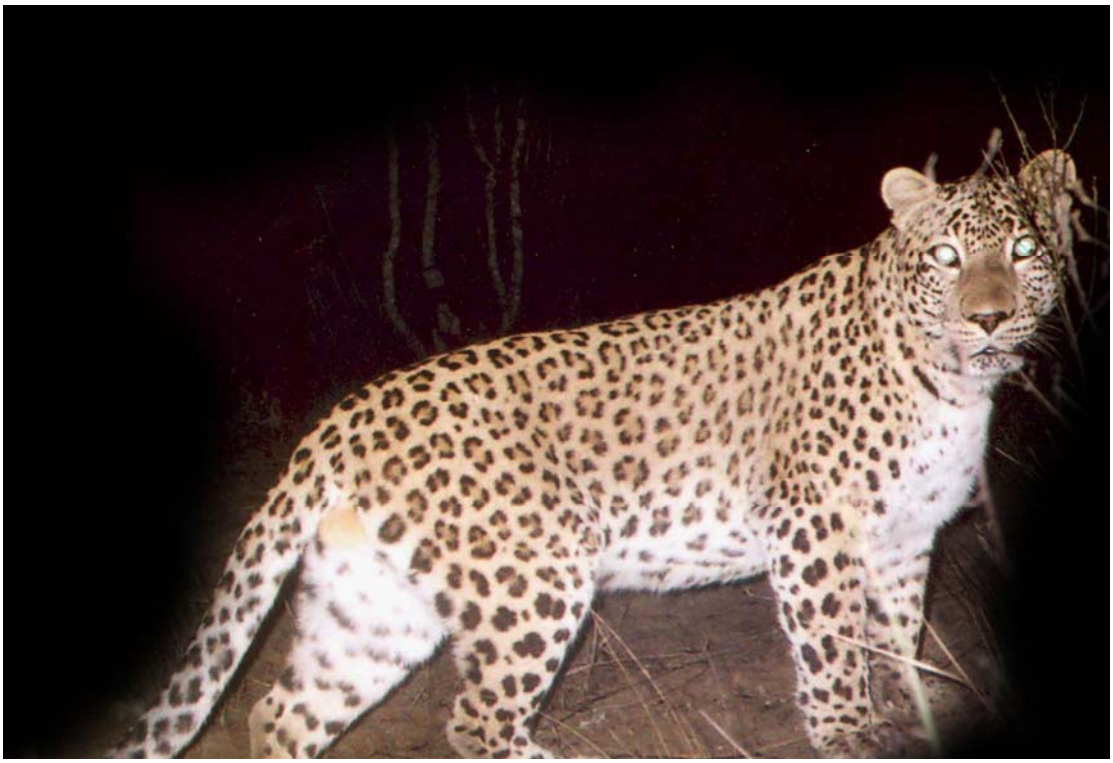
NATIONAL ACTION PLAN
for the Conservation of Leopard
(*Pantera pardus*, L.)
in Georgia
(2010 – 2014)



Tbilisi, 2010

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Statement of support and responsibility for the implementation of the National Action Plan for the Conservation of Leopard in Georgia

The Georgian Ministry of Environmental Protection and Natural Resources (MEPNR) will provide organizational support to any competent organization, specialist and expert willing to participate in the implementation of this Plan. While not responsible for the full financing MEPNR may also finance selected activities of this Plan.

WWF, NACRES, Tbilisi Zoo and other interested organizations will provide technical assistance to any other organizations, specialists and experts willing to contribute to the implementation of the activities outlined in this Plan. The said organizations will also make every effort to raise funds for the implementation of this Action Plan.

This action plan has been elaborated with the initiative and financial support of WWF Caucasus Programme Office.

List of participants of the planning workshop for the development of *Leopard Action Plan for Georgia* (21-22 April, 2009)

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CONTENT

1. Introduction

Leopard is one of the rarest predators both in Georgia and in the Caucasus ecoregion. Decrease in the number of leopard started around 1950. The main factors that have contributed to this are hunting and habitat fragmentation.

Surveys have over the last years produced more evidence and even some spectacular photos of leopards in Georgia, but all new evidence has confirmed that only few individuals remain. To save the leopard population in Georgia, urgent conservation actions are needed.

Leopard is recognized as priority specie in the Biodiversity Strategy and Action Plan for Georgia, which was approved by Georgian government in 2005. Since 1977, this specie is under legal protection. It is currently listed in the Georgian Red List as Critically Endangered (CR). In the Caucasus Ecoregion, the subspecies *Panthera pardus saxicolor* is spread. This subspecies is listed in IUCN Red List of Threatened Species as Endangered (EN). Leopard is also protected by international legislation. For example, is listed in CITES Appendix 1, international movement of species samples (individuals and derivatives) is strictly controlled.

In Georgian culture, leopard has high esthetic and symbolic value. Leopard is an umbrella species selected for making conservation related decisions, typically because protecting these species indirectly protects the many other species that make up the ecological community of its habitat.

Leopard long-term conservation cannot be achieved without regional cooperation. The most important step towards this goal was the workshop organized by WWF and IUCN Cat Specialist Group, held in 2007 in Tbilisi. Its purpose was to discuss the conservation of leopard at ecoregional level. The workshop brought together scientists, decision makers and other stakeholders from governmental and non-governmental sectors of Armenia, Azerbaijan, Georgia, Iran, Turkey and Russia.

As a result, the “Strategy for the Conservation of the Leopard in the Caucasus Ecoregion” was developed. The aim of the Conservation Strategy was to define goals and objectives, identify priority conservation actions at the range level, and provide guidance for the development and implementation of National Action Plans.

Therefore, the National Action Plan for Leopard Conservation in Georgia is based on the eco-regional strategy of this species with timeframe about 5 years.

This document is the result of a joint effort between Minister of Environment Protection and Natural Resources of Georgia, WWF and NACRES. Development of Action plan involved a wide range of experts and stakeholders, including representatives from research institutions, as well as governmental and non-governmental organizations. In April 2009, the first draft of the plan was developed. The document was circulated among experts and other stakeholders for review. Comments and suggestions from this review process were taken into account, wherever possible, during the preparation of the final draft, which was then submitted to the Ministry of Environment for final comments and approval.

1.1 Structure of the Action Plan

This Action Plan is based on the structure proposed in the “Strategy for the Conservation of the Leopard in the Caucasus Ecoregion.” The second chapter of this plan reviews the data of the species as follow: biology, behavior, ecology, and historical and current situation. Also the main problems regarding leopard conservation in Georgia and implementation of the national action plans are also discussed. The third chapter presents the goals and objectives of the document.

Based on the general goal, which is expected being reached during the next 10 year, medium-term strategic goals were developed. In order to achieve the strategic goals several different objectives were identified. The implementation of the national action plan is based on specific results, which are expected being achieved during the next 5 years (action plan is the first step in the implementation of strategic goals).

18 outcomes are complex and require more than one "specific" action. These expected outcomes are described in the fourth chapter. The fifth chapter provides a logical framework. The last chapter of this Plan is dedicated to consider planning aspects, such as the legal status of the document, organizational structures for its implementation, as well as coordination, monitoring, updates and funding raising issues.

2. Species Review

2.1 Georgian name of leopard

There are some misunderstandings about *Panthera pardus* Georgian name. For this species, the term "Leopard" can be found in many languages of the world, which is the combination of two words: (*leon = lion and pardos = male panther)* and reflects an idea that these animals are crossbreed of lions and panthers. The term leopard is also widely spread in Georgia, but in Georgian language, the name of this animal is also "Jiqi", and in mountain regions (i.e., Khevi, Khevsureti and Tusheti) this animal is called "Vepkhi" or "Vepkhvi", which means tiger. Nowadays, the term "Vepkhvi" is used in literature to refere to tigers (*Panthera tigris*). However, in old Georgian language this term was used to describe all big cats, such as lynx (*Lynx lynx)*, leopard *(Panthera pardus)*, and cheetah (*Acinonyx jubatus)*. In order to avoid misunderstandings there are synonyms for *Panther pardus* in Georgian language (i.e., Jiki and Leopardi). It is important to point out that leopard is of great cultural and esthetic significance for Georgians. Poems and stories about this species have been written (e.g., "vefkhistkaosani" poem and "ambavi vefkhisa da mokmisa" story).

2.2 Taxonomy, biology and ecology

In all Caucasus and overall in Georgia, many aspects of leopard biology, behavior, ecology and conservation are not clear. Now, it is considered that the subspecies found in the Caucasus Ecoregion is the *Panthera pardus saxicolor* (Miththapala et al., 1996; Uphyrkina et al. 2001). All the rest of subspecies (i.e., *P.p.tuliana, P.p. ciscaucasica, P.p. transcaucasica, P.p. dathei,* and *P.p.sindica*) are synonyms[1]. In the IUCN Red list, the Caucasian subspecies of *Panthera pardus* is mentioned as *P.p. saxicolor*. However, it is necessary to point out that additional research is needed in order to determine the geographical distribution and taxonomy of leopard (Breitenmoser et al., 2007).

Caucasian leopard, compared to other subspecies, is bigger in size and lighter in color (e.g., compared to African and Asian subspecies). The size of male leopard found in Vashlovani Protected Areas was: height of the withers 70-75 cm.; front feet length 10 cm.; front feet width, 10,5 cm.; length of pad, 6 cm. and width, 7 cm. Back feet length is a bit smaller than front 9 cm. (Lortkipanidze et al., 2004).

The data about Leopard diet in Georgia is scarce. According to Janashvili (1963) and Arabuli (1987), the diet of leopard in Georgia mainly consists of deer, roe deer, Caucasian tur, chamois, and wild boar. Studies in other countries of the Caucasus, showed that leopard diet is very

[1] Khorozyan et al. (2006) believed that *P. p. tuliana* subspecies is independent. This subspecies can be found in Turkey. But for the Caucasus subspecies the term "ciscaucasica" is more appropriate rather than "*saxicolor*, as Dinik (1914) mentioned "

diverse[2] and includes hare, badger, porcupine and ground nesting birds. Leopards prey could also be domestic animals, including dogs, especially when large ungulates density is very low (Heptner & Sludskii, 1972). However, despite of reduction of prey species numbers, there is still enough food for a small population of leopards in the Caucasus Ecoregion (Mallon et al. 2007).

2.3 Historical distribution and numbers

Until the beginning of 20th century, leopards were distributed almost all over Georgia, except Javakheti and southeastern part of Georgia with open areas (Dinik 1914; Satunin 1915). According to Dinik (1914), leopard density was especially high in Bzipi Gorge (Abkhazia), Meskheti Ridge and the mountain areas at Black Sea coast. Also Dinik describes several cases of poisoning of leopard in Borjomi gorge, indicating high density in the region. He also noted leopards were usually killed in Alazani valley and eastern part of greater Caucasus. There were no records about finding of leopard in Vashlovani and Chachuna protected areas. The semi desert habitats with adjacent Alazani, Iori and Mtkvari river basins before building of Mingechauri water reservoir (1953-1965), could be a suitable habitat for leopard. Leopards also were killed in Lagodekhi nature reserve (Markov, 1934).

Intensive hunting, persecution and urbanization have caused fragmentation of leopard range. At the first half of the last century, this species was already rare. According to Vereshchagin (1959), in the 1950's cases of finding and hunting on leopard became very rare. During this time, small amount of leopard only remained in Abkhazia (Janashvili, 1954; Shidlovskii, 1964) and Lagodekhi (Janashvili, 1954). At the beginning of 1960's, Janashvili (1963) noted that the leopard might also have remained in the central part of greater Caucasus. Since 1950 till nowadays, 8 records of leopard killing are known (Table 1). By the end of the 20th century, due to numbers decline, it was believed that species became locally extinct. However, Arabuli (1987, 2006) stated that leopard might have survived in Fshav-khevsureti and Tusheti regions, and in Arsiani range (i.e., Lesser Caucasus).

Table 1. Leopard sight-facts since 1950's till the end of the 20th century

Year	Location/Comment
1949 – 1952 (precise date unknown)	Saguramo range, village Tsnelisi
1950	Znauri District, village Gantiadi / male
1952	Ckhinvali District,village Stalinin
1954	Saguramo range, Zedazeni
1970	Pshavi, village Matura / found dead in avalanche
1979	Arkhoti, Khevsureti
1986	Arkhoti, Khevsureti / 2 individuals

[2] The leopard main prey species vary by region within in The Caucasus. For example, in Armenia, leopard in Khosrovi Reserve mainly feed on Bezoar goat, whereas in the South part of Armenia, leopards pray species are wild boar and roe deer (Khorozyan et.al.0, 2005). In Iran, the main source of food for leopards is bezoar goat, wild sheep and wild boar (as cited in Mallon et al., 2007). According to Lukarevski et al. (2007), leopard spreading in the Eastern part of Greater Caucasus and Lesser Caucasus feed mainly on bezoar goat, wild boar and roe deer.

2.4 Current distribution

The last individual of leopard was killed in 1986 year. A single leopard has been discovered in Vashlovani protected areas, in autumn of 2003. At the beginning footprints were found (Lortqifanidze at el., 2004), and after few months, the young male was captured on photo camera[3] and until now it is the only documentary fact of leopard presence in Georgia. At the same period, scats of big cat and special marks made on the ground were found in Tusheti protected areas and it was concluded that this big cat could be a leopard.[4]. Survey was also conducted in Khevsureti but no signs of leopard presence were found, local hunters provided only anecdotal reports.

Based on these data, we can assume that leopard exists only in Vashlovani protected areas and in surrounding territories, and in Tusheti protected areas – close to Russian border. In addition, information provided by local people, as well as the natural low-density and mysterious life of leopard, make us believe that this species could be found in other regions of Georgia.

2.5 Protection and conservation

Since 1977, leopard is a legally protected species in Georgia. At that period, the first Georgian red list was elaborated (Zazanashvili et. all, 2007). In 1982, Georgian red data book was published. During the Soviet time, hunting on leopard as well as on other species which were listed in red list, was prohibited. In 2005, a new version of the Georgian red list was elaborated. In this version, leopard is listed as Critically Endangered (CR). In the meantime, the sub-species of leopard spread in Georgia - *Panthera pardus saxicolor* is listed as Endangered (EN) in IUCN red list with trend of decreasing.

During the last century (Zazanashvili et. al. 2007) for conservation of Persian leopard no actions were undertaken in Georgia and in the whole Caucasus. During the last years, research was focused on current distribution of the leopard. Few years ago, protected areas in Georgia were enlarged (including Tusheti and Vashlovani protected areas), which will definitely support the conservation of leopard population in Georgia.

2.6 Ongoing conservation and research projects

Conservation and research activities on leopard are currently carried out only in Vashlovani protected areas. Since 2004, NACRES is implementing leopard monitoring program in Vashlovani protected areas in cooperation with park administration. In 2010, the Agency of protected areas, WWF Caucasus Programme Office, and NACRES started joint researches in Tusheti. Besides, leopard habitat modeling was done for the Caucasus by A. Gavashelishvili and V. Lukarevski (Lukarevski et al., 2007), which will be extended in future by adding new important parameters.

In the last years, intensive educational activities have taken place at International and national level. The species is used to raise attention on various conservation activities and protected areas of Georgia.

2.7 Problem analyzes: threats and existing information

In Georgia, the decrease in the numbers of leopard started in 1950's. It seems that main reasons were persecution and hunting, urbanization and infrastructural development, which caused

[3] NACRES' research under the framework of the Protected Areas Development Project.
[4] Survey on the status of leopard carried out by WWF Caucasus Office, NACRES and Dr. F. Lukarevski (invited consultant).

isolation and habitat fragmentation. Probably, lack of prey species was not the main problem, because the numbers of prey species started reducing only in 1990's. After Georgia independence, hunting was not controlled for long time. Therefore, there is no data about leopard killing during these years in Georgia.

The reason could be low density of the species and the likelihood to find leopard during the hunting was extremely low. Poaching still remains as a main threat for leopard and killing even one animal can significantly influence on the population. The scientists and experts agree that there are enough suitable habitats in Georgia for leopard. Illegal hunting on prey species could be considered as an indirect threat for leopard population.

Like other large predators, leopard can predate on livestock. At this stage, conflict is not serious, but there is the root cause of the conflict. In general, conflict is followed by active persecution and death of carnivores, if appropriate measures are not taken on time.

Therefore, during reducing above mentioned threats or implementing other conservation activities, existing contexts or forecasting challenges should be taken into consideration.

One of the most important issues is that leopard needs large suitable areas or habitats, which is mainly a constraint for small countries, such as Georgia. The way to overcome this problem is to implement long-term strategy and improve regional collaboration, develop a network of protected areas, which has to include corridors, as well as stepping-stones connectivity schemes.

Despite the serious planning and implementing constraints, we have to consider that the final effect will justify the effort, because leopard is umbrella species and therefore will help to conserve other species and even ecosystems.

Like with other predators, social and political aspects need to be considered during conservation activities planned on leopard. Activities should include human-carnivore conflict mitigation and implementing public awareness campaigns, with main focus on esthetic and cultural significance of leopard.

For proper planning and effective implementation of activities for leopard conservation, it is important to have accurate information about the biology, behavior and ecology of the species. Current priorities are to carry out research and clarify range, as well as to confirm the presence of individuals.

3. Action Plan Vision, Goals and Objectives

3.1 Vision and Goal

Vision of the Action Plan for the Conservation of Leopard in Georgia is based on the national biodiversity strategy and action plan and means the follow:

> *In harmony with people, long-term conservation of leopard and wildlife are ensured throughout the country.*

To achieve the vision our goal for the next 10 years is as follow:

> *Secure leopard and its prey species viable population and ensure its habitat conservation and sustainable use, as well as elaborating effective mechanisms for coexistence of leopard and local population in the country.*

3.2 Objectives

1. Increase viability of leopard and its prey species populations;
2. Implement research and monitoring programs for leopard and its prey species in the protected areas of Georgia;
3. Increase efficiency of protected area systems for better leopard conservation;
4. Implement public awareness campaigns and environmental education programs, as well as receive support from local people in leopard and wildlife conservation; and
5. Increase cooperation in leopard conservation at international and regional level.

4. Expected outcomes and corresponding actions

Outcome 1: Current distribution and minimal number of leopard in Georgia are known

Current range of leopard is unknown in Georgia. We have some information that except Vashlovani protected areas leopard still exists in Tusheti and Khevsureti. However, it is hard to suppose the real number. Therefore, research in Tusheti should be carried out during the first years of the action plan. This will include photo-traps as well as other field research methods. These methods will be used to proof the leopard presence, as well as to evaluate its numbers. Similar type of research is planned to be conduct in Khevsureti, where is high probability of leopard presence.

In Vashlovani protected areas, there is only one leopard identified. Monitoring process covered only part of semi arid habitat and included only Vashlovani protected areas. In order to specify the numbers of leopards in the region, we need to expand the study area, especially towards the Iori plateau (according to recent reports a big cat, presumably a leopard, was seen near Chachuna managed reserve).

Leopard could be remained in other parts of Georgia – in Lagodekhi protected areas, in Borjom-Kharagauli national park and in Kazbegi protected areas. These are the places where food and suitable habitat for Leopard are still available. Survey should be done with appropriate approaches and methods, which have to be easily implemented and requires low financial and human resources. The research could be carried out by the administrations of protected areas. After obtaining more reliable and updated data, more detailed research should be planned.

Outcome 2: Leopard diet in Georgia is known

There is no reliable data on leopard diet in the country. Based on the general existing information about the ecology of predator and the little material accumulated until now, we can only presume leopard prey species. Hence, it is very important to determine the leopard food ratio for its effective conservation. It is also necessary to study leopard diet in Tusheti and in Vashlovani protected areas.

During the research, scats of the leopard will be collected in Tusheti and Vashlovani. If necessary, genetic analysis could be necessary to identify if the scat really belongs to the leopard. The identified scats will be analyzed with standard methods – using a microscope and etc.

Outcome 3: Distribution and density of leopard prey species is defined in Tusheti and Vashlovani protected areas

From wild ungulates, only wild boar is spread in Vashlovani and this species should be identified as a leopard prey species there. In recent years, wild boar number has not been estimated. It is necessary to conduct ecological studies for assessing the distribution and numbers of wild boar population. Moreover, it is important to make research with footprint calculation method for pre-planned and standard routes, which should be equally distributed among the whole study area. Photo traps could be also used to collect additional information.

Studies conducted in other countries of the ecoregion (especially Armenia and Iran) have shown that even with the existence of other wild ungulates, leopard prefers bezoar goat. Hence, bezoar goat is expected to be leopard main prey in Tusheti protected areas. Here ecological studies should be conducted on Bezoar goat, evaluate its conservation status and population viability.

Bezoar goat range must be specified and the current number of wild goat population need to be determined (e.g., direct counting methods from pre-defined areas can be used). This information will be used for further improving the zoning system of Tusheti protected areas. It is obvious that, the distribution of other ungulates, such as Tur, roe deer, chamois and deer still have a relevant role in Leopard wild prey ratio. If enough resources will be available, research on this species should be done. However, bezoar goat is of high conservation priority not only because of its relevance for leopard diet, but due to its rare status for Georgia.

Outcome 4: Human - leopard conflict is evaluated in Tusheti and Vashlovani protected areas

In the last years, there have been reports of leopards attacking livestock in semiarid zones. For example, in February and March of 2009, shepherds have seen leopard several times. The animal as they say has been stealing sheep. However, conflict between leopard and local population is not strong (unlike conflicts with other predators), but in future, with more information about distribution and livestock loss, conflict could be more serious. After the distribution of leopard will be defined, survey should be undertaken to evaluate level of the human-carnivore conflict. This will have the purpose to find out if leopard is participating in the conflict between predators and local population; and if it is true, how serious is the conflict.

Research has to be based on sociological and socio-economic assessments. Then, appropriate mitigating measures could be planned. For example, compensation for the damage caused to shepherds by predators should be designed. However, international experience shows that to operate such system and to achieve the desired outcome is related to quite a lot of constraints; requires a serious and efficient administration. The first stage is to select the best mechanisms for compensating the loss to livestock caused by leopard (as well as other predators). It also includes developing guiding principles for the compensation system. This activity due to its complexity should be started at next stage of the Action plan.

Outcome 5: Metapopulation model is developed

The Georgian leopard population is an integrating part of the Caucasus Ecoregion metapopulation. It cannot be conserved in the long-term without understanding better the processes inside the metapopulation. In order to conduct the needed metapopulation study in

Georgia, genetic analysis is one of the effective tools to carry it out. This method will allow scientists to determine gene flow between populations. This knowledge will considerably improve the planning of conservation measures.

There are several ecoregional habitat models. For creating these models, many parameters were used (e.g., relief, proximity to settlements, snow cover, etc.). Such models should be improved by incorporating more important parameters, such as the food availability etc. It should be noted that the plan provided in other actions would contribute to improve existing models. Even more precise models of leopard distribution will help scientist to identify more accurately potential distribution sites of leopards, as well as to establish corridors between populations.

Outcome 6: Leopard food base is improved

Viable populations of wild ungulates remain mostly within protected areas. Hence, it is necessary to improve protection regime of these species in protected areas, as well as to reduce poaching level as much as possible. These activities should be started at least in Vashlovani and Tusheti protected areas.

This action have to include elaborating and implementing of effective and regular patrolling system within protected areas, as well as effective measures to strength the law enforcement (e.g., implement of video monitoring, establishment of additional ranger stations, etc.). Results of wild ungulate monitoring will be the best indicator to evaluate the improvement of law enforcement.

In Vashlovani protected areas, only wild boar is remained in the area. Also Persian gazelle was spread about 50 - 60 years ago and was an important species of the semiarid ecosystem. Due to uncontrolled hunting and other factors, it is locally extinct now. Last year in Vashlovani started Persian gazelle captive breeding program and it is planned to release animals back to the wild according to the reintroduction plan.

Outcome 7: leopard Monitoring with unified methods is established and is carried out in Vashlovani and Tusheti protected areas.

In priority areas, such as Vashlovani and Tusheti protected areas, constant monitoring is needed. This will allow scientists to obtain information about numbers and population dynamics of this predator. This information is, of course, needed for long-term conservation.

Information about leopard has been collected since 2004 in Vashlovani protected areas. For monitoring, photo-traps cameras have been used. This method has shown to be quite effective. It has allowed scientist to determine numbers, as well as to monitor activities.

The same monitoring system is planned to be started in Tusheti protected areas. In general, monitoring of leopards should become a priority of biodiversity monitoring activities in Vashlovani and Tusheti protected areas. However, it is noteworthy that the Strategy for the Conservation of Leopard in the Caucasus ecoregion demands all Caucasian countries to develop unified methods for leopard monitoring. Obtained data could be easily comparable, allowing scientists to see the whole picture of leopard current situation in the ecoregion.

Outcome 8: Monitoring of leopard prey species is ongoing

For successfully conserving leopards, it is necessary permanently to monitor leopard prey species populations. Monitoring of leopard prey species should be carried out at least in protected areas. Due to limited resources, it is recommended to select relevant protected areas and main prey species. For example, bezoar goat is probably the main prey species for leopard in Tusheti. Hence, the first task will be to implement a monitoring system for this species. Bezoar goat can be monitored using direct counting method. Long-term monitoring system will allow scientists and managers to observe dynamics of goat population. However, with additional resources and qualified personnel, the monitoring system should include other wild ungulates as well. Monitoring of tur, deer and chamois populations should be done. Meanwhile, monitoring of

wild boar is the priority in Vashlovani protected areas. It is appropriate to use numbers-index for this specie. However, other methods or their combination could also be applied.

Outcome 9: Capacities for leopard and ungulates monitoring in Vashlovani and Tusheti protected areas are significantly improved

Qualified personnel are needed to implement leopard and their prey species monitoring program. Staff of the protected areas (e.g., manager, natural resource specialists, rangers, etc.) has repeatedly passed trainings in a variety of topics. Because of the high rate of turnover and the lack of relevant practice, new set of trainings are needed. Qualified Rangers, who will be actively involved in fieldwork activities, are needed in order to implement monitoring system in Vashlovani and Tusheti protected areas.

Outcome 10: Most part of leopard range included in protected areas

It is important that most places where leopard is spread in Georgia will be covered by different protected areas. It is planned to establish in nearest future protected area in Khevsureti, where suitable habitat and prey species for leopard are represented. It is believed that also leopard still remains in that area.

According to recent information, leopard can also be found in Chachuna managed reserve. This place is an important shelter for leopard, as well as other big mammals. The Chachuna managed reserve covers only a small area (i.e., mainly small part of riparian forest among river Iori). Hence, it is recommended to expand the area of this protected area, by including more diverse and important habitats, such as Areulebi habitat.

Generally, it is very important to improve the efficiency of the protected areas and establishing new ones. This includes establishing protected corridors between protected areas and ensuring them certain protection regime. This is important in order to increase the environmental sustainability of protected areas, which in turn will contribute to maintain viability populations of species. Leopard habitat models will be the most effective tool to identifying migration corridors. In terms of this action plan, it is possible to elaborate the concept of protected corridors, which could be later established.

Outcome 11: Ex-situ conservation of Caucasian leopard is ensured

Leopard is one of the endangered species in Georgia. Hence, restocking and reintroduction of this specie might be necessary in the future. The number of leopard in all countries is very low. Therefore, the establishment of the Caucasian leopard breeding centre is outlined as an important action for species conservation. In breeding centre, animals will be kept to start restoration of wild population where it will be necessary.

Outcome 12: Suitability of leopard restocking measure in semiarid zone of Georgian is evaluated

For rare and endangered species, one of the most effective ways for restoring them into the wild is restocking. However, when the case is related to predators, along with other issues, it is important to take into account social aspects. Restocking is generally considered when population recovery by other means is ineffective. Therefore, a special assessment should be done, which will clarify if restocking is needed to restore leopard viable population in Georgia. During the implementing of this action plan assessment should be done. Based on its results, actions will be planned for the next years (2015 – 2019).

Outcome 13: The effectiveness of leopard and wildlife protection within protected areas is significantly increased

The main condition for long-term conservation and restoration of leopard in Georgia is to support effective protection of leopard and its prey populations. At this point, the maximum level of protection is quite possible in protected areas, where already exists infrastructure, technical

and human resources. It is necessary to improve protection in Vashlovani and Tusheti protected areas. A better patrolling system, as well as mechanisms to raise ranger's motivation is needed.

At the same time, it is necessary to increase qualification of rangers, which can be implemented through a permanent training system. This system should focus on poaching level reduction. In addition, one of the most necessary pre-conditions is to clarify Rangers' duties, which essentially require legislative changes. Therefore, it is planned to improve the legal framework regarding Rangers' rights and duties.

Outcome 14: National legislation is improved for better protection of the leopard

Leopard has been included in the Georgian Red List in 1977. However, for leopard conservation at the national level, changes in legislation are needed. For example, the rule about "Regulation of Wild Animals" states that wildlife can be exterminated, if there is an emergency that demands this action. In order to reduce the threat of killing leopards, regulation should be changed to clarify rights and duties of farmers in cases when wild animal included in the red list (e.g., leopard) attacks the livestock.

There is very high penalty for killing of large mammals, and when the species is listed in red list, the penalty grows five times. Therefore, it is needed to improve the method of calculating the environmental damage caused by poaching. This will allow us to have a more realistic and logic penalty system.

Outcome 15: Collaboration between all involved agencies in the field of leopard conservation is significantly improved

The agency of protected areas, the inspection of environmental protection, and the biodiversity service, which are all part of the MEPNR, are responsible for protecting and conserving biodiversity. Within this organizational structure for biodiversity protection, more coordination and cooperation among its parties is needed. Therefore, it is essential that these agencies will work and plan together based on special agreement, which could be a special memorandum specifically focusing on protecting and conserving of the leopard.

In boundary zones, there are some functional overlaps between two entities (i.e., Ministry of Interior and Border Police, and the APA). These sometimes constraint the effective implementation of protective measures in protected areas located on boundary zones. This is a situation that needs to be solved by clarifying the competences between the different governmental agencies.

Outcome16: Local communities and the general public support the conservation of leopard in Georgia

Unfortunately, local people living close to protected areas often have a negative attitude towards protected areas. This has negatively affected the management of protected areas, as well as the successful of different conservation measures. The lack of information and a general low environmental awareness level has caused discontent of local people. Moreover, local people are not part of the management process of protected areas. Therefore, a transition from a traditional management approach to a more collaborative management approach is recommended, which could be done through advisory councils that will function in a way that will ensure civil society participation.

The re-discovery of the leopard happened five years ago in Georgia, and this news was widely covered by mass media. However, most of the public still does not know anything about this fact and in general about leopard. Therefore, educational plans and public awareness activities are thought for both national and local levels. This will include a large-scale campaign, which will use various tools (e.g., television programs, advertisements, billboards and other advertising space, as well as interpretative boards in protected areas, various types of printed materials, etc.)

In addition, various activities oriented to leopard conservation will be hosted in Vashlovani and Tusheti protected areas, which may include the exhibition and sale of handy-craft products with leopard symbols made by local people. Hunters are considered the main target group for the educational campaigns. Georgian hunters must be well informed about leopard existence in our country, as well as its environmental, conservational, esthetical and cultural importance. An effective and cheap way will be to help Department of Licenses and Permits, as well as Hunter Union to publish and distribute special information leaflets or brochures on this species (e.g. together with the hunting license).

Outcome 17: Experience is shared across the whole Ecoregion

The conservation of leopard viable populations without regional cooperation is impossible. In 2007, countries of the Caucasus Ecoregion, with participation of international experts, developed the "Strategy for the Conservation of the Leopard in the Caucasus Ecoregion". In this document, one of the actions is to develop and implement a leopard monitoring system at Ecoregional scale. It is very important that leopard monitoring, as far as possible, uses unified methods with the purpose of having comparable data that will allow seeing the whole picture of leopard in the Caucasus Ecoregion. In order to resolve this and other ecoregional issues, information exchange will be done through seminars about leopard conservation. In this action plan, it is planned to hold these seminars in Georgia.

5. Logical framework

OUTCOME	ACTION	PRIORITY	TIME-FRAME	REQUIRED RESOURCES	INDICATORS	TASK NUMBER
1. Current distribution and minimal number of leopard in Georgia are known	1.1. Define leopard distribution and its number in Tusheti protected areas	High	2010-2012	20 000	Data (including photographs) collected during the research and/or genetic analysis results	2
	1.2. Validate leopard distribution (i.e., existence) in Khevsureti	High	2010-2011	15 000	Photographic and other materials, and/or results of genetic analysis	2
	1.3. Determine leopard distribution and numbers in Iori Plateau	High	2010-2012	20 000	Map of distribution, camera trap data indicating leopard number, and/or results of genetic analysis	2
	1.4. Determine distribution (i.e., existence) of leopard in different areas of Georgia (e.g., Lagodekhi Nature Reserve, Borjomi-Kharagauli National Park, Svaneti, Arsiani ridge, Kazbbegi)	Medium	2011-2012	10 000	Map of distribution based on data collected by different research methods (e.g., camera traps, interview of local populations and/or results of genetic analysis)	2
2. Leopard diet in Georgia is known	2.1 Investigate leopard diet in Tusheti, Khevsureti and Vashlovani (with non-invasive methods)	High	2010-2012	Included in the budget of 1.1., 1.2., and 1.3.	List of prey species and their ratio in leopard diet according regions	2
3 Distribution and density of leopard prey species is defined in Tusheti and Vashlovani protected areas	3.1 Assess wild boar (as a only ungulate in the region) population number and evaluate possibility of its population growth in Vashlovani national park	High	2010-2011	9 000	Wild boar (as a possible pray species) distribution map and data on its population number.	2
	3.2 Evaluate the viability of bezoar goat population in Tusheti protected areas	High	2010-2011	10 000	Data showing conservation status of bezoar goat	2

OUTCOME	ACTION	PRIORITY	TIME-FRAME	REQUIRED RESOURCES	INDICATORS	TASK NUMBER
	3.3 Assess number other prey species (e.g., roe deer, Caucasian tur, chamois) in Tusheti protected areas	Low	2010-2011	6 000 (Will be implemented together with 3.3)	Distribution maps and data on prey species density.	2
4. Human - leopard conflict is evaluated in Tusheti and Vashlovani protected areas	4.1 Evaluate attitudes of local population towards leopard and assess damage caused by the predator in Vashlovani and Tusheti protected areas	Medium	2011-2012	10 000	Results of social-economic surveys and interview of local communities – quantitative and qualitative data	2
5. Metapopulation model is developed	5.1 Conduct Metapopulation analysis to identify status of small Georgian leopard population	Medium	2012-2013	3 000	Model and data of genetic analysis	2
	5.2 Validate existing leopard habitat model	Medium	2013	3 000	Map of suitable leopard habitats	2
6. Leopard food base is improved	6.1 Intensify protection of leopard primary prey species in Tusheti and Vashlovani protected areas	High	2010-2012	Will be implemented in connection with 1.3.	Reports and data showing implemented protection measures (e.g. regular patrolling of rangers) and pray species monitoring results.	1
	6.2 Initiation of a long-term reintroduction program for Goitered gazelle in Vashlovani area	High	2010-2014	60 000 (preparation of the program and starting stages)	Goited gazelle reintroduction program is finalized and approved; Within the program breeding centre is established and after 5 years there are at least 100 individuals.	1

OUTCOME	ACTION	PRIORITY	TIME-FRAME	REQUIRED RESOURCES	INDICATORS	TASK NUMBER
7. leopard Monitoring with unified methods is established and is carried out in Vashlovani and Tusheti protected areas	7.1 (a) Develop leopard monitoring system in Tusheti and Vashlovani protected areas. (b) Monitor leopard in Vashlovani and Tusheti protected areas (by protected area administrations) based on unified methods	High	(a) 2010-2011 (b) 2012-2014	(a) 30 000 (b) 36 000 (6 000 per year for each national park)	Approved leopard monitoring plans for Vashlovani and Tusheti protected areas; and there is a permanently updated data base.	2
8. Monitoring of leopard prey species is ongoing	8.1. Develop and implement monitoring of bezoar goat in Tusheti protected areas	High	2010-2013	6 000	Approved plan of wild goat monitoring for Tusheti protected areas; and there is a permanently updated data base.	2
	8.2. Monitore ungulates (i.e., tur, deer, chamois) in Tusheti protected areas	Medium	2011-2013	6 000	Approved ungulates plan monitoring (i.e., tur, deer, chamois) in Tusheti protected areas; and there is a permanently updated data base.	2
	8.3. Monitoring of wild boar in Vashlovani protected areas	High	2010-2013	4 000	Approved wild boar monitoring plan in Vashlovani protected areas. Permanently renewing data base	2
9. Capacities for leopard and ungulates monitoring in Vashlovani and Tusheti protected areas are significantly improved	9.1. Organize extra trainings for Vashlovani and Tusheti protected areas rangers in leopard and ungulates monitoring	Medium	2010-2012	10 000	Training data	2; 3.

OUTCOME	ACTION	PRIORITY	TIME-FRAME	REQUIRED RESOURCES	INDICATORS	TASK NUMBER
10. Most part of leopard range included in protected areas	10.1 Establish and develop protected areas in Khevsureti	High	2010-2013	1, 000, 000 (Attracting donors)	Khevsureti protected areas are legally established and its administration is developed	3
	10.2 Expend Chachuna managed reserve	High	2010-2011	50 000	The law is issued about expantion of Chachuna protected area	3
	10.3 Develop the concept of biological corridor management based on the leopard metapopulation model	Medium	2013	5 000	With the participation of all interested entities national concept of biological corridor management is developed and approved	3
11 Ex-situ conservation of Caucasian leopard is ensured	11.1 Establish the Caucasian leopard captivity breeding centre	Medium	2014	1 000 000 (Attracting donors)	Georgian ex-sity Conservation Centre for Caucasian leopard has minimum two breeding couples of *P.p. saxicolor*	1
12. Suitability of leopard restocking measure in semiarid zone of Georgian is evaluated	12.1 assess the leopard restoring/reintroducing possibilities	Medium	2011-2012	20 000	Evaluation report	1; 2.
13. The effectiveness of leopard and wildlife protection within protected areas is significantly increased	13.1 Develop effective anti-poaching system in Tusheti and Vashlovani protected areas and improving their financial and technical recourses	High	2010-2011	200 000	Written material of patrolling and other protective measures; target protected areas have appropriate equipment.	3
	13.2 Establish a permanently worked and effective system for improving ranger qualification	High	2011-2012	100 000	Plans of requalification impruvements (special sources, in-house training schedules); materials proofing rangers attendance on the trainings and periodical tests results.	3

OUTCOME	ACTION	PRIORITY	TIME-FRAME	REQUIRED RESOURCES	INDICATORS	TASK NUMBER
	13.3 Improve legislation regarding ranger rights and duties– make changes in legislation that will facilitate better law enforcement.	High	2011-2012	5 000	Corresponding changes are made in legislation	3
14. National legislation is improved for better protection of the leopard	14.1 improve legal act of "Rules of Wildlife Regulation to exclude legal possibility to kill leopards	High	2010-2011	5 000	Corresponding changes are made in the legislation	1
	14.2 Improve poachers penalty calculation methods, which will serve as basis better law enforcement	High	2010-2011	5 000	Corresponding changes are made in the legislation	1
	14.3 evaluation of possibility to establish compensation to damage caused by leopard (as well as other predators) to the local population (finding rational and effective ways)	High	2010-2011	5 000	Recommendations about effective and acceptable compensation mechanisms are presented and delivered to decision making entities	1; 4.
15. Collaboration between all involved agencies in the field of leopard conservation is significantly improved	15.1 Facilitate agreement action plans of agency of protected areas, the inspection of environmental protection and the biodiversity service for better conservation of leopard and its wild prey species	High	2010-2013	-	Reports of joint meetings and discussions, written documentation (i.e., minutes)	1; 4.
	15.2 Clarify rights and duties between the agency of protected areas and boarder police for better monitoring of protected areas close to the boarder zone	High	2011-2012	-	Corresponding legal act is approved	3

OUTCOME	ACTION	PRIORITY	TIME-FRAME	REQUIRED RESOURCES	INDICATORS	TASK NUMBER
16. Local communities and the general public support the conservation of leopard in Georgia	16.1 Reorganize Advisory Council of protected areas and increase public involvement in protected area management and governance	Medium	2011-2012	-	Corresponding changes are made in the statute	4; 3.
	16.2 Initiate educational and social awareness raising activities at national and local levels	High	2010-2014	100 000	Educational material is prepared and spread	4
	16.3 Initiate various activities dedicated to leopard in Tusheti and Vashlovani protected areas	High	2010-2014	40 000	At least one activity is held in each protected area	4
	16.4 Inform hunters about conservation and legislation status of leopard	High	2010-2014	10 000	Special informational leaflet is distributed among the hunters (e.g. together with the hunting licence)	4
17. Experience is shared across the whole Ecoregion	17.1 Organize regional meeting for unifying monitoring methods and developing mechanisms for information exchange	High	2012	40 000	Unified method of leopard monitoring exists	5
	17.2 Host Ecoregional meetings dedicated to leopard conservation	Medium	2013	40 000	Seminar and meeting materials	5

6. Implementation

6.1. Action Plan Monitoring and Evaluation

Monitoring of this plan includes permanent observation to the points in which i) actions were performed, ii) periods of time, and iii) what has progressed for achieving results according to their time-frame period. The monitoring process is based on the indicators for each action provided in logical framework (i.e., Section 5).

On the fourth year of action plan implementation Ministry of Environment Protection and National Recourses, WWF and NACRES joint commission members will discuss and assess the implementation process of the plan, which will come up with updating the plan.

6.2 Action Plan Update and Changes

The leopard conservation action plan duration is five years. Update will be needed after this period. Goals and objectives will be maintained without changing and the main changes will be in the actions list. During this 5 year period some actions will be fully implemented, while others maybe extended for the next 5 years. In addition, new actions will be elaborated based on the results. Moreover, based on the critical evaluation and monitoring of the plan and its actions adequate changes will be made. Like in the first version, main interested parties will be part of developing the second version of this plan.

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