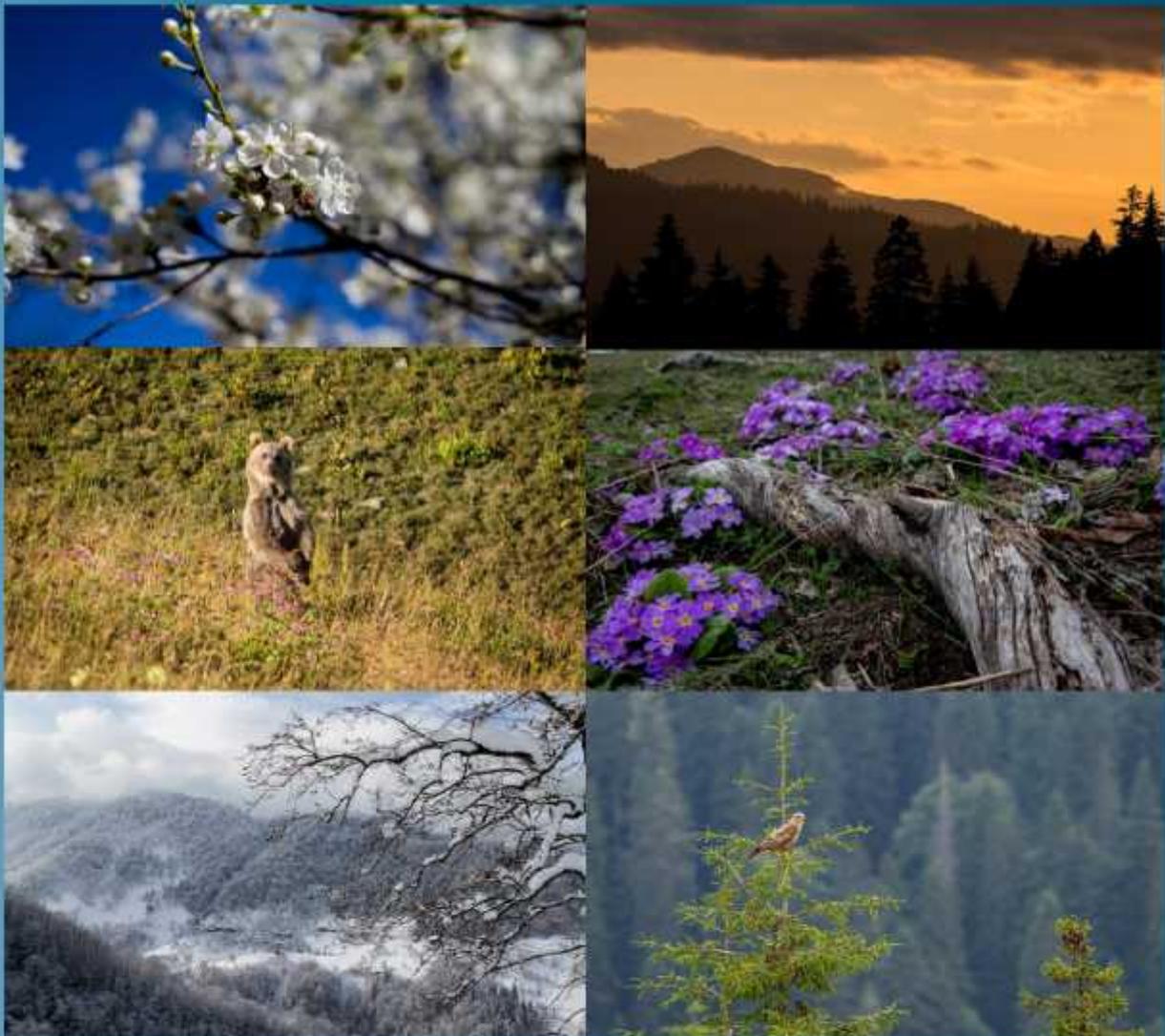


# Biodiversity and Wild Animals in Ajara

Student's Book



Education Training Course on Conservation for Ajara Schools

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**Education Training Course on Conservation for Ajara Schools**

**Batumi**

**2017**

## **Introduction**

### **Biodiversity and Wild Animals in Ajara Conservation Education Training Course for Ajara Schools**

The aim of this teaching module is to raise awareness of the relationship between humans and wild animals, as well as of the crucial role of wildlife in the functioning of the ecosystem, its recreational, aesthetic and economic importance and the necessity of conservation. It will also facilitate the reduction of the risk of attack on domestic animals by wild animals, through preventative measures in the high mountains of Ajara, which in turn is a precondition for the economic strengthening of small farms and improving their living conditions. The principles of teaching this subject are based on identifying the problems and solutions, project and research based teaching methodology and involving students in practical activities.

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## Lesson 1. Wildlife with us

The territory of the Autonomous Republic of Ajara, with an area of 2,900 km<sup>2</sup>, is distinguished by its high number of forests (the total area 65%) and diversity. Here you will see the subalpine conifer forests, colchic forest, as well as ancient deciduous forests which include oak, beech and chestnut trees.

The proportion of the forested area in Ajara is especially high when compared to Georgia (39.1%), neighbouring Turkey (11%) and the whole world (27%).

Ajara is located in a region of biological diversity in the Caucasus, so this means that the region is

rich with biodiversity. The International Union for Conservation of Nature (IUCN) has included the region as one of the world's 34 hotspots, which are characterized by having the greatest biological diversity and which are extremely vulnerable terrestrial ecosystems. Furthermore, pursuant to the geographical location, this area is part of the World's acknowledged 200 eco-regions, distinguished by the abundance of endemic species, its taxonomic uniqueness and according to the infrequency of habitats in the south-west corridor of the Lesser Caucasus. It is also represented in the priority list of 25 regions that are unique with the world's biodiversity level and in terms of the need for protection.

The highly diverse physical-geographical conditions of Ajara and its distinctive geological past, along with its rich flora, provided for a rich and diverse animal world. The Ajara Region along with other regions of Georgia constitutes a specific "fauna knot", where the so called endemic animals of local origin as well as European and Asian species are abundantly gathered. According to the existing data, the diversity of fauna in the Ajara Region is represented by 4,627 species. Among them 4,028 belong to invertebrates (15 species are entered into the Red List of Georgia), and 599 – Chordates (66 Species are listed in the Red List). (*Ministry of Finance and Economy of the Autonomous Republic, 2012*).



**Photo:** Road to Chirukhi, Shuakhevi Municipality, By: Nika Tsiklauri © EcoFilms.ge

### **Definition of terms:**

**Biodiversity** - Biodiversity (also known as biological diversity) is a broader concept which includes all kinds of life on Earth. Biodiversity includes microorganisms, plants, animals and ecosystems. Furthermore biodiversity encompasses the genetic variety within each species and the variety of ecosystems that species create.

## Lesson 2. The principle components of biodiversity

### What is an ecosystem?

Animals, microorganisms, water, soil, wind, rain and minerals are all part of nature. The existence of different types of organisms is essential for an ecosystem, as each of them performs different a function in it. For example, if there are no wolves and foxes in the forest, the roebuck and rabbit will no longer have an “enemy”. They will breed continuously and will need more vegetation for food. What happens in the woods in such cases? The grass is completely grazed, the twigs and branches on the trees are stripped of leaves, sprouts and the tree bark is gnawed. There is not sufficient food for the roebuck and the rabbit. As a result, many of them will starve to death.

**Source:** Kopaliani, Natia. “Hyena, Viper and Others...” Biodiversity hot spots, Tbilisi, 2002.

### What does biodiversity mean?

The word "biodiversity" was introduced in 1986 by American zoologist Eduard Wilson. Biodiversity is a broader concept and includes all kinds of living organisms and genetic varieties that live on the Earth.

Moreover, this concept includes the ecosystems, of which they are a part.

Biodiversity is the unity of all living organisms: (for example: earth, forests, lakes, oceans etc.) So, when we talk about the biodiversity of Georgia, we consider the total distribution of living organisms in Georgia. If it concerns the biodiversity of a region, (e.g. Ajara) the total number of

living organisms in that region is being referred to. Living organisms are densely populated in some areas, while there others have only a few inhabitants. In practice, there are known groups of species, according to their natural areas. The data about the distribution of organisms in areas simplifies the study of the biodiversity of the relevant area.

Currently, there are 34 hotspots of biodiversity on the planet. These are the richest territories inhabited by the living organisms. One of them is the Caucasus, particularly Georgia (please see the map in the appendices: lesson 2, Annex 2). In order for an area to be granted hotspot status, there should be at least 1,500 endemic species, and their numbers should have decreased by 70% in recent times.

The Caucasus is also in one of the 200 global eco-regions, which are allocated by the World Wide Fund for Nature (WWF) based on criteria such as: diversity of species, level of endemism, taxonomic uniqueness, evolutionary processes and peculiarities of the historical development of flora and fauna, diversity of plant types and rarity of biomes in terms of global levels.

The biodiversity of Georgia could be characterised according to the total amount of the animal and plant species and the number of rare species and endemism.

The flora of Georgia (the same as plant-life) consists of more than 4,100-species of vascular plants (6,350-species are rendered in the whole Caucasus). 21% of the flora of Georgia, or nearly 900 species are endemic



**Picture:** Green Lake, Khulo Municipality

By: Nika Tsiklauri © EcoFilms.ge

**Ecosystems + Species + Genetic  
variations = Biodiversity**

(600 in the Caucasus, 300 of which are endemic.). The wildlife of Georgia is also diverse. There are more than 700 species of vertebrates and nearly 17,000 – species of invertebrates.

### What is endemic?

Species that are found only in a particular area and are not found anywhere else are called endemic - another term is a native species. For example, a lot of relict and endemic species are gathered in Mtirala National Park. (Among the national parks should be mentioned the Caucasus (5), Georgia (1), Kolkheti (3) and Ajara (3)) The rarest species of endemic plants of Ajara are - Lazeti: Epige, azalea, cherry laurel, hymenophilum, primula megasaefolia and so on. Moreover, a native endemic of Georgia found in the forest soil is also very interesting: *Allolobophora kintrishiana*. Rare endemic and relict species can be found in the area of Mtirala National Park: *Mertensiella caucasica*, *Pelodytes caucasicus*, *Rana macronemis* and *Bufo verrucosissimus*.



**Picture:** *Primula megasaefolia*

By: Nika Tsiklauri © EcoFilms.ge

Endemism is the total number of endemic species shown as a percentage of the total species. For example, in order to calculate amphibian endemism in Georgia, we have to work out the percentage of amphibian species. We know that 3 of the 12 species of amphibians in Georgia represent are endemic to the Caucasus. Therefore,  $3/12 \times 100 = 25\%$ . The endemism of amphibians in Georgia is 25%.

### Definition of terms:

**Endemic** - Species that are found only in a particular area and that do not exist anywhere else is called endemic.

**Endemism** (index of endemism) – endemism shows, the proportion of endemic species in relation to the total number of species.

### Lesson 3. Wild animal habitats in Ajara ecosystems

The forest habitats in the Caucasus, Georgia and Ajara

There are about 400 species of plants in the forests of Georgia: including trees (153), high bushes (202), low bushes (29) and lianas (11). Many of the forests in Georgia contain the relict tree species of the tertiary period, these trees remained when there were no glaciers in the western Caucasus and the climate did not degrade the forest.



**Picture:** Buxus colchita Machakhela National Park, By: Erekle Chikvaidze © Wild Horn

There are 24 defined Natura 2000 habitat types in Georgia. 18 species of forest habitats belong to the region of moderate forests and 6 species of the Mediterranean Sea leafy forest habitats.

It is noteworthy that there is a type of refugium habitat of Colchic forest in the Ajara region containing the relict species – fern, Hymenophyllum tunbrigense, tree - plants - Fagus orientalis, Castanea sativa, Zelkova carpinifolia, Pterocarya fraxinifolia, Diospyros lotus, Taxus baccata etc. Because of this data, these forests became the object of protection (e.g. Mtirala National Park.) It is also important that four different habitats differ from Europe-related habitats, these are: 1) dark coniferous forest (Piceeta orientalis-Abieta nordmanniana); 2) pine forests (Pinus kochiana); 3) forest of taxus baccata; and 4) hornbeam forest (Carpinus caucasica).

Five Habitats of the Mediterranean Sea leafy forest are unique to the Caucasus. 1) Chestnut copse (Castaneasativa); 2) Zelkovacarpinifolia; 3) Buxuscolchica; 4) Colchic relict leafy mixed forest; 5) Arid clear forest; 6) Subalpine turbiricillinar.

#### **The importance of Ajara forests and their biodiversity**

The administrative territory of the Autonomous Republic of Ajara is characterized with a high density and diversity of forests. Forests occupy 65% of the total area (up to 40% of the area of Georgia is covered with forest). Here you will see both subalpine and colchic mixed leafy forests, which are mainly represented by oak, beech, chestnut, fir, spruce and pine forests. The total area covered with forest amounts to 191,604 hectares.

Pursuant to the geographical location, this area is included in the 200 recognised eco-regions that are distinguished by their diversity of species, level of endemism, taxonomic uniqueness, origin peculiarities and rarity of habitats in the South Western Corridor of the Lesser Caucasus.

Within the initiative of the World Wildlife Fund (WWF), "100 hotspots of European forests" were identified, that implies 100 vulnerable forests that urgently need to be protected. One of the priorities has been granted to the unique forest ecosystems of Ajara.

The highly diverse physical-geographical conditions of Ajara and its distinctive geological past, along with the rich flora, contributed to the creation of a rich and diverse animal world. Ajara, along with other regions of Georgia, represents a "fauna knot", where in addition to the so called native origin endemic animals, European and Asian species are also represented. According to the present data, the diversity of the fauna of Ajara is represented by 4,627 species. Out of them 4,028 species belong to invertebrates (15 species are included in the Red List of Georgia) and 599 – chordates (66 species are included in the Red List) (Ministry of Finance and Economy of the Autonomous Republic of Ajara, 2012).



**Picture:** The Eastern Beech, *Fagus Orientalis*, Batumi Botanical Garden

#### **Definition of terms:**

**Habitat** - The geographical area of living organisms, where each of them lives, feeds, breeds, grows and develops. This is a natural or physical environment for living organisms that exists around the bio population. Habitat consists of physical (soil, humidity, temperature) factors as well as biological (e.g. accessibility on food). The habitat is not essential to be a geographical environment for the parasites. Instead there are the host organisms or the specific body.

**Refugium** – Shelter, on the terrestrial surface or ocean bottom section of the world, the place where the species or group of living organisms survived through unfavourable conditions and nowadays survive and remain in this area.

**Relict species** –A surviving species of an otherwise extinct group of organisms, also a remnant of a formerly widespread species that persists in an isolated area.

**Natura 2000** - Is a “network of nature protected areas” covering the entire European Union. It was created to ensure the long-term conservation of Europe's most important and vulnerable species and habitats and is a central element of the European Union nature protection system.

**WWF World Wildlife Fund** – an international, non-governmental organization, which works in the area of conservation, research and restoration of the natural environment. Created in 1961; since 1990s, the representation is allocated in Georgia.

## Lesson 4. Law of Georgia on “Wildlife“

Pursuant to the applicable law of Georgia, the animal world contains "all wild animals, that are temporarily or permanently resident on the territory of Georgia, they are in naturally free conditions in its territorial waters, continental shelf, excluding the economic zone." The wildlife of Georgia represents the wealth of the country and is protected by the state. According to the above mentioned legislation, the animal world is the property of the state and under specific conditions the right of use is granted to physical and juridical persons.

Georgian legislation on wildlife is based on the Constitution of Georgia, as well as international agreements and reconciliations. The main normative act of the Georgian wildlife is the Law of Georgia on “Wildlife”, which was adopted on December 25, 1996 and regulates the sphere of the protection of the animal world and the use of its facilities between the state authorities and physical and juridical persons.

**The aims of the law are:** 1. To ensure the protection of wildlife, its habitat environment and its restoration, according to the sustainable management principles of species diversity and maintaining genetic resources; 2. To ensure judicial safeguarding of the wildlife and the state regulation related to the use of wildlife objects.

According to the law, the protection of wildlife is carried out on the basis of the country's sustainable development strategy, national environmental action program, regional, departmental and action programs for local environmental protection and for environmental management plans and in accordance with the legislation on the use of environmental and natural resources of Georgia. The planning of the wildlife protection measures includes the development and integration of the following events:

- Management plans for protected areas;
- Leading perspective plans of the forestry organization;
- In the regulatory framework of the land tenure of administrative-territorial units;
- Resettlement and development plans and projects;
- Infrastructure projects;
- Building and sector development plans;
- Protecting and using existing water, forest, land and other natural resources, projects and programmes.

### **Definition of terms:**

**The sustainability of the animal world** - the continued existence of the diversity of wildlife, for an indefinite period.

**Sustainable use of wildlife** – the use of animals in such a way, that the maintenance of diversity of wildlife, sustainability and reproduction abilities are ensured within an undefined time.

*Note: The definition of terms is based on the law of Georgia on wildlife.*

## Lesson 5. Forms and regulations for the use of wildlife

### What is the use of wildlife and what type of benefits does it have?

Pursuant to the law of the wildlife, the use of the animal world includes on site research and removal from the environment. The common use of the wildlife objects means the satisfaction of individual consumption of citizens of Georgia as well as the aesthetic, recreational, sanitation measures and other needs. The types of benefit from the wildlife include: hunting, fishing, gathering for zoological collections and scientific research. Hunting in Georgia is allowed only in specially allocated areas - hunting farms. The aim of creating such areas is to:

- A) Protect resident wildlife resources (animals and birds);
- B) Maintain their species diversity;
- C) Maintain the optimal number of each species;
- D) Carry out scientifically justified measures, in accordance with the applicable legislation with the aim of the development of the sector.

The famous hunting farms in Georgia are “Iori Chalebi” near Sagarejo, “Dali Mountains” near Dedoplistskaro among others. It should be noted that hunting farms can be set up only in the following categories of protected areas: preserved areas, protected landscape and areas for multilateral use. Bird hunting outside the territories of hunting farms is also available. Hunting is allowed within a specific timeframe, which is determined by the Ministry of Environment and Natural Resources Protection of Georgia.

**Hunting is prohibited** - in state reserves, national parks and 500-metre zones around them, as well as within the administrative boundaries of Georgian cities. Hunting, with any kind of explosive and other means that causes the torture of wild animals is banned. Hunting any wildlife objects that are included in the "Red List" of Georgia is prohibited. Hunting without permission or with illegal weapons that lead to significant losses is also banned.

**Violation of the hunting rules** is considered as poaching. Over-hunting is also seen as poaching. That is one of the reasons leading to biodiversity loss. Pursuant to Article 301 of the Criminal Code, a fine will be imposed on a person of 100 to 150 GEL and in particular cases the deprivation of liberty under Article 031 of the Criminal Code of Georgia, if he violates hunting rules on the species belonging to the hunting facilities. The above mentioned information is presented in the table of the annex. (Teacher’s Handbook.)

### Definition of terms:

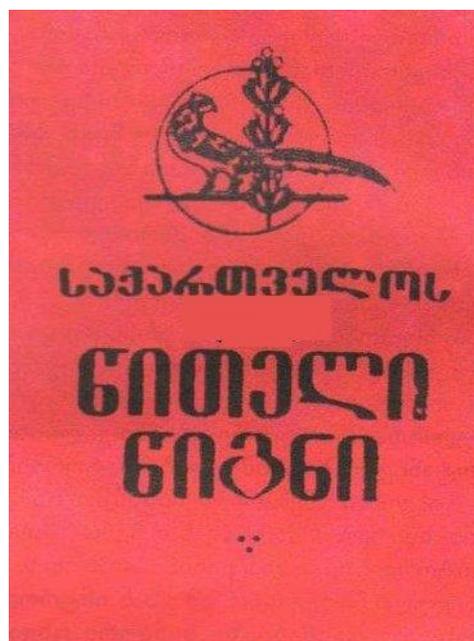
**Hunting farms** – is a territorial-agricultural area established by law, which includes the territory allocated in the natural habitat zone for indigenous species of wild bird and animal species, or the area allocated in natural conditions suitable for the species.

**Poaching** - Excessive extraction of the representatives of the animal world which is prohibited.

## Lesson 6. Protecting endangered species in Georgia

### The Red Book of Georgia

The Red Book is a list of rare and endangered animal species, with a brief description of their current circumstances. There are international, national and local versions of the Red Book. The initiator of the book was the International Union for Conservation of Nature, which in 1949 started to gather information on rare plant and animal species. In 1966, the first editions of rare species of mammals and birds were published. The Red Book (as well as the Red List) is not a legal document and has only a recommendatory status. The book is designed to make recommendations for countries with endangered animals. Throughout the world, the importance of these recommendations is enormous. The Red Book in Georgia was published in 1982. Part I of the book contains the rarest animals, and part II refers to the plants, part III represents - inorganic natural monuments. In 1994, the International Union for Conservation of Nature (IUCN) adopted the new system and criteria for the Red Book. The International Union for Conservation of Nature (IUCN) is the world's first global environmental protection organization and currently 1200 organizations are involved creating the world's largest conservation network. The main objective of the IUCN is to preserve the world diversity.



**Picture:** Triton, Kintrishi Protected Landscape, Kobuleti Municipality. By: Erekle Chikvaidze © Wild Horn

### The Red List of Georgia

The endangered species of Georgia are protected by the relevant legislation. The Law of Georgia on the "Red List" and in the "Red Book" was adopted in 2003. The main purpose of the law is to draw up the "Red List" and "Red Book" of Georgia, the legal regulation for the protection and use of endangered species, taking into consideration the interests of present and future generations. It includes the protection and restoration of endangered species on the territory of Georgia, preservation of species diversity and genetic resources. Biodiversity is in extreme danger in Georgia, as well as in the

Caucasus. Most of the forests have been transformed through the human influence. Due to excessive grazing in the high mountains, the natural plant cover is being destroyed and the soil is exposed. The process of erosion is underway. Natural plants remain in only on a small part of the historical area.

The threats to biodiversity in Georgia should be emphasized: Poaching, deforestation, excessive grazing, illegal trade of plant and animal species, over-fishing, pollution of rivers and land cultivation with excessive irrigation. As a result, there is a degradation of the habitats of living organisms, a decline in species and the erosion of ecological processes and all together this leads to the destruction of biodiversity.

**The result of these deplorable conditions is that 141 species of the Georgian fauna and 56 species of flora have been placed on the Red List.**

Work on the Red List is a continuous process, as the conditions of the species changes over time and the Red List needs to be updated.

**Definition of terms:**

**“Red List” of Georgia** – List of endangered of wild animal and plant species in the territory of Georgia;

**“Red Book” of Georgia** – document, that contains the data on the species entered into the “Red List” according to their status, dispersal area, residence, number, breeding places and conditions, measures taken to protect them and necessary activities for protection, as well as the risk factors associated with them;

*Note: The definition of terms relies on the law of Georgia on the "Red List" and "Red Book"*

**Goderdzi Petrified Forest**

The Goderdzi Petrified Forest (also referred to as a flint forest) is of world importance. It is the rarest wonder of the world, which can only be found in central Asia and in the land of Georgia. According to the geologist D. Kandiashvili, flint-silicon-dioxide is the most common mineral in the natural world. The forest is made of a flint which is like translucent stone and comes in a variety of colours. .

Millions of years ago, there was a forest that was covered with volcanic ash. Over time the organic materials in the buried trees was replaced with minerals, mainly silicate, from the ground water, Over millennia the wood is turned into stone while retaining the original size and shape of the trees. In some places there are well preserved palm and heat-loving leafy plants, in particular, the laurel fossils which indicates that in this period we had a tropical climate. Some trees are buried in vertical positions, while others have fallen over.. The large remains indicate the existence of a forest at the time of volcanic eruptions. The original Goderdzi Forest dates back to the Pliocene Age. Due to its scientific significance "Goderdzi Flora" needs to be protected and preserved.

*Source of information: Guram Khomeriki; the “Red Book” of Georgia 1982*

## Lesson 7. Protected areas in Ajara

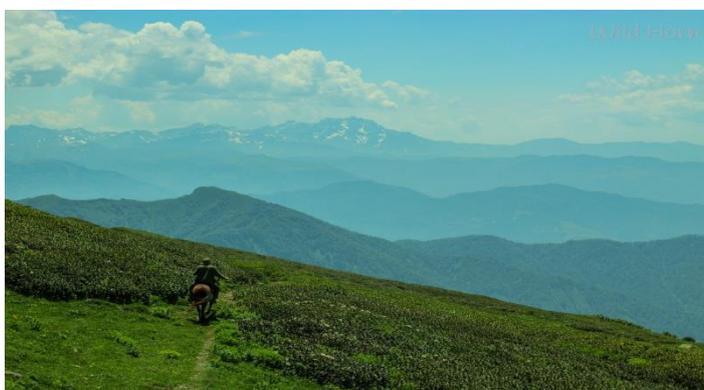
### Objectives for creation of protected areas in Georgia and their categories

The establishment of the system of protected territories in Georgia serves to preserve the natural, cultural and environmental and other components for future generations, the protection of human mental and physical health conditions and is one of the main foundations for the civilized development of society.

Protected areas are established in Georgia to restore and protect - unique, rare and typical ecosystems, plant and animal species, natural formations and cultural landscapes which are an important part of our national heritage, their scientific, educational, recreational and natural resources and in order to develop the use of sparing farms. ([www.apa.gov.ge](http://www.apa.gov.ge)) Protected areas are created in order to maintain biodiversity in a certain area. After a particular area receives protected status, it is necessary to follow legally established regulations in this area. (See Annex 1 - Table N1 Types of Protected Areas and their definition).

### Protected areas in Ajara

Currently, the protected areas of the Ajara Autonomous Republic cover 39,202 hectares in total. They are: Mtirala National Park (15,806 ha); Kintrishi state reserve (10,703 ha); Kintrishi protected landscape (3,190 ha); Machakhela National Park (8,733 ha); Kobuleti reserve (331 ha) and Kobuleti preserved area (439 hectares). For more clarification use the map for Ajara Protected Areas, See Annex 3.



**Picture:** Kintrishi Protected Landscape, Kobuleti Municipality.

By Erekle Chikvaidze © Wild Horn

### Definition of terms:

**WWF** – Information on World Wildlife Fund, **please, see here:** <http://wwf.org/>

**IUCN** - International Union for Conservation of Nature. This organization created the Global Red List around the world. Information about the organization, **please see here:** <https://www.iucn.org>

**Ramsar Convention** - The Convention on Wetlands of International Importance, especially Waterfowl.

**Habitat** - The Convention protects the territories required for bird species of international importance to live in. The Convention was adopted in 1971 in the city of Ramsar, Iran. In 1987 amendments were made in the Saskatchewan province of, Regina, Canada. The Convention is the first global international treaty that is entirely devoted to one type of ecosystem.

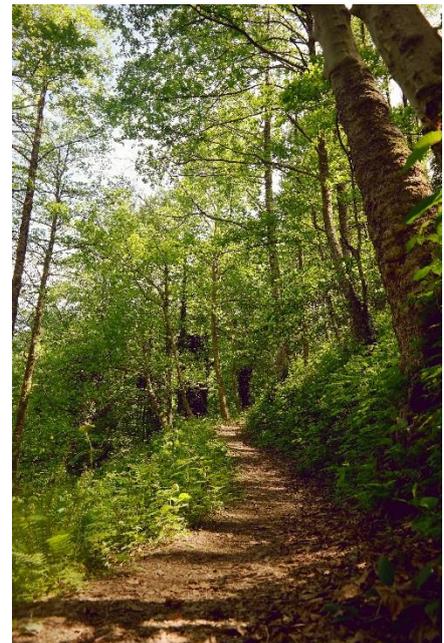
## Lesson 8. The predatory animals of Ajara and their lifestyle

Ajara is located in a region of biological diversity in the Caucasus, so this means that the region is rich with biodiversity. The International Union for Conservation of Nature has included the region as one of the world's 34 hotspots, which are characterized by having the greatest biological diversity and are extremely vulnerable terrestrial ecosystems. Furthermore, pursuant to the geographical location, this area is part of the World's acknowledged 200 eco-regions, distinguished by the abundance of endemic species, its taxonomic uniqueness and according to the infrequency of habitats in the south-west corridor of the small Caucasus. It is also represented in the priority list of 25 regions that are unique with the world's biodiversity level and in terms of the need for protection.

The initiative of the World Wildlife Fund (WWF), has also included the area in the "100 European forest hotspots" this means 100 vulnerable forests that necessarily need to be protected. One of the priorities has been granted to the unique forest ecosystems of Ajara (Manvelidze, 2008).

Ajara, along with other regions of Georgia, represents a "fauna knot" where as well as the so called local origin endemic animals, European and Asian species are widely represented. According to the present data, the diversity of the fauna of Ajara is represented by 4,627 species. Out of them 4,028 belong to invertebrates (15 species are included in the Red List of Georgia) and 599 – chordate (66 species are included in the Red List)

**Source:** „Human-Wildlife Interface Baseline survey", November, 2015". <http://alcp.ge/pdfs/e237a1dca094ad6e0a8ff675e432811d.pdf>



**Picture:** Mtirala National Park.  
By Erekle Chikvaidze © Wild Horn

### Definition of terms

**Hotspot** – a relatively small area, inhabited by many different types of plants and animals. Many of them are found only in these places and nowhere else. Hotspots are characterized by high endemism. Such areas are especially sensitive with regard to adverse changes in the environment. For example, the damage of the plant cover may result in a chain reaction affecting endangered species. It is almost impossible to stop this chain reaction, so it can be said that the "hotspot" area is the home for extremely endangered animals and plants and requires immediate protection. The characteristics of "hotspots" are: 1) exclusive diversity of species; 2) high endemism; 3) a high level of jeopardy which impacts the organisms living there.

*Note: The definition of the term is based on the Civil Encyclopaedic Dictionary of the National Parliamentary Library of Georgia.*

## Lesson 9. The Bear

**Part 1. The Brown bear** (*Latin name Ursus arctos*), bear family - Ursidae.

Description /Distribution: The Brown Bear is dispersed across Europe and North America. It can be found throughout the whole territory of Georgia. The bear is a European species and lives in many biotypes ranging from over-saturated to arid. It can be found in all high zones over 4000 m above sea level.

The Caucasian brown bear is a high forest dweller in Georgia. The weight of male brown bear is between 300-400 kg, the female is weighs less and is smaller. Its height is about 2.5 m.



**Picture:** Bear, Ajara slope, captured by the photo- trap.

Food: The bear is a predator but, in contrast to other predators, consumes little meat. It mainly eats plants - fruits, berries, bulbs, mushrooms, hazelnuts, and acorns, in addition to insects and honey. The bear also eats small mammals, reptiles, ants, pupas, and worms, if they are available nearby and caught. Hungry bears often eat domestic animals and birds. They also impose a danger to the corn, wheat, barley, rye, and other crops grown on the mountain slopes.

Breeding: Generally bears mate only once every two years usually in June. Pregnancy lasts 280 days, and after that the female gives birth to usually two, occasionally four cubs in its den.. Bear cubs are very small, and newborns weigh only 200-700 grams and are very similar to small rats. They are born blind, without teeth or fur. The cubs stay in the den with their mother and are fed with her milk and grow fast. In spring, when they come tottering out into the warm sun they are already quite large. Bears stay with their mother for two or three years. A two-year-old bear is almost fully grown. In this period, the bear still gets pregnant, so the male bears spend some part of their lives with their children.

Lifestyle: Most of the bears are active during the day and spend most of the day in search of food. Bears possess an excellent sense of smell. While walking, occasionally the bear stops, raises itself on its back paws and tries to find the traces of a smell.

The bear usually moves slowly, walking all four limbs. However, in case of danger, bears are able to run very fast. At this time, its speed can reach 50-60 km/h. The relatively small species of bear are good climbers, and are often found sleeping in the trees. All bears are good swimmers.

Bears hibernate (sleep) during the winter. As the first snow appears it finds a den and prepares it for a long sleep, filling it with grass, moss, dried branches and leaves. The den is often located in caves, under the rocks or in the roots of large trees. During the winter, the temperature and pulse of the bear does not fall as low, as it does in the case of other animals which hibernate, so it is able to leave the den in good weather and go looking for food. Afterwards, it arrives back and continues sleeping. The hibernation period lasts six months. In spring the bear is thin and weak. Normally bears live alone, but in some cases, in order to find food, they often gather in a group. The bear is usually a coward as it avoids and runs away from people, but when threatened, it is very dangerous and obstinate, especially if it is wounded.

*How bears live in Georgia:* David Tarkhnishvili, director of the Institute of Ecology, states in an article printed in the famous scientific journal "Molecular Ecology," "the behaviour of the bear has not changed in the past few decades. The article describes the genetics of the bear living in Georgia and the Caucasus. "Previously, it was believed that there are several types of bear in Georgia, but genetic research has shown, that large and small Caucasian bears do not differ greatly. Concerning the big Caucasian bear, it seems that for 15 million years, since the period of glaciations ended, the female bears have not changed their habitat. Only male bears have moved. So, we have two continuous populations of bears, one from Lagodekhi to the Great Caucasus, the second is a small Caucasian bio-population that comes from the eastern part of the Trialeti Range, passes the Meskhetian ridge and continues on to Turkey." The female bears do not move between the Greater and Lesser Caucasian regions.

*Quantity:* In 2012, following a joint decision of the Ministry of Energy and Natural Resources and the Ministry of Environmental Protection, a survey was carried out to determine the types of species dispersed throughout the territory of Georgia, including the quantity of brown bear. According to the survey, there are currently 1643 bears living in Georgia. With reference to different studies, in the twentieth century the bear has disappeared from grove forests, and is no longer found on the Javakheti plateau.

According to the Ajara municipality's latest data, the bear population is as follows:

Khelvachauri	Kobuleti	Keda	Shuakhevi	Khulo
20	26	42	45	42

The ratio of genders 1:1 (male/female) The bio population density is one of the highest in Georgia and amounts to 0.113 individuals per 100 hectares (Gurielidze, 2012; Gurielidze, 2013). For more information please see, Annex 1. Overview of brown bear density in other countries.

**Part 2. Annex 2. Interview with the Director of "Nakresi";**

*Annex 3. The uncertain future of the captured bears*

**Definition of terms:**

**Eurotopus** - widely accepted species with ecological factors are called eurotopus. That exists in a different biotope.

Please, see the Annex 4 – *the natural area of the bear.*

## Lesson 10. The Wolf

**The Grey wolf** (Latin name *Canis lupus*)

Description/Distribution: a wild mammal belonging to the dog family. The grey wolf is 105 to 160 centimeters tall and its weight ranges from 35-50 kg, rarely up to 75kg. It inhabits vast areas of the Northern Hemisphere, and can be found in forests, grassland as well as in the semi-deserts of the arctic tundra.

Duration/Density: as a result of the research (according to 2014 data) it has been established that the number of wolves in the country has not increased. There are about 1400 to 1500 wolves living in Georgia.

However, the total number of wolves in Georgia is much higher than in other European countries, only six countries have more than 1000 wolves, 11 - over 500, and less than 8 countries - 50 wolves (see Annex for detailed information).

The size of the territory occupied by the different packs, vary greatly and depend on a variety of factors: the number of other wild animals, geographical area, human intervention and human's living environment: e.g.: Areas in America range from 80 to 2,500 km<sup>2</sup> and from 500 to 2, 100 500 km<sup>2</sup> in Europe. It is noteworthy that wolves' trails marked with urine and faeces are actively found in strategic places and along the borders of these territories. The marked trails remain for 2 or 3 weeks. Territorial boundaries are rarely crossed. If this happens, violent aggression could be caused and may result in deaths within the groups.

The dispersal of wolves is apparently associated with a lack of access to food; as the higher animal's biomass, the greater is the waste volume and the survival of the descendant. The number of wolves is controlled by humans, it is estimated, that the death of more than 35% of the total population, particularly in autumn, could result in a decline the in number of species and also to its final extinction.

According to Ajara Municipalities the data is the following:

Khelvachauri	Kobuleti	Keda	Shuakhevi	Khulo
12	16	20	28	26

Gender ratio is 1:1. Density of the population is 0.025 1 km<sup>2</sup>. Tendency of population is stable.

Nutrition: The Wolf is an animal that is adaptable and eats everything that is possible to be caught. In summer time the wolves eat birds, frogs, bugs, and sometimes an unusual fruit and moss "salad." Furthermore, the wolf eats both domestic and wild animals such as rabbits, dogs, and small rodents. Often the carrion is eaten by the wolf. While hunting, the wolf prefers a large sized victim, in order to fully recover the spent energy. A small sheep or deer is the usual victim of a single wolf but a pack of the wolves will try to get as large an animal as possible. If the whole pack goes hunting, they can even bring down a large elk which weighs 500kg, which is ten times the weight of the wolf. Strength, energy, courage and teamwork are needed to catch and bring down such big prey.

While the range of prey is diverse and numerous; the wolf uses one of the main senses –that of smell – when hunting. When the pack of wolves picks up the scent of a victim's footsteps, all of its members are stop for a moment, bend their heads in the direction of the smell and wag their tails in a specific way. Further action depends on where the pack is: the wolves move directly into attack if the field is wide open, but in the forest, it is possible to stalk silently. With their sense of smell, the pack of wolves lies in wait and lays siege to the



**Picture:** Wolf, Village Kokoleti, captured by the photo-trap

victim, for example in the case of an elk. Often the victim smells the approach of the wolf and intensifies its defensive action.

*Breeding:* During this period, they live in pairs. In late autumn and early winter, they sometimes join and form packs with 10-12 members. In rare cases, large packs contain about 20 wolves. A pair of wolves, one male and one female, are often in charge of the pack. The rest of the members are their descendants who are not sufficiently grown to create their own pack. In spring, after a 62-65-days pregnancy, the she-wolf gives birth to between 3 and 13, usually 5 blind cubs, after 10-13 days the cubs will open their eyes. When the cubs are bigger, the wolf takes them to the river and observes how they drink water. A wolf normally drinks water like a cow, but it can happen that a cub will lap water like a dog. In this case, the she-wolf eats it immediately. It is interesting that couples remain devoted to each other to the end of their lives, when their cubs are mature, they go from the family and create their own "family." The she-wolf is ready for breeding, at the age of two or three years, a male wolf should be five years old. In old age, the she-wolf carries soft chunks of meat to its enfeebled elderly "husband" in its lair.

*Lifestyle:* The wolf is a "social" animal who is a great defender of the "ranks" in his family. The male wolf occupies the dominant position in the ruling couples. If one partner gets lost or dies, the other will take over their functions. The battle for the ruling place is always real between wolves, although sometimes it is symbolic, because each wolf knows its place in the pack. In the packs, there are often "social rituals" in which the chief wolf must prove its superiority otherwise it will be replaced by another member of the pack. In most cases, the "dismissed" chief leaves their own pack and starts another life.

*Interesting facts:* The wolf causes serious damage to agriculture and hunting wolves in the Soviet Union was allowed at any time. Even 500 "maneti" were allocated as an award. The hunters had a special way of hunting the wolf. It is known that the wolves communicate with each other by howling. Some of the hunters could imitate the sound. In spite of being a very careful animal, the wolf was often deceived.

If a hunter saw an animal killed by a wolf, he would take his partner hunting the same night. Two men were needed because the wolf watched his victims from a long distance to make sure that there were no human footprints. In order to diminish suspicions one hunter would carry the other hunter on his back for a distance of 80-100 meters and leave him in the bushes then he goes back. The wolf would look around and find that there was a man who had come and gone, and the smell of other man was not discovered. The wolf howled, the hidden hunter would respond for "full confidence". In this manner, the wolf was killed and the hunters received a good bonus.

*Wolf's characteristic features while hunting:* A special characteristic for the wolf is to mark the areas with an odour. Any wolf that smells an area designated by another pack and avoids it. The second basic method for identifying the location of each other is the howling. Confrontations often take place in wolves. Therefore, in order to prevent an undesirable meeting, the wolves often howl, this way they inform the approaching pack about their location. One wolf begins to howl and the other members of the same pack follow him on the principle of the singer's team. During the winter migration, the howling of the wolves is constant, with reference to the howls they understand what areas are occupied. If the pack is small and relatively weak, it prefers to remain silent and wander stealthily around the forest, so not to bump into a strong enemy. For this reason, wolves usually refuse to howl.

In most cases, the pack of the wolves prefers silence in order to ambush their prey. Such actions are characterized by those wolves, which live in areas where free territories are rare and they need to fight to gain them. In late autumn, the wolf changes his habits: instead of wandering in the forest area, he is preparing for the breeding season - looking for a cosy lair. Finding a lair is a prerequisite for a pregnant wolf.

The target herd (e.g. deer) of the wolves often tries to protect their weaker members. They do this by kicking or butting the wolf with their horns. Sometimes the wolf pulls back, but if it notices a young or a sick member in the herd, it waits for a chance to attack. If the wolves work as a team their chances of success are much

higher. The wolves set an ambush and wait for the appropriate moment to easily get their prey. At this time, two or three wolves wait to ambush the herd, while others attack the group, putting them in a panic and forcing them to enter the trap. Afterwards, they attack the herd and continue to act as a team. After a successful attack the leader eats first, shredding the victim and is completely absorbed in eating. Only after that, do the other wolves have the right to eat. After a good dinner, any remains are buried in the ground for the future or just left there. When finished, the wolf goes to the nearest spring and washes its face and sleeps. After waking up the process starts again from the beginning.

*Economic importance:* Occasionally people hunt wolves, but it is not a significant hunting object.

*Conservation:* Pursuant to the Georgian evaluation it does not have a status, it is not rated. Conservation status (IUCN) is less endangered species.

**Definition of terms:**

**Biomass** - Biomass is a product of biological origin or waste that is received from agriculture (vegetable and animal), forestry and related industries (including fishing) and industrial/municipal waste.

**Social animal** – is the animal, whose lifestyle is social. So, it lives in a group, and among the members are defined relationship rules.

*Annexes of the lesson 10: Text 1, 2, 3 and a table list 1: Information about wolf density in other countries (Boitani, 2000).*

## Lesson 11. The Lynx

### **Eurasian Lynx** (*Latin name Lynx*)

Description/Distribution: The Lynx is a mammal and a member of the cat family; the length of its body 82-109 centimetres, and weighs 12-22 kg (rarely more than 32 kg.) Compared with the male, the female is smaller. A lynx has very long, strong legs a short tail and long hair at the tip of its ears and long whiskers. The colouring can vary: one colour (straw coloured, Reddish – white) or spotted.

In Georgia there is a small number of Lynx, it is not equally distributed on the territory, it can be found at an altitude of 2500 m above sea level. The number and density is unknown. Two females are considered for one male. The tendency of population is stable. They can be found in “Adjaristskali Gorge” in Ajara



**Picture:** Lynx, Lagodekhi Reserve, captured by the photo-trap.

According to the latest data (2016), according to the municipalities in Ajara, the number of animals is as follows

<i>Khelvachauri</i>	<i>Kobuleti</i>	<i>Keda</i>	<i>Shuakhevi</i>	<i>Khulo</i>
20	26	42	45	42

In Georgia, there are two quite different types of lynx. The Caucasian lynx is dog sized, it is called a “condole” in the mountains (Khevsureti, Pshavi, Tusheti). It is present in Small and Middle Asia, Tibet, the Caucasus, Spain, Scandinavia, Carpathians. The Eurasian lynx is widespread throughout the north of Europe, and can also be found in parts of central Asia and in North America. It resides in mountains as well as in the lower forests.

The lynx in size and colours is very similar to Lealyan Cat. In the forests of Iori and Alazani, in Vashlovani where both these species live, hunters often have trouble to distinguish them, especially when the Lynx is without spots, the tail of Lynx is short whereas the cat’s tail is long.

Feeding/breeding: The Lynx eats mammals and birds and it sometimes attacks deer, roebuck, cattle or sheep. The lynx starts breeding at two years of age. It mates in February-March. The lynx is a monogamous animal and lives with its partner. During the breeding period, it chooses a roughly prepared cosy spot, under a fallen tree or under rocks, where it gives birth to two or three (maximum 5) small kittens in May or June. It does not stay long in this place, as soon as the kittens are able to walk, they move to another place. The kittens are trained to hunt by the parents for two or three months. When they run out of prey, they change their location and often travel tens of kilometres to find new one.

Lifestyle: The Lynx is a solitary animal and is active at night. It marks its territory with small mounds which it digs up with its paws but only if the lynx population density is high, (quantity on a defined area), so in low density area it doesn’t mark the area, making the discovery of the lynx challenging. A lynx mainly inhabits densely forested areas where it can climb and hide in the trees. The lynx does not stay for a long time in bushy and treeless places. More often it can be found in the high Alpine Zone, and if there are chamois and aurochs around it will stay there permanently.

The lynx doesn’t dig a den or make a permanent lair as it is always looking for new hunting grounds. It hunts during the day as well as at night, and spends a lot of time in the trees and delights in the clumps of rocks. It

climbs in the trees with regular branches, like coniferous trees, and has a rest there, while simultaneously spying its surroundings. It is always ready to catch a victim. It is distinguished with a wonderful instinct. Because of its lonely life, it is hardly ever seen by anyone. The presence of lynx in the forest is hardly noticeable and is impossible to find without the help of specially trained dogs. It is a bit easier in winter due to the tracks in the snow. Only in extreme cases does it reveal itself and scares away the hunting dogs. Lynx hunts comfortably by the lying in ambush and stealing. It doesn't track its prey over long distances, but never lets it off, it slowly creeps closer to its prey as it is playing. When it is close enough, it catches the prey in several leaps gets astride the fast animals such as a roebuck, chamois, young deer (fawn) and rabbit. It also successfully hunts grouse, snow cock and pheasant.

Conservation: In 1980, the lynx was entered into the Red Book as an endangered species and today is granted the following status:

- Status of Conservation (Georgian) - Endangered Species CR C2 (aI);
- Conservation status 54T (IUCN) - less endangered species;

Economic significance: it is interesting in terms of eco-tourism and is attractive to scientists. There are few examples of livestock attacks.

**Definition of terms:**

**Monogamy** - the form of breeding, when the male is pairing with one female during one or more seasons.

## Lesson 12. The Jackal

### The Jackal (*Latin name - Canis aureus*)

**Description/distribution** The jackal is an omnivorous mammal belonging to the dog family. Body length is 71-82 cm, weight - 7-13 kg. The jackal is straw-coloured in winter and a dirty – yellow/red/black colour in summer. The tail is reddish-brown and black at the tip. The jackal is native to southeast Europe, northern Africa, South Asia and Sri Lanka. In Georgia, the jackal is found almost everywhere up to 1000m above sea level. It resides in groves, bushes and near to a source of water (pond, lake, river or spring.)

According to the latest data from Ajara Municipality (2016), the numbers of jackal are as follows;

Khelvachauri	Kobuleti	Keda	Shuakhevi	Khulo
20	26	42	45	42



Picture: Jackal, Ajara slope, captured by the photo-trap

The population of the Jackal is increasing in Ajara.

**Feeding:** The jackal is considered to be an omnivorous animal, though, like other predators it prefers meat. 54% of its diet is meat, while the remaining 46% is plant or vegetable. It eats rodents, rabbits, birds, reptiles, amphibians, fish and insects etc. The jackal even eats carrion and does not reject other animal's leftovers. They follow the tracks of the big predators in order to eat the waste of their prey. The jackals are grouped together of up to 8-12 individuals, sometimes more than one family and are waiting for the leftovers. Joint hunting is very profitable and they are very coordinated while hunting. Jackals will also find food in the landfills along the edge of forests.

**Breeding:** Mating occurs between January and February. They are monogamous animals with a gestation period of 60-63 days. Before pairing, the male digs a den which is almost 1metre deep.. The female gives birth to 4-6 (maximum 8) blind, feeble puppies. The puppies are fed with milk for 2-3 months and they first eat meat at the age of 15-20 days. The parents regurgitate their meat and share it with their children. The puppies grow rapidly and leave the lair with their mother at the age of three months. Younger descendants often stay with their parents and assist them in bringing up the new generation, but in that time their sexual activity is oppressed. The female reaches sexual maturity at the age of 11 months and males at the age of one year, but as a rule, at the age of two the animals are ready for breeding.

**Lifestyle:** The jackal is active mainly at night. It has a characteristic loud howling - "scream". Jackals howl before hunting and while running. They often follow some loud noise. They do not howl in rainy or cloudy weather, but they especially howl when they see the moon in the sky. The jackal is a smart and flexible animal capable of catching a flying bird. It also captures the ground nesting birds. It is very cautious, often checking the environment during the hunt for danger. The jackal adapts easily to tough winter conditions and sub-zero temperatures of -25C. Taming of the jackal is very easy. But even a tamed jackal often attacks domestic animals and destroys gardens. It lives for 8-10 years in nature and up to 16 years in captivity.

**Economic significance:** In the Georgian population there was always an unambiguous negative attitude toward this species, which is still true today. However, less is known about them than about most animals. As well as snakes, the jackal also keeps the number of rodents in balance, which is very important for agriculture. As the jackal eats the agricultural pests (rodents, insects) and feeds on landfills, it provides significant help to people in

sanitation and economic terms. With the destruction of carrion and killing of sick animals, the jackal prevents the spread of many diseases. All these can be a motivating factor for the rural population to protect the animal from hunters. It is necessary to strengthen the protection of gardens and plantations in order to protect their own harvest from the attack of jackal, as the usual jackal carries out attacks on plants such as corn and watermelon. The skin of the jackal is of low quality and industrial application is small. The jackal is sometimes linked to the spread of [rabies](#) and [glandular plague](#).

**Conservation:** Because of the wide distribution pursuant to the IUCN classification, this species is not in danger. There is no Georgian status of conservation, it is not rated.

#### **Definition of terms**

**Omnivorous** - The peculiarity of animal nutrition, when the animal feeds on a variety of foods - both vegetable and animal. It also eats carrion.

**Pairing** – oestrous, sexual activity period for female mammal animal. The time of ovulation.

*Annexes: Annex 1 – Jackal spread; Annex 2 - text*

## Lesson 13. The Fox

### **The Red fox** (*Latin name Vulpes vulpes*)

**Description/distribution:** The fox is a predatory mammal of the dog family. There are three species of common fox found in Georgia. Body-length is 90 cm, tail - 40-60 cm, weight 10 kg. Its nose is long, the ears are long and triangular. The fur is thick and soft, amber-coloured on its back with a white chest and stomach, the end of its tail is usually white. The fox is found everywhere, except for Antarctica. It is a widespread species in Georgia. It can be found everywhere up to 2800m above sea level in Ajara (2012. Gurielidze.)

**Habitat:** The red fox resides in forests, valleys and deserts.

It lives in a den that it digs itself. However, it sometimes takes over the place of a badger or other animal. It uses natural shelters - caves, rocks, and holes under rocks, fallen trees, hollows etc.

**Feeding:** - omnivorous. The diet of the fox ranges from animals to plants, including fruits and herbaceous plants. The animals it prefers are: rodents, rabbits, squirrels and birds. However, it does not reject invertebrate animals like bugs, crustaceans, locusts among others. It will also find food in landfills.

**Breeding:** they mate once a year and give birth to 3-12 puppies, which are fed with milk up to 1.5 months old. Sexual maturity is reached at 10-11 months. Young puppies are often given live prey to learn how to eat meat and to develop some hunting skills.

**Lifestyle:** It is active especially at night, but it is also able to hunt during the daytime. Its eye sight is relatively weak, but its hearing and sense of smell are very good. It is known for its cleverness and caution. The fox lives for 15-20 years in captivity, and a few years less in nature. Fox hunting is banned.

**Economic significance:** The fox is an important object for handmade crafts (the fur is used). The fox is useful regarding controlling the number of harmful rodents, but it causes great harm to the other animals and birds including ground nesting birds: quail, pheasant, francolin, partridge, ptarmigan and others. It is dangerous as it can spread rabies. It also causes damage to poultry on farms.

**Conservation:** Due to the widespread population, according to the IUCN the species are not endangered. There is not a Georgian status for conservation it is not rated.



**Picture:** Fox, Lagodekhi reserve, captured by the photo-trap.

### **Definition of terms:**

**Introduced type** - Non-local species that cause the loss of local biodiversity. Such species, in spite of not being in these areas for many years, are well adapted to the habitats and conditions and threaten the local species.

## Lesson 14. The Wild boar

**Wild Boar** (*Latin name Sus scrofa*) is a typical representative of the pig family. A subspecies inhabits Georgia - the Caucasus wild boar.

**Description:** the body is short and round with a big head, with a long snout and short neck. The body length for males is up to 200 cm, height 124 cm, weight 300 kg - the female is smaller than the male: body length up to 180 cm, height 100 cm, weighs up to 200 kg. The body is covered with coarse hair, greyish-brown in colour. Piglets are light brown in colour with distinct straight stripes on its back and sides.

**Distribution:** Europe, the Caucasus, the north of Asia, including southern Siberia and the Far East and North Africa. It is found in grove forests in Georgia as well as up to 2500m above sea level but only in some places: Lagodekhi, Kvareli, Tsiteltskaro, Sighnaghi, Gardabani, Dusheti, Kaspi, Akhaltsikhe, Aspindza, Poti, Lanchkhuti, Tsalenjikha Region and several places in Abkhazia. It is found in the forest areas of Ajara, but is not equally distributed on these areas, it is vertically spread over 2,700 m above the sea level.

*Data according to the Ajara Municipalities are the following:*

<i>Khelvachauri</i>	<i>Kobuleti</i>	<i>Keda</i>	<i>Shuakhevi</i>	<i>Khulo</i>
16	24	38	45	38

Density amounts 0.007 per capita 1 ha. Ratio of genders 1:3 (male/female); (*Gurielidze, 2012; Gurielidze, 2013*).

**Habitat:** The wild boar is well-adapted to diverse ecological conditions, which is supported by the fact that the wild boar eats almost everything. It makes shelter in impenetrable bushes and reed beds on the banks of the rivers and ponds, sites with water and bathing places.

**Natural enemies:** We could say that the wild boar has almost no enemies. Sometimes the young suckling pigs, are attacked by the wolf and lynx, in the past even by the leopard. Neither the wolf nor lynx and bear dare to attack a solitary wild boar.

**Feeding:** The boar is omnivorous and eats everything. Its food ranges from plants to animals. It eats fruit, berries, acorns, beechnuts, chestnut, and walnuts, as well as insects and their larvae, snails and other invertebrates, sometimes the birds on the ground, their eggs and broods and mice and rodents.

**Breeding:** grows rapidly and breeds at the age of one and a half year, mating occurs in November to December and it gives birth to little piglets in March - April, there are 3-7 piglets in a single farrow.

**Lifestyle:** a typical inhabitant of the forest, but travels over the valleys and at this time goes a long distance from the forest. It lives in groups of up to 20 individuals. Being in a herd makes it easier defend against an enemy.

**Economic significance:** The wild boar destroys lots of insects and worms, which is beneficial to agriculture. For example, it is known that the number of May bugs may be reduced by 30-40 percent. The same can be said about some other types of insects. It is also worth mentioning that the wild boar digs the soil and thereby



**Picture:** Wild boar, upper Chkhutuneti, captured by the photo-trap

contributes to the sowing and seeding of plants. It causes some damage to agriculture by damaging grain and vegetable crops and in a number of places destroys plant sprouts and saplings.

The wild boar takes a prominent place among hunters. The meat, fat and bristle are widely used. Buttons and other products are made from its claws and fangs. Currently hunting is prohibited, it is permitted only on hunting farms, and as a result, the number of wild boars has increased significantly.

Conservation: Because of the widespread dispersal of the boar, under IUCN classification, this species is not endangered. There is no Georgian status of conservation, it is not rated.

**Definition of terms:**

**Shelter** - This is a place that confirms the existence of a wild boar. The wild boar was lying or slept in a specific place. It should be noted that this animal does not have a lair in the forest.

**Herd of wild boar** - The form of living together, is the same as a pack of wolves, a herd of deer, and flock of birds.

## Lesson 15. The importance of wild animal, sanitary, tourist, biodiversity/ecosystem

**Ecosystem services:** The direct and indirect contribution of ecosystems for human well-being are divided into four categories: ensured, regulatory, habitat or supportive and cultural.

a) Ensured services include those products that are directly offered from ecosystem. In particular, these natural products are: wild fruit, nuts, berries, mushrooms, grass and other vegetable products, that are an important resource for the existence and well-being of the rural population. Ensured services include wood and timber for materials, types of fauna species for food, including fish, water for energy, drinking and irrigation etc.

b) Regulatory services mean the benefits received as a result of the regulated physical, chemical and biological processes between the organism and the environment. For example, forest ecosystems play a decisive role in stabilising the soil of Georgia, as well as preventing and mitigating hazardous natural events such as landslides, soil erosion, floods, etc.

c) Habitat / supportive services are directly related to a species' living environment or habitat. The ecosystems serve the species, as they represent their shelter and migratory path. For example, the river is a fish habitat, as well as a connecting section to the river (migratory path) or various water sources (Lake to river, river to sea.) Humans do not receive direct benefit from the support services. They benefit wildlife, that itself represents a part of the ecosystem.

d) Cultural services include nonfinancial benefits that people receive from ecosystems. For example, cultural services: tourism, especially ecotourism.

Ecotourism includes the following forms of tourism:

- a) All forms of tourism related to nature, where the main motivation of tourists is to observe and gain knowledge about traditional cultures maintained in natural conditions;
- b) Has educational and interpretive features;
- c) It is organized, as a rule, but not exclusively, for small groups by specialized tour operators. The service provider's partners are the small local enterprises operating in the destination site;
- d) Reduces the negative impact on the natural and social-cultural environment;
- e) It helps to maintain the use of natural resources in the following ways:

1. It benefits the local population, organizations and units, which are engaged in the management of natural resources for conservation;
2. Offers alternative opportunities for employment and revenue to the local population;
3. Raises the awareness of the local population and tourists about the conservation of natural and cultural wealth.



**Picture:** observing birds, Sakhalvsho village, Kobuleti municipality. By: Erekle Chikvaidze © Wild Horn

### **The importance of ecotourism development in Ajara**

The mutually beneficial coexistence of wild animals and humans in Ajara is related to the development of ecotourism in the mountainous regions. Most of the tourists arriving in Ajara, visit the Black Sea coastline, but in recent times interest in the mountainous regions of Ajara has increased. Some of the visitors visit the village of Zemo Ajara for one or more days. The main purpose of such visits is to view local landscapes and biodiversity, sharing the local, well-preserved cultural monuments and ethnographic traditions of mountainous Ajara. The development of transport infrastructure in mountainous municipalities may be connected to even more tourist interest in the area, turning it into a more popular tourist attraction. This is promoted by the existence of the protected areas. The establishment of Machakhela National Park will increase tourist numbers who are interested in biodiversity. The development of ecotourism can become an important source of income for the local population, but it is necessary to increase the knowledge and awareness of the population on the correct / appropriate and sustainable use of natural resources. In case of adequate, correctly planned and managed biodiversity conservation and local socio-economic development programs, local settlements will be the main stakeholders in maintaining the biodiversity.

#### **Definition of terms:**

**Ecotourism** - means travelling to view the natural environment and the cultural diversity created by humans, without inflicting any damage to it. Ecotourism involves tourists who have a clear understanding of their responsibilities to the environment. The aim of such tours is to get close to wildlife and nature. Ecotourism minimizes the adverse effects of environmental and cultural-social impacts on the environment, promoting the growth of economic revenues for the population of protected areas and the population of the regions."

**Ecosystem services:** The direct and indirect contributions of ecosystems for human well-being are divided into four categories: ensured, regulatory, habitat or supportive, and cultural

## Lesson 16. Wild animals - A problem or a challenge for farms

### Part 1: A problem

Which wild animal is considered as a major threat to human, economic activity and domestic animals?

Based on the results of a survey conducted in high mountainous Ajara, four wild animals were identified, which, according to the respondents' opinions, caused problems for the local population, these are: the bear, the wolf, the jackal and the fox. The frequency of nomination is given in the diagram (see Annex 1).

It should be noted that each respondent had the opportunity to name more than one animal. Accordingly, the total number of answers is more than 100%, and the diagram reflects how many times each animal was named by the respondents.

**The majority of respondents (84%) named the bear as the main participant of these attacks. The wolf (57%) takes second place and third (39%) place is given to the jackal. The naming of fox as an attacker amounts to 25%.**

### Part 2: Challenge

Development of agro-tourism is one of the strategic benchmarks of the Government of Ajara; as a result, the program seeks accessibility to the positive results of the successful and inclusive agro-tourism market for farmers. On the other hand, the development of successful agro-tourism can contribute to and benefit local governments and communities and vice versa.

The main market attractions of the Ajara region are its unique flora and fauna, honey received from wild and domestic farms, as well as traditional farming activities and lifestyle. It is very important that the entrepreneurs involved in agriculture and the wilderness coexist and that local communities should learn how to manage and improve the resources, which can significantly improve their living conditions and livelihoods.

#### Definition of Terms:

**Agro-tourism** - one of the types of tourism. It is an independent direction of tourism, where tourists aim to live as a local resident, to work with local people in the fields, to milk the cows, to cultivate the land, to eat with and to become a member of the host family for some time.

## Lesson 17. Wild animal attacks - character, seasonality and frequency<sup>1</sup>

**The nature of attacks:** Respondents interviewed during the survey described the character of each attacker (See Annex 1 - Diagram 2: The damage and major predators).

Pursuant to the information provided by the respondents:

**The Bear** – Causes damage to domestic livestock (nominated 62%) and cultivated crops - grains, cereals, vineyards (nominated 27%). The bear also damages bees and beehives. 8% of bear attacks described by the respondents refer to damage to bees. Also, a small number of cases involved attacks on humans and domestic birds (nominated 2%).

**The Wolf** - impacts mainly domestic animals (nominated 88%). It is noteworthy, that the respondents mentioned several cases of wolf attack on a man. The respondents also mentioned crop damage caused by the wolf (3% of respondents).

**The Jackal** mainly inflicts damage to poultry (nominated 60%). However, it also causes damage to cultivated crops (nominated 25%) and domestic cattle (nominated 13%).

**The Fox** as the attacker causes major damage to poultry (nominated 100%). It should be noted that the fox does not cause other types of damage described by the respondents.

**Seasonality of attacks:** In order to examine the nature of the relationship between wild animals and humans, it is important to determine the season or time when the animal attacks occur. The results of the study focusing on the seasonality of attacks, is reflected in Diagram 3 - seasonality of wild animal attacks, in Annex 2.

As can be seen in the diagram, with regard to wild animal attacks, the autumn is particularly active. The winter season is relatively less active. There is no actual difference between the seasonal activities of the various wild animals. The jackal and the fox are distinguished, according to the respondents, the attacks from them occur throughout the year (in all seasons.) The activity begins in the spring, rises in summer and peaks in autumn.

*Table N1 Frequency of predatory attacks pursuant to the municipalities of Ajara*

	<b>Bear</b>	<b>Wolf</b>	<b>Jackal</b>	<b>Fox</b>
<b>Kobuleti</b>	Average	Average	Average	
<b>Khelvachauri</b>	Frequent	Rare	Frequent	
<b>Keda</b>	Frequent	Frequent	Frequent	Frequent
<b>Shuakhevi</b>	Frequent	Frequent	Average	Rare
<b>Khulo</b>	Average	Frequent	Rare	

As can be seen from the Table:

**Bear** attacks are marked as "frequent" in Khelvachauri, Keda and Shuakhevi. The frequency of attacks in Kobuleti and Khulo are evaluated as "average".

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<sup>1</sup>This material is prepared by the basic research conducted in Ajara Region on Human-Wildlife Interface

In the case of the **wolf**, Keda, Shuakhevi and Khulo respondents talk about "frequent" attacks. In Khelvachauri respondents mentioned "rare" attacks with an "average" intensity of attacks in Kobuleti.

"Frequent" attacks from the **jackal** were mentioned in Khelvachauri and Keda, Kobuleti and Shuakhevi as "average" intensity attacks and in Khulo as "rare".

Respondents of the Keda municipality say, that the intensity of **fox's** attacks is "frequent". In Shuakhevi attacks are evaluated as "rare". According to the table we can conclude that Keda municipality is particularly vulnerable to the intensity of attacking animals, and Shuakhevi is distinguished by intensity attacks from bear.

**Definition of terms:**

**Sustainable development** – A society's development system, which in terms of economic development and environmental protection, enables human well-being, increase in the quality of life and the right of future generations to benefit from the reversible quantitative and qualitative alterations, with maximally protected natural resources and environment. Sustainable development implies a form of economic growth that ensures the welfare of the public in the short, medium, and most importantly, the long term. It is based on the principle that today's demands must be satisfied so as not to threaten the future generations. Sustainable development implies the creation of conditions for the long-term economic development while maximising the consideration given to environmental issues.

"Sustainable development is to satisfy the needs of the present day with the use of resources that will not be compromised for the future" - "World Commission for Environment and Development", 1987.

## Lesson 18. Response to wild animal attacks

### Response to wild animals' attack:

According to the applicable legislation there are some recognised mechanisms for response to wild animals attack:

- In case of an actual attack, the wild animal can be removed immediately and it does not require prior consent from the Ministry of Environment and Natural Resources Protection of Georgia.
- In cases where an attack is not carried out, but there is a potential problem, the concerned municipality makes an application to the Ministry of Environment and Natural Resources Protection about the need to implement a regulation measure. In order to carry out this measure, the Ministry, where necessary, will send an expert or group of experts on site. After considering the conclusion of the municipality's application and / or the expert group, the Ministry prepares a draft agreement signed between the Ministry and the Municipality. The Government of Georgia makes a decision on whether the Ministry or the Municipality is delegated the right, or responsibility to deal with the problem. After delegating the right to either the Ministry or the Municipality, the implementation of the regulatory measure is monitored by the Environmental Supervision Department. As a result of the regulatory measure the wild animal is removed from the environment and destroyed.
- Since 2014, a 24-hour Call Centre - Hotline 153 operates in order to receive information about environmental issues, including wild animal attacks, the Environmental Supervision Department is responsible for reacting to the received calls. It should be noted that in case of call to 112 (Emergency and Operative Response Centre) the operator will direct an incident to 153.



Pursuant to the local Environmental Surveillance Department, a report is drawn up about the call and communicated to the Biodiversity Department. Relevant experts are then sent from Tbilisi and a conclusion is made on site. The Ministry then delegates the right to take further action to the Municipality. It should be mentioned that in case of a direct call to 153 the resident / farmer bypasses the local government and is able to provide the information directly to the body which is responsible for responding to such incidents.

### Established practices of responses:

- Notification of relevant departments (Local Administration of Environmental Protection, Authorities of Municipalities, Police, Food Safety Services, etc.). Almost a tenth of the respondents (9.80%) speak about this practice.
- To take control of the damaged animal to ensure that there is no risk of spreading rabies or other diseases. Only one respondent speaks about this practice, which makes us to think, that this practice is less well established.

- Some of the respondents speak about the practice of hunting and removing wild animals from the area. For example, it was noted that a municipal program of "homeless and tramp animals" is underway, that envisages the purchase of hunting equipment for the implementation of preventive measures (wild animal care). For this purpose, special "hunting groups" are created in the villages, which make a relevant response (animals are scared away). It was also noted that a hunter who lives in the village (officially registered) has the right to take part in the process of destruction/liquidation of the wild animal. The number of respondents who talk about such practices totals 7.84% across the region.
- Some respondents talk about simple preventive measures conducted by the local population. It is worth mentioning- noise (screaming, whistling), burning fire, installing the scare crows and so on.

**Definition of terms:**

**Environmental Supervision Department** - is a state agency with the following functions: 1. Prevention, detection and suppression of the illegal use of natural resources; 2. Prevention, detection and elimination of environmental pollution; 3. Control of the fulfilment of the conditions of permits and licenses issued in the field of environment protection

**Department of Biodiversity and Forest Policy** - is one of the departments of the Ministry of Environment and Natural Resources Protection, one its functions, among others, is to regulate the number of wild animals, detailed information can be [seen here](#)

Annex 1 – Diagram 5, established practices of responses in municipal areas

## Lesson 19. Risk Mitigation – Preventive Measures

### ***Strategy for preventing wild animal attacks***

*Artificial and natural (physical and biological) barriers:*

#### **Group I: Fladry and Turbo Barrier**

Barriers are widely-used to keep domestic animals or crops safe from wild animals. People have been using barriers since time immemorial: fencing in cereal crops and gardens, grazing lands or animal shelters. There are various materials used for making barriers such as tree branches, stones, wire netting etc.

In order to protect domestic animals from wolves, Eastern European countries and Russia use a fladry barrier (see picture 1), or a more modern Turbo Fladry barrier. A fladry barrier is of simple design and it consists of flapping flags attached to a rope while a Turbo barrier uses electric wire instead of rope. As studies have shown, wolves are afraid of flapping flags placed along the rope/electric wire and thus, they never cross such barriers. Installation of such barriers is easy at domestic livestock shelters; however, it is difficult to use them in pastures. Moreover, it is worth noting that the above-mentioned barrier does not scare bears away. Domestic animals do not care for these barriers and therefore, they do not go near them. Typically a fladry barrier is used in combination with other barriers.



***Picture 1: Fladry barrier***

#### **Group II: „Electric Fence”**

Presently, an “electric fence” is the most efficient prevention method which is successful for both small livestock and cattle, for example, from an attack from a brown bear or a wolf. Even domestic livestock avoid contact with it, which is also an important factor. The electric fence is used to protect livestock sleeping areas as well as fencing large areas of grazing land. An electric fence is also effective when used for keeping bee hives (see picture 2) and agricultural lands safe from wild animals. (Kenya wildlife service, 1996).



**Picture 2:** *Solar powered electric fence protecting bee hives from wild animals*

While the cost of initial installation of an electric fence is considered to be a disadvantage; it offers excellent cost effectiveness over the long term, due to its durability and simple design. The type and design of electric fence largely depends on which animal species the electric fence is installed to defend against. It is important to introduce a system of farming management which will reduce contact between wild animals and domesticated livestock and agricultural lands (night lightening, solar powered electric fences, fully programmed light and sound devices (see picture 3) that can be mounted along the fence or tree line in the territory of pastures against predators).



**Picture 3** *“ScareCall” – Light and sound device*

The device can provide unexpected active sound and light effect. A *“ScareCall”* is a programmable sound and light device that can be installed on a fence or a tree on the grazing land to deter wild animal attacks. The device provides unexpected active sound and light effects (for example sound of shooting). Source: (Shivik, 2006)

### **Group III: Shepherding by guarding**

Active shepherding of a flock with the help of a shepherd in a pasture, a lightly armed person shepherds a flock or herd, is an effective way to protect pastures from wild-animal attacks (Patterson, et al., 2004). While shepherding through guarding, it is possible to use dogs for guarding (as shepherds). It is a good strategy and reduces the risk of wild-animal attacks; however, there are some cases when dogs are not effective enough to stand up against a bear or a wolf to protect flocks (Musiani, et al., 2013). There are mostly mixed breed dogs in the villages of Ajara which have not gone through a special training program. In order to provide effective herding, it is important to have a special breed of dog such as a Caucasian or Georgian Shepherd (“Nagazi”) which has undergone a special training program. It is necessary to raise awareness in the population and carry out programs aimed at providing them with the proper information on the effectiveness of the herding dogs as well as share best practice and expertise in the different mountainous regions of Georgia (Tusheti, Pshav-Khevsureti).

### **Group IV: Renewal of livestock farms**

In this case, it is recommended to introduce animal species in livestock farms which, generally, will not be attacked by wild animals. The buffalo is among those animals which historically were found in Ajara. In addition, buffalo prevent possible wild animal attacks on farms and their presence on livestock farms would make these farms more sustainable.

The buffalo is an aggressive, heavy-bodied animal with thick skin. Wild animals usually avoid attacking them. It is noteworthy that there have not been any recorded attacks on buffalo from wild animals (bears, wolves) in Georgia over the past 20 years. Due to natural conditions, it is easily possible to have buffalo in the Ajara region. Besides, it should be taken into consideration that buffalo farming is more profitable in terms of economics. In particular, the best yogurt, butter, cheese, “Sulguni”, cottage cheese etc. come from buffalo milk; their taste and other characteristics including price are better than typical products coming from beef. However, the adult buffalo meat cannot be compared with cow meat because it has rough fibres and is relatively poor. It should be noted that a young buffalo has better meat characteristics than cow in normal conditions. In terms of care – buffalo is better at digestion of raw food by 10-15% and is the best at working in the fields. .

#### **Definition of terms:**

**Electric fence** – a special electric device used for protecting domestic animals from wild-animal attacks.

### ***Mitigation strategy:***

***Compensation system:*** Interaction between humans and wild animals causes significant economic damage for humans and payment of compensation is the only means to mitigate the negative aspects of the interaction so people should be either fully or partially compensated for their losses. For the introduction of a compensation system, the funds could be obtained from fees for permits and licenses issued for the use of natural resources (hunting, firewood), incomes from protected areas or through the help of donors. In this regard, it should be noted that the existence of large wild animals is an object of interest that may contribute to the development of ecosystem. In such cases, large wild animals could be considered as ecosystem services (cultural services – ecotourism, recreation). Consequently, it is possible to introduce a specific system of payment - a payment for ecosystem service and by doing so, part of the accumulated funds could be used as compensation for losses incurred by the local population. In the case of tourism development, local residents are in some way the providers of this service (they do not destroy wild animals but cherish them and support full service for all users). Accordingly, it is logical for the population as service providers to develop appropriate schemes for compensation. In such cases, it is likely that the level of readiness of the population to coexist with the wild environment and the adaptation to possible losses caused by this coexistence will be increased. Also, the local peoples' attitudes toward wild animals will be improved.

***Crop and livestock insurance:*** Crop and livestock insurance is an effective and innovative way to mitigate the negative aspects of the interaction between humans and wild animals, but this is still an experimental type of insurance; it is not well-organized and people do not have enough information about it. This type of insurance covers damage to the harvest or livestock from wild animals. This system allows the government and municipality to be involved in this insurance coverage which will reduce the amount the farmer has to pay for the insurance.

### ***Government and provision of information:***

***Identification of threats through data management and analysis:*** Identification of threats through data management and analysis is very important because it allows the areas and seasons of wild animal attacks to be identified. This analysis will help us to select the appropriate mitigation strategy and reduce the sense of fear and helplessness in the local population.

### ***Conservation education for the local population:***

Educational activities at different levels, for example at schools, among farmers, in different social and economic groups, aimed at sharing expertise and the latest information on innovative technologies about the interaction between humans and wildlife; strengthening ad-hoc capabilities to reduce negative attitudes and raise public awareness about the interaction between humans and wildlife, which may lead to higher incomes. Education and training will also help to increase conservationist attitudes, raise awareness about the importance of wildlife and its ethical and economic values for functioning ecosystems, to understand its recreational and aesthetic significance and advance the development of its function.

- Develop systems aimed at identifying/detecting/predicting the so called “hot spots” of wild-animal attacks, collect data and make impact evaluations, develop and implement a monitoring system of wild animals (it is possible with the use of camera/photo trapping);
- Work out and implement measures for improving the food supply for wild animals in wildlife (for example, reproduction programs of wild hoofed animals, protection and replanting of fruit-bearing plants growing in wild forests etc);
- Create and introduce a permanent monitoring system over the situation;

***Institutional mechanisms:***

*A response group working against wild-animal attacks:* it is preferable to establish a rapid response group of trained personnel in order to provide a rapid reaction in response to negative issues arising from the interaction between humans and wildlife. Staff shall meet the following requirements: a representative of the Ministry of Environment (protected territory ranger, forest ranger or representative of supervision inspection of environment), representatives of the Municipality, Ministry of Agriculture and several people from the community. Local residents should have the opportunity to provide information about attacks directly to the group.

*Disaster risk reduction working Municipality groups<sup>2</sup>:*

Working groups monitoring disaster risk reduction and livestock diseases are functioning in all five municipalities of Ajara. The main goals of the working groups are: collection and dissemination of information on livestock diseases; conduction of effective epizootic quarantine; pasture and grazing management; purposeful use of agricultural lands; registration and evaluation/calculation of damage coming from livestock diseases and wild animals. The municipalities operate a free hotline through which municipalities are informed about the livestock diseases and wild animal attacks; based on the information the municipality carries out preventive measures that will further reduce farmers' losses. These groups are collecting and processing data on wild animal attacks.

*Removal of wild animals:* improvement of the permission system on wild animals' removal in emergency cases and development of accurate guidelines/instructions. Also, increase power and responsibilities of local government in this regard.

**Source:** „Human-Wildlife Interface Baseline survey", November, 2015".

**Definition of terms:**

**Compensation** – something given or received as an equivalent for property, reward, benefit, fee, reimbursement for delivery of goods, expenses, rendered services or loss.

**Conservation education** –one of the goals is to disseminate information on latest experience and share knowledge on innovative technologies as well as raise public awareness toward wild animals.

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<sup>2</sup>The mentioned groups were established in the municipalities of Ajara in 2015 with the support of Alliances Lesser Caucasus Program (ALCP).

## Annexes

### Lesson 1.

#### *Annex 1 - Card*

Please answer the questions below:

- In your opinion, why biodiversity is unique in Ajara? Shall we preserve it and why?
- In your opinion, what is most people's attitude towards preserving biodiversity? What do you think, what is the basis for such attitudes?
- What benefits can people get when they treat nature rationally?
- What is the result when people treat nature irrationally? Put forward your arguments.
- What is the importance of positive attitudes against wildlife? Please express your opinion and support it by giving examples (for example, from a movie, a book or a personal experience)

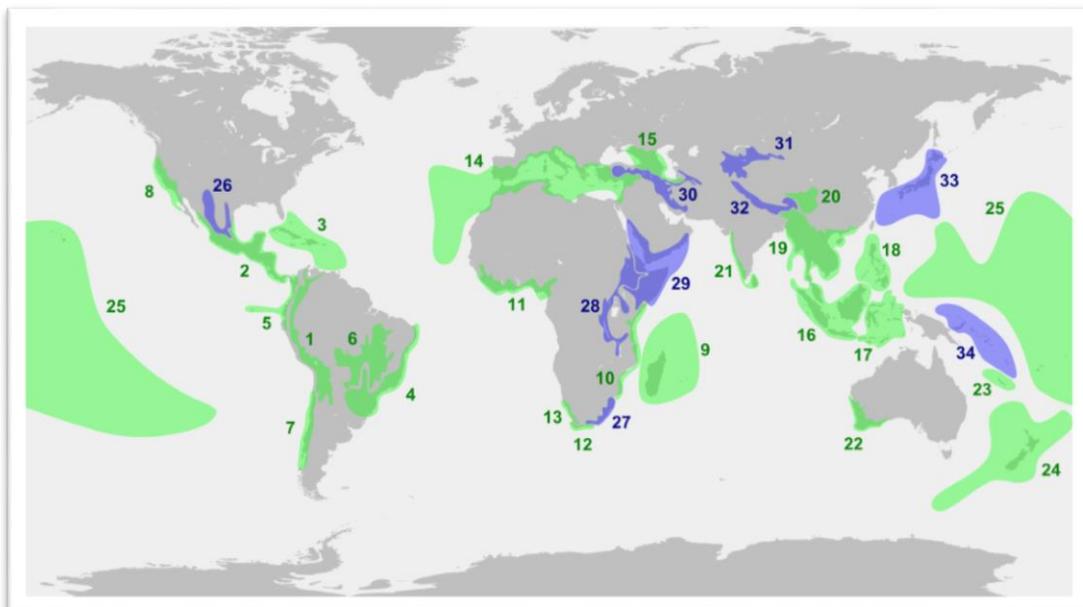
### Lesson 2.

#### *Annex 1 - Text*

Let's imagine a forest ecosystem where the dwellers are wolves, roebucks, rabbits, foxes; grass and trees are growing; there are a lot of soil microorganisms in the ecosystem; the fox and wolf are predators. They eat roebucks and rabbits; roebucks and rabbits eat grass, leaves, sprouts, fruit or vegetable foods. What will happen, if one day you cannot find a fox and a wolf in the forest? Support your opinion.

Source: Kopaliani, Natia. "Hyena, Viper and Others..." *Biodiversity hot spots, Tbilisi 2002*. See link of guidelines

#### *Annex 2 – Hotspots of biodiversity*



## Lesson 4.

### *Annex 1 - Text*

Please get familiar with the information given in the text and point out one important problem:

1. Reducing the number of endangered animals;
2. Hunting and fishing during animal breeding season;
3. Artificial change of wildlife habitats, for example, destruction of access paths to water and drinking places, reduction of feeding sites in order to construct different buildings and so on.;
4. Arbitrary resettlement and hybridization of wild animals;
5. Capturing wild animals and keeping them in an improper environment.

### *Annex 2 – Definition of terms*

**Re-introduction** – returning wild animal species to the localities from where they have been extirpated. The release of wild animals into their former areas, where none of these species are currently preserved.

**Introduction** – strange species of fauna are introduced into the wild.

**Restocking** – restoring wild animals in the nature. Introduction of wild animals in their former areas, where a small number of these species are preserved.

**Hybridization** - the process of combining different varieties and species of animals, as well as crossbreeding of wild animals with domesticated animals to create a hybrid.

### *Annex 3 - Table*

<b>Problem</b> (Describe a problem)	<b>The cause</b> (Assumptions about the causes of the problem)	<b>Regulations and activities</b> (Define legislative regulations and activities that will help to solve the problem)

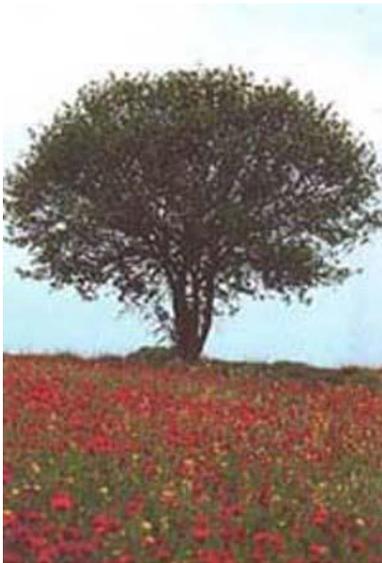
## Lesson 5.

**Annex 1 – Table: Hunting rules and regulations**

<p><b>What is necessary for hunting</b></p>	<ul style="list-style-type: none"> <li>• Age of 18 years old;</li> <li>• Right to possess firearm necessary for hunting;</li> <li>• In case of hunting migratory birds, one shall necessarily have the original receipt of a proof confirming the payment prescribed under the “Law of Georgia on Fees for the Use of Natural Resources”;</li> <li>• A document certifying the right of keeping and carrying the appropriate hunting firearm issued by the relevant body under the Ministry of Internal Affairs of Georgia;</li> <li>• Hunting (apart from migratory birds) is permitted based on the document on obtaining wildlife objects that are subject to hunting containing binding terms and obligations.</li> </ul>
<p><b>Forbidden places for hunting, hunting legal methods</b></p>	<p>Hunting is banned:</p> <ul style="list-style-type: none"> <li>• In state reserves, national parks and 500 m zones as well as administrative boundaries of Georgia.</li> </ul> <p>Hunting is banned:</p> <ul style="list-style-type: none"> <li>• By using explosives or other means causing harm to wild animals.</li> </ul> <p>Hunting is banned:</p> <ul style="list-style-type: none"> <li>• Without a permit or in a prohibited area, or by a prohibited firearm or a means causing significant damage.</li> </ul> <p>Hunting is banned:</p> <ul style="list-style-type: none"> <li>• In wildlife areas incorporated in the “Red List” of Georgia.</li> </ul>
<p><b>Penalties for hunting violations</b></p>	<p>Punishment can be administrative or criminal.</p> <p><b>Punishment rules are regulated under the Article 86 as prescribed by the Administrative Offences Code of Georgia.</b></p> <p>Violations carry different penalties: fines from 100 GEL to 500 GEL, hunting with non-hunting gun is punishable with a fine of 500-700 GEL, confiscation of obtained objects and hunting gun. In cases of other types of violations, the penalty increases from 800 GEL to 1500 GEL including confiscation of gun and obtained animal.</p> <p><b>As per article 301 under the Law of Georgia of Criminal Code</b> hunting without a license or in a prohibited area or at a prohibited time or/and with a banned firearm causing significant damage - is subject to penalties or corrective labor of up to two years or imprisonment for up to two years, or a deprivation of the right to occupy a position and pursue a particular activity for up to three years.</p> <p>2. Hunting in the state reserves or other protected areas where hunting is completely prohibited, or through the means of mechanical transport or mass destruction, or hunting for wild birds/animals being in helpless conditions, or during an ecological emergency or in an ecological disaster zone, or hunting for wildlife incorporated in the "Red List" of Georgia is also punishable by fines or corrective labour of up to two years or imprisonment for up to three years, or deprivation of the right to occupy a position and pursue a particular activity for up to three years.</p>

## Lesson 6.

### *Annex 1 Pictures*



Large amounts of water were needed to  
do this by nature  
Photo by I. Macharashvili



Ten years of lifeless landscape created  
by a human  
Photo by I. Macharashvili

**Source of pictures:** Matcharashvili, Irakli. “Hyena, Viper and Others...” Biodiversity hot spots, Tbilisi, 2002.  
See the link to book [here](#)

### *Annex 2 - Text*

Currently, 99% of the species of animals and plants on earth are considered to be extinct. Mass extinction which has been observed in our time in the living world has not been on the planet since the disappearance of dinosaurs. It happened 65 million years ago. What is the reason for such an appalling process? It is mainly due to the expansion of the sphere of humans' activity, their intensive use of natural resources. Large areas of forests are cut down; a lot of factories are being built that pollute the air, soil, water leading to the death of many living organisms. People kill animals and use their habitats for various purposes to satisfy their wants and needs. It is obvious, that such "consumer" behaviours will bring disastrous results not only to the nature of wildlife but also to the human being. Humans destroy the environment where they live. In a word, humanity will destroy itself.

**How can we preserve living things on earth?**

**Source:** Kopaliani, Natia. “Hyena, Viper and Others...” Biodiversity hot spots, Tbilisi, 2002

## Lesson 7.

### *Annex 1 - Table N1*

Types of protected areas	Aim of creation and descriptions
State Reserves	<p>State Reserves are established in order to maintain nature, natural processes and genetic resources in a dynamic and pristine condition, and to conduct scientific research and studies, with a minor impact, for educational and environmental monitoring purposes. For a State Reserve to be declared such a territory and/or wetlands shall be selected, that will ensure the maintenance of natural objects and processes without special care and restoration. There are 14 state reserves in Georgia the total area of which is 140,672 thousand ha. Including Batsari, Babaneuri, Bichvinta-Miuseri, Borjomi, Vashlovani, Tusheti, Lagodekhi, Liakhvi, Sataplea, Mariamjvari, Ritsa, Psu-Gumisti, Kintrishi and Kobuleti.</p>
National Park	<p>A national park is generally created in order to protect relatively large, natural ecosystems of exceptional beauty that are of national and international importance and to conserve the existing biodiversity. In addition, national parks play an important role in the development of eco-tourism, particularly in the promotion of the natural and cultural heritage of Georgia at an international level. Currently, there are 10 national parks in Georgia, with total area of 276,723.7 thousand ha.</p>
Prohibited areas	<p>Currently, where previously forest and hunting farms existed, hunting farms have been established based on the use of special licenses. These are Gardabani, Iori, Chachuna and Korughi Managed Reserves. It is allowed to conduct special restorative and maintenance measures on the territory of a managed nature reserve. It is also permitted to use certain renewable resources under strict supervision and control. Today, there are 18 prohibited areas in Georgia and their total area is 66,449 thousand ha.</p>
Natural monument	<p>A natural monument is a relatively small territory of national importance with ecosystems of outstanding and unique value, separate geomorphologic and hydrological formations, separate species of plants or fossils of living organisms. A natural monument can be a cave, a valley, river deltas, planted forest etc.</p> <p>There are currently 41 natural monuments with granted status. As of data by 2014, the total area of the natural monuments is 2,257.74 ha.</p>
Protected landscape	<p>“Tusheti protected Landscape” – the first protected landscape was created in Georgia in 2003 (31,518 thousand ha.), “Kintrishi Protected Landscape” was established in 2009 (3,190 thousand ha.). Sustainable use of natural resources and ecotourism development is possible in this protected area to facilitate conservation goals. As of 2013, the total area of protected landscapes in Georgia is 34,708 thousand ha. A Protected Landscape is administered by the protected areas administration under the local municipality in close</p>

	coordination with LELP Agency of Protected Areas.
Areas of multilateral use	<p>According to current Georgian legislation, it is allowed to establish multiple use areas; however such protected areas do not currently exist.</p> <p>Multilateral use areas are established for economic activities that are organized in accordance with the requirements of environmental protection and for use of renewable natural resources. Multilateral use areas require a relatively large area or/and aquatory, which represents natural foundation for accumulating water, productivity of forests and pasture, hunting, fishing, spread of flora and fauna, as well as tourism. It is acceptable for the areas to be partially modified and to include populated areas. The area should not include unique natural formations of national importance.</p>

## ***Annex 2 Protected areas in Ajara***

### **1. Mtirala National Park**

Mtirala National Park is situated in the south-western part of the Caucasus, the most western part of Ajara-Imereti Range, Kobuleti-Chaqvi Ridge. Area: 15.806 ha. Mtirala National Park was founded in 2006 by the initiative of Ajara Autonomous Republic and the Agency of Protected Areas under the Ministry of Environment and Natural Resources Protection of Georgia and with the support of World Wildlife Fund ([WWF](#)) and the Norwegian Government. Mount Mtirala, which reaches a height of 1.381 m above the sea level, is distinguished with abundant precipitation; it is considered to be the wettest place in Georgia (4.520 mm). Because of this, it is named as “Mtirala” with the meaning “weeping”. High humidity, frequent rains and fog make the Mtirala natural landscape very special.

Mtirala National Park is rich with vegetation. The park’s territory has been a shelter for Kolkheti animals and plants including extremely rare, endangered, endemic and relict species so far. There are 68 families, 202 genres and 284 species of plants. 16 species are endemic, among them 5 – Caucasian, 1 – Georgian, 3 – Colchic and 3 – Ajarian. The rare relict endemic species included in the Red List of Georgia are: Pontic oak (*Quercus potica*), Caucasian mountain shrub birch tree (*Betula medwedewii*), Rhododendron (*Rhododendron ungeronii*), Epigea (*Epigaea gaultherioides*), Colchic box-tree (*Buxus colchica*), Colchic bladdernut (*Staphylea colchica*), Yew (*Taxus baccata*), common chestnut (*Castanea sativa*), Colchic nut (*Corylus colchica*), walnut tree (*Juglans regia*).

The fauna of Mtirala National Park is represented by 95 species. The Brown bear is widely spread among large mammals. 23 animal species are included in the Red List of Georgia: lynx, brown bear, Caucasian squirrel, Caucasian salamander, Caucasian adder and the butterflies – Apollo and Caucasian festoon. Among the relatively bigger fowls there are: small eagles, kites, hawks, etc.

*Importance of Mtirala National Park:* the park has the most significant function – it promotes the maintenance of natural ecosystem balance across Kobuleti-Chakvi Ridge, which is a precondition to avoid erosion-landslides and flooding. The ecologically clean environment of the National Park creates ideal conditions for stability and purity of potable water. The park also creates favourable conditions for ecotourism development.

*Historical-cultural value:* Chakvistavi village located in Mtirala area is interesting from a historical-ethnographic point of view. The village is far away from the main populated zone and is surrounded by Mtirala National Park territory. Traditional architectural elements, old buildings and water mills are still preserved there.

### **2. Kobuleti Protected Areas**

Kobuleti State Reserve and Managed Reserve were created in order to save internationally important unique wetland ecosystems for waterfowl habitat, as high value natural heritage, status of which is recognized by the [Ramsar Convention](#). The mentioned wetlands are located in [Ajara Autonomous Republic](#), which include the north-eastern part of Kobuleti coastal plain and are distinguished by their diversity of [birds](#) and [plants](#).

The bogs, whatever the negative attitude of society, have a great number of different functions. First of all, the [bog](#) provides collection and maintenance of fresh water and regulates the flow of surface and underground waters through which the level of ground water is preserved. In addition, the [bog](#) ensures the stabilization of climatic conditions, keeps [erosion](#) away and maintains local [biodiversity](#). This bog is the habitat for many rare and endangered species of plants and animals and for migratory birds, it is a place to rest.

Kobuleti Protected Areas include sphagnum peat bogs of Ispani 1 and Ispani 2, its [relief](#) is flat and is a little eroded by rivers black gully and Togoni. The climate here is typically coastal, generally humid and subtropical. Annual precipitation is 1,500-2,500 mm, the most part of which comes in [autumn](#) and [winter](#) through rains. The wetland habitats of Kobuleti Protected Areas are characterized by the diversity of migratory waterfowl species. It is especially rich with vegetation. Currently, half the degraded secondary plant groups are represented in Ispani 1. Ispani 2 is of world importance due to its unique percolating – dome-like bog, which is fed only with [rainwater](#). Peat mosses – sphagnum varieties are the main characteristics of peat bog in the Kobuleti Protected Areas, such as the so-called "Imeretian sedge", white beak sedge (*Rhynchospora alba*), Caucasian beak sedge (*Rhynchospora caucasica*), [Great Pond-sedge \(\*Carex riparia\*\)](#), [buckbean \(\*Menyanthes trifoliata\*\)](#) and [round-leaved sundew \(\*Drosera rotundiflora\*\)](#) and other varieties. The majority of the mentioned plants are of northern (boreal) origin and appeared in Kolkheta during the Ice Age of the Quaternary periods. Colchic plants also grow in these peat bogs, such as Pontic rhododendron (*Rhododendron ponticum*), Yellow azalea (*Rhododendron luteum*), climber (*Smilax excelsa*), etc.; Rare and endangered Royal fern (*Osmunda regalis*)<sup>[1]</sup> can be found in Kobuleti Managed Nature Reserve as well, which is included in the Red List of Georgia.

Among the animals, the otter (*Lutra lutra*) is an inhabitant here. As for fowl, a lot of rare and endangered species can be found here which are included in the Red List of Georgia (5 species: black stork, small windhover, imperial eagle, white-tailed eagle, greater spotted eagle), rare species of Europe can be found here as well (28 species), such as: European bee-eater, kingfisher, pygmy cormorant, squacco heron, ibis, black stork, etc.; moreover, species of globally endangered fowl are also represented here, such as: Montagu's harrier, small windhover, field lapwing, great snipe, corncrake and others.

### **3. Machakhela National Park**

In 2012 Machakhela Gorge was declared a National Park, created to preserve its unique biological and landscape biodiversity, long-term protection of Colchic forest ecosystem, provision of ecological security and development of tourist and recreational activities in the natural environment. The gorge is situated in the valley of the Machakhela River, which is a trans-boundary river between Georgia and Turkey. Total area of the Gorge is 8.733 ha.

Machakhela National Park has a shared border with Camili Biosphere Reserve located in Turkey stipulating the development of trans-boundary cooperation.

Machakhela Gorge is characterized by its rare diversity of endemic and relict species. The significant part of the territory is occupied by Colchic type mixed deciduous forest with beech being the most dominant. The forests also contain: chestnut, oak, etc. Among woody species there are 13 varieties listed in the Red List of Georgia. The territory is rich with fauna too.

Machakhela National Park is part of an ecological corridor, which connects the protected territories of south-west Georgia (in particular, Mtirala National Park and Kintrishi Protected Areas) and north-east Turkey (particularly, Camili Biosphere Reserve). In addition, it has a crucial role in the establishment of a network of protected territories of the western part of the Lesser Caucasus and the development of Georgian-Turkish trans-border conservation.

Within the framework of Machakhela National Park conservation target species are as follows: Caucasian bee, brown bear, Caspian snow cock, Caucasian salamander, yew, Chorokhi oak, rhododendron ungerii, Lazian iris. The preservation of organic agriculture, local architectural and cultural heritage is also very important.

#### **4. Kintrishi Reserve and Protected Landscape**

Kintrishi Protected Areas include the Kintrishi Reserve, established in 1959, and Kintrishi Protected Landscape was founded in 2007. Kintrishi Protected Areas are located in the fascinating Kintrishi river gorge, between the village of Tskhemvani and Mount Khino. The lower border of Kintrishi Protected Areas lies at 250-300 m above sea level, and the upper one borders Alpine pastures (2,500 m above the sea level). The highest mountain peak is Mount Sarbiela (height – 2471 m above sea level). The area of Kintrishi Protected Areas makes up 13893 ha, 10703 of which is occupied by the Reserve and 3190 ha by the Protected Landscape. Kintrishi Protected areas are located between the Black Sea and the mountain system of Achara-Imereti. The mountains hold up the moist air of the sea creating a climate of high humidity. This climate in turn, is a significant factor determining the unique floral diversity.

The most beautiful landscapes of Kintrishi Protected Areas are represented by: mountain reliefs, fascinating gorges of the river Kintrishi, rugged territory with small gullies and narrow ravines. Local flora and fauna include a lot of endemic and relict species of Georgia, the Caucasus and Ajara.

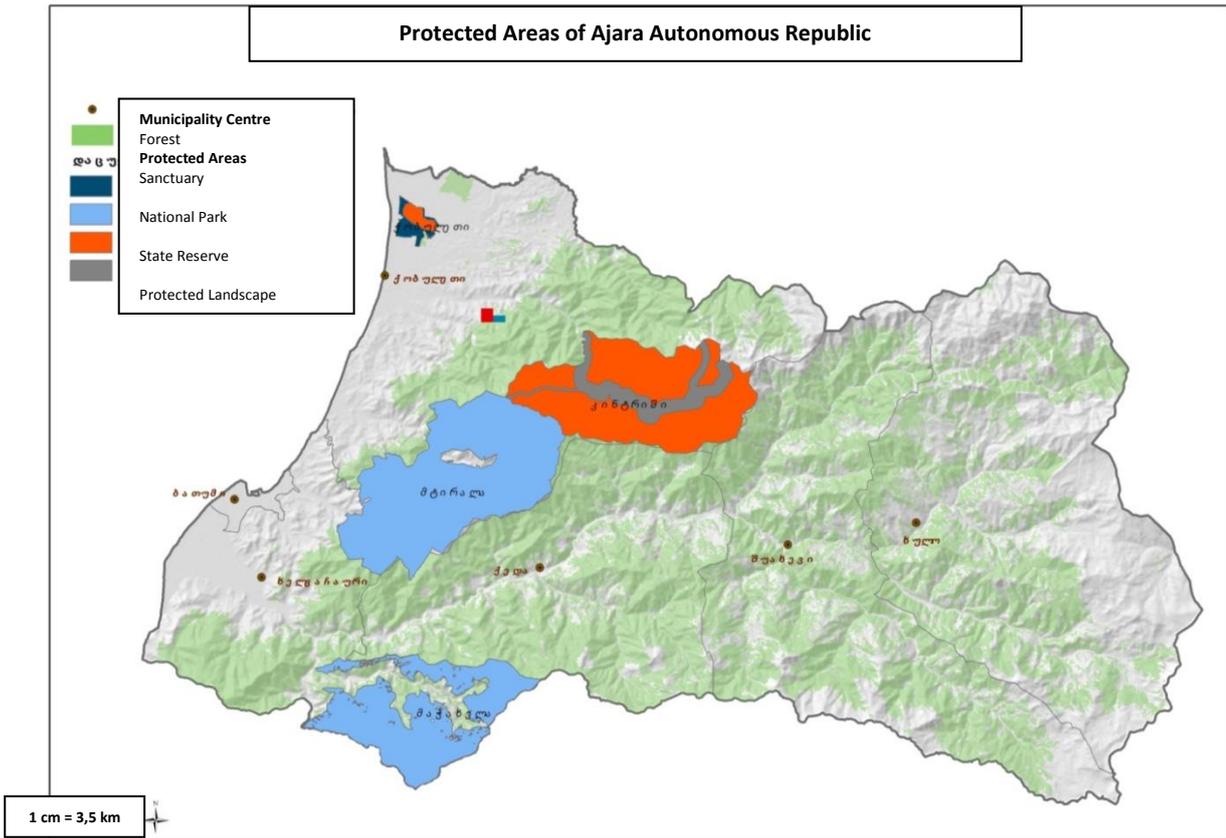
**Flora** – approximately 80% of Kintrishi Protected Areas are covered with forests. It is worth mentioning that it is the largest area covered with forest among the protected territories of Georgia. Kintrishi forest is characterized by the vast majority of Ajarian endemic species. Brushwood is represented by Colchic type evergreen shrubs and ferns. On Kintrishi territory botanists are mostly interested in evergreen rhododendrons - Pontic rhododendron, Rhododendron Caucasium, bilberry, cherry, laurel and azalea shrubs. The mentioned shrubs grow in the mountains, under birch and Pontic oak, at the edge of alpine and subalpine border.

Dendroflora of protected areas comprises 102 species. Here are spread 46 tree-plant species, 4 shrubs varieties and 8 liana species; the following trees are specific to the Kintrishi Protected Areas: Pontic oak, Medvedev birch, rhododendron ungerii, Pontic rhododendron, yew, Colchic capers, Broom, Caucasian persimmon, chestnut. From the Red List of Georgia, Imeretian oak, Pontic oak, Q. hartwissiana, Colchic boxwood, yew, Medvedev birch, chestnut, arbutus wing nut, wing nut, rhododendron ungerii, can be found here.

**Fauna** - the following predators inhabit the Kintrishi Protected Areas: brown bear, whose population is quite stable. The wolf and lynx are rarely seen here. Ungulate animals, roe and chamois can be found at the edge of the alpine and sub-alpine zones. Small mammal inhabitants of Kintrishi Gorge are: mole, weasel, Caucasian (Persian) squirrel, rabbit, fox, badger, wild cat among others. In the Reserve the population of otter is not well studied, though, it has been observed many times before in the Gorge. Rivers and ravines are rich in trout. Shemaya and carp are found in downstream in the Kintrishi river.

Local birdlife is quite rich in birds of prey. In Kintrishi protected areas there are: booted eagle, buzzard, hawk, falcon, hobby and common kestrel. As for endemic animals, there are 28 species of small mammals in Kintrishi Protected Areas: including the European hedgehog, Caucasian squirrel, grey rat and several species of bats.

Map 1.



### **Annex 1. Review of density of the brown bear in other countries**

The population density of the bear fluctuates and depends on the availability of food, amount of harvest and increase/decrease in the number of bears. The highest density (100-200 bears/1000 km<sup>2</sup>) is observed in Romania and the Danube river basin countries. The lowest index (0.5-1 bears/1000 km<sup>2</sup>) is fixed in some areas of Fennoscandia. Brown bears, like the majority of large sized wild animals, are characterized by low density (especially in the north, for example, 0.5 bears/1000 km<sup>2</sup> - in the south Norway, 20-25 bears/1000 km<sup>2</sup> – in central Sweden) and large territories.(Swenson et al., 2000).

Individual territories of adult bears differ according to gender. For example, in central Sweden a male's territory averages 543 km<sup>2</sup>, and a female's territory – 345 km<sup>2</sup>. The area of individual territory depends on food supply too, the more food available, the smaller the individual territory is. For example, in Croatia, where the bear's habitat is comparatively more productive than the northern coniferous forests, male bears occupy 128 km<sup>2</sup> area and female ones – 58 km<sup>2</sup>.

(Source: „Human-Wildlife Interface Baseline survey”).

### ***Annex 2. Interview with Irakli Shavgulidze, the Director of “Nacres”:***

Among bears' species the brown bear is spread throughout Georgia. Even though hunting bears is banned, the brown bear is always facing the threat from poachers, they are hunting bears despite the fact that they are included in the Red List of Georgia. Controlling bear hunting cannot be managed. The great number of bear-cubs found in captivity proves the high occurrence of poaching. “Bear-cubs will not be found in human's hands, unless their mother has been killed” – says Irakli Shavgulidze, the representative of “Nacres”, Centre for Biodiversity Research & Conservation.

According to Irakli Shavgulidze, a brown bear can only be removed from nature if it poses a threat to humans. Even in such cases, killing it is the last resort.

“This year, there was such a case in Sachkhere District where a bear disturbed the population, it killed the cattle. There have been talks about taking some measures, though as far as I know, a licence to kill the bear has not been issued” – states Irakli Shavgulidze.

According to him, similar cases are dealt with in different ways throughout the world. Compensation is one of the ways. For example, if a bear kills cattle, a special service should evaluate the loss and pay compensation to the owner. In similar cases one more way is to identify the specific killer animal and after that issue a permission to remove that specific animal from nature. Removal from nature is conducted in two ways; one way is to kill animal, and another – to put it temporarily in another place.

“In Georgia, there is one way only, if the animal is identified to be a killer, a relevant licence to kill it is issued. We should be very careful when issuing a licence to kill an animal. It needs execution and a professional hunter to perform it, who will locate the specific bear. If you go and kill all the bears in the forest, it will not solve the problem. The specific bear will come to the village again. We are always careful that licences should not be issued easily” –states Irakli Shavgulidze.

### **Annex 3. The uncertain future of brown bears in captivity<sup>3</sup>**

The brown bear is included in the Red List of Georgia. Regardless that this species is under special protection, poaching is still a big threat. In Georgia, we often see brown bears in public places, for example in restaurants' yards. The newspaper "Batumelebi" was interested if any vision or plan exists where it is possible to return captive animals back into their natural environment. The Department of Environmental Supervision is responsible for solving this issue.

Regarding the question asked by "Batumelebi": What types of sanctions were/or will be placed on people, who keep bears in captivity, the Press Service of the Department of Environmental Supervision answered in writing: „According to the Article 85<sup>3</sup> of the Administrative Offences Code of Georgia the purchase, sale or keeping in captivity endangered wild animals included in the Red List of Georgia without relevant permission is considered to be a punishable action and causes a penalty from 150 to 850 GEL with confiscation of infringer's personal property belongings, which were the tools used to commit the aforementioned violations, or without it, confiscation of obtained animals”.

On the question – how they were going to solve the problem and are there any measures planned to return them back to the environment, this was the answer from the Department:

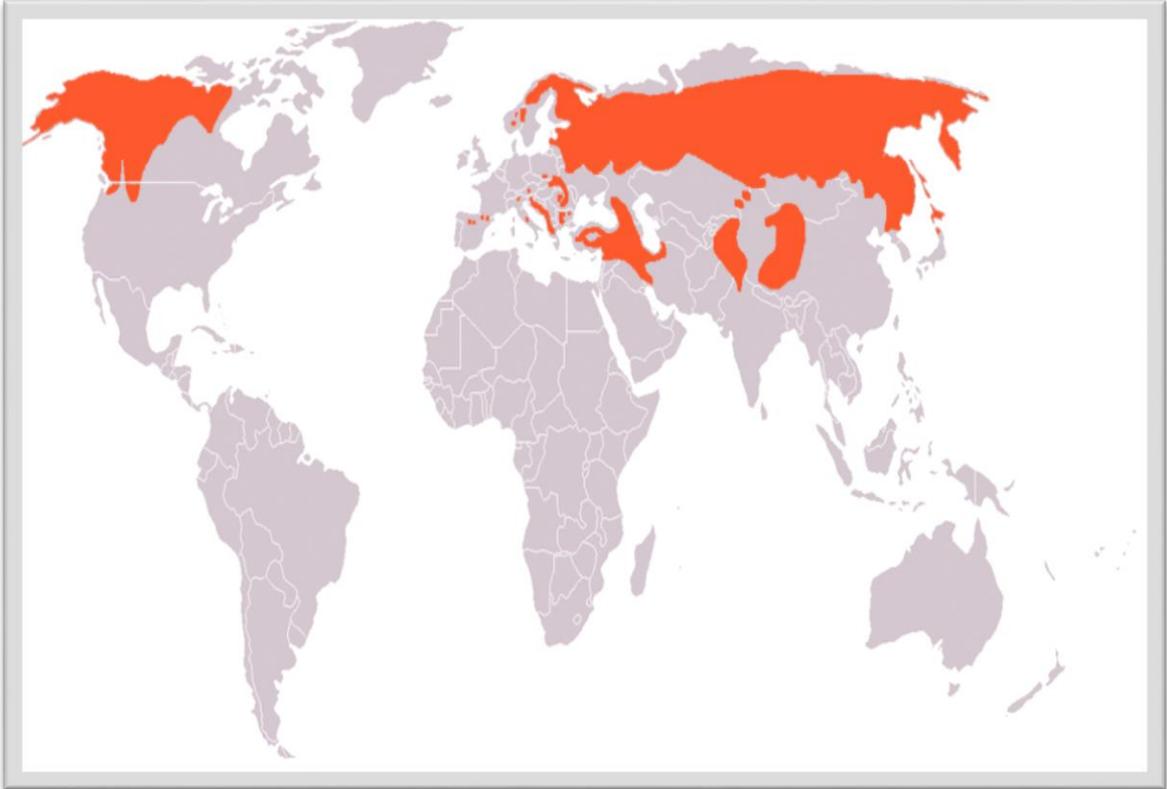
“The response to a brown bears' captivation includes confiscation of the captive animal itself. In addition, non-existence of a wild animal shelter is a big problem that makes it impossible to place the confiscated animals somewhere and provide their further adaptation to wild nature.” The return of captive wild animals into the wild, particularly animals missing their natural instincts and norms of behaviour, is possible only after a period of adaptation, otherwise, the return of the animal to the wild will be unsuccessful. The problem can be solved by setting up relevant shelters, where adaptation processes with wild environment can be conducted.“ As for shelter, the only place, where it is possible to take a captive brown bear, is Tbilisi Zoo. According to the Director of the Zoo, Zurab Gurielidze, there is not enough space in the zoo to keep captive bears.

“Presently, we have 15 bears, which is a large number. There is not enough space for them. In total, there are 50 bears, in difficult conditions, in various places of Georgia, for example, in the territories of restaurants. One such restaurant “Eden's Garden” is on Rikoti Pass, where a bear lives in the area of 2 m<sup>2</sup> in unbearable conditions. All these bears need to be confiscated, but a location to where they can be moved, does not physically exist. There will be a bears' shelter on Tbilisi Sea soon. All this will cost 300-400 thousand GEL, which, in our opinion, should be allocated from the budget. After that, we will take care of them ourselves”, – says Zurab Gurielidze.

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<sup>3</sup>(Article [www.netgazeti.ge](http://www.netgazeti.ge) 01.07.2014)

Annex 4. Map - bears' habitat area



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### Text N1

Humans have a specific attitude towards the wolf. On the one hand, a wolf is an enemy of the people, on the other, frequently enough, it deserves sympathy and respect.

It is obvious that the negative attitude towards this animal has appeared since a human has started farm animal breeding. If there is a problem in the forest, a wolf takes advantage of domestic animals. Cattle run relatively slowly and if they are not properly protected, it is easy to catch them.

In regard to the relation between beast and prey there exists law in the ecology, according to which a beast catches a prey, for which it spends less energy, consequently, it gets more benefit from such prey. For example, a rabbit should be easier to catch than a deer. In the case of catching a deer, a wolf spends more energy, than while hunting a rabbit. However the energy received from a deer is much higher (wolf is a social animal and its actions are very often beneficial to the whole group).

The same law covers the capture of domestic animals by a wolf, since they are relatively slow and have less ability to defend themselves unlike wild animals. Though in cases where the domestic animal is protected, the situation changes and risks are assessed to what extent it is easier to catch a cow, which is protected by dogs - wolf-like creatures (dogs do not differ much from wolves. If a dog appears in the forest, it turns into a wolf very soon). In such cases a wolf, surely chooses a place to stop, where it will be more protected with its offspring. But, if the balance in the wild is so unequal that the number of ungulates in the forest is catastrophically low, like it is in Georgia today, the wolf has to take big risks: die of starvation or fighting to get food.

This is one reason, which caused/presently causes humans' antagonist attitude towards the wolf. Due to the present situation, in the areas, where wolf's expansion has recently been happening, i.e. the wolf has returned to its traditional hunting area, where now, animal breeding is widespread. This causes a difficult situation between the animal breeders and the wolf. ,

As for sheep breeding, one of the main functions of dogs is protecting sheep from wolves. Several years ago, we conducted research about the conflict between humans and animals and the situation clearly showed that in general, there are no big dogs in west Georgia, there are only small dogs, which are so called "dessert" for wolves. The local population cannot, do not want to, understand that cattle going into the forest need protection, otherwise, they can become a snack for predators including two-legged wolves and as a rule, the four-legged wolves are blamed for it.

These are the two main reasons why wolves' attack cattle. In many villages of Georgia cattle are not protected. To this end, there is a strange approach in some regions: sheep are protected, but horses are not. It is justified, when the horse is with the well bound herd of horses protected by its stallion leader, it is a difficult snack for any predator, though such herds of horses are very rare in Georgia.

### Z. Gurielidze. Joint project of journal "Liberali" and Tbilisi Zoo

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### Text N2

As for positive attitude of humans towards wolves, humans have always had close relations with wolves. The dog originated directly from them. Often, "wolf" is a positive epithet. Physically it is a very strong animal, moving over a large territory, is clever and is very intelligent. In certain cases, some tribes of American Indians, who knew the noted animal well, did not hunt wolves at all. A wolf was also, one of their totems. Probably, they understood that the existence of wolves in nature provided a permanent food source for them.

Very often, humans' sympathy towards wolves is caused by the monogamy of this animal. This predator has an interesting social structure and lives in families, a male wolf together with its female wolf, 1 year old and younger offspring. This group is very similar to the human patriarchal structure. 1 year old offspring live with families for some period of time, which has an evolutionary meaning - close relatives should not be cross-bred. In case of such cross-breeding the resistance of an organism's embryo organism is much reduced.

As for wolves' monogamy, in my experience, I can say that frequently, when zoo visitors learn about it, they express great respect towards wolves, probably because in reality it is difficult to see monogamy in humans.

#### **Z. Gurielidze. Joint project of journal "Liberali" and Tbilisi Zoo**

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#### **Text N3**

It is interesting, how a wolf obtains food in the wild. As per popular opinion "the wolf is a cleaner of nature". This term does not express well the function a wolf performs. Wolf does not "clean", it maintains a healthy population of its own prey. In general, too, evolutionary role of each predator is the maintenance of ecosystem's sustainability. A sustainable, well-functioning ecosystem consists of many "parts" and is created due to the relationship between those parts. We can get the worst result by removing some of these "parts", even if it is not seen on the surface.

It is worth mentioning that during the rutting season wolves do not hunt deer. At that time, a physically strong buck is very aggressive, thus, the risk for the predator increases. Through, this period, which lasts a month or 6 weeks or more, wolves prefer to change the food into more easily obtained ones (rodents, rabbits), however, they do not go far from the deer, and wait for the completion of the rut.

After the rut, the female deer and bucks separate from each other. Though, the females are accompanied by bucks which were defeated in the battle or by young bucks, which did not take part in these battles at all and hope to do so in the future.

As for the physically strongest, elder buck, it hardly eats any food during the rutting season but uses a lot of energy during sexual activity and thus, is exhausted. It stays either the same place and does not go anywhere, or vice-versa, but it separates from the female deer. Imagine the large body mass of a weakened, lonely buck so it is a real gift of food for the predator.

That is the reason predators capture the elder buck. It is replaced by the young bucks, which followed the female deer. This is useful for deer population. When a wolf eats a deer, it is a tragedy for deer, but for deer population it is one of the ways it stays healthy.

The second positive influence wolves or in general, wild animals have on population of prey, is the removal of the so called, ballast animals. This does not mean that a wolf does not hunt on female deer and roes, though according to statistics, wolves catch relatively many more weak animals which are easier to hunt.

There exists one more important period - giving birth. At these times deer are least protected and try to use the factor of being together to maximise their defence. Deer have a very good sense of hearing and smell, consequently, while they are in groups they have more opportunity to detect a predator relatively early and have a greater running distance, than an individual deer.

Running distance - this is a distance from predator to prey, i.e. the closest distance the prey allows the predator to reach before it runs. This is characteristic for all animals. In such cases, the running distance of female deer and roes is relatively bigger than that of bucks. Very frequently, bucks try to defend themselves by fighting the predators.

It is favourable for wolves, since they rarely hunt individually; while hunting in groups, good hunters divide the functions. This process is very interesting too, because these predators bring the alpha wolf, which is able to do everything well, to the front. It alpha wolf appears to be able to manage everything, it is a good strategist and while hunting, it is able to give different directions to lower rank wolves.

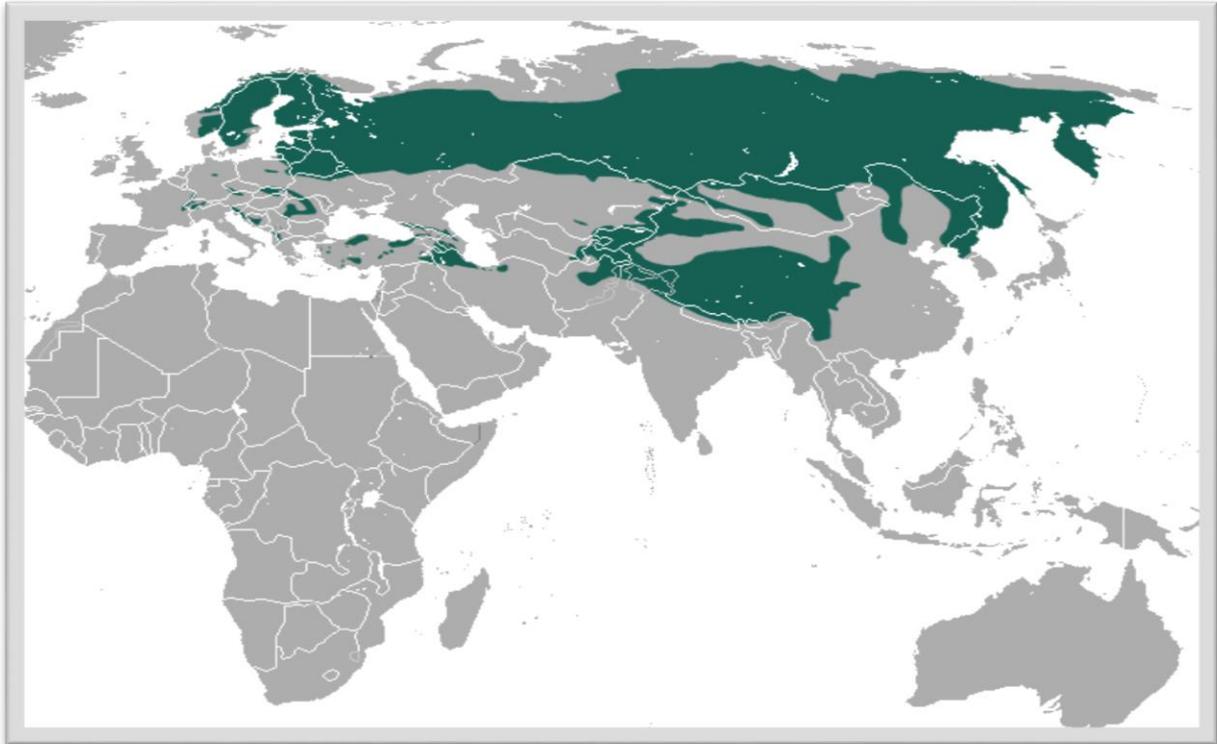
**Annex**

*Table 2: Information about the wolves’ population density in other countries. (Boitani, 2000).*

<b>Population Name</b>	<b>Country</b>	<b>Size (2012)</b>	<b>Tendency</b>
<b>Scandinavian</b>	Norway, Sweden	260-330	Increasing
<b>Karelian</b>	Finland	150-165	Decreasing
<b>Baltic</b>	Estonia, Latvia, Lithuania, Poland	870-1400	From stable to increasing
<b>Lowlands of Central Europe</b>	Germany, Poland	36 packs	Increasing
<b>Carpathians</b>	Slovakia, The Czech Republic, Poland, Romania, Hungary, Serbia	3000	Stable
<b>Dinaric-Baltic</b>	Slovenia, Croatia, Bosnia & Herzegovina, Montenegro, Greece, Bulgaria	3900	Stable
<b>Alpine</b>	Italy, France, Switzerland, Austria, Slovenia	280	Increasing
<b>Italian Peninsula</b>	Italy	600-800	Stable
<b>Iberian</b>	Spain, Portugal	2500 (data of 2007)	Decreasing
<b>Sierra-Morena</b>	Spain	1 group	Decreasing

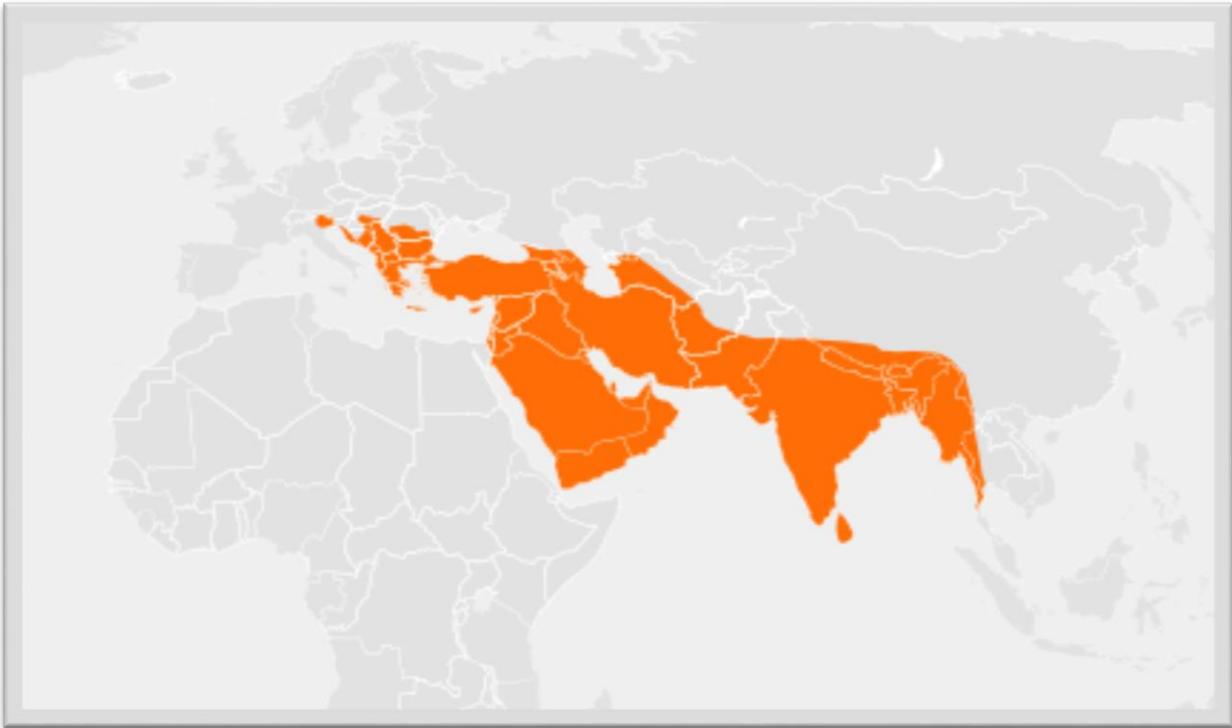
Lesson 11.

**Annex 1** –*European lynx habitat area*



## Lesson 12.

### Annex 1 –Jackal habitat area



### Annex 2. - Text

“The Georgian population has always had a well-defined negative attitude towards this species which remains to this day, although less is known about it compared with other animals. The Jackal suffers oppression from humans in many places throughout the world, though people are convinced of the “usefulness” of its existence one example is of Israel: here the number of jackals was much decreased, because they were mass poisoned. The decrease in the number of jackals increased the number of human deaths from 229 to 435 in two years “.

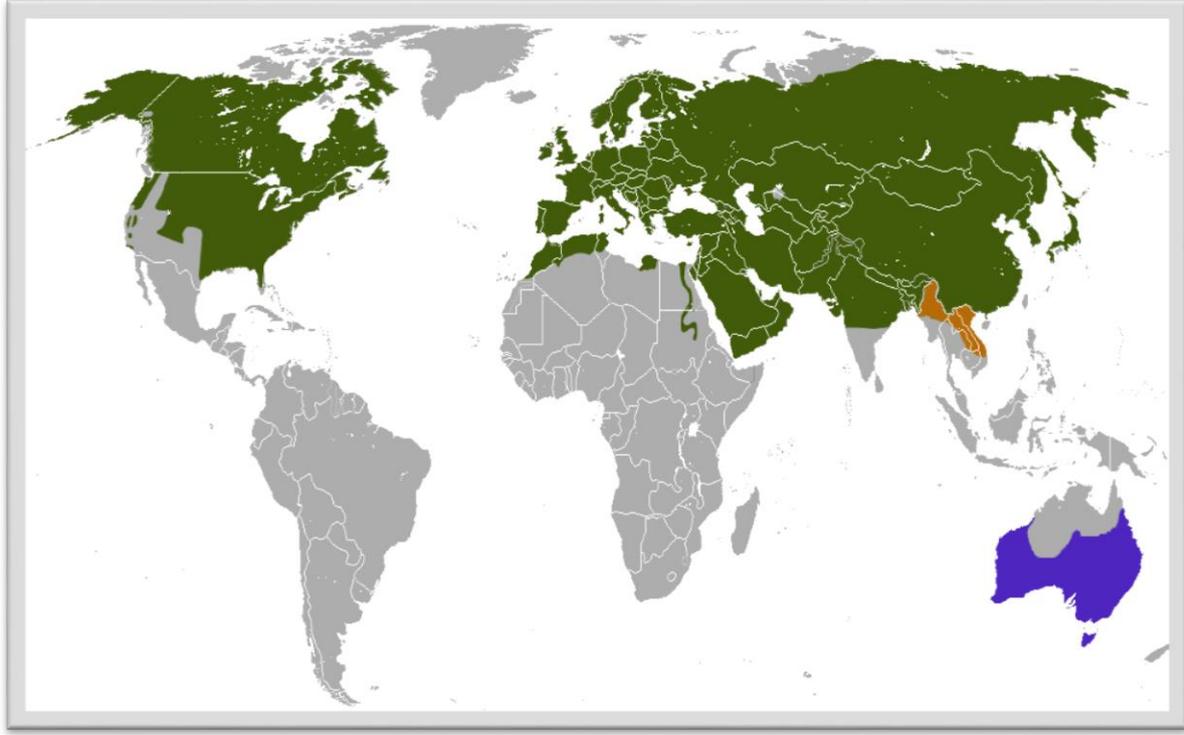
#### Assignment:

**Make an assumption and explain the reasons causing the above mentioned fact.**

Source: Iamze Khutsishvili. “Hyena, Viper and Others...” Biodiversity hot spots. Tbilisi, 2002.

**Lesson 13.**

*Annex 1–Map: Fox habitat area*



*It is introduced in Australia*

**Lesson 14.**

*Annex 1 –Table*

Problem	Causing reasons	Benefit	Damage

**Annex 2 – Wild boar habitat area**



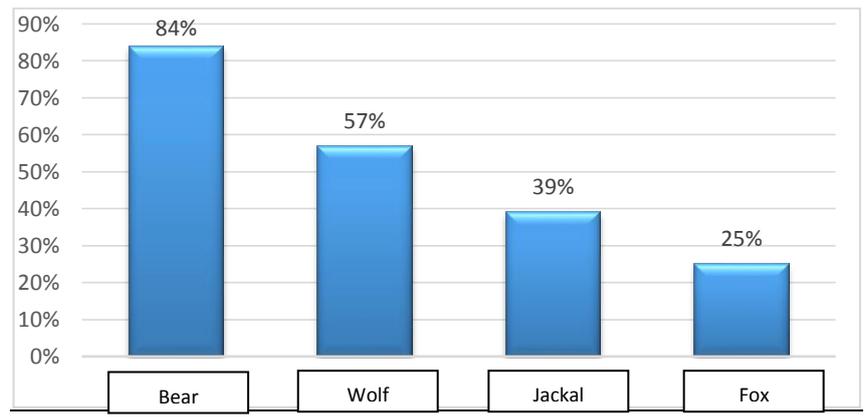
**Annex 3 - Questionnaire**

**Assignment:** Get acquainted with the issues given below and think of relevant ones.

- Taking into consideration both the damage caused by the wild boar and the benefits given by wild boar, decide whether we should work on reducing the causes behind the decrease of the number wild boar? Support your answer.
- How can we inform society in a realistic (right) way about the benefits given and damages caused by wild boar?
- What mechanisms can you offer farmers to protect their crops from damage caused by wild boars?

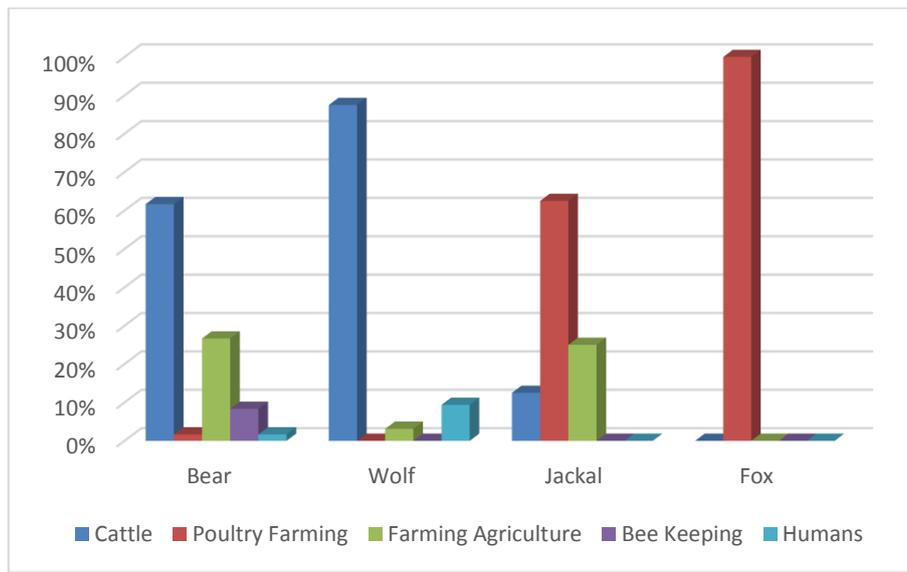
**Lesson 16.**

**Annex 1 - Diagram: the main wild animals and their habitat frequency**

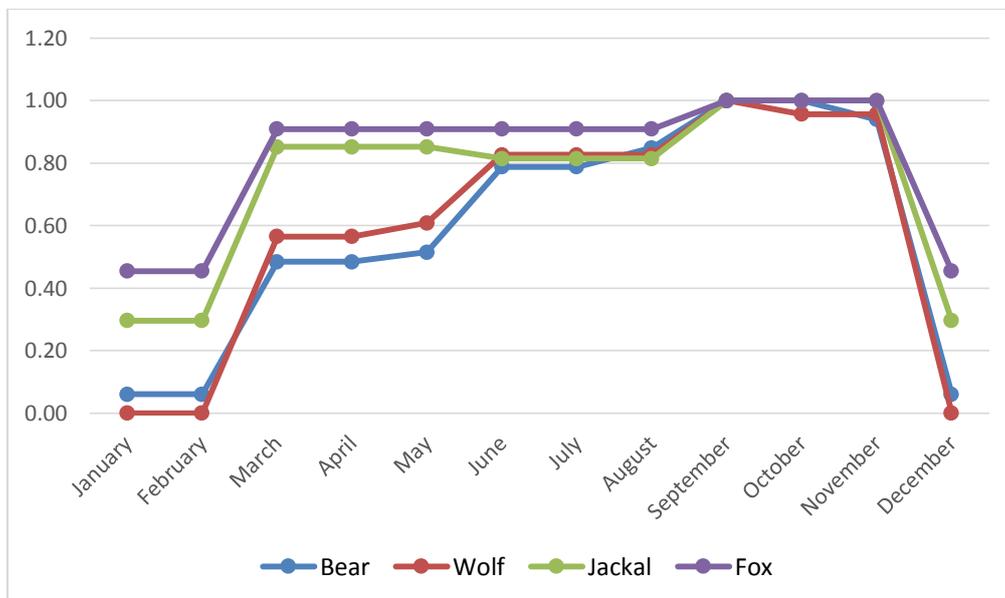


**Lesson 17.**

**Annex 1 – Diagram 2: the main wild animals and damage caused by them**

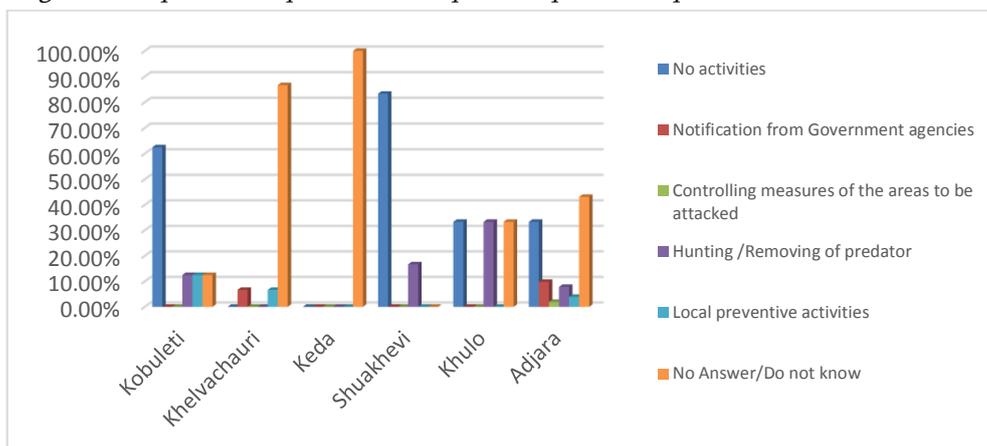


**Annex 2 - Diagram 3: attacks of wild animals by seasons**



## Lesson 18.

**Annex 1 - Diagram 5: Implemented practices of response as per municipalities**



## Lesson 19.

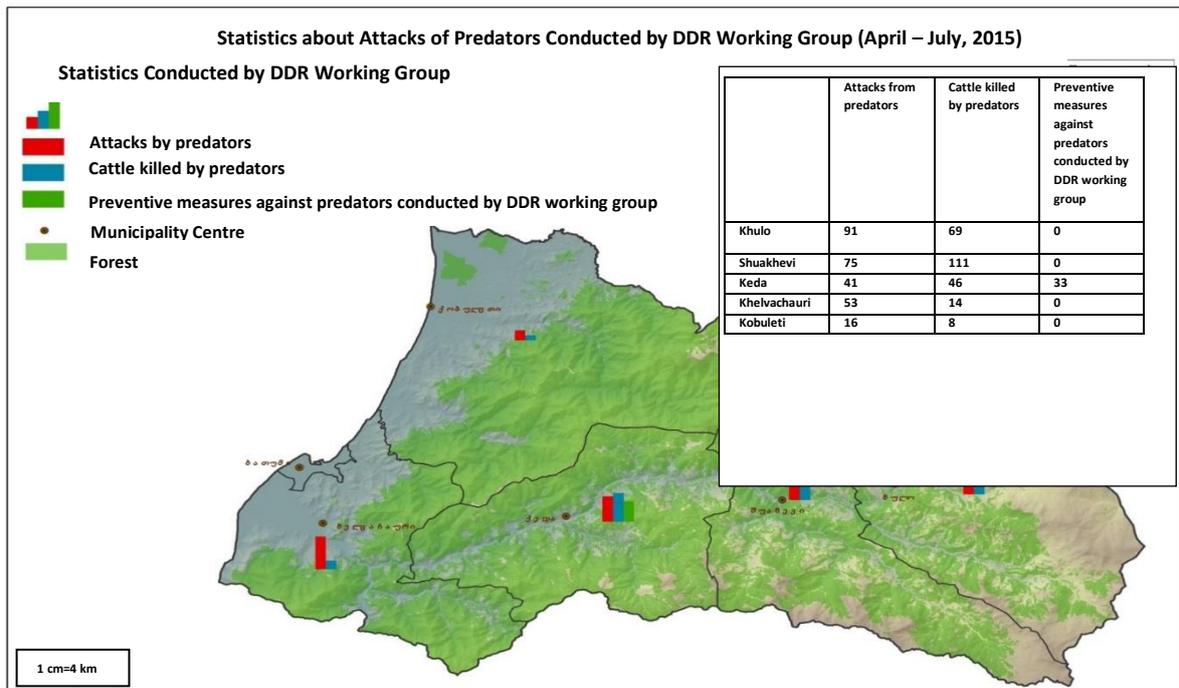
### Assignment

Assess preventive measures and means given in the text of the lesson and fill the table

Activity/Device	Positive Side	Negative Side	Recommendation

Lesson 20.

Annex 1– map of attacks fixed by Disaster Risk Mitigation Municipal Groups



## Information about Fauna According to Ajara Municipalities

		Khelvachauri	Kobuleti	Keda	Shuakhevi	Khulo
Original jackal (Latin: <i>Canis aureus</i> )	54T Conservation status (Georgian)	Has no status, it is not assessed				
	54T Conservation status 54T (IUCN)	Less endangered species				
	Habitat	Lowlands, in some cases it was observed on 1,100 m high (Gurielidze, 2012).				
	Quantity/Density	Original species, precise number is not identified; density can be assessed as high. Significant increase in number is fixed during the last 10 years. In spring, before reproduction density fluctuates from 1 jackal/0,5 – 2,5 km <sup>2</sup> . (Bukhnikashvili and P P Kandaurov, 2002; Gurielidze, 2012.)				
	Population tendency	Increase (Gurielidze, 2012).				
	54T Economic value (at national scale)	Periodically, people are hunting it, but it is not a popular object for hunting in Georgia (Gurielidze, 2012). They benefit agriculture by preventing the increase in the number of rodents and leporidaes. Original jackal attacks crops like maize and watermelon (Heptner & Naumov, 1998). It can transmit rabies (Wilde, 2005).				
	54T Monitoring methods	Calculation according to survey; video traps; modeling of habitat usefulness.				
	54T Scientific-research activity	Current research activities do not exist. Potentially, it is possible to receive consultations from all zoologists studying mammals. Scientific-research institutions – Ilia State University, Institute of Zoology, Institute of Ecology, non-governmental organization NACRES, FFI.				
Red fox (Latin: <i>Vulpes vulpes</i> )	54T Conservation status (Georgian)	Has no status, it is not assessed				
	54T Conservation status 54T (IUCN)	Less endangered species				
	Habitat	It is spread throughout the whole territory of Municipality; vertically it is disseminated up to 2800 m above the sea level (Gurielidze, 2012).				
	Quantity/Density	Information about the size of population is not available. Despite this, it is a widespread (though, not many) species. It is less common in Kolkheti Lowland and in general, the zones where jackals are located ( <i>Canis aureus</i> ) (Gurielidze, 2012).				
	Population tendency	Stable (Gurielidze, 2012).				
	54T Economic value (at national scale)	Periodically, people are hunting it because of its fur, but it is not a popular object for hunting in Georgia. It regulates rodents' density on agriculture landscape. It is frequently mentioned in folklore (Gurielidze, 2012). It can transmit rabies (Stephen & Derek 2008).				

	54T Monitoring methods	Calculation according to survey; video traps; modelling of habitat usefulness.				
	54T Scientific-research activities	Current research activities do not exist. Potentially, it is possible to receive consultations from all zoologists studying mammals. Scientific-research institutions – Ilia State University, Institute of Zoology, Institute of Ecology, non-governmental organization NACRES, FFI.				
Wildcat (European/wild) (Latin: Felissilvestri)	54T Conservation status (Georgian)	Has no status, it is not assessed				
	54T Conservation status 54T (IUCN)	Less endangered species				
	Habitat	It is spread on the whole territory; vertically it is disseminated up to 2,000 m above the sea level (Bukhnikashvili&Kandaurov, 2002).				
	Quantity/Density	70	110	165	180	160
		Gender ratio is 1:3 (male/female). Population density is high - 0.22-0.44 100 ha (Gurielidze, 2012; Gurielidze, 2013).				
	Population tendency	Stable (Gurielidze, 2012; Gurielidze, 2013).				
	54T Economic value (at national scale)	Wildcats have an important role in controlling rodents and other small mammals' populations. Domestic cats transmit many diseases to humans, including rabies, phelinosis (fever/benign viral Lymphadenitis caused by cat's scratches) and several parasite infections (Nowak, 1997).				
	54T Monitoring methods	Calculation according to survey; video traps;				
54T Scientific-research activities	Current research activities do not exist. Scientific-research institutions – Ilia State University, Institute of Zoology, Institute of Ecology, non-governmental organization NACRES, FFI.					
Original wolf (Latin Canis lupus)	54T Conservation status (Georgian)	Has no status, it is not assessed				
	54T Conservation status 54T (IUCN)	Less endangered species. Version 3.10T				
	Habitat	Practically it is spread equally throughout the whole territory of Ajara, vertically it is disseminated up to 2,900 m above the sea level (Bukhnikashvili&Kandaurov, 2002).				

	Quantity/Density	12	16	20	28	26
		Gender ratio is 1:1 (male/female). Population density is 0.025 1 km P (Gurielidze, 2012; 2 P Gurielidze 2013).				
	Population tendency	Stable (Gurielidze, 2012; Gurielidze, 2013).				
Brown bear (Latin <i>Ursus arctos</i> )	54T Economic value (at national scale)	Periodically, people are hunting it, but it is not a popular object for hunting in Georgia. It attacks cattle. It is an important character in Georgian national folklore (Gurielidze, 2012; Gurielidze, 2013). It can transmit rabies (Linnell, 2002).				
	54T Monitoring methods	Calculation according to survey; video traps; modelling of habitat usefulness.				
	54T Scientific-research activities	Current research activities: Ilia State University, Institute of Zoology, Institute of Ecology, Prof. Kopaliani N.; non-governmental organization NACRES, FFI.				
	54T Conservation status (Georgian)	Endangered species EN C2 (aI)				
	54T Conservation status 54T (IUCN)	Less endangered species				
	Habitat	Widespread species, but it is not equally disseminated on the territory of Municipality, vertically it is spread up to 3,000 m above the sea level (Bukhnikashvili&Kandaurov, 2002).				
	Quantity/Density	20	26	42	45	42
		Gender ratio is 1:1 (male/female). Population density is one of the highest in Georgia - 0.113 species per 100 ha (Gurielidze, 2012; Gurielidze 2013).				
	Population tendency	Stable (Gurielidze, 2012; Gurielidze, 2013).				
	54T Economic value (at national scale)	It is interesting in regard to attraction of eco-tourists and scientists. It attacks cattle. It is under great threat from poachers. It is an important character in Georgian national folklore (Gurielidze, 2012; Gurielidze, 2013).				
54T Monitoring methods	Telemetry, genetic analysis, researches (long-range identification, aerial photography); video traps; modelling of habitat usefulness.					

	54T Activities	Current research activities: (1) ISU, Institute of Ecology, Institute of Zoology, contact person – Zurab Gurielidze, Aleksandre Gavashelishvili; (2) NACRES, contact person – Bezhan Lortkipanidze. DNA analyses and bears population genetics studies are being carried out in the Ilia State University with the internal support of the university. In 2012, the Government financed aerial photography and land survey works carried out by the institute of Ecology of Ilia State University.
Lynx (Latin: Lynx lynx)	54T Conservation status (Georgian)	Endangered species CR C2 (aI)
	54T Conservation status 54T (IUCN)	Less endangered species
	Habitat	This species is small in number, it is not equally disseminated on the territory, vertically it is spread up to 2,500 m above the sea level (Bukhnikashvili&Kandaurov, 2002).
	Quantity/Density	The number and density is unknown, Gender ratio is 1:2 (male/female). There is no information about population size (Gurielidze, 2012; Gurielidze 2013).
	Population tendency	Stable (Gurielidze, 2012; Gurielidze, 2013).
	54T Economic value (at national scale)	It is interesting in regard to being an attraction for ecotourists and scientists. It rare attacks cattle. (Gurielidze, 2012; Gurielidze, 2013).
	54T Monitoring methods	Researches (long-range identification); video traps; modelling of habitat usefulness.
	54T Scientific-research activities	(1) ISU, Institute of Ecology, Institute of Zoology; (2) NACRES, contact persons – Zura Gurielidze, Natia Kopaliani (Ilia State University), Bezhan Lortkipanidze (NACRES). In 2012, the Government financed land survey works carried out by the institute of Ecology of Ilia State University.
Original badger (Latin: Melesmeles)	54T Conservation status (Georgian)	Has no status, it is not assessed
	54T Conservation status 54T (IUCN)	Less endangered species
	Habitat	This species is small in number, it is not equally disseminated on the territory, tries to move from places, where the jackal is. vertically it is spread up to 2,200 m above the sea level (Bukhnikashvili&Kandaurov, 2002).
	Quantity/Density	The number is unknown, density can be evaluated as high (Gurielidze, 2012; Gurielidze 2013).
	Population tendency	Stable (Gurielidze, 2012; Gurielidze, 2013).
	54T Economic value (at national scale)	It is under great threat from poachers (Gurielidze, 2012; Gurielidze, 2013). Original badger can damage agriculture crops and orchards as well in the populated zones (Delahay, et al., 2008).

	54T Monitoring methods	Modeling of habitat usefulness.				
	54T Scientific-research activities	Current research activities do not exist. Scientific-research institutions – Ilia State University, Institute of Zoology, Institute of Ecology, non-governmental organization NACRES, FFI.				
Wild boar (Latin: <i>Sus scrofa</i> )	54T Conservation status (Georgian)	Has no status, it is not assessed				
	54T Conservation status 54T (IUCN)	Less endangered species				
	Habitat	It is spread in the forest area of the Municipality, it is not equally disseminated on the territory; vertically it is spread up to 2,700 m above the sea level (Bukhnikashvili&Kandaurov, 2002).				
	Quantity/Density	16	24	38	45	38
		Density is 0.007 species per ha. Gender ratio is 1:3 (male/female). (Gurielidze, 2012; Gurielidze 2013).				
	Population tendency	Decrease (Gurielidze, 2013)				
	54T Economic value (at national scale)	A popular hunting object in Georgia. Wild boars may be problematic for farmers. In the areas, where wild boars are widely spread, agriculture crops are frequently damaged (Gurielidze, 2012; Gurielidze 2013).				
	54T Monitoring methods	Monitoring should cover supervision of movement in the sections to be studied, direct visual calculation from the surveillance points located in high places, calculation at night through thermal video cameras, also, indirect methods (for example, calculation of excrements). (Krebs, 2006; Sutherland, 2006; Thompson et al., 1998). Observation on wild boar.				
		Visual observation and supervision of movement (footprints, excrements, etc.) should be conducted by professional zoologists or trained experts together with forestry officers and/or students. Conduction of recording provided through many years regarding footprints of the species in the protected areas or reserves conditions the current tendency.				
	54T Scientific-research activities	In assessment of 2012 (Gurielidze 2013) population size is suggested to be from 1000 to 1500 species throughout country. Several times wild boars were brought from far away geographic zones; it is more presumable that there is a case of wide hybridization with wild boars. Allegedly, population's size was greatly decreased at the end of 2000s as a result of African plague epidemic.				
	54T Conservation status (Georgian)	Has no status, it is not assessed				
	54T Conservation status 54T (IUCN)	Less endangered species				

	Habitat	It is spread in the forested part of the Municipality, it is equally disseminated on the territory, vertically it is spread up to 2,500 m above the sea level (Bukhnikashvili&Kandaurov, 2002).				
	Quantity/Density	80	120	185	200	185
		Density is 0.15 species per km <sup>2</sup> . Gender ratio is 1:3 (male/female). (Gurielidze, P P 2012; Gurielidze 2013).				
	Population tendency	Stable (Gurielidze, 2012; Gurielidze, 2013).				
	54T Economic value (at national scale)	It is hunted and is threatened by poachers (Gurielidze, 2012)				
	54T Monitoring methods	Monitoring should cover supervision of movement in the sections to be studied, direct visual calculation from the surveillance points located in highly places, calculation at night through thermal video cameras, also, indirect methods (for example, calculation of excrements. (Krebs, 2006; Sutherland, 2006; Thompson et al., 1998). Visual observation and supervision of movement (footprints, excrements, etc.) should be conducted by professional zoologists or trained experts together with forestry officers and/or students. Conduction of recording provided through many years regarding footprints of the species in the protected areas or reserves conditions the current tendency.				
	54T Scientific-research activities	Contact persons: Ilia State University, Institute of Ecology - Natia Kopaliani, Zura Gurielidze, Aleksandre Gavashelishvili. Current research projects do not exist. Calculation in the section to be studied was carried out in 2012, irregular calculation is being conducted in hunting farms in accordance with requirements of Biodiversity Conservation Department of the Ministry of Environment Protection. In extrapolation assessment of 2012 (Gurielidze 2013) population size is suggested to be from 7000 to 8000 species throughout country. Spatial dissemination of roe deer depends on the existence of food (green plants), shelter (shrubs) and non-existence of domestic hoofed cattle.				
Chamois (Latin: Rupicapra rupicapra)	54T Conservation status (Georgian)	Endangered species EN				
	54T Conservation status 54T (IUCN)	Less endangered species				
	Habitat	It is spread in the forested part of the Municipality, it is not equally disseminated on the territory, vertically it is spread up to 2,600 m above the sea level (Bukhnikashvili&Kandaurov, 2002).				
	Quantity/Density	40		80	100	
		Density is 0.45 species per 100 ha. Gender ratio is 1:2 (male/female). (Gurielidze 2012; Gurielidze 2013).				
	Population tendency	Unknown				

	54T Economic value (at national scale)	It is actively hunted, , it suffers a great pressure from poachers. It is an important character in Georgian national folklore (Gurielidze, 2012; Gurielidze, 2013).
	54T Monitoring methods	Calculation according to survey; video traps; modeling of habitat usefulness.
	54T Scientific-research activities	Current research projects do not exist. Scientific-research institutions – Ilia State University, Institute of Zoology, Institute of Ecology, non-governmental organization NACRES, FFI.

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Confédération suisse  
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