National Biodiversity Strategy and Action Plan of Georgia
2013-2020

Thematic Field: Forest Biodiversity of Georgia – Situation Analysis Report

WWF-Caucasus Programme Office

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Overall description of biodiversity of Georgian forests

Georgia, as part of the Caucasus, is one of the 200 global ecoregions identified by World Wide Fund for Nature (WWF). At present, 34 biodiversity hotspots have been identified by Conservation International (parts of the Earth, which are richest in biodiversity and, at the same time, most threatened). Of these 34, Georgia is part of the Caucasian (most of the Georgian territory, northern slopes of the Greater Caucasus Mountain Range, southern parts of the Russian Federation, including Adygea, Kabardo-Balkaria, Karachay-Cherkessia, Chechnya, North Ossethia and Dagestan) and Iran-Anatolian (southern Georgia – Javakheti, parts of Azerbaijan, Armenia, Iran and Turkey) hotspots.

Forests are considered the most important biome for biodiversity conservation in Georgia and Caucasus in general, covering about 40% of the country's territory. Many endemic and relic species of woody plants and herbs (flora) as well as important and rare animal species (fauna) are associated with forests.

Flora

As a consequence of its location, and its physical and climatic diversity, Georgia has remarkably rich and diverse flora in comparison to other temperate countries. There is a high level of endemism, which includes components of various biogeographical origins. Many groups of plants are believed to originate in the Caucasus Mountain Range and the process of plant speciation is believed to be still taking place.

Forests in Georgia are highly diverse, consisting of broadleaf, coniferous, arid open and lowland (including floodplains) forests and woodlands, which are shaped by elevation, soil conditions and climate. Broadleaf forests consist primarily of oriental beech *(Fagus orientalis)*, Georgian oak *(Quercus iberica)*, hornbeam *(Carpinus caucasica, C. betulus)* and chestnut *(Castanea sativa)*. Most oak species *(Q. iberica*, *Q. pedunculiflora)* growing in Georgia are endemic to the Caucasus region. Georgian oak is the main species growing in the lower and mid-elevation forest belts, and floodplain oak *(Q. pedunculiflora)* is the dominant species in the floodplain areas.

Chestnut, hackberry *(Celtis caucasica),* box tree *(Buxus colchica),* zelkova (Zelkova carpinifolia), yew *(Taxus baccata)*, elm *(Ulmus carpinifolia, U. glabra)* and high-mountain maple *(Acer trautwetteri)* are regarded by many experts as particularly valuable tree species which need special care and protection. For instance, in terms of biodiversity, chestnut is a mast (fruit bearing) species important for feeding forest animals, such as wild boar *(Sus scrofa)* and brown bear *(Ursus arctos).*

In the Colchic foothills, chestnut and beech forests with evergreen understorey are dominating. Dark coniferous forests, made up mainly of oriental spruce *(Picea orientalis)* and Caucasian fir *(Abies nordmanniana),* are found in the western part of the Lesser Caucasus Range and on both sides of the western and central Greater Caucasus Range.

Native pine forests *(Pinus kochiana)* occur in the northern parts of Georgia in the high mountains of Khevsureti. They are also found in the southern Caucasus, especially in the Kura River watershed in Georgia. Arid open woodlands form on dry, rocky slopes in south-eastern Georgia, made up of juniper *(Juniperus foetidissima),* pistachio *(Pistacia mutica)* and hackberry species. Lowland forests are found in floodplains and on low river terraces, generally growing on alluvial, swampy, or moist soils. Very few lowland forests have been preserved to this day. Some stands remain in the Kolkheti lowlands and in the Kura, Iori and Alazani river valleys. In total, there are about 15-25 woody plants growing in the forests, which could be regarded as endemics of Georgia, according to expert estimates.

Fauna

Most of Georgia's and the region's rare and endangered animal species are associated with forest ecosystems. Some of the bat species, brown bear *(Ursus arctos),* turs *(Capra caucasica, C. cylindricornis)*, chamois *(Rupicapra rupicapra)*, Caucasian red deer *(Cervus elaphus)* and Caucasian salamander *(Mertensiella caucasica)* depend on ecologically intact forest. The endemic invertebrates such as Caucasian running beetle *(Lyrurus mlokosiewiczi)* are also strictly associated with forest ecosystems.

Forests provide leaves, nuts and roots on which roe deer *(Capreolus capreolus)* and wild boar feed. Forest ecosystems are also associated with the common otter *(Lutra lutra)* and European mink *(Mustela lutreola)*. West- and east-Caucasian turs *(Capra caucasica, C. cylindricornis)* and the Caucasian black grouse (*Tetrao mlokosiewiczi*) - species that live in the sub-alpine belt - use mountain forests as wintering habitats. Caucasian populations of European wild cat *(Felis silvestris)* and pine marten *(Martes martes)* are relatively abundant and important for conservation of these species world-wide.

The forests of the Western-Central Caucasus (Georgia) are largely isolated from other large forest massifs in Europe and Central Asia and contain most of region's endemic species. Most of these endemic species are associated with forest landscapes - Caucasian adder *(Vipera kaznakovi),* Caucasian mud-diver *(Pelodytes caucasicus)* and Caucasian toad *(Bufo verrucosissimus)* (all three are on the International Union for Conservation of Nature (IUCN) Red List), several endemic rodents including Robert's snow vole *(Chionoys roberti)*, Pontic forest mouse *(Apodemus ponticus)*, Caucasian mole *(Talpa caucasica)* and Shelkownikow's water shrew *(Neomys schelkovnikovi)*.

Caucasian forests are also rich in bird species harboring eagle owls, seven species of woodpeckers and some species of smaller birds coexisting here with wide-spread European birds.

NBSAP 2005-2011 - achievements and unmet needs

The NBSAP for the period 2005-2011 contained a number of forest biodiversity-related strategic priorities, objectives and action plans. This section includes the evaluation of the levels to which these priorities and objectives have been met as well as additional explanations and next desirable steps (see Table 1). The factors which contributed to the various levels of fulfilment of the NBSAP 2005-2011 are discussed in a more detail in the subsequent sections.

Table 1: NBSAP 2005-2011 – level of fulfilment

Strategic priorities	Extents of achievement	Explanations	Next steps
A Strategic Vision – *In 10 years from 2005 - Sustainable forestry, employing legally, scientifically, environmentally and economically sound practices that minimize the impact on the wildlife, preserves forest biodiversity and maintains the integrity of forest ecosystem.*	***Met to a limited extent* -*** Despite some efforts, currently implemented forestry practices are still predominantly unsustainable	Existing forestry institutions are still weak; current forest management guidelines are out of date and cannot properly address biodiversity concerns; forest roads are built without due consideration of ecological needs; there is a lack of properly qualified professionals	Institutional strengthening; elaboration of new forest management standards; boosting the capacity of state forest authorities; conducting forest inventory and categorization; training of forestry staff;
Strategic goals and objectives - Strategic goals - *To conserve forest biodiversity through sustainable forest management*	***Met to a limited extent -*** Forest biodiversity is mainly protected in formally designated Protected Areas	There is a lack of relevant experience; present forest management does not properly consider biodiversity issues; forest monitoring is only conducted to a very limited extent	Adoption and implementation of the new forest management guidelines; conducting monitoring for pests and diseases; training of forestry staff
Specific objectives - *To establish managed plantations using native species; to prohibit reforestation and afforestation with introduced species*	***Not met -*** Practically no plantations comprised of native species and managed for timber production have been established	No adequate legal provisions exist for promoting managed tree plantations of native species (e.g. *Alnus, Populus, Salix etc*); financial resources of the state forestry authorities are limited; the private sector has not demonstrated any significant interests	As an immediate priority - creation of favourable legal and economic conditions to encourage private investments in this field; in the longer term, the establishment of plantations managed by the state
To develop sustainable forest policies and management strategy, based on an ecosystem approach	***Not met -*** No National Forest Policy and Strategy has been adopted	Several drafts of the forest policy and strategy have been prepared; however, none of them has been formally approved	Adoption of the forest policy and strategy with participation of all key stakeholders based on an ecosystem approach and sustainability principles
To elaborate standards, methods and rules on forest inventory, cadastre, management planning and use in line with sustainable development and biodiversity conservation requirements	***Met to a limited extent -*** Some regulations (for instance logging rules) have been introduced in legislation; however, this is not sufficient for adequate protection of biodiversity; the draft of the national sustainable forest management standard (with principles, criteria, indicators and verifiers) has been prepared for Georgia by a group of	Recently, efforts were made to adopt a new set of forestry regulations and standards that would address biodiversity-related concerns; however, no major progress has been made so far; the standard elaborated by the experts is voluntary and is based on FSC principles and criteria and addresses the needs of biodiversity conservation; it was prepared by a group of experts coordinated by WWF-CauPO and supported by GTZ	Elaboration and adoption of sustainability-based forestry legislation, standards (both mandatory and voluntary) and guidelines that would safeguard biodiversity conservation

Strategic priorities	Extents of achievement	Explanations	Next steps
	experts	(presently GIZ)	
To establish a forest certification system for the sale of timber from sustainably managed sources	***Met to a limited extent -*** The draft of the national sustainable forest management standard (with principles, criteria, indicators and verifiers) has been prepared for Georgia by a group of experts	The standard is based on FSC principles and criteria and addresses the needs of biodiversity conservation; it was prepared by a group of experts coordinated by WWF-CauPO and supported by GTZ (presently GIZ); however, no further steps were made towards forest certification	The standard needs to be endorsed by FSC; in order to promote voluntary forest certification, it is important to formally establish a National Initiative; there is a good scope for cooperation with neighbouring countries in this issue
To simplify and improve the organization of the timber licensing system and to regulate the forest use fees in a way to increase the financial income from forests, to help develop forest protection and management, and to attract increased financial investments	***Met to a limited extent -*** Based on the Forest Code (1999), long-term wood use licensing was launched in 2007; however, the private and public benefits from this system are still quite limited	The introduced licensing system includes several types of forest use by private companies, including the use of wood for 20, 10 and five years; this new system has experienced a number of difficulties and, as a result, only 5% of the forest fund is managed under the licenses; no progress has been achieved in terms of forest use fees, especially for non-wood products	Clearer specification of the rights and responsibilities of the license holders; adopting and implementing advanced forestry regulations and standards; to adopt new regulations on forest use fees, taking into consideration the interests of all stakeholders
To establish a moratorium of timber extraction from old growth forests, and those of high conservation value (HCVF) and to use the priority principle with respect to these forests	***Met to a limited extent -*** Existing legal provisions are not sufficient to meet this priority	Although there exist some legal provisions on HCVFs, no detailed management prescriptions (including restrictions of logging in ecologically sensitive areas) have been elaborated and implemented	Identification and mapping of HCVF and elaborating management prescriptions for these forests; old-growth forests should be assigned a special protection regime; categorization system of Forests Europe could be interesting; this system encompasses protected and protective forests; for the first category, the purpose of management is biodiversity conservation, which is consistent with IUCN I, II and IV categories; the second category envisages the protection of landscapes and special natural features; management objective in the third category is maintenance of protective functions of forests
To elaborate and implement	***Met to a limited extent -***	In recent years, the state forest	Elaboration and adoption

Strategic priorities	Extents of achievement	Explanations	Next steps
programs on restoration of degraded forests and reforestation, in order to increase the forest cover and restore forest types, which had been degraded or destroyed	Only a few reforestation projects have been implemented	authorities could not conduct forest restoration due to the lack of funding; only a few projects on the restoration of natural forest landscapes have been implemented by WWF, GIZ, REC and other organizations on a pilot basis; the total area restored is just a few hundred hectares	of guidelines on reforestation and forest transformation (from monocultures to close to nature forests with higher biodiversity); adoption of a program on implementation of these measures; making joint efforts to identify funds for the implementation of these programs
Action plan for species and habitats - *Prepare a national program on conservation of flood plain forests 2005-2010;* Indicators: *National program on flood plain forests conservation approved by the Government; Concrete actions implemented*	***Met to a limited extent -*** The program has not been elaborated; however, some floodplain forests have been restored on a pilot basis; the management plan for Alazani floodplain forests was elaborated under the project "*Development of Protected Areas System in Eastern Georgia*" supported by the WB/GEF	The existence of such a program is very important for attracting funds for the restoration of floodplain forests; a few projects on the restoration of natural floodplain forests have been implemented in recent years; however, these projects were mainly implemented by the NGOs on a pilot basis and the restored area is very limited	Adoption of the program on the basis of national forestry policy and strategy
Legislation and institutional development - *Prepare and adopt a new law on Forest Privatization*	***Not met -*** The law has not been adopted	This law is the prerequisite for forest privatization; the issue is very sensitive and it has very deep political and economic implications; consequently, forest privatization has never been considered as an immediate priority	The adoption of this law will depend on the recognition of forest privatization as a priority by the government and the society as a whole
To use the methods of land use planning and zoning in management of forest resources	***Not met –*** Forest management is still isolated from general land use planning process	No respective methods have been elaborated and implemented	Elaboration and implementation of respective methods; clearer distribution of functions among relevant ministries in parallel with the adoption of forest policy

Note*: *the degree of fulfilment includes three levels: 1) Partly met, 2) Met to a limited extent and 3) Not met; unfortunately, no priority has been met to a full extent.*

Major threats to forest biodiversity and their causes

Forest biodiversity is still facing various threats, including illegal logging, unsustainable grazing, pests and diseases, poaching, unsustainable hunting and unsustainable forest management. Climate change, forest fires and infrastructure development represent additional, relatively recent challenges. All these factors negatively affect forest biodiversity.

Over the last two decades, **illegal logging** (logging without permission or with violation of the established legal procedures) has been a serious problem in Georgia. Two major types of logging can be distinguished - for fuelwood and for construction timber. In the 1990s and early 2000s, the volumes of illegal logging were extremely high, amounting to several millions of cubic meters per

year. Reliable estimates were practically impossible to obtain. According to the official estimates, the total volume of illegal logging has reduced in recent years (from 53,854 m3 in 2009 to 7,339 m3 in 2011). The actual volumes, however, are much higher mainly due to the high demand for wood.

The most significant driver of logging for fuelwood is rural poverty. Poor population cannot afford to purchase alternative energy resources such as liquid gas. Because of the strict law enforcement on one hand and improved natural gas supply to the villages on the other, the volumes of fuelwood harvesting have been reduced. However, relatively remotely located villages in Georgia still do not have gas supply. As a result, the demand for fuelwood is still high, exceeding the natural capacity of forests growing near these villages. The problem is aggravated by the lack of awareness about ecological and socio-economic consequences of illegal logging.

Additionally, the fuelwood management is not very sustainable or efficient. The use of dried fuelwood, efficient wood stoves and sustainable (selective) harvests of wood would substantially reduce the negative impacts on forests.

The major drivers of logging and processing of commercial timber are domestic and foreign market demands. The volumes of illegal harvesting of commercial timber have been substantially reduced in recent years due to the strict law enforcement and border controls. In contrast, the volumes of legally harvested timber might increase, due to the growing market demand (which is related to the economic growth in the Caucasus and neighbouring regions in recent period). However, in recent years, there are variable tendencies in this respect (see Table 2).

Table 2: The volumes of legally harvested wood in the period 2006-2011

Years	The volumes of harvested wood, m^3		
	Timber	**Fuelwood**	**Total**
2006	102946	481495	584441
2007	100921	704501	805422
2008	78915	761158	840073
2009	49197	658103	707300
2010	73473	725419	798892
2011	90823	562664	653487
Grand total, 2006-2011	**496275**	**3893340**	**4389615**

The combating against illegal logging is complicated by frequent changes in legislation and limited capacities of and coordination among relevant state authorities. Due to the generic character of the present definition of illegal logging, often it is not possible to determine whether the harvested wood is legal or not.

For effective protection of forests against illegal activities, it is essential to supply relevant law enforcement authorities with adequately qualified staff and advanced communication means. In 2011, the functions of Environmental Inspectorate were transferred to the Monitoring Department

of the MoENR (due to the abolishment of the former). Further changes are planned in this direction for the nearest future. At present, forest protection function is fulfilled by the rangers of the Forest Resource Management Department. Due to the relatively limited number of forestry rangers, average area under the control of a ranger is quite high (up to 5,000 ha), which complicates effective protection of the forests.

In general, the capacities of state forestry authorities are still insufficient to safeguard law enforcement at a sufficiently high level. Without adequate legislation, standards and capacities, it is likely that unsustainable forest use will continue.

According to expert estimates, **unsustainable grazing** by livestock (cattle, sheep, goats and pigs) causes much greater damage to forest ecosystems than illegal logging. Main causes of excessive grazing are limited control from the state authorities, poverty, limited alternative livelihood opportunities, improper range management, lack of sufficient control by shepherds and a lack of awareness of the population. For many families, livestock keeping is almost exclusively the sole source of livelihood. Unsustainable range management practices (e.g. the concentration of livestock in relatively small areas near villages, failure to use pasture rotation systems, etc) as well as the lack of agricultural subsidies and extension services further aggravate the problem. Forests located around population centres are particularly affected by overgrazing.

Forest **pests and diseases** represent another significant threat. One of the most prominent diseases is chestnut cancer (*Cryphonectria parasitica*, formerly called *Endothia parasitica*), which apart from chestnut, already threatens other species, such as oak. The problem of Dutch Elm Disease (caused by fungus *Ceratocystis ulmi*) which has already destroyed most of the grown up elm trees *(Ulmus glabra)* in Europe is also occurring in Georgia (though to a lesser extent than in other parts of Europe). The relatively new disease, the fungi causing the so-called "scorching of box trees" threatens large areas of natural box tree ecosystems in western Georgia. Specificannly, entire trees lose their leaves and die. The species of fungi causing this disease is still under the process of identification.

Effective combating against forest pests and diseases requires comprehensive scientific and field assessments, monitoring and active intervention measures. These measures are very difficult to implement due to the lack of funding and technical capacities.

The **collection of non-wood forest products** (e.g. early flowers of *Staphylea colchica*, bulbs of snowdrops *(Galanthus spp.)* and cyclamens *(Cyclamen vernum)*, seeds of Caucasian fir *(Abies nordmanniana*) is an important activity. There are official data on the volumes of resources of Caucasian fir and snowdrops licensed for harvesting (see Table 3). However, there is no reliable information about the real volumes of collection of these products. At present, no license is issued for the collection of cyclamen bulbs.

Table 3: Information about the volumes of resources of Caucasian fir and snowdrops licensed for harvesting for the period 2008-2011

Years	Caucasian fir cones, t	Snowdrop bulbs, unit
2008	91	10540832
2009	388,7	11462057
2010	300,4	13044836
2011	(no data available)	15000000

Consequently, it is very difficult to assess the sustainability of collection of these products. According to the estimates of experts, there are no obvious signs of the reduction of volumes of these products. The Ministry of Environment is planning to conduct detailed assessment of the conditions of snowdrop and cyclamen resources. Based on the outcomes of this study, more sustainable annual collection quotas will be established.

There is a bigger problem with respect to the collection of other non-wood forest products such as fruits, berries and mushrooms. The existing forest legislation allows collection of these products free of charge for personal consumption. However, no thresholds have been specified, beyond which the collection of these products would be regarded as commercial. Furthermore, no payments or fees are envisaged by the present legislation for the collection of these products in commercial volumes. No annual quotas are defined either. This might create significant risks of unsustainable extraction.

The first direct signs of **climate change** can already be observed in Georgia and the Caucasus in general. These include more frequent and intensive rainfalls, increased temperatures, melting of the glaciers, heavier floods, longer draughts and even colder winters.

At present, about 15-20% of the total emissions of the “greenhouse gases” are attributed to the deforestation. Main sources of greenhouse gas emissions (causing climate change through global warming) include industry, transport and agricultural sectors.

Although the exact magnitudes of negative impacts of climate change upon forest biodiversity are very difficult to predict, they seem to be very significant. Climate change also increases the likelihood of forest fires.

In the past, **forest fires** occurred relatively seldom and at the smaller scales in Georgia, affecting a few hectares of forests (mainly conifers). However, with the increased incidences of draughts and higher summer temperatures (supposedly - associated with the climate change, however, this issue needs further investigation), forest fires have become a much more serious problem. The levels of risks of natural forest fires vary across different parts of Georgia. For instance, natural pine *(Pinus kochiana)* forest in Tusheti is more vulnerable than forest located in other areas due to the relatively dry climate. Although these forests usually survive natural, the so-called “low-running” fires, certain pine stands have died due to the burning from this type of fire.

At present, fires encompass tens or sometimes even hundreds of hectares of forests each year. In 2005, about 500 hectares of forests were burnt near Abastumani. The biggest damage caused by forest fires in recent period occurred in 2008. Nearly 1,000 ha of forests were either seriously damaged or completely burnt in Shida Kartli and Samtskhe-Javakheti regions during the military conflict with the Russian Federation. In 2010, about 370 hectares of forests were burnt in Georgia, mainly broadleaves. In general, around 2,500 hectares of forests were destroyed or seriously damaged due to forest fires in the last 3-4 years.

Forest fires are often triggered by irresponsible human behaviour (e.g. lighting campfire in inappropriate areas or seasons and throwing a burning cigarette). Shepherds often deliberately burn grass in the pastures and sometimes the fire moves to the forests.

While naturally occurring fires in limited areas are beneficial for the succession of certain forest types, artificially caused fires are usually detrimental to forest biodiversity.

Preventing and combating forest fires is still very difficult in Georgia, due to the inadequate early warning and fire-fighting systems and a lack of capacity. The necessary equipment is lacking, while the responsibilities and functions should be distributed more clearly among the relevant authorities (Ministry of Energy and Natural Resources, Ministry of Interior, Emergency Service and local self-governing bodies).

In addition, mountainous terrain, steep slopes and a lack of roads make some of the forests very difficult to access. Nevertheless, in recent years the forestry and other relevant state authorities gained certain experience in forest fire fighting. For instance, the state Emergency Service uses special helicopters equipped with water tanks. However, better coordination is required among the authorities. Existing human and technical capacities should also be enhanced and strengthened.

In recent years, rapid economic recovery and growth as well as the development of tourism in the country will trigger large-scale **infrastructure development**. It is planned to construct new pipelines, dams, power lines, railways, roads and buildings.

Hydropower development is given a particular focus in the economic policy of the country. In the next few years, electricity will become the most important export item. The establishment of electricity plants and dams may require clearance of significant forest areas.

Open-pit mining requires compliance with strict environmental norms. If these norms are not followed, there could occur significant direct (cutting large areas covered with trees) and indirect (air pollution, which could damage surrounding forests) environmental damage.

Because of the strategically important location of Georgia and its “corridor” function between Europe and Asia, transportation networks (railways, motor roads, motels) will be modernized and extended.

In the conditions of rapid infrastructure development, careful planning and sufficient consideration of ecological aspects are essential. The awareness of decision-makers about real economic values of natural ecosystems (especially the values of forest biodiversity and protective functions) should be adequate. Socio-economic and ecological consequences of the potential damages to the environment should not be overlooked. Serious biodiversity losses through the destruction of natural habitats and animal migration routes should be prevented.

Hunting is another very important factor directly affecting biodiversity. Key legislation dealing with hunting are Forest Code (1999), Law on Wild Fauna (1996), Law on Red List and Red Book (2003), Law on Licenses and Permissions (2005), Law on Management of State Forest Fund (2010) and Statute on the Rules of Extraction of Wild Fauna Species, Dates and the List of Allowed Hunting Weapons and Equipment approved by the Order #07 of the Minister of Energy and Natural resources (6 April, 2011) and changes to this Statute approved by the Order #275 of the Minister of Energy and Natural resources (27 December, 2011).

The Law on Wild Fauna (1996) states that hunting is subject to licensing. Only sport hunting is allowed in Georgia.

Illegal hunting (poaching) is still a serious problem in Georgia, negatively affecting biodiversity of forest fauna. In recent decades, poaching and illegal wildlife trade increased significantly as a result of the economic crisis, rural poverty and a lack of awareness of hunters. Unsustainable hunting of game and poaching of rare species is widespread in mountain regions in particular. It is relatively easy to hunt ungulates and, as a result, the latter are particularly vulnerable. Wild/bezoar goat (*Capra aegagrus)*, wild boar, red deer and roe deer depend on forests. With economic growth in Georgia and neighboring countries and opening of borders, the demand for certain fauna species might grow, creating more favorable grounds for poaching.

At present, control mechanisms to reduce poaching are not very effective, while administrative resources for enforcement are limited. Government agencies are responsible for setting quotas for game species. However, due to the lack of funding and limited capacities, monitoring of game numbers and population dynamics is not carried out. There is no reliable information about the numbers of individuals of game species remaining in the wild, which puts the animal populations (mostly ungulates) under great risk.

Legal, but unsustainable hunting is another problem apart from poaching, caused by a lack of knowledge of basic hunting rules. These factors are causing a rapid decline in the number of individual animals of game species.

Until recently, with the exception of migratory birds, hunting was only permitted in special hunting reserves. Most of these reserves lack necessary infrastructure and capacities. From 2011 onwards hunting is allowed outside the hunting reserves (but not in strictly protected areas and forests located in the vicinity of population centers). The relevant amendments have been made in current

Forest Code (1999) and Law on Red List and Red Book (2003). The impacts of this decision on biodiversity are very difficult to predict, as very little time has passed.

In spring 2011, the Ministry of Energy and Natural Resources (MoENR) approved regulation allowing hunting certain numbers of the Red List species (e.g. brown bear, bezoar goat, red deer etc). The motivation behind this decision was to promote hunting tourism. These decisions were very negatively perceived by the majority of environmental NGOs. According to the latter, this step might encourage poaching at even larger scale. Some NGOs claim that hunting should only take place within special reserves. In exceptional cases, hunting outside the reserves could be allowed for certain species such as hare or roe deer (as there is a lack of hunting reserves in Georgia).

In 2012, the Agency of Natural Resources initiated the process of assessment of the game numbers (including rare species), in order to determine more ecologically sustainable annual hunting quotas. For this purpose, the agency conducted a tender in February-March of the same year, in which Ilia State University was the winner. Consequently, an agreement was signed between the agency and university, according to which the relevant staff of the university (12 or if necessary more specialists) will conduct inventory and assessment of relevant species of wild fauna (including rare species) until the end of 2012. As a result of this work, it will be defined, which species can be hunted and by which annual quota, taking into consideration sustainability principle.

Legally permitted, but **unsustainably conducted forestry operations** may pose additional challenges to the biodiversity of forests. Unsustainable logging happens when tree stands are selected for felling without due regard to conservation values of forests. In the past decades, carelessly conducted tree cutting (e.g. failure to avoid damages to natural regeneration, excessive soil compaction and damage, etc) significantly affected ecologically sensitive mountain forests in Georgia. The quality of currently conducted forest management in terms of biodiversity is discussed in a more detail in the next section.

The quality of forest management with respect to biodiversity

Sustainable forest management should be economically viable, socially acceptable and environmentally sound. Biodiversity conservation is an essential part of sustainable forestry and is shaped by a number of factors, such as policy, institutions, legislation, financial and human resources, capacities and management “on the ground”.

Policy priorities, principles and criteria for sustainable forest management have been outlined in a number of international agreements and processes such as the so-called “Statement on Forestry Principles” (adopted in Rio de Janeiro in 1992), Expanded Programme of Work on Forest Biodiversity (within the Framework of the Convention of Biological Diversity (CBD), Forests Europe

and voluntary forest certification systems. Key provisions of these agreements and systems include:

- Ecosystem-based approach;
- Reduction of the threats to forest biodiversity (e.g. illegal logging, invasive species) and their underlying causes;
- Restoration of forest biodiversity;
- Enhancing institutional enabling environment;
- Addressing socio-economic aspects (e.g. poverty and a lack of alternative livelihoods for local population);
- Categorization of forests;
- Special protection and care of High Conservation Value Forests.

Georgia is a party to the CBD since April 1994. It also participates in other international and regional forestry processes such as Forests Europe, Bern Convention (1979) and European Landscape Convention (2000).

In January 2012, the Georgian Government approved the Second National Environmental Action Plan (NEAP, 2012-2016). The plan comprises 11 thematic fields, including forestry. Specifically, major problems experienced in the forestry sector (e.g. absence of sustainable forestry mechanisms, unsustainable logging, over-grazing, habitat degradation etc) and their causes, conducted measures, stakeholders and legislation are analyzed. The long-term forestry-related goal is defined as “improvement of functional conditions of the forests by means of development of sustainable forestry”. Concrete measures include the adoption of the new legislative act – Forest Law, elaboration of technical and methodological bases for sustainable forestry, conducting of urgent measures in priority areas (forest restoration, combating pests and diseases) etc. The successful implementation of the NEAP requires active cooperation among relevant authorities and, most importantly, securing adequate financial resources.

Recently, Georgian Government made very significant commitments which are directly related to forest biodiversity. For instance, in his speech at the 16th Conference of the UN Framework Convention on Climate Change in Cancun, Mexico, (December 2010), the President of Georgia shared a country’s vision as well as concrete actions on adaptation to and mitigation of negative impacts of climate change. Among these commitments, restoration of forests and improving the quality of forest management were also mentioned.

It should be mentioned that based on the initiative of the President of Georgia and with strong support from World Wide Fund for Nature (WWF), Georgia was nominated as one of the several pilot countries for implementation of TEEB (the Economics of Ecosystems and Biodiversity). TEEB

was initiated by the German Government and European Commission and is financially supported by the United Nations Environment Programme (UNEP). It is planned to involve more donors in this initiative.

In Georgia, the economic benefits of biodiversity and ecosystems and costs of their degradation will be evaluated and demonstrated. The aim is to support the mainstreaming of biodiversity and ecosystem considerations in decision-making, which should result in integration of ecologically sustainable management in national and regional planning. The launch of the TEEB initiative in Georgia is planned for 2012.

Despite considerable efforts undertaken by the Georgian state forestry authorities, no major improvements can be observed in the quality of forest management in recent years. The current policy, legislative and institutional set up of the forestry sector of the country does not fully respond to the above-mentioned international requirements related to sustainable forestry and biodiversity conservation.

Forestry policy

Until now, there does not exist formally approved forest policy and strategy document in Georgia. In the Spring of 2006, a national Working Group supported by the Food and Agriculture Organization of the United Nations (UN FAO), drafted the forest policy principles (in cooperation with stakeholders) and submitted the document to the Ministry of Environment Protection and Natural Resources (MoEPNR). However, that document was not approved and, instead, a new draft of forestry policy and strategy document was elaborated. The latter was not approved either. In 2007, the MoEPNR prepared a document titled “Forestry Policy of Georgia” and uploaded on its website. Formal approval of this document did not occur.

In 2009, the Ministry prepared *The Vision on the Development of Georgian Forestry Sector,* which was discussed by the stakeholders. It is necessary to elaborate and adopt forest policy and strategy (with participation of all relevant stakeholders), in order to define more clearly the long-term strategic priorities and objectives for the forestry sector, including the reforms.

Legislation and institutional set up

Forest Code adopted in 1999 states that principles of protection and sustainable management of Georgian forests are based on Georgian Constitution, Statement on Forestry Principles adopted at the “Earth Summit” in Rio de Janeiro in 1992 and principles reflected in Article 5 of the Georgian Law on Protection of Environment (1996). The latter includes biodiversity conservation, risk mitigation and prevention, sustainability and several other important principles.

The Code contains special provisions, according to which all major types of forest ownership are allowed (including private ownership). It also states that a Law on Forest Privatization should be adopted before the forest privatization starts. However, the adoption of this law has been postponed several times. One of the major reasons for the delay with forest privatization is that the Georgian society in general is not ready for such important changes. According to the widespread view among the society, after the transfer of state forests to private owners, the latter will clear the forests to get a rapid income. Due to the limited capacities of the state forestry authorities, it would be difficult for them to properly monitor private forests in case of large-scale privatization.

It should be mentioned, however, that according to amendments to the Law on State Property (dated 10 December 2010), it is allowed to privatize former collective and state farm forests located within the boundaries of population centers.

Problems exist with respect to establishment of community and communal (municipal) forest management systems. The Forest Code says that the Local Forest Fund shall be managed by local self-governing authorities. However, the boundaries of Local Forest Fund have not been drawn and, respectively, the transfer of forests to local self-governing authorities has not taken place. In addition, the municipalities are not ready to take over the responsibility for forest management. This is mainly caused by the lack of funding, capacity and experience of the latter. The division of responsibilities between the local self-government and central government is not very clear.

The potential Local Forest Fund mainly consists of former collective farm forests located near population centers. These forests are degraded and their wood resources are very limited. Similar difficulties (e.g. lack of capacities) are experienced by local communities which makes the establishment of sustainable community forestry schemes problematic. Nevertheless, according to expert views, there is potential in certain locations (such as Svaneti, Dedoplistskaro, surroundings of Tbilisi) for the development of sustainable community or communal forestry schemes. In these areas, many communities and households are willing to manage surrounding forests in a sustainable way. These people partly possess traditional (indigenous) knowledge of sustainable, ecologicaly sound forest use.

In 2004, the Forestry Department was incorporated into the Ministry of Environment Protection and Natural Resources, to improve the coordination between forest management and nature conservation units. In 2005, the “Regulation on the Procedure and Terms of Forest Use Licensing" was adopted, which provided for general and special (either logging or hunting) types of licenses. According to this law, all licenses were to be sold through auctions. The long-term wood use licenses mentioned below were issued on the basis of this regulation.

In 2007, the number of staff of the Forestry Department was sharply reduced, while the salaries of the remaining staff were increased substantially, in order to boost the efficiency of administration.

Several Regional Forestry Offices were established, each containing a few forestry units. As a result of this reform, the average forest area under the responsibility of one forest ranger increased to about 5,000 ha. At present, the rangers lack equipment and transportation means to control the forest areas under their responsibility.

One auction was held in 2006, and three more in 2007 and, as a result, four wood production licenses were issued to private logging companies for 20 years. In 2008, the authority to issue Forest Use Licenses was transferred from the MoEPNR to the Ministry of Economic Development. In the subsequent years, several more wood production licenses (for 20, 10 and five years) were issued on the basis of auctions. By May 2012, private companies have obtained 69 licenses of this type over the area of 161,671 ha, which is around 5.7% of the total forest cover. Brief information on each license is given in the report on the thematic field “Assessment and Sustainable Use of Biological Resources”, prepared by NGO NACRES in 2012.

This new system of licensing has experienced a number of problems. No reliable forest inventory was conducted before the auctions. Several important obligations were imposed upon the license holders, such as conducting detailed forest inventory, reforestation and provision of certain volumes of wood to local population for fuelwood harvesting. In addition, these companies had to prepare a management plan based on FSC principles and get it approved by an independent and internationally recognized auditor company. The approval of the management plan by the Ministry was a precondition for starting logging operations.

All these obligations as well as poor accessibility of forest cutting areas created substantial difficulties to the licensees. Consequently, implementation of advanced and environmentally sound logging operations (which are usually associated with substantial investments) is problematic.

In 2011, the Forestry Department was renamed into the Forest Management Department and incorporated into the Agency of Natural Resources, a Legal Entity of Public Law. The agency has been established within the MoENR. At this stage, it is difficult to judge about the effectiveness of this change in terms of the quality of forest management. Much will depend on the availability of financial and human resources and, most importantly, the willingness to incorporate social and environmental concerns into forest management. State forestry bodies should have sufficient funding as well as the authority to adequately implement forestry practices.

In 2011, the MoENR announced that it planned to transfer much of the state forests to private companies on the basis of long term lease (about 50 years). It should be emphasized that such important steps need comprehensive prior evaluation and analyses in terms of their social, environmental, economic and policy consequences. Reliable information should be available about the conditions of forest resources potentially available to private companies. Biodiversity should be protected regardless the tenure status of forests, while environmentally sensitive and vulnerable forest stands should be excluded from commercial use.

These institutional changes need to be accompanied by relevant changes in legislation. In the second half of 2011, the Ministry of Energy and Natural resources started to actively work (with participation of stakeholders) on the elaboration of a new Forest Law (which should replace the Forest Code adopted in 1999). The new Forest Law will almost exclusively address forestry issues, while nature conservation and biodiversity aspects will be covered by other relevant legislation, such as Law on Protection of Environment (1996). The definition of forest is more clearly reflected in the new Forest Law. The general biodiversity-related requirements are also incorporated. The notion of 49-year forest lease is introduced. It is also envisaged to divide the forest cover into three major categories: Protective, special purpose and management. Logging will be restricted in the first two categories. However, the concrete norms (for instance, logging rules, which are very important for biodiversity) should be defined in the special regulations. Only after the adoption of these regulations it would be possible to judge about the effectiveness of the new forestry legislation.

MoENR aims to regulate economic aspects of forestry and natural resource management in general. The responsibility for biodiversity conservation is mainly left with the Ministry of Environment (MoE). The functions and responsibilities in terms of biodiversity (as well as other aspects) have to be clarified very explicitly, in order to safeguard adequate management and protection.

Finally, it should be emphasized that frequent institutional changes in the forestry sector have reduced the stability and slowed down the adoption and implementation of sustainable management practices in recent years.

Projects related to forest biodiversity

The recently implemented projects related to forest biodiversity have had a pilot character. For instance, WWF-Caucasus Programme Office implemented a project on “Mitigating Impacts of Climate Change through the Restoration of Forest Landscapes in Southern Caucasus” during the period of 2008 – 2012. The project was supported by German government (Ministry of Environment and Nuclear Safety) and implemented with assistance of WWF Germany via Kreditanstalt fuer Wiederaufbau (KfW). The main objectives were to restore degraded natural forest landscapes and improve existing capacities in this area. As a result of the implementation of the project, nearly 250 hectares of floodplain and mid-mountain forests were restored (by planting and promoting natural regeneration) with several native species. Although main purpose of the project was to enhance the resilience of forests against climate change (i.e. adaptation), the improvement of biodiversity through restoration of habitats and connectivity is a very important additional benefit.

Another example is the project on Climate Tolerant Rehabilitation of Degraded Landscapes in Georgia. The project was implemented in Dedoplitstskaro Municipality by Gesellschaft fuer Internationale Zusammenarbeit (GIZ) office in Georgia with the financial support of the Ministry of Environment and Nuclear Safety of Germany (from November 2008 to October 2011). The main objective was to mitigate impacts of climate changes through the development of appropriate models for rehabilitation of degraded landscapes. As a result, tens of hectares of windbreaks and arid forests were restored under this project by using native species such as ash *(Fraxinus excelsior)* and pine *(Pinus eldarica).*

NACRES (Noah's Ark Centre for the Recovery of Endangered Species) has implemented a project on *Ecosystems and Species Conservation in Georgia: Brown Bear, 2005-2006.* The project was supported by British Petroleum and its partners – Baku-Tbilisi-Ceyhan and South Caucasus Pipeline companies as well as Environmental Investment Programme (EIP). The objective was to conserve brown bear and its habitats in Trialeti Mountain Range and Borjomi-Kharagauli NP through sustainable and participatory management. Zoological and ecological research was conducted in target areas on the conditions of bear population and its habitats as well as existing threats. In parallel, socio-economic research was conducted on the destruction of bear habitats and causes of poaching. After the collection of necessary information, an Action Plan was elaborated through participation of key interested parties. The future activity should include the implementation of this Action Plan.

It is also worth to mention the activity on *Elaboration of the Conservation Management Plan for Alazani Floodplain Forest* within the framework of the Global Environmental Facility (GEF) / World Bank (WB) Project – "*Protected Areas Development*", approved in 2001). Within the framework of this activity, an NGO Georgia's Protected Areas Program (GPAP) elaborated a plan for conservation, restoration and integrated management of Alazani floodplain forests (multipurpose use territory – IUCN Category VI), which is the first step towards the adoption of the National Program on Conservation of Flood Plain Forests, envisaged by the NBSAP 2005.

Regional Environmental Centre (REC) Caucasus has started the project "Support Development of Biodiversity Conservation Policies and Practices in Mountain Regions of the South Caucasus". The project aims to build capacities of local communities and self-governing authorities to address biodiversity loss in forest ecosystems of mountains in South Caucasus, to improve participatory biodiversity management in general. The project is funded by Norwegian Ministry of Foreign Affairs and will be implemented in Armenia, Azerbaijan and Georgia in 2011-2014. The specific objectives include: Awareness raising of key stakeholders on values of biodiversity and forest ecosystem services and demonstration of relevant practical aspects through implementation of pilot activities on restoration of degraded forest ecosystems.

Substantial additional financial resources (including state budget funds) are necessary, in order to implement the positive outcomes of these projects at a much wider scale.

Forest categorization

Adequate protection and, at the same time, obtaining maximum benefits from forests in a sustainable way (multipurpose management) requires flexible categorization (functional zoning) of forests. For instance, the so-called “corridor function” of forests – provision of ecological corridors for linking habitats and migration of species – should be supported. Ecologically sensitive ecosystems, such as pristine forests, should be incorporated into protected areas or given special protection regimes, where commercial harvesting should be forbidden. Logging should also be restricted in forests which fulfill vital ecological (soil erosion and landslide prevention) and recreational functions.

In recent years, the concept of High Conservation Value Forests (HCVF) is implemented in many countries. The characteristic features and management regime in HCVFs are outlined in the 9th Principle in the *Principles and Criteria* of Forest Stewardship Council (FSC). Six types and sub-types of such forests are distinguished, which include biodiversity, large natural landscapes, ecological (protective) and social functions. Management of these forests is envisaged in a way that protects and enhances these valuable and unique features.

The present Georgian forestry legislation and management standards cannot adequately provide for multipurpose forest management and functional zoning. The Forest Code defines green zone, resort, soil and water protection forests as well as forests with special significance (floodplain and subalpine forests, buffer forests protecting roads and water bodies etc). The Code generally restricts logging operations in most of these ecologically sensitive forest categories.

The notion and definition criteria for HCVFs have been included in the “Regulation on the Procedure and Terms of Forest Use Licensing" (2005) with active participation of representatives of NGOs and scientific institutions and experts. Some logging restrictions are provided for these forests. However, more detailed management prescriptions are needed to identify, map and protect valuable natural forest ecosystems, including ecological corridors, HCVFs and pristine forests. The FSC Principles and Criteria were used in the formulation of relevant definitions.

Last, but not least, forestry should be considered in the wider land use context, in order to achieve real sustainability.

Forest management on the ground

Forest management operations on the ground are mainly performed by private companies holding wood use rights for five, 10 and 20 years.

In general, it could be said that most of the methods of “close to nature forestry” practiced in central European countries and being part of modern forest laws and certification systems still has not being incorporated into forest operations in Georgia. Examples for biodiversity friendly elements of sustainable forest management are:

- Obligation to leave deadwood and import biotope trees;
- Obligation to reforest with native species;
- Selective logging instead of clear cuts;
- Minimization of damage to remaining trees and natural regeneration.

In August 2010, the Georgian Government adopted a Resolution on “Maintenance and Restoration of Forests”, in which it is stated that forest restoration and afforestation should be conducted in line with the requirements of biodiversity conservation. In addition, according to this Resolution, the advantage should be given to native, site-adapted species, which, undoubtedly, is a step forward.

The basis for felling operations of licensees in Georgia is the so called forest use (exploitation) plan. The template of this document applies inter alia to forest protection measures and reforestation as well as to biodiversity and environment protection measures, which forest users have to follow.

Often the decision on the trees to be felled and method of felling is made by woodcutters without adequate training. Control of felling operations is carried out with focus on correct felling of marked trees. Biodiversity factors (e.g. deadwood, damages on regeneration, etc.) are given less consideration.

Forest roads are vital for sustainable use of forest, but they could be also source of negative impacts on biodiversity by disturbing habitats of wild animals. Unfortunately often forest roads in Georgia are constructed without considering possible impacts on the protection function of forests and biodiversity. Management directives for forest roads considering biodiversity as well as health and safety norms for the workers should be developed.

Inside the cutting areas the use of heavy log haulers often damages or compacts the forest soil and negatively impacts soil fauna and flora.

Nevertheless, in general the condition of forest biodiversity is relatively better within forest cutting compartments inside licensed forest areas, in comparison to those areas where no license was issued and where cuttings took place in a chaotic way in the past (please, see the field visit notes in the annex). The reason is that as a rule, workers with more practical experience are operating within licensed areas. Despite the fact that biodiversity conservation is not the first priority for the

license holders, they try to abide the norms defined by the relevant legislation, including those related to biodiversity (unlike illegal loggers).

The condition of forest biodiversity and observed trends are described in the next section.

Present condition of forest biodiversity, negative impacts and observed trends

Georgia has a relatively high percentage of forest cover, according to which it belongs to the forest-rich countries. However, due to the over-use of the forests, canopy cover has reached critically low thresholds (less than 50%) in more than 55% of forest area. Such forests have significantly decreased the protective functions and lost the ability of regeneration which negatively affects the biodiversity. At present, the country's forest biodiversity is threatened by climate change, unsustainable use (logging and grazing), forest fires, introduction of alien species and unsustainable hunting/poaching. Unsustainable infrastructure development may introduce additional threats.

It should be emphasized that the present condition of forest biodiversity is not studied intensively and, therefore, concrete figures are very difficult to find. Nevertheless, in this chapter some general aspects and trends are described.

Climate change

Climate change has already started to have significant impact on nature and people in Georgia – effects that will become even more visible in the future. It adds stress to forest ecosystems and their biodiversity. If not mitigated significantly, it will cause the degradation and disappearance of most of the forest ecosystem types in the next decades. For instance, Juniper-pistachio-hackberry, floodplain oak and poplar-willow forest types located in Eastern Georgia have been reduced to less than 25% of their natural distribution in past decades.

The timber line in high mountains (subalpine zone) in Kazbegi Municipality in eastern Georgia has moved up a bit. According to some experts, this is caused by the warming of climate, while others argue that this is the result of reducing grazing pressure in that particular area. Nevertheless, the expected increases in some of the forest areas are insignificant to the comparison of the forest area which will be lost or degraded due to the climate change.

Although the concrete mechanisms of impacts of climate change on forest biodiversity (as well as biodiversity in general) are not fully known yet, most experts agree that these impacts will be predominantly negative. The reduction of negative impacts of climate change will require the enhancement of ecosystem resilience. This would require various measures such as forest restoration and improvement of management.

Unsustainable forest use and management in general

The detailed description of current impacts of forest management “on the ground” upon biodiversity is given above. This section considers broader contexts.

Forests which have been degraded through unsustainable logging or application of incorrect management practices can no longer provide vital ecosystem functions such as soil protection and flood control. They are also not able to regenerate naturally. An important component in many forest types is the presence of old trees and dead wood. It serves as the only habitat for many specialist species. If they are removed, many species – like woodpeckers – run the risk of disappearing.

Beech forests play the leading role in the region’s timber industry. Careless clear-cutting of mountain beech stands has permanently damaged a significant portion of valuable beech forests in Georgia. Oak forests, largely cleared for farmlands and pastures, have been spared mostly in remote canyons and on relatively poor soils. Chestnut forests in the Colchic foothills have also been logged intensively. In western Georgia broadleaf forests have been cleared for tea and hazelnut plantations in the past. Coniferous forests have been logged in soviet times for paper production and timber, resulting in the reduction of these resources.

Although in general the collection of non-wood forest products does not seem to be depleting the existing resources, in some areas it is unsustainable. For instance, excessive chestnut collection by local villagers occurs near population centers, which hampers natural regeneration. Until recently, the collection of *Abies nordmanniana* seeds was conducted by using unacceptable methods, such as cutting the tops of the trees. At present this practice has been sharply reduced through strict law enforcement. However, further assessment studies on natural capacity of this resource are needed to get a clearer picture on sustainability of seed collection.

Arid open woodlands form on dry, rocky slopes in the eastern and southern Caucasus and are made up of juniper species and pistachio. These forests are particularly vulnerable, suffering from unsustainable logging and grazing. Lowland forests are mainly found in floodplains on low river terraces, generally growing on alluvial, swampy, or moist soils. Very few lowland forests have been preserved to this day - some stands remain only in Kolkheti lowlands and in the Kura, Iori, and Alazani river valleys.

Improper management as well as other anthropogenic factors (forest fires, grazing, etc) cause undesirable forest successions - the replacement of valuable natural forest stands with economically and ecologically less valuable forests. One example could be the gradual transformation of natural forests of Georgian oak (eastern Georgia) into the scrubland mainly comprised of species such as *Paliurus spina christi*. Unsustainable forest management also triggers the spread of pests and diseases.

Unsustainable grazing

In Georgia, the density of grazing wildlife (e.g. red deer) is often so low that damage by game can be ignored. However, uncontrolled and excessive grazing by domestic animals seriously threatens the forest ecosystem. Natural regeneration of forests is undermined through grazing. In addition, already regenerated plants are often completely destroyed. This contributes to the degradation of biodiversity at the genetic level. Often this damage is irreversible. Overgrazing causes the compaction of soil which triggers erosion, which in its turn contributes to natural habitat loss.

Non-native and invasive species

According to expert estimations, 50.000 to 60.000 ha are covered by planted forests in Georgia. These plantations (the so-called “forest cultures”) partly consist of exotic and not site adapted species (e.g. *Pinus nigra*) and are mostly homogenous monoculture monocultures. These monocultures are much poorer in biodiversity than “close to nature” forests with native tree species.

Another example is the so-called “Tree of Heaven” *(Alianthus altissima).* It is a popular garden plant introduced from China to many other parts of the world. As an exotic species it potentially threatens the natural areas in Georgia especially in floodplain areas. If uncontrolled, it can out-compete valuable native species, such as wingnut *(Pterocaria pterocarpa)*. Other potentially invasive species are Paulownia and Criptomeria. The former is planted on private agricultural land for its fast-growing and goo-quality timber. However, the question whether Paulownia can give a good quality timber in Georgian conditions, needs further investigation. Criptomeria has been used in windbreaks for decades. If uncontrolled, these species could threaten native forests in the future. In any case, the potential threat from invasive species should be studied more carefully.

Unsustainable hunting/poaching

The numbers of large herbivores have dropped dramatically in the past century due to poaching and overhunting. Many hunted species, such as red deer (*Cervus elaphus*) and brown bear *(Ursus arctos)*, have lower rates of reproduction in comparison to other species. Consequently, these species are particularly vulnerable – their numbers have been substantially reduced in recent decades. For instance, red deer numbers have plummeted from 800 to around 150 in Lagodekhi Nature Reserve. The population of brown bear has decreased by about a third in the past 15-20 years. Hunting species are only left within strictly protected areas. Brown bear, bezoar goat, and turs are also heavily poached in the Caucasus. Leopards have been driven to near extinction due to poaching and habitat destruction. Lynx, otter, martens, wild cat, fox, and jackal are killed for their furs.

The magnitudes of impacts of poaching and improper hunting need to be carefully assessed. Based on this assessment, remediation measures should be elaborated and implemented. If conducted properly, hunting can increase the size and number of healthy populations of animals. It can also generate significant income, which could be reinvested into biodiversity conservation.

Forest fires

Forest fires cause damage or destruction of trees, bushes and natural regeneration. Soil layer and microorganisms are also burnt. If not occurring naturally, forest fires change the directions of forest succession. This could delay the establishment of optimal potential natural vegetation cover for decades and even centuries.

Infrastructure development

As it was already mentioned, infrastructure development (dams, pipelines and power lines) is a relatively new threat to forest biodiversity. Based on present assessments, significant areas of forests will be cleared for infrastructure building. However, it is not very clear how large forest areas will be affected in total (either directly or indirectly). For instance, in the case of dams it is expected that several thousand hectares of forest areas will be covered by water, while much larger area covered by forest will be affected indirectly through local climate (moisture and temperature regimes) change. It needs to be mentioned, that certain forest area has already been cut due to construction of pipelines and power lines. Even the clearance of relatively small forest area could cause irreversible damages if this forest is located within ecological corridor or other environmentally sensitive area.

Concluding remarks

Based on the information presented above, main threats to forest biodiversity and their causes can be outlined as follows:

- **Unsustainable (including illegal) logging**
    - Rural poverty and a lack of affordable alternative energy resources;
    - Market demand (both domestic and international) for forest products;
    - Lack of awareness among the loggers and consumers;
    - Limited capacities of the state forestry authorities for control and extension service;
    - Gaps and ambiguities in legislation.

- **Excessive livestock grazing**
    - Rural poverty;
    - Lack of alternative livelihood opportunities;
    - Lack of awareness of the farmers;
    - Inefficient livestock management systems;
    - Absence of subsidies, small grants, favorable-term loans and a lack of extension services to the farmers.

- **Forest fires**
    - Climate change (however, the issue needs further investigation);
    - Irresponsible forest visitors;
    - Irresponsible practices (e.g. burning grass);
    - Lack of capacity to adequately combat forest fires.

- **Climate change**
    - “Greenhouse gases” emitted into the atmosphere by the industry, agriculture and transport sectors;
    - Deforestation and forest degradation.

- **Unsustainable infrastructure development**
    - Rapid economic growth and tourism development;
    - Pressure for decision-making in the short periods of time;
    - Insufficient knowledge and consideration of ecological values, underestimation of economic consequences of the destruction of natural ecosystems.

- **Unsustainable hunting and poaching**
    - High demand for certain fauna species;
    - Lack of proper control mechanisms;
    - Limited capacities of hunting reserves;
    - Limited knowledge and awareness of the hunters;
    - Week control/law enforcement.

- **Unsustainable forest management**
    - No formally approved National Forest Policy and Strategy document;
    - Frequent institutional and legislative changes within the forestry sector;
    - Limited funding and capacities, lack of adequately trained staff;

- Lack of clarity with respect to the optimal levels of involvement of private sector;
- Inadequate license conditions for private companies;
- Outdated forest inventory data and inadequate management standards.

As it can be concluded, the vision, objectives and action plan of the forestry part of the NBSAP 2005-2011 have only been achieved to a limited extent. Major factors impeding the progress were the lack of funds and capacities as well as frequent priority changes within the forestry sector. Severe shortage of adequately qualified specialists is another problem, which could only be addressed by the promotion of forestry education and training.

It is therefore essential to adopt a national forest policy, strategy and action plan, in order to identify the long-term directions of the reforms and achieve stability in the sector. The expenditures necessary for the fulfilment of relevant strategic priorities should be identified. This would attract funds from various sources. The relevant legislation, regulations and standards should be adopted on the basis of the national forest policy, which would safeguard the protection of the unique forest biodiversity of the country.

Annex

Notes of the meetings with stakeholders

Meeting at GIZ (15 February 2012)

Participants: Hannes Neuner, Ilia Osepashvili (WWF-CauPO); Natia Kobakhidze, Dieter Mueller, Christina Straub, Giorgi Kolbin (GIZ).

Sweet Chestnut (*Castanea Sativa*) was named as one of the rare/unique native tree species which needs particular care/protection.

Illegal logging, grazing, forest fires, Chestnut cancer (*Cryphonectria parasitica* (formerly *Endothia parasitica*), which now threatens other species as well), "scorching of box trees" (*Buxus colchica*), mistletoe *(*Viscum album) – a parasite growing on a number of broadleaved and coniferous trees, unsustainable collection of early flowers of Staphylea colchica, bulbs of snowdrops and cyclamens, invasive species (Aylanthus, Cryptomeria) – were all listed as significant threats to forest biodiversity.

Poverty was named as a major cause of illegal logging for firewood, while poverty and poor range management (e.g. lack of control) - of grazing.

Major causes of forest fires are negligence of the visitors, lighting campfire in inappropriate places and leaving the fire unattended later on; in addition, shepherds burn grass and the fire sometimes moves to forests.

Regarding legal and institutional issues – the serious concern is that the Ministry of Energy and Natural Resources is mainly interested to deal with economic aspects of forestry and shift the responsibility for ecological issues to the Ministry of Environment; the latter is not very actively engaged with forests at the moment, probably deeming that this should be the responsibility of the former; in this situation, there is a risk that forest biodiversity will not be protected sufficiently well.

In terms of essential measures to be taken in the next few years, the best way of forest restoration (and thus improvement of biodiversity) is exclusion of livestock and in this way contributing to natural regeneration; in addition, afforestation with fast-growing native species should help reduce pressures (for fuelwood and timber) on natural forests.

Meeting at the Forest Management Department (17 February 2012)

Participants: Hannes Neuner, Ilia Osepashvili (WWF-CauPO); Natia Iordanishvili, Arsen Chinchaladze (the Department).

Yew *(Taxus baccata)* and Zelkova (Zelkova carpinifolia) were named as rare/unique native tree species which need particular care and protection.

Among the major threats to forest biodiversity - illegal logging, grazing and forest fires (in 2010, the total area of forest fires was about 370 ha) were listed.

Major causes of illegal logging is poverty, of grazing – poverty and poor control; major causes of fire are negligence of the visitors and artificial fires made by the shepherds to burn grass (the fires often move on to forests).

Paulownia was mentioned as an invasive tree species, which starts to spread within native woodlands in Western Georgia (Adjara) and Eastern Georgia (Kakheti, Lagodekhi Municipality); it spreads from private fast-growing plantations, planted for its timber value; although it is not very much spread yet, if uncontrolled, it might create some problems to native forest biodiversity in the future.

Meeting at the Biodiversity Protection Service (17 February 2012)

Participants: Ilia Osepashvili (WWF-CauPO); Ioseb Kartsivadze, Nona Khelaia (the Biodiversity Protection Service).

Colchic box tree (Buxus colchica) was named as a rare/unique native tree species which need particular care and protection.

Unsustainable (whether legal or illegal) resource use, forest diseases, forest fires, the collection of mushrooms, forest fruits and berries were mentioned as main threats to forest biodiversity.

In terms of collection of bulbs of snowdrops and cyclamens (non-wood forest products), it was mentioned that despite considerable demand for this resource, no visible threat of over-exploitation has been observed so far; the specialists from Kew Gardens (London, the UK) are working together with local experts to assess the existing resources of these products and make more reliable conclusions in terms of the sustainability of current use.

There is a problem with respect to the collection of other non-wood forest products (fruits, berries, mushrooms etc) - the forest legislation says that collection of these products for personal consumption is free of charge; however, there are no thresholds determined, beyond which the collection would be regarded as commercial, for which payments should be made; there are presently no payments envisaged by the law for the commercial use of these products; in these circumstances, the collection of these products might be unsustainable.

Law enforcement was mentioned as a major cause of the reduction of illegal logging, but there are no reliable figures on real logging volumes.

Regarding forests being cut as a result of infrastructure development – at present, considering the data from various EIA studies, significant areas of forests will be cut, but this figure does not seem alarmingly high.

Financial problems were mentioned as one of the major causes preventing from conducting biodiversity-friendly forestry measures (reforestation, forest transformation, monitoring, etc)

In terms of fire fighting, remote location and difficulty of access were mentioned as the first problem; however, in recent years the forestry service and other state bodies have gained significant experience; the responsible authorities are Ministry of Energy and Natural Resources, Ministry of Interior, Emergency Service and local self-governing authorities; the Emergency Service has purchased special helicopters for fire-fighting, equipped with water tanks.

In terms of hunting – poaching is still a serious problem; there is no monitoring of species listed for hunting and, as a result, it is not possible to define annual sustainable hunting quotas in a reliable way; from 2011 onwards, hunting will be allowed outside the hunting reserves (but not in strictly protected areas and forests located in the vicinity of population centers).

The future priorities (for the next few years) should include investments into sustainable forestry and monitoring.

Meeting at the Department of Natural Resources under Ministry of Energy and Natural resources (17 February 2012)

Participants: Hannes Neuner, Ilia Osepashvili (WWF-CauPO); Archil Adamia (Head of the Department).

The current approach in combating illegal logging is to remove incentives for illegal activities; this includes controlling markets and other wood realization points; also improving monitoring/tracing systems is essential;

In terms of hunting – changes were made in the Forest Code (1999) and Law on Red List and Red Book (2003), which clearly allowed hunting outside hunting reserves; the impacts of this decision on biodiversity are not known yet, as very little time has passed.

The main legislation currently dealing with hunting is Forest Code (1999), Law on Wild Fauna (1996), Law on Red List and Red Book (2003), List of Hunting Species and Hunting Rules approved by the Order of the Minister of Energy and Natural resources (6 April, 2011).

The Agency of Natural Resources will conduct inventory of hunting species which will be completed by the end of 2012; after this, it will be feasible to set more reliable sustainable hunting quotas.

Meeting at Ilia State University (20 February 2012)

Participants: Ilia Osepashvili (WWF-CauPO); Davit Tarkhnishvili, Otar Abdaladze (Ilia State University)

The biggest threat to forest biodiversity is unsustainable logging; one of the major causes of this problem is a low awareness level; grazing is another problem; however, the scales of the problems vary depending on the region and location; for instance, forests located near population centers are particularly affected by logging/grazing.

In terms of hunting – at present the number of large mammals has been drastically reduced because of unsustainable hunting and poaching; for instance Red deer is only left within strictly protected areas (Nature Reserves); it is relatively easy to hunt ungulates and, as a result, the latter are particularly vulnerable.

It is not acceptable to set seasonal quotas for hunting without conducting reliable monitoring and assessment of all hunting species; this is to avoid hunting those species which are left in limited numbers, particularly Red List species.

There is uncertainty in terms of climate change and, thus, the issue needs further study.

The essential priorities for the next few years – expanding Protected Areas and conducting reliable forest inventory and adequate functional zoning (categorization) of forests.

Phone conversation with the representative of REC Caucasus (20 February 2012)

Participants: Ilia Osepashvili (WWF-CauPO); Ana Rukhadze (RECC)

Box tree was named as one of the rare forest tree species which need special care and protection; in general, all endangered species under Red List should be taken particular care of.

Major threats to forest biodiversity – unsustainable logging (destroying habitat) and grazing (destroying natural regeneration); major cause of the recent reduction in illegal logging is law enforcement.

Invasive species – Paulownia;

In terms of collection of bulbs of snowdrops and cyclamens, no obvious threats are observed – the current harvesting rates are not alarming; further assessments will be carried out in the nearest future.

The impacts of climate change are difficult to assess at this stage; this issue needs further study.

Forest fires – the current scales are difficult to qualify as dangerous.

The essential priority for the next few years – to adopt forestry policy.

Email communication with David Kikodze, Deputy Director of Tbilisi Botanical Garden (21 February 2012)

Subject: the total number of forest-based endemic woody species (Georgia).

According to the estimations of David Kikodze, there are up to 25 endemic forest-based woody species in Georgia (only Georgian endemics). In general, it is estimated that there are 46 endemic species, but most of them are representatives of Rubus. The latter could hardly be defined as a woody species in its true sense.

Meeting at the office of Greens Movement (23 February 2012)

Participants: Ilia Osepashvili (WWF-CauPO); Rusudan Simonidze, Marina Zhordania (Greens Movement)

Yew, oak species (all of them), chestnut, box tree, zelcova, Caucasian hackberry (Celtis caucasica) and high-mountain maple (Acer trautwetteri) were mentioned as rare and very valuable species which need special protection.

Forest fires, unsustainable logging, poor management and grazing (including pigs eating chestnut, acorns and bulbs and goats eating tree bark in the winter) were listed as main threats to forest biodiversity; the major causes are poor legislation, low awareness levels, and poverty;

Unsustainable logging causes forest stand degradation and thus biodiversity decline; in addition, undesirable forest successions, such as the replacement of valuable natural forest stands with economically and ecologically less valuable forests (triggered by anthropogenic factors) are obvious; unsustainable management also triggers the spread of pests and diseases.

The impacts of climate change on forest biodiversity should be further studied, as the present trends are not very clear.

In contrast to the widespread opinion - the actual volumes of logging (whether legal or illegal) have not been reduced; the legally harvested volumes are going to increase due to the boosted demand.

The building of hydropower stations (dams) will cause significant forest clearance.

In terms of forest fires, the relevant authorities lack necessary capacities and equipment.

Hunting of species incorporated into the Red List should be totally prohibited; in the future, it could be allowed to multiply these species in hunting reserves for subsequent (sustainable) hunting; hunting should be forbidden near population centers for safety reasons; hunting should only take place within hunting reserves.

Community forestry schemes will be feasible in the future, if the local awareness will be at the sufficient level.

Future priorities – the Protected Areas should be expanded; legislation and institutions should be improved; awareness-raising activities conducted.

Meeting at IUCN (23 February 2012)

Participants: Ilia Osepashvili, Hannes Neuner (WWF-CauPO); Eka Otarashvili (IUCN)

Yew, chestnut and box tree were named as rare and very valuable species which need special protection.

Unsustainable logging (including illegal) is one of the most important threats; generally illegal logging is decreasing due to improved natural gas supply, law enforcement and border control; it is important to separate subsistence-related firewood logging (root causes being poverty and a lack of alternative livelihood opportunities) from commercial timber logging; the former occurs mainly near population centers, the latter – in more remote areas.

The volumes of legal wood harvesting are increasing due to the demand and introduction of private companies on the basis of longer-term wood use rights (5-20 years); logging for fuelwood is more widespread important and therefore represents a bigger threat; however, timber logging in licensed forests- though it might be legal- is not always executed in a sustainable way.

Grazing is important threat due to the poverty, limited awareness and lack of adequate pasture management.

Unsustainable logging damages forest canopy structure and destroys habitat; forest functions such as watershed protection are also damaged; as a result, biodiversity is negatively affected.

Use of non wood products, has not had a significant impact on biodiversity so far; the state is planning to conduct inventory of wild flower resources to determine more sustainable quotas.

Climate change impact can be noticed in high mountain area by shifting of tree line to higher altitudes.

New infrastructure development (especially dams from hydropower plants, power lines, etc.) is threatening forest areas.

Unsustainable hunting and poaching represent another problem; there is no information database, which could support sustainable hunting activities; poor infrastructure in hunting reserves and poor legislation are further problems.

Institutional aspects of forest management:

Reform process is ongoing, still not fully clear responsibilities of ministries

Lack of monitoring of management plans and actual operations in licensed out areas, old inventory data

Lack of proper categorization (zoning) of forests

Capacities of communities and municipalities to manage forests is still not sufficient, but there is potential (e.G. Svaneti, Tbilisi City Forests, Dedoplitskaro) and some indigenous knowledge on sustainable forestry should be used.

Forest fires have been an important threat in recent years; root causes are lack of awareness, unclear responsibilities in fire prevention and fire fighting, lack of funds, man-made fires (campfire, shepherds).

Future strategies – forest categorization, incorporation of forestry into wider land use context, clear regulatory requirements in management plans, monitoring mechanisms (pest control etc) and clearer division of responsibilities among the relevant authorities.

Meeting at NACRES (23 February 2012)

Participants: Ilia Osepashvili, Hannes Neuner (WWF-CauPO); Irakli Shavgulidze (NACRES)

Yew, chestnut, pistachio (Pistacia mutica) and juniper species were named as rare and very valuable species which need special protection; for instance, chestnut is a mast species, important for feeding wild animals (wild boar).

Major decline of wild ungulates is observed; of these – Wild goat, wild boar, red deer and roe deer depend on forests (mainly pine); over-hunting is a major cause of the decline;

Main problem for bear population is unsustainable hunting/poaching; forest management (sustainable) is positive for bear.

In certain locations collection of non-wood forest products is unsustainable – for instance, excessive chestnut collection by local villagers hampers natural regeneration; no sufficient assessments have been conducted to assess the natural capacity levels of these products.

Until recently, the collection of Abies nordmanniana seeds was conducted by using unacceptable methods, such as cutting the tops of the trees; at present this practice has been stopped through strict law enforcement; however, the issue (sustainability, natural capacity) needs further assessment studies.

There are quotas for collection of flowers (e.g. cyclamen, snow drop), approved by the Ministry of Environment on the basis of recommendations from CITES Scientific Authority; but the are not controlled.

Unsustainable logging and wood processing (sawmills) is the most severe problem – it might be legal, but unsustainable; the impacts of logging for fuelwood have to be assessed.

The volumes of legal harvesting are increasing; grazing is a problem in certain areas.

The impacts of illegal logging and grazing are direct impacts; indirect impacts – habitat destruction and fragmentation.

Paulownia is an invasive species which could potentially threaten native forests, including in Lagedekhi NR.

The impacts of climate change on forest biodiversity should be further studied, as the present trends are not very clear; it is not clear whether the damages to the environment occur due to climate change or just anthropogenic causes; there are signs of desertification (appearance of porcupine in semi-deserts of south-eastern Georgia in the last years as well as dryness resistant vegetation characteristic of desert and semi-desert zones.

The reduction in volumes of illegal logging was due to stricter law enforcement and border control, gasification and by the fact that people in the cities now depend much less on fuelwood.

Commercial logging was (and could be in the future) the biggest threat.

Desirable forest management approach – leaving old trees (habitats); reforestation with native, site-adapted species.

Forest fires are big threat in several areas; for instance, Tusheti pine forest is vulnerable due to the dry climate; although these forests usually survive natural (e.g. running) fires, there are also locations where natural stands could not recover and died after the occurrence of the natural fires in the past; often forest fires are caused by humans (campfire, shepherds, cigarettes, etc);

there are no sufficient capacities in the country for effective fire prevention and fighting; the damage to biodiversity is very severe, as nearly everything is destroyed, including soil microorganisms.

Hunting – lifting the ban on hunting Red List species is unacceptable; law enforcement should be improved and laws should safeguard sustainable hunting; when there are no reliable numbers of naturally occurring animals, how could we decide on quotas? Hunting outside the reserves could only be allowed for certain species such as hare or roe deer (as there is a lack of hunting reserves in Georgia); the whole system of hunting should be reorganized.

Priorities for the next five years – forest policy should be adopted to determine what we need from forests (e.g. ecotourism); forest values should be clearly demonstrated; functional zoning should be conducted; potential risks for certain species should be identified; forest habitats should be restored, particularly – floodplain forests.

PROJECT implemented by Nacres – Ecosystems and Species Conservation in Georgia: Brown Bear, 2005-2006.

The project was supported by British Petroleum and its partners – Baku-Tbilisi-Ceyhan and South Caucasus Pipeline companies. The project was implemented in 2005-2006 with support from

Environmental Investment Programme (EIP). The objective was to conserve brown bear and its habitats in Trialeti Mountain Range and Borjomi-Kharagauli NP through sustainable and participatory management.

Zoological and ecological research was conducted in target areas on the conditions of bear population and its habitats as well as existing threats. In parallel, socio-economic research was conducted on the destruction of bear habitats and causes of poaching. After the collection of necessary information, an Action Plan was elaborated through participation of key interested parties.

Meeting at NGO Green Alternative (9 March 2012)

Participants: Ilia Osepashvili (WWF-CauPO); Irakli Macharashvili (Green Alternative).

Yew, chestnut, elm (Ulmus carpinifolia, U. glabra) and box tree were named as rare and very valuable species which need special protection. For instance, elm is suffering from Dutch Elm Disease and thus need special care and protection;

Unsustainable logging and forest management in general as well as grazing were mentioned as very most serious problems threatening forest biodiversity; the implementation of infrastructure projects in areas distinguished for their biodiversity, including in protected areas (power lines, roads, etc), mining (e.g. open pit mining for manganese in Chiatura Municipality) and building large dams were also mentioned as serious problems; in terms of threats from invasive species – this issue should be studied more carefully.

The timber line in high mountains (subalpine zone) in Kazbegi Municipality has moved up, which is either caused by the warming of climate, or mitigating grazing pressure in that area.

It is very arguable that the volumes of illegal harvesting have substantially decreased in recent years; the demand is roughly the same due to rural poverty, while the prices for natural gas are quite high. On the contrary, in some areas the demand for fuelwood has been sharply reduced in comparison to the 1990s, due to the population migration from villages. Law enforcement can only be effective in a relatively short term.

In general, the capacities of hunting reserves are very weak.

Good management (for instance removal of excess forest litter) decreases the risks of forest fires.

It is important to conduct functional zoning of forests, in order to identify the areas of forest use (e.g. fuelwood) by local population, commercial logging sites and conservation zones.

Notes on the findings of the two field visits to the logging sites

The first field visit

The first visit was made on 21 April 2012 by WWF-Caucasus Programme Office. Several forest sites, where logging took place, were visited in Mtskheta, Tianeti and Telavi Municipalities. No logging licenses had been issued in these areas and, respectively, no officially designated cutting areas exist there. Nevertheless, the impacts of (not permitted) logging (which took place in various extents in the past years) could be observed in these areas.

The first site is located near the village of Tskvaritchamia (Mtskheta Municipality). The examined area covers approximately two hectares and is dominated by the secondary (re-sprouted) hornbeam-beech stand, where hornbeam trees are about 70% and beech trees – 30%. There is one wild pear tree. The canopy cover is about 60-70%.

Illegal (not allowed) selective cutting took place in this area – around 10-20% of the trees have been felled. The cuttings mostly took place 3-4 years ago. One young hornbeam tree was cut in the last year. There are several standing dead trees, creating favorable conditions for biodiversity. No signs of grazing were observed on the site. Natural regeneration is sufficient for both dominant species. Consequently, the overall biodiversity condition could be regarded as sufficient. The probable reason of a relatively limited scale of logging is that the forest is located near the large population centre (Tbilisi) as well as close to the road, which hampers illegal loggers to some extent.

The second site (around 2-3 ha were examined) is more distant from Tbilisi, in so-called Sabaduri Forest (Tianeti Municipality). Here the secondary stand of beech is dominating. The canopy cover is about 50-60%. About 30% of the mature trees were removed (on average) by selective cuttings, around 5-6 years ago. Because this stand is not an officially designated cutting area, these cuttings can be regarded as illegal (not allowed). However, no signs of grazing could be observed.

There is deadwood on the territory - standing as well as fallen trees. In some places, the canopy cover is less than 50% due to excessive cuttings. The excess sunlight penetrates to the ground in these spots, triggering the development of vigorous grass and bramble cover, which hampers natural regeneration (especially for beech). If this tendency continues (e.g. excessive forest cutting and failure to conduct forest maintenance), there is a risk that undesirable succession will take place in these spots, specifically – the establishment of stands of less valuable species (oriental hornbeam, *Paliurus spina christi*). Consequently, the biodiversity condition is worse on this site, in comparison to the first one, which is caused by chaotic and excessive cutting.

The third site is located near the Sioni Reservoir, above the village of Sioni (Tianeti Municipality). About 4-5 hectares were observed. There is a secondary mixed forest here – hornbeam-beech (roughly 40-40%) with mixture of maple, wild apple and planted black pine. The canopy cover is

about 60-70%. It has been increased thanks to the young trees. Otherwise, the top canopy layer is up to 30% due to the excessive (not allowed) cuttings. About 30% of the mature trees have been cut. Natural regeneration condition is satisfactory. Volumes of dead trees are relatively low (1-2 fallen trees per hectare).

However, there are several standing over-mature trees with holes, which creates good habitats for biodiversity. No signs of livestock grazing can be observed. The farther from the road, the greater intensity of cuttings can be seen (around 40% of the trees have been cut, including some young trees with 20-25 cm of diameter; the canopy cover is fallen to 30-40%). There are several trees which have been cut in the last year, but not removed from the forest. As a result, the fallen trees have piled up, which creates the risk of emerging of pests and diseases. Due to the excessive cuts, this territory is in the worst condition with respect to biodiversity. The excessiveness of cuts is most probably caused by the vicinity of this forest to the village.

The last site which was visited on that day is located near Shuamta Monastery in Telavi Municipality. Around 3-4 hectares were examined. There is a secondary hornbeam-beech forest here with around 90% of the canopy cover. About 10-15 years ago, most of the big trees were cut in this forest. However, at present practically no logging takes place here.

The canopy cover has been increased at the expense of the rapidly growing young trees. There are several over-mature trees with holes, which creates good condition for biodiversity. There are no signs of livestock grazing. Consequently, natural regeneration is sufficient. Most of the naturally regenerated trees are of a seed origin, which can be regarded as signs of health improvement of the stand. This forest is a good habitat for roe deer, wild boar and bear.

The second field visit

The second visit was made on 29 April 2012. This time two cutting areas were visited in the forest under special logging license (20 years), located in the valley of riv. Ilto in Akhmeta Municipality. The license holder is “Georgian Wood and Industrial development” Ltd - Georgian-Chinese company (license number is 10003, area – 9,370 ha).

The meeting was arranged with Mr. Ilia Datunashvili, Head of the Monitoring Unit of the Kakheti Representation of the company. As a result of the meeting, information was obtained about the activities of the company with respect to biodiversity management and conservation within the above-mentioned territory.

The company tries to fulfill the requirements of the forest use plan based on forest inventory. The plan is in compliance with the demands of the formally approved forest use rules. With respect to biodiversity, these demands include the prohibition of commercial harvest within the sites of special functional purpose, including the slopes steeper than 35^0, floodplains, subalpine forests,

within 200 meter-wide forest belt along the routes of the snow avalanches and mudflows, within 200 meter-wide forest belt along rivers, lakes and other water bodies, etc. Another important requirement is the need to protect soil and manage the remaining parts of the trees after logging.

Forest compartments #76 (sub-compartment 1, total area of the cutting area – 20 ha) and #81 (sub-compartment 3, total area of the cutting area – 8 ha) were visited. The cutting areas are mainly comprised of beech with mixture of oak, wild cherry, lime and maple. There is also elm. The average slope degree is $20\text{-}30^0$. The average canopy cover – 70-80% (including logged and not logged spots).

Beech is logged in these cutting areas. Trees are felled by chainsaws. Skidding is performed by a tractor TT4. Caterpillar technique is also used such as DT and „Altay". In general, caterpillar tractors cause less damage (compaction) to the soil in comparison to those on wheels. Cranes are used for loading of the logs on the lorries after they are taken out of the forest.

Because on this territory forest use had been quite intensive in the past, a dense network of the forest roads is still remaining. Consequently, in most cases the company just had to rehabilitate old (abandoned) roads. However, in some places it was necessary to build new skidding trails, which was done by the road building bulldozers C100 and C130.

The trees are cleaned from branches immediately after felling, which reduces the area of soil damage during the skidding. The thick branches are removed from the forest and used as fuelwood. The thin branches are scattered.

According to the current forest use rules (the Decision of the Georgian Government # 242 on the Approval of the Forest Use Rules dated 20 August 2010), „the number of the irreversibly damaged remaining trees after logging (with diameter equaling to or more than 8 cm) should not exceed 10% of the quantity of the logged trees". This requirement is met on the two observed sites. The logging brigades hired by the company try their best to avoid damages to the remaining trees (especially seedlings) during felling operations.

Concerning the deadwood – the standing dried trees (the so-called zero trees) are marked, felled (for the safety reasons) and left on the spot. This creates good habitats for biodiversity. With respect to forest restoration – the company plans to conduct measures of promotion of natural regeneration (through soil preparation). In general, the condition of natural regeneration is satisfactory on these territories.

There is no livestock grazing on these licensed areas. Only sheep moves through the area periodically. However, the sheep follows its trail and does not go into the forest.

An animal migration corridor is also located in the area (Mukhati-Damasti direction), which is about 600 meters wide. No logging takes place within this corridor. There is also Damasti Shrine in this area, which is an additional very important factor for the protection of the surrounding forests.

There are no invasive species on the territory and, therefore, no such problem exists. However, Dutch elm disease is a problem – the elm trees die before they reach maturity.

Voluntary-selective cuttings are conducted on the territory. Consequently, there is no danger of fragmentation of forests. Chemicals are not used.

The canopy cover of the logged area is reduced to 50-60% which is within the norm. However, in rare cases (on the crossroads of the skidding trails, where additional trees have to be removed for safety reasons), the canopy cover is reduced to 40-50%. In these spots it is necessary to conduct the promotion of natural regeneration.

The skidding trails are quite narrow and sometimes very steep. In some segments, there are long and deep pits (in some areas about half a meter deep) created by water flow. As a result, despite periodic renovation of these roads by special bulldozers, there are certain risks for workers.

Main challenge faced by the company is illegal logging. Specifically, illegal loggers use the roads built by the company and enter the forests located near these roads. The company does not have adequate means of protection of its forests. On one hand, the limited number of staff does not allow full monitoring of the forest. On the other hand, only the relevant state authorities have the rights to conduct relevant law enforcement measures.

In general, based on the field inspections it was revealed, that the overall biodiversity condition is better in the licensed logging areas, in comparison to other forests where logging took place without permission. The reason is the circumstance, that the officially designated logging sites are located in very remote areas, where the wood harvesting is conducted by relatively experienced personnel. The condition of forests located near villages is much worse due to the chaotic tree cutting by the local population.

Consequently, it is essential to elaborate mechanisms of protection of licensed as well as other forests. In addition, it is necessary to increase the qualification of the workers operating in the forest.

Minutes of the stakeholder workshop

The workshop was held at WWF-Caucasus Programme Office on 29 March 2012. Representatives of all key stakeholders from the Governmental and NGO sector attended. Ilia Osepashvili, Forest Officer at WWF-Caucasus Programme Office presented key findings of the situation analysis of forest biodiversity. The presentation included two major parts – a) assessment of the levels of achievement of NBSAP 2005 priorities and objectives and b) existing problems to biodiversity and their root causes. It was followed by question-answer sessions.

At the beginning, an issue of forest categorization was touched upon. It was mentioned by the participants that the forest categorization system under MCPFE (now Forests Europe) could be interesting for Georgia. This system safeguards adequate protection of forests as well as sustainable and ecologically sound use of their resources.

Concerning the planned programme on restoration of floodplain forests, Natia Kobakhidze (GIZ) suggested incorporating into the situation analysis the information about the WB project on integrated management of floodplain of River Alazani. This project is of a pilot character, but could be regarded as a first step towards adoption of floodplain forest programme.

Nugzar Zazanashvili (WWF) emphasized the need to include into the analysis the official commitments of the Georgian Government with respect to biodiversity and environment in general. These could include the plans related to mitigation of climate change mentioned by the President of Georgia at the 16th Conference of the UN Framework Convention on Climate Change in Cancun, Mexico in December 2010. Another example is international commitment of Georgia to launch TEEB in the country in 2012. Paata Shanshiashvili (US DoI ITAP) supported this idea, mentioning that international commitments have always had particular importance for the conservation of biodiversity.

Nugzar Zazanashvili also mentioned that since 1 January 2011, Georgia is a party to European Landscape Convention. This gives a very good opportunity to promote integrated land use management in the country. This would also mean better coordination among various authorities responsible for forest conservation, agriculture, water management and other related sectors.

The next issue which was raised was whether to include the specific objective of adoption of the Law on Forest Privatisation in the next NBSAP document or not. At first glance, forest privatisation can not positively affect biodiversity. On the other hand, the process of forest privatisation, if launched in isolation from the overall sustainability (including nature conservation) context, would put natural ecosystems under considerable risk. Consequently, the privatisation issue could remain in the next NBSAP document, but with an additional statement putting emphasis on the need to protect biodiversity.

Nona Khelaia, a representative of the Biodiversity Protection Service (MoE), mentioned that initially there was a lack of understanding among the forest use license holders with respect to the needs of biodiversity conservation (e.g. protection of forest fauna). It took considerable efforts before existing awareness levels were considerably raised.

The next discussion topic was on invasive species. Marina Jordania (Greens Movement) maintained that healthy ecosystems are usually capable of resisting such species. Nugzar Zazanashvili emphasized that introduced species does not necessarily mean invasive one. He also mentioned that simple prohibition of establishment of wood plantations comprised of introduced species would not be correct. Initially, assessments should be made and if a species

seems potentially ibvasive, then the establishment of plantations of this species should be restricted or not allowed at all. Other, non-invasive species could definitely be used for short-rotation energy plantations, as this would reduce pressures from native forests. Giorgi Kavtaradze (State Agrarian University) said that because invasive species are always exotic, there is a wrong viewpoint among some people that all introduced species are invasive. He also said that invasive species usually find favorable conditions in those places where native forest ecosystems are substantially weakened. Finally, he also mentioned that it would be good to introduce categorization system to grade the levels of invasiveness of species (e.g. high, medim, low). The participants emphasized that there is much degraded (abandoned) agricultural land in Georgia, which could be used for fast-growing short-rotation plantations. Georgian State Agrarian University plans to undertake a project to study the potential of establishment of fast-growing plantations in Georgia.

Nodar Elizbarashvili (Iv. Javakhishvili Tbilisi State University) mentioned the project supported by the WB in Georgia, implemented in the 2000s. In this project, inventory of much of the Georgian forests was carried out. In addition, landscape-ecological assessment of forests was made and the map was produced. This map (1:200,000) shows the forests in three colors - red colors (about 50% of the total forest area) represent the zones where no logging should be conducted (except maintenance cuts), yellow colors demonstrate the forests, where the use could be conducted with some restrictions, and green colors mark the areas where commercial logging could be conducted. However, the latter represents only around 15% of the total forest cover and is very fragmented. Consequently, Georgian forests predominantly have ecological and biodiversity conservation functions. There are no sufficient resources for commercial wood utilization at a large scale.

During the discussion of the problem of forest fires, it was mentioned that the influence of climate change on the levels of risk of forest fires is not very certain. It was also mentioned that natural forest fires are not always beneficial for biodiversity.

With respect to infrastructure development, Paata Shanshiashvili mentioned that the concentration of infrastructure in certain places could be a potential problem, and not the overall level of its development in the country. Excessive infrastructure concentration causes fragmentation of biodiversity habitats.

Regarding hunting – it was mentioned that hunting reserves are not only established to hunt and make profit. Another important objective is breeding animals and only after the numbers are sufficiently high, the hunting could be carried out. In present circumstances when hunting has been allowed outside the reserves as well, there is a need to integrate hinting aspects into the forest management planning.

Nugzar Zazanashvili mentioned that many problems related to forest biodiversity are caused by the present uncertainty in the sector in general. Frequent institutional and legislative changes

increasingly complicate the situation. Therefore, conservation of biodiversity requires very strong political will. The next NBSAP document, particularly in the governance section, could adopt scenario approach, to address the difficulty associated with uncertainty.

Finally, Malkhaz Dzneladze (WWF) mentioned that there is no formal requirement in the country related to the existence of natural resource (including forest) management planning systems. Giorgi Kavtaradze added that the establishment and management of such a system is a direct responsibility of the state.

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