body weight do not show correlation. For that reason the tracks measures have only informative means.

By the method for individual determination by track from hind paw (Гънчев Райчев, 1989) the research about the number, the home-range and the structure of the population of the species in Stara Planina Mountain (Spasov et al., 2000a; Спиридонов, Милева, 1987; Ж. Спиридонов, непубл.) and in Rhodopi Mountain (Б. Киров, непубл.) was made.

Marking trees, where adult males leave tracks of their presence, as a element of the specific territorial behavior of the species, are spotted in many places in Stara Planina, Rila and Pirin Mountains.

The **excrement's** shape, size, consistence and smell depends on the type of the food and can vary. The scats in which dominates soft fruits (berries etc.) reminds of the cattle's, but after the consumption of acorns they are stiff and long. In that case the scats from adult males have diameter of 5.5 – 6 cm.

3. Description of the bear habitats

To satisfy its biological needs, the brown bear have certain requirements for the different parameters of the habitat. In the past the species was found not only in the mountains and highland forests, but in the lowland forests and grasslands as well. With the spread of the humans, the bears were pushed in places that were unsuitable or not preferred by humans and today they are found in mountains and in highland forests only.

Summarization of the types of the bear's habitats is possible only after integrated interpretation of the essential for the species' presence factors and conditions (Ganchev, 2003). Usually the bear's distribution is connected with the variety of the tree species and the grass coverage, in correlation with the geographic and the

anthropogenic factors. The species usually inhabits distant from human settlements mountainous regions, deep and rarely visited by man forests, etc..

Typifying of the bear's habitats is related with a lot of dynamic parameters, like: limited distribution of the species only in some mountain zones, similar climate conditions, low extend of altitude dispersion, day and night migratory activity, as well as active anthropogenic influences.

The influence of the climate over the bear's presence in Bulgaria is without practical mean; accept in the specific seasonal changes. In that case the change in the climate forms a stereotype behavior, as adaptation for presence in different biotopes.

The tree and grass vegetation, combined with relief configuration of the region create conditions for living and sheltering, with variety of regional differences. Some of the factors that characterize the separate types of habitats, in some conditions decrease their means in compensation of others. Separately from the migration we can not talk about differentiated ecotypes of the brown bear species in Bulgaria.

Specific place in the bears life take the food presence in the essential periods – the spring and the early summer. With the early growing plants and with the died during winter animals the food is provided. But when that is unavailable, the bears migrate, till the food conditions get back to normal.

Different types of animals that inhabit the same territory have also some mean. That correlation is determined and racked on the base of the competition and the importance of those animals as the food for the bear.

The influence of the anthropogenic factors for the typifying of the bear's habitats is crucial. Bears avoid regions with intense tourism activity, for example. In the same time, they have no problems to live in regions with extensive herding. The same thing is observed in the places with intensive game breeding. The bear is not a game species, but it takes advantage of the rich food supply and improved biotechnical base for the game.

On that base there are three main types of habitats in our mountains:

1. High mountain areas

2. Areas in the middle of the mountains
3. Low mountain areas

The categories **high**, **middle** and **low** are defined by the altitude range, as the simplest form of differentiation. The mixed forest formations are typical for Rila and Stara Planina Mountains, because of the look of the natural habitats and also for the high rate of afforesting in the past.

Illustrative and unpretending to be complete, the summarized plan for the three types of habitats is made for Stara Planina Mountain (ГЪНЧЕВ, 1989; ГЪНЧЕВ, 2003). The detailed description can be found in Appendix 4.

4. The bears and the human

4.1 DAMAGES

In Bulgaria the bears do damages on agricultures and livestock (including the bee-keeping). That affects very small part of the population (see Paragraph 4.3 “*HUMAN DIMENSIONS OF THE ATTITUDE TOWARDS BEARS*“), but because of the low living standard it has great social effect.

In generally, damages of the brown bear can be divided in to the following categories:

- damages on livestock
- damages on beehives
- damages on orchards and other agriculture(strawberries, raspberries, etc.)

Table 2 Registered damages in RIEW “Smolian”

Registered damages in RIEW “Smolian”					
	Number of damages.				
year	beehives	sheep	cattle	dogs	equines
2004	11	6	4		2
2005	12	45	3		1
2006	77	32	1	1	1
Total	100	83	8	1	4

The results from the research for the region of West Rhodopi Mountain (for the period 1983 – 1988) lead to the conclusion that the percent of the bears that attack livestock is between 2 and 4,6 (table 3) (Kirov, 1992)

Table 3 Percentage of the bears attacked livestock for West Rhodopi (Kirov, 1991)

Year	1983	1984	1985	1986	1987	1988	total
Census	65	65	65	60	58	50	
Number of the bears' attacks on livestock	2	1	3	2	2	1	12
% of the bears that attack domestic animals	3.08%	1.54%	4.62%	3.33%	3.45%	2.00%	

Табл.4 Percentages of attacked livestock by types.

Type of the domestic animals	%
sheep	72,4
goats	15,7
horses	1,3
cattle	10,5

The dominating factor that drives bears to become problem animals is formed stereotype of feeding behavior. Without getting in details how that stereotype was formed (it may be a result of illness, lack of enough food in natural habitat, taught by the mother, provocation from the ill animal with unnatural behavior, free ranging of livestock, etc.) it is shown in 5 – 10% of the individuals, in a certain situation.

Bears rarely hunt wild animals, but as a predator, it can not be concerned as a damage (it's a part of bear's natural behavior)

4.2 INFRASTRUCTURE

4.2.1 Highways

The highways Trakia and Hemus are big barrier for migration of the middle size and large mammals, including the bear between Balkan and Rilo-Rodope mountain and between Central and West Balkan.

The Trakia highways is the most important barrier and the main factor for stopping of the middle size and large animals including bears, from Balkan mountain through Sredna Gora to Vitosha and Rila. The Hemus motorway is a similar barrier, that has influence on the animals' migration from Central toward West Balkan mountain and backwards.

The total length of now existing Trakia highways is 160.5 km. Its extension is planed, its total length should be 443km. 42.5 % of the highways length /68.2km./ passes through forest and meadow habitats, which are important for migration of the middle size and large mammals, including the bear. The existing points in this region, where the bear passing is possible are the following: (Annex 2):

- The segment from the road to Verila station to the road to Novi Han has only one object with ecological importance for the bears' passing - this is a viaduct with place for passing of 250 m.

- The segment for the road to Novi Han to the road to Kostadinkino and Vakarel, has 4 viaducts with front for passing from 200 to 300m. Bear tracks until now have not been found, but the presence of bears close to Vakarel was proofed, which shows that this segments is unimportant biocorridor for bears passing from Vitosha and Rila.

- The Traianovi Vrata tunnel with front of passing 700m. , has optimal conditions for bear passing. The segment is an important corridor that gives possibilities for the bears from Galabets-Aramliets-Eledjik corridor, to pass over the Traianovi Vrata tunnel to the forests around Kostenets in Rila.

The total length on the actual Hemus highways is 66.816km. Almost 80% /53.3 km./ passes through forest and meadow habitats. The points where the motorway could be passed by bears are: (Annex 2):

- The segment from Churek to the road to Bebresh dam, alongside which there are 4 viaducts and one tunnel with total front for passing 3760m.

- The segment from the road to Bebresh dam to the road to Djurovo is important for bears because there are viaducts and tunnels with wide front of passing /total 3190m. /.

Comparative analyze of the two motorways shows, that in spite of the bigger length of Trakia highways when passing mountain and forest regions / total 68.2 km. /, compared to Hemus highways / total 53.3 km. /, the Trakia highways is worse equipped for mammal and bears passing. The most important difference is the presence of 4 tunnels on Hemus highways and only one tunnel on Trakia highways. Because of that Hemus highways has two time wider front for passing /3570.4m. on Trakia compared to 8970 m. on Hemus/ and almost all the front on Hemus is suitable for bear passing.

Table 5 Assessed parameters for Trakia and Hemus highways about suitable objects for bear crossing.

Assessed parameters	Trakia	Hemus
Total length, m.	68200	53310
Average altitude	675	683
Total number of objects	49	28
Number of objects suitable for bears	6	10
Total valuation of the objects	142	131
Total valuation of the objects suitable for bears	55	94
Tunnels	1	4
Total width of the objects	3570.4	8970
Total width of the objects suitable for bears	2020	8211
Total valuation by km.	2.11	2.37
Total valuation by km suitable for bears	0.76	1.35

The valuation of the two highways shows, that they are not sufficiently equipment for large mammals passing, including bears. That's why the two highways are big barrier stopping natural migration processes. Besides, the highways are not safe

enough (there are holes in the fences). Future measures should be made in order to ensure the possibility for passing through natural and artificial tunnels, viaducts and specially constructed devices.

4.2.2 Other roads

The other roads' influence on the bear is barely investigated. There is no data for road incidents with cars involving bears, but it is considered that all asphalted roads have a big influence on the bear population.

The forest roads, which are used in forest management are very interesting – both in negative and positive point of view (transport of lumber, forest workers, food for the feeding places, for fire fighting, etc.). In the view of the fact that vehicles are moving slowly, there is little risk of incident with bear. These roads are barely used most of the time, and there is little disturbance. On the other side, these roads could be used and are now used by poachers, as well as by forest fruit, herb and mushrooms pickers, and for transporting and disposing of dump which influences the bear's status.

. In addition, the total surface on the forest roads reduces the total forest cover, but that has a positive effect, because this opens strips for shine of the lower levels of the forest, which stimulates the development of berries and other species important for the bear.

The effect of the actual density of forest roads over the bear population in Bulgaria is not determined.

The average density of the asphalt roads (first-, second- and third-class roads) in the regions inhabited by bears is 0.5 km/km². The density of the forest roads in national scale is not summarized yet.

4.2.3 Railways

In the regions inhabited by bears and in the regions important for their migration the main railways are:

- Sofia-Pazardzik (double effect due to the parallel going of the railway along the first-class road)

- Sofia – Karlovo – Kazanlak (in most of the forested areas the railroad goes in a tunnel underground)
- Dupnitsa – Blagoevgrad – Sandanski (potential effect on the accidentally passing individuals from Rila and Pirin towards the border mountains with Macedonia)
- Velingrad – Yakorouda – Razlog (potential effect on the connection Rila-Rhodopi)
- Sofia – Svoge – Mezdra (here the combination with the main first-class road and the ragged relief creates triple barrier)

The railways by themselves are not problems for the bears, but there are cases of incidents when bears are killed, especially in the regions with lower visibility – tunnels or where on both sides of the railway there are serious obstacles (ravines, steep slopes, rocks). For instance in the beginning of the 90s a bear with cub, was found smashed by a train on the railway north of Ihtiman.

4.3 HUMAN DIMENSIONS OF THE ATTITUDE TOWARDS BEARS

In the period August-December 2004, a sociological survey was conducted within the framework of the project “Human dimension analysis of the attitude towards bears”. The surveys’ aims were:

- To determine the attitude of the local people towards bears;
- To determine the problematic cross points in the relationships between humans and bears (e.g. do bears cause damages and of what kind);
- To understand in overall the opinion of the locals about what measures are essential for solving the problems between humans and bears.

The results from the survey will provide guidelines for future projects, for researching means of peaceful co-existence of humans and bears; for solving conflicts and looking for effective approaches for protection of the livestock and bee-hives against wild animal attacks.

With the intension to achieve its goals, the survey had the following more definite aims:

- To understand the public general knowledge of bears;
- To determine the public perception of bears;
- To gather information of whether bears cause damages and of what kind;
- To determine the public attitude towards bears;
- To discuss measures necessary to be undertaken for the bears' damages.

Range of the survey

The survey has been conducted in four study areas in the country, namely:

- Pirin Mountain;
- Rhodope Mountain;
- Rila Mountain;
- Central Balkan(CB).

Because of the extend of the project the information has been gathered on two parts: Part 1 – in the period from August to December, 2004; Part 2 – the period from January to May, 2007.

During the Part 1 were visited 71 settlements in Pirin and Rhodopi Mountains. During the Part 2 were visited 160 settlements in Rila, Central Balkan and Rhodopi Mountains.

Method of the research

The method of the research is direct, standard interview. **The total of 1105** interviews were carried out – **547 during the Part 1** and **558 during the Part 2**. Table 6 presents the number of the interviews carried in each of the regions.

Table 6 Number of the carried interviews for regions

Region	Number of interviews	Part
Pirin	172	Part1
Rhodopi	467	Part 1 & 2
Rila	195	Part 2
Central Balkan	246	Part 2

For the interview the specially designed questionnaires was used. It was carried out from BALKANI Wildlife Society in the following periods: September – November, 2004 and January – May, 2007.

Data processing

The data is processed with specialized statistical program for sociological surveys – SPSS 11.0.

RESULTS FROM THE RESEARCH

The following material, summarizes the results from the survey, comparing them by regions.

In conclusion the main findings of the survey will be summarized:

- The survey identifies **a positive attitude towards bears** of the people inhabiting the four study areas. It is hard to tell in which region the people have friendlier attitude towards bears because the state “friendly attitude” is combination of a lot of factors – knowledge about the bears, if they have met the bears in the wild, received damages, etc. The results from the question “What is your attitude towards bears?” shows, that the friendliest towards bears are the people from Rila Mountain, compared to the other three regions. That, however, should not be taken lightly.
- Taken as a whole, the results shows, that **the people from the Rhodopi and Pirin Mountains have more intensive and direct contact with the bears** –

encountering with them (or knowing of someone, who encountered them) is more intense, the taken damage from bears is more frequent, there are even insurances made for damages from wild animals. **The citizens from Rila and Central Balkan in most of the cases think that in the region where they live do not have bears** and to the questions that concern the specific actions for the bears (do they do damages, do we have to take measures for that, what should be done and on what level, etc.) they can not give certain answer.

- **The people from the Rhodopi Mountain can be determined as “most harmed” from the living close to bears.** Most of the people in that region tell, that they have met bears – personally or know someone who had; mark, that bears do damages to their farming; livestock and beehives are most damaged. As a result the local people think, that measures have to be taken.
- **The people in Pirin are “most tolerant” towards bears,** compared to the other regions. Largest part of the people in the local communities consider the damages made by bears as natural and do not think that any measures should be taken. They also, in great percentage, tell that will be interested/curious with eventual bear meeting.
- **In Rila, locals show the friendliest attitude toward bears** in any question about to the relation human-bear. They agree that the bears are useful, that their presence in Bulgaria is a good sign, that the bears are important component of the nature. They do not agree that the bears are more harmful than useful, and that they have to be removed. The locals in Rila do not have so direct impact with the bears – there are few cases of damages and there is not even one case of insurance made. The people do not have idea if there should be measures taken against damages and on what level.
- **In the region of Central Balkan the situation is similar to the one in Rila.** The people in the region of Central Balkan (Central Stara Planina) believe in great proportion that where they live, there are no bears. Great numbers of people tell that the bears do not do damages; that their farming do not take

damages from the bears, and if measures are taken – on what level they should be. In contrary of the people from Rila, they are not so positive in the answers relating the bear-human relations.

Figure 3 Do the bears cause damages?

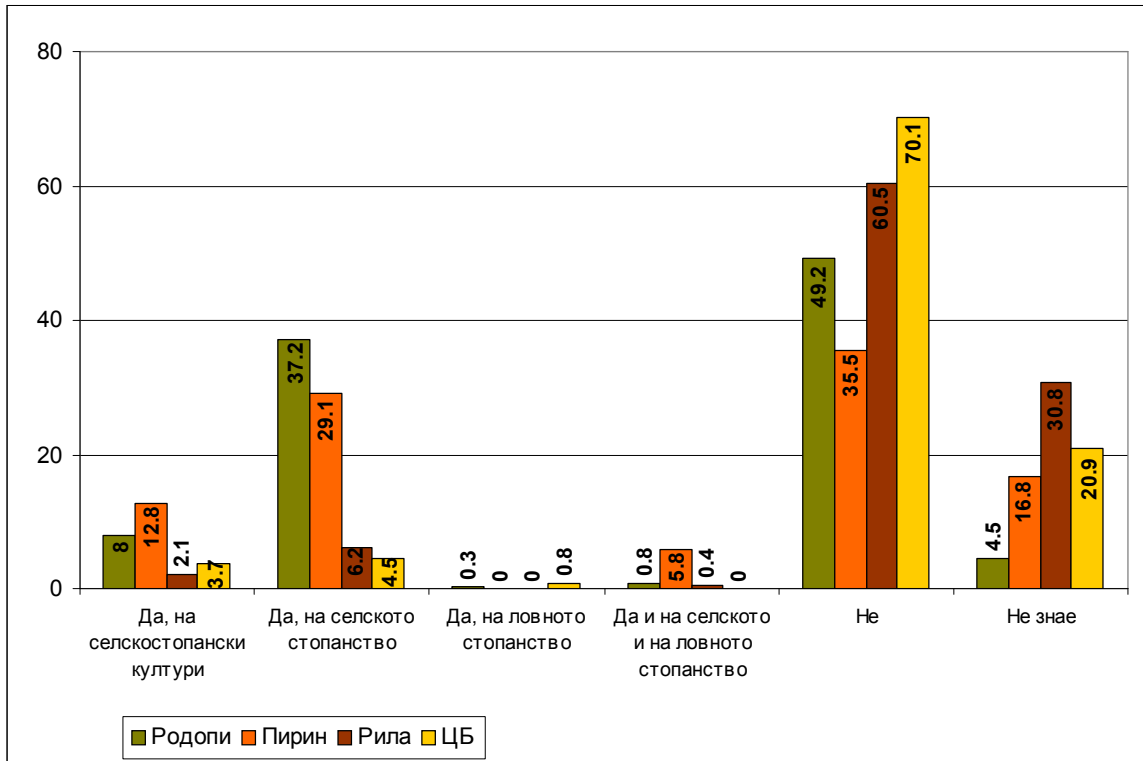
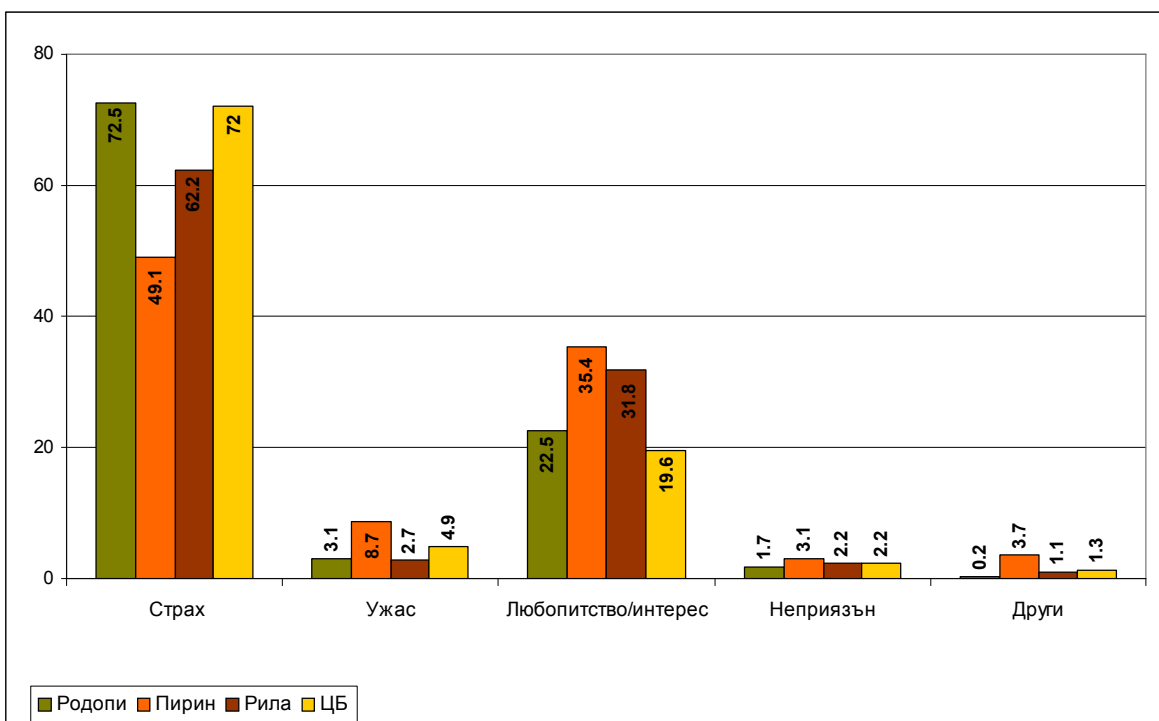


Figure 4 Feeling in eventual meeting with bear



5. Legal status

5.1 CURRENT LEGAL STATUS

According to the current legislation of Republic of Bulgaria Brown bear (*Ursus arctos*) is included in Annex II and Annex III of Biodiversity act (State Gazette (SG) 77 from 9 August 2002, modified in SG 88 from 4 November 200). The bear is included with “*”, which requires that species habitats are with high conservation priority and should be included in National ecological network part of European ecological network Natura 2000. The species is also included in Annex III of art. 38 which requires strict protection for the animal species in their natural range, prohibiting:

- all forms of deliberate capture or killing of specimens of these species in the wild;
- deliberate disturbance of these species, particularly during the period of breeding, rearing, hibernation and migration
- taking from the wild of dead animals;
- keeping, transport and sale or exchange, and offering for sale or exchange, of specimens taken from the wild;
- stuffing, having in possession, exposing, transporting, exporting, trading or selling of stuffed animals.

According to art. 48 of Biodiversity act exceptions for the species from art. 38 are allowed only if there are no other alternatives and in condition that population of the species is in favorable status in their natural habitats. Exceptions concerning bears are:

- protecting from serious damage agricultures and livestock (art. 48, paragraph 2)
- in the sake of human health and safety (art. 48, paragraph 3).

Exceptions for species of Annex III are allowed only with permission signed by Minister of Environment and Waters (art. 49).

The regime of issuing the permission for removing problem bears is regulated in regulation No 8 (SG issue 4 16 January 2004).

Damages caused by bears are reported (registered) by commission with representatives of Ministry of Environment and Waters (MoEW), local municipality and forest unit, the person who suffered the damage. The damages are to be compensated by MoEW.

Brawn bear is included in Bulgarian Red Data Book in the category “rear species”.

5.2 INTERNATIONAL LEGISLATION

The brown bear is included in:

- Annex 4 and Annex 2 of Council Directive 92/43/EEC on the Conservation of Natural Habitats and of Wild Fauna and Flora (Habitat Directive) require strict protection of Brown bear and special conservation of species habitats (to be part of Natura 2000 network).
- Annex 2 of The Convention on the conservation of European wildlife and natural habitats (Bern Convention), ratified in Bulgaria in the year 1991 (State Gazette 23/10.03.1995 of the Republic of Bulgaria)
- Convention on Biological Diversity, (State Gazette of the Republic of Bulgaria 22/1996)
- Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES).
- European Community (EC) Regulation No. 338/97 of 9 December 1996 on the protection of species of wild fauna and flora by regulating trade)
- European Brown Bear Conservation Action Plan – contains recommendations for the Action plan for conservation of the species in Bulgaria.

6. Dynamics of the population (number, trend, sex structure, mortality, etc.)

Because of lack of standard, scientifically approved monitoring method, it is impossible to comment any trend in brown bear's population in Bulgaria.

The data from annual census of NFB is showing an increase of the number of the bears in the last 5 years (table 1). That rising trend and the presented number of the bears are not accepted as reliable from the working group of the management plan due to the following reasons:

1) Lack of unified methodology in the different administrative units (FUs, SGBS, NPs) – the used till now methodology (by Raicho Gunchev), based on year-round observation and data collecting, gives very good results for Stara planina mountain. That goes especially for SGBS' facilities, with abundance of food (year-round

supplemental feeding) and lack of disturbance, where bears have small home ranges, and the qualified staff can give precise and reliable information. In the other parts of the country, where the individual home-range is bigger, the method in fact is not used.

2) Data is not compared for the different administrative units – even if the method is applied, in practice the results to be compared and some bears can be counted more than once which results in overestimation .

The cryptic way of life, the need of large territory for the largest predator in the country, capability of movement on large distances and the fact that the bears are concentrated on small areas if there is abundance of food (orchards, wild fruits, supplemental feeding) make the precise counting of the bears almost impossible. In the most cases, the results are based on the annual observations made by foresters and hunters, and the fact that the same animals inhabit adjacent territories in general is not concerned. The home range of the bears in Europe, determined by radio-telemetry is no less than 10 000 ha in most cases, which tells that the bear tracks and damages from one animal can be observed in several administrative units, in different seasons.

There is not a data base in Bulgaria, for analyses of the dynamics of the brown bear population. There is not reliable data from the whole country or sample areas collected annually for extended period of time (at least 10 years), which allows results to be compared.

Intensive supplemental feeding of the game (almost year-round), lack of disturbance and better protection in the SGBS leads to concentration of bears in these regions. That gives the false idea that the number of bears is above the socially accepted capacity (maximum permissible number), called “hyper population”. About 30 % of the bear habitats in Bulgaria are within the territories of SGBSs. Bears visit the feeding places mostly in spring and autumn (in periods of insufficient natural food). In that case what is observed is concentration but not about “hyper population”.

New analyses are made for the preparation of “The Red Data Book of Bulgaria”, II edition.(G. Spiridonov, N. Spasov, in preparation). They rely on questionnaire data and evaluation of the habitats in the country, using data about the individual home-range. Refers to that analysis, the number of the bears for 2006 is not more than 550 bears

(including cubs) – twice less than the official data (tabl.1). The difference is explained with the probable overestimation of the density of the population, on one hand, and the decreasing if the number of bears because of the increased poaching, on the other. Lots of data for poaching is collected for Pirin and Rila Mountains.

Evaluation of the bear habitats by the R. Gunchev's method in 80% of the of the bear habitats in Bulgaria (appendix 1, table 1), shows that the total maximum permissible bear number (socially accepted carrying capacity) for bears in Bulgaria is about 600 (Al. Obretenov).

In the last 3-4 years during the field work for the current action plan was found bear presence in regions with no such presence for the last 50-60 years. This might suggest that the poaching is decreased – the appearance of the bears in new areas can be because in the core area the number of the bears is reaching the optimal density, and part of the animals are dispersing in unoccupied areas with plenty of food. On other hand the reason can be increased disturbance and/or deteriorated of currant habitats and also some of the registered cases now can be migrating bears, that visited the areas before but were not reported.

In conclusion, summarized previous data shows that in the current situation (habitats and social conditions), the number of the bears can not be more than 550-800 individuals. On the base of the methods we have, the work group trust that the bears in Bulgaria are between 500 and 700. There is not a reliable data base for estimation of the dynamics of the population. The DNA data is in process of collection and analysis, which should give answers to a lot of questions for the current status of the species in Bulgaria.

The highest number and density of the population of the brown bear is registered in West Rodopi and Central Balkan mountains (Gunchev 1989; Spasov, Spiridonov 1999; Gunchev & collective 2005; Spiridonov, Spasov – Red Data Book of Bulgaria-in progress).

The sex structure of the bears is presented in the official data in Ministry of Agricultures and Forests. There is not a detailed research based on scientifically proofed methods.

There is not a official research over bear's mortality in Bulgaria. Existing data is only for legally killed problem bears.

7. Distribution

7.1 CURRENT DATA ON THE DISTRIBUTION.

Based of the data acquired through monitoring the game species in the FUs and SGBSs in Bulgaria and also on publish data, it could be admitted that the bear population in Bulgaria is concentrated in 2 subpopulations, combined in one meta-population. The 2 subpopulations are Central Stara planina subpopulation and Rilo-Rhodopean subpopulation. Moreover in the last 10 years there are many cases of registered of individuals, permanently occupying areas outside the known distribution of the breeding subpopulations. These are the region of Kraishte – Karvav kamak – Ruy, Osogovo, Konjavska planina, Western Stara Planina. Theses individuals are not a stable reproductive unit, but bears in dispersion which occupy new territorys. Based on the geographic characteristic of these regions, all with the exceptions of Western Stara planina could be considered marginal to Rilo-Rhodopean population thus showing that the existing barriers as settlements and infrastructure are not insuperable for the migration and the exchange of genetic material. There is no information for the condition of the bear population in Macedonia and Serbia.

The nature of the subpopulation in Western Stara planina is controversial. The data coming from the Serbian side shows the availability of small, but stable population in the Serbian part of Stara Planina. In the beginning of 2006 there is a translocation of bears from Tara mountain (western Serbia on the border with Bosna).

Central Stara planina subpopulation:

In the Central Balkan the brown bears inhabit the entire territory of the National Park, excluding the alpine zone. Outside the National Park the bears are presented in the FUs „Cherni Vit”, „Ribaritzha”, „Teteven”, „Trojan”, „Apriltzi”, „Borima”, „Klisura”, „Rozino”, „Cherni Osum”, „Karlovo”, „Kazanluk”, „Gabrovo”, „Muglij” and SGBSs „Mazalat”, „Rusalka” and „Rositza” (Lugut).

Kotel's (SGBS „Kotel”) population is considered to be stable, constantly reproducing and exchanging genetic material with the main Central-Balkan population. There is a data for animal movement to Sredna gora Mountain, in the region of Klisura and Koprivshtitza, and also towards Pirdop and Aramlietz.

Rilo-Rhodopean subpopulation:

Includes the massifs of Rila, Pirin, Slavianka, West and Central Rodopi, Plana, Verila and Vitosha Mountains. For Rila, Pirin and Slavianka the presence is detected in different seasons, from 350 m. altitude to the upper edge of the forest, and rarely in the sub-alpine zone. Verila and Plana Mountains are considered as transition zone, and part of the home range of the individuals inhabiting Vitosha and Rila. Because of the type of the relief, anthropogenic factors, the vegetation and the small size of the mountains, their ability to sustain the local population of bears is not considered.

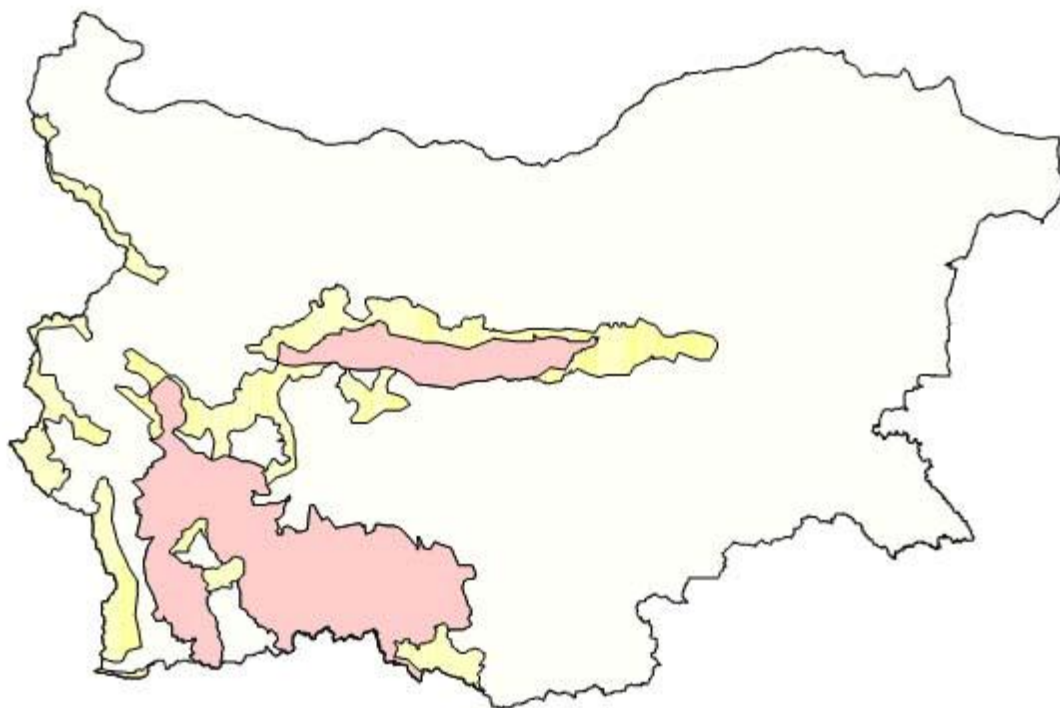
To Rilo-Rhodopian sub-population we include appeared in the last five years individuals in Karvav kamak, Rui, Osogovo and Konevska Mountains. In the east, the distribution borders are considered to be the territories of the “Ardino”, “Zlatograd”, “Jenda” and “Kirkovo” FUs.

The individuals reported in the region of Giumurdjiiski Snejnik (FU Kirkovo) do not inhabit the area permanently.

Administrative units:

NR Rila, NP Pirin, NP Central Balkan, Nature parks:: Vitosha and Rilski Manastir; SGBSs: Vitoshko-Studena, Razlog, Beglika, Chepino, Широка polyana, Borovo, Izvora, Kormisosh, Rodipi, FUs; Yundola, Dikchan, Garmen, Samokov, Borovets, Dupnitsa, Kostenets, Yakoruda, Belica, Razlog, Blagoevgrad, Simitli, Kresna, Tsaparevo-Strumyani, Dobrinishte, Mesta, Gotze Delchev, Sandanski, Katuntzi, Velingrad, Rakitovo, Eleshinica, Slishte, Chehlyovo, Dospat, Borino, Trigrad, Mugla, Smolyan, Smilyan, Pamporovo, Широка laka, Slavejno, Chepelare, Hvoina, Mihalkovo, Batak, Zlatograd, Kirkovo, Zhenda, Asenovgrad, Peshtera, Plovdiv, Pazardzhik and Krichim Marginal zones: SGBS Osogovo, FUs; Chuprene, Chiprovci, Petrohan, Tran, Kyustendil, Nevestino, Parvomai and SGBS Midzhur.

Figure 5 Map of the current bear distribution in Bulgaria. In pink – zones with permanent presence, in yellow – zones of temporary or accidental presence



7.2 CORRIDORS

The knowledge about corridors and stepping stones is of great importance for solving the problems with bear population management and conservation of the vital places for contact between the subpopulations in Bulgaria and on the Balkans.

Potential regions of contact (corridors), connecting the existing in the country local bear population and corridors that could be used for futures connections with population in Macedonia, Serbia and Greece are important for the viability and sustainability of the bear population on Balkans.

Several working/possible corridors between populations are determined so far (Spasov *et al*, 1999):

1. Between Central Balkan and Rila trough Eledjik and Ihtimanska Sredna Gora
2. Between Rila and Pirin: in the area of Predela
3. Between Rila and West Rodopi Mountain -through the valley of Mesta river, Yundola

passage

4. Between Rila and the mountains south from Sofia: Plana and Verila.

Stara planina subpopulation is practically (Spiridonov, Spasov, 1985; Spasov 2003) or to a considerable degree isolated, which defines the corridor between Balkan range and Rila/Rodope range through Sredna Gora as really important. The genetic material exchange is vital for the Stara planina range subpopulation survival. This isolation seems already to be existent since the middle of last century. (Ruskov, 1961; Ruskov, Markov, 1974).

In the Sredna Gora the following corridors have been determined:

- Corridor extending from Central Balkan towards Sredna Gora through Koznica or in Klisura part of Central Stara planina.
- Corridor from Ihtimanska Sredna Gora towards Rila. Direct connection through eastern corridor and/or through the small mountain ranges of Lozenska, Plana and Vitosha mountains./west corridor/.

Above Klisura there are seven viaducts /some of them about 15m. tall/ close one to another, over deep rocky gorges, with thick wood and bush vegetations. They are optimal natural corridors for passing from one mountain to another. The northern slopes of Tetevensky part of Central Stara planina are one of the best habitats for the bear in the country. From there the bears do migrate southwards toward Central Stara planina and as a proof in 1997 data for bear presence just above Bunovo village was collected (Spasov *et al*, 1999). The same authors register a constant presence of bears in the regions of Bogdan peak and Baricadite /Sashtinska Sredna Gora/, during and before 2005. A bear was observed in the region of Oborishte and Kamenitza /Ihtimanska Sredna Gora/, during 1998 and 7-8 years before.

There are two possible places for bear passing from Ihtimanska Sredna Gora toward Rila Mountain. The first one is in the region east from Verinsko village, where the highway passes above a gorge with thick wood and bush vegetation. The second one is through Karabair – Eledjik, which have direct connection with Mirovo village. There is constant bear presence in the Karabair region. There is information that during the 80s the bears have been migrating from there toward Eledjik and now this is

proofed by the forest officers of Ihtiman state forestry in the region of Nadejda hut. The possible contact between the two subpopulations during the last years is proofed also by observation of bears in SGBS Aramliets in Ihtimanska Sredna Gora and of a bear with cubs / in region of Bania village/. One of the most probable ways for populating Sredna Gora is from Central Stara planina through Koznica ridge, where in the end of 90s a poisoned bear was found.

Separate bears pass to East and West Stara planina mountain, to Sashtisska Sredna Gora /from Central Stara planina mountain/, to the small mountains between Sofia and Rila /from Rila/, to Eastern Rodopes in the regions of Ardino and Kardjali /from Western Rodopes/, as well as to the mountains on the West border /in the regions of Trun, Breznik and between Osogovo and Ograjden/. For the last one they probably come from Pirin or Rila (Spasov et al. 1999) It is not clear if the bears that appear in West Balkan mountain come from the Central Balkan subpopulation or from Rila subpopulation/through Vitosha- Liulin-Tran region/ or from bears that recently inhabit the border area with East Serbia. Special attention should be given to animals migrating toward, through and along the mountains on the west Bulgarian border and especially towards Serbia through West Balkan mountain. A connection between the Carpathian and Central Balkan population is possible through the Danube river in the region of the Iron gates, as some of the migrants could possibly be settled in the region of the Western Stara planina.

The exchange of individuals between Rila, Rodope, Pirin and Slavianka mountains is still not obstructed. Proof of that are the observations of the first bear with radio collar in Bulgaria. It was released in Rila in 2006 and last was found in the central parts of Pirin mountain (Dutsov and all, pers. comm.). Some data for the presence of bears (and cubs) has been collected along the south border including their passing to and from Greece. There is information for the presence of bears in south border area from Slavianka mountain to Zlatograd /with exception of the Mesta river valley where bears are found only in a narrow strip on the border/.

8. CURRENT MANAGEMENT OF THE POPULATION

The current management of Brown bear in Republic of Bulgaria is based on the Biodiversity Act (BA), State Gazette of the Republic of Bulgaria, issue 77/9.08.2002, transformed later with Acts of the Parliament.

Brown bear is included in Annex 3 of BA, according to which the species is protected (incorporates the regulations of annex 4 of directive 43/92 EEC).

In accordance with Art. 48 of the Biodiversity Act, derogations from Art. 38 are allowed in the cases of:

- For protection of the species from the wild flora and fauna and conservation of the natural habitats;
- For protection of the agricultures, farm animals, forests, water and other type of property;
- For protection of the peoples health and safety, including the aviation or other primary issues;
- For the purposes of the education and science researches, helping the sustainable development of the bear's population.

These exceptions apply only if no other alternatives exist and in condition that the population of the species is in favorable conservation status in their natural habitats. In both cases permissions for removing bears are given only for problematic animals by the Minister of Environment and Waters. The regime of issuing such permissions is provided for by Ordinance No 8 of MOEW (SG issue 4 of 16 January 2004).

Before becoming protected, Brown bear was managed as a game species according to 10 years hunting management plans (which were prepared for 41 forest and game units average 200 – 300 km²). Hunting was allowed only if the maximum permissible density (number of bears at the end of winter that do not make sufficient damage on livestock and agricultures offspring excluded) was achieved, natural mortality and poaching were taken into account.(Annex 1).

The bear's habitats census is made according the method of Raicho Gunchev. Administrative units shown in the table below covers the 80 % of the bears areal in

Bulgaria. With the time, some of the borders are changed or overlapped. Despite that, we can make the following conclusions:

1. The total carrying capacity for Bulgaria is 600 bears.
2. The number of the bears from censuses are greatly above the determined carrying capacity, mainly because of the over counting of one bear in tow or three FUs/SGBSs.

Only mature individuals (≥ 7 years old) were allowed to be hunted (excluding problem animals) and no more than 4 % males and 4% females in total 8% from the estimated number of bears (maximum permissible).

After social and political changes in the end of 1989-ies pressure for trophy hunting increased as well as the level of poaching. Only in 1991 30 bears were shot from foreign hunters. The high price, which hunters pay for the trophies, forced managers to increase the numbers of harvested animals. At the same time trophies of illegally killed bears were also offered.

In order to decrease hunting pressure and reduce poaching the Minister of Environment and Waters declare Brown bear as a protected species under the Nature Conservation Act (countermanded by Biodiversity act 2002). That changed the status of the bear and only problem bears have been legally hunted /average 6-7 animal annually/. Export was only allowed with CITES certificate. Hunting permissions had been given by National Forestry Board but coordinated with MoEW. Significant contribution for reducing harvesting and stabilizing of the population of bears in Bulgaria has had the declaring of the three national parks (NP). NP "Rila" designed in 1992 with area of 1079, 23 km² (now about 80 km²), NP "Central Balkan" 1991, area 732,16 km², NP "Pirin" 403,56 km². The three national parks are important bear habitats and hunting in all of them is prohibited.

Proclamation of the bears as protected species and establishment of the National Parks led to stabilization of the bear's population in Bulgaria. Unfortunately the poaching of bears is still the main negative factor on bear population.

PART 3 FUTURE MANAGEMENT OF THE BEAR POPULATIN

1. Zoning and distribution

According to the project team's research, the analysis of the game-management plans and the field work, a map for the distribution of the bears in Bulgaria was created.

Table 9 Current distribution of the bears in Bulgaria

	Core area, ha	Core area, %	Peripheral area, ha	Peripheral area, %	Total, ha	Total, %
NP	127482	23.43%	55232	9.93%	193047	17.55%
SGBS	218420	40.15%	136310	24.52%	354730	32.25%
other	198098	36.42%	364458	65.55%	552223	50.20%
total	544000	100.00%	556000	100.00%	1100000	100.00%

Territories occupied by the species nowadays are approximately 11 000 km² (110 000 ha, Appendix 6, map 1). They are separated as:

- Core areas - constant presence of bears with relatively high density and breeding. Such are Stara Planina and Rilo-Rhodopian population.
- Marginal areas – not constant bear presence but seasonal, low density and rarely a breeding.

On the basis of GIS analysis of the main parameters of the bear's habitats, a model of the suitable habitats (present and potential) is made (Appendix 6, map 2). The potential bear distribution corridors are specified and verified by field research.

2. Socially accepted numbers and density of the bears

The socially accepted number is that, when the bears and the people live together, with minimum conflict.

On the basis of the models (Appendix 6, Table 11), habitat assessment by Gunchev (Appendix 1) and on the basis of estimated optimal density and home range, between 600-800 bears can exist in the borders of the current area. The habitats in Bulgaria have

the potential to increase bear density and number up to 1200-1300 bears, if bear – human conflict is minimized and as a result the poaching decreased.

Table 11 Potential density of the bears in Bulgaria according the suitability of the habitats in the core area in the moment

Class	Area км²	Area, ha	Maximal density	refers to:
1	5679,67	567967	568	Бонитет 1
2	2623,77	262377	184	Бонитет 2
3	1361,53	136153	41	Бонитет 3
Total	9664.97	966497	793	

The total number of the bears in the areas with constant presence, according the model is 800.

The working group agreed upon following:

- If the bears appear in new territories to be led undisturbed, by decreasing the bear-human conflict.
- The connection of the bear’s habitats in the border areas, corridors and stepping stones must be preserved.
- It is important the exchange of genetic material to be ensured, between the subpopulations of the brown bear.

3. Monitoring of the status of the population

The proper management of the brown bear population in Bulgaria requires systematic analyses on the numbers, distribution, trends, gender and age structure of the population. The need appears due to the lack of consensus from all interested parties about the number and status of the Brown bear.

There is urgent need for establishment of national monitoring methodology and system for monitoring (counting) bears, coordinated by the managing the species site, and implemented by the interested parties (SFA, NPD, EEA).

EEA is working on the new National Monitoring System of the Biological Diversity in Bulgaria. This system could easily accept the role of the national centre for collection and working out of the raw data concerning the condition of priority species populations in country. That requires the cooperation of all interested parties.

With the purpose of keeping low costs and maintaining of constant data base, different levels of monitoring national brown bear are recommended.

Now a day methods for monitoring consist of three basic monitoring levels:

- Registering of presence
- Registering trends
- Registering density (frequency of occurrence) and minimal number of individuals on certain area

Thus can be generalized in 2 different difficulty levels:

A. Common level of monitoring – Registering presence and trends. With the tools of the common monitoring we are observing the frequency of appearance, occupation of new territories, occurrence of reproduction and habitat use

- Registering the signs of presence- footprints, marking, food searching, and excrements etc. registering of this type of observations is good indicator for presence/absence, as for occurrence of reproduction in the cases when footprints of cubs are registered.
- Direct observations – age group and presence of cubs, first and second year.
- Periodical counts for direct observations on predefined feeding places – this type of monitoring is good for trends in the population estimation.

B. High monitoring level. – Estimation of densities and minimal viable population size, registering the influence of environmental factors.

Training of the observers is needed.

Habitat assessment. Creation of nationally accepted habitat suitability model for Brown bear in the country. Habitat conditions can be identified as – excellent, good,

poor. The model must be dynamic and to allow updates if changes of the environmental condition occurs. Recommended use of GIS verified by seasonal, field observations of individuals and/or signs of their presence.

Diet - dependence of distribution and density of the food resources. Scat analyses for seasonal diet identification. Habitat suitability model must be used as a base.

Reproductive biology of the species. Estimation of reproductive rate and status of the population. Registering number of reproductions, number of offspring, first and second year cub's survival rate. Registering of dead.

Individual territory size and habitat use. Telemetry and DNA fingerprinting (capture, mark, recapture).

Numbers: estimation of numbers – DNA capture, mark, recapture, on the base of the genetic samples of live individuals (non-invasive) – excrements and hairs.

Correction of the trends received by common monitoring level (growing, stable, decreasing population).

Monitoring the anthropogenic factors influence:

- Registering mortal cases caused by traffic (traffic network influence).
- Registering cases of illegal harvesting (poaching).
- Registration of all legal harvesting (problem bears, harvest).
- Registering changes in the activity near the infrastructural projects.

Creation of database for the whole country with unified blanks (Приложение 7) for:

- Found tracks and signs;
- Shot animal or found dead to which collected samples are added: 1) Sample for DNA analysis (tissue in alcohol or hair); 2) first premolar for identifying the age; 3) Other samples for veterinary analyses (trichinelosis, rabies, etc);
- For registering the damages done by bears.

The unified blanks should be included in the National System for monitoring of the biodiversity in Bulgaria and the regulation for implementation of the Hunting Law.

For registering the trend for the development of the population this plan accepts to use the data from a systematic national monitoring (counting) on feeding places for wild ungulates (stands) twice a year (in April and November) during full moon to follow the trend. During the observation, independent observers will participate. All participants in the monitoring fill in an unified form, a copy of which stays within the observing institution and another – goes to the national database kept by the EEA, which will provide the final data to the Bear working group. The data will be analyzed and mapped in GIS.

Apart from counting on stands, the National System for monitoring of the biodiversity in Bulgaria includes other methods for individual counting and habitat assessment

Every 5 years in min. 30% of the key habitats should be conducted research with capture-mark-recapture for collecting DNA

In some model habitats full analyses with different methods should be done.

4. Activities influencing directly the population

4.1 Population control

4.1.1. Season

Population control is carried out in spring and autumn season. Spring – males only, autumn – male and female. The season last from 15 March to 15 May and from 15 October to 15 December.

Hunting quota

Population control is possible only if a vital population of not less than 500 individuals of the brown bear in Bulgaria is proofed with scientific methods and when optimal density or increasing numbers bear population is achieved / p. Monitoring/.

The population control includes all legally harvested individuals, illegal kills, bears killed by traffic or other human causes, as well as translocation of live animals of the population.

The work group decided for the first two years of this plan to have trial period with population control that allows harvesting of 10 bears per year

(including problem bears), after an exact report of all mortalities (killed by poachers, traffic, etc.). That can occur after approval of the current Action Plan and after settling of all the legal issues. The revision 2 years after the Action Plan approval must be done.

If the **population control harvesting rate** for a year is not used, it **can not be added** to the quota for the next year.

4.1.3. Quota distribution

Harvesting of bears can be permitted only if the maximum permissible number of bears is achieved and it is proofed with scientific methods.

The maximum permissible number of bears could be determined according to hunting management plans, which are unified in the national base of data and GIS model.

The work group decides where and how the quota of 10 bears will be used, on the base of the regional groups' recommendations and depending on the status of the bear's population in these regions.

We recommend that the future actions for increasing the exchange of the individuals between the populations have to be done. These individuals do not take place in the harvesting quota.

We recommend that small fee from the harvesting profit, should be taken and distributed by Ministry of Environment and Water for damage compensations and preventive measures.

4.1.4. Hunting methods and hunting tools

Bears could be hunting only individually in the presence of qualified guide. The following conditions should be fulfilled:

- Harvest could be made only from responsible for the game management of the area, according to the rules of the organized hunting tourism;
- Incomes from the shooting of bears could be used only for activities connected with the conservation of the species, compensation of damages made by bears and for other activities related to hunting management;

- It is strictly prohibited shooting of female with cubs, or cubs themselves;
- It is prohibited hunting of bears in national parks and other protected areas where hunting is not allowed;

Hunting on a high stand next to a feeding site

The most common method for hunting of bears is from a high stand next to a feeding site during full moon. The method has the following advantages:

- There are good possibilities for observation and determination of the sex and age of the bear.
- Only the individuals shown by the hunting guide and permitted during the season are shot;
- The possibility to wound and loose the bear is decreased.
- The safest method for the hunter and the hunting guide;

Hunting by stalking

The bear can be stalked around animal carcasses, bear dens, orchards etc.

4.2 SUPPLEMENTAL FEEDING

It is not possible to restrain the bears from getting to the feeding places for the game. Despite that the supplemental feeding for bears is not allowed, accept in the hunting season.

Use of carrion and slaughterhouse's wastes as supplemental food is forbidden.

4.3 POACHING

4.3.1 Reasons

The brown bear in Bulgaria in general avoids people and it's less aggressive than the bears in other parts of the world. Thanks to the good sense of smell and hearing, the bear in most cases manages to identify the human approach and to avoid close encounters with humans. That makes the species more difficult to poach comparing to chamois, deer etc. Still the bear is a conflict species and damages human properties and livestock, uses part of supplemental feeding provided for ungulates as well as destroys

some hunting facilities – high stands etc. (by marking). The trophy of bear is desired by most of the hunters. Hunters do believe that the bear scares way the wild game (ungulates) and from time to time kills deer or wild boar. The above mentioned is used by some hunters as an argument to poach bears. Bears are also killed in illegal snares for wild boar. The lack of effective compensation system forces the people who suffer damages to take the law in their hands and to kill the problem animals. If a bear appears in area not permanently occupied by the species (re-colonization, corridor areas, etc.) that animal is likely to be killed due to curiosity, fear or a life time chance to get a trophy from rear animal. So poaching has not only negative impact on density, sex and age ratio of the population but prevents the re-colonization of suitable habitats and reconnection of the fragmented or isolated sub-populations. Due to the big home ranges of the species and the concentration of bears due to abundant food in some areas the poaching outside the protected areas and Game breeding stations has very negative impact on the structure and density of the population in better protected areas.

The political instability in the country, the detachment of the authorities and the inability to manage the species lead to an increase of the illegal hunting in many regions. Proving and penalizing the poaching is a very difficult task especially in the local hunting societies where there is a practice to conceal similar violations even though in this associations people representing state authorities often participate. That is why there is a need of clarifying this the problem and unifying the efforts of all stakeholders as well as introduction of different measures for decreasing the illegal bear hunting.

According to the above mentioned reasons, the measures for decreasing poaching were separated in the following groups:

4.3.2 Damage prevention and compensation of the damages caused by bears

A. Prevention of damages made by bears and compensating them:

Aim: Reduction of poaching due to protection of property.

B. Direct measures for decreasing and prevention of poaching:

B.1. Organizing and carrying out minimum number of obligatory control check-ups by the authorities of NFB, MIA and RIEW on the local hunting societies activities operating within the present and the potential bear habitats and the bio-corridors.

Aim: Discontinuation of the illegal bear hunting during the hunting on other game species.

B.2. Modification and complementation annexes of the Hunting and Game Conservation Act (HGCA) regulating the responsibilities of the local hunting societies during rough violations in group hunting activities and regular violations of Hunting and game conservation act, PAA and BA. Foreseeing sanctions for the societies including the deprivation of hunting rights within the hunting management region for 1 year in case of violations during group hunting or failure to carry out this action plan and the connected with it legislation documents and hunting management projects.

Aim: Decrease of illegal bear hunting during the hunting on other game species.

B.3. Modification and complementation of the Hunting and Game Conservation Act with annexes with responsibilities of the participants in the group hunting and obligation for immediate report by mobile phone of the violation of HGCA and article 37 of Biological Diversity Act (killed species from annex 3 such as brown bear, chamois etc.) and immediate fulfilling the information about violation in the paper of license for hunting.

Fines and other punishments such as losing the right and license to hunt for all participants in group hunting if bear (or other species from annex 3 of BDA) is killed during this hunting and is not immediately reported.

Aim: To decrease illegal hunting of bears during hunting other species.

B.4. Integration of measures for decreasing the illegal bear hunting in the whole strategy and the annual plans of the NFB and the RFB for control activities.

Aim: Providing most effective control on the field and prevention against the illegal bear hunting.

B.5. Making the illegal bear hunting and the illegal setting of loops and traps within the bear habitats part of the criminal law according Article 278v, paragraph 4 of the Criminal Code.

Aim: Restraint of bear poaching due to demand of trophies.

B.6. Inclusion of urgent and priority measures for the bears conservation in the annual plans of the National Parks Rila, Pirin and Central Balkan and the Nature Parks Vitosha, Bulgarka and Rislki manastir, RIEW – Smolyan, Plovdiv, Pazardzhik etc.

Aim: Integration of the aims of this Plan in the management plans of the protected territories where bears are found.

B.7. Development and application of effective system for stimulation (financial and other) of the controlling authorities and the local people which take part in the catching of the poachers or provide information for their activities. There is a need of a budget of about 30 000 Bulgarian leva per year for 1000 leva awards for indictment and 500 leva for provision of vital information about poaching. The same awards to be given in case of successfully caught and sentenced violator for setting up loops and traps within the bear habitats even without catching up a bear.

Aim: Enhancement of the control and the prevention on the illegal poached species on local level.

B.8. Each registered case is reported to a public prosecutor and for each case an observer lawyer (prosecutor) is approached, in international one if possible.

Aim: Decreasing the cases which are dropped down by limitation, corruption etc.

B.9. Involving a wider circle of stakeholders when resolving problem with poaching (private hunting farmers, interested influential people, hunting societies, State Game-Breeding stations, MIA, Jurisdictional system. NFB, MOEW, NGO etc.) and development and implementation of regional plans for decreasing the bear poaching in the respective regions.

C. Enhancement of the control on the registration of a bear trophy and its exhibition in public

C.1. Legal regulation of the registration of bear trophies with proved origin after paying the respective registration tax.

The registration should be possible only the next 6 months after the adoption of this Plan. The possibility for registration should be widely popularized in the media.

Aim: Strengthening of the penalty responsibility and decreasing the illegal bear hunting.

C.2. Creating and managing of national database at the NFB for the bear trophies, registration of all trophies of the species in the database including a CIC evaluation protocol and a picture. Putting a hologram sticker bearing a unique ID number, the same as the one on the CIC evaluation protocol, on each registered trophy. The database should be available for checking-ups by the controlling authorities (MIA, MOEW).

Aim: Preventing from the illegal trading of trophies and a more effective control.

C.3. Development and maintaining a national database by the MOEW for illegal hunting, trading with illegally attained trophies, legal import of bear trophies according CITES and obligatory coordinated check-ups with the country exporting them. The database should include information for caught or prevented poaching attempts, cases for trade with illegally obtained trophies or exhibiting of such in

public, carried out investigation and criminal cases, personal information on the poachers etc.

Aim: Determining of organized channels for illegal hunting tourism, trading with trophies, fictive (not existing) import of trophies and non-favorable for the species popular poaching practices.

C.4. Organizing of regular joined check-ups of public restaurants, hotels and private houses by representatives of MOEW, NFB, MIA and the prosecutors for illegal trophies of bear and other hunting and protected species.

Aim: Decreasing the poaching for illegal exhibition of trophies as an attraction.

D. Increasing the awareness of the different target groups:

D.1. Training on writing statements and ascertain protocols.

Aim: Preventing of dropping down of penal acts due to technical mistakes in them.

D.2. Carrying out seminars in the risk regions with representatives of the Forestry Enterprises, State Game-Breeding stations, National and Nature Parks Directorates, Bulgarian Fishing and Hunting Association, RIEW, MIA and the prosecution.

Aim: Training the representatives and coordinating the measures against the illegal bear hunting.

D.3. Development, printing and distribution of leaflets, posters and stickers about the bear, popular articles in specialized publications, hunting programmes in the electronic media aiming the different target groups. Development and presenting themes on the interaction of the bear with the rest of the game species, density, behavior, the effect of the hunting etc.

Aim: Increasing the awareness and the nature conservation culture of the different target groups.

D.4. Development and maintaining of a home page on bears containing rich information and education database.

Aim: Increasing the awareness and the nature conservation culture of the wide public in global aspect.

D.5. Development of printed publication of this Action Plan.

Aim: Popularization the Plan and increasing the awareness of the different target groups.

D.6. Clear demonstration to the local people that the presence of bears in the region could have direct benefits (eco-tourism, stamp on the local products etc.).

5. Habitat preservation

There is a need of constant monitoring of the bears habitats, the potential influences and changes in them. By that correct measures can be taken for their preservation.

The preservation of the bear's habitats preserves the habitats of many other species as well. There is a need of founding priority habitats for the brown bear, as Natura 2000 sites. There is a need of including of minimum of 70 % of the bear's habitats in Natura 2000.

5.1 GENERAL MEASURES FOR CONSERVATION OF THE BEAR HABITATS

Transportation Infrastructure

There is a need for identification of the transport infrastructure that affects the habitat suitability for bears and the connectivity of the subpopulations. For this there is a need of:

- identification of all types of existing infrastructure and its effect on bear habitats;

- assessment in advance of all types of planned infrastructure and its effect on bear habitats, including solutions for existing problematic areas;
- during construction of new and modernization of the existing roads and railroads through the bear habitat, to be assessed in advance all factors affecting the free movement of the bears, the change in the habitat quality and the connectivity of the subpopulations. All building and reconstruction activities to be stopped until the requirements for the connectivity or the survival of the population are met;
- when construction of roads or railroads is inevitable, it should be attempted to:
 - avoid intersection of the most vulnerable parts of the habitats and corridors connecting the population inside or linking it to other countries population;
 - to plan and build passages for bears and other animals across fast traffic roads (with tunnels, viaducts, green bridges) (Permeability of Roads for Animals — Design Guidelines, 2002);
 - roads used for forestry to be forbidden for public use;

Conservation and improvement of forest ecosystems

For conservation and improvement of the bear habitat quality there is a need of:

- identification and evaluation of current status;
- adoption of long-term forestry development strategy, through aiding the natural restoration and conservation of the mixed forest stands and nut-bearing beech, oak trees and other important for the bear vegetation;
- evaluation of the resources needed for the bear in the parts of nature placed under special protection;
- planning an increase the size of the parts of nature placed under special protection for conserving key habitats, corridors for connectivity and other places of significance.

Agricultural development

Aiming the decrease of conflicts and assessing the influence on the agriculture there is a need of:

- identification and evaluation of the existing agriculture and its influence of the bear and its habitat;
- planning and assessment of future actions in this field (avoidance of intensive crop production over large areas, preventing the promotion of intensive livestock production in areas with high bear density) for prevention of potential conflicts.
- avoiding the funding livestock breeding, bee-keeping, agriculture, etc. with EC funds without effective program for prevention or decrease of potential damages.

Sport and tourist facilities and activities

For decreasing the effect of the sport and tourist activities on the habitats of the bears there is a need of:

- identification of the current status and the effects of the sport and tourist facilities on bear;
- banning the construction of such facilities and activities in the key habitats of the bear range unless they meet the requirements set by the Bulgarian Biodiversity Act;
- banning the tourist and sport activities that disturb peace and quiet in bear habitats;
- avoiding all activities resulting in damage to bear habitats;

5.2 SPECIFIC MEASURES FOR CONSERVATION OF THE BEAR HABITATS

1. Development of common methodology for monitoring the habitat quality as part of it to include methods for defining the types of habitats and their carrying capacity.
2. Assigning of corridors between key regions: Vitosha – Rila – Pirin; Stara planina- Rila - Rhodopi through Sredna gora and Rila - Pirin – Rhodopi as Natura 2000 sites.
3. Assigning of corridors towards suitable habitats in which the species is not currently present, but was in the past, thus aiding its return in that areas. Provision of the links between the population in Rila, Pirin and Rhodopi with these in Macedonia and Greece and their inclusion in Natura 2000.

4. Establishing priority bear habitats and sites as protected areas. Developing a network of protected areas in border areas in Rhodopi, Pirin, Belasitza and Slavjanka where link with Greece exist and in areas in Central Stara planina and Western Stara planina as stepping stones for linking the population to Serbia.
5. Intensive guarding measures in key habitats with high bear density, permanently inhabited by bears inhabited at least 6 months.
6. Intensive guarding measures in the corridors in Sredna Gora (**stepping stones**), that connect the two populations..
7. Total ban on building ski tracks, sport facilities and other infrastructure in key bear habitats.
8. Restriction of forestry activities in highly suitable bear habitats.
9. Planting berry-plants as natural bear food source.
10. Establishing planting areas with plant species with high percent of use by the bears.
11. Restriction of access of people (herb and mushroom collectors, tourists, livestock breeders) in border areas and corridor areas during the spring (march-15 June).
12. Forestry activities in key habitats with enormous use of vehicles and people to be conducted out of the period critical for the species (December -15 July).

6. Garbage

Garbage is an inevitable by-product of the progress of technology and civilization. The waste from larger towns and communities is mostly managed in an adequate way and are far from bears, but small communities and villages in regions with high density of bears had inherited a bad practice from the old times when waste management was not considered to be an important issue, not to deal accordingly with the garbage.

Garbage dumps which are not organized in a satisfactory way and illegal garbage dumps located at easily accessible sites of relatively small visibility represent a potential danger in bear areas or close to bear areas.

The danger for bears is indirect and with long-lasting significant effects - they instinctively follow the easiest way of getting food and thus become regular visitors of these locations, losing their instinct for constant food searches over large areas. The

garbage dumps attract bears with the available “easy food” and they start to associate the smell of humans with a positive experience, this being the opposite from experiences they had before. A bear with such experiences might not try to avoid humans in every contact, or may even become habituated to humans. This does not mean that the bear is dangerous, but such behavior is certainly very undesirable as it contains risk.

Whole families of young sub-adults with mothers who have grown up near the garbage dumps represent an even bigger danger. The chances that fatal incidents will occur when a man encounters such a bear are much larger and can result in negative changes in public attitudes.

Every food source that is treated as garbage — food scraps, garbage in various garbage cans and containers or garbage deposited in legal or illegal garbage dumps. These must be inaccessible to bears.

For prevention of bear access to garbage the following is needed:

1. Garbage dumps should not be located in bear habitats. Where this cannot be avoided, a garbage dump should be fenced-in in a manner that prevents bears from accessing and feeding on garbage. The most effective method is to surround the garbage dump with an electric fence as the entrance gate to the garbage dump should be closed.

2. Illegal garbage dumps should be cleared. Perpetrators should be punished according the law.

3. Containers for the collection of garbage should be located in places inaccessible to bears. Additionally, they should be made of such a material (generally sturdy metal) and always closed in a manner that prevents a bear from opening or destroying them. They should be emptied on a regular basis and there should never be overfilled or with garbage lying around them.

4. Household garbage bins should be kept inside structures that are inaccessible to bears. They should be placed out in the open only during the day, immediately before pick-up.

5. The dumping of food remains in bear habitats should be banned, especially along tourist routes or pathways which are frequently used by people. Penalty for perpetrators should be adopted.

6. The public awareness for consequences of spilling and dumping of garbage should be increased. The public should be informed for the risks of leaving food garbage. In mountains there must be clear messages for the tourists, considering the danger from food dumping.

7. Problem bears

The term „problem bear” replaces the so far used terms „bloodthirsty bear” and „honey bear” for generalization of the types of behavior of the species and the problems that come out of it.

Definition: Bear/bears, whose behavior is out of the normal for the species and with this pose a threat to the humans and their property.

7.1 GRADATION OF THE SIGNS, DEFINING A BEAR AS A PROBLEM BEAR:

1. Systematically approaching human settlements, but runs if approached by a human.
2. Systematically approaching human settlements and is not runs if approached by a human.
3. Allows approaching of human up to 15 meters before running away.
4. Damages orchard trees or crops which are not fenced or secured against attack of bears.
5. Damages orchard trees or crops which are fenced or secured against attack of bears.
6. Attacks and/or kills livestock animals or destroys beehives which are outside settlements and without being guarded or fenced.
7. Attacks and/or kills livestock animals or destroys beehives which are outside settlements but guarded and/or fenced.
8. Attacks and/or kills livestock animals or destroys beehives which are outside settlements in the presence of a shepherd.

9. Attacks and/or kills livestock animals or destroys beehives in close vicinity to or in a settlement in time without a presence of humans.
10. Attacks and/or kills livestock animals or destroys beehives in close vicinity to or in a settlement with a presence of humans.
11. Makes a false attack to a human (people) – attacks and stops in few meters in front of the human then leaves.
12. Attacks and/or injures and/or kills a human.

Other:

- Feeds on garbage dump areas near settlements.
- Damages buildings.

7.2 MEASURES TO BE TAKEN, WHEN SIGNS AS THE STATED ABOVE APPEAR.

In cases described in point 1,2, 4, 6 or Other should be used electric fences as preventive measures or chasing away with rubber bullets. To identify cases of repetition of the attacks (3 or more) of the same bear a marking of the individual is recommended – by taking a DNA sample from the place of attack or/and putting a radio collar, tattoos or ear tags (one or more of these actions) If repetition of the attacks by a same bear is proved, the individual should be removed (destroyed).

In cases described in point 5 и 10 chasing away with rubber bullets is recommended. To identify cases of repetition of the attacks of the same bear, marking of the individual is recommended – by taking a DNA sample from the place of attack or/and putting a radio collar, tattoos or ear tags (one or more of these actions) If repetition of the attacks by a same bear is proved, the individual should be removed (destroyed).

In cases described in point 3 chasing away with rubber bullets is recommended. To identify cases of repetition of the attacks of the same bear, marking of the individual is recommended – by taking a DNA sample from the place of attack or/and putting a radio collar, tattoos or ear tags (one or more of these actions) If repetition of the attacks by a same bear is proved, the individual should be removed (destroyed).

In cases described in point 11 и 12 the individual should be marked for recognition and further removal.

In cases described as “Others” it is recommended chasing away with rubber bullets, preventive measures for decreasing the access to the places for bears– regular fences, electric fences, containers, etc. Marking of the individuals should be done.

In change in any of the behaviors described from 1 to 12, removal is recommended.

8. Emergency groups

(commissions on establishment and solution of problems on the species brown bear in regions).

Characteristics of emergency groups:

Emergency groups will be composed of two divisions:

- One national commission
- 6-8 regional commissions

The national commission will include one representative-expert each from the Ministry of environment and waters, the Ministry of agriculture and forests, National forest bureau, Bulgarian science academy / university (science expert), the National veterinary service and a representative from NGOs.

The regional commission will include experts from– Regional forest bureau /state game forestry (representative of the manager of the species), Regional inspection on environment and waters or National Park (Natural Park)), a vet, independent expert (trained), a representative of the local authority (municipality corresponding to the region).

Chairman of the regional commission is the representative of Regional inspection on environment and waters. The person that suffered loses has no right to vote, he just gives information.

Duties and activities of the National commission:

- It elects the members of the regional commissions and controls the activity of these commissions.
- It collects and analyses the data presented by the regional commissions.

- It makes decisions on coping with problematic bears, as well as on damage compensation.
- It makes proposals for a shooting of a problematic bear.
- It coordinates annual quota for shooting of brown bear specimens in regions.
- It controls all the activities of other organizations, institutions and individuals, connected with the brown bear.
- It acts as a major informing body for giving of information on problematic bears to the public in connection with conflicts settlement.

Duties and activities of the regional commissions:

- *They immediately visit the place*, in case of signal for damages done by bear, other accident caused by a problematic bear or in case of found trapped bear or dead one with suspicion for human intervention.
- They ascertain and instantly evaluate the damage and immediately presented their conclusions in a protocol to the National commission.
- They make suggestions to the National commission about compensations for owner of damaged by brown bear property.
- They make suggestions to the National commission for immediate actions against a problematic bear according to the data gathered. In case of urgency, they react instantly in order to solve the problem.
- They prescribe local preventing measures (for example dung-hill cleaning, etc.) to reduce the problems

They immediately take or set activities or measures in case of trap release or in other conditions, which harmed the specimen, as well as medical treatment of such ones.

Decisions in all commissions are made if there is a quorum of minimum four members of the group only after a consensus, on the part of all who signed the protocol or the purpose.

To keep the expert level of the regional commissions' members high, they have to go to an annual refreshing course, in addition a training course for new damage appraisers has to be carried out.

Coping with a problematic bear – at first through frightening, if this measure is ineffective, then other steps can be taken: catch and marking of a problematic bear for easier tracking, moving the bear to other place, holding in captivity (zoo or else) and as a last resort shooting. Measures have to be directed to preserve the species and to solve the problem “human-bear”.

Duties of regional commissions’ members:

Representative of Regional inspection on environment and waters (a person entitled by the director) – a chairman.

Functions:

- He convenes and organizes the members of the commission. He keeps a register of information, connected with preservation, management and problems caused by the species brown bear.

Representative of Regional forest bureau:

- He presents a map material, checks the permissions for pasture; expert opinion.

Representative of the local authority:

- He presents and checks inquiry cards for registration of agricultural property.

Representative of .the National veterinary service:

- He makes assessment of the injured domestic animals, level of injury, meat consumption suitability. Vet medical help in case of catch, anesthetizing and medical treatment of specimens from species brown bear.

Representative of the species manager (Hunt association):

- The specimen carried out the attack gets identified, its habitat gets localized (couch, places for feeding, etc.). The representatives make suggestions for

organization of the shooting of problematic bears. They carried out systematic observations, monitoring and taxation of brown bears populations in the hunt regions, managed by them.

Representative of NGOs:

- Independent balancing function between the other institutions on deciding of issues connected with the brown bear managing problems.

Finances should be provided for the proper work of the emergency teams and to cover their expenses – trip money, accommodation, etc..

9. Bears and tourism

9.1 BEARS IN THE WILD

For the last 15 years more and more tourists visit Bulgaria, so they can see preserved nature and folklore. So called “eco-tourism” get more popular with each year, because, by that way the nature can be “used” and also preserved. Vary big is the interest for the village- and agro-tourism, as well as the mountain eco-tourism (including many type of sports like mountain climbing, tracking, mountain bike tours, canoeing, horse riding, etc.), bird watching and educational tourism.

Development of the tourism needs a delicate balance so the nature can be preserved. So it must be practiced with high rate of responsibility.

There is a need of advertisement of Bulgaria as destination with preserved nature. This will give us a name of country which works for the sustainable management of its nature in long term.

Example for popularization of the bear as symbol of the wild is “Central Balkan” Natural Park, which logo is the brown bear.

Why to include the bears in tourism?

The bear is attractive species because of is huge size and strength, and the large part that it takes in the folklore of a lot of nations. The bear is a symbol of the wild. The fact, that the bears inhabit curtain regions means, that they are with preserved nature.

One and the same bear can be more profitable alive, because it can be observed (photographed) a lot of times. The hunt tourism is less and less popular in contrary with

the increasing interest to the preserved nature and its inhabitants. Anyway the hunting and eco-tourism do not contradict with each other – usually the best places for eco-tourism are the game-breeding stations.

There is a need for the local people to understand that they have the financial interest to protect “their” bears, in the regions where they live. After all, the number of the tourists that come to observe bears can be larger than the number of the hunters that come to shoot bears. Expanding the activities of the game-breeding stations towards the eco-tourism can get additional profit to the managing the region unit.

The local people have the ability to develop small business (family hotels, restaurants, gift shops) and services (tour guides, other services, etc.) in order to satisfy the needs of the tourists.

Ways for bear tourism

- Observation and photographing.
- Visiting the regions where live bears and observation of their life activity tracks (footprints, markings on trees, dens, etc.).
 - The bear tourism can be combined with other forms of tourism, which can be more profitable (horse riding, bird watching, lectures for the wild life, visit of natural wonders, and culture sites, etc.)
 - Different type of goods with bear's image in the local gift shops.
 - Including the "bear tourism" in the travel agencies' lists for advertisement and increasing of the number of the tourists.
 - Opening the education centers, with attractive information for the bears and other type of animals.

Some examples for financial profit from that kind of centers are the bear center (and the similar one – for the wolf) of the NGO "ARCTUROS", Greece. The annual profit is significant (Spiros Psaorudas, personal note). The international center for the wolf, Minnesota, USA, brings to the local economy 3 000 000 USD per year and 66 working places (full time job) (Mech, Boitani, 2003).

In Romania, in the Carpathian Project for the large carnivores, was developed a program for "large carnivores" tourism in a small region of south-east Carpaths (in Brashov city). In 1997, the total profit from that tourism was 80 000 EUR; in 2002 – 560 000 EUR, 260 500 of which stayed in the local community (in the family hotels, tour guides, tour operators, horse bases and stables, etc.) (Promberger, 2002).

Some necessary conditions for implementation of the "bear tourism"

1. Preservation of the bears in the region in a long term period
2. Development of infrastructure – in Game-breeding stations is partly ready, but in rural areas it has to be build.
3. Training of guides – there are trained guides in Game-breeding stations, but amongst the locals – it's rarely seen.

4. Development of additional services in the regions with “bear tourism” (gift shops and products with logo “BEAR”, horse bases, accommodation places, restaurants, etc.)

9.2 CAPTIVE BEARS

The institutions, which hold bears captive, have to be licensed as institutions that are allowed to breed wild animals in accordance with the BA (section 8, article 58-62).

Institutions can use bears, that are bred in captivity, for education through entertainment of the visitors, as well as for economic profit. The educational programs have to be directed towards raising the knowledge and the culture of the people about biology, the behaviour and conservation status of the bears in Bulgaria and worldwide.

The bears held captive according to the Law (section 8, article 61) for the biological education must have:

- An appropriate enclosure with enough room for movement and normal life of the specimen, in which they do not feel bored and which afford the best possible copy of their natural habitats

- An appropriate feeding, close to their natural one
- Places for hiding, where they cannot be disturbed

Institutions, which hold bears captive, have to provide the visitors with:

- Provide safety to the visitors and keepers
- Educational information about the species
- Follow the fate of the offsprings and the other individuals, which they transfer to other institutions, as not allowing the transfer to the institutions and individuals which do not provide for the minimum requirement conditions for keeping bears and are not licensed according to the Biodiversity Act and the Zoo Regulation.

The practice of keeping bears in captivity in the SGBSs should be stopped.

In cases, in which a bear needs to be held captive for a medical treatment or else, all steps against bears getting used to the people must be taken, to avoid creation of a problematic bear. Bears must not be held in such conditions for more than three

months. In symptoms of getting used, bear must not be let go, but remains for a permanent breeding in the relevant institutions (zoos).

10. Minimizing and compensation of the damages

10.1 MINIMIZING THE DAMAGES

For decreasing the attacks and minimizing the damages, an Act must adopt. It must include the following obligate preventive measures for decreasing to minimum of the damages made by bear:

- Protecting the livestock pens, apiaries, orchards outside the villages (solid buildings, electric fences, enclosures, etc.);
- Free-range pasture without shepherd must be forbidden;
- Obligate use of trained shepherd dogs;
- The damages are registered by the regional commission (point 8 from the current Action Plan) and filled in standard form for damage registration (appendix 5);

10.1.1. Development, appliance and funding of the preventive measures for Rila, Pirin, Central Balkan and Rhodope Mountains.

- Localization of the bear's habitats and enriching its natural feeding base;
- Use of frightening and repelling methods for chasing away the problem bears;
- Breeding, training and rendering to the locals of specialized dog breeds for livestock protection;
- Education of the farm owners, shepherds, bee keepers and other concerned groups in the problem regions;
- Financial cover of the preventive measures – electric fences, dogs, etc., for helping the locals in taking them;
- The insurance system for compensation of damages must be developed. Development of system for insurance of the damages from the owner on the base of Liability policy. Such practices have in Germany for compensation of damages made by wild pigs.

- Not allowing the throwing of food, carrion, etc. outside of the proper places.

10.2 DAMAGE COMPENSATION

Damages are paid only if all of the demands in point 10.1 of the current Action Plan or the Act developed by point 10.1 are fulfilled.

There is a need of efficient compensatory mechanism – 100% compensation for damages after fulfillment of all demands mentioned above, so forming of negative attitude from the locals to be avoided. The compensation can be not only monetary, but in the form of preventive measures as electric fences, shepherd dogs, etc., if the owner wish so. We recommend that preventive measures should be taken in the regions with greater risk.

Order for declaration, determination and compensation of the damages made by bears.

The concerned person sends an application to the nearest municipality or FU in the same day the damage have occurred, or in the next day and if there is certainty that the bear cause the damage. The evidences from the site should not be erased or manipulated in any way.

The FU director or the major of the closest settlement receives the application for the damage, after the certain conditions:

1. The application is lodged in time, with all necessary data filled in.
2. The place, the day and the hour when the damage was done are correct and can be given to the commission.
3. The owner has all necessary documentation for its damaged property.
4. The owner has license for pasture or contract for the pasture in the region where the damage took place (for livestock).

The FU director or the major, if all data is filled correctly in the application, informs the head of the Action group (commission) by phone, fax, and e-mail in the Regional Directorate of Environment and Water for appointing, organizing and forming a commission.

Action group (commission) with members:

Person from the Regional Administration, Regional Inspectorate of Environment and Water, Regional Forestry Directorate, Regional Veterinary Service, species manager, NGO, the live-stock breeders organizations and the Concerned site.

It takes actions for:

- 1) Determining the type and the size of the damage on the property.
- 2) **Takes actions** for identification of the species that have caused the damage.
- 3) **Collects and describes** the found tracks of presence of brown bear (footprint's size, hares, scats, etc.)
- 4) **Describes** the way of the entering, attack, killing and feeding.
- 5) **Takes** samples, GPS-location, takes pictures

- 6) **Determines** the number of the killed and/or injured live-stock – number on the registration ear-mark, average weigh, sex, age; number and type of the destroyed bee-hives.
- 7) **Makes** written statement and recommendation for compensation of the owner, from fund funded by the species manager.
- 8) **Makes** analysis every three mounts for appliance of the preventive measures and following the laws in Republic of Bulgaria.

11. Informing of the public and its involvement in the decision making process

For that purpose the discussions (type “open house”) will be used for analysis of the public's opinion about the Action Plan. The places for the discussions should cover large enough area, so they can be representative. The time chosen should allow maximal presence of interested people.

The members of the Action Group for creation of the Action Plan must be on the meeting in as large number as possible and to explain the Plan to the people.

There should be increase of the public awareness about the bears, the preventive measures. There should be public understanding and support for the Action Plan.

12. International cooperation

In 1994, the Wilderness Fund society had developed national program for bear preservation in Bulgaria. In it large part takes the trans-boundary cooperation in species conservation. In the same year as the step the Wilderness Fund get in contact with similar society from Greece – ARCTUROS, Thasaloniki. In 1996, Wilderness Fund initiates the creation of Balkan Network for bear preservation with the help of organizations, institutions and experts from Bulgaria, Greece, Republic of Macedonia, Serbia and Albania.

On the base of the projects from Wilderness Fund, BALKANI Wildlife Society, ARCTUROS, that network cooperates many initiatives took place on the Balkans for the last few years (1995-2001). Between them: research of the bears populations in the border areas, research of the internal and trans-boundary corridors, researches over the local infrastructure in the bear's habitats, rising the public awareness, organizing seminars and lectures in the schools, initiating taking of preventive measures for live-stock protection, etc.

Building of the tunnel in the new border post between Bulgaria and Greece near Hadjidimovo was also supported by ecological organizations in Greece and Bulgaria. This tunnel will leave unaffected the bio corridor for migration and genetic exchange between the Greek's and Bulgarian's bear populations.

In 1998, BALKANI Wildlife Society along with the Ministry of Environment and Water and with the financial support of the International Bear Foundation (now ALERTIS – fund for bear and nature conservation) have started the campaign for micro-chip marking and veterinarian care for the bears in captivity. The activities still take places.

In 2002, the book “Protected zones in south Balkan peninsula” with special part for the large carnivores and the current Acts and Norms for their preservation. Partners

were NGOs and scientific organizations from Albania, Greece, Serbia, Macedonia and Bulgaria.

Since 2005, Bulgaria have members in Brown Bear Specialist Group to the IUCN Commission. Actively take part in the IUCN's Large Carnivores Initiative for Europe.

13. Funding or the implementation of the plan

13.1 NATIONAL SOURCES

- The state budget of Republic of Bulgaria, in proportions agreed in advance between the responsible Ministries;
- Funding through PUDOS of Ministry of Environment and Waters – for covering specific priority activities based on the action plan for the bear;
- By the Executive Agency for Environment (MOEW) through the program for the National System for monitoring of the biodiversity in Bulgaria;
- Funds from sources for the Hunting law, which are provided to the responsible Ministries
 - Resources from tax collecting upon hunting of the species;
 - Local and regional administrative financial resources;
 - Resources coming from scientific and academic project on the species;
 - Other.

13.2 INTERNATIONAL SOURCES

Besides national sources of funding, international sources for extra and more occasional activities can be sought after. There are several possibilities, of which a few will be listed below although the list is not complete. Very often, the listed organisations and funding agencies have websites where the necessary procedures to apply for funding can be found.

- EU-life funds <http://www.ec.europa.eu/environment/life>
- ALERTIS – fund for bear and nature conservation www.alertis.nl
- European Natural Heritage Fund (Euronatur) www.euronatur.org
- Frankfurt Zoological Society www.zgf.de
- IBA: International Bear Association www.bearbiology.com

For subsidies for livestock breeding coming from EC there is opportunity for funding of damage preventive measures.

14. Implementation and revision of the plan

This is adaptable (flexible) action plan. The plan will be revised on the base of its effectiveness every 2 years. National commission will be responsible for implementation and revision of this plan.

After public hearing and accepting of the plan by the Minister of Environment and Water, MoEW and State Forest Agency will jointly undertake actions on plan's implementation.

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APPENDICES

APPENDIX 1

Estimation of socially accepted caring capacity of Brown bear in Bulgaria according to game management plans (FU, SGBS, NP) according to methodology developed by Raicho Ganchev (table)

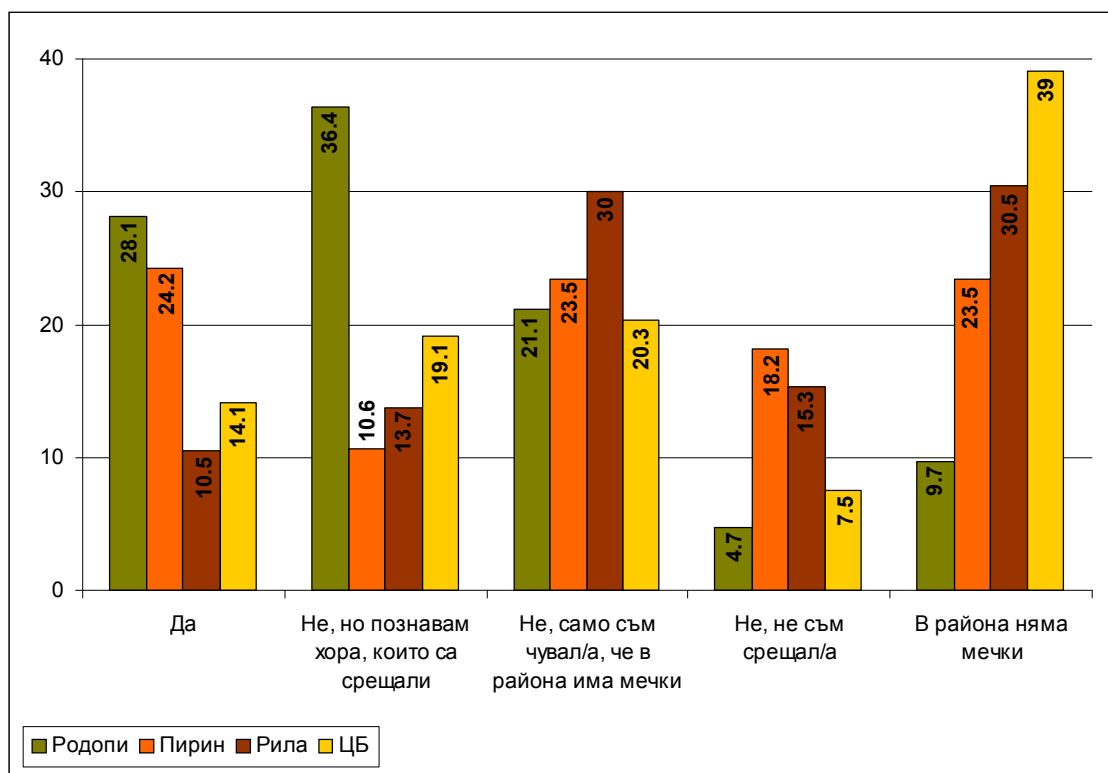
APPENDIX 2

Passages with ecological importance for Brown bear along the Trakia Motorway (table)

APPENDIX 3

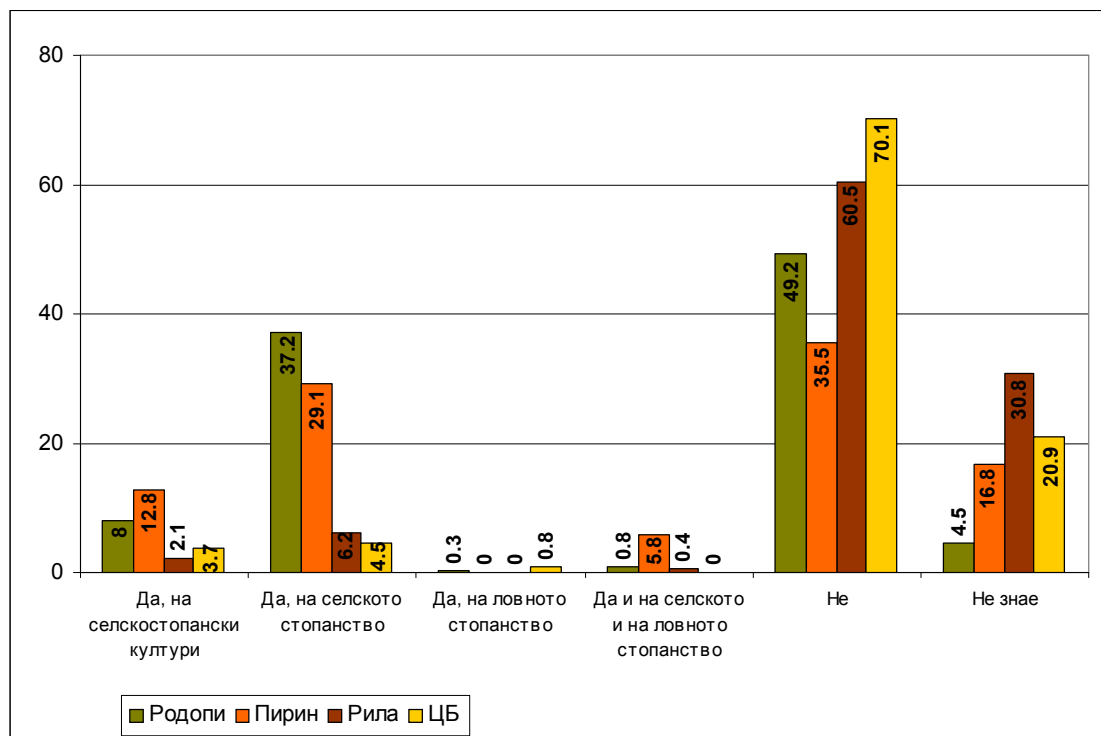
Human dimension analysis about Brown bear in the species' habita

Графика 1 Срецали ли сте мечка?

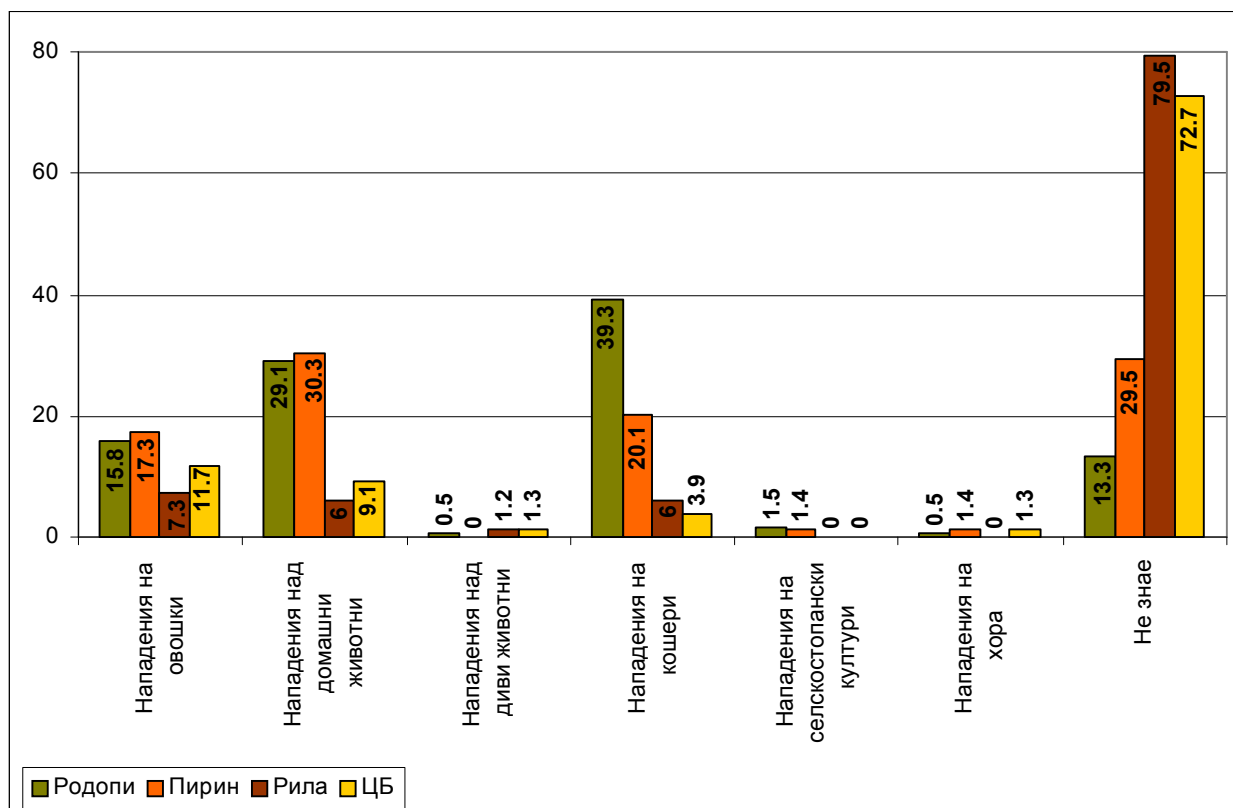


Графика 2 Нанасят ли мечките щети?

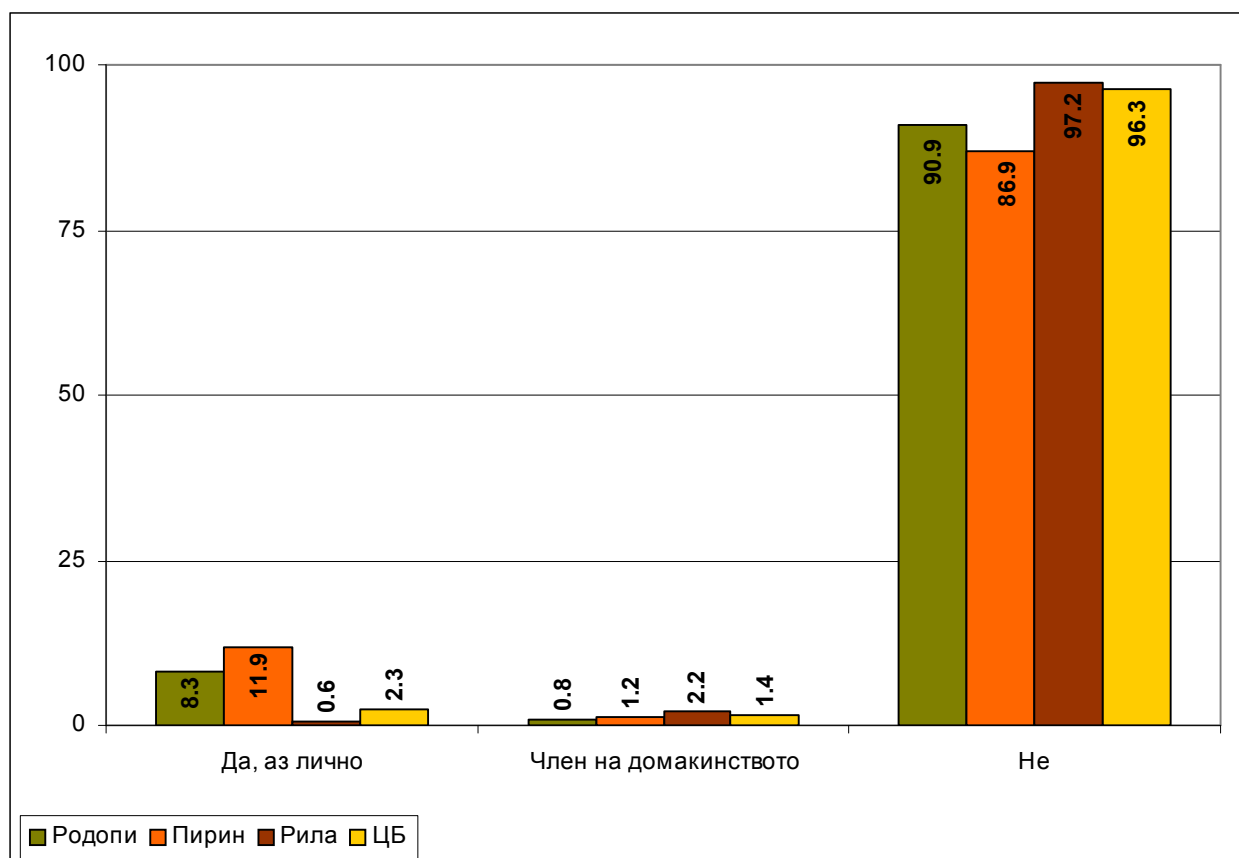
Action plan for the Brown bear in Bulgaria



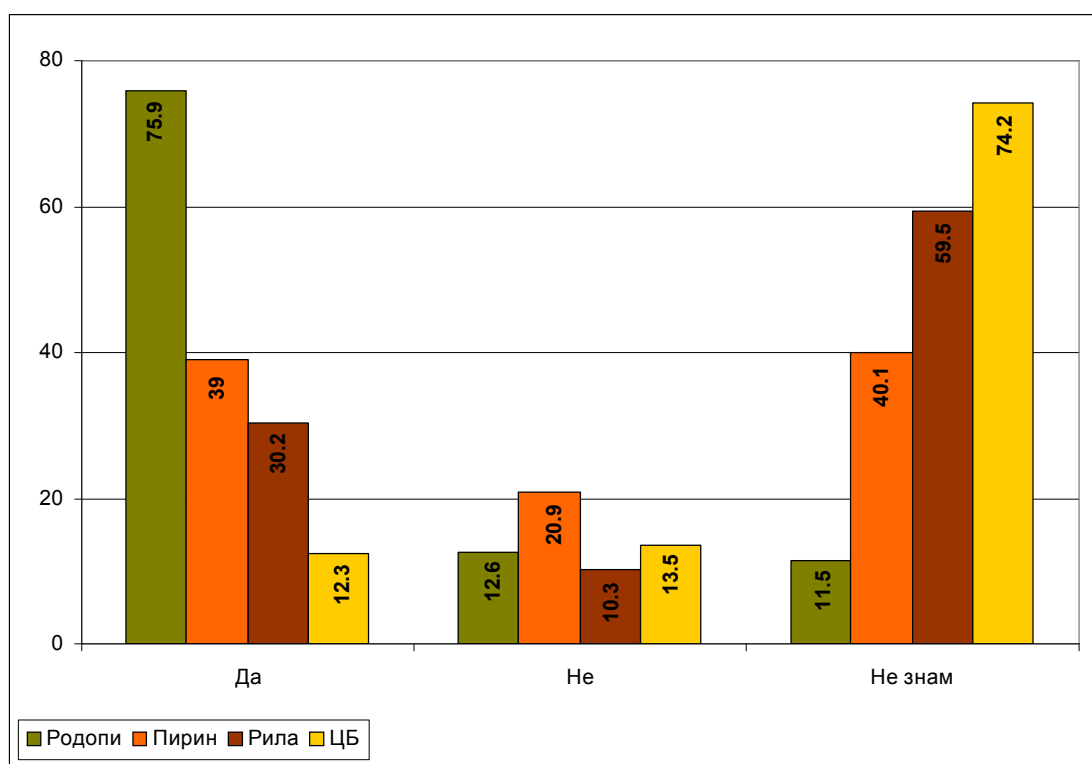
Графика 3 Какви щети нанасят мечките?



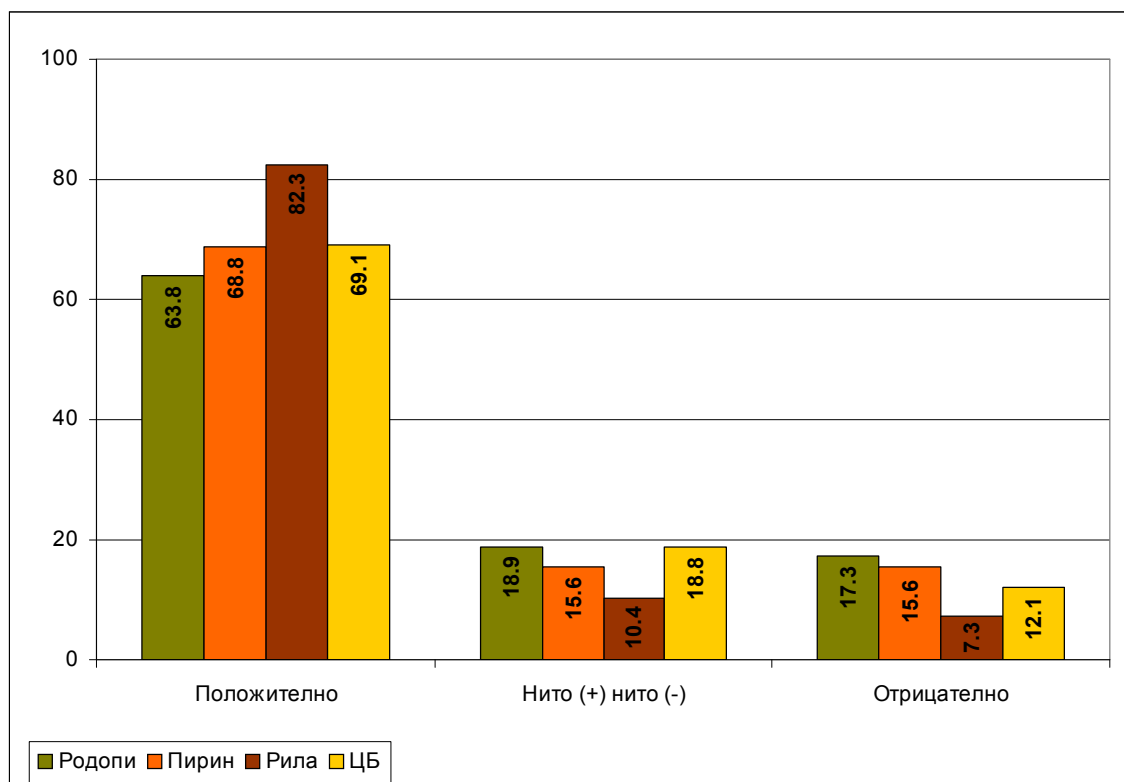
Графика 4 Нанесени щети на личното стопанство



Графика 5 Считате ли, че трябва да се вземат мерки срещу нападенията?



Графика 6 Отношение към мечката



APPENDIX 4

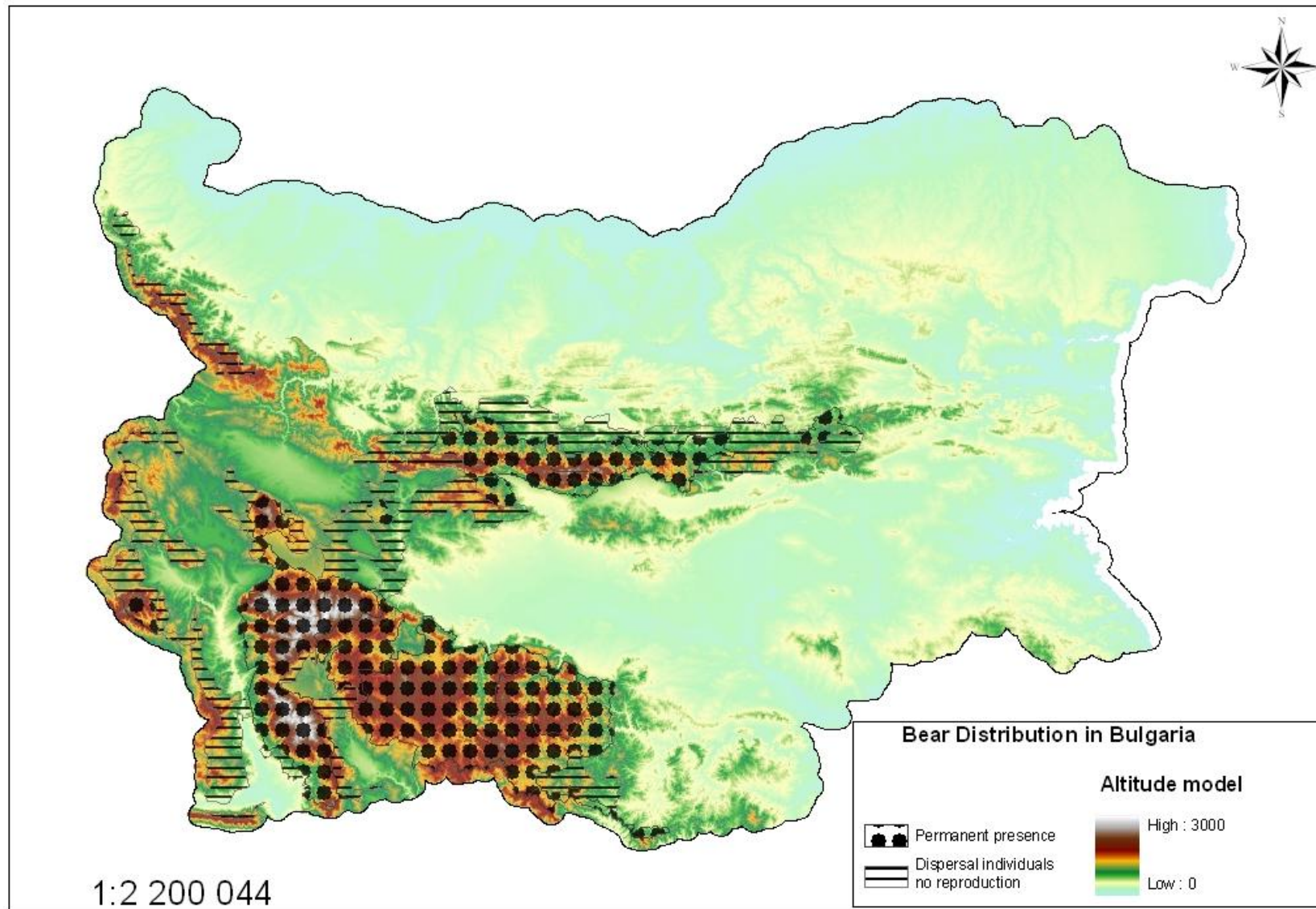
Detailed description of the Brown bear's habitats in Bulgaria

APPENDIX 5

Form for registration (description) of damages caused by bears

APPENDIX 6

Map of current distribution of Brown bear in Bulgaria



APPENDIX 7

Form for registration of dead bear

APPENDIX 8

Modern methods for Brown bear censuses

APPENDIX 9

Procedure for registration and compensation of damages caused by Brown bear