



Georgia

Task Report on Implementation of Biodiversity (*Capra spp.*) Monitoring



UNDP/GEF project "Catalyzing Financial Sustainability of Georgia's
Protected Areas System" (00070382)

Testing site-level revenue generation mechanisms in Tusheti PAs

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The views expressed in this report are those of the author and do not necessarily represent those of the United Nations or UNDP.

Abbreviations used

APA	Agency of Protected Areas
FFI	Fauna and Flora International, UK
IUCN	International Union for Conservation of Nature
NACRES	Centre for Biodiversity Conservation and Research
NP	National Park
PA	Protected Area
TPA	Tusheti Protected Areas
UNDP	United Nations Development Program

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1 Introduction

“Biodiversity (*Capra spp.* - tur and wild goat) monitoring program” for Tusheti Protected Areas was elaborated in spring 2011¹. According to this document the overall goal of biodiversity monitoring in TPA is to set up and implement the monitoring of priority species and other components that are most important in respect of conservation and ecotourism management.

Following the above goal and also the requirements of the Project², the primary objective of biodiversity monitoring in TPA in 2011 was the monitoring of wild goats focusing on population numbers and population range. The monitoring of the tur population was also an important priority. Therefore it was planned to gather information on the status of the tur population too. The training of TPA rangers in biodiversity monitoring was still considered a priority. Although a number of TPA staff received this training in the previous year (i.e. in 2010), many of them had since left and the newly recruited rangers obviously needed additional training in biodiversity monitoring.

As indicated in Biodiversity *Capra spp.* – tur and wild goat, monitoring program (2011), in the future, as more resources for biodiversity monitoring become available and the local capacity improves, the scope of the monitoring program should expand accordingly. (For example, a comprehensive monitoring scheme would ideally involve data collection in various, if not all, seasons. However at present Tusheti is almost inaccessible during November through May. Biodiversity monitoring in this period of the year would be very costly and would require additional human resources. Therefore biodiversity monitoring in Tusheti during the winter months is currently not feasible).

2 Capacity raising for biodiversity monitoring

2.1 Trainings

Within the current project, training was delivered to the rangers and natural resource specialist of TPA in the beginning of the summer surveys, in July 2011. During the several days of training, the following topics were covered: biodiversity monitoring and data collection in the field including using GPS, direct counts of wild goat, and GIS technologies

¹Report on Design of Biodiversity (*Capra spp.*) Monitoring, NACRES 2011 (UNDP/GEF)

² Current project („Testing site-level revenue generation mechanisms in Tusheti PAs“(UNDP/GEF) has tur and wild goat as priority species for biodiversity monitoring and therefore our activities are mainly focused on these species.

for biodiversity monitoring. For this purpose field data sheets for wild goat direct counts and eyewitness interviews were reviewed with the rangers and the principles of use of camera traps were explained. APA provided 4 digital camera traps to TPA. It was envisaged that the rangers would independently install them in preselected locations.

It is notable that within the framework of the EC funded “Georgia Carnivore Conservation Project” (FFI/NACRES)³ the natural resource specialist of TPA attended a short course in use of GIS technologies.

2.2 Equipment

The current project does not envisage the provision of any equipment to TPA. The above mentioned FFI/NACRES project provided the TPA with a powerful portable computer, binoculars and first aid kits; and later also two GPS units. These GPS units have built-in digital cameras, which will facilitate biodiversity data collection in the field, documenting facts recorded in the field as well as subsequent analysis.

3 Involving the local community in biodiversity monitoring

In July 2011, association Friends of Tusheti Protected Areas, one of the project’s local working groups, organized a so called ecological camp in Tusheti. The aim of this 12-day camp was to involve Tusheti youth (students) in different aspects of the TPA management (see Appendix 1 for the list of participants). The participating students learnt about the role and functions of TPA, rangers’ tasks and responsibilities, the administrative structure of TPA, tourism in Tusheti, the fauna and flora of Tusheti, and about environmentally friendly traditions of Tusheti. Special emphasis was placed on the involvement of the youth in biodiversity monitoring.



Photo 1: The eco-camp participants learning how to use GPS and map data.

³“Georgia Carnivore Conservation Project” is jointly implemented by FFI and NACRES

In addition to theoretical part, the camp participants attended practical trainings and participated in actual field work. They became familiar with such themes as biodiversity monitoring, storage of monitoring information, and use of field data sheets.

Field trips were conducted to the Kue area where the students participated in counting of wild goats. (Kue is one of the sites of wild got monitoring)



Photo 2: The eco-camp participants learning about field techniques of data collection for biodiversity monitoring.

At this point involving the local community representatives in biodiversity monitoring in Tusheti primarily has an educational purpose. In the future this activity should be continued and further developed so that more attention is paid to actual data collection and biodiversity monitoring.

4 Involving visitors in biodiversity monitoring

The visitors that participated in the testing of the wildlife watching, namely the wild goat watching itinerary⁴ were also involved in wild goat monitoring. Very often data provided by visitors need to be double-checked before they can be used in the monitoring process. In this particular case some of the visitors provided valuable assistance in locating separate individuals and small groups of wild goats and the numbers were immediately verified by a specialist. This approach of use of information from the visitors should continue in the future too.

⁴Task report on Establishing wildlife watching tours for visitors, NACRES 2011 (UNDP/GEF)



Photo 3: Park visitors counting the wild goats from the Kue observation point.

It is notable that the TPA web site currently being developed by APA will include a special appeal to the park visitors to report back to APA/TPA administration any information potentially valuable to biodiversity monitoring in Tusheti.

5 Monitoring of the wild goat population

After receiving relevant training, some of the rangers joined the project implementation team in the wild goat monitoring in the vicinity of village Omalo. The natural resource specialist and rangers had access to high quality binoculars. This allowed them to collect better quality data as compared to previous years.

In 2011 the wild goat monitoring involved the monitoring of two main population parameters: population numbers and population range. These two parameters allow the assessment of the overall trend of the population (whether it is stable, increasing or declining). Data on other characteristics such as social structure and sex composition, and daily activity were also collected.

Following the recommendations of Biodiversity *Capra spp.* – tur and wild goat, monitoring program (2011), direct counts were used to estimate the wild goat population numbers. According to the preliminary plan wild goat direct counts were conducted twice, in July and September.

The wild goat range map developed in previous years had to be verified because some sections were included only on the basis of suitable habitat availability or reports from local people. This year we updated the wild goat summer range on the basis of credible reports of direct observations from various sources.

5.1 Direct counts

It is one of the critical assumptions of any direct count that one and the same individual/group is not recorded more than once. Direct counts were conducted from a number of preselected points. These were chosen so that they allowed the largest possible area of wild goat observation to be within the visibility. The counts were conducted in early morning (at dawn) or in the evening (before dark). During these times females with young as well as younger (non-breeding) males tend to be more active; in search of food and minerals they come out into forest openings and natural leaks. The observations were made using binoculars or a scope; individuals were counted and where possible sex and age composition was also noted (adult, sub-adult or young). Each herd was given a name after the site/gorge in which they were observed (not after the name of the observation site because it is sometimes possible to observe more than one herd from a single observation site).

For the purpose of wild goat population monitoring, direct counts were carried out from four selected sites:

- (1) The Keseloebi from which one can see the Khakhabo hillside as well as the rocky slopes just below the castle.
- (2) Kue, from which it is possible to observe the rocky slopes below mount Sonekha and parts of the Tsitel Mta.
- (3) Omalos Tavi⁵, from which rocky slopes near village Shenako as well as those beside village Omalo could be observed.
- (4) Chigho gorge (near the religious site), from which rocky slopes below the Lashari Salotsavi and the forested hillsides just across the observation point are seen.

Observations were conducted twice a day during 6:00 - 9:00 hrs and from 17:00 hrs until dark. The observation team consisted of at least two members, each conducting an independent count but constantly verifying the animals seen by the other(s). The final number of observed individuals was then calculated considering the results of each observer. In order to obtain the final number for a given herd, observations were undertaken during at least three days with similar weather conditions.

⁵ This observation point was added this year. It is a convenient point to observe wild goats at a relatively close distance. There are many natural leaks, which increases the chances of spotting wild goats there.

5.2 *Wild goat range monitoring*

Camera trapping pictures are probably the best evidence of species presence. However, reports about animal footprint or scats from an experienced person as well as about animal sighting are also useful information. Thus credible reports of wild goat sighting were used to update the existing range map.

5.3 *Results (wild goat monitoring)*

5.3.1 Population numbers

Our studies have shown that the best time to conduct wild goat direct counts is the period from 17:00 hrs until dark. Early morning is less preferred time because the wild goats tend to remain in their resting sites. By the time the morning light allows direct counts, most of the animals may already be lying down in their resting places during which time they are extremely difficult to spot. In addition, fog is a commonplace in early morning hours making the observation very difficult. In the afternoon, as they begin to move around to graze and leak on natural leaks the wild goats are easier to spot. First groups were spotted already as early as 17:20 (i.e. in 20 minutes after the start of the observation).

Some correlation has been noted between the probability of spotting the wild goats and the weather conditions on the previous day(s). In the given sites the wild goats are more likely to come out to feed after a mostly dry day. We were unable to spot any individuals after overnight or morning rain. In the rainy weather or some time after the rain the animals do not move around very much and tend to take shelter in caves or crevices. During such time the wild goats are almost impossible to spot because many of such shelters are also covered with dense vegetation. Therefore weather conditions should be taken into account when planning/conducting wild goat direct counts.

Wild goat direct counts were conducted from the above four observation sites (see Appendix 1 for the results of direct counts). In July, we counted 18 adults, 4 sub-adults and 7 young. In September, we observed 24 adults and 12 sub-adults. Higher number of sub-adults as compared to the July data, may be explained by the fact that in September it was already very hard to tell sub-adults from the yearlings especially from a distance.

It is notable that in July differently from September, no adult males were observed near the females. This may be associated with the following: (1) during the summer months there is more human presence (visitors and local people) in Tusheti. Due to relatively high

disturbance and/or certain ecological factors most males prefer to remain in the alpine zone, (2) the males are more shy than the females and as human disturbance decreases in September they begin to come out into open areas more often, (3) in September as the mating season approaches 5-6 year-old males (this is the age class we were observing more often during the September surveys) try to stay closer to the females.

Despite multiple attempts both in July and in September we were unable to spot any individuals from the Keselo observation point. However, in the beginning of July, park rangers observed 3 individuals just across the observation point, on the slopes of village Khakhabo.

5.3.2 Comparison of the 2010 and 2011 data

In 2010, wild goat direct counts were conducted only in July. In 2011 it was done twice, in July and in September. In September 2011 from some observation points a higher number of individuals were counted as compared to the results obtained in July. Nevertheless, it is more appropriate to compare the data collected during the same month of the two years i.e. in July.

In 2010, from the Keselo observation site two herds were recorded, one on the rocky slopes just below the castle (2 females) and the other (5 females and 3 young) on the Khakhabo hillside. No wild goats were recorded in 2011 from the Keselo. But TPA rangers counted 3 females on the side of village Khakhabo in the beginning of July.

The data gathered in 2010 and in 2011 from the Kue observation site are practically identical. During both years two herds were recorded containing 9 individuals in total. In Chigho gorge, from the Lashari Salotsavi two herds were observed in 2010: one below the Lashari Salotsavi (4 females and 7 young) and the other just across the observation point (7 females and 6 young). In 2011 below the Lashari Salotsavi, 2 females, and on the opposite hill 3 females, 2 yearlings and 2 young were recorded

It is probably premature to make conclusions about the status of the wild goat herd of any specific site or about the whole population. Farther surveys and monitoring are needed and counts should be conducted annually both in July and September. In order to determine the status (trend) of the population, data need to be collected uninterruptedly over several years. In comparison with the previous year the population appears to be stable. It is important to note that large mammal populations do not immediately respond to improved

management by an increase in numbers⁶. It normally takes several years before any positive trend can be detected. In this particular case it is probably a positive sign that no decline of population numbers has been noted.

5.3.3 Range mapping

Our studies have shown that few groups of wild goat still remain near villages Old Diklo and Intsokhi. This year several independent sources (locals, visitors and rangers) confirmed the presence of wild goats in the vicinity of village Khiso. Wild goats were also observed near the rangers' station in Samkhevi. Consequently certain parts of the wild goat range in which the species presence was under question mark, have now been confirmed. The updated wild goat range map is provided in the appendices (Appendix 3).

In general, updating of the wild goat range map is an ongoing effort and relevant activities should be undertaken each year. There are several specific priority sites that should be verified next year. These include: village Bochorna, mount Makratela, and Vebo.

6 Monitoring of the tur population

It is extremely difficult to conduct regular direct counts of the tur population in Tusheti and presently the TPA administration does not have sufficient capacity or resources. Camera trapping method was suggested to monitor the tur population⁷. Naturally camera trapping data do not give real numbers but only indices (very often an index is the only appropriate/possible measure of the status of the population being monitored). According to the preliminary plan camera trapping data were to be gathered from spring through the end of the autumn in the following three priority sites: the Nartsapi pass, Chesho gorge, and Chigho gorge. However, due to lack of camera trapping equipment only two units were allocated to the tur population monitoring. The NACRES team and the rangers installed one of them at a busy tur trail in Chesho gorge. The second was placed near the Nartsapi pass by the rangers after they had received additional training.

The camera trap installed in Chesho gorge operated during 56 days. No tur were captured on this camera (but other animals were recorded such as Caucasian snowcocks). The other unit installed on the Nartsapi pass collected data during 52 days ($N_{t/d} = 52$) and it captured tur as well as fox, wolf and Caucasian snowcocks. During this time a total of 25 tur

⁶ A large mammal population usually rapidly responds to strong negative influences in which case the response is of course a decline.

⁷Biodiversity *Capra spp.* – Tur and wild goat, monitoring program for Tusheti Protected Areas, NACRES, 2011. (UNDP/GEF)

individuals⁸ were photographed by the camera ($N_i = 25$). Thus we have the following index for tur in the upstream Larovani, the Nartsapi pass for summer 2011:

$$i = N_i / N_{t/d} = 0.48$$

According to the data collected in 2010 from the same site, the index was 0.51.

By no means are the data collected during two years sufficient to determine the trend in the population. After several years of monitoring it will be possible to build a graph and assess the situation. However, as in the case of the wild goat population, it is a good sign that there is not a significant decrease in the index. The small difference between the 2010 and 2011 indices may be explained by following: in 2010 at the Nartsapi pass we had two camera traps installed opposite to each other so that the passage was completely "locked". In 2011 due to lack of equipment only one camera was installed at that site. This could have had an effect on the number of photographed individuals.

The tur population monitoring using camera traps and population indices should continue in subsequent years too. It is also advisable to use two camera traps at each trapping site. This will allow monitoring the whole of the wider trail and passages and also minimize risks associated with equipment failure.

7 Random collection of data

As outlined in the monitoring plan, data on the wild goat and tur populations in addition to the above mentioned targeted activities were also gathered as a "by-product" of other management activities. During patrolling or other routine movement around the park the rangers and other staff of the TPA administration observed and recorded tur and wild goat groups as well as other wildlife and/or their signs. All of these recordings were then entered into a simple data base (see chapter 9).

8 Monitoring of other species

Apart from wild goat and tur it is important to collect data on other species too, primarily on leopard and red deer. Over the last period no new information was obtained about leopard. No report of leopard sighting was received from locals or visitors.

⁸It is important to note that this is a simple total number of photographed tur without identifying individual animals.

Special activities to investigate the presence of the red deer were conducted in the Kumelaurta forest, potential red deer range in Tusheti. Despite some expectation no individuals or signs of red deer presence (tracks, fecal pellets) were found during the field surveys in July. Local shepherds were also interviewed but they did not confirm any sighting (presence) of red deer over the current summer season. We installed a camera trap to obtain more credible information. It was revisited in about two months' time. The camera trap had not recorded any red deer or any other animal, which indicated equipment failure. However, during the same period, on August 19, 2011, one of the park rangers sighted a red deer in the Kumelaurta area.

At this point it is hard to make any conclusion on the red deer population in Tusheti. Further surveys and monitoring is needed to determine if there is a red deer re-colonization process or simply isolated cases of appearance of vagrant individuals.

9 Monitoring data base

Maintenance of a data base is one of the necessary components of any biodiversity monitoring system. We entered the data collected by the TPA rangers in 2011 into a simple Microsoft Excel document⁹ (Appendix 4), which can serve as a basis of a simple and easy-to-use data base. Presently this data base includes species recorded during patrols with location and date, and means of detection (footprint, scat, visual observation, etc.).

Data collection is essential part of biodiversity monitoring. However, a special tool is needed to file the information and to store it in an orderly manner (i.e. to create an effective data base) and then to allow effective use of this information. One such instrument is GIS technologies. In order for the Tusheti data base to be converted into a GIS data base, each entry must have a geographical reference. Geographical coordinates could not be collected by the TPA rangers during summer 2011 due to lack of GPS equipment. Presently the situation has been somewhat improved¹⁰. By adding GIS references to each new entry the existing data base can be synchronized with a GIS data base. It is also advisable to take photo of each recording of foot print or scat.

⁹ Microsoft Access or Excel may be used for creating a monitoring data base. However Excel is in general a more commonly used software and it may be easier and more appropriate for the protected areas.

¹⁰ "Georgia Carnivore Conservation Project" (FFI/NACRES) provided TPA with two units of GPS equipped with a digital camera and the purchase of more units are intended.

Appendix 1: List of student participants in biodiversity monitoring

1. Levan Chrelashvili - Tbilisi Humanitarian University, Faculty of Law.
2. Levan Cholikidze – Tbilisi Technical University, Informatics and Management.
3. Soso Cholikidze - Tbilisi Technical University, Informatics and Management.
4. Mikheil Bashinuridze - Tbilisi Technical University, Faculty of Construction.
5. Vakhtang Kochlamazashvili – St. Andrew University, Faculty of Physics and Mathematics and Computer Sciences.
6. Tamar Azikuri – Ivane Javakhishvili Tbilisi State University, Business and Management Faculty.
7. Salome Idoidze - Ivane Javakhishvili Tbilisi State University, Business and Management Faculty.
8. Natia Tilidze - Ilia State University, Faculty of Arts and Sciences.
9. Natia Ujirauli - Georgian Aviation University, Business and Management Faculty.
10. Lia Itiuridze - University of International Relations of Georgia, Faculty of Finance and Banking.

Appendix 2: Results of direct wild goat counts, 2011

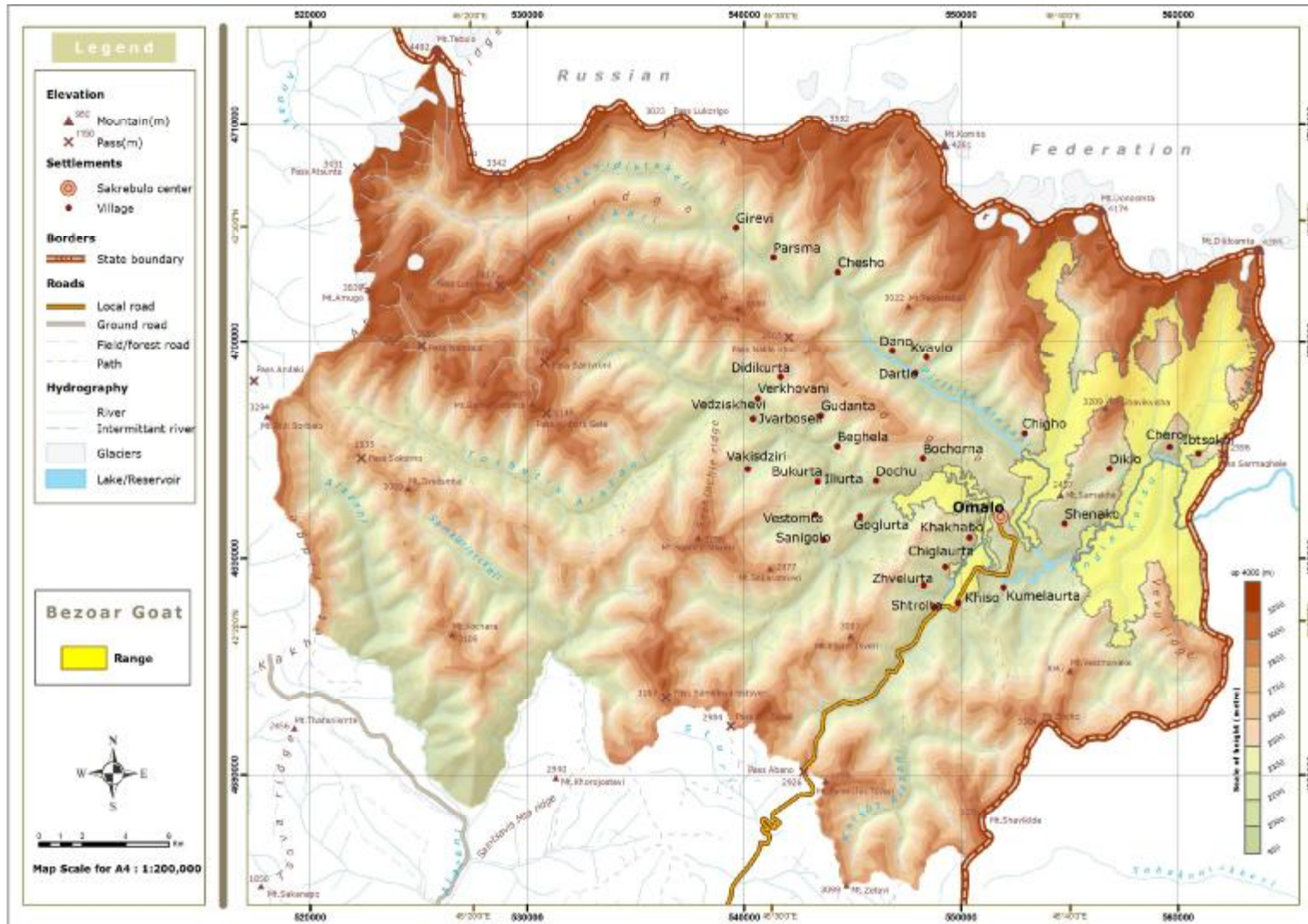
July, 2011

Observation site	Observation period	Adult female	Adult male	Subadult	Young
Kue	Day 1	1	0	1	1
Kue	Day 2	0	0	0	0
Kue	Day 3	5	0	1	0
Keseloebi	Day 1	0	0	0	0
Keseloebi	Day 2	0	0	0	0
Keseloebi	Day 3	0	0	0	0
Chigho gorge	Day 1	0	0	0	0
Chigho gorge	Day 2	4	0	0	3
Chigho gorge	Day 3	5	0	2	2
Omalos Tavi	Day 1	8	0	1	3
Omalos Tavi	Day 2	3	0	0	3
Omalos Tavi	Day 3	5	0	0	2

September, 2011

Observation site	Observation period	Adult female	Adult male	Subadult	Young
Kue	Day 1	0	2	2	0
Kue	Day 2	5	0	1	0
Kue	Day 3	9	1	0	0
Keseloebi	Day 1	0	0	0	0
Keseloebi	Day 2	0	0	0	0
Keseloebi	Day 3	0	0	0	0
Chigho gorge	Day 1	6	2	9	0
Chigho gorge	Day 2	4	0	2	0
Chigho gorge	Day 3	0	0	3	0
Omalos Tavi	Day 1	2	0	1	0
Omalos Tavi	Day 2	2	0	1	0
Omalos Tavi	Day 3	4	1	1	0

Appendix 3: Updated map of wild goat range in Tusheti



Appendix 4. Biodiversity Monitoring data base (2011)

Species	Location	Date	Footprint	Scat	Direct observation	Audio signal
Wild goat	Near Ishoreki	01.07.2011	0	0	2	0
Bearded vulture	Kue	01.07.2011	0	0	3	0
Bearded vulture	Near Keseloebi	16.07.2011	0	0	1	0
Bearded vulture	Near Keseloebi	25.07.2011	0	0	2	0
Wild goat	Kurbukhi spring	03.07.2011	0	1	0	0
Wild goat	Near Gulpivtana	03.07.2011	0	0	2	0
Brown bear	Kurbukhi spring	28.07.2011	1	1	0	0
Wild boar	Khoshane	17.07.2011	1	0	1	0
Roe deer	Kumelaurta	17.07.2011	1	0	1	0
Brown bear	Laa	17.07.2011	1	1	0	0
Bearded vulture	Bigoetsatibe	17.07.2011	0	0	3	0
Roe deer	Ageurta	17.07.2011	0	0	1	0
Wild goat	Nakhiduri	18.07.2011	0	0	3	0
Caucasian Black Grouse	Fitsischala	18.07.2011	0	0	2	0
Wolf	Nakhiduri	18.07.2011	1	0	0	0
Brown bear	Nakhiduri	18.07.2011	1	0	0	0
Brown bear	Samkhevi	22.07.2011	0	0	1	0
Caucasian Snowcock	Larovani pass	10.07.2011	0	0	5	0
Brown bear	Larovani	10.07.2011	1	0	0	0
Wolf	Larovani	10.07.2011	0	1	1	0
Wild goat	Khakhabo	15.07.2011	0	0	3	0
Wild goat	Kue	12.08.2011	0	0	2	0
Bearded vulture	Near Khakhabo	25.08.2011	0	0	1	0
Bearded vulture	Tsitel Mta	25.08.2011	0	0	1	0
Chukar	Upper Omalo	25.09.2011	0	0	18	0
Marten	Kue	25.08.2011	0	1	0	0
Wild goat	Gulfichtana	03.08.2011	0	0	4	0
Wild boar	Khoshane	17.08.2011	1	0	0	0
Bearded vulture	Bigoetsatibe	17.08.2011	0	0	1	0
Wild goat	Samkhevi	22.08.2011	0	0	3	0

Red deer	Kumelaurta	19.08.2011	0	0	1	0
Caucasian Black Grouse	Ficischala	22.08.2011	0	0	1	0
Wolf	Nakhiduri	22.08.2011	1	0	0	0
Caucasian Snowcock	Larovani	13.08.2011	0	0	10	0
Brown bear	Larovani	13.08.2011	1	0	0	0
Tur	Near ortskali	15.09.2011	0	0	5	0
Tur	Borbalo	16.09.2011	0	0	17	0
Caucasian Snowcock	Chigho gorge	18.08.2011	0	0	12	0
Roe deer	Mtsieri	14.09.2011	0	0	1	0
Wild goat	Gele	15.09.2011	0	0	2	0
Brown bear	Gele	10.09.2011	0	0	1	0
Wild goat	Near Omalo	14.09.2011	0	0	2	0
Chukar	Bochorna	05.09.2011	0	0	70-75	0
Roe deer	Khoshane	02.09.2011	0	0	1	0
Wild goat	Near Omalo	20.09.2011	0	0	4	0
Wolf	Chigho gorge	25.09.2011	0	0	2	0
Tur	Chigho gorge	25.09.2011	0	0	12	0
Lynx	Near Omalo	27.09.2011	0	0	1	0