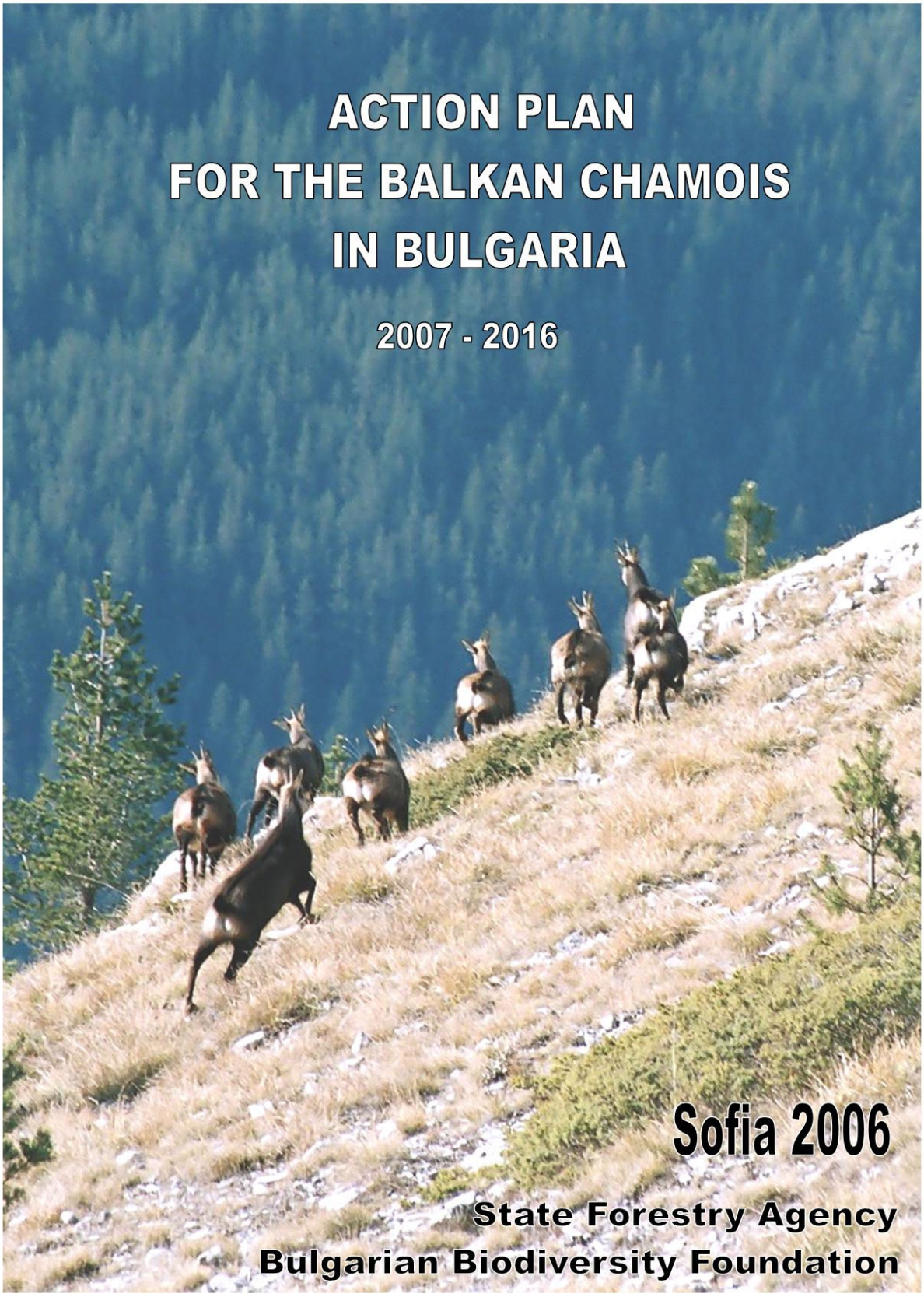
ACTION PLAN FOR THE BALKAN CHAMOIS IN BULGARIA

2007 - 2016



Sofia 2006

State Forestry Agency
Bulgarian Biodiversity Foundation

ACTION PLAN FOR THE BALKAN CHAMOIS IN BULGARIA

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STATE FORESTRY AGENCY

The present Action Plan for the Balkan Chamois (*Rupicapra rupicapra balcanica*, Bolkay, 1925) has been developed by a team from the Bulgarian Biodiversity Foundation (BBF) in accordance with the Terms of Reference prepared by the State Forestry Agency (SFA) and coordinated with the Ministry of Environment and Water (Annex 3). The Action Plan has been developed with the financial support of the SFA.

The draft versions of the Plan were discussed and complemented during workshops and public hearings, which were organized, with participation of representatives of the interested parties: scientific and educational institutions, control authorities (RIEW, RFB), National and Nature Parks Directorates and non-governmental organizations.

The Plan has been developed in accordance with the requirements of Decree No 5 of MoEW from 01 August 2003 (State Gazette, issue 73/ 19 August 2003) on the development of Action Plans for plant and animal species.

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CONTENTS

SUMMARY

The Action Plan for the Balkan chamois in Bulgaria examines the questions on the conservation of the species on the national level. It is developed based on the Terms of Reference of SFA, coordinated with MoEW and includes the plans and programmes developed until now for the population of the Balkan chamois in the Bulgarian National Parks.

The Balkan chamois is included in Annex 2 and Annex 4 of Directive 92/43/EEC, Annex 3 of Article 37 of the Biodiversity Act and the Red Book of the Republic of Bulgaria. The field work on the present Plan includes 11 censuses in the Rhodopes Mountains and one in Rila NP carried out in December 2005 and July 2006 using the route method with participation of independent observers. Additional observations on the species sex and age structure in the Rhodopes Mountains have also been carried out. Information on the species distribution outside the territories of the censuses has been gathered.

In the process of preparation of the Plan six workshops and public hearings were carried out where the Plan targets and activities were discussed and complemented.

The Balkan chamois subspecies is distributed in the mountain ranges on the Balkan Peninsula. In Bulgaria it is found in places with altitudes between 600 – 2 900 m. above sea level, in the rocky complexes of Rila, Pirin, Stara planina and the Rhodopes Mountains. At present the chamois is being reintroduced in Vitosha Mountain. The total number for the country is estimated between 1 700 and 2 300 individuals (2005).

During the wars at the beginning of the 20th century the chamois range was reduced significantly and its numbers considerably declined, totalling around 1 000 for the whole country (Hristovich, 1939; Petrov, 1965). After effective measures for reducing illegal hunting and a reintroduction programme (State Game-Breeding Station Kormisosh in 1977), the number and the distribution of the species increased, reaching its maximum level at the beginning of the 90ies. Due to the political instability of the transition period and connected with it illegal shooting, the number of the chamois in Rila, Pirin and Stara Planina had declined to almost half and the species could only survive in places, remote and most difficult to reach. In the Rhodopes even though the species is nearly extinct from locations such as Kupena and the area above Hrabrino village, as a whole the population is stable and during the last 15 years it is even increasing its number and range.

A number of anatomic, morphologic and physiologic adaptations are typical for the chamois, which make the species the best adapted mammal for living in the Alpine zone and on rocky terrains. Hence the influence of the climate (extremely low temperatures in the winter, wind etc.), predators, competition with wild ungulates are insignificant and are not limiting factors in the dynamics of vital chamois populations. Due to their specific adaptations the chamois have an advantage over predators in rocky habitats. In case of danger chamois go out on open rocks and wait for the predators reactions. This useful strategy against their natural enemies makes them very vulnerable and easy to shoot by men. Poaching is the most unfavourable limiting factor. It leads to a decrease in density and unbalance in the sex and age structure. Ultimately the result is extinction of chamois in many suitable locations. This as a whole creates additional fragmentations and inbreeding conditions.

The adaptability towards specific habitats makes the species natural distribution mosaic; this is why they are especially sensible to additional fragmentation, destroying and/or habitats degradation (during construction of roads, tourist infrastructure, hydro technical equipment etc.). The level of the hybridization (genetic pollution) with the Alpine subspecies is not exactly known (SGBS Kormisosh). The feral dogs close to settlements, dumpsites and tourist centres could be a reason for chamois to avoid otherwise suitable habitats. The change of the legal status of the species after integration of the EU / European legislation and the prohibition of its use will lead to loss of interest towards chamois conservation on behalf of the hunting community. In the Rhodopes where the species is more vulnerable than in the Alpine zone a full hunting ban would have a strong unfavourable influence on the long-term species conservation.

In Bulgaria there is over 2 000 km^2 of habitat- suitable for chamois; which gives the possibility for a total population of at least 20 000 animals.

The main target of the Plan is restoration and conservation of the Balkan chamois and its habitats in Bulgaria and targeting a number of at least 5 000 individuals by the year 2015.

For the conservation of the species and its habitats the following different activities are foreseen in different fields:

- legislation and policy
- direct measures for habitats- and species conservation
- monitoring and scientific studies
- international cooperation and awareness rising among different target groups.

In general the measures target the decrease of the illegal shooting, habitats conservation, motivating the local communities for better species management (quotas according to the IUCN Manual on sustainable use etc.), monitoring and awareness raising. The Plan also includes establishment of working group on the monitoring, implementation, planning and approval of the annual activities included in the Plan. The working group should include representatives from SFA, MoEW, Hunting Societies, Bulgarian Academy of Sciences (BAS) and NGOs.

A matrix for monitoring and control for implementation of the project targets is created. Budget and time frame are generalized.

Reasons for developing the Plan

The present Plan has been developed in accordance to Agreement No 440/ 10 November 2005 between the State Forest Agency of the Ministry of Agriculture and Forestry according Terms of Reference and coordinated with the Ministry of Environment and Waters (Annex 3).

1. TAXONOMY, DISTRIBUTION, BIOLOGY AND ECOLOGY OF THE SPECIES

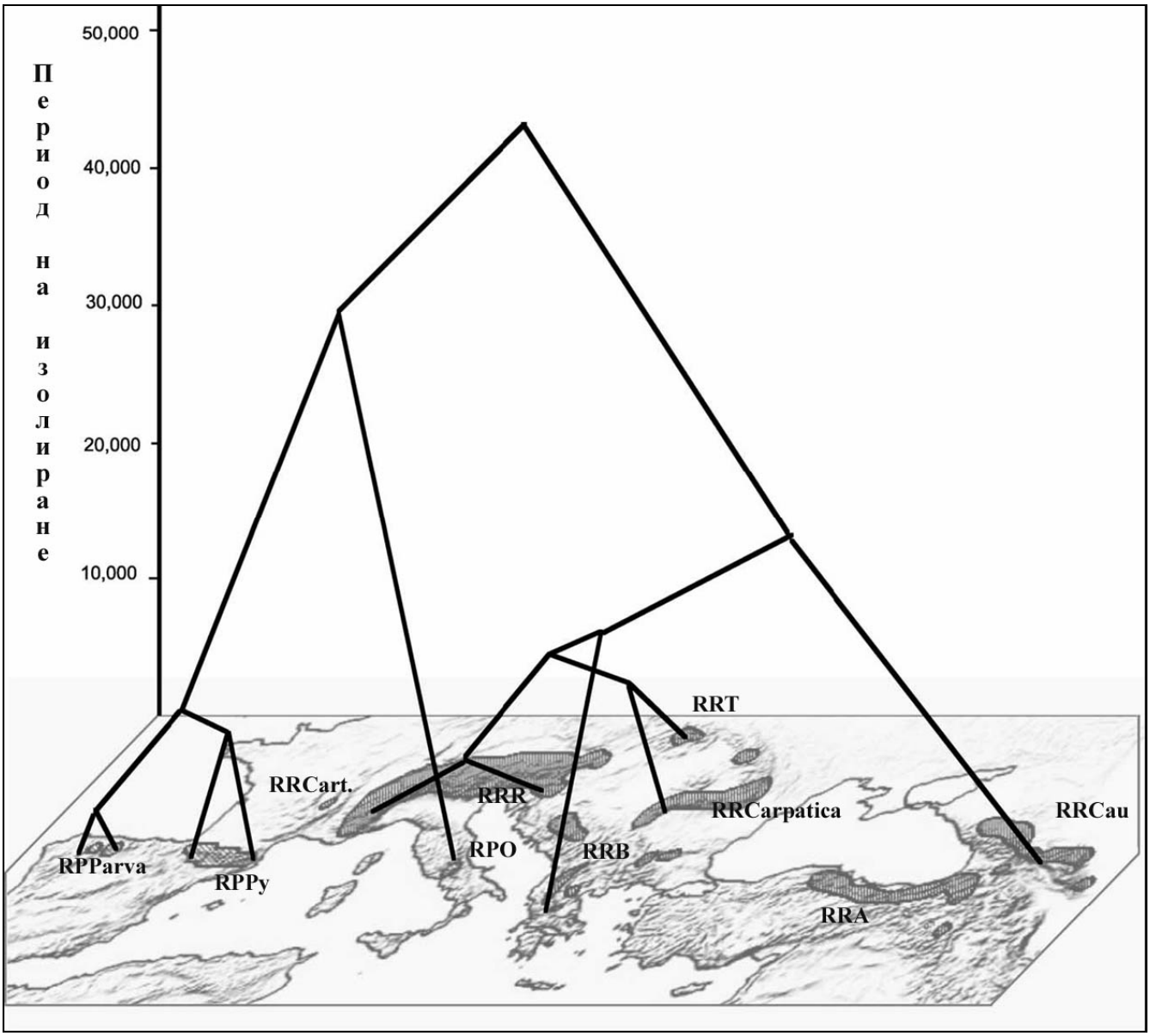
1.1.Taxonomy and distribution of the species

1.1.1. General taxonomy and distribution

The chamois (*Rupicapra sp.*) origins from *Pachygazella sp.* which inhabited Central Asia around 10 million years ago (Lovari et al., 1980). From there the Rupicapras moved west reaching Europe. The first fossils of *Rupicapra sp.* appeared in Europe in the mid Pleistocene, (Lovari et al., 1980).
Until the eighties of the 20th century, 10 chamois subspecies for the whole species range were described, belonging to one species - *Rupicapra rupicapra*. More detailed study of the chamois origin, structure and behaviour has lead to the recognition of two different species – southern chamois (*Rupicapra pyrenaica*) with three subspecies distributed in Southwest Europe and northern chamois (*Rupicapra rupicapra*) including seven subspecies distributed in the rest of the species range.

- *R. pyrenaica pyrenaica* (RPPy – figure 1) – Pyrenean chamois. It is found in the Spanish and the French part of the Pyrenees Mountains. Its population is around 53 000 species, in the French part around 15 500 (Roucher, 1997).
- *R. pyrenaica parva (RPParva – figure 1)* – Cantabrian chamois. It inhabits the high parts of the Cantabrian Mountains with above 19 000 individuals (Alados, 1997*).*
- *R. pyrenaica ornata (RPO – figure 1)* – Apennines (Abruzzo) chamois. It is found only in Abruzzo National Park with around 650 individuals (Dupré E. et al, 2001).
- *R. rupicapra rupicapra* (RRR – figure 1) – Alpine chamois. The most numerous and most widely distributed subspecies. It is found in the Alps and the neighbouring mountain ranges of Germany, France, Italy, Austria, Switzerland, Croatia and Slovenia. It is also introduced in New Zealand, Slovakia, and the former Yugoslavia and in many other places.
- *R. rupicapra cartusiana* (RRCart. – figure 1) – it is found in restricted territory of around 350 km^2 in the Chartreuse limestone massif in the pre-Alps, France. Its population is decreasing and in 1985 it is evaluated to the least of 150 individuals (Roucher, 1997). After the development and the implementation of the Action Plan for the subspecies its number has increased to above 770 individuals in 1997 (5 times increase with 16 % annual growth) (Roucher, 1999).
- *R. rupicapra tatrica* (RRT – figure 1) – distributed in the high Tatra Mountains and it is introduced in Low Tatra National Park. In 1993 its population is estimated to 600 -640 individuals (Hrabe, 1997), and in the end of the 90ies it has decreased to 300 – 400.
- *R. rupicapra carpatica* (RRCarpatica – figure 1) – the Carpathian chamois. It is found in the Transylvanian Alps and in the Carpathian Mountains. In 1990 its population is around 9 000 individuals (Weber, 1997).
- *R. rupicapra asiatica* (RRA – figure 1) – the Asian (Anatolian) chamois, is found in North-eastern and Eastern Anatolia and south of Trabzon. There are no reliable determined numbers available (Kence and Tarhan, 1997).
- *R. rupicapra caucasica* (RRCau – figure 1) – Caucasian chamois. Distributed in the Caucasian Mountains along the river Pashada and in southeast, in around 900 km. to the mountain Babadag in Azerbaijan. In 1990 the population is estimated to around 15 000.
- Balkan chamois *(Rupicapra rupicapra balcanica, Bolkay, 1925)* (RRB – figure 1)

Figure 1. Phylogeography of the species *Rupicapra spp.* Subspecies and the species separation in years (according Perez et al., 2002)

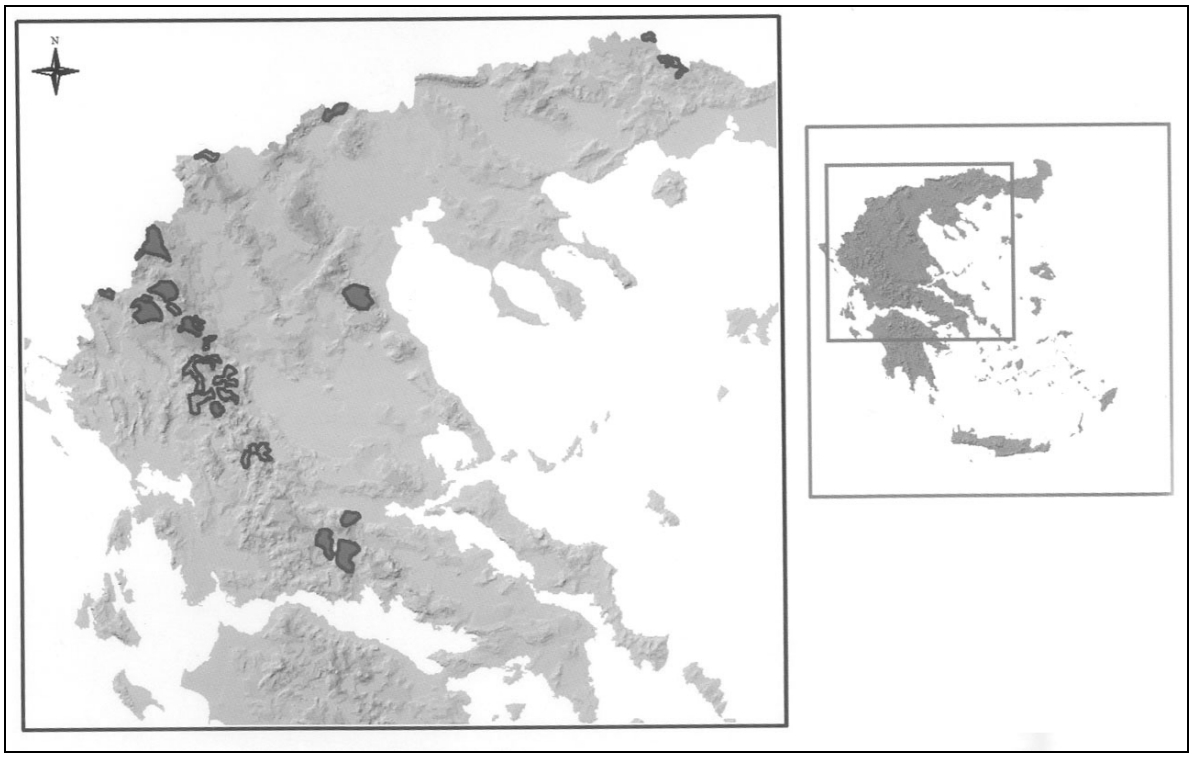


As can be seen from Figure 1, the Balkan subspecies had separated from the Alpine (*R. r. rupicapra*) after the end of the last glacial period around 10 000 years ago. There is no certain method for distinguishing the Alpine from the Balkan subspecies using the external features. The two subspecies are separated only by the differences in maxillary tooth row and the horn characteristics.

1.1.2. Distribution of the Balkan chamois

The Balkan chamois is found in isolated habitats in the mountains of the Balkan Peninsula. In Greece the chamois form six scattered and isolated population groups: in the Rhodopes and the mountain ranges from Epirus to northwest Parnassos (figure 2), (Adamakopolous et al., 1997). Its population in Greece is evaluated at between 300 and 500 individuals as the separate populations consist of between 10 and 100 chamois (Adamakopolous et al., 1997).

Figure 2. Distribution of the Balkan chamois in Greece (Papaioannou, 2000)



In Albania the chamois are found in the north in the Albanian part of the Alps, in the east in Dibra highlands, the Librazhd region and Puke, the Mirdite and Mat, in central Albania in Barat and Skrapar and in the south in Kolonje and Permett. The total chamois population in Albania comes up to around 1 000 individuals (Gjiknuri, 1997).

In former Yugoslavia the Balkan chamois is found in the mountain ranges of Bosnia and Herzegovina, Montenegro, Serbia, Kosovo and FYROM. At the end of the 80ies of the 20th century its number is above 14 000 of which 11 800 were within their natural populations. The chamois reintroductions and introductions in the former Yugoslavia were relatively often seen and as a result at the beginning of the 90ies more than 2 500 chamois were found in regions where chamois were not found before. But after 1990 the conditions dramatically aggravated and there is not information on the present chamois condition (Kryštufek, et al. 1997).

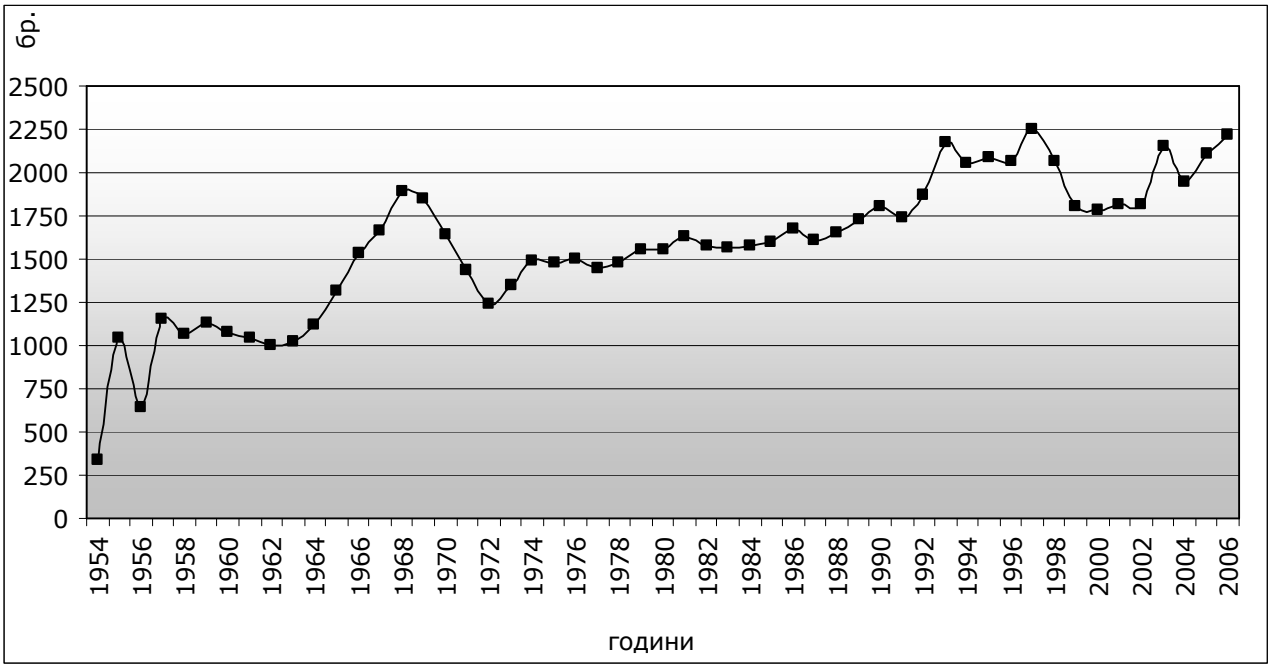
1.1.3. Distribution and number in Bulgaria

In Bulgaria the Balkan chamois is found on the steep slopes of rocky complexes in Rila, Pirin, Stara Planina and the Rhodopes mountain ranges at altitudes of around 600 to 2 900 m. Information for the chamois in the Rhodopes is first given by Xenophon, who writes that the Thracian people were hunting them (Petrov, 1965). Until the mid 19th century the Balkan chamois had wider range of distribution in Bulgaria, as it inhabited almost all suitable habitats in Stara Planina and the Rila – Rhodopian mountain range. After the wars from the end of the 19th and the beginning of the 20th century people came into the possession of long-range rifles. This leads to an increase in the success of chamois hunting and considerable decrease of the species number. In many of its ranges, the result was a complete extinction of the species. At this time there were no hunting restrictions and no specific hunting season. With the Hunting Act of 1897 a hunting season for the chamois was introduced from 1 August to 31 December, and in 1898 a 10 years ban of the hunting in Stara Planina was introduced as the chamois there were fewer than 30 individuals (Petkov, 1898). With the adoption of the subsequent hunting legislation acts the hunting season was shortened until it became one month –

October, with the Hunting Act from 1948. Despite the shortening of the hunting season and the hunting prohibition in many places the chamois number still remained unsatisfactory. According to Hristovich (1939) there were around 1 000 chamois in Bulgaria: Rila – 600 – 700, the Rhodopes – 150 – 200, Pirin 80 – 100 and in Stara Planina around 100 (Petrov, 1965). After the Second World War the control on the illegal hunting was strengthened and the populations slowly began to increase as chamois also widened there distribution. According to annual censuses data (source SFA, figure 3) the number of chamois started steadily to increase by 1965. The data from 1960, 1961, 1970 and 1971 was interpolated due to incomplete available data. The unnatural fluctuations in the number between the years 1954 – 1957, 1959 – 1963 and 1969 – 1973 are due to two main reasons: first – lack of censuses in many of the chamois inhabited places and second – lack of unified census methodology. Possibly the chamois reached their highest number at the end of the 80ties and the beginning of the 90ties, although according to the official information the peak was at the end of the 90ties. In the 80ties in conditions of exceeded "maximum permissible stock number", in many places the theoretically calculated permissible stock or a little higher number of chamois was reported. During this period for Stara Planina around 270 chamois were reported but their number was a lot higher and in many places herds of 40-50 animals were seen (Ganchev, 2001). The maximum permissible stock number is low in general – 6 chamois/ 100 hectares for the best habitats. In the Alps the density reaches 15-20 animals/ 100 ha (Lovari, 1997).
In 1977 in Kormisosh hunting reserve introduction of chamois from the Alpine subspecies was done and after mixing with the local population it reached up to 300 – 400 individuals in 2005.

Figure 3. Dynamics of the Balkan chamois number 1954 – 2004

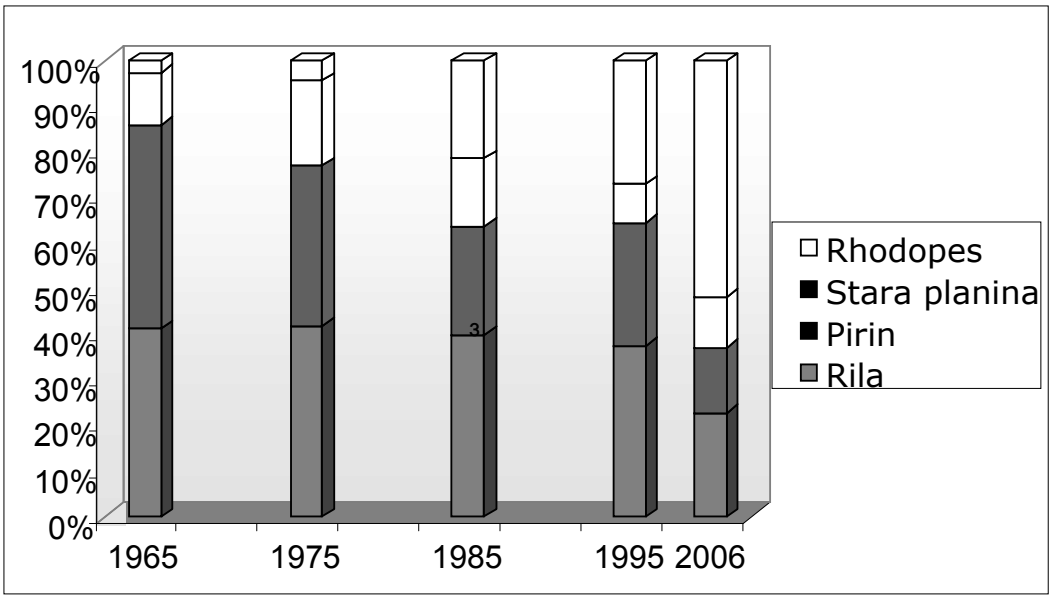
(Source SFA)



The political and socio – economic changes at the beginning of the 90ties lead to political instability, unsatisfactory control and upholding of legislation. Many well functioning hunting reserves were being destroyed due to political reasons. As a result the chamois decreased from above 270 individuals to around 100 in Stara Planina, from 400 to around 200 in Pirin and from 650 to around 300 in Rila. At the end of the 90ties the chamois density in certain ranges decreased so much that the poachers lost interest

towards it. This coincides with the establishment of the National Park Directorates, approval of their Management Plans, strengthening the guarding control etc. Even though the level of illegal hunting in the protected territories is still high, during the last 5 years a slow increase of the chamois number in the National Parks is noticed.

Figure 4. Changing the percentage correlation between the separate populations



According to the census carried out in the Rhodopes in the 90ties the chamois increased its number and its range. E.g. taking new habitats (Mugla, Shiroka Laka, area around the village of Fotinovo etc.). The reasons for that are as follows:

- Low level of poaching within the State Game-Breeding Stations where the animals settle themselves and inhabit suitable habitats outside the SGBS;
- The introduced Alpine chamois in SGBS Kormisosh;
- The fences along the Greek borders are not maintained and as a result the individuals from an artificially separated population connect again, creating a more vital subpopulation (Valchev, et al. 2005).

Due to the above mentioned reasons the population in the Rhodopes increased from 2-3 % in the 60ties of the 19th century to above 50% of the species population in Bulgaria in 2006 (figure 4).

1.2.Biology and ecology of the species

1.2.1. Feeding

The chamois show some selectivity towards its food. In the spring and the summer the diet consists mainly of grass species (62 %) found in the Alpine pastures and in the lighter forests. They use intensively the poor vegetation of reduced, rocky, steep terrains. They also feed with grass species containing toxic alkaloids (white hellebore (*Veratrum lobelianum* etc.). Coniferous such as dwarf pine (*Pinus mugo*), Norway spruce (*Picea abies*) and silver fir (*Abies alba*) are found in its diet all year long with the total of

around 4 % (Knaus and Schröder, 1975). The chamois feed on dwarf pine in spite of its unfavourable mechanical features, even in the periods with rich grass species vegetation. The chamois density and concentration depends a lot on the food availability. The regions containing their preferred food in the different seasons are also the places where the herds stay the longest during the respective season.

1.2.2. Reproduction and development

The Balkan chamois mating period is usually in November as it is determined by the day period (the decreasing day time). The introduced chamois in New Zealand mate in April and give birth in November. If fertilization does not happen during the chamois ovulation period, most often another ovulation follows, which for the chamois is a 3 weeks cycle. This is why there is a peak activity during the fertilization and intervals during littering, because the period of the pregnancy strongly varies (Knaus and Schröder, 1975).

Reaching sexual maturity depends mainly on the food, climate, density and social conditions. For populations with high density, due to the social stress the female chamois stay smaller in size (section 1.2.5). Positive correlation has also been proven between the weight and the sexual maturity (Albon, et al, 1983).

The earliest age when the females can reach sexual maturity is in their second year (over 1.5 years old) and next spring they can have young. The pregnant females in their second year are more vulnerable to diseases at the end of the winter and the spring, than those not pregnant at this age. It is found that for the Alpine countries the fertilization of females at the age of 1.5 years is extremely rare, the percentage of fertilized females at the age of 2.5 years is higher but in general it strongly varies. Even in bad conditions during their third year, almost all females take part in the mating period and after 24-26 weeks give birth. It is believed that the fertility of the females does not change until they reach 12 years of age. Littering at the age of 18 was also registered (Knaus and Schröder, 1975).

For the male chamois there is considerable difference between the sexual maturity and the participation in the reproduction period; there are even cases where spermatozoon are found in the testicles of one year old males. Increased participation in the reproduction and the fertilization of females is noticed 1-2 years later and in normal conditions it is strongly expressed after fourth years of age of the males. This also depends on the social structure of the herd.

The increased presence of older goats leads to inactivity of the younger males and to a shorter mating period. If the young males mate actively they loose weight and often cannot strengthen up and live through the winter.

The reproductive rate of the mature females (older than two years) for Switzerland and Austria is 64 – 72 % (Knaus and Schröder, 1975). When restoring chamois in suitable habitats, the growth is higher than the average (above 90 % of the mature females) and in conditions of cold winter and late snowfalls the growth could be very low. The mechanism leading to lower growth is not yet clear (for example – for red deer there are cases of abortion and for other mammals there is embryo restoration in the uterus walls). Other important condition for the growth is the survival of the newborn. For chamois in misery (in enclosures and zoos) the mortality rate is high in the period directly after birth due to weak kids, parasites etc.

1.2.3. Sex and age structure of the populations of the Balkan chamois in Bulgaria

From the 631 chamois observed during the censuses in the Rhodopes (December 2005) the sex and the age of 255 (41.06 %) was not defined. The rest of (366) chamois were determined (Table 1). On the 11 and 12 July 2006 censuses using the methodology used in December 2005 for determination the birth coefficient were organized. The observations were done in 7 routes within SGBS Izvora and 5 routes within SGBS Kormisosh. The high percentage of the not-determined animals is a disadvantage, but

very often parts of the herds or single animals are far in the forests and/or they hide away before a reliable determination of the age and the sex group is possible. Out of the determined chamois the mature females dominate (35.25 %) as their percentage is considerably higher than the one of the mature males (Table 1). Additional investigations on the exact assessment of the sex and age structure are needed. The majority of the mature females could be due to the following reasons:

- This is the first census in the Rhodopes carried out using this methodology. It is possible that there are mistakes in the assessment of the sex and the age. It is believed that the herds outside their mating period are divided in male and female, but very often in the big herds there are males determined as females by the observers.
- After the mating period the males often live in small groups or alone. Because of this it is difficult to observe them in December. Due to the rich oak fruit-bearing the males probably spend more time in the forest, feeding with acorns so that they restore quickly their weight after the end of the mating period.
- As in most cases the males are in small groups or alone, most probably the observers cannot notice them in forests or very broken terrains. Often 1-2 chamois are noticed and during long observations and/or animals moving in a herd of above 10 chamois could be seen i.e. single animals are more likely to be missed.
- The group of young females includes individuals up to three years of age and the one of young males – up to six years i.e. as early as this age there is superiority of the females which cannot be explained with the trophy hunting.
- The sex ratio of the observed undetermined animals (41 % of all chamois observed – Table 1) is not clear. Possibly there the males have superiority.
- The females live longer than the males due to the higher mortality in male. Twenty year old females are seen (24) while males older than 20 years are not found (Knaus, 1975).

Table 1. Sex and age structure of the determined in the Rhodopes chamois (December 2005)

	Total number of the observed animals	Young females	Mature females	Young males (3-6 г.)	Mature males	Old males	Kids	Yearlings	Not-determined
Number	631	28	129	28	66	0	88	27	255
% of the chamois with assessed sex and age		7.65	35.25	7.65	18.03	0.00	24.04	7.38	
% of all observed chamois		4.51	20.77	4.51	20	0.00	14.17	4.35	41.06

Figure 5. Sex and age structure of the determined chamois in the Rhodopes (December 2005)

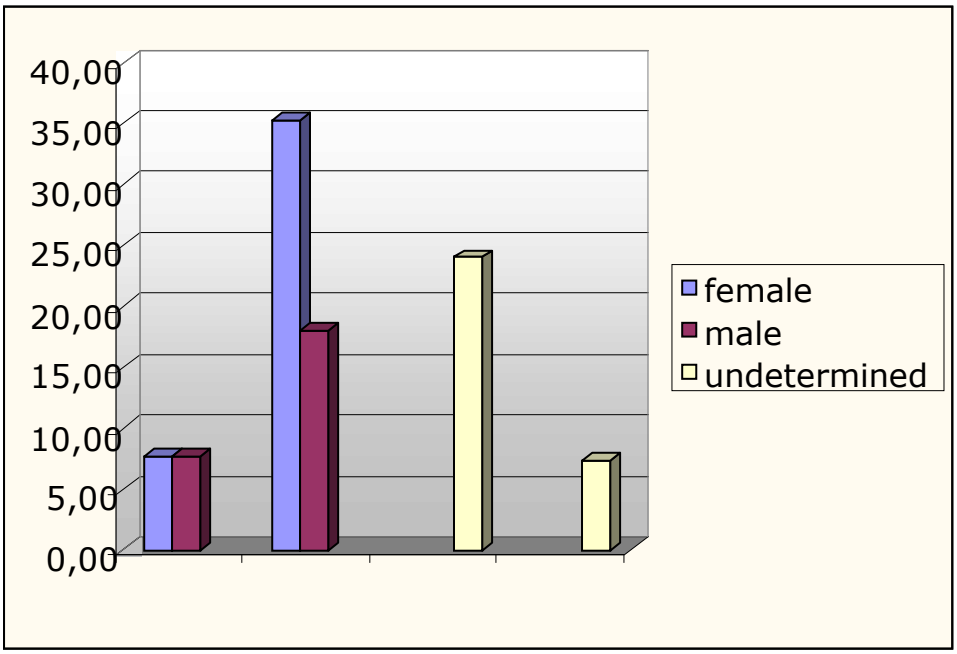


Figure 6. Age structure of all chamois observed in the Rhodopes

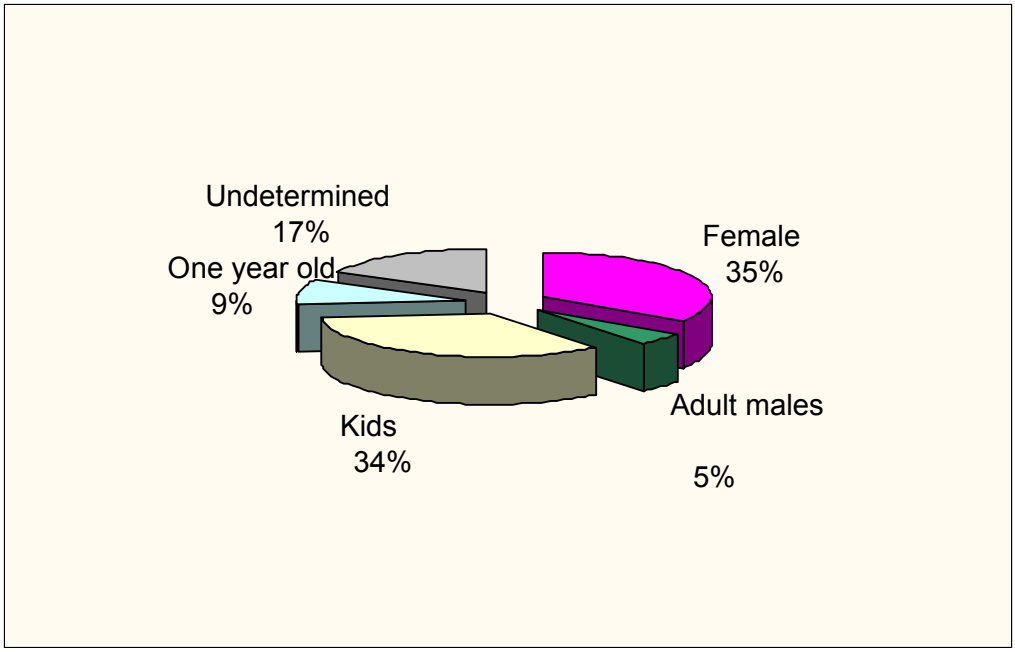


Table 2. National Parks Census

Central Balkan NP

Year / % sex and age distribution	Chamois				Total
	male	female	newborn	Not-determined	
1999	8	18	2	2	30
%	26.67%	60.00%	6.67%	6.67%	100.00%
2000	9	29	8	11	57
%	15.79%	50.88%	14.04%	19.30%	100.00%
2001	15	41	9	23	88
%	17.05%	46.59%	10.23%	26.14%	100.00%
2002	48	41	6	70	165
%	29.09%	24.85%	3.64%	42.42%	100.00%
2003	32	85	8	33	158
%	20.25%	53.80%	5.06%	20.89%	100.00%
2004	49	110	57		216
%	22.69%	50.93%	26.39%	0.00%	100.00%
2005	41	112	51	7	211
%	19.43%	53.08%	24.17%	3.32%	100.00%

Rila NP

Year / % sex and age distribution	Chamois				Total
	male	female	newborn	Not-determined	
2002	34	110	56	29	229
%	14.85%	48.03%	24.45%	12.66%	100.00%
2003	115	221	66	0	402
%	28.61%	54.98%	16.42%	0.00%	100.00%
2004	107	225	64		396
%	27.02%	56.82%	16.16%	0.00%	100.00%
2005	60	187	49	82	378
%	15.87%	49.47%	12.96%	21.69%	100.00%

Pirin NP

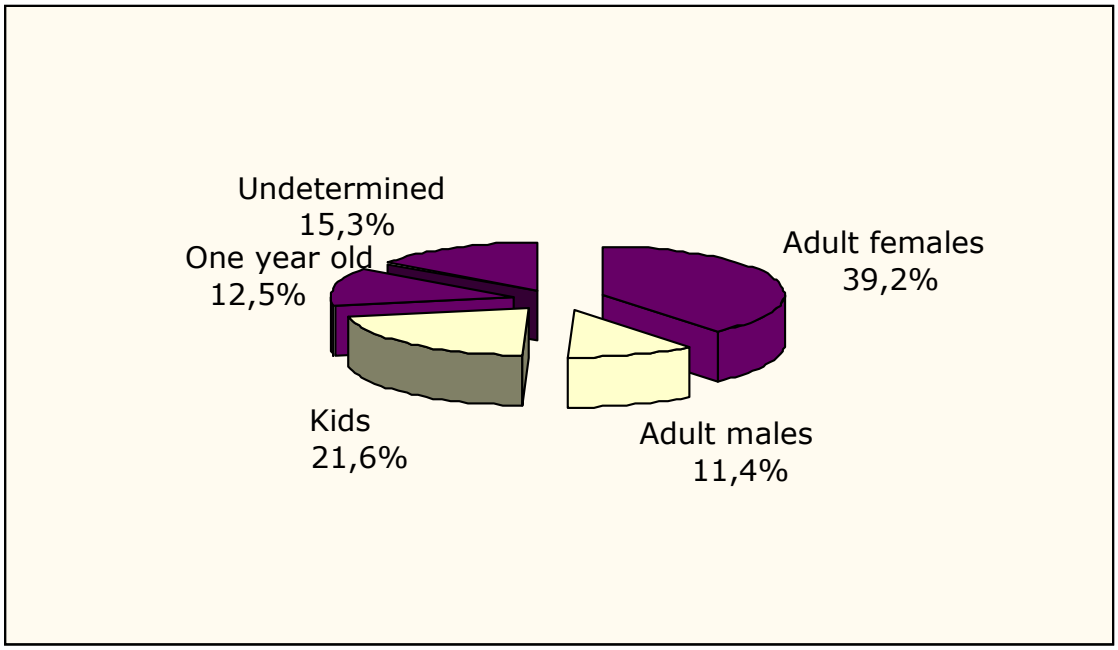
Year / % sex and age distribution	Chamois				Total
	male	female	newborn	Not-determined	
2000	67	155			222
%	30.00%	70.00%	0.00%	0.00%	100.00%
2001	83	151			234
%	35.47%	64.53%	0.00%	0.00%	100.00%
2002	85	192			277
%	30.68%	69.32%	0.00%	0.00%	100.00%
2003	86	187			273
%	31.50%	68.50%	0.00%	0.00%	100.00%
2004	76	189			265
%	28.68%	71.32%	0.00%	0.00%	100.00%
2005	52	152	72		276
%	18.88%	55.51%	26.00%	0.00%	100.00%

As can be seen from Table 2, the males within the three national parks account for around 30 % of the population. Exception is for Pirin NP where until 2004 males are around or a bit over 30 %. After that a sudden drop in the total number is noticed and the percentages of male individuals drop.

The natural sex ratio is 1:1. The disturbed sex structure could be due to selective illegal shooting or inaccurate sex determination during censuses. The percentage participation of the males is under 20% where the column "Not-determined" is filled. Not filling this column, means that either all animals were determined, which in big number of observers is practically impossible, or the forms were filled without the observers being certain in the accuracy of the assessment (more likely). In the case when there are no animals reported in the column "not-determined" the percentage of the males is higher (up to 31 %). Here too, as in the Rhodopes, it is likely that in the bigger herds with kids the mature animals are assessed only as females and the groups without newborn or single individuals – as male.

The census using the methodology and the form developed by the project team was implemented on 14 July 2006 (Annex 1).

Figure 7. Age structure of all chamois observed in Rila NP – 14 July 2006



1.2.4. Activity and migrations

From July to December the chamois spend more time in the Alpine zone than in the forests. From January till June most of the herds stay under the upper border of the forest (Lovari and Cosentino, 1986). The herds' size is changing during the year as the tendencies are for smaller herds in the winter. Also the number of animals is increasing during the warmer months. The herds are largest in June – November, with the maximum in August – September. For the Apennine chamois the herds consisting of only male or female are under 5 % as the male usually consists of 2-3 individuals and the female are bigger in number. The male aged up to 5 years rarely form "harems" during the mating period and in that time they move in "bachelor" groups or on their own (Lovari and Cosentino, 1986).

The daily activity of the chamois could be summarized easier in the summer. In the morning hours most animals graze. After that a pause follows excluding small percentage of grazing animals, the rest lay down often in the shadow and ruminates. Between the 8 and 16 hours there are 3 or 4 phases of intensive feeding, as the intensity is the highest in the morning and during the late afternoon hours. The difference is clear because the animals look for the sun in the winter and in the summer they hide away from the heat. In foggy and cloudy weather they graze longer and in the night unlike the deer (Cervidae) they are not active. There is information for grazing in full moon but such is extremely rare (Knaus and Schröder, 1975).

In the winter chamois are found in places where the snow is blown away by wind or avalanches; but usually they are found in such places in quiet days (with light wind).

The places chosen by the chamois in quiet and windy days are very different. This also goes for the forest areas. Obviously to prevent energy loss from cool down by wind, windy places with more accessible food are not visited. This leads to chamois concentration in quiet places but with worse food base. Except for the food, main factor for choosing the habitat is the temperature regime. In the winter they prefer warm and sunny places and in the summer – windy and shadowy ones.

The seasonal vertical movements in the Alps are bigger than the horizontal.

In heavier winters wider movements are registered.

1.2.5. Intraspecies interactions

The chamois are gregarious species. The chamois herd change in structure and size not just during the different seasons but also during the day.

The older female in the herd have clearly expressed hierarchy and higher ranks (dominating) while the young (1-3 years old) are subordinates. During feeding the older females can attack the younger especially the ones not fast enough to run away when the dominating approach. This creates the so called "social stress" within the herds. It is reported that the younger female eat less food than the older female because of the fact that they raise their heads more often and do smaller number of biting per minute, even in the alpine pastures where predator attacks are extremely rare (Lovari, S., G. Rosto, 1985). In populations with higher density and larger in size, in herds the level of social stress is higher. Because of this the young female from this populations are more apt to migrations compared to the populations having lower density (Lovari and Rosto, 1985). In addition the average weight of female yearling in populations with lower density is a lot higher than the weight of the same in denser populations (Bauer, 1985).

1.2.6. Interspecies interactions

1.2.6.1. Predators influence

The chamois are the best adapted animals to steep and rocky terrains among all ungulate mammals. Their herd way of living and the skilful use of the terrain help them to successfully protect from predators. In Bulgaria the native chamois predators are grey wolf, bear, wild cat, fox, golden eagle and feral dogs.

- **Grey wolf (*Canis lupus*) –** according to Michailov (1999), the losses caused by wolves in Rila NP do not exceed 5-7 % even where the wolf density is reasonably high. Victims are most often kids and yearlings but this is a natural process and the losses are insignificant.
- **Feral dogs –** there are no studies on the influence of feral dogs. They are especially dangerous in areas close to settlements, dumpsites, chalets etc. where they concentrate. The savage packs do organized hunting similar to wolves. Such a case was observed on 14 November 2005 in Gerzovitsa locality, not far from Smolyan and the town dumpsite. After checking the terrain, the dogs separated – one of them chased the chamois barking and the rest were waiting in ambush. When a female with a kid approached the ambush two of the dogs attacked without barking as they shortened the distance to the kid to under 10 m. Unlike the wolves the dogs find additional food within the settlements. So the feral dogs can afford regular chasing of chamois even with no success. The regular chasing by dogs could lead to insufficient food intake for the chamois as well as fatigue of the animals which make them more vulnerable towards diseases and to attacks by other predators. It could also lead to permanent abandonment of suitable habitats.
- **Golden eagle (*Aquila chrysaetos*)**. The rare observations of newborn successfully hunted by golden eagle, create the impression with hunters for success. But such cases most likely are rare and it can not be said that they influence the chamois population. The kid often looks for protection between the legs of its mother and the steep rocky terrains and cracks decrease the chance for success for the eagle. The eagle also feeds with carrion, which is why it is possible some of the food lefts found in the nests are from dead chamois (K. Andonov – found skull of a kid in a golden eagle nest in Rila NP, unpublished data).
- The death caused by **bear, fox and wild cat** is extremely rare and it is not important for the population growth (Knaus and Schröder, 1975).

1.2.6.2. Rival herbivorous species

In the National Parks the chamois do not have rivals among the rest of the wild ungulate species, as their habitats include mainly the alpine and the sub-alpine part of the mountains where the density of the rest of the ungulates is low and the competition is insignificant, so it is not an important factor. Mainly in the winter season chamois enter the forest ecosystems where competition with roe deer, wild boar and red deer is possible.

The studied rumens of chamois, red deer and roe deer show that the red deer has the widest food niche followed by the chamois. The roe deer is a lot more selective and its food niche is a lot narrower. The diets of roe deer and chamois overlap to a great extend, while the diet of the roe deer differ from this of the two species in the summer. The plant species used for food by the red deer and the chamois in the autumn and in the winter overlap to a great extends (Schröder and Schröder, 1984). In the Rhodopes, competition between red deer and chamois is possible in areas close to the rocky massifs. The intensely year around feeding of wild boar within the chamois habitats, leads to high concentration of the species and they often disturb the chamois. In the other parts of the country the density of the wild ungulate is a lot lower than the optimal and rival interactions do not occur.

1.2.7. Requirements of the conditions of the environment

1.2.7.1. Average annual and monthly temperatures and precipitations in the typical chamois habitats

The mountains of the Rila – Rhodopians massive are situated on the border between the moderate continental and the transitional Mediterranean climate. The climate is influenced by elements of the relief – the vertical segmentation, exposure, altitude. The diverse vertical segmentation (forms and orientation of the valleys, the barriers between them) influences the circulation of the air currents and through them the temperatures, the winds and the precipitations.

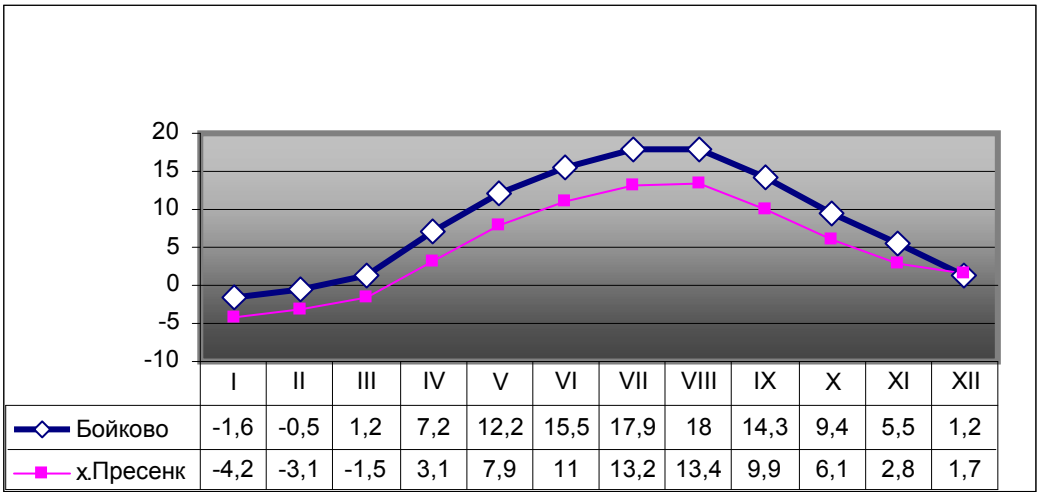
Table 3. Average annual temperatures (Rila)

Station, altitude	Average temperature January, °C	Average temperature July, °C	Annual temperature amplitude, °C	Average annual temperature, °C
Musala Peak 2925 м	-10.90	5.10	17.10	-3.00
Musala chalet 2390 м	-7.30	8.60	16.60	0.50
Sitnyakovo 1740 м	-4.40	13.10	17.50	4.30
Borovets 1340 м	-4.40	15.30	19.70	5.40

For characterising the Rhodopes climate region data from the meteorological station (MS) at Persenk chalet (1750 m), MS at Boikovo village (1100 m) and MS Manastir village is used.

In Figure 8 the differences of the temperature regime in the different zones can be seen. In the low regions the average annual temperature is 8.4 ºC while in the high regions it is 4.7 ºC.

Figure 8. Dynamics of the average monthly temperatures in ºC



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
Бойково	-1,6	-0,5	1,2	7,2	12,2	15,5	17,9	18	14,3	9,4	5,5	1,2
х.Пресенк	-4,2	-3,1	-1,5	3,1	7,9	11	13,2	13,4	9,9	6,1	2,8	1,7

1.2.7.2. Dynamics of the snowfalls (in days for the different months) and duration of the snow cover detention

Long lasting formation of snow cover in the low zones of Rila NP is seen after 10-15 December for the northern slopes and 20-30 December for the southern ones. On average the snow cover in the Park lasts for 200-220 days. The average monthly maximum snow cover thickness for the low zone is in February and it reaches 20-30 cm and for the high zone (above 2000 m) – in March, reaches 70-80 cm. In the highest parts of the Park the maximum snow cover thickness reaches 200-240 cm and most often is seen at the end of March. The first long-lasting snow cover at around 2400 m is formed in the beginning of October. The average duration of the period with long-lasting snow cover is 70-80 days for altitude of 1 200 – 1 300 m and it reaches up to 180-200 days for altitude of above 2 000 m. For altitude of above 1 200 m long-lasting snow cover is formed each winter. The snows melting in the high parts starts in the mid April and it can end as late as June. The drifted snow on the bottoms of the circuses melts at the end of July and ice blocks in the lakes can be seen even in August.

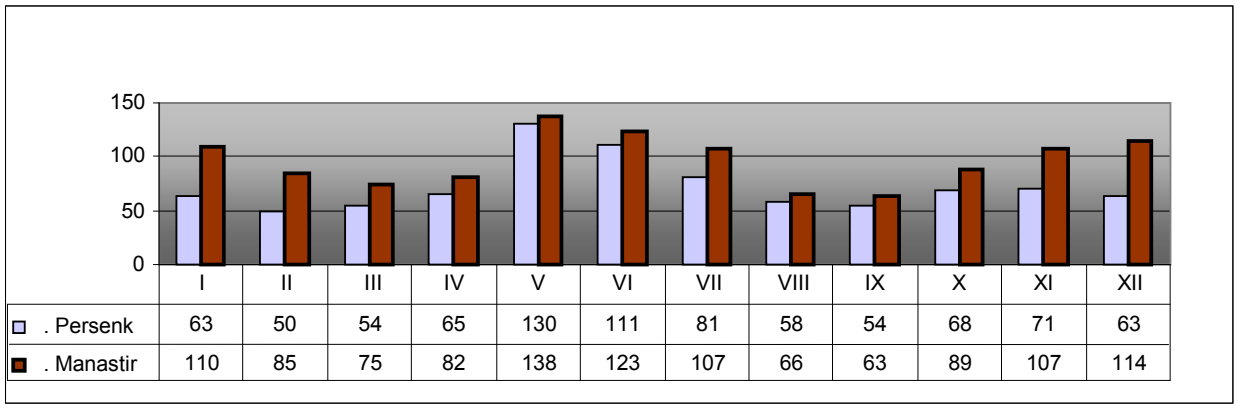
In the Rhodopes in average the date of the first snow cover is 30 November and the date for snow cover melting is 1 April. The average duration of the long-lasting snow cover is 118 days. The average snow cover height is from 5 to 0 cm with its maximum in January when the maximum snow cover height reaches 80 cm.

The annual amount of precipitations increases with the increase of altitude to 2300-2400 m and above this border the precipitations show tendencies of decrease. For the high parts the average annual precipitation amount is within the boundaries of 1051-1200 mm (within the chamois habitats), while for the lower parts it is 700-800 mm. The precipitations distribution during the year is uneven. In the winter the precipitations on the northern slopes of the Rila – Rhodopian massif are less than in the southern slopes where they reach up to 22-25 % of the annual norm.

Table 4. Annual precipitations in Rila NP

Station	Altitude, м	Precipitations, mm
Borovets	1340	929
Sitnyakovo	1500	977
Musala Peak	2925	1193

Figure 9. Average annual amounts of the precipitations in the Rhodopes, in mm



	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII
. Persenk	63	50	54	65	130	111	81	58	54	68	71	63
. Manastir	110	85	75	82	138	123	107	66	63	89	107	114

In Stara planina the precipitations increase with the higher altitude and usually they reach 1 200 mm/year as they are heavier in the northern slopes. The highest average annual amount of the precipitations for the country is reported within the Park regions – 1360 mm/year (Ambaritsa chalet). The southern slopes are left in a precipitation shadow and the average amount there is around 550 mm/year. The maximum precipitations are in July and the minimum is in February. The winter precipitations consist mainly of snow. The snow cover lasts for around 6 months. Avalanches are often seen and they occur mainly in the diapason between 1 500 and 2 200 m, most in the treeless zone.

1.2.7.3. Other key abiotic and biotic conditions of the preferred habitats

The main prerequisite for the chamois habitats is the availability of steep slopes in the alpine zone and in the zone below the upper border of the forest. The species has a wide food spectrum which together with other anatomic and physiologic adaptations, allow them to survive in different habitat conditions. Balkan chamois in Bulgaria are seen from around 600 m (Krichim FU) to 2 900 m. Chamois were introduced around Kaliakra Cape (D. Nankinov, I. Hristov, verbal reports). The Cantabrian chamois inhabits complexes close to sea level in Northern Spain.

2. THREATS AND LIMITING FACTORS

2.1.Limiting factors of natural character

2.1.1. Climate factors and calamities - snow, avalanches

Chamois are adapted to stand severe cold winter condition in the high mountain parts but sometimes they become victim of harsh colds, deep snow, avalanches and snow slides. For the adults the mortality in the winter is an average of around 10 %. Most of the losses are among the newborn during their first winter (it is possible that losses reach 30 – 40 %).

The most common reasons for the winter mortality are low quality food and bad accessibility to food under the snow cover when the chamois cannot satisfy their energy needs. When loosing weight animals are more vulnerable towards influences of parasites and diseases. In higher density the percentage of the winter losses is higher.

The number of days with snow cover does not have such an influence on the winter losses as the thickness of the snow cover does. Considering the age mainly newborn and yearlings die, followed by male. Females have lesser losses.

One of the reasons for the higher losses of male is the loss of weight during the mating period (Knaus and Schröder, 1975).

Importance: insignificant / local

2.1.2. Predators

2.1.2.1. Natural predators

The natural chamois predators in Bulgaria are grey wolf, bear, wild cat, red fox and golden eagle. The losses from grey wolves in Rila do not exceed 5-7 % even where the wolf density is relatively high. Victims are mainly kids and one year olds and in this natural process the losses are insignificant. The successful hunting of other predators is rather accidental and rare. The influence of all predators is insignificant and it does not play an important or unfavourable role on the populations (section 1.2.6.1).

Importance: insignificant / local

2.1.2.2. Dogs

Significantly more unfavourable could be the influence of the feral dogs that find food in areas close to settlements, dumpsites, chalets etc. They can regularly and for a long time disturb (chase) chamois even with no success. As a result many habitats close to settlements, chalets and dumpsites are left uninhabited or have a low density (section 1.2.6.1).

High number of shepherd dogs especially without fetter rods (equipment stopping them from running too fast), do often disturb and hunt successfully chamois kids. At places with intensive grazing this could lead to extinction of suitable habitats.

Importance: significant / everywhere

2.1.3. Competition with other ungulates

The ungulates found naturally in the chamois habitats are roe deer and red deer. The roe deer is selective species and it has another food niche (section 1.2.6.2). To a great extend the red deer diet overlaps with the chamois but both red deer and roe deer have lower densities in the chamois habitats. Competition with red deer could be possible only where the density of the two species is high, but there are no data for a strong negative influence.

In intensive feeding and concentration of wild boar within the chamois habitats, the wild boar regularly disturbs the chamois.

Importance: insignificant / local

2.1.4. Infectious and parasites diseases

In Western Europe infections of conjunctivitis among the chamois are often found. Despite the high frequency of its distribution the populations restore successfully after the outbreak. All prophylactic and preventive methods tried showed to be not useful. The disease appeared comparatively soon and the epidemics are also typical for small isolated populations. The respiratory system epidemics (complex pneumonia) are relatively common; they are also important pathogenic factor for describing the populations' dynamics.

Studies on the chamois diseases in Bulgaria and the parasitozes in particular have not been made or are poor (Tyufekchiev, 1978).

According to Dr. Ivan Todev (unpublished data) in National Research Station of Wildlife Management, Biology and Pathology faecal samples were examined and partly helminthological autopsy of organs of single shot animals were done.

For the period 1998 – 2006 samples of 43 chamois and organs – liver, lungs and oesophagus of 21 animals were examined.

Table 5. Reported invasion in the chamois on the base of studied samples for the period 1998 – 2006

Parasites invasion	Number of the examined animals	Number of the invaded	Extensity of the invasion, %
Gastric-intestinal strongilate	43	26	60.47
Nematodirus sp.	43	7	16.28
Protostrongylidae	43	24	55.81
Dictyocaulus sp.	43	1	2.33
Gongylonema pulchrum	43	9	20.93
Trichuris sp.	43	1	2.33
Fasciola hepatica	43	1	2.33
Eimeria sp.	43	5	11.63

From Table 5 can be seen that the gastrointestinal strongilates have the highest percentage. The cultivation of trichstrongylid larvae proves the availability of representatives of the genus Haemonchus, Chabertia, Ostertagia, Nematodirus. The lung strongilates are presented by nematodes from Protostrongylidae (55.71 %) from the Neostrongylus, Muellerius, Varestrongylus and Dictyocaulidae (2.33 %) - Dictyocaulus.

The nematode eggs of *Trichuris* sp. and *Fasciola hepatica* are found only in single samples.

In the parasites autopsy of internal organs, invasion of Gongylonema pulchrum was found in five chamois oesophaguses as the intensity of the invasion is from 1 to 10 specimens. In the liver of the two chamois echinococcosis larva form (*Echinoccocus granulosus* larvae) and one case of *Dicrocoelium dendriticum* were found.

Parasitism is a widely distributed biological phenomena in nature. The game health condition for chamois, is influenced mainly by the intensity of the invasion (number of parasites in one animal) which hasn't been examined in the present study. The high intensity plays a negative influence mainly in the young and in females that have recently littered.

Importance: medium / everywhere

2.2.Limiting factors of anthropogenic character

2.2.1. Changing the habitats

2.2.1.1. Construction of ski tracks and equipments

The construction of ski tracks, including forest cutting and their maintenance, as well as the construction of the servicing equipments (ski lifts) leads to habitats degradation for chamois. These activities push the herds to regions unsuitable for them and lead to fragmentation and isolation of the separate habitats, destroying the chamois food base, changing the landscape and loss of places for shelter and hiding. The ski tracks used in

winter and the access roads give for the rest of the year a convenient access for poachers to the chamois habitats.

The ski tracks and equipments construction in the region of Stara Planina caused the degradation of many of the typical chamois habitats. In order to determine to what extend the chamois population is affected, the trends in the distribution and the number of the species before and after the constructions should be followed. Despite the fact that the territory of Rila NP is not part of the project, the realization of "Super Borovets" Project will add to the degradation of the chamois winter habitats. The implementation of "Panichishte – Kabul – Sedemte ezera" Project will have similar effect, as well as the development of the Semkovo resort as a ski centre in Rila. This will lead to the complete degradation of parts of the chamois habitats, isolating the regions and making it impossible to increase the number and distribution of the already small population. Future plans for ski centres also endanger the Stara Planina population.

Importance: significant / potential

2.2.1.2. Changing the grass composition and the aspect of the grassland communities

The succession changes of the grass composition are a proven fact that hasn't been studied enough. In the past numerous herds of the grazing wild and domestic animals were determining the development of specific plant species and vegetation communities. Nowadays the number of the grazing animals is very low compared to the past which leads to increased succession and overgrowing of the pastures.

Importance: significant / potential

2.2.2. Direct destroying of the species

2.2.2.1. Poaching

Chamois adapts excellently towards survival from predators by climbing on very steep and rocky slopes. Very often chamois allow the predator (including the people) to come close because they feel safe on the rocky complexes. These adaptations however are not effective for protection from long – range rifles. In open rocky places they can be seen from far away and it is relatively easy to stalk them. Because of this, even just one poacher familiar with the terrain and the animals' habits can easily kill a high number of the chamois in the region, while the rest will leave the area due to regular disturbance.

Despite the hunting prohibitions within the National Parks the poaching still exists. According to Michailov (1999) poaching happens all year long in almost all chamois habitats in Rila NP, even on the territories of the four reserves where the species is permanently or temporarily found. Chamois are illegally chased and shot by legal hunters as well as by people working on the Park's territory using legal or illegal weapons. The poaching not only does not allow increase in number but it also aggravates the population structure, disturbs the herds and chases the chamois away from their wintering and reproduction places. Disturbing are also the reported cases of hunting done by the chalet hosts and staff from the spheres of tourism, sport and guarding, employees of Beli Iskar Dam, Treshtenik, Panichishte, Borovets, Belmeken Sport base etc., using even machine rifles. The studies show that the reported losses and decrease in number are the result of illegal hunting. This was established during terrain observations and by the gathered questionnaires data in the period 1997 – 1998. In September, October and the beginning of November when 30 person days of observations in the chamois habitats in the alpine zone were carried out, 20 separate shootings using rifle were reported (heard). If we assume that every second shooting was accurate this means that over 10 chamois were killed or wounded in a rather small area.

In the last years the work of the National Park staff, the increased guarding measures, the imposed sanctions for the violators caught and the lower success of the

poachers due to the lower chamois density in the accessible places, have decreased the poaching level compared to the period 1989 – 1998.

The political instability in the country, the lack of interest or the inability to manage the species have lead to increase of illegal hunting and regular disturbance. As a result in many habitats the chamois density has decreased and some areas are left uninhabited even within the protected areas. This leads to increase of fragmentation of populations, higher level of inbreeding and thus to lower vitality of individuals and populations and more vulnerable to diseases, epidemics, natural disasters, predators etc.

The reasons for poaching are the meat, trophies, illegal hunting tourism etc. Because of these reasons the illegal hunters will be divided in the following groups:

2.2.2.2. Regular hunters during regular hunting on other species

Within the given hunting regions where chamois are found and in regions bordering SGBS, chamois are often illegally shot during hunting for other game species (wild boar or predators). For example, in Izvora SGBS, close to the boundary managed by the local hunting association, five of the legally hunted chamois pellets from smooth barrel rifle were found (on the territory of Izvora SGBS hunting chamois with smooth barrel gun is not allowed). Similar are the problems of Chepino SGBS and other SGBS. In Smolyan FU on 26 November 2005 during drive hunt of wild boar a male chamois was illegally shot. In unofficial conversations in the Rhodopes region and around the NP, most hunters confirm that during the regular hunting of other species, chamois are also illegally hunted.

Importance: significant / everywhere

2.2.2.3. Local people

The local people know best the habits of the animals, the region and the guarding and control system. There are cases of chamois poaching by regular hunters as well as by local people who are not hunters. The latter hunt using illegal weapons and/or snares.

There is a case of annual shooting of around 30 chamois in Rila NP by two local people – confirmed by independent source from Kostenets village. There are cases of illegal hunting on chamois using dogs – beagles in the region of the Central Rila slope in Grohod locality – Strazhnik peak on the border of Borovets FU and Yakoruda FU (confirmed by eng. Dzhambazki from Beglika FU). Undoubtedly illegal hunting is also done by legal hunters (Mihailov, 1999).

Importance: significant / everywhere

2.2.2.4. Administration staff and chalet hosts

The data from the questionnaires filled in by the foresters and the chalet hosts (who specially asked for anonymity) confirm the assumptions for poaching done by the guards of Belmeken Dam. Another category of illegal hunters (most often using illegal weapons) are the chalet hosts and the administration staff – Sport base Belmeken, holiday homes etc. (Mihailov, 1999). The host of Belmeken chalet has even made special food offers, including chamois specialties. There is similar information for other national parks. Poaching is the main reason for the considerable decrease of numbers and human induced changes in the chamois sex and age structure within the national parks during the last 15 years (Mihailov, 1999).

The administration staff working close to the chamois habitats can comparatively easy and regularly also be part in poaching.

Importance: significant / everywhere

2.2.2.5. Authorities and "businessmen" from powerful groups

Many of the cases when state authorities staff (Ministry of Internal Affairs, Ministry of Defence etc.) and/or representatives of the "shady" business, hunt illegally on chamois during hunting on other game species. This also occurs during group hunting or hunting with guides outside the hunting season and within protected territories. Except the direct illegal killing of chamois and other rare game species (bear, capercaillie etc.), this and similar behaviour de-motivates the local people to manage the game within the given hunting regions according to the legislation base, the forestry management projects and plans. This leads to increase of poaching from the local people and makes it even more difficult to solve the poaching problem. In small settlements where people know each other as relatives and/or friends it is almost impossible to give a penal decree for illegal hunting for a local resident, given that authority staff or an influential businessman can do as they like, without any penalty. This encourages more people to hunt illegally and de-motivates the staff of SFA and MOEW to follow their obligations.

Importance: significant / everywhere

2.2.2.6. Illegal hunting tourism

Illegal hunting tourism is most often organized in the National Parks. In most cases the guides are local people who take friends and/or state authorities' staff and influential businessmen without charging them money but there is also information for organizing hunting for payments. According to the local people from the surrounding of Rila NP, chamois hunting in the park could be organized for around 300 BGL for a chamois and this is only if the hunting is successful. Illegal hunting in Rila NP was advertised in 2003 on an internet home page of a safari club (in English) offering dumping prices.

Not rare are the cases of organized inroads of poachers even from Sofia – staff of MIA and MoD accompanied by local guides – according to the questionnaires filed by hunters from Kostenets, Raduil and Govedartsi villages (also asked for anonymity). Obviously the main factor that has lead to the decrease of chamois number and the destroying of the population structure in Rila NP as well as in the rest of the NP's was the organized (offered by local guides) illegal hunting during the period 1989 – 1998 (Mihailov, 1999).

Importance: significant / everywhere

2.2.2.7. Trophy hunting

It is a popular practice in public places (restaurants, taverns etc.) to exhibit trophies of game and protected species. This way a niche on the market for chamois trophies and hides is created. This is an additional motivation for the local hunters who know the chamois habitats well and their typical characteristics. As a result this could lead to complete species extinction within some habitats.

Importance: significant / local

2.2.3. Changing the status and discontinuing the economic use of the species

According to the changes in the Biodiversity Act (SG, issue 88 from 4 August 2005) the chamois hunting will be prohibited from the official EU accession date. Full prohibition of the chamois hunting would lead to loss of interest towards the species by the structures of HAA and SFA, increasing the illegal hunting and habitats degradation as well as to lacking motivation for future reintroductions in suitable habitats. In the National Parks the chamois number halved until the end of the 90ties in comparison to the end of the 80ties of the 20th century. In the Rhodopes where the species is more vulnerable, the

population is stable and during the same period increase in number and range is noticed (Figure 5). One of the main reasons for this increase is the better control and as a result – the decrease of poaching (section 1.1.3).

Despite the full prohibition of chamois hunting in Greece and many uninhabited suitable habitats, the species has not increased their number and range in the last twenty years. There is no reason to believe that in Bulgaria it would happen differently. On the contrary, this would lead to decrease in chamois number and density within the SGBS and around them and would have many negative consequences on the long-term survival of the subspecies outside the protected territories.

There are many examples where managed and sensible harvesting has a positive influence on the populations. One of the rarest chamois subspecies (*Rupicapra rupicapra cartusiana*), distributed in the limestone massive Chartreuse, France in 1985 reached its minimum size of 157 individuals with range of around 6 000 ha (Roucher, 1999). After involving the local hunters, popularization of the problem among them and signing an agreement for managing the whole population on the territories of 22 hunting societies, measures for restoration of the species were introduced. The hunting was stopped until 1990 (till reaching the minimal permissible stock). Harvesting started again in 1990 at a 2 % rate increasing to 4% in 1997. The result is an increase in the population to ≥ 770 in 1997 and also the range has increased to 28 000 ha (Roucher, 1999).

Importance: significant / everywhere

2.2.4. Disturbance of the species

Some human activities have negative influence without directly destroying chamois habitats. The regular disturbance pushes the species out from many suitable habitats. Such are the tourist over-activity, construction of new roads, cutting the forests etc., especially if the region has hunting during the whole year.

According to Knaus and Schröder (1975), chamois, if they are not hunted get used to noisy places and feel safe there. A herd of 9 – 11 chamois was observed during the census at no more than 200 meters above the industrial zone of the town of Devin.

The popular practice of extreme skiing could have very unfavourable consequences. The running of the animal in conditions of thick snow, requiring a lot of strength during a time with negative energy balance, has a high impact and could cause death. Many skiers do not know about these consequences.

The intensive tourist flow in some of the chamois habitats and the presence of herbs and mushrooms collectors are other factors indirectly influencing the population status. The constant disturbance during the wintering, the reproduction and even during the mating period, stresses the chamois. Their day as well as their seasonal rhythm of activity is disturbed (feeding, resting, migrating). In spite of available good habitats conditions – food/ protection , if these are unreachable, chamois are forced to spend more time in regions with lesser conditions.

*Importance***:** medium / potential

2.2.5. Diseases and parasites connected to livestock-breeding

In natural conditions parasites have low effect on the population of their host, but this is not so when a parasite "jumps" from one host to another (Caughley & Sinclair, 1994). Then most often pathogens are transmitted from domestic to wild animals. Through them they are transmitted from one isolated geographic region to another.

Most often cases of parasitical and bacterial diseases in chamois in Europe are caused by the so called pneumonia complex (dictyocaulosis, pasteurellosis), scab (*Sarcoptes rupicaprae*) and conjunctivitis (most often *Mycoplasma conjuctivae*), (Giacometti et al, 1997). Four cases of positive samples for Q – fever which is transmitted from domestic animals were found. The conjunctivitis and the scab are transmitted to chamois from domestic animals (Festa-Bianchet, 2002). Due to the

chamois migrations – seasonal migrations, searching for food or during the breeding period etc. the infections (for example the scab) can be transmitted to far away from the places where the contact with the domestic animals has been. Most often the infection is transmitted when males move to different groups of females in the mating period (Festa-Bianchet, 2002).

Some investigations on the endoparasites for chamois in Bulgaria has Tyufekchiev (1978), where the availability of family *Trichostrongylidae* from genus *Ostertagia* and *Nematodirus* in different level of invasion, family *Protostrongylidae* from genus *Protostrongylus* and *Cystocaulus*, *Trichuris ovis,* taenias and the big liver–rot *Fasciola hepatica* are found*. C*hamois suffers many diseases found in domestic animals such as *Fasciolosis* (rot),*Echinococcosis*, *Brucellosis*, *Dictyocaulosis*.

Importance: significant / potential

2.2.6. Competition with domestic livestock

As serious threat for the Apennines chamois Lovari (1997) shows the competition for pastures with domestic stock and especially domestic goat.

The grazing is the second important factor changing the chamois habitats. The over-grazing could be a reason for decrease of the food base and the presence of dogs and herdsmen concentrates the chamois in the most unreachable and poor grazing regions, as this leads to higher social stress. This is why the permissible number of grazing domestic stock is determined annually with the preparation of the Annual Plan on grazing and hay use, consistent with the Parks Management Plans and the forestry management plans. The data analyses show that on the territory of Rila NP, grazing is only 3 to 5 % of the actual permissible number of domestic stock, which is decreasing every year. Similar in Central Balkan NP during the last 40 – 50 years due to social – economic reasons the number of grazing animals in the high-mountain treeless zone has drastically decreased. At present grazing domestic animals are no rivals of the chamois within the National Parks.

For Bulgaria this threat exists only close to the settlements.

Importance: insignificant / potential

2.2.7. Fragmentation

Fragmentation of ranges and populations leads to a decreasing sustainability (resistance) towards diseases, as a result of aggravated inbreeding. As a result diversion from the periodicity of mating and birth, including immature animals in the mating period, unbalanced sex and age structure, weakening of vitality and reproductive abilities of the species etc. could be registered. In small and isolated populations this could lead to chamois extinction. Actually the chamois populations in Rila, Pirin, Tsentralen Balkan and West Rhodopes do not interact i.e. there are no natural corridors. Since no genetic investigations on animals from separate populations found in Bulgaria have been made, the need of implementing a "blood refreshment" procedure can not be determined.

Besides the isolations between separate populations, another influencing factor is the internal disunion of a local population – presence of some groups inhabiting habitats away from the main core. This may cause difficulties for direct and free interaction between the animals from the different local groups.

Main factors causing isolation by fragmentation of the range are:

- Construction of ski tracks and equipments, intensive tourist pressure on the main tourist routes;

- Construction and building of roads, increased urbanization in certain regions, building of hydro power-plants and micro Hydro-Power Stations and servicing

roads. The infrastructure and equipments leads not only to loss of suitable habitats and direct disturbance but it also makes easy access possible for e.g. poaching.

Importance: significant / potential

2.2.8. Hybridization with the introduced Alpine chamois

In 1977 in Kormisosh State hunting reserve chamois from Switzerland were introduced (Spiridonov and Genov, 1997; Bedrov, 1999 etc.). According to Bedrov (1999) 15 female and 1 male chamois were introduced and in 1978 two male from Devin were transported but one of them died. According to Genov and Massei (1989) eight chamois were imported from Austria and later 2 male were transported from the Devin population. In accordance with an official letter from RFB Plovdiv to SFA (Ref. No LR 3 March from 20 January 2006) , in 1978 eleven female and two male chamois were imported from Switzerland. Due to sterility of the introduced male chamois (from Switzerland), 2 male from Devin breeding farm and 1 from Rila (Sara giol locality) were transported. Although there are some differences in the data, it is a fact that at the end of the 70ties one group of 13-15 chamois from the alpine subspecies with domination of the female were introduced.

In the 30ties of the 20th century chamois were hunted in Chervenata stena locality (Lovets magazine, 1936) and in a letter for "establishing new forest reserves, sites Karamush, Laki" (State archive Smolyan, fund 951, inventory No 2, archive 62) it is mentioned that the region is inhabited by chamois. According to old hunters and staff of SFA from the region, before the introduction in 1977, chamois were found only in the region of Chervenata stena and around Sushitsa River. Even though having low number and possibly low heterozygosis the Balkan subspecies was found here before the reintroduction. Male animals from the Rhodopes and Rila were also transported. As a result the two subspecies created hybrid and more vital population with higher genetic diversity, reaching 230 – 250 animals in 1994 (Bedrov, 1999). The census from 13 December 2005 confirmed the presence of 220-300 chamois in Kormisosh SGBS and the neighbouring territories as in the last years the chamois take new habitats within the breeding station and neighbouring forestry units. This population cannot be accepted as isolated and exchange of animals (probably young vagrants) was surely made. Twenty chamois were reported in the neighbouring Kormisosh Breeding station Hvoina FU (State archive Smolyan, fund 854, inventory No 2, archive 9). The locality within Hvoina FU is about 30 km west of the Kormisosh locality and approximately at the same distance from the Devin one. If it was completely isolated it was probably not going to survive by now as its number is under the biological minimum (inbreeding etc.).

Additional studies are needed in order to find out what is the extend of hybridization with the alpine subspecies of the Laki population and the rest of the Rhodopes subpopulations. The two subspecies are divided based on differences in the teeth line on the upper jaw and the horn characteristics (Kryštufek et al., 1997). The studies should include craniometrical measures and DNA analyses.

Importance: significant / local

3. NATURE CONSERVATION STATUS, TAKEN MEASURES ON MANAGEMENT AND CONSERVATION OF THE SPECIES AND THE INHABITED TERRITORIES AND HABITATS

3.1. Legal status

3.1.1. National legislation

After the Biodiversity Act changes (SG, issue 88 from 4 November 2005) the Balkan chamois is included in Annex 2 and Annex 3 of the Act. In accordance to Article 38 (1) for the animal species from Annex 3 are prohibited:

1. All forms of deliberate animal catching or killing using any equipment, means and methods;
2. Chasing and disturbing, especially during the breeding periods, raising the kids, wintering and migration;
5. Taking found dead animals;
6. Possessing, transferring, transportation, export, trading and offering for sale or exchange of animals taken from nature;
7. Taxidermy, possessing, exhibiting in public, transferring, transportation, exportation, trading and offering for sale or exchange of stuffed animals;

According to Article 75 of the Biodiversity Act "The prohibitions from Article 38 for the chamois species and European wild cat start to operate with the operation of the Accession Agreement of Republic of Bulgaria to the European Union – 1 January 2007".

The species is included in the Red Book of the Republic of Bulgaria under the category "threatened".

According to the present legislation the chamois is a hunting species from Annex 1 of the Hunting and Game Conservation Act. The hunting within the National Parks is prohibited.

In accordance to Article 74 of the Regulation of Implementation of Hunting and Game Conservation Act the hunting of **chamois,** alpine ibex, Tibetan yak and capercaillie is done as organized hunting tourism or with scientific purpose with permission issued by the director of the State Forest Agency.

3.1.2. International legislation

The Balkan chamois is included in Annex 2 of the European Directive on the habitats conservation (Directive 92/43) which requires strict protection of the species and the designation of territories with special regime of protection (the Natura 2000 network), and also in Annex 4 – plant and animal species of community importance requiring strict protection.

Included in Annex 3 of the Bern Convention ratified by Bulgaria on 25 January 1991, operating since 1 May 1991, update SG, issue 23 from 10 March 1995.

3.2.Conservation and management of the species population in the country

3.2.1. Institutional responsibilities on the chamois conservation and management in Bulgaria

3.1.1.1. National Parks and Reserves

In spite of the wide territories, considering the large mammals' populations within the National Parks, conditions for functioning of completely independent, natural, self-dependent systems do not exist. All living plant and animal species found on the territory of the National Parks are subject to conservation, no matter whether it is protected species or not. The chamois is among them. The Parks are divided into a certain number of park regions each of which is divided to a number of guarding sections. Each guarding section is guarded by one employee - "Park guarding and control". The hunting is absolutely prohibited within the National Parks and any such act is recognized as poaching and is in violation with the Protected Areas Act.

One of the main methods for chamois conservation is popularizing the species among the local communities. After the establishment of the Parks administrations, more intentional activities using the parks for education purposes for the children as well as for

wider part of the population have started. Enthusiasts were always there to lead the children in the park, aiming at nature conservation education.

In connection to the chamois population management since 1999 in Central Balkan NP and since 2001 in Pirin NP, yearly spring, - and since 2002- autumn censuses were organized and carried out. The park authorities carry out simultaneous observations in all known species habitats for several days. As a result of the carried out monitoring, the National Park Directory set up and maintains a database regarding the number, the sex and age structure.

In 2001 the Action Plan for the conservation and the restoration of the chamois in Central Balkan NP was developed (Ganchev, 2001) which purpose was to make wide analyses on the reasons for the low chamois number within the Park, as well as to identify the main parameters and activities for its future management, guarding and reproduction. The Plan includes methodology for monitoring the species as used in Rila and Pirin NP. Concrete measures for decrease of negative factors and improving the conditions for chamois existence in Central Balkan NP are marked in the plan. Following the same principle a methodology for Pirin NP is developed. The park directorates carry out supporting activities for improving the chamois status – rock-salt is provided in the chamois habitats. Besides the provision of their minerals need this activity is carried out aiming to keep the chamois for a maximum period of time within the parks' territories where the poachers' access is more difficult.

The main information for analyses in the parks directorates is gathered by the "Park guarding and control" (the park rangers) employees. It includes number of animals observed, age, sex and location of the observations. The assessment of the age and the sex of the animal is not always possible. The main reason for that are often the long observation distances and the moderate observation equipment that the employees use. The park directorates have different number of Biodiversity experts who analyze the previously provided information. The gathered and analyzed data can provide information on the population number, status and structure. For more specific information, external expertise is needed e.g. on species biology, determining subspecies, gene pools and presence of inbreeding, diseases and degeneration of the population.

3.1.1.2. SFA structures

Outside the National Parks, the chamois is managed by the SFA structures (SGBS and FU). In the SGBS in accordance to the forestry management plans and the hunting management projects, small clear cuts for creating more pastures, wintering places and places for salt are prepared. There is a well functioning guarding control. The harvesting is done in accordance to the hunting management plans following hunting tourism rules.

Chamois are found within the following Game-Breeding stations and Forestry Units:

- Smolyan RFB – Izvora SGBS, Mugla FU and Smolyan FU, Devin FU, Borino FU, Trigrad FU, Shiroka laka FU, Mihalkovo FU, Hvoina FU, Slaveino FU*;
- Pazardzhik RFB – Borovo SGBS, Rodopi SGBS, Shiroka polyana SGBS and Chepino SGBS, Rakitovo SGBS;
- Plovdiv RFB – Kormisosh SGBS, Krichim FU, Assenovgrad FU. Larger parts of the territories of Assenovgrad FU and Slaveino FU inhabited by chamois, are rented in hunting management compared to Kormisosh SGBS, Laki.;
- Sofia RFB – Vitosha NP, Kostenets FU;
- Kyustendil RFB – Vitoshko – Studena SGBS (Vitosha NP), Rilski manastir NP.

3.1.1.3. Regional Hunting and Anglers Associations (HAA)

Outside the SGBS the chamois habitats fall within the state managed regions within the FU and in the territories rented by the State to local hunting associations and managed

by them. In the rented territories in general the level of poaching and the disturbance is much higher.

Part of the populations fall within the territory managed by Sokol HAA.
In 2001, Smolyan excludes 440 ha of its hunting territory as a "chamois breeding reserve".

3.2.2. Habitats Conservation

Three of the four Bulgarian Balkan chamois subpopulations are protected within the Central Balkan, Rila and Pirin National Parks and the included reserves. For the protection of separate habitats of the Rhodopes subpopulation, there are the reserves Kupena, Dupkata and the protected territories Karadzhov kamak and Struiliitsa, Chervenata Stena.

Bulgaria still has no designated protected zones as part of the European ecological network Natura 2000. The populations in Central Balkan, Rila, Pirin and Vitosha fall within the territories of the proposed protected zones with the same names. Most of the chamois habitats in the Rhodopes fall within potential Natura 2000 sites.

3.3.Regimes on chamois use

Most of the chamois habitats in the country fall within Central Balkan, Rila and Pirin National Parks where hunting is prohibited.

Outside the protected territories chamois are managed in accordance to the 10 year game management plans. The plan includes habitat assessment. After that the maximum permissible stock number for the habitat is determined, tables for the perspective game development for reaching the desired density sex and age structure are prepared. When reaching the permissible stock number the hunting bag is determined as the winter natural losses and losses from poaching are considered.

With the Biodiversity Act changes, chamois will become a protected species from the EU accession date for Bulgaria. According to the present legislation, chamois is a hunting species from Annex 1 of the Hunting and Game Conservation Act (SG). In accordance to Article 74 of The Regulation of Implementation of Hunting and Game Conservation Act the chamois hunting is carried out as organized hunting tourism or with scientific purposes with a permission issued by the Director of the State Forest Agency.

3.4.Reintroduction in Vitosha

In the past chamois was found in Vitosha Mountain. It is not known when exactly the species became extinct in the mountain, but during the last hundred years only single animals were very rarely seen, most probably coming from Rila Mountains. The decrease of game and domestic stock in Vitosha during the last fifteen years, lead to bad pastures condition and many habitats which in principle are suitable for large herbivores are left unused.

Because of these reasons in 2002 Vitoshko – Studena SGBS, Vitosha NP and Balkani Wildlife Society started a project for the restoration of the Balkan chamois in Vitosha.

In 2002 after a acclimatisation enclosure of 30 ha was constructed the catching and the transportation of chamois from the Rhodopes started. Different catching methods were used – anaesthetic rifle, nets etc. The catching of live animals is quite a difficult process. Only in 2006 for 114 field days (at least 2 people engaged) 10 chamois were caught of which 4 transported to Vitosha. By now 16 chamois were transported to Vitosha, the birth of 12 kids is reported.

3.5.The importance of the chamois as an eco-tourism object

The acceptance of Central Balkan and Rila NP in the PAN Parks system set the beginning of the development of new tourism, the so called ecotourism. This kind of tourism has

the task to engage mainly the local communities around the parks with biodiversity conservation, organising green schools and attracting the tourists by introducing local crafts, traditions, customs and last but not least, local wild animal and plant species. As a start for direct contact with the wild nature, construction of specialised routes had started – tourists trail whose purpose it is to show the species diversity, with chamois among them. For example such an eco-trail has been the opened in 2005 - Beli Iskar in Rila NP from which chamois habitats can be observed, with very often single or groups of 3 – 4 animals. The species attracts mainly tourists interested in observations and photography of wild animals as well as many foreigners. It can be said that the chamois is an object of tourism as one of the main species inhabiting the national parks.

3.6. The role of the former economic use as a factor for the species conservation

The Rhodopes population inhabits mainly the territories of the game-breeding stations and the FU (rented territories to the local HAA and state managed regions). This population is more vulnerable than the ones within the national parks due to the presence of many settlement areas, road network and the fragmentation of the separate habitats. In spite of that the chamois number in the Rhodopes in the last 15 years is stable and even increasing. The censuses carried out in December 2005 show that in the game-breeding station even though there is hunting, the density of the species is 10-15 / 100 ha, which is the highest density in the country. The regulated hunting is compensated with the measures against poaching and conservation including improvement of the species' habitats. In these conditions with the comparatively high reproductive rate of chamois, the harvesting does not have a negative impact on the populations' growth. No hunting or harvesting in high population density leads to a decrease in the reproductive rate (section 1.2.2) and higher natural mortality. In cases of planned harvesting in line with the natural development of the population, part of the taken out animals would die of natural causes in near future i.e. the sustainable use based on monitoring using scientifically accepted methods doesn't play negative influence on the population. Even in the EU countries poaching increases significantly when legal harvesting is lacking. In conditions of illegal hunting there is no data on the number, sex and age of the shot animals, or on the time and conditions of the shooting, which could have a very negative influence on the species.

The Balkan chamois is a desired game species (usually the demand is more than the supply) with a comparatively high price and of special importance for the SGBS. The chamois hunters during hunting trips are also offered other game species (roe deer, wild boar, etc.). After the services are added to that, the incomes from the chamois license usually is around half of the whole income from hunters who chose the respective SGBS, mainly thanks to the chamois. All this motivates the local structures to sustainable management of the population of chamois and to conserve its habitats (of which many other species benefit).

In Izvora SGBS with an area of around 6 000 ha, for the last 10 years the incomes only from the chamois licenses come up to 269 125 BGL and the total income from the same hunters who hunted on chamois with the included service taxes and other game species is around half a million leva (477,387 BGL). The average chamois shot per year are 10.8 animals (6-15). During the census on 7 December 2005 the chamois number in Izvora SGBS was 230-280 animals. If we assume that in the last 10 years the number was 200-280 animals then the annual quota had varied between 3.9 % – 5.4 % of the population. In spite of the harvest, the chamois density here is the highest in the country. The poaching level in Izvora SGBS is low and in practice it does not affect the population growth. In the last 15 years chamois dispersed in territories of the neighbouring forestry units and hunting societies. At some places their density is still low mainly due to poaching. After obtaining some chamois licenses, the neighbouring hunting society Devin uses the species for hunting tourism.

The incomes from this activity motivates its members to preserve the species and the illegal shooting has significantly decreased.

Chamois are also hunted on the territory of the Sokol hunting society, Smolyan which in 2001 excludes from its wild boar hunting territory 440 ha and designated them as chamois breeding reserve. The permissible stock number was reached and annually 2-3 chamois are legally hunted. Despite the benefits of the legal shooting there is still chamois poaching during the wild boar hunting (section 2.2.2.1.1.) but the presence of density close to the maximum permissible stock number, shows that the poaching there is not a limiting factor.

The complete chamois hunting prohibition (as it is foreseen according to the last Biodiversity Act changes and Directive 92/43/EEC) would lead to loss of interest towards the species and increase the illegal hunting and degrade the habitats. In spite of the complete chamois hunting prohibition in Greece and the existence of many uninhabited suitable habitats, the species hasn't increased its number and its range in the last 20 years. According to Dr. Haritakis Papaioannou one of the main limiting factors is poaching. There are no reasons to believe that in Bulgaria this will happen differently. Moreover this would lead to a decrease in chamois number and density within and around the game-breeding stations and would have very negative results on the long-term survival of the subspecies in the country.

4. TARGETS OF THE ACTION PLAN FOR CHAMOIS

4.1. Main target

Restoration and conservation of the Balkan chamois and its habitats in Bulgaria. The species population in the next 10 years should reach a number of at least 5 000 animals within the country.

4.2. Secondary targets

- Considerable decrease of poaching on the species.
- Providing sustainable use and management of the species.
- Providing the conservation and the legal protection of the species key habitats.
- Establishment of quality base for database and GIS model for integrated analyses, to make possible managerial decisions on the species populations' conservation and its key habitats.
- Integrating the targets of the present Plan in the national and regional sector strategies, plans, programmes, projects and policies for territories where chamois are found and for general biodiversity conservation.
- Coordinating the work and exchange of information between the interested institutions and organizations on national and international level for the effective conservation of the Balkan chamois.
- Optimizing the effect in planning and applying measures for conservation and sustainable management of the species based on scientifically proven data.
- Maintain the genetic purity of the local subspecies and providing effective genetic exchange between its (sub)populations.
- Awareness raising and increasing the nature conservation culture of the different target groups regarding the biology, ecology, distribution, nature conservation status and the species importance, and sharpening the sensibility of the community towards the problems connected to its conservation.

5. ACTIVITIES NEEDED FOR THE CONSERVATION OF THE SPECIES AND ITS HABITATS

5.1. Legislation activities

5.1.1. Introducing regulated use of the species following the rules for the exclusions of growing populations and the ones with reached minimal permissible stock for harvest, which number is confirmed with the census by independent observers. The use should be done following the sustainable hunting principle based on the guidelines of the IUCN Caprinae working group.

In The Regulation of Implementation of Hunting and Game Conservation Act the chamois hunting rules according to the recommendations of the present Action Plan are shown in details.

Aim: Providing sustainable quota and management of the species outside the protected territories, using strong support and engaging the hunting community.

Importance: Significant

Urgency: Constant

Success indicators: Successfully applied quota mechanism for sustainable use leading to increasing the chamois number in Bulgaria. The optimum density is reached and widening the range in habitats outside the PT, regular monitoring of the species, annual plans and reports on the use developed and applied.

5.1.2. Legal regulation of the registration of trophies obtained until now with proven origin after paying of the respective registration tax.

The registration tax should be popularized widely in the media.

Aim: Restricting poaching on the species aiming to obtain and show/ exhibit trophies.

Importance: Significant

Urgency: Permanent

Success indicators: Established database on the trophies and the registered trophies.

5.1.3. Criminalisation of the illegal chamois hunting according to Article 278, paragraph 4 of the Criminal Code

Aim: Strengthening the penal responsibility and decrease of illegal chamois shooting.

Importance: Significant

Urgency: Permanent

Success indicators: The chamois and the bear are included in the text of Article 4, paragraph 278V of the Criminal Code

5.1.4. Changing Article 67, paragraph 4 of the Biodiversity Act with a view to possible prohibition of the subspecies import.

Aim: Preventing the genetic pollution with other subspecies.

Importance: Significant

Urgency: Urgent

Success indicators: The word "subspecies" is added to the text of Article 64, paragraph 4.

5.1.5. Changing and complementing the HGCA for regulating the responsibilities of the hunting societies on rough violations during group hunting and regular violations of HGCA, PAA and BA.

Planning sanctions for the societies including deprivation of the hunting right within the hunting region for 1 year in case of a violation during group hunting. Also on non-following the present Plan and the connected normative documents and the hunting management plans.

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

Importance: Significant

Urgency: Permanent

Success indicators: In chapter "Administrative violations" of HGCA; text on penalties for societies during group hunting as well as in cases of systematic violations of HGCA by members or the societies is added.

5.1.6. Including in HGCA (Section 4, chapter "Game Management"), RIHGCA (Chapter 4, „Management and game conservation") and the Regulation of the hunting management for prohibition of wild boar facilities (feeding places, mud baths, etc.) in a zone of 500 m around key chamois habitats. To prohibit an artificial increase of the density of wild boar, as the species disturbs the chamois and deteriorates their habitats.

Aim: Restricting the species disturbance when building and hunting management use, bio-technical equipment in and around key habitats.

Importance: Significant

Urgency: Permanent

Success indicators: Changing the legislation base.

5.1.7. Prohibition for carrying shot guns and rifles, arbalests and bows on the territory of the national parks and reserves.

The prohibition should be valid for a prepared shooting weapon (taken out of the case) as well as for weapons taken apart or parts of such, kept and/or legally transported. The prohibition is valid for personal as well as for business guarding weapons; permitting only the use of short pistol or revolvers for the needs of the guards.

Aim: Restricting the illegal hunting within the protected territories.
Importance: Significant
Urgency: Permanent
Success indicators: Regulated prohibitions in PAA and/or Explosives, Firearms and Ammunitions Control Act for carrying weapons on the territory of the protected territories and increased penalties in cases of violations.

5.2. Policies

5.2.1. The National Action Plan for chamois should be adequately integrated in the National Plan for Biodiversity Conservation.

Aim: Including the activities of the Plan in the NNPS priorities and providing its adequate financing.
Importance: Significant
Urgency: Medium
Success indicators: Priority activities of the present Plan are integrated in the National Plan for Biodiversity Conservation and adequately financed.

5.2.2. Creating an institutional working group with Decree by the Minister of Environment and Water with representatives of SFA, MoEW, BAS, hunting and nature conservation NGOs for monitoring the Plan. On implementation, planning and approving the annual shooting quotas, accepting the annual reports and preparing annual programmes based on the present Action Plan including:

- Planning annual monitoring activities connected to determining and accounting the main population indicators.
- Planning annual activities on habitats conservation and restoration.
- Annual activities on the species use.
- Annual activities connected to the species reintroduction.
- Activities connected to the preservation of the genetic purity of the Balkan subspecies.
- Time limits and institutions responsible for development of the annual programme.
- Time limits and institutions responsible for reporting the implementation of the annual programme.
- Other priority activities.

The annual programmes should guarantee the implementation of the present Plan.

Aim: Applying the coordinated standard activities between the different institutions.
Importance: Significant
Urgency: Permanent
Success indicators: Organizing and carrying out of at least three workshops of the working group, where the annual plans are developed and approved, and the annual shooting quota are planned and approved, and the annual reports are considered and approved.

5.2.3. Integrating measures for decreasing the illegal chamois hunting within the whole strategy and the annual plans for controlling activities of SFA and RFB.

Aim: Providing maximal effective terrain control and prevention against illegal chamois hunting.
Importance: Significant
Urgency: Permanent
Success indicators: Included specific measures on control and prevention of illegal hunting in the NP and SFA strategies and the annual plans.

5.2.4. Carrying out seminars in the risk regions with representatives of FU, SGBS, National and Nature Parks, HAA, MOEW and the prosecution.

Aim: Educating the employees and coordinating the measures against illegal chamois hunting.
Importance: Significant
Urgency: Permanent
Success indicators: At least five seminars in risk regions per year carried out and employees educated.

5.2.5. Including urgent and priority measures for chamois conservation in the annual plans of Rila, Pirin and Central Balkan National Parks, Vitosha, Balgarka and Rilski manastir Nature Parks, RIEW Smolyan, Plovdiv, Pazardzhik etc.

Aim: Integrating the targets of the present Plan in the Management plans of the protected territories where chamois are present.
Importance: Significant
Urgency: Medium (permanent)
Success indicators: All annual plans on activities in the protected territories include adequate measures for chamois conservation foreseen in the present Plan.

5.2.6. Integration of the present Action Plan in the hunting and forestry management plans and programs as well as in the annual plans for use.

Aim: Coordinating the targets and the activities of the present Plan with the ones set in the forestry and hunting plans.
Importance: Significant
Urgency: Permanent
Success indicators: Hunting and forestry plans on local level include priority measures for chamois conservation foreseen in the present Plan.

5.2.7. Actualization of the regional action plans on the territory of the three national parks and creating such for populations in the Rhodopes.

Aim: Analyzing the specific conditions and problems to take specific measures for conservation of the local populations.
Importance: Significant
Urgency: Permanent
Success indicators: Developed regional plans

5.3. Direct measures for habitats conservation

5.3.1. Designating chamois habitats as Natura 2000 sites.

Aim: Providing the conservation and the sustainable management of the species key habitats.
Importance: Significant
Urgency: Permanent

Success indicators: At least 80 % of the species habitats are included in Natura 2000 protected zones.

5.3.2. Designating bio-corridors between key populations: Vitosha – Rila – Pirin, Rila – Rhodopian as well as with the remote habitats in the Rhodopes and Stara Planina.

Aim: Providing genetic exchange between the populations.
Importance: Significant
Urgency: Permanent
Success indicators: Bio-corridors between the separate habitats of the species designated and included in Natura 2000

5.3.3. Designating priority sites and chamois habitats as protected territories according to the PAA. Establishing a network of protected territories on the northern boundary of Rhodope Greek National Park which main purpose is to provide protection of the trans-boundary chamois population and to provide three corridors through the municipalities of Rudozem, Smolyan and Devin (Tsigansko gradishte PA, Gerzovitsa PA and Kozite skali NM).

Aim: Preserving the species key-linkage territories
Importance: Significant
Urgency: Permanent
Success indicators: Designation of at least 50 % of the species key territories as PAs.

5.4.Direct measures for species conservation

5.4.1. Organizing and carrying out of mandatory number of checks of the hunting societies operating within (close to) the chamois habitats by the SFA, MIA and RIEW organs.

Aim: Discontinuation of the illegal chamois hunting during the hunting on other animals.
Importance: Significant
Urgency: Permanent
Success indicators: Certain number of unexpected checks is realized. Violators caught up and sanctioned.

5.4.2. Organizing and carrying out mandatory number of checking of the tourist chalets, hydro technical equipments (the guarding of the dams) close to the chamois habitats by the organs of SFA, MIA, and RIEW together with NGOs.

Aim: Discontinuation of the illegal chamois hunting by authority staff and chalet hosts.
Importance: Significant
Urgency: Permanent
Success indicators: Certain number of unexpected checks is realized. Violators caught up and sanctioned.

5.4.3. Strengthened guarding measures within the key habitats.

Aim: Increasing the prevention and maximum restriction of the poaching.
Importance: Significant
Urgency: Permanent
Success indicators: The intensity of checking on the territories with an easy access and during the months of October and November, is increased with 50 %. Number of violators caught up and poaching attempts averted.

5.4.4. In case of proven genetic influence of the Alpine chamois subpopulation in Kormisosh, developing a programme for increased shooting of male of this subpopulation and distributing male from the local population aiming for gradual genetic absorption of the Alpine genes.

Aim: Preserving the genetic purity of the species.
Importance: Significant
Urgency: Permanent
Success indicators: Programme that provides restoration of the original genotype in long-term period developed and applied.

5.4.5. Developing and maintaining national MOEW database for organizing and carrying out illegal hunting as well as trading with illegally obtained trophies. The database should include information on the revealed and averted attempts on poaching, trading with illegally obtained trophies or exhibiting of such in public, the carried out investigation and penalty cases, personal information on the poachers etc.

Aim: Finding out the organized channels for illegal hunting tourism and the popularized poaching practices unfavourable for the species.
Importance: Significant
Urgency: Permanent
Success indicators: Developed, periodically updated and analyzed database. Assisting the investigation and court organs in proving recidivisms using the results of the database analyses.

5.4.6. Developing and applying of an effective system for (financial) stimulation of the controlling organs and the local people taking part in catching of poachers or providing information on them. A budget of 50 000 BGL per year is needed, covering bonuses of 1 000 BGL for a drawn statement and 500 BGL for provision of information.

Aim: Stimulating the increase of the control and the prevention on the illegal hunting on local level.
Importance: Significant
Urgency: Permanent
Success indicators: Increased percentage of caught poachers by the control organs, as a result of provided information by the local people.

5.4.7. Organizing regular joined checking of the illegal chamois trophies and other hunting and protected species in the public restaurants and private houses by representatives of MOEW, SFA, MIA and the prosecution.

Aim: Decreasing the illegal shooting for illegal exhibition of trophies as an attraction.
Importance: Significant
Urgency: Permanent
Success indicators: Lack of exhibited animals in public restaurants.

5.4.8. Diverting the tourist trails and prohibition of forestry management activities in the key habitats and surroundings during the breeding period (April, May, June). The important breeding habitats take a small area of the FU/SGBS territory and include rocky terrains with major inclination and inaccessible low productive forests. At the same time the regular disturbance in this period leads to high mortality of the newborn.

Aim: Decreasing the losses of newborn caused by the disturbance during the breeding period.

Importance: Medium

Urgency: Permanent

Success indicators: Temporally discontinued access to key habitats and tourist trails in the protected territories during the breeding period (April – June). Prohibition on forestry management activities within the key breeding habitats of the species in this period. Including the planned restrictions and prohibitions in the local forestry management plans.

5.4.9. Decreasing the number of feral dogs within the species key habitats including the NP.

Aim: Eliminating the influence of feral dogs especially in the key habitats of the species located close to chalets, settlements and dumpsites.

Importance: Significant

Urgency: Permanent

Success indicators: Lack of feral dogs and the shepherds' dogs wear fetter (rods that stop them from running too fast and chasing the wild ungulates).

5.4.10. Restricting the grazing of domestic stock within the key habitats.

Aim: Restricting the competition in high concentration of domestic stock (goats) and prevention of transmission of infective diseases from the domestic animals.

Importance: Significant

Urgency: Permanent

Success indicators: Regulated prohibition for grazing within key habitats and plans for permissible number animals /ha in the rest of the habitats.

5.4.11. Reintroduction of the species in suitable habitats in Vitosha, West and East Stara Planina, Vrachanski Balkan NP and in suitable but uninhabited habitats in the Rhodopes etc.

Aim: Restoration of the species in its past habitats and reaching optimal density for the country.

Importance: Significant

Urgency: Permanent

Success indicators: At least one successful reintroduction until 2012.

5.4.12. Reinforcement in small and isolated populations in cases of inbreeding by trans/relocating chamois.

Aim: Averting the inbreeding within the frames of small and isolated populations.

Importance: Significant

Urgency: Permanent

Success indicators: Populations where the danger of inbreeding is significant and reinforcement with optimum number of animals for enriching their adaptive gene pools and connecting the fragmented subpopulations.

5.4.13. Establishing and management of a national database of SFA for the chamois trophies, registering all trophies of the species in the database including protocol for CIC evaluation and a picture. Placing of a hologram sticker on each registered trophy with unique ID number coinciding with the one on the CIC evaluation protocol. The database should be accessible for checking by the control organs (MIA, MOEW, SFA).

Aim: Discontinuing the illegal trophies trading and more effective control.

Importance: Significant
Urgency: Permanent
Success indicators: Database of SFA established and the trophies registered.

5.4.14. Placing detectors with a GSM module for registering shooting within the key habitats.

Aim: Effective fighting against the illegal shooting.
Importance: Medium
Urgency: Permanent

5.4.15. Establishing a mobility group of the three National Parks and reserves which performs sudden checks without the knowledge of the park authorities.

Aim: Effective reaction against the illegal shooting.
Importance: Medium
Urgency: Permanent

5.5.Monitoring and scientific studies

5.5.1. Including methodology for chamois monitoring (Annex 1) in the National Biodiversity Monitoring System (NBMS). The need of such methodology is caused by the use of different census methods by the different structures. Determining the exact number of the animals and the dynamics of the population is most important. For determining the dynamics a unified integrated methodology should be used, so the data coming from different places and from different years can be analyzed and compared. For places where shooting quota are allowed the censuses should be done by independent observers and should be performed at least once per four years as the population is counted.

Aim: Determining and following the chamois population parameters in Bulgaria according to unique adapted methodology and criteria.
Importance: High
Urgency: Permanent
Success indicators: Methodology established and successfully applied, included in NBMS. National database including the results from the monitoring established and regularly updated.

5.5.2. Carrying out census following the approved methodology and using independent observers every three years also in cases of doubts for incorrect data when planning the harvest/use.

Aim: Revising the received data by the annual censuses data and effective planning of the annual quota for shooting.
Importance: Significant
Urgency: Permanent
Success indicators: Census organized and carried out following the approved methodology and according to the planned time limits. Protocols and reports developed listing specific recommendations on the censuses.

5.5.3. Training volunteers for carrying out censuses.

Aim: Providing coordination and increasing the accuracy of the census of the species

Importance: Medium
Urgency: Permanent
Success indicators: At least 15 volunteers trained per year

5.5.4. Preparation and establishment of a GIS model for the inhabited and the potential chamois habitats in Bulgaria and national chamois database including number, distribution, density, investigations of the health and genetic status.

Aim: Creating a wide base for determining the potential habitats of the species and integrated analyses and management decision making for maintaining optimal condition of the species population parameters and the health status. Form for each shot animal and DNA samples and veterinary medical examinations.
Importance: Medium
Urgency: Permanent
Success indicators: Developed, tested and proven model. GIS database established and periodically updated from ? 31 December 2007. Filled forms and samples for all harvested animals received. Database established and running.

5.5.5. Determining the level of hybridization by craniometrical examinations and DNA analysis of the subpopulation in the region of Kormisosh game-breeding station.

Aim: Determining the level of species hybridization.
Importance: Significant
Urgency: Short-term
Success indicators: Investigation of the level of hybridization carried out.

5.5.6. Investigating the presence and the level of inbreeding within small and isolated populations using DNA tests.

Aim: Optimizing the effect when planning and applying measures for averting inbreeding and increasing the vitality of the populations on the base of scientifically proven data.
Importance: Significant
Urgency: Short-term
Success indicators: Investigation of the level of inbreeding carried out.

5.6.International cooperation

5.6.1. Exchange of information and coordinating the activities with international organizations and institutions working with the chamois.

Aim: Exchange of constructive experience for realization of the monitoring and applying common priorities in the management and the conservation of the chamois populations.
Importance: Significant
Urgency: Permanent
Success indicators: Participation in at least 50 % of all important meetings concerning chamois and Caprinae on an international scale. Established active international correspondence and exchange of information.

5.6.2. Transboundary cooperation on applying joint activities on conservation and management of shared chamois populations. Development of joined programmes on chamois conservation in the Rhodopes (between Rhodope Nature Park in Greece and RFB and RIEW Smolyan). Development of

common programmes with Greece, FYROM and Serbia for potential reintroductions in Slavyanka, Belasitsa, West Stara Planina etc.

Aim: Conservation and effective management of the trans-boundary chamois populations as shared richness.
Importance: Significant
Urgency: Permanent
Success indicators: Realisation of joined activities and projects on conservation of Balkan chamois. At least two trans-boundary protected territories on the conservation of the species designated.

5.7.Awareness raising among the different target groups

5.7.1. Development, printing and distribution of leaflets, posters, stickers on the chamois and popular articles in specialized edition for the different target groups.

Aim: Raising the awareness and the nature conservation culture of the different target groups.
Importance: Medium
Urgency: Permanent
Success indicators: Printed and distributed information materials – at least three posters with total number of 7 000 copies, at least 3 stickers with 10 000 copies. At least 2 popular articles in specialized editions published annually.

5.7.2. Establishment and maintenance of internet home page for the Balkan chamois containing rich information and education database.

Aim: Raising the awareness and the nature conservation culture of the wide public in global aspect.
Importance: Medium
Urgency: Permanent
Success indicators: Established and periodically updated internet home page.

5.7.3. Organizing and carrying out campaigns for explaining the prohibitions for hunting and weapons carrying within the NP and the protected territories as well as within territories managed by the hunting associations out of the hunting season. Development and placing of information signs on the national parks entrances and within important habitats including short texts on the species conservation status and telephone for signals for reporting of noticed violation.

Aim: Increasing the prevention and the control on the violations to the species and the awareness of the local communities and the tourist on the species conservation status and its importance.
Importance: Significant
Urgency: Permanent
Success indicators: At least one campaign per year carried out with the NP and the protected territories. Information signs within the key habitats in the whole country developed and placed.

5.7.4. Information campaign on advertising the "green" telephone line for reporting of noticed poachers by visitors of the national parks.
Aim: Increasing the prevention and the control on illegal activities against the species.
Importance: Significant
Urgency: Permanent

Success indicators: Information materials issued and distributed in key places. Number of received and processed signals lead to catching violators. Report on the effectiveness of the campaign.

5.7.5. Development of printed publication of the present Action Plan.

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

Importance: Significant

Urgency: Sort-term

Success indicators: Published Action Plan with circulation of at least 1 000 copies.

6. REGIMES AND NORMS FOR PROTECTION AND USE

6.1.Regime on the chamois hunting prohibition

The chamois is a protected species included in Annex 3 of Article 37 of the Biodiversity Act.

As it was noted although the species is more vulnerable in the Rhodopes than it is in the Alpine zone of the National Parks, the population there is stable and increases its number and range (section 1.1.3.).

For the long-term survival of the species the local communities and the interested parties (hunting societies, structures of SFA etc.) should be motivated and involved. If certain biological and social conditions are met, the wild Caprinae become a renewable resource that could be sustainable used (Wegge, 1997). In planned use, the mortality by hunting to a great extend substitutes the losses which otherwise would have been caused by natural causes. This means that the natural mortality and the growth depend on the density; the mortality caused by the regulated extensive hunting does not have a significant influence on the population size. The ideal case is to take out animals just before they die from natural causes. In practice this is not really feasible. This is why the quota should be lower than the growth and should not exceed 8% of the population in cases of reached optimal density.

The harvest should be done according to the exclusions mentioned in Article 48 of Biodiversity Act and Regulation No 8 / 12 December 2003 on the rules and the conditions for issuing permissions for the exclusions from the prohibitions introduced with the BA on animal and plant species from Annex 3, animal species from Annex 4, all bird species except the ones in Annexes 3 and 4 for using unselected equipments, means and methods for catching and killing from Annex 5, issued by the Minister of Environment and Water and the Minister of Agriculture and Forestry, SG issue 4 from 16 January 2004.

In order to achieve sustainable chamois hunting the below listed set of rules should be followed:

6.1.1. Reliable and scientifically proven monitoring system approved by the Executive Environmental Agency and included in NBMS as at least once in 4 years censuses by independent observers are organized.

6.1.2. Maximum permissible stock number (density of the population). Chamois inhabit mainly terrains not-suitable for agriculture and low-productivity forestry plantations (steep, rocky terrains). Because of this chamois do not cause significant damages to agriculture and forestry and it is appropriate that the term "permissible stock" is changed with "minimal stock number". In order to allow sustainable use of chamois, the minimal stock number (the density of the subpopulation) should not be lower than 3-5 chamois/ 100 ha in the different capacity of the habitats. If results from additional studies using scientifically proven methods are available the requirements for minimal stock number could be changed by the working group but harvest under 2/100 ha is not allowed.

6.1.3. Capacity of the habitat. In order to determine the capacity, additional studies and GIS model development of the present and of the potential

habitats are needed. Until the development of the GIS model the habitat assessment of the existing hunting management plans and legislation should be used. After the establishment of the GIS in the process of the development of the hunting management plans, the experts should propose changes of the model on the base of the field studies.

6.1.4. According to the exclusions in the Biodiversity Act the hunting quota are allowed for populations having density above the minimal stock number and has at least 15 % annual growth. In order the permit use in certain hunting region the minimal population size is 30 chamois. The relation in use is M:F 1:1. Use over 5-8 % of the population estimation is not allowed as the trophy male are not more than 30 % of the planned quota. The aim is maintaining the sex ratio M:F 1:1 and the distribution of the use in sex and age groups depends on the population structure and is corrected in cases of changing the real structure.

6.1.5. The working group plans the quota on population level in carried out censuses using the monitoring methodology. The quotas in the separate administrative units (SGBS, FU) are distributed by the working group, depending on the condition of the species in the respective units as the amount of all animals for hunting in the different units cannot exceed the determined population quota.

6.1.6. Hunting season. The trophy hunting of adult male before and at the beginning of the mating period (October – November) leads to the inability for elite animals to take part in the mating. If they are absent, not all female will be fertilised and younger male will be admitted in the mating period. The young male loose weight after the intensive mating period and the mortality among them in the winter becomes higher than usual. This leads to a disturbed sex and age structure of the males, decreased reproductive rate and higher natural mortality within the males (especially young once). This is why the best period for trophy hunting is after the end of the mating season – in December. In the middle and at the end of the winter, many of the habitats are not accessible and regular disturbance leads to higher mortality. It is better that the females are hunted before the mating period. Due to the following:

- The hunting season for male chamois is from 1 December to 15 January and from 10 April to 10 May;
- The hunting season for female chamois is from 15 September till 31 October;
- The season for catching live chamois for reintroductions and reinforcements is from 15 September till 20 February.

6.2. Regime for catching live animals for reintroduction in other places

All reintroductions of the species are approved by the working group after presenting of projects for reintroduction and feasibility studies. The annual hunting quota together with the animals for reintroductions and reinforcements cannot exceed 10 % of the population. The relocated chamois should be marked with ear marks and are no subject of hunting for at least 3 years after their transportation.

6.3. Prophylactic shooting of wounded animals

If wounded animals are found, these animals will be shot all year long as part of the annual quota. In cases of doubts the working group can put up requirements for presenting video materials and/or pictures as evidence.

6.4. Selective shooting of old and degenerate animals

If such animals exist they are shot with priority in the annual quota.

6.5.Means for shooting chamois

- Chamois are hunted only in the presence of a qualified hunter as a guide who possesses the certificate for selective chamois hunting and the certificate for hunting guide;
- Only animals shown by the guide and allowed for the respective season (female, young and trophy adult male) are shot;
- Only rifles with the appropriate calibre should be used for shooting - carbines with energy of 100 m ≥ 2000 J and bullet with weight ≥ 5.0 gr.

7. OBSERVATION AND CONTROL ON THE IMPLEMENTATION AND THE EFFECT FROM THE ACCOMPLISHED ACTIVITIES (MONITORING AND EVALUATION OF THE PLAN)

Monitoring is a process of constant following and observation (gathering, processing and evaluation of certain information on the planned activities) in the progress of the implementation of the present Plan. The evaluation includes reporting the level on which it has achieved the set targets (evaluation of the Plan effectiveness).

The monitoring and the evaluation assist the decision making process regarding the need of joint measures, changes and adapting or actualisation of the Plan, changing the Plan's main approach or even its discontinuation. These activities are necessary for reporting and for the coordination of targets for the short and long-term Plan implementation.

The monitoring system of the present Plan is developed on the base of:

7.1.Identifying the monitoring regions of the results and the products

The regions for monitoring in the present document include the key activities and aspects for the achievement of the main and secondary targets and the specific aims of the activities.

7.2.Identifying main questions and criteria/ variables

For each monitoring region specific monitoring criteria/ variables are determined. This process is facilitated by the formulation of main questions identifying the elements with most significant importance for the Plan.

7.3.Determining indicators and norms /standards

The indicators in the present Plan are directly monitored elements that assist the establishment of the differences in the status of certain phenomena, in quality and quantity within a certain period of time. The indicators measure the phenomena connected directly or indirectly to the monitoring region and the respective main question/ criteria.

7.4.Evaluation criteria and indicators selection

The criteria used for selecting the indicators are reliability, relevance, sensibility and expedience.

7.5.Frequency of the monitoring

The coordination of the implementation of the present Plan is the main element for reaching the set targets. For its achievement is needed:

- Carrying out at least two meetings per year of the working group implementing the Plan activities;
- Developing and presenting detailed annual plans and annual reports (activities and finances) on the implementation of the Plan;
- Carrying out complete analyses of the level of the set targets and actualising the Plan if necessary. This should be done after the approval of the Plan in the fifth year of its implementation.