

**Strategy and Executive Plan  
for the Conservation  
of Biodiversity  
within the Russian Federation**

Moscow - 2014



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11.1.2 Global target 2 – By 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems

11.1.3 Global target 3 – By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions

11.1.4 Global target 4 – By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production

and consumption and have kept the impacts of use of natural resources well within safe ecological limits

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11.2.3 Global target 7 – By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity

11.2.4 Global target 8 – By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity

11.2.5 Global target 9 – By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment

11.2.6 Global target 10 – By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning

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11.3.1 Global target 11 – By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes

11.3.2 Global target 12 – By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity

11.3.2 Global target 13: By 2020, the genetic diversity of cultivated plants and farmed and domesticated animals and of wild relatives, including other socio-economically as well as culturally valuable species, is maintained, and strategies have been developed and implemented for minimizing genetic erosion and safeguarding their genetic diversity

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11.5.2. Global target 19 – By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties

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# List of used abbreviations

Abbreviation	Description
CAFF	The working group for the conservation of arctic flora and fauna
DFG	German research foundation
ENPI FLEG	The “European Neighborhood and Partnership Instrument” that is aimed at ameliorating the governance of forest sectors in Eastern-European countries
IBAs	Important Bird Areas
ICLEI	International council for local initiatives aimed at the improvement of the environment
IIASA	International Institute for Applied Systems Analysis
IPCC	International Panel on Climate Change
IPCC SREX	Report on the management of risks and extreme events
MSC	Marine Stewardship Council
TEEB	The economics of ecosystems and biodiversity
WWF	World Wildlife Fund
BVF	Biologically Valuable Forests
GDP	Gross Domestic Product
WTO	World Trade Organization
GMOs	Genetically Modified Organisms
GC	Gigaton of carbon (billion tons of carbon)
GEF	Global Ecological Fund
AGRUB	Access to genetic resources and mutual use of benefits
UAGIS	Unified and automated governmental informational system
EU	European Union
CBD	Convention on biological diversity
kV	Kilovolts
CPC	Central Product Classification
KOT	Key ornithological territories
KOTR	Key ornithological territories of Russia
UFT	Untouched Forest Territories
ISIC	International Standard Industrial Classification
BIO	Biotechnology Industry Organization

MSY	Maximum sustainable yield
PA's	Protected Areas
OECD	Organization for Economic Cooperation and Development
TLV	Threshold limit value
RAS	Russian Academy of Sciences
RGS	Russian Geography Society
CITES	Convention on International Trade of Endangered Species
POP	Persistent organic pollutants
HEVAL	High environmental value agricultural lands
SEEA	System of Environment-Economic Accounting
SW	Solid waste
HM	Heavy metals
IP	Industrial Pollutants
TLA	Traditional land-use areas
EI	Energy industry
RWS	Recirculating Water system
FASO Russia	Federal agency for scientific organization of Russia
FAO	Food and Agriculture Organization of the UN
UNESCO	United Nations Educational Scientific and Cultural Organization
YNAO	Yamalo-Nenetz Autonomous Okrug



# I. Overview

## Section 1. Biodiversity within the Russian Federation

According to annex 2 of the Convention on Biological Diversity, biological diversity is defined as the variability among living organisms from all sources including, inter alia, terrestrial, marine and other aquatic ecosystems and the ecological complexes of which they are part. The latter includes diversity within species, between species and of ecosystems.

In this manner, the concept of biodiversity includes a wide array of life forms, particularly concentrating on the following:

- Genetic diversity (intra-species and cross-population variations)
- Diversity of species (number of plant, animal and microorganism species over a given territory)
- Diversity of ecosystems, habitats as well as their biotic and abiotic interactions

Biological diversity is the result of almost four billion years of development. A vast number of life forms and ecological processes ensure the continuation of biological evolution, which is a necessary factor for the success of the human race.

Biological diversity is the chief natural resource of Russia which assures the possibility of sustainable development. This is a permanent commodity that is invaluable for ecological, social, economic and esthetic reasons. It provides the potential for self-organization within the biosphere by ensuring its' regenerative qualities, resistance to negative natural and anthropogenic influences as well as by being the resource necessary to compensate for the loss of individual biotic elements.

The Russian Federation encompasses 1/8 of the total terrestrial landmass of our planet and the majority of non-tropical climates of Eurasia. The total area of the country is 17 075.4 km<sup>2</sup>. Despite large landscape diversity, the biodiversity within the RF is relatively low when compared to more southern regions of the planet. There are landscapes from eight different natural zones within the country where hundreds of thousands of various flora and fauna species can be found, totaling between 1 and 20 percent of total world biodiversity for certain taxons.

There are over 12 500 species of vascular plants, 2200 of bryophyte, 3000 lichen and 11 000 species of fungi, 320 mammal, 732 bird, 80 reptile, 29 amphibian

and 343 species of freshwater fish. There are also 9 species of cyclostomata and around 1500 species of salt-water fish species and over 150 000 species of fauna.

A portion of the species (as well as subspecies and certain populations) described above are included in the IUCN Red List of the Russian Federation, an official document containing a list and description of rare and endangered flora and fauna species as well as directions of the necessary measures for their restoration. The list contains 413 species (subspecies) of animals, 652 species (subspecies) and plants and 24 species of fungi.

Sea shores and shallow waters are of an intrazonal character and are located in almost all natural zones within the Russian Federation – from the polar deserts and arctic tundras to the broadleaved forests of the Russian Far East, Caspian neardeserts and Mediterranean xerophilous sparse forests near the shores of the Black Sea. They are represented by a large spectrum of shoreline types which is vital for the formation of biodiversity in coastal ecosystems. The regions that contain these ecosystems are the ones with the highest levels of biological diversity. In the Russian Far East, the local flora and mammal fauna reaches 1200 and

**Table 1.1.** *Biological diversity of the main types of organisms located in coastal marine ecosystems*

Sea	Number of invertebrate bottom-dwelling species	Number of fish and cyclostomata	Number of algae species
Black	791	166	236
Azov	186	79	33
Caspian	400	78	116
Japan	2000	603	379
Okhotsk	2100	276	299
Bering	1500	297	138
Baltic	20 (marine)	50	50
Barents	1800	144	No data
White	1000	51	200
Kara	1300	54	134
Laptev	500	37	No data
Chukotka	800	37	70

75 species per 100 km<sup>2</sup> accordingly while the shores of the Black Sea can boast 1100 and 70 species per 100 km<sup>2</sup>. No less important is the state of biodiversity in the seas themselves (Table 1.1).

Russia contains a substantial portion of the ecosystem (biome) and natural landscape diversity of our planet's temperate belt. The status quo remains in part due the relatively low levels of ecosystem destruction throughout the country (up to 65% of the landmass, chiefly in the Arctic, Siberia and Far East are under the protection of various protected areas). The total percentage of arable land in biomes reaches 40-50% for forest and steppe ecosystems. However, overall, agricultural lands (excluding the grazing grounds for domesticated caribou populations) range from 0% (tundra) to 85% (steppes) of the total landmass. A substantial portion of the forest and steppe biomes are occupied by meadows and steppes (Table 1.2).

The landscape diversity of the Russian Federation includes approximately 20 types of landscapes (arctic, subarctic, boreal (taiga), humid sub boreal, semi-arid and arid, northern subtropical, mountainous alpine/glacier and others, bog, meadow, aquatic, marine, shallow-water, etc.) and over 350 landscapes (Isachenko, 2001; Melchenko et al., 2004). Amongst the ones listed above, the most common are the

**Table 1.2. Biomes of Russia:**  
*the distribution of forests and arable lands across various biomes*

Biome	Area of biome (million hectares)	Proportion of land occupied by biome, %	Proportion of forests within the biome, %	Proportion of arable lands, %	Including	
					Farm fields, %	Hayfields and grazing grounds, %
Polar deserts and tundras	197.8	11.6	–	0.03	–	–
Forest tundra, sparse forests and northern taiga	233.6	13.7	37.7	0.05	–	–
Moderate taiga	222.6	13.0	76.4	5.0	4.3	1.1
Southern taiga, coniferous-broadleaved and broadleaved forests	245.4	14.3	57.6	17.3	10.4	6.9
Forest-steppe	127.3	7.5	27.5	57.2	40.6	16.6
Regular and dry steppes	79.9	4.7	4.0	73.3	47.3	26.0
Dry and desertified steppes	22.2	1.3	–	85.5	51.8	33.7
Semi-deserts	14.7	0.9	–	75.9	13.5	62.4
Mountains	565.7	33.0	62.7	7.6	1.5	6.1

taiga (boreal) landscapes – 52%. Cold Arctic and subarctic (both mountainous and lowland) ecosystems take up 21% of the land mass. Mountainous landscapes take up another 30–33%. The most developed, habitable and optimal for agricultural use are steppe-forest and broadleaved forest landscapes which occupy 8% of the total area.

The Convention on Biological Diversity ties together the principles of biodiversity and sustainable development. The preamble of the Convention states that it is necessary to conserve biodiversity not only for its own sake but also to enhance the possibility for its human exploitation thus increasing the wellbeing of the entire human race. This principle has led to the development of the concept of ecosystem services which are provided by biological diversity. These can play a decisive role in fulfilling the need for nutrition, healthcare and a clean environment.

The National Strategy for the Conservation of Biodiversity of Russia (2001) has identified the key areas of livelihood functions played by biological diversity: provisioning functions, habitat functions as well as informational and spiritual-esthetic functions. The classification of ecosystem services in the Russian Federation is based on the groups described above. In addition, recreational services have been identified as a separate, multifaceted, group that is largely dependent on the success of the first three groups.

### **The classification of ecosystem services in Russia**

- 1. Provisioning services** (natural systems produce a biomass that is extracted by humans and utilized for various purposes):
  - 1.1 The provision of timber;
  - 1.2. The provision non-timber forest products and other terrestrial ecosystems (fungi, berries, nuts, bark, bast, medicinal, cosmetic and decorative elements, etc.);
  - 1.3. The provision of foodstuff for cattle on natural meadows and hayfields;
  - 1.4. The provision of marine products, primarily fish;
  - 1.5. Provision of freshwater ecosystem resources, primarily fish;
  - 1.6. Provision of game animals.
  
- 2. Regulating services** (the creation and maintenance of the right conditions for comfortable human life and economic growth):

### 2.1. Anti-climate-change services

- Regulation of greenhouse gas flows;
- Storage of CO<sub>2</sub> within ecosystems

### 2.2. Services for the regulations of the hydrosphere:

- regulating the amount of precipitation and global water flow;
- stabilizing water flows, decreasing the severity of floods and the damage caused by them
- ensuring the quality of water supply for terrestrial ecosystems.

### 2.3. Services for the formation and maintenance of soil quality:

- ensuring the bioproductivity of the soil;
- protecting soil from water-based erosion, preventing landslides into aquatic sources, rockslides and mudslides;
- protecting the soil from wind erosion and preventing sand storms;
- regulating freeze-thaw processes.

### 2.4. Services for the detection and elimination of pollution:

- The control and processing of pollutants in terrestrial ecosystems;
- Biological purification of water in natural waterways.

### 2.5. Services that regulate biological processes that are important for economic and ecological security (control for the number of pests in agriculture and forestry, pollinators, etc.).

## **3. Informational services** (important information and other immaterial benefits)

### 3.1. Genetic resources of natural species and populations

### 3.2. Information concerning the structure and functioning of natural systems which may be utilized by people

### 3.3. Esthetic and educational value of natural systems;

### 3.4. Esthetic, spiritual and religious significance of natural systems.

## **4. Recreational services** (the creation of natural conditions for people's leisure based on the three components described above)

### 4.1. Creating natural conditions for daily leisure in proximity to people's homes;

### 4.2. Creating the right conditions for weekend recreation and out-of-city pleasures;

### 4.3. Creating the right conditions for nature-based educational tourism;

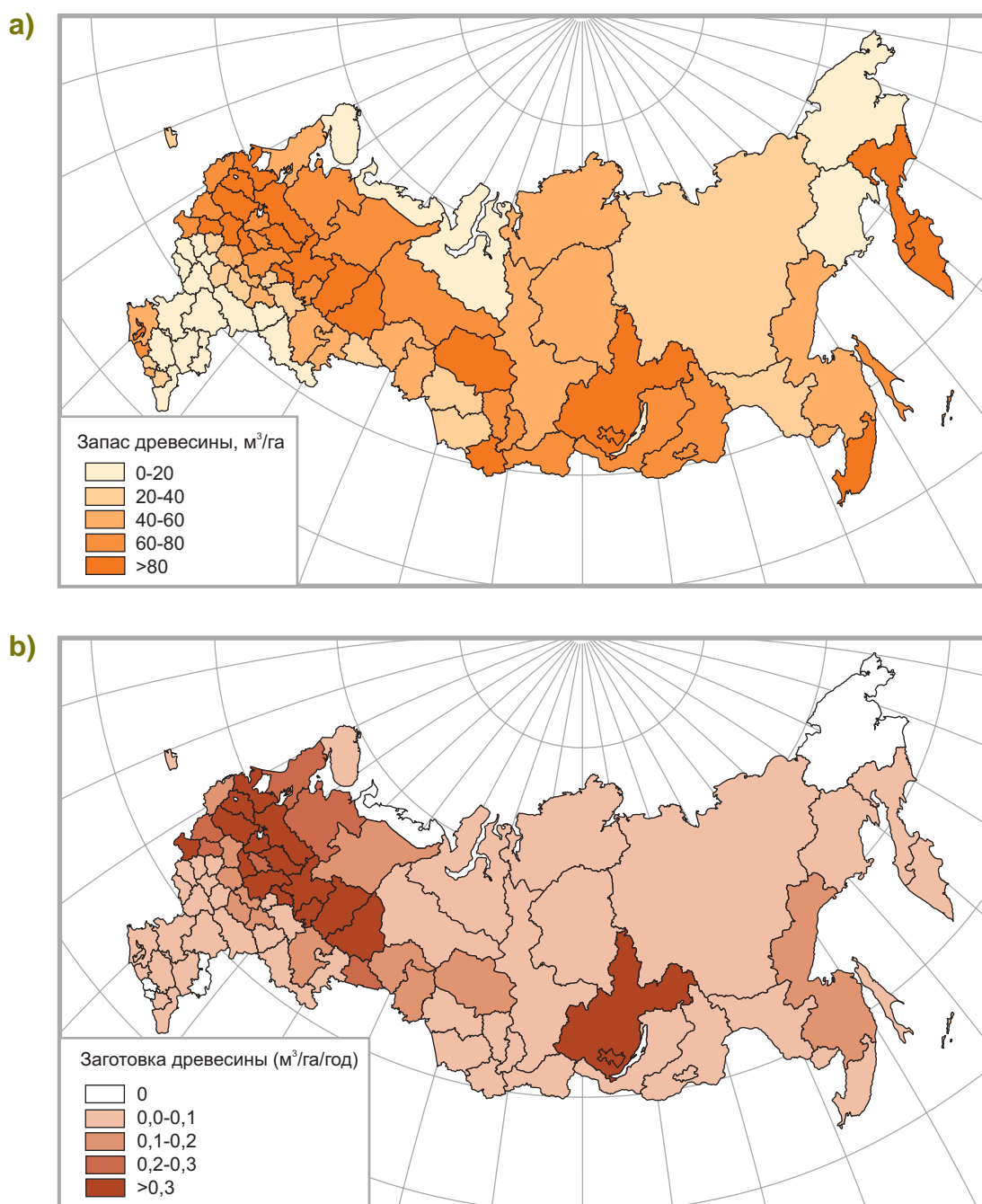
### 4.4. Creating the right conditions for active tourism outside such as fishing and hunting.

### 4.5. Creating the right conditions for health-related leisure at resorts.

## 1. Provisioning services

### 1.1. The production of timber

In an economic sense, the production of timber is the most crucial component of all ecosystem services within the Russian Federation. Currently the forestry sector composes around 1% of the country's GDP and there is large potential for growth. This ecosystem service is important both at the regional and federal levels of government.



**Diagram 1.1.1. Statistics on the production of timber**  
 a) the supply of firewood (m<sup>3</sup>/hectare) b) the production of timber (m<sup>3</sup>/year)

The potential worth of this service can be estimated based on the quantity of available timber across the regions (diagram 1.1.1. a). The amount of timber that can be sustainably extracted from the ecosystems is to be estimated according to the yield of logging sites. The current use of this ecosystem service can be expressed in the quantity of extracted timber mass (diagram 1.1.1. b), both for construction purposes as well as firewood. For a more accurate assessment of the real amount of timber extracted, we must take into account illegal logging activities. The demand for the service can be extrapolated into the future – through historic statistics of the growth of the forestry sector and through the number of individuals currently employed in the industry, assuming that they must all earn a sustainable salary. The demand for firewood is determined through the length of the heating-requiring seasons and through the number of homes with firewood-based heating systems.

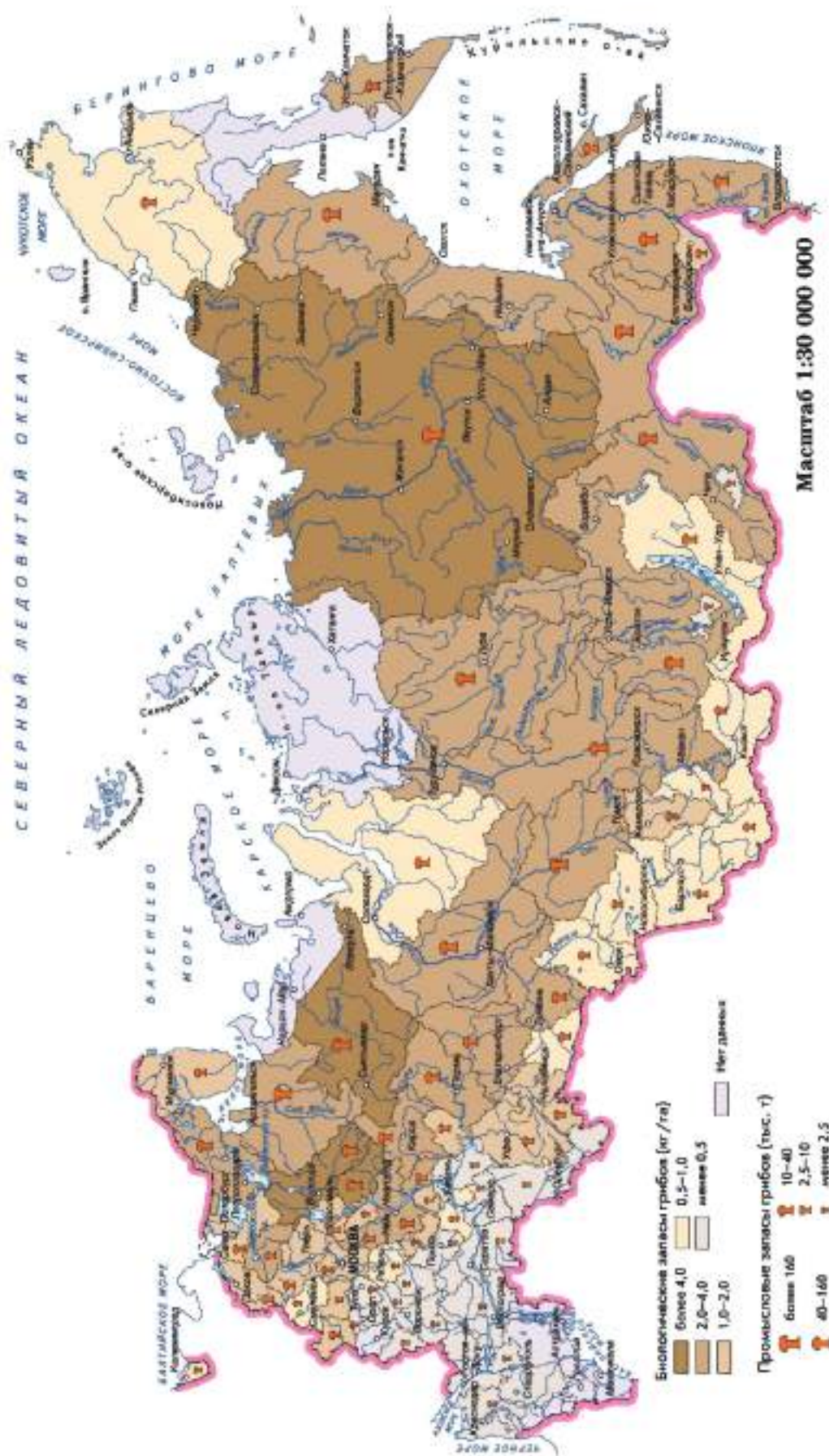
## **1.2. The production of non-timber resources of forests and other terrestrial ecosystems**

The non-timber resources of forests and other terrestrial ecosystems are extremely diverse in their nature and potential application. Amongst others, it includes the collection of tree and shrub bark, brushwood, branch foodstuffs from fir, pine and spruce trees. These resources can also be of nutritional (berries, edible mushrooms, forest pastures and haymaking fields), medicinal, melliferous and technical value. The value of these products is substantial. The yearly harvest of wild berries, nuts and mushrooms in Russia is measured in millions of tons (1.2.1). It has been shown that in some categories of forests, the value of these non-timber products can exceed that provided by timber. The possibility of harvesting wild mushrooms and berries carries not only practical but also recreational value to urban dwellers. However, the majority of these resources are located outside of humanly-accessible regions.

Governmental statistics concerning the harvest and consumption of non-timber forest products currently does not encompass all the activity that occurs. The evaluations for the volume of the key types of non-timber products presented in this report are based on longitudinal studies combined with data retrieved from a number of different sources. There is also circumstantial evidence about the consumption of this ecological resource: the regional population size and the proportion of the region accessible by transport.

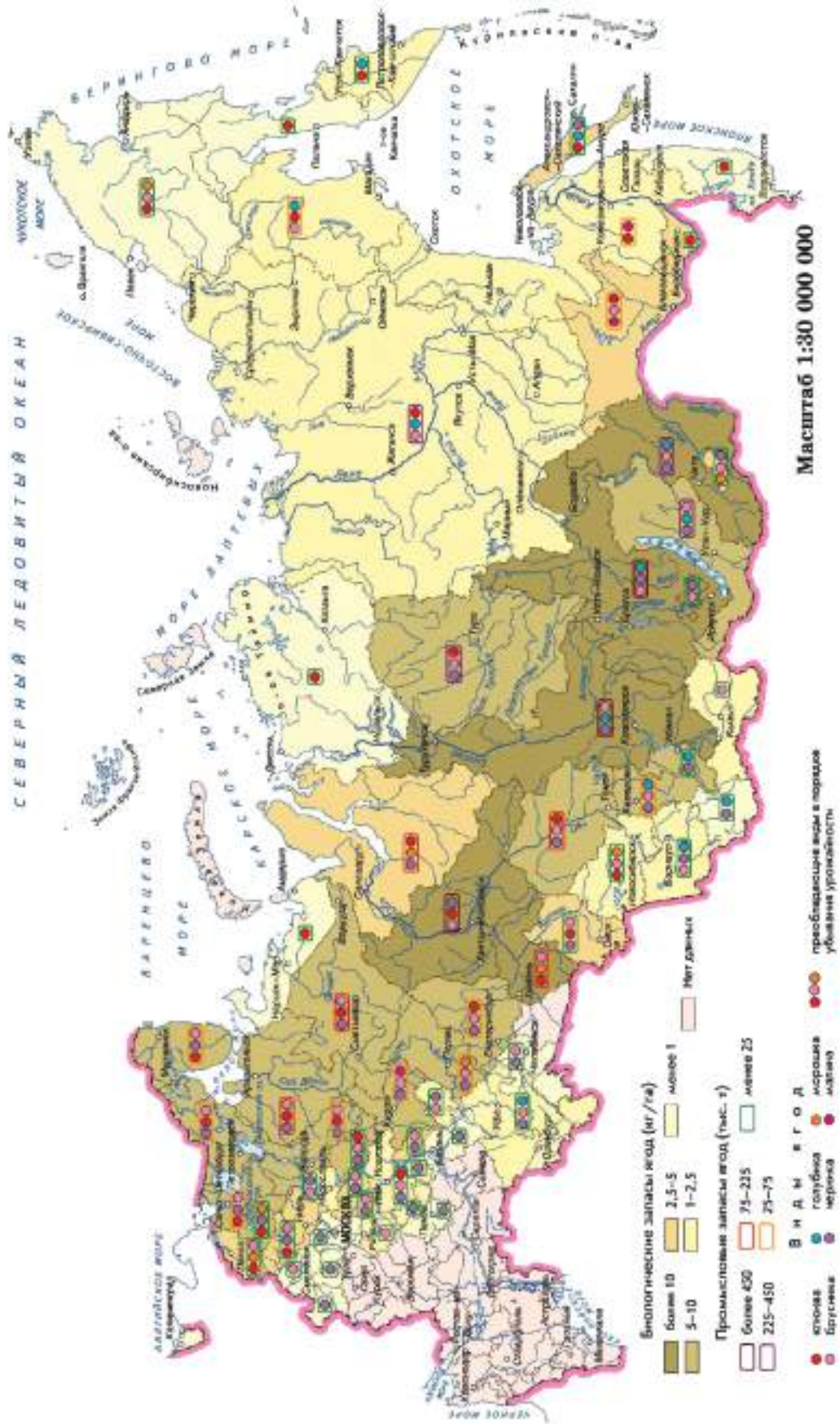
## **1.3. The production of resources from natural pastures and haystacks**

The ecosystem service of resources produced on naturally-formed pastures and haystacks is important for regions that have grazing-centered cattle farming. Chiefly these



а)

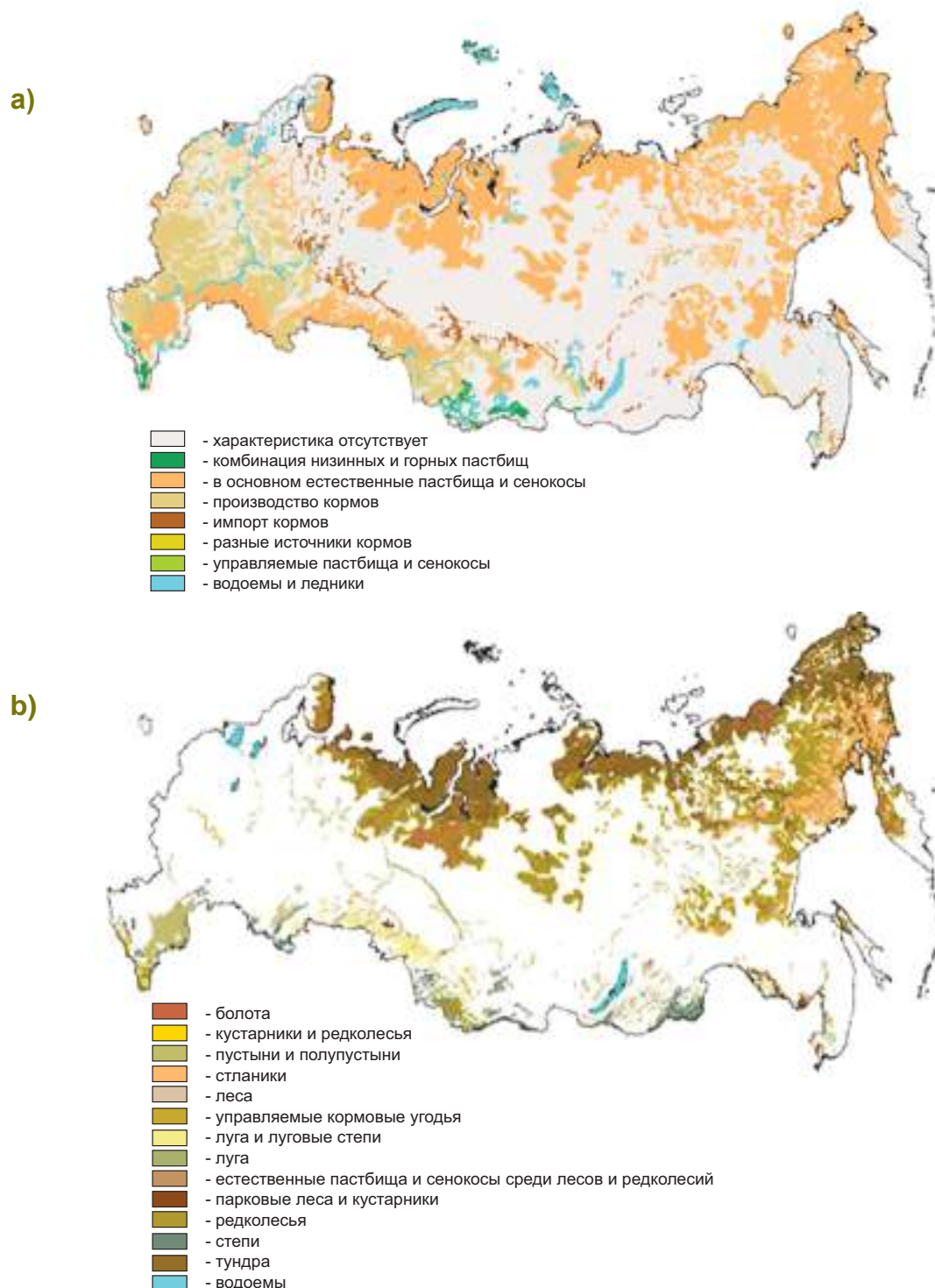




b)

**Diagram 1.2.1.** Data for the volume of the non-timber resources provided by terrestrial ecosystems  
a) volume of edible mushrooms (kg/hectare); b) stock of berries(kg/hectare).

are the Northern and Siberian regions as well as near-desert Caspian and West-Siberian territories (diagram 1.3.1 a). The service is also important throughout the entire country for the segment of the population that owns cattle. This ecosystem service is primarily important on the local and regional governmental levels. On top of being economically important as a source of nutrients for cattle, the service is also crucial for the sustaining of traditional lifestyles amongst indigenous populations of Russia



**Diagram 1.3.1.** Data for the estimation of the value of the ecosystem service of produce received from natural pastured and haystacks a) types of cattle foodstuffs b) pastures located with the Russian Federation

such as the deer-herding communities of the North. Despite the obvious importance of the ecosystem service both for agriculture as well as the broader population, the government does not collect data on wild and semi-wild grasslands. Some information about the area, state and changing tendencies of these ecosystems can be picked up from the Governmental Land Cadaster of Fodder-Producing Areas. Additional information about grazing lands and meadows can be taken from the Governmental Forest Cadaster.

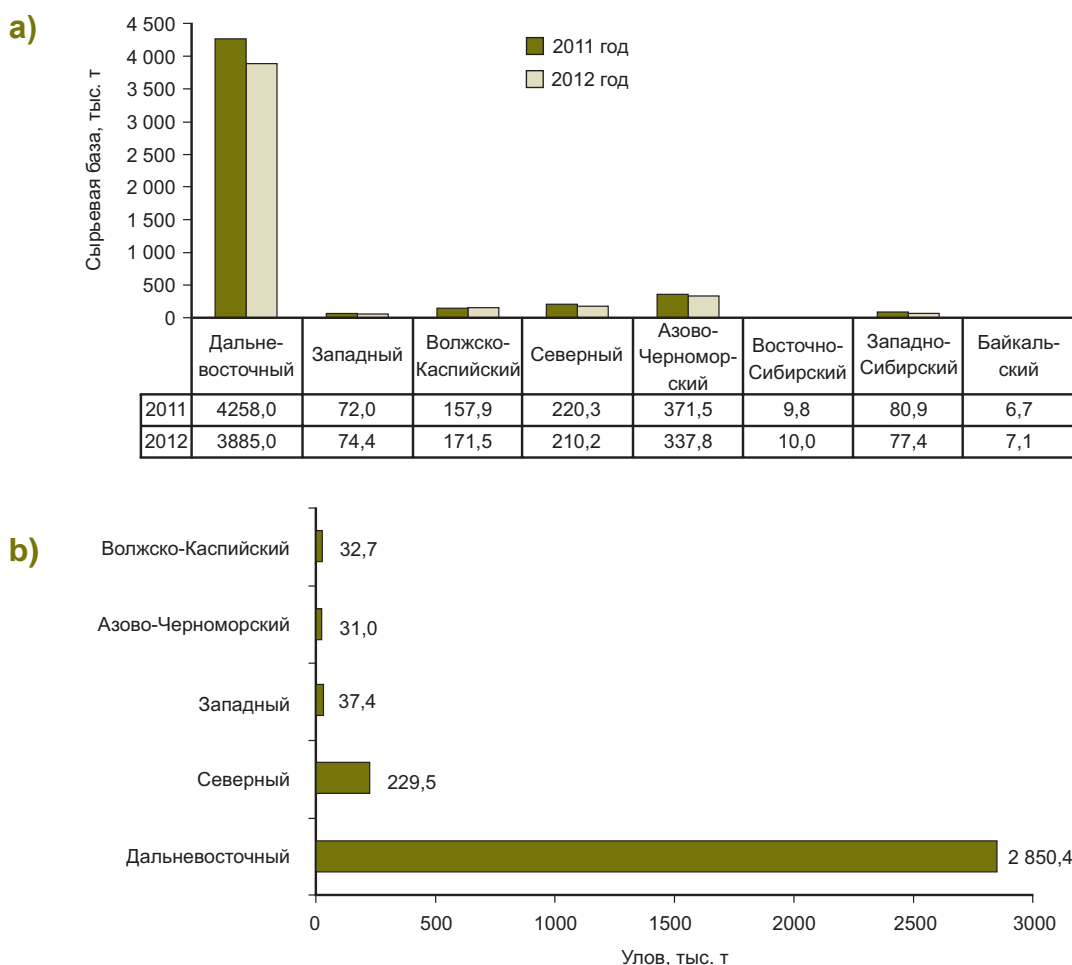
The potential volume of the service can be estimated using the statistics on the productivity of ecosystems that qualify as official grazing grounds (diagram 1.3.1 b). However, it is important to note that on top of the areas identified in diagram 1.3.1. b, there are substantial un-accounted areas of grazing grounds that are used for privately-owned cattle. The most accurate evaluation of the value of the service can be attained through the calculation of cattle populations in regions that utilize natural pastures and haystacks.

#### **1.4–1.5. The provision of resources by marine and freshwater ecosystems**

The resources produced by marine and freshwater ecosystems are important on both the national and regional levels. Despite the fact that fishing composes less than 1% of the national GDP, the economies of some regions, chiefly those located in the Far East, are largely dependent on the fishing industries.

The potential volume of resources provided by this service can be estimated by the available fishing stock (diagram 1.4.1 a) and through actual level of marine bioresource extraction (diagram 1.4.1 b). The current extraction levels utilize approximately 60% of the total available stock. To accurately predict the total proportion of utilized aquatic bioresources, it is necessary to know the volumes of IUU-fishing. In the long-term, the demand for the service can be assessed through predicted growth of the fishing industries. The current demand for this ecosystem service is estimated through the number of individuals employed in the fishing industry.

The value of the produce provided by freshwater ecosystems is considerably lower than those of their marine counterparts. To demonstrate, the total catch from all freshwater sources accumulated to 0.178 million tons while the catch from the exclusive economic zone, territorial waters and internal marine bodies accounted for 3.36 million tons. However, the freshwater bodies play an important role in providing the recreational component of the service. Not only that but freshwater fishing is also crucial for the maintenance of traditional lifestyles of indigenous populations of the North, Siberia and Russian Far East.



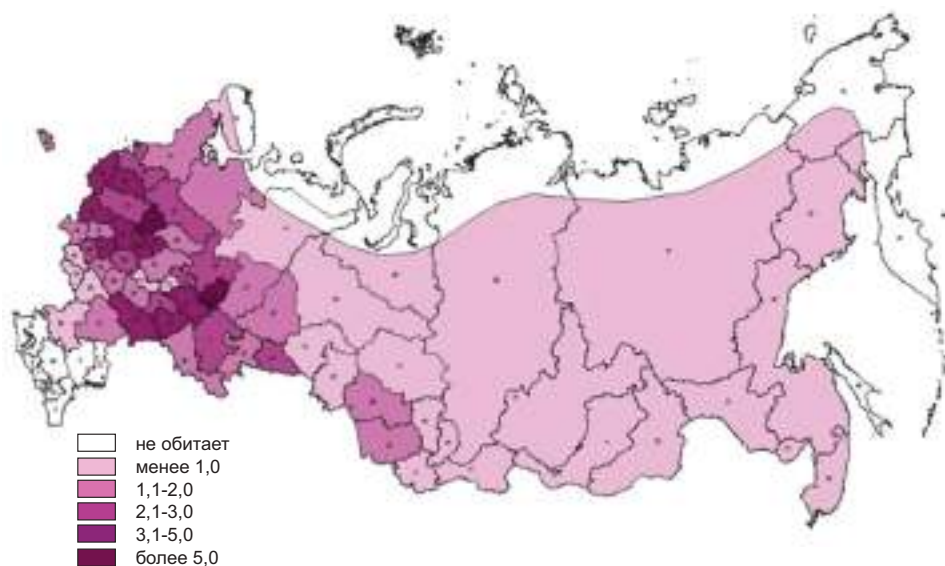
**Diagram 1.4.1.** Data for the estimation of the value of marine ecosystems:  
 a) the total stock of fish within the RF in 2011-2012 at designated fishing grounds  
 b) annual catch achieved in 2011 in the exclusive economic zone, territorial waters and internal marine bodies

## 1.6. The provision of game species

This service is primarily important at the regional and local levels. The recreational component of the service is large. It is also important for the maintenance of traditional economies of indigenous populations of the North, Siberia and Russian Far East.

The potential of the service is estimated by the total stock of game animals (an example is demonstrated in diagram 1.6.1 a, b). The current value of the service is estimate through the statistics on the total amount of wildlife extracted from the ecosystems. The future demand for the service can be calculated by extrapolating historic growth trends of the hunting industry. The current demand is calculated with the number of hunters currently operating in the region (diagram, 1.6.1. c).

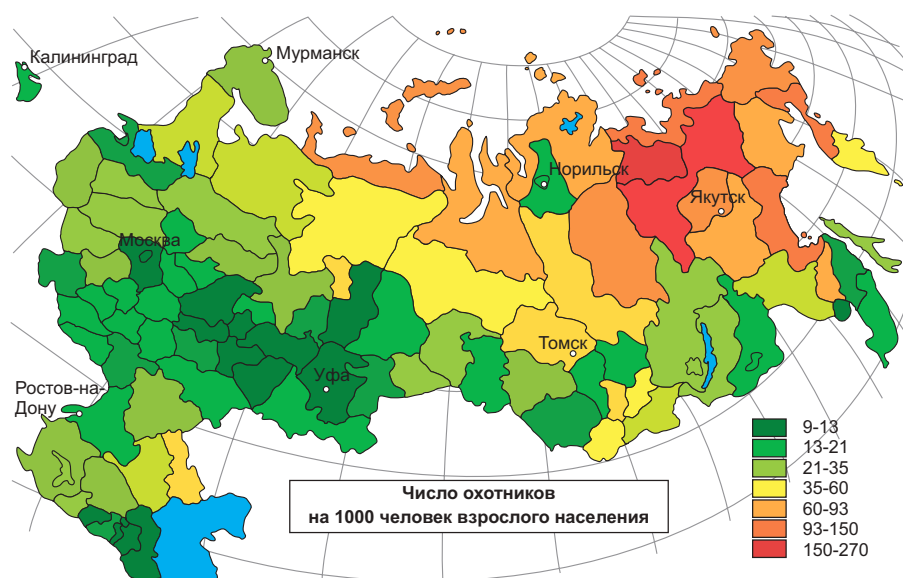
a)



b)



c)



**Diagram 1.6.1.** Statistics on the value of the hunting ecological service:  
 a) density of elk populations (individuals per 1000 hectares of forest ecosystems)  
 b) dynamics of the population numbers and extraction efforts of elk  
 c) number of hunters per 1000 inhabitants

## 2. Habitat services

### 2.1. Services offsetting climate change

#### *The regulation of greenhouse gas flows between the Earth surface and the atmosphere*

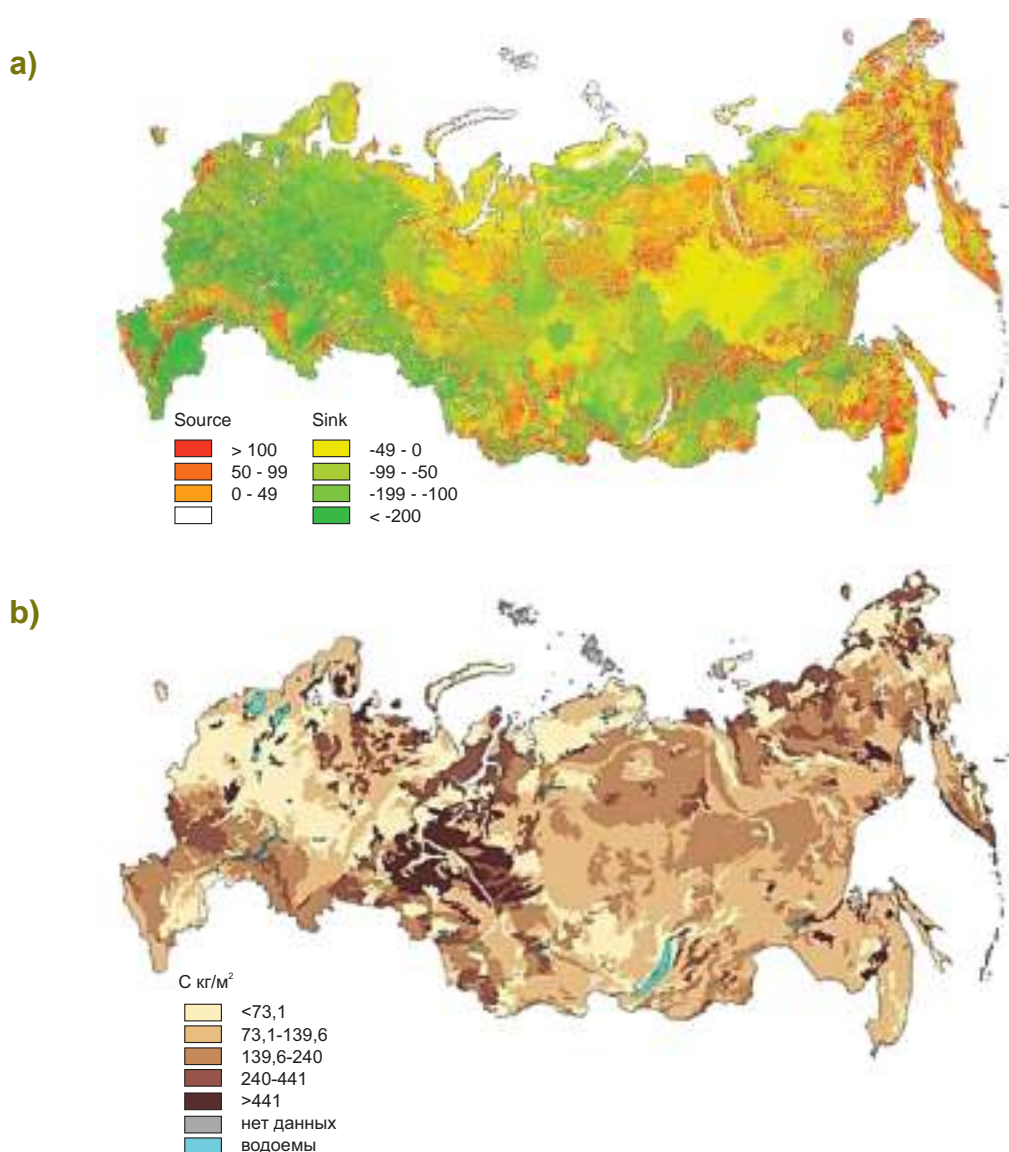
The volume of the service provided by the ecosystem is evaluated by the flow/secretion of carbon (table 2.1.1). The largest sources of carbon storage are forests due to both their large areas and their current state ( a large portion of the secondary forest growths has been restored). The second most important ecosystems in that sense are the marshes. The most efficient carbon absorption per a unit of area is done by abandoned pastures. Carbon is emitted by forest rare-stands and fires. The ecosystems that occupy the second largest terrestrial area are those of meadow-shrub ecosystems (most often these are northern and alpine tundras). However, these play a small role in atmospheric carbon absorption which is associated with the negative effects of global warming. The Russian Federation is a net-absorber of carbon (diagram 2.1.1 a). The fastest absorption of carbon occurs in the European portions of the country due to large areas of young forests and overgrown agricultural lands. In the Asian portion of the country, some ecosystems play a substantial role as source of carbon emissions as a result of forest-fire propensities.

**Table 2.1.1.** Contribution of various ecosystems to the process of carbon dioxide storage. Positive numbers reflect net carbon storage while negative numbers indicate that these ecosystems are a net source of emissions.

Type of ecosystem	Total area, million hectares	Carbon stock per Mt S year
Forests	820.9	691.9
Marshes	144.6	53.4
Abandoned pastures	29.9	46.1
Meadows	24.0	28.5
Pastures and grazing grounds	145.8	25.0
Fallow Lands	19.0	4.2
Other ecosystems, including marine ones	101.1	-11.8
Meadow-shrub	315.7	-15.0
Land affected by fires	23.7	-20.8
Forest rare-stands	85.1	-40.3
All ecosystems in Russia	1709.8	761.2

### Carbon storage accumulated by ecosystems

The volume of the service is estimated according to the store of carbon in soil, including those amounts found in marshes, permafrost and biomass. The most important long-term storages of carbon can be found in soil, peat and permafrost. The store of carbon in living and dead biomass of forests amounts for 49.5 billion tons with another 116.5 billion tons found in forest soil. The volume of the store of carbon in peat marshes is somewhere between 33.6 and 67.2 billion tons. The total amount stored in steppe ecosystems can be estimated as 35 billion tons. The stores found in tundra soil within Russia is estimated at 28.6 billion tons. The greatest accumulations of carbon in soil layers are concentrated in Western Siberia as well as areas affected by permafrost and steppes (diagram 2.1.1 b)



**Diagram 2.1.1.** Indicators that evaluate the value of the climate-forming services  
a) the balance of carbon within Russia according to IIASA estimates  $\text{C}/\text{M}^2/\text{год}$   
b) the average density of carbon within the top one meter of soil layers

The volume of the services utilized globally is equal to the volume produced by ecosystems. The entire population of our planet benefits from the climate regulation services conducted by ecosystems. In other words, all the services produced by the world's ecosystems in the regulation of climate change, are consumed by the entire world population in the form of decreased anthropogenic climate effects. However, the creation of international (interregional) eco-service markets brings forth the question of evaluating national (regional) eco-service consumption rates. The volume of consumption can be evaluated according to the population size or the size of the economy that is directly dependent on climate (such as agriculture).

## **2.2. Services for the regulation of the hydrosphere**

This group of ecosystem services is one of the most crucial ones when it comes to the well-being of the population and the development of the economy (primarily agriculture). This service includes the regulation of precipitation amounts and the total amount of water-flows, stabilization of water-flows, decreasing the quantity and intensity of floods and ensuring the quality of water that enters water wells. This service is most crucial at the regional, or more specifically, at the water-basin level. It is also vital to take into account the direction of the flows: ecosystems located up-stream of the river provide ecosystem services for those regions located down river. Sustainable water consumption is a crucial factor in this matter, especially for regions with large agricultural industries and population densities.

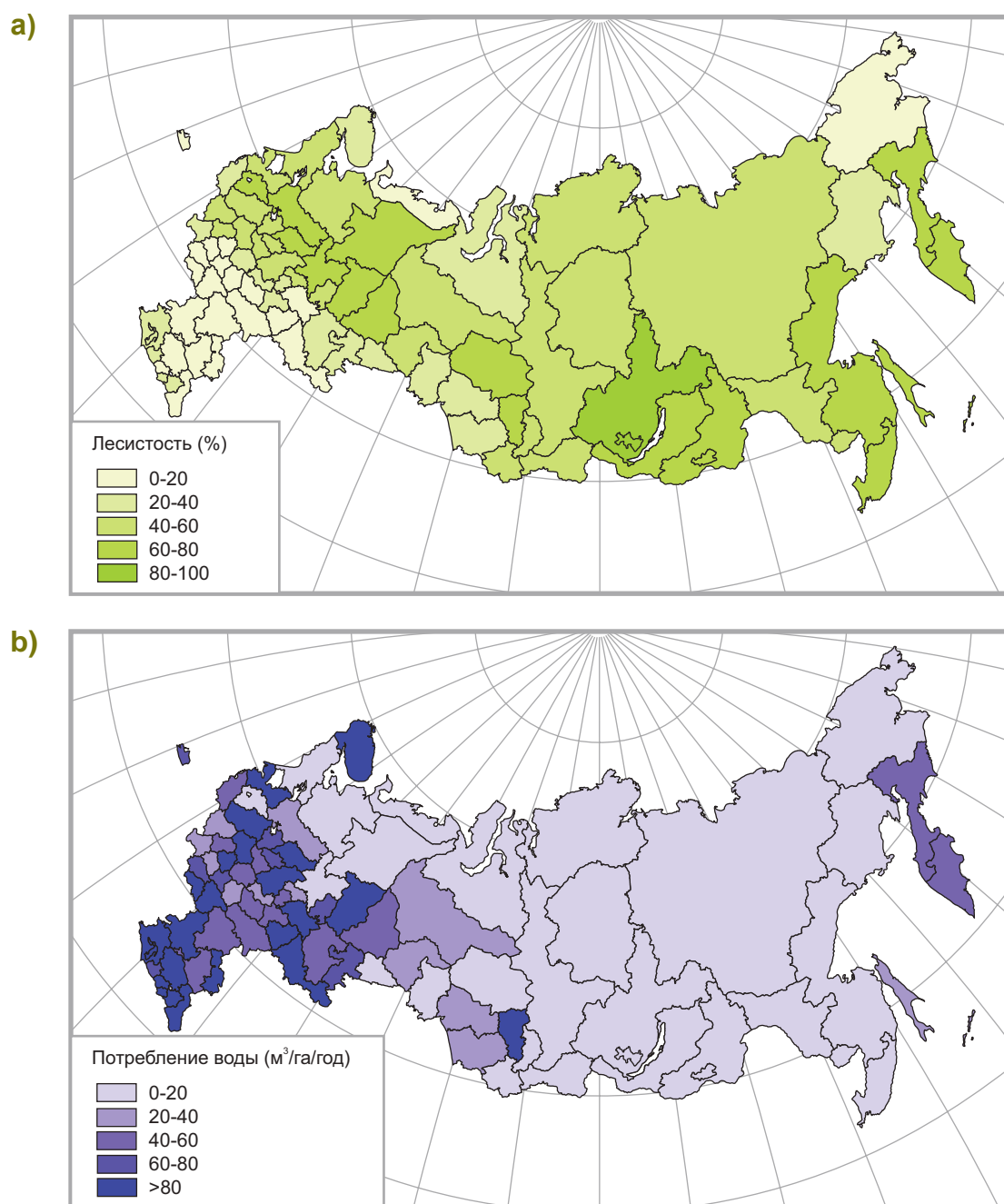
The potential for the ecosystems to provide this service is evaluated according to the area they cover in the region (basin). Forests play a central role in this process so at the initial stages of evaluating the volume of these services within Russia, one can use the proportion of forest coverage within the examined region (diagram 2.2.1 a). The demand for these services is determined according to the volume of water consumption in the region (2.2.1 b), or, more specifically, according to the usage of regional water reserves.

## **2.3. Services for the formation and protection of soil covers**

This group of services includes the promotion of bio-productive soil, the protection of soil layers from wind and water erosion, the prevention of sand storms and landslides as well as the regulation of freeze-thaw processes. These services are of regional and local importance.

The capability of the ecosystems to provide this service is determined according to their level of destruction in the region (diagram 2.3.1 a). In areas where ecosystems

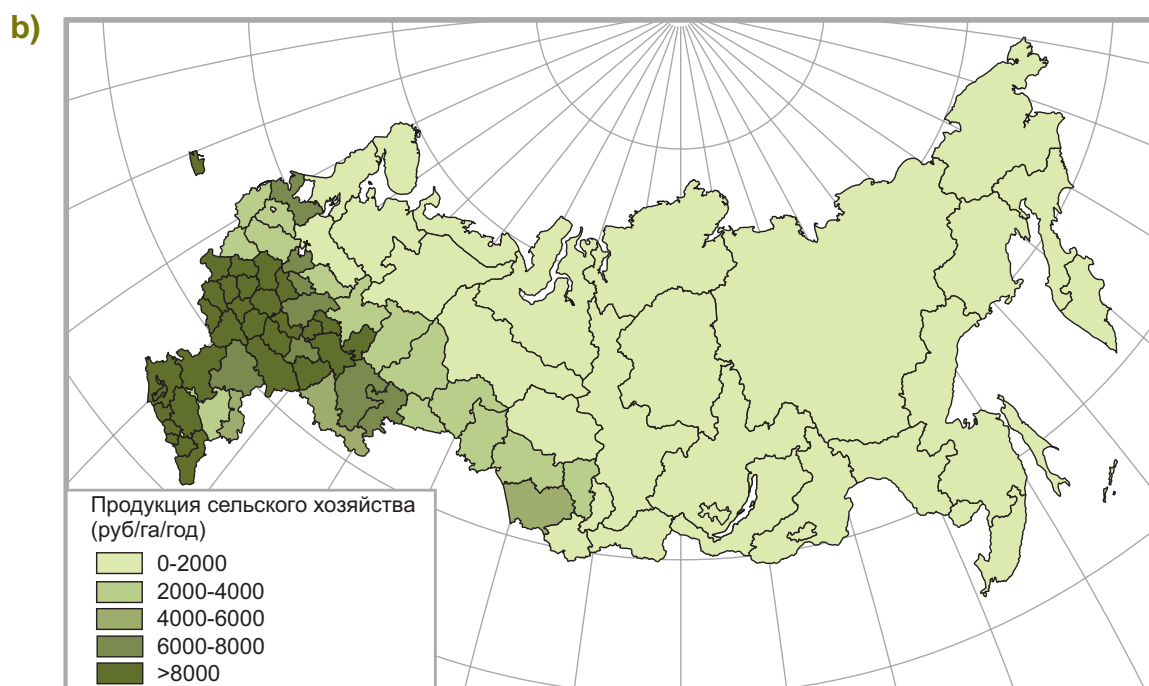




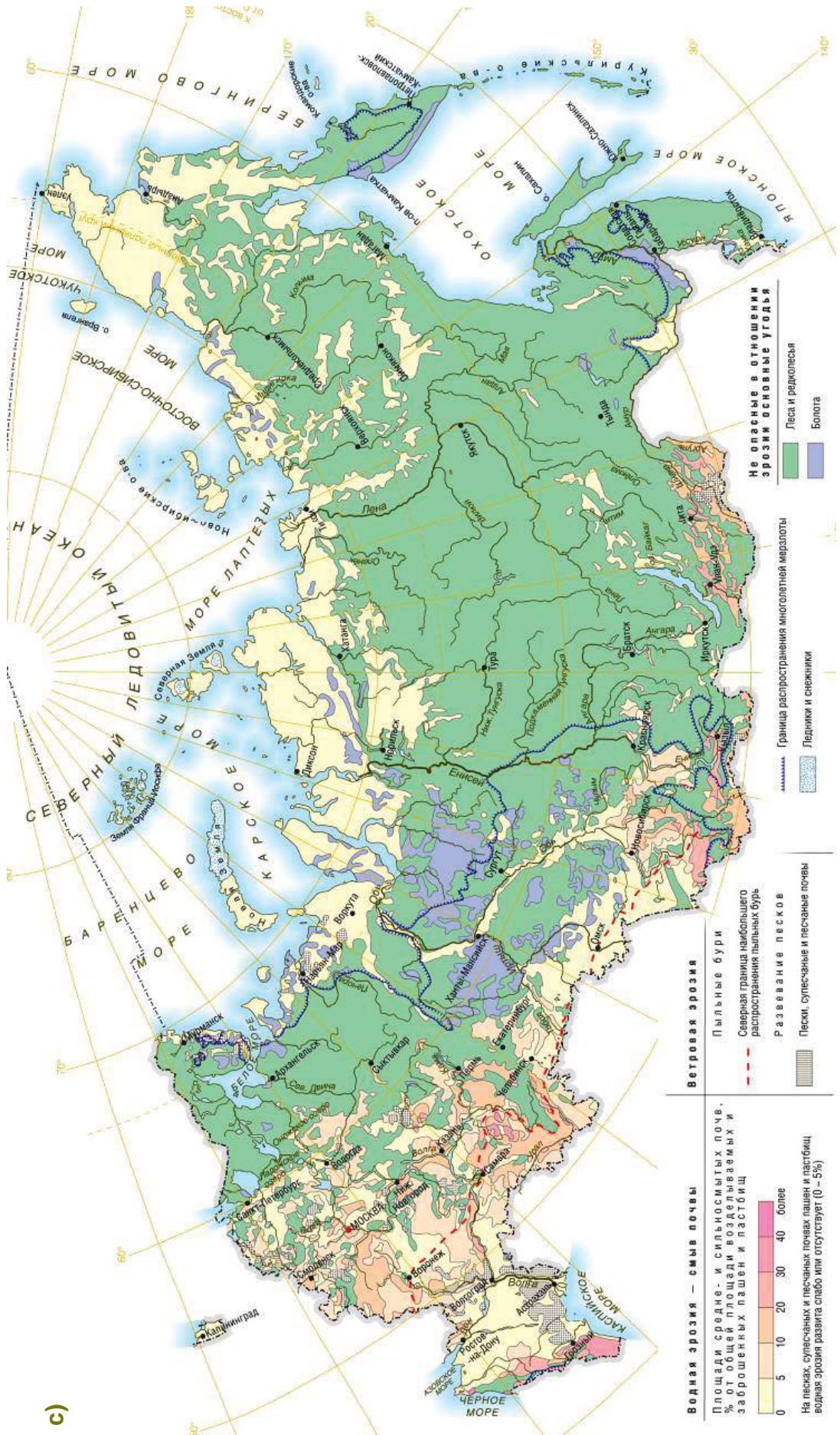
**Diagram 2.2.1.** Indicators for the evaluation of hydro-regulating services:  
*a) forest coverage (% of area covered by forest ecosystems);*  
*b) the consumption of water (m<sup>3</sup>/hectare/year).*

are intact and compose a large portion of the total area, the potential volume of the service is very substantial. In areas where the ecosystems are lacking, this service is practically absent.

This service is most demanded in regions with the most developed agricultural sectors, where the natural ecosystems have been minimally preserved. This is because the bio-productivity formation service largely predicts the productivity of the utilized arable land (diagram 2.3.1 b). The protection of soil from wind and water



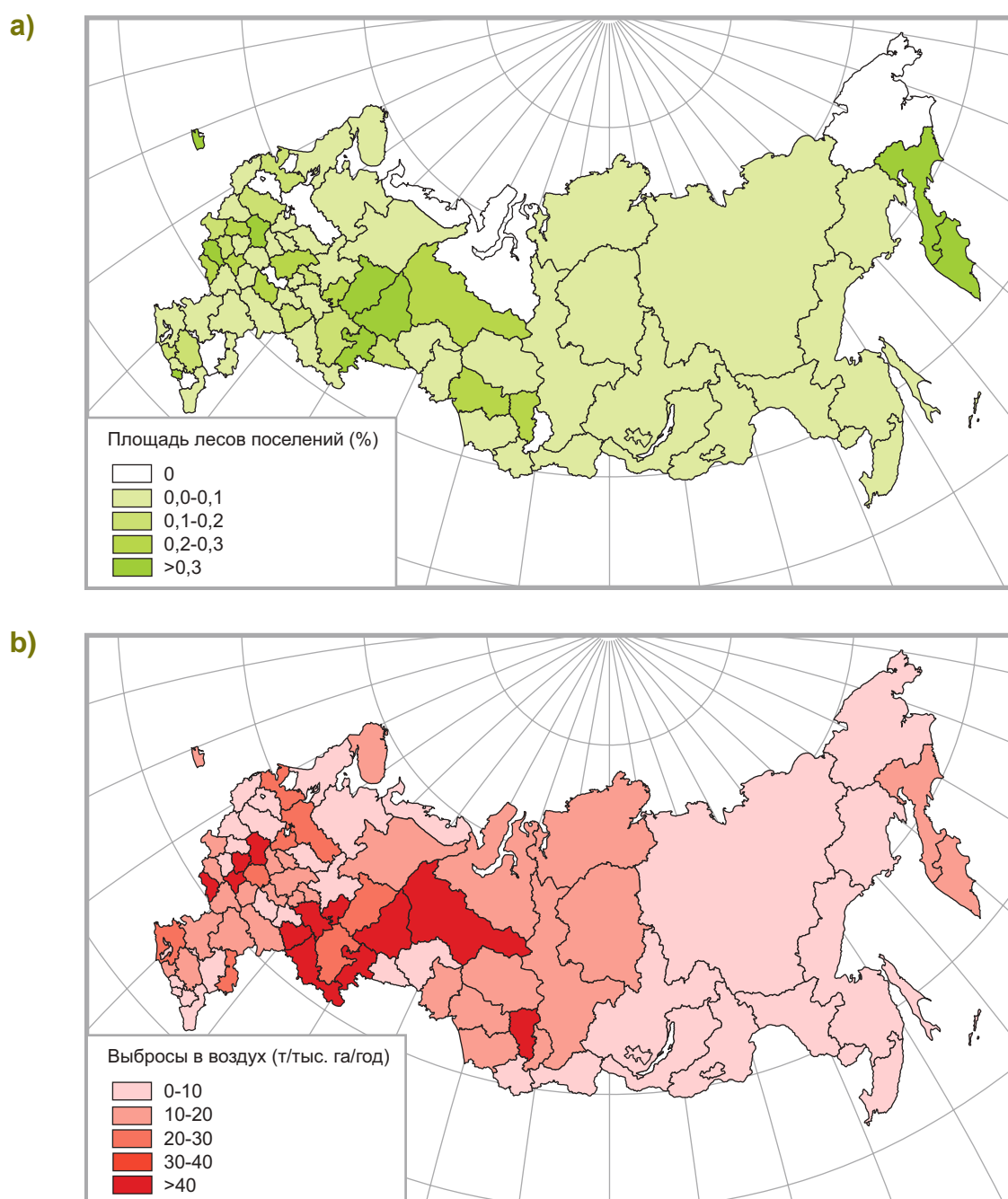
**Diagram 2.3.1.** Indicators for the estimation of the demand for the ecosystem services of the formation and protection of soil layers:  
 a) the portion of land area lacking a vegetative cover;  
 b) agricultural output (rub/hectare/year);  
 c) propensity of soil erosion throughout the country



а)

erosion is most important in erosion-prone regions (diagram 2.3.1 c) which, simultaneously, are the regions most heavily dependent on agriculture.

The thaw-freeze eco-service is most crucial in areas affected by permafrost. The effect of natural ecosystems (most importantly, fauna) on the creation and destruction of frost layers is significant at the local level. The destruction of the vegetative



**Diagram 2.4.1.** Indicators for the estimation of the pollution-mitigating service: a) area of forests b) emissions into the atmosphere from stationary sources (tons/ thousand hectares/year).

cover can lead to the destabilization of frost layers which can be a threat to buildings and other infrastructural projects.

The selected regions encompass almost the entire area of the country. It is for this reason that this group of ecosystem services is extremely important for Russia as it contributes to agricultural productivity and mediates the threat to buildings and infrastructural projects caused by the destabilization of permafrost layers and in mountainous regions.

## **2.4. Services for the detection and processing of pollution**

### ***The detection and processing of pollution by terrestrial ecosystems***

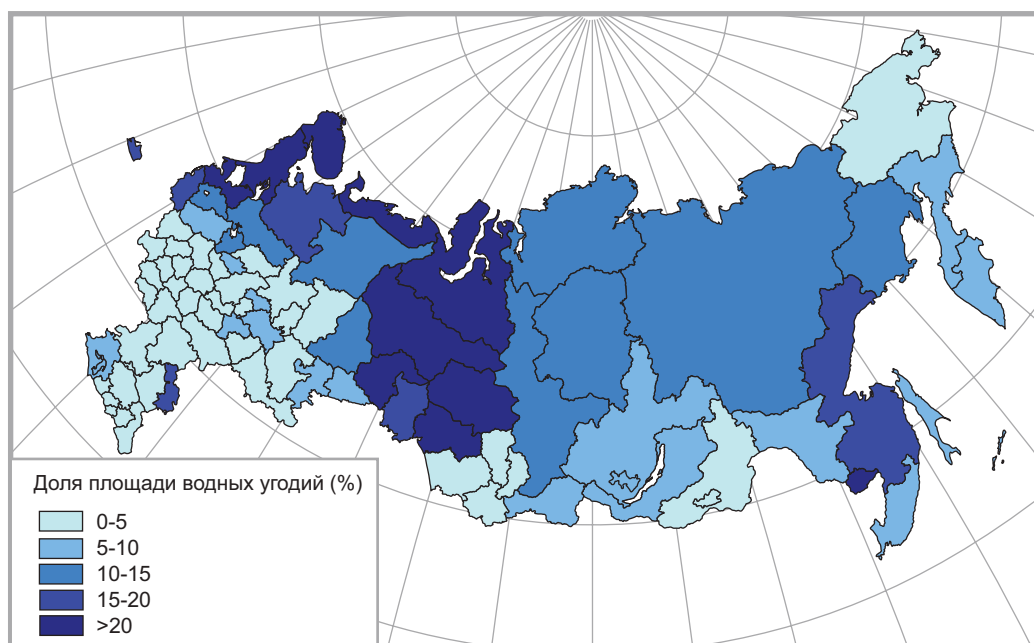
The ecosystem service of air filtration by the vegetative cover is of a local-regional importance. The process “works” by providing clean air for populations in specific urban centers and industrial areas. The service is also important for preventing the polluting of agricultural fields and important aquatic territories.

The importance of the service can be estimated according to the amount of pollution trapped by vegetation. Pollution is best detected and processed by forests. This is why the proportion of land covered by forests is the most important indicator (diagram 2.2.1 a). To make a more precise estimation, one should also consider the amount of vegetative growth found directly within urban centers (diagram 2.4.1 a). The pollution-offsetting services are most important in regions plagued by high air pollution (2.4.1 b).

### ***Biological cleaning of water in natural reservoirs***

This service provides the population and economy with clean water. The service is significant at the regional and local levels.

The potential for the value provided by the service is evaluated according to the area covered by aquatic ecosystems (diagram 2.4.2). The efficiency of the service is determined by the quality of the existing populations of plants and animals. The transformation of aquatic vegetation, plankton, fish and invertebrates leads to the changes in their ability to clean water. Presently, the biggest deterrent to the service is caused by the pollution of water bodies, construction of dams and the invasive species. The rivers and lakes that are located in economically developed regions of Russia are substantially polluted. The construction of dams has transformed most of the large rivers into a chain of stand-still water bodies with varying water levels. The ecosystems of these rivers are significantly disrupted, causing a decrease in



**Diagram 2.4.2.** Indicators for evaluating the service of biological water cleaning: the proportion of land covered by aquatic ecosystems.

their ability to filter/clean the water. The introduction of alien species has also altered the structure and function of water-cleaning capabilities of these ecosystems.

The service is most important in regions with intensive use of water resources (diagram 2.2.1 b).

## 2.5. Services for the regulation of biological processes which are important for economic development and ecological safety

The ecosystem service for the control of forest pests is primarily important for regions where forests are most affected by diseases and pest infestations. Simultaneously, these regions are also the most populated and with the smallest forest areas (diagram 2.5.1 a) which increases the importance of the service.

The ecosystem service for the control of agricultural pests is especially important for agricultural regions (diagram 2.31 b).

The service for the control of pollinator populations is important for regions that grow entomophilous crops (diagram 2.5.1 b). The demand for this service can be evaluated according to the area covered by berry and fruit plantations. The amount of economic benefit derived from the service can also be evaluated by the quantity of honey produced (diagram 2.5.1 c).

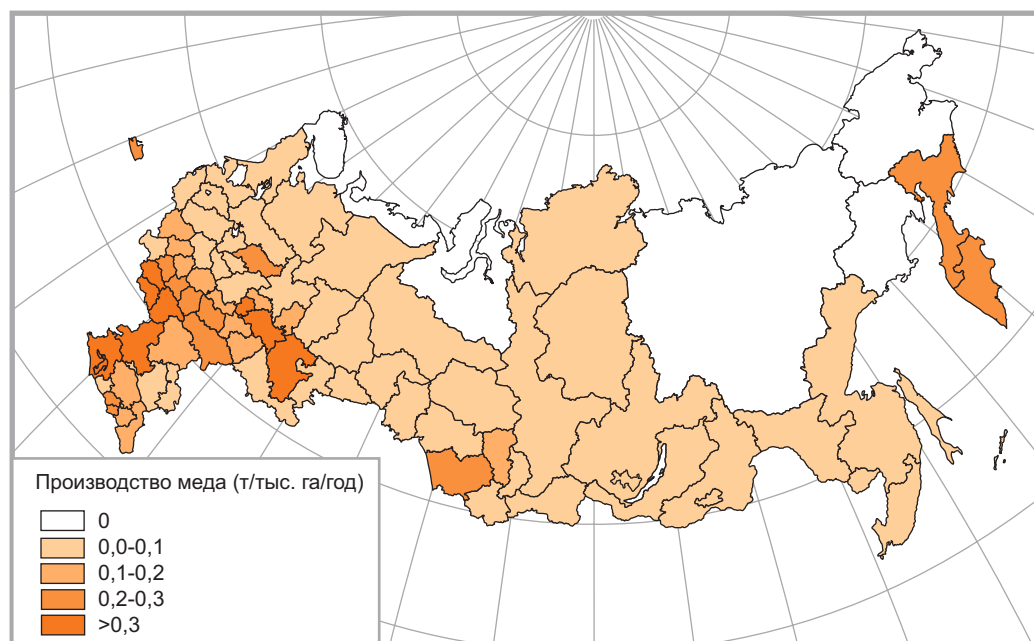
a)



b)



c)

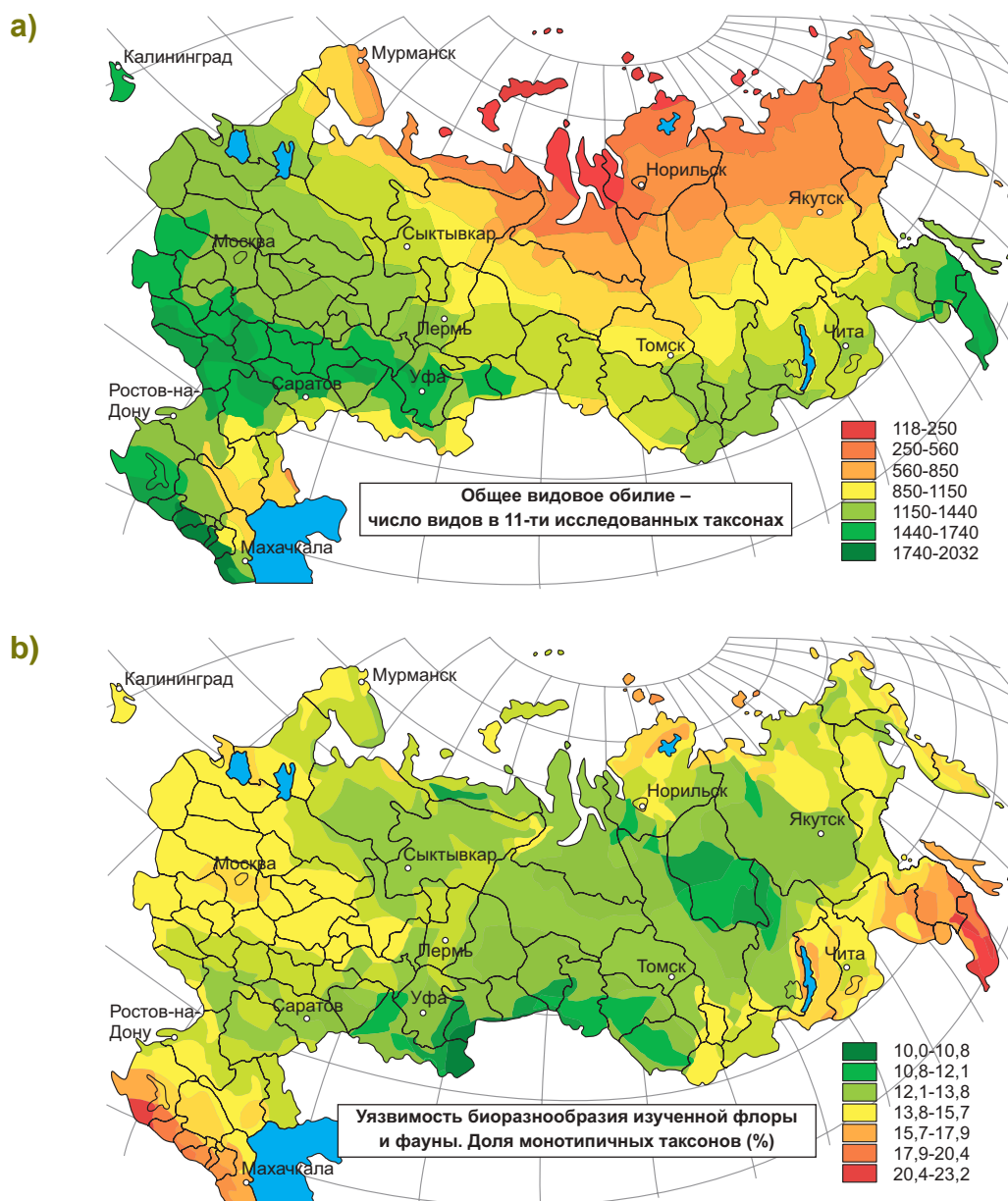


**Diagram 2.5.1.** Indicators for the evaluation of benefits derived from the services promoting economic growth and ecological security: a) density of pest populations and areas of forests affected by disease in May 2012; b) the main type of crops c) the production of honey (tons/thousand hectares/year).

### 3. Informational ecosystem services

#### 3.1. Genetic resources of species and populations

Indicators for the potential benefit of ecosystem services that conserve natural genetic resources can be derived from the diversity of species (diagram 3.1.1 a). These indicators can be enhanced by the data of unique species diversity: the proportion of monotype taxons in regional flora and fauna (diagram 3.1.1 b). The utilization of natural genetic resources for the production of pharmaceutical, cosmetic and oth-

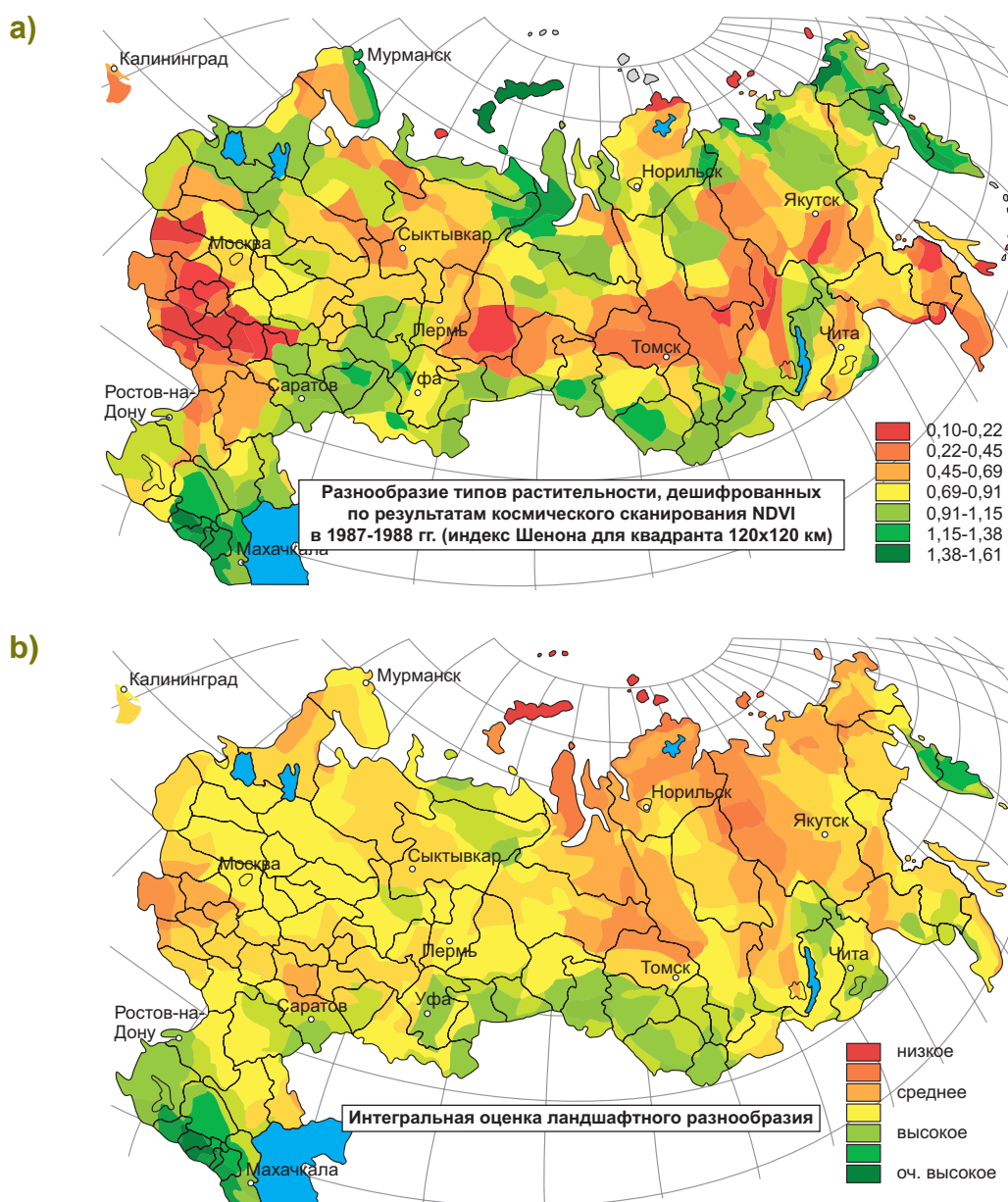


**Diagram 3.1.1.** Indicators for the evaluation of genetic resources of species and populations: a) the biodiversity of 11 selected taxons of vascular plants, fungi, lichen, insects, fish, amphibians, reptiles, birds and mammals b) the proportion of monotype taxons



er biotechnical produce is rapidly growing. The volume of produce received from natural genetic resources is comparable or even exceeds the volume of bioresource trade. However, data is lacking on the commercial use of genetic resources collected in Russian ecosystems. This is why it is currently impossible to evaluate the volume of the service (the extraction of medicinal herbs, mushrooms and other resources has been categorized as the non-timber production of terrestrial ecosystems).

The potential volume of the service is inversely related to the spread of anthropogenic changes throughout the regions. The most human-caused destruction has oc-



**Diagram 3.2.1.** Indicators of the structure and functioning of ecosystems  
a) the diversity of vegetative growth b) landscape diversity

curred in regions that were most biologically diverse. This factor highlights the increased importance of the conservation of ecosystems in economically-developed regions which act as stores of potentially important information for humans.

### 3.2. Information about the structure and functioning of natural systems which can be used by humans

The evaluation of the benefit of ecosystem services for the conservation of information about the structure and functioning of natural systems that can be used by humans can be derived from biological diversity (diagram 3.1.1 a) and the diversity of ecosystems. The latter can be estimated by examining the diversity of vegetative growth and natural landscapes (diagram 3.2.1 a, b).

### 3.3. – 3.4. The esthetic, educational, ethical, spiritual and religious significance of ecosystems

The ecosystem services associated with the esthetic and educational significance of nature are primarily important as components of recreational services. Ecosystem services associated with the esthetic, spiritual and religious significance of nature are the most difficult to evaluate. At the local level, their significance can be estimated according to the number of natural landmarks that have a spiritual signifi-



**Diagram 3.3.1.** Indicators for the evaluation of the religious importance of ecosystems: the importance of cultural traditions

cance (sacred trees, rocks, streams, etc.). At the national level, these can be unique natural sites which play an important role in the national identification of Russians (for example the Baikal Lake). On a global level, the formal evaluation of this service can be done according to the existence of UNESCO World Heritage Sights located within Russia: the Virgin Komi Forests, the Baikal Lake, Kamchatka volcanoes, Sikhote-Alin Nature Reserve, Golden Mountains of Altai, Ubsunur Hollow, Western Caucasus, the Wrangel Island, Putorana Plateau and Lena Pillars.

Circumstantial evidence of the religious importance of ecosystems can be derived from evaluating the prominence of cultural traditions within the various regions (diagram 3.3.1).

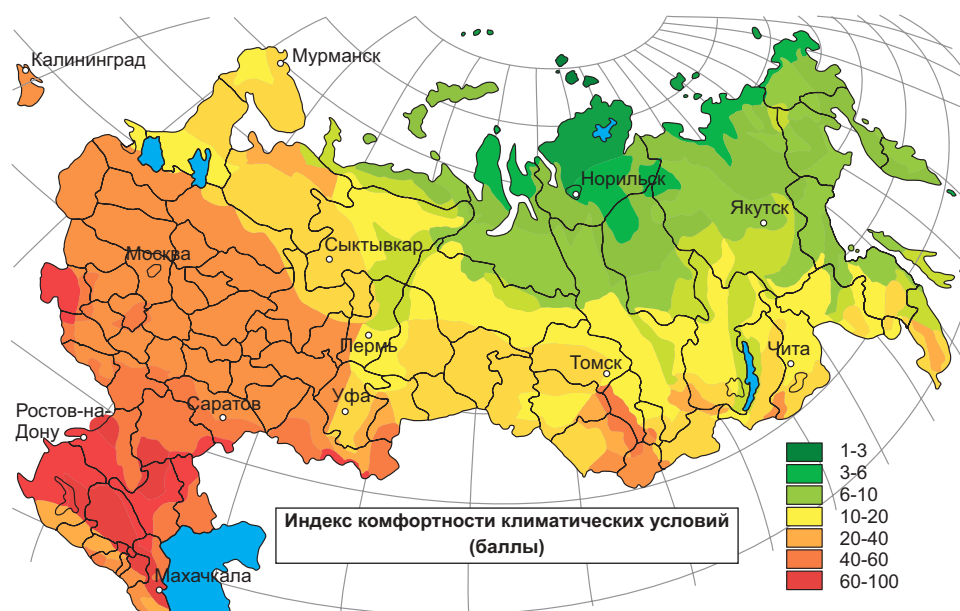
#### **4. Recreational services of ecosystems**

Recreational services are of a multifaceted nature since different types of recreation involve different combinations of the three main sections of ecosystem services. Amongst the *provisioning services*, the most important are the non-timber resources of forests (mushrooms, berries), hunting and fishing resources (recreational and competitive fishing) as well as timber resources for the construction and heating of recreational homes. The *habitat* services ensure a healthy ecological environment and provide specific conditions for holiday resorts. *Informational* services are important for educational recreation, nature watching as well as the creation of attractive landscapes and views.

##### **4.1. – 4.2. The creation of the right natural conditions for near-home leisure, weekend outings and out-of-town activities**

The potential benefit of ecosystem services which create the right natural conditions for near-home leisure, weekend outings and out-of-town activities (including recreational fishing and mushroom/berry-picking trips) is defined by the extent to which the climate provides comfortable conditions (diagram 4.1.1) and the level of ecosystem preservation. The lesser the extent to which the ecosystems are destroyed, the larger the potential of their recreational benefit. The qualities of these services are also decreased by increased levels of pollution.

This group of eco-services is most demanded in regions with high population densities, that is to say, in regions where the risks of anthropogenic effects on the ecosystems are highest.

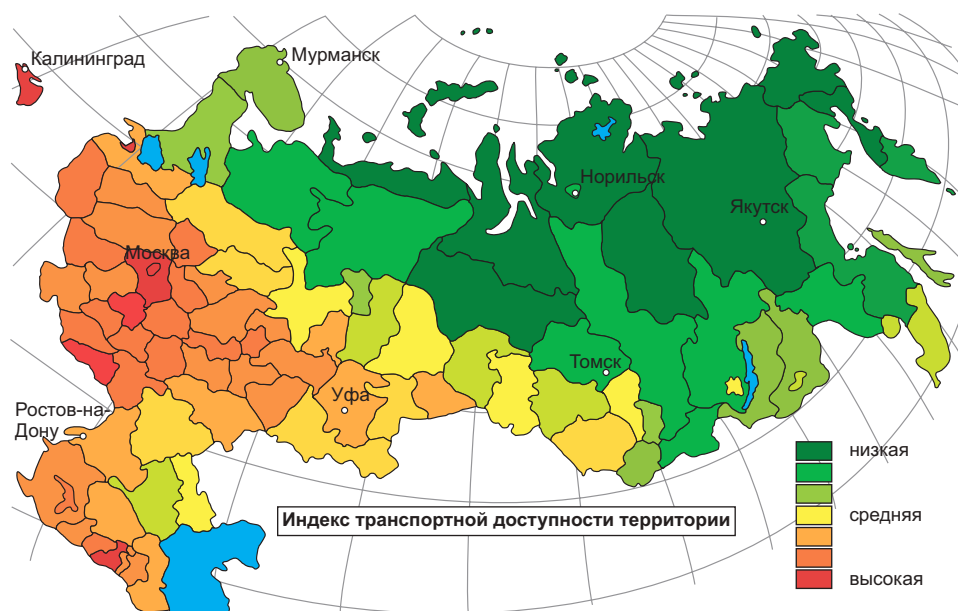


**Diagram 4.1.1.** The potential benefit of ecosystem services which create the right natural conditions for near-home leisure, weekend outings and out-of-town activities: climate-comfort index

#### 4.3 – 4.4. The creation of natural conditions for educational and active nature tourism

The quality of the ecosystem services which create the optimal conditions for educational and active nature-based tourism (including recreational and competitive fishing) are largely determined by the quality of the remaining ecosystems (3.2.1 a) and by landscape diversity. For educational eco-tourism, the most important aspects is the scenery and biological diversity that can be observed by the tourists. For some forms of active tourism, such as mountaineering or rafting, mountainous landscapes play a deciding role. For recreational and competitive fishing/hunting, it is the productive capacities of the aquatic ecosystems (1.4.1) and hunting grounds (1.6.1) that are most important.

The potential for the use of this group of ecosystem services is determined by the transportation accessibility of the region (diagram 4.3.1) and, for a number of different leisure activities, by the presence of adequate infrastructure.



**Diagram 4.3.1.** Indicators for the evaluation of the benefit provided by the eco-services which create the optimal conditions for educational and active nature tourism: transportation accessibility index.

#### 4.5. The creation of the natural conditions for health-related tourism at resorts

The potential benefit of the ecosystem services for the creation of the right conditions for health-related tourism at designated resorts is largely dependent on the comfort of climate conditions (diagram 4.1.1), a lack of pollution, the presence of natural health elements (mineral waters, mud baths, etc.), the presence of water-bodies such as lakes, the presence of mountain slopes for alpine skiing, etc. The potential to use these services is limited by the presence of adequate recreational infrastructure such as quality hotels and restaurants (with appropriate transportation accessibility).

## **Section 2. The importance of biodiversity and ecosystem services for the country and its inhabitants**

Within the structure of the Russian national economic added value, the portion of the industries associated with the use of biological resources and natural ecosystems is around 4%. Agriculture, hunting and forestry make up 3.8% of that number with the fishing industry contributing another 0.2%. The development of these industries in a biologically sustainable manner will allow them to play an increasingly important role within not only the national economy, but also the ecological and social sectors.

The forests of Russia play an exceptionally important biosphere role as they ensure the ecological security of the country and the planet as a whole. Forests occupy almost half of the entire Russian territory. They are largely naturally grown and are a part of the key socio-economic factors that promote the development of the country. The forests also play a crucial habitat role, ensure a favorable ecological situation, increase the wellbeing of the general population and are culturally and esthetically valuable. Forests that pertain to the “exploitative” category make up almost half of the overall forest mass and are largely used for the production of timber for commercial purposes. Russia is the fourth largest producer of timber in the world. It is the timber production industry that currently accounts for the majority of the economic profits derived from Russian forests. However, these forests also hold the potential to be used as large resources of non-timber value. The potential lies in their use for recreational purposes, for northern deer breeding and for other agricultural purposes (such as hay fields, grazing of cattle and bee-breeding). In many regions within the Russian Federation, the collection of nutritional forest resources (berries, mushrooms and nuts) and the collection of medicinal herbs (for commercial purposes) are a chief source of livelihood for rural inhabitants. In many cases, the use of forests for the extraction of non-timber and nutritional resources, medicinal herbs, conducting agricultural activity and for recreational purposes (including hunting) is more profitable than extracting timber.

Russia has inexpensive and reproducible natural meadows and haystack fields. These grazing grounds are only used to 12-15% of their capacity which leaves high amounts of reserves open for potential use. The production of dry, green and juicy fodder in various climatic zones of Russia requires the use of over 17-18 million hectares of pasture, 91 million hectares of natural grazing grounds and 325 million hectares of deer grazing fields. Together, these encompass over 75% of all agricul-

tural lands. These lands are the basis for cattle breeding and are the necessary conditions for the survival of dozens of millions of the nation's inhabitants who continue traditional pasture farming. These are the deer farmers of the North, cattle farmers of the Northern Caucasus (inhabitants of Dagestan, Chechnya, Ingushetia, Kabardino-Balkaria, Adygea and others) and those in the Steppe belt (Buryatia, Kalmykia, etc.). Almost the entire cattle industry of Russia that operates with large cattle is dependent on natural grazing grounds such as steppes and meadows.

The fishing industry of the Russian Federation is an important and multifaceted sector of the economy that includes a wide spectrum of activities, from the modeling of future fish stock sizes to the organization of retail both at home and abroad. The industry currently employs over 5 thousand various organizations and around 360 thousand individuals. The industry plays a crucial role within the economy of the country as a supplier of food, fodder and industrial products (fish meal, cod-liver oil, fodder fish for poultry animals, agar, various biological active ingredients, etc.). From the total amount of animal protein consumed, fish protein composes approximately 10 percent and 25 percent is made up of fish-meat protein combinations. Fishing companies are often formative for communities that are located near the marine coast as they provide the majority of jobs in the region. It is most important for regions of the Russian Far East and the North where fishing is the main source of income for the population. This includes the indigenous populations of the North, Siberia and Russian Far East. Recreational fishing has traditionally been important for the population of the country. The majority of such activities occur at internal bodies of water. There has been a marked increase in the amount of fish extracted from the ecosystems, now sitting at approximately 4.3-4.4 million of tons annually. In 2013, the average Russian consumed 18 kg of fish (in 2012 the number was 22 kg per person). This is a critical indicator as 18-20 kg is sufficient for ensuring a healthy lifestyle.

Hunting is a traditional form of land-use within Russia. There are 228 species of birds and animals in the RF that have been identified as game species. Russia is a world leader in the populations of some of these species. A number of species can only be found in Russia, some of these include the sable, Siberian roe deer, Siberian musk deer, red deer, Manchurian wapiti, the Taymir and Sayan populations of the wild reindeer, Siberian ibex and the wolverine. While from the national economic standpoint hunting is not a significant contribution to the wellbeing of the country, at the local level the socio-economic importance of hunting cannot be overstressed.

Hunting is an integral part of the culture of most of the communities found within the country and is the key source of survival for over 50 indigenous populations of the North, Siberia and Far East. Hunting is also an important source of leisure and sport for urban inhabitants and is an indispensable (often only) form of leisure for rural communities. At present day, there are over 10 million hunters (including their family members) and over 4 thousand hunting organizations. The estimated value of hunting resources is 87 billion rubles and annual revenue received from this activity is estimated at 16.2 billion rubles. There are over 80 thousand individuals across the country who are, in different forms, involved in the hunting industry. Considering that most of these people live in rural areas, there is no alternative source of employment for them.

As has been previously mentioned, Russia takes up the majority of non-tropical Eurasia. Despite the fact that biodiversity indexes of Russia are lower than many of those countries located in the tropic and sub-tropic belts, Russia has one of the most diverse landscapes in the world. On top of that, over 65% of the country territory is either virgin or minimally impacted by anthropogenic pressure which creates optimal ecosystems for the survival of plants and animals. The implementation of the concept of biodiversity within the conservation policies of the country has allowed to methodologically strengthen the argument for the development of territorial protection within the country. Primarily, this is done through the creation of an efficient and representative network of protected areas (PAs) of various protective categories and statuses. The existing PA framework of the Russian Federation includes: 102 governmental natural reserves; 47 national parks; 69 federal zakazniks; 2200 regional-status zakazniks; 7265 natural heritage sights (including 19 of federal status) and 61 regional-status natural parks. On top of that, there have been another 3300 protected areas created of various regional and local protective statuses. The total area of all protected areas is 213 million hectares (including terrestrial ecosystems with internal bodies of water which take up 202 million hectares or 11.8% of the entire area of the country). The creation of such a unique system has been one of the most notable conservation accomplishments of Russia. The most valuable natural complexes are located within the federal protected area system. The system constructed on the base of federal nature reserves, national parks and federal zakazniks which employs 10 thousand full-time professionals. The beginnings of the territorial environmental protection can be traced back to 1916 when the first governmental nature reserve was created. Since then environmental protection has become an entire industry



based on scientific findings, federal and regional legal frameworks as well as an institutionalized structure.

It is important to note the following when evaluating the economic benefits of ecosystem services.

Russian ecosystems play a crucial role in ensuring ecological security, sustainable economic development, improved health conditions and increased quality of life for the entire populations. The role that these ecosystems play in regulating climate change is of a global significance.

The provisioning services ensure the functioning of such important sectors of the economy as forestry, fishing and hunting. In many regions, especially those located the Northern portion of European Russia, Siberia and the Far East, these activities compose a significant portion of the economic activity. The eco-services that ensure the productivity of natural pastures as well as the abundance of fish and game animals are crucial for the traditional lifestyles of indigenous populations of the North, Siberia and Russian Far East. The most important ecosystem services are those that play a habitat-forming role. These provide stable environmental conditions which predetermine the potential economic development of the regions, the health and the general wellbeing of the local populations. The climate and hydro-regulating services are at the basis of a successful agricultural industry. Services that decrease the likelihood and severity of natural cataclysms minimize the damage caused to the local populations and the economy as a whole. Informational services allow for future biotechnological advancements and the development of ecologically-friendly technologies. Recreational services allow for individuals to partake in quality leisure time.

Despite the importance of ecosystem services played by Russian ecosystems both for the country and the planet as a whole, the government currently does not hold as a priority the evaluation and sustenance of national ecosystem services. Presently, only the most profitable provisioning services are accounted for, such as the production of timber, industrial fishing, and extraction of marine produce as well as the hunting of game animals. However, these services are viewed as a result of a functioning industrial stock as opposed to independent ecosystem services. The ecological component is partially accounted for within the framework of “Sustainable Forest-Use Practices”. Fishery and hunting specialists acknowledge the importance of conserving the habitats of industrial stock but otherwise generally

ignore the ecosystem approach when working with biological resources. Habitat-forming, informational and recreational services are currently not systematically evaluated. Only the habitat role of forests is partially accounted for in the current system of working with protected forest areas.

Both international and domestic projects have demonstrated the fact that when evaluating ecosystem services, the importance of habitat services can be several times higher than just the value of the biological resources which can be found within the given ecosystem. For example, existing models demonstrate the fact that the overall value of forest ecosystems can be 2-4 times greater than the market price of the available timber within them.

The value of informational services is comparable to the value of provisioning services. In this manner, the annual sale of the medicinal and cosmetic products made from natural genetic resources is approximately 100 billion USD. This number is equal to the annual worth of the forest and marine resource industries. At the same time, a TEEB model has shown that the market for genetic resources is potentially larger than the one for timber and marine products combined. The annual gain from ecological tourism is measured in dozens of billions of dollars.

In this manner, habitat, informational and recreational ecosystem services are many times as valuable as the immediate economic gains derived from extracting bioresources. Considering the fact that the Russian forestry sector accounts for approximately 1% of GDP, one can evaluate the benefit of all ecosystem services as a few percent of GDP. These estimates are supported by the evaluation of the damage caused by the 2010 forest fires which were largely a result of the loss of hydro-regulating functions of the turf ecosystems located in the European portion of Russia. The total damage from the loss of harvest, forests and property accounted for 1% of the country's GDP and if we are to include the increased mortality as a result of these then the number can be as high as 2% of national GDP. It is important to understand that these financial losses were the result of the deterioration of only one type of ecological service, in a part of the country and in only one year.

The size of the Russian Federation makes it important to accurately evaluate the overall significance of the ecosystem services and to carefully divide the ecosystems into regions for which an accurate accounting, monitoring and evaluation system can be devised. Examples of the expert evaluation of various ecosystem services and functions across various spatial scales are shown in table 2.1.

Table 2.1. The importance of ecosystem services of Russia in various spatial scales

Services	Immediate and local scale	Regional scale	Inter-regional and national scale	International and global scale
<b>1. PROVISIONARY</b>				
1.1. Production of timber	<b>High</b> The collection of firewood and construction material for individual use. Timber is an important resource for a number of individuals and businesses, especially for those located in rural areas	<b>High</b> The availability of timber is a factor that influences the economic efficiency of large timber-processing plants. In a number of regions, the timber-processing industry composes a large portion of governmental budget	<b>Medium</b> The role of the forestry industry in the national economy is important but is significantly less than the oil sector. Forestry composes approximately 1% of the national GDP	<b>High</b> As of 2012, Russia was the world's largest exporter of logs and was second in exporting lumber. Any potential changes in the quantity of wood exported will have large effects on world prices
1.2. Non-timber produce of terrestrial ecosystems	<b>Medium</b> The collection of mushrooms, berries and medicinal herbs is an important source of consumption and revenue for some portions of the population	<b>Low</b> This resource does not play an important role in the regional economies	<b>Low</b> This resource does not play an important role in the national economy	<b>Low</b> This resource plays a small part in the export industry. However, international demand for certain components of the resource (such as wild ginseng) is very high
1.3. Natural pasture and haystack produce	<b>High</b> Provides fodder for the cattle of local populations such as the indigenous peoples of the North	<b>High or medium</b> Significantly impacts the regional development of the cattle and deer-breeding industries	<b>High or medium</b> Impacts the national development of agriculture (the segment of cattle breeding that uses natural pastures)	<b>Low</b> The Russian Federation is a net importer of cattle produce
1.4. Produce of marine ecosystems	<b>High</b> Fish and other marine products are an important resource for local populations in some regions	<b>High</b> Plays an important role in the economies of certain regions	<b>Medium</b> The contribution of the fishing industry to the national economy is substantial but is considerably smaller than of some other economic sectors. Fishing composes less than 1% of the national GDP	<b>Medium</b> The export of marine products from Russia in 2012-2013 composed around 2% of the global catch (the ratio of fish stocks in territorial waters compared to the total global stock)

Services	Immediate and local scale	Regional scale	Inter-regional and national scale	International and global scale
1.5. Produce of freshwater ecosystems	<b>High</b> Fish found in rivers and lakes is an important resource for local populations in some regions	<b>High</b> Plays an important role in the economies of a small number of regions	<b>Medium</b> The contribution of the fishing industry to the national economy is substantial but is considerably smaller than of some other economic sectors. Fishing composes less than 1% of the national GDP	<b>Low or none</b> The export of freshwater fish from Russia does not amount to a significant proportion the global trade (proportions of stock)
1.6. Hunting	<b>Medium</b> An important resource for personal consumption and sale for certain segments of the population	<b>Low</b> This resource does not play a key role in the regional economies	<b>Low</b> This resource does not play a key role in the national economy	<b>Low</b> This resource does not play a key role in the international economy
<b>2. HABITAT</b>				
<b>2.1.Services that regulate the climate and atmosphere</b>				
2.1.1. Regulating the carbon cycle and the flows of greenhouse gases	<b>Low, can become medium in future</b> The use of forest ecosystems and protected areas in local carbon projects	<b>Low, potentially medium in future</b> c are sometimes able to introduce the “carbon” component into regional forest regulations	<b>Low, potentially medium in future</b> Russia’s government pays close attention to the adequate acknowledgement of Russian forests as a key role for combating climate change. At times the authorities allocate special funds to promote extra carbon sequestration by forests	<b>High</b> Russian terrestrial ecosystems are one of the largest storages and up-takers of carbon and play a key role in global climate change mitigation
2.1.2. Biophysical climate regulation	<b>Low</b> The microclimate is dependent on local vegetation and the local climate is influenced by regional ecosystems	<b>Medium or high</b> The service is important for the regulation of precipitation levels and wind strength in continental regions	<b>High</b> The ecosystems spread over the large area of the country play a large role in influencing the physical parameters of ecosystems and climate tendencies	<b>High</b> The ecosystems spread over the large area of the country play a large role in influencing the physical parameters of ecosystems on a global scale

Services	Immediate and local scale	Regional scale	Inter-regional and national scale	International and global scale
2.1.3. Air filtration by natural ecosystems	<b>Low</b> Heavily influences the cleanliness of air in industrial zones and cities	<b>Low</b> Is important for industrially-developed regions	<b>Negligible</b>	<b>Negligible</b>
<b>2.2. Hydrosphere regulating services</b>				
2.2.1. Regulating the hydraulic functions of ecosystems: regulation of water flows, water filtration by terrestrial ecosystems and decreasing the intensity and damage of floods	<b>High</b> The protection of springs, streams and wells. Providing the local population with water	<b>High</b> The regulation of small river flows and lakes which prevents floods. This service is vital in some regions	<b>Medium, potentially high in future</b> The importance of water-providing functions will increase with continued climate and vegetation changes	<b>Medium, potentially high in future</b> The flow of Russia's rivers, especially into the Arctic Ocean, influences ocean water flows, the global climate and the migration routes of many marine biological resources
2.2.2. Biological cleaning of water in natural water systems	<b>High</b> Ensures the quality of water in small ponds and lakes	<b>High</b> Ensures water quality in regionally-important water systems	<b>Medium</b> Influences the quality of water in large rivers and lakes	<b>Medium or low</b> Influences the quality of water in transnational rivers
<b>2.3. Services for the formation and maintenance of soils</b>				
2.3.1. The creation of bio-productive soil	<b>High</b> For pastures	<b>High or medium</b> Important for pastures and haystacks	<b>High or medium</b> Determines the efficiency of the national agriculture industry	<b>Medium</b> Influences national food prices because of fluctuations of Russian export/import activities
2.3.2. Filtration of pollution from soils through biological processes	<b>High</b> Important for areas of local soil pollution	<b>High</b> Important for regions with high levels of soil pollution	<b>Medium</b> Considering the huge land mass of the country, the importance of the service varies regionally	<b>Medium</b> Neutralizes a considerable portion of the pollution that happens on our territory

Services	Immediate and local scale	Regional scale	Inter-regional and national scale	International and global scale
2.3.3. Protection of soil against wind and water erosion. This includes the prevention of sand storms and landslides.	<b>High</b> Determines the resistance of soils. Plays a crucial role for agricultural, mountainous and shoreline ecosystems which can become subject to erosion	<b>High</b> Determines the efficiency of agricultural businesses. Is important for mountainous regions and regions with high population and economic activity densities along shorelines that can become subject to erosion <b>Low</b> Important at the local level and for regions with large areas affected by permafrost	<b>High</b> Determines the efficiency of the national agriculture industry	<b>Medium</b> Prevents dust flows into neighboring countries
2.3.4. Regulation of freeze-thaw processes	<b>High</b> Determines the resistance of permafrost layers which impacts the security of infrastructural projects	<b>Low</b> Important at the local level and for regions with large areas affected by permafrost	<b>Negligible</b>	<b>Not applicable</b>
Controlling the population number of species that are economically important: agricultural pests and pollinators	<b>High</b> The biological control of pests and pollinators heavily influences local agricultural productivity	<b>High</b> Is important for the economies of regions reliant on agriculture and the forest industry	<b>High</b> Influences the efficiency of the forest and agriculture industries	<b>Medium, potentially high in the future</b> Climate change can lead to the spread of pest populations which may come to affect previously unaffected territories
Controlling the populations of species that play an important medicinal role (components of local disease hotbeds)	<b>High</b> Important for areas that are local hotbeds of disease	<b>High</b> Important for areas that are regional hotbeds of disease	<b>Low, potentially high in the future</b> The significance of natural hotbeds of diseases is currently low in the country but can increase with continued climate change	<b>Low</b> The northern nature of Russia's climate makes a foreign invasion of species into our territory more likely than the vice versa

Services	Immediate and local scale	Regional scale	Inter-regional and national scale	International and global scale
<b>3. INFORMATIONAL</b>				
Genetic resources of species and populations. Information about the structure and functioning of natural systems which can be used for the creation of analogs	<b>None</b> There are currently no mechanisms at the local level which allow the use of genetic resources	<b>None</b> There are currently no regional markets for genetic resources	<b>None, potentially high in the future</b> The high potential future importance is determined by the large ecosystem and biological diversity found in Russia	<b>None, potentially high in the future</b> The high potential future importance is determined by the large ecosystem and biological diversity found in Russia
	Esthetic and educational significance of natural ecosystems	<b>Evaluation with the “recreational” service framework</b>		
Esthetic, spiritual and religious meaning of natural systems	<b>Low</b> Nature serves as part of the culture-forming component in rural area	<b>Medium</b> Nature serves as part of the culture-forming component at the regional level	<b>High</b> The importance of nature for the formation of national culture	<b>Low, potentially high in the future</b> World Heritage UNESCO sights. The importance of Russian natural ecosystems for the global community
<b>4. RECREATIONAL</b>				
The creation of the right natural conditions for daily outdoor activities, for weekend outdoor outings such as picnics and for out-of-town recreations such as fishing as well as mushroom and berry picking	<b>High</b> Outdoor recreation near the home is the most important form of leisure for a huge portion of the population	<b>High</b> Important for the health and wellbeing of populations at the regional level	<b>High</b> Important for the health and wellbeing of populations at the national level	<b>None</b>

Services	Immediate and local scale	Regional scale	Inter-regional and national scale	International and global scale
The creation of the right conditions for educational and active outdoor tourism	<p><b>High</b> The contribution of this kind of tourism into the local economies will continue to increase</p>	<p><b>Medium</b> The contribution of this kind of tourism into the regional economies will continue to increase</p>	<p><b>Low</b> The contribution to the national economy is insignificant</p>	<p><b>Low, potentially medium in the future</b> The importance of unique ecosystems found in Russia may increase with the development of proper infrastructure</p>
The creation of the right conditions for restorative leisure at resorts	<p><b>High</b> The economy-forming component of resort-oriented localities</p>	<p><b>Medium</b> The economy-forming component of resort-oriented regions</p>	<p><b>Low, potentially medium in the future</b> Resorts and significant natural sights will continue to play an increasing role in the national economy</p>	<p><b>Low</b> The role of Russian resorts at the global level is small</p>

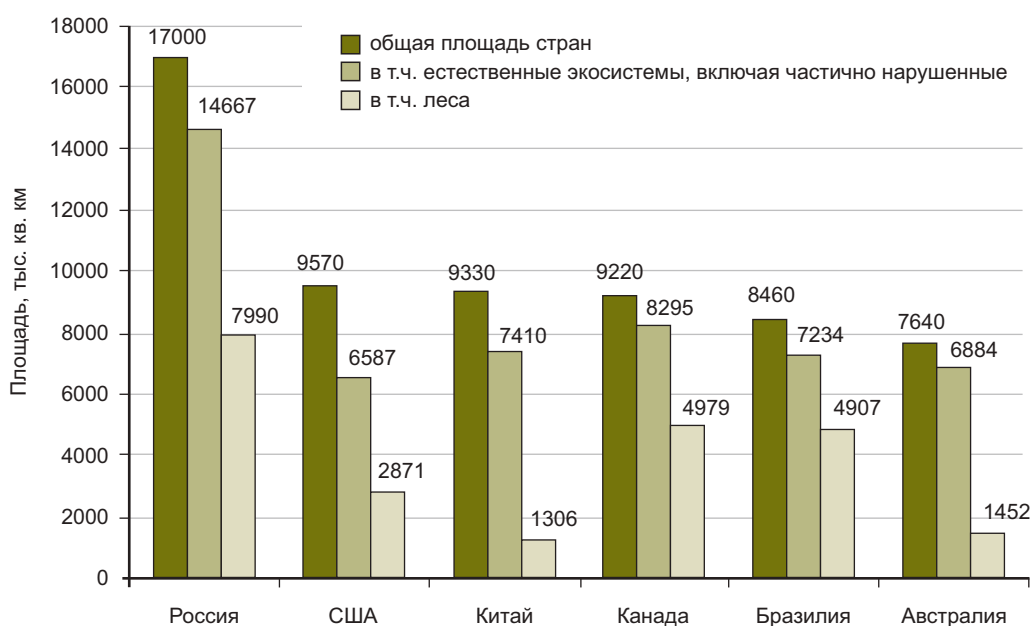


### Section 3. The importance and influence of biodiversity and ecosystem services on a global scale

Russia's ecosystems play a key role in the regulation and conservation of biodiversity as well as in the support of ecosystem services that are important for the entire world.

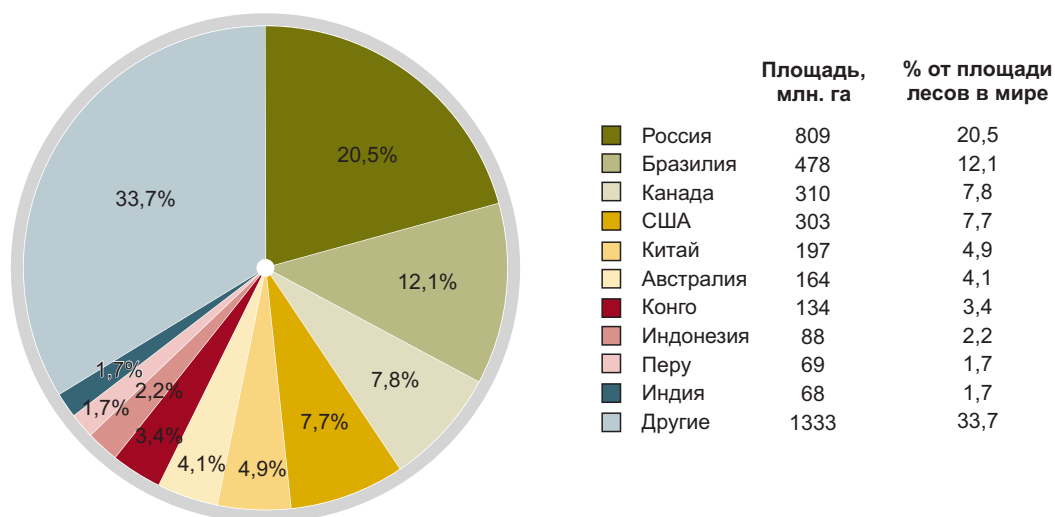
Russia has the largest land area in the world that has not been affected by human activity. The latter composes 60-65% of the entire country's territory and is considerably larger than analogous territories in other world countries such as Brazil, Canada, Australia, USA, etc. (diagram 3.1)

Russia has almost all the types of ecosystems and species biodiversity that are found in the largest continental region of the planet, Northern Eurasia. Some of Russia's ecosystems are unique, containing flora and fauna species which are globally important. The country's protected areas compose approximately 9% of all protected areas in the world. Some of these have been included into the list of World Heritage Sights and have the status of biosphere reserves. As of 2010, Russia contained 25 UNESCO World Heritage Sights, 11 of which were of natural significance and another 15 were culture-oriented.



**Diagram 3.1.** The overall area and proportion of terrestrial ecosystems in the largest countries of the world

Russia has the largest stores of forest resources and holds over 20% of total world forest-covered landmass (diagram 3.2). Russian forests are an important store of carbon, significantly impact the continental and global climate and influence Eurasian water-cycles.



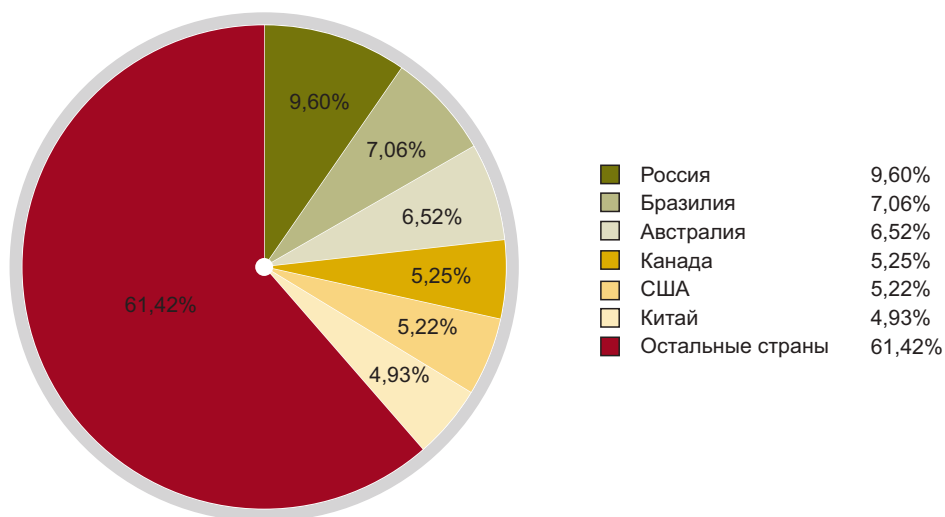
**Diagram 3.2. The ten countries with the largest forest areas**

An important component of Russia’s landscapes is the large area of wetland ecosystems such as marshes, wetlands and peats. These areas compose approximately 60% of all such ecosystems in the northern hemisphere. There is more carbon stored in boreal wetlands, including arctic tundras, than in tropical rainforests. This is because of the comparatively slow decomposition of organic matter than occurs under cold temperatures.

Russian ecosystems play a key role in regulating of the global carbon cycle. There is a substantial portion of world carbon storages located in the soil and vegetation of terrestrial ecosystems of Russia. A large portion of the carbon stores are long-term as they are located in soil, peat and permafrost. Vast amounts of carbon can be found in the Russian arctic shelf. Overall, Russia is a net-storage of carbon.

The hydro-regulating and hydro-protective functions of Russian ecosystems are also of a global significance. Russia has the largest global stores of freshwater resources, composing 20% of total world freshwater stocks. The majority of the stock is found in the unique natural ecosystem of the Baikal Lake. Russia is second to only Brazil in the quantity of river flows.

A comprehensive evaluation of the contribution of various countries to the conservation of biosphere stability which was conducted within the GEF “Biodiversity Conservation in Russia” project, has demonstrated that Russia accounts for almost 10% of the global biosphere stability (diagram 3.3).



**Diagram 3.3.** The contribution of individual countries to the conservation of biotic stability of terrestrial ecosystems (calculated according to data provided by the UN, World resource institute, FAO and the international biological program under the GEF “Biodiversity conservation in Russia”)

## **Section 4. Potential future changes in the sphere of biodiversity use and conservation**

We have created a matrix that demonstrates the potential future changes in the field of biodiversity use and conservation with the according potential consequences. The matrix includes the main biomes of the country and the observed natural negative (climate change) and anthropogenic (changes in industries with and without biodiversity considerations) tendencies (table 4.1).

**Table 4.1. Matrix with long-term (2030) forecasts of changes in Russia's biodiversity considering climate change and industrial expansion tendencies. Includes a comparison between various scenarios of increasing investment into sustainable biodiversity use.**

Biome	Tundra	Taiga	Steppe	Freshwater	Oceans	Океанский шельф
<b>Nature-related anthropogenic trends</b>						
Scenario with severe global warming	The melting of permafrost and the degradation of permafrost landscapes. Increase by a factor of two in the amount of dangerous meteorological occurrences. Increased biodiversity and productivity. Decrease in the number of rare species (such as polar bears).	Increase by a factor of two in the number of dangerous meteorological occurrences. Increased likelihood of fires and melting of permafrost layers. Changes in forest structure, increased invasion of alien species and growing threats to local biodiversity. Overall increase of biodiversity.	Increase in the number of droughts and severity of desertification. Increase by a factor of two in the number of dangerous meteorological occurrences. Increased invasion of alien species and threats to local biodiversity.	Increase by a factor of two in the number of dangerous meteorological occurrences. Increased eutrophication of lakes, changes in river flows, instability in water flows and decrease of local biodiversity.	Increase by a factor of two in the number of dangerous meteorological occurrences. Changes in the thermic, ice, oxygen and salt structures, increased invasion of alien species and decrease of local biodiversity. As a potential development we can see more favorable conditions for the northern sea passage.	Рост числа опасных метеорологических явлений в 2 раза. Изменения термического, ледового и солевого режима, локальное снижение местного биоразнообразия. В перспективе – более благоприятные условия для Северного морского пути
Scenario with slight global warming	Melting of permafrost and increased in thaw processes. Slight increase in the number of dangerous meteorological occurrences. Increased biodiversity and increase in productivity. Slow decrease in the number of rare species (such as polar bears)	Slight increase in the number of dangerous meteorological occurrences. Changes in forest structure, increased invasion of alien species and growing threats to local biodiversity	Slight increase in the number of dangerous meteorological occurrences. Increase in the number of droughts and higher severity of desertification processes. Increased invasions of alien species and threats to local biodiversity.	Slight increase in the number of dangerous meteorological occurrences. Increased eutrophication of lakes, changes in river flows, instability in water flows and decrease of local biodiversity.	Slight increase in the number of dangerous meteorological occurrences. Changes in the thermic, ice, oxygen and salt structures, increased invasion of alien species and decrease of local biodiversity.	Слабый рост числа опасных метеорологических явлений. Медленные изменения термического, ледового и солевого режима, локальное снижение местного биоразнообразия

Biome	Tundra	Taiga	Steppe	Freshwater	Oceans	Океанский шельф
Scenario with active implementation of climate-adaptation measures	Melting of permafrost and increase in thaw processes. Considerable increase in number of dangerous meteorological occurrences. Slight increase in the number of dangerous meteorological occurrences. Slight increase in the number of dangerous meteorological occurrences which cause economic damage. Increased frequency of fires and melting of permafrost. Change in the structure of forests, increased invasions by alien species and threats to local biodiversity. Adaptive measures decrease the likelihood of fires, invasive species are actively combatted, the populations of many rare and endemic species are stable.	Considerable increase in the number of dangerous meteorological occurrences. Slight increase in the number of dangerous meteorological occurrences which cause economic damage. Increased likelihood of fires and melting of permafrost. Change in the structure of forests, increased invasions by alien species and threats to local biodiversity. Adaptive measures decrease the likelihood of fires, invasive species are actively combatted, the populations of many rare and endemic species are stable.	Considerable increase in the number of dangerous meteorological occurrences. Slight increase in the number of dangerous meteorological occurrences which cause economic damage. Increase in the frequency of droughts and severity of desertification processes. Increased species invasion which threaten local biodiversity. Adaptive measures decrease the likelihood of fires, invasive species are actively combatted, the populations of many rare and endemic species are stable.	Considerable increase in the number of dangerous meteorological occurrences. Slight increase in the number of dangerous meteorological occurrences which cause economic damage. Increased eutrophication of lakes, increased species invasion and decrease in local biodiversity. Adaptive measures decrease the damage from floods, dried waterways and their eutrophication. Active actions are taken against invasive species with the populations of most rare and endemic species being stable.	Considerable increase in the number of dangerous meteorological occurrences. Slight increase in the number of dangerous meteorological occurrences which cause economic damage. Changes in the thermic, ice, oxygen and salt structures, increased invasion of alien species and decrease of local biodiversity. Adaptive measures decrease the damage caused by storms, floods and shoreline destruction. Invasive species are actively combatted and the populations of most rare and endemic species remain stable.	Значительный рост числа опасных метеорологических явлений. Незначительный рост числа опасных
<b>Anthropogenic (industrial) tendencies</b>						
Increased gas and oil extraction activities	Increased area of ruined ecosystems and decrease in biodiversity	Increased area of ruined ecosystems and decrease in biodiversity	Decreased biodiversity of the agro-landscape	Increase in pollution and the disturbance factor, decreased diversity of aquatic organisms	Increase in pollution and ecosystem disturbance, destruction of ecosystems, decrease in biodiversity	Разрушение экосистем, снижение биоразнообразия

Biome	Tundra	Taiga	Steppe	Freshwater	Oceans	Океанский шельф
Use of modern gas/oil destruction technologies	Minimizing the extent to which the industry affects biodiversity, restoration of destroyed ecosystems	Minimizing the extent to which the industry affects biodiversity, restoration of destroyed ecosystems	Minimizing the extent to which the industry affects biodiversity, restoration of destroyed ecosystems	Decreasing the risk of pollution and stabilizing biodiversity	Decreasing the risk of pollution and stabilizing biodiversity	Снижение риска загрязнения, стабилизация биоразнообразия
Inability to implement sustainable forest-use practices	–	Increased rate at which forests are ruined (1-2 million hectares annually), growing threats to biodiversity	Destruction of forests within their southern range, continuation of attempts to plant forests in steppes which is detrimental to steppe biodiversity	Decreased water flows, increased frequency of catastrophic water-related occurrences (floods), decreased biodiversity	–	–
Full implementation of sustainable forest-use practices	Protection of forest-tundra ecosystems and forest biodiversity in the northern ecosystems	Restoration of original biodiversity and its continued sustainable use	Creating conditions for the conservation of “island” floodplain forests	Supporting sustainable water use in rivers and lakes	–	–
Mass expansion of transportation infrastructure including the spread of high-speed auto highways	Degradation of biota, landscape fragmentation, decreased biodiversity	Increased landscape fragmentation, deterioration of migration corridors for large mammals, decreased biodiversity	Increased landscape fragmentation, deterioration of migration corridors for large mammals, decreased biodiversity	Erosion of water banks and pollution of waterways near roads	–	–
Development of the Northern Sea Route	Increased transformation of shoreline ecosystems, increased disturbance for aquatic birds and marine arctic mammals	–	–	Transformation of river estuaries that flow into the seas of the Arctic Ocean as well as near old and new ports	Increased transformation of shoreline ecosystems, increased disturbance for aquatic birds and marine arctic mammals. Pollution of marine ecosystems and increased risk of species invasion	Рост фактора беспокойства для морских, водоплавающих и околоводных птиц, морских млекопитающих Арктики. Загрязнение морской среды

Biome	Tundra	Taiga	Steppe	Freshwater	Oceans	Океанский шельф
Continuation of current trends in the development of the agriculture industry	Continued degradation of pastures in the northern portion of European Russia, Yamal Peninsula, Sakha Republic and Chukotka. Decreased biodiversity	Overgrowth of haystacks and pastures by scrub growth, decrease in fauna diversity due to the decrease of non-forest land area, less availability of fodder for migrating birds as well as for carnivorous and herbivore mammals	Sharp decrease in steppe biodiversity, deterioration of the already critical populations of the Saiga antelope, Great bustard and some insect species. Destruction of steppe ecosystems, increased species invasions and proliferation of GM-species	Deterioration of steppe waterways, extinction of certain aquatic organisms due to pollution and eutrophication, increased species invasions	Deteriorated conditions for aquatic organisms of marine shallow waters due to increased pollution of southern rivers (Volga, Don, Kuban, etc.).	–
Mass greening of the agriculture industry, increase in governmental support, ban on growth of GMPs, conservation of species diversity for local farmers	Restoration of the area and productivity of deer-breeding pastures, conservation of genetic diversity of the deer population	Development of “island” animal and plant breeding, support of the agro-landscape and traditional agricultural production in areas of mass bird migrations	Conservation of natural steppe ecosystems within the natural agrolandscape or regional ecological networks aimed at biodiversity conservation. Creation of reserves for local cattle species	Decreased pollution of steppe waterways, decreased risk of species invasion and rare species extinction, development of aquaculture	–	–



The discussed expert evaluations of broad anthropogenic processes and specific industrial anthropogenic tendencies divide future predictions into those that are positive and those that are negative. The pessimistic prognosis assumes that the socio-economic development of Russia will be conducted without a serious consideration of the role of biodiversity and ecosystem services. In the long run, this will decrease both the quality of eco-services and proliferation of biodiversity. The damage will in part occur due to the multifaceted and cumulative effects of such processes. These will manifest themselves differently throughout various ecosystems. According to experts, the most effective counteractions that can be taken towards the pessimistic prognosis lie in the area of combatting climate change, strategic development of the forestry and agriculture industries as well as the long-term ecological development of Russia.

Presently, there are reasons to believe in the possibility of an optimistic scenario of the state of biodiversity within the Russian Federation.

There are a number of factors which promote positive tendencies in the field of sustainable use of natural resources and biodiversity. The first is the implementation of the principles of the governmental policies aimed at the ecological development of the RF until the year 2030 which was ratified by the President of the Russian Federation on April 28 2012 (№ Пп-1102). The second is the long-term government policies in the sphere of protected areas. Others include the protection of rare and endangered species of animals, plants and fungi, implementation of sustainable hunting practices as well as the inclusion of provisions for sustainable biodiversity use in long-term governmental strategies and programs for the development of various industries at both the federal and regional levels.

## **Section 5. The causes and potential consequences of losing biodiversity**

Expert evaluations for the identification of the most important current and future biodiversity threats across various Russian biomes, together with the consequences of such occurrences, were presented as early as the 4<sup>th</sup> National Report on the Conservation of Biodiversity within the Russian Federation (2009). There have been a number of threats prioritized. These are both in the category of climate change as well as anthropogenic factors caused by economic activity.

The current and prospective threats to biodiversity and changes caused to ecosystem services that they cause are identified in the table below (table 5.1).

**Table 5.1 .Current and prospective threats to the biodiversity of Russia and the changes in ecosystem services that they cause**

Threats to biodiversity	Productive	Habitat-forming	Informational and recreational
<p><b>Climatic changes:</b></p> <ul style="list-style-type: none"> <li>-decreased area of marine ice fields,</li> <li>- change in the process of snow accumulation and melting on mountains,</li> <li>- increase in the depth of permafrost thawing and increase of area subject to thermo erosion</li> <li>- proliferation of species into new northern territories,</li> <li>- climatic succession of forest growth (change in the composition of Siberian and Far East forests due to climate aridization)</li> <li>- desertification of steppe ecosystems due to climate aridization, creation of centers of desertification in the south of European Russia, Siberia and Transbaikal regions</li> <li>- increase in the number and intensity of natural disasters (such as storms and floods)</li> <li>- increased probability of pest population explosions that target forestry and agriculture</li> <li>- destabilization of natural disease hotspots</li> </ul>	<p>Changes in the productivity of forests, natural pastures and haystacks due to climatic changes:</p> <ul style="list-style-type: none"> <li>-decrease in the productivity of regions whose climate become more arid;</li> <li>-increase in productivity of northern regions that are well supplied with water resources</li> </ul> <p><b>Likely future developments</b> increased changes at potentially a higher speed</p>	<p>Increased value of ecosystem services when it comes to freeze-thaw processes, soil erosion and landslide prevention. Hydro-regulating processes such as the prevention of floods and the decrease of their severity. Biological services for the population control of pests and control of disease hotspots.</p> <p>Various changes in different regions when it comes to regulating carbon flows:</p> <ul style="list-style-type: none"> <li>-increased carbon sequestration and productivity of certain ecosystems</li> <li>-release of carbon in forests affected by increased pest damage</li> </ul> <p><b>Likely future developments</b> - proliferation of the tendencies listed above - decrease in the hydro-regulating function of ecosystems due to climatic successions in regions with an increasingly arid climate, a factor which may worsen water supply; - substantial changes in the biophysical mechanisms for climate regulation due to changes in the snow cover, vegetative grow over large territories and alterations in the ice fields of the Arctic ocean</p>	<p>Increased climate polarization is a threat for the development of recreational activities</p> <p><b>Likely future developments</b> worsening conditions for outdoor recreation in areas subject to increasingly arid climates</p>

Threats to biodiversity	Productive	Habitat-forming	Informational and recreational
<p><b>Alien species invasions</b></p> <ul style="list-style-type: none"> <li>- increased invasion due to climate change</li> <li>- man-induced species invasion (Red King crab and Far East salmon in the Barents Sea, muskox, etc).</li> </ul>	<p>Decreased productivity of traditional economic activities</p> <p><b>Likely future developments</b></p> <p>Proliferation of the tendencies described above due to climate change</p>	<p>These are difficult to predict due to a lack of knowledge about the changes that occur to the habitat function of ecosystems after the invasion of alien species</p> <p><b>Likely future developments</b></p> <p>These are difficult to predict due to a lack of knowledge about changes that occur to habitat services as a result of changes in the biome</p>	<p>Degradation of informational services due to the destruction of original ecosystem structures.</p> <p>Decrease in the recreational services of ecosystems subject to widespread species invasion</p> <p><b>Likely future developments</b></p> <p>increase in the tendencies described above due to climate change</p>
<p><b>Increase in the frequency of fires and the area affected by them</b></p> <ul style="list-style-type: none"> <li>- increased likelihood of peat and steppe fires due to climate change and unsustainable land use. Increased vulnerability to fires in Siberian and Far East forests:</li> <li>- certain types of forest, meadow and steppe ecosystems will be replaced by their post-fire counterparts</li> </ul>	<p>Decrease in the stock of available timber due to fires</p> <p><b>Likely future developments</b></p> <ul style="list-style-type: none"> <li>- increase in the tendencies described due to climate change</li> </ul>	<p>Degradation of all ecosystem services for a number of years in areas affected by the fires</p> <p><b>Likely future developments</b></p> <ul style="list-style-type: none"> <li>- increase in the tendencies described due to climate change</li> </ul>	<p>Decrease in the value of the services for a number of years following the fire, until full recuperation of the area occurs</p> <p><b>Likely future developments</b></p> <ul style="list-style-type: none"> <li>- increase in the tendencies described due to climate change</li> </ul>
<p><b>Pollution</b></p> <p>Human-induced pollution of the atmosphere, waters, soil and organisms (through industrial activity and mineral extraction). Initial steps in the exploration of the sea shelf for the extraction and transportation of oil and gas</p>	<p>Disappearance of production ecosystem services at areas affected by pollution</p> <p><b>Likely future developments</b></p> <p>the severity of the changes depend on the efficiency of pollution-prevention measures</p>	<p>Increased importance of biological services that filter and clean air, water and soil. Disappearance of habitat services in areas affected by pollution</p> <p><b>Likely future developments</b></p> <p>the severity of the changes depend on the efficiency of pollution-prevention measures</p>	<p>Disappearance of informational and recreational ecosystem services in areas affected by pollution</p> <p><b>Likely future developments</b></p> <p>the severity of the changes depend on the efficiency of pollution-prevention measures</p>

Threats to biodiversity	Productive	Habitat-forming	Informational and recreational
<b>Anthropogenic degradation of fauna</b> Decrease in the area and transformation of remaining virgin forests			Degradation of informational services
Fragmentation of forests in highly populated areas with developed infrastructure		Degradation of habitat services due to a decrease in ecosystem resilience <b>Likely future developments</b> Increase of the described tendencies in areas affected by urbanization (such as New Moscow)	Degradation of informational services <b>Likely future developments</b> strong fragmentation will cause a degradation of recreational services
Centralized areas of ecosystem fragmentation in areas of mineral extraction due to exploration activity, transportation networks, building of roads and pipelines, etc.		Degradation of habitat services due to a decrease in ecosystem resilience <b>Likely future developments</b> negative tendencies can be augmented by climate change	
Degradation of field shelterbelts and protective forests growths (for agricultural, anti-fire, firewood production and cattle grazing purposes)		Loss of habitat services, primarily those responsible for protection against soil erosion and those that regulate water flows <b>Likely future developments</b> the negative consequences can be augmented by climate change	Loss of recreational services <b>Likely future developments</b> the negative consequences can be augmented by climate change
Increased fragmentation of steppe ecosystems. Fragmentation of the remaining steppe landscapes in southern Ural, southern Siberia as well as Transbaikal and Far East regions	Деградация продукционной функции природных пастбищ <b>Likely future developments</b> the negative consequences can be augmented by climate change	Деградация средообразующих услуг, прежде всего, по защите почв от эрозии и водорегулирующих услуг <b>Likely future developments</b> the negative consequences can be augmented by climate change	Деградация информационных услуг <b>Likely future developments</b> the negative consequences can be augmented by climate change

Threats to biodiversity	Productive	Habitat-forming	Informational and recreational
<p>Proliferation of water and wind erosion (hillslope plowing, polluting agricultural practices, unsustainable grazing, etc).</p> <p>Increased human activity in mountainous regions due to mineral extraction, construction of land infrastructure, building of pipelines and increased logging activities (including those done on hillsides)</p> <p><b>Unsustainable development of commercial recreation</b> Damaging impact on forest ecosystems caused by increased mass tourism (Baikal, Altai, Western Caucasus and others). Another damaging factor is the development of recreation activities in protected areas</p> <p><b>Deficiencies of governmental control</b></p>	<p>Degradation of the productive function of natural grazing grounds</p> <p><b>Likely future developments</b> the negative consequences can be augmented by climate change</p>	<p>Degradation of habitat services , especially those responsible for protection against soil erosion and those regulating water flows</p> <p><b>Likely future developments</b> the negative consequences can be augmented by climate change</p> <p>Degradation of habitat services , especially those protecting against soil erosion and landslides as well as those regulating water flows</p> <p><b>Likely future developments</b> future developments will be determined by mountain land-use policies</p> <p>Localized degradation of habitat services</p> <p><b>Likely future developments</b> Future developments will depend on the efficiency of measures aimed at regulating recreational activities</p>	<p>Degradation of recreational services</p> <p><b>Likely future developments</b> future developments will be determined by mountain land-use policies</p> <p>Degradation of informational, recreational and esthetic services due to unsustainable human activity</p> <p><b>Likely future developments</b> Increased recreational burden will destroy the informational services of protected areas</p>
<p>Insufficient representativeness of protected areas and inefficient operation of PAs at the regional and federal levels</p>		<p>Localized degradation of habitat services</p>	<p><b>Likely future developments</b> локальная утрата информационных услуг</p>

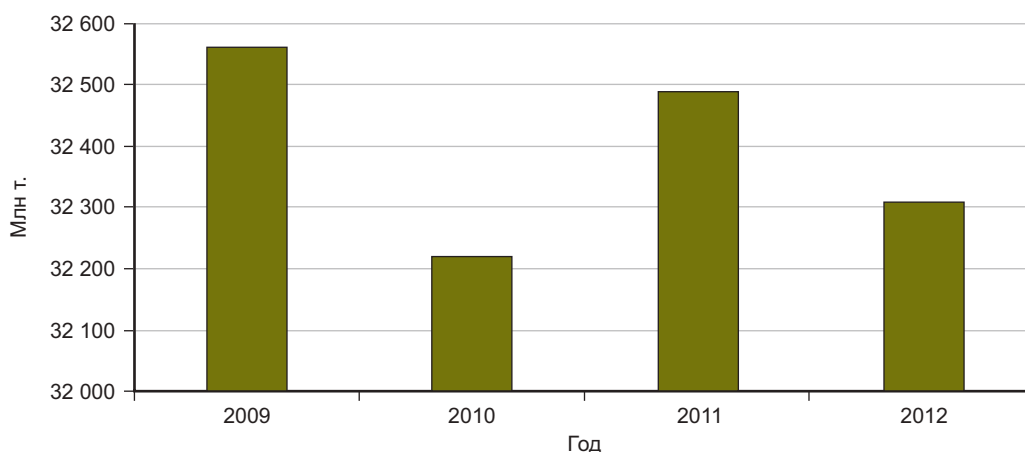
Threats to biodiversity	Productive	Habitat-forming	Informational and recreational
Shortcomings of forestry legal frameworks and implementation practices aimed in shifting to sustainable forest-use because of an over-emphasis on economic gain	If the maximum sustainable yield is respected the production function remain stable	Degradation of water and climate habitat ecosystem services in areas with extensive logging activities <b>Likely future developments</b> negative consequences can be augmented due to climate change	Degradation of informational and recreational services in high-intensity logging areas <b>Likely future developments</b> negative consequences can be augmented by climate change
Illegal logging and extraction of biological resources	Degradation of provisioning services	Degradation of habitat services as result of illegal logging activities <b>Likely future developments</b> negative consequences can be augmented by climate change	
Lack of a system for monitoring ecosystem services and biodiversity	Inability to efficiently manage natural systems and their functions due to a lack of data about their state and changes that occur <b>Likely future developments</b> the lack of a monitoring system will lead to a further degradation of biodiversity and ecosystem services		
Lack of economic incentives to preserve biodiversity and ecosystem services	Inability to efficiently conserve biodiversity and support the development of ecosystem services <b>Likely future developments</b> A lack of economic incentives to preserve biodiversity and ecosystem services will lead to their further degradation		

Climate change as a threat to biodiversity was not separately discussed at the 5<sup>th</sup> National Panel for the Preservation of Biodiversity in the Russian Federation (2014). The following direct and indirect threats to Russia's biodiversity have been organized in order of priority for the protection of the nation's biota and ecosystem diversity.

**1. The destruction of fauna and flora habitats** during the industrialization of previously wild ecosystems (for example during the exploration of gas and oil reserves in the Arctic zone). For tundra and forest-tundra ecosystems, experts have evaluated that for every 1-2 USD of investment, approximately 1 square meter of ecosystems is destroyed. At the same time, the price of ecological restoration of 1 square meter of tundra fluctuates between 1 and 7 US dollars (depending on whether the area needs to be cleansed of petrol and/or detoxified). The rate of ecosystem destruction continues to be higher than the rates of their restoration both through human activity and by natural processes (some estimates claim that this discrepancy is as high as hundreds of thousands of hectares per year). This gap does not seem to be closing through the creation of new protected areas and national parks. Regions that have historically seen high rates of economic activity experience a growing anthropogenic burden on their natural ecosystems. These ecological threats lead to the inability of rare and endangered species of plants and animals to withstand the increasing anthropogenic burden. The most vulnerable of these are the Orchidaceae family, of which 66 species are now on the IUCN Red List of the Russian Federation (there are a total of 130 species found in Russia). An analysis of 41 Orchidaceae species found in central Russia indicates a substantial deterioration in their position and a decrease in their habitat range.

**2. Chemical pollution of the environment.** According to data collected from multi-year monitoring efforts by the Federal Service for Hydrometeorology and Environmental Monitoring of Russia (information taken from the reports on environmental pollution within the Russian Federation in the 2010-2013 period), the background concentration of anthropogenic pollutants within Central Russia has remained low. This information concerns the concentration of heavy metals, sulfur and nitrogen dioxides, polycyclic aromatic hydrocarbons and others. At the same time, the decrease in observed pollutants observed since the 1990's (as a result of a fall in industrial production) has halted and some areas are experiencing an increase in pollutants (diagram 5.1). This is true not only around direct sources of pollutants as well





**Diagram 5.1.** Emission of pollutants into the atmosphere during the 2009-2012 period within the Russian Federation by both stationary and mobile sources in millions of tons (data provided by Rosstat and Rosprirodnadzor)

as for overall higher levels of background pollution in the environment (in the air, soil and waterways)

These factors have negative impacts on the state of populations of some species of plants and animals and impact their reproductive capabilities. Increases in air pollution cause the most threat to biodiversity near such industrial centers such as Ekaterinburg, Norilsk, Irkutsk, Krasnoyarsk, Kemerovo, Novosibirsk and others. The contamination of soils by pesticides affects the state of biodiversity in the agricultural landscapes of Central, Volga and Southern Federal Districts. High pollution levels of rivers and lakes is also observed at the Kola Peninsula, the Moscow, Chelyabinsk and Sverdlovsk regions as well as in the basins of the Northern Dvina, Ob, Angara and lower Volga rivers.

**3. The fragmentation of landscapes and isolation of natural ecosystems**, especially tundras and forest-tundras in areas of gas and oil extraction. This threat has considerably increased in the past years due to the exploration of new oil fields, the creation of dense infrastructure for the transportation of hydrocarbons, the construction of roads and railways as well as the unregulated movements of tracked carriers. The process of ecosystem isolation and decrease of the size of remaining steppe ecosystems occurs due to a new wave of ploughing of previously virgin steppe ecosystems, due to unsustainable cattle grazing, unregulated transport activities and the increased frequency of steppe fires. This process can be observed throughout the entire steppe region of European Russia and Western Siberia. The effect of ecosystem isolation on biodiversity has not been well researched and the negative impact can be seen in the steppe regions as well as urbanized territories.

**4. The transformation of traditional agricultural landscapes** of temperate and southern taiga regions, forest-steppes and mixed forests. The process occurs due to the continued abandonment of plough lands, haystacks and pastures which are overgrown by forests and undergrowth which are low in biodiversity and fodder qualities for migrating animals. A similar occurrence can be observed at middle and high-range mountains of the Caucasus due to a decline in agricultural activity, decreased cattle populations, abandonment of previously ploughed areas and the overgrowth by forests and shrubs of the lower border of the sub-alpine zone. The decrease in landscape diversity and its fodder qualities leads to a decrease in biodiversity and even to the disappearance of certain plant and animal species which require non-forest ecosystems. The most common cases are species that require meadows, both those on found on plains as well as alpine and subalpine mountainous meadows. Due to a recent increase in agricultural activities, the importance of this threat will decrease.

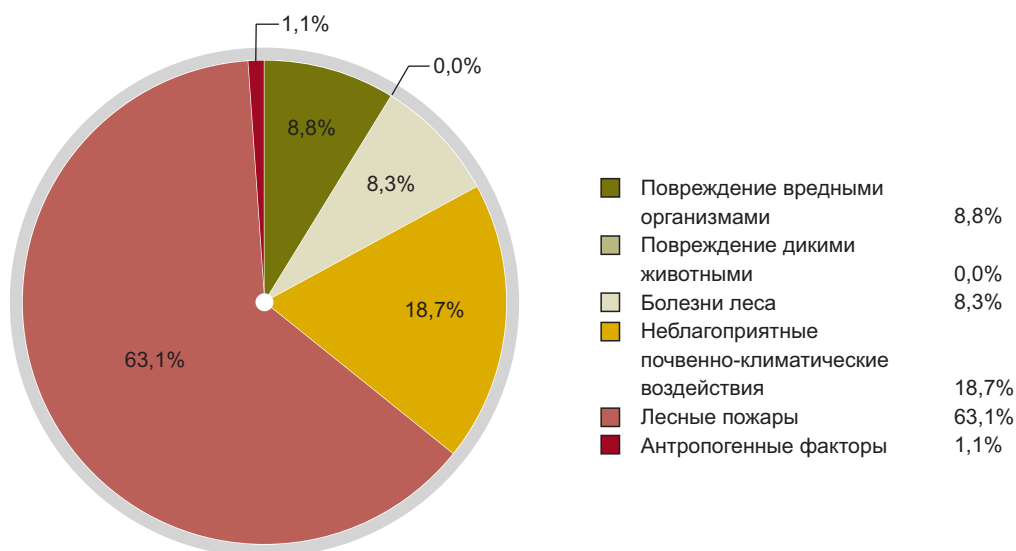
**5. Threat of transformation of indigenous biodiversity due to invasive species.** This threat is most relevant for the underwater landscapes of the Azov Sea, primarily in the regions of the Kerch straight and near the coastal waters of the Black Sea, in the shallow-water landscapes of the Volga delta and Northern Caspian region as well as in the Volga River basin and its cascade of water storages. The latter region has already been affected by a substantial transformation of its freshwater organisms: the benthos, plankton and fish fauna. Regions of Northern Caucasus, Russia Far East and the steppe zones of European Russia have, over the past decades, all become an arena for the invasion alien species. This includes species that cause both economic damage (decrease in ecosystem productivity, increase in disease hotspots, spread of weeds and allergens) and ecological damage (degradation of ecosystems, pushing out of indigenous populations). Some of Russia's protected areas are composed as much as 20-25% by foreign fauna species. At the same time, some invasive species play an active role as game animals (muskrat, raccoon dog, American mink and others), as marine produce (Far East salmon and Red king crab in the Barents Sea), as medicinal herbs in central Russia, etc.

**6. Threats to biodiversity associated with high levels of poaching and overexploitation of natural resources.** Compared to other ecological problems, poaching remains to be a serious threat to biological diversity. Poaching and the illegal extraction of rare and endangered flora and fauna species remain to be high because of the economic attractiveness that some of these species present to those engaged in illegal business

activities (for example the tiger, leopard, snow leopard, large falconiforme species, sturgeons, early-blooming as well as pretty flowers such as wild species of galathus, cyclamen, Orchidaceae and others). Illegal fishing remains to be a serious negative factor that influences the development of the fishing industry. This is true not only for interior waters but also in adjacent seas, especially in the Far East region. Poaching is one of the main factors that impede the growth of populations of the most important game species. The level of poaching for a number of important game species exceeds the levels of legal economic activity and is evaluated to have an annual worth of 18 billion rubles. In some cases, natural and anthropogenic factors can operate together causing a synergetic effect. In this manner, the lack of Saiga antelope population growth is caused by the fact that the annual death rate of the animals is equal or greater than the population birth rates. There a number of factors that contribute to the high death rates of the Saiga population of which poaching is the most important. However, the unfavorable environmental conditions during crucial periods for population (for example during the birth periods) and high wolf populations also play a substantial role in influencing population numbers. Prior to 2013 there was an observed tendencies for wild boar population restoration. However, this trend has reversed in many of the regions of European Russia due to the efforts conducted in many of the country's regions to prevent the spread of the African swine fever virus. The observed decrease of ungulate populations which serve as prey for a number of rare and carnivorous species (such as tigers, leopards and snow leopards) endangers their survival.

**7. Threats to forest biodiversity due to forest fires and other anthropogenic factors as well as due to damage caused by pests and diseases.** This phenomenon is most dangerous for the regions of Northern European Russia, southern Siberia and the Far East where there are large areas of virgin forests. Despite the fact that the area affected by fires in 2013 decreased by a factor of 2.4 compared to the same indicators in 2010, fires remain to be the main cause of forest damage within the Russian Federation. Fires cause just below 2/3 of all forest destruction within the country (diagram 5.2).

The positive role of forest fires in their ability to positively influence biodiversity by creating a higher diversity of habitats is minimal in the northern regions which are affected by permafrost. On the contrary, fires that occur within the region prevent forests from attaining optimal maturation stages and from restoring to their pre-fire condition. In recent years, the European spruce bark beetle and the *Polygraphus*



**Diagram 5.2. Causes of forest destruction**

*poligruhus* cause severe damage to forests across the entire country. They affect oak, pine, fir and other coniferous species. At times, their presence greatly damages the forest canopy, causing, amongst other things, the death of pine populations.

In this manner, despite a lack of a systematic evaluation of biodiversity threats in this field, expert evaluations allow us to claim that no considerable positive changes have occurred in mitigating the problem. The threats, present in different degrees within various ecosystems, lead to their degradation as a whole as well as their components and ecosystem services. A lack of efforts to mitigate this threat allows us to predict that these factors will have a negative impact on the future state of biodiversity.

Currently, the existing and future threats to biodiversity do not considerably impact the socio-economic situation of the country's population. This is likely due to the fact that there is a time discrepancy between human actions and effects on biodiversity, because of an overall underestimation of the value of biodiversity as well as a lack of understanding of the threshold nature of biodiversity threats.

If we are to evaluate the underlying causes of biodiversity threat, it is clear that they stem from human economic activity and the unsustainable practices in various industries which do not adequately take into account biodiversity problems. The economic sectors that are most closely related to biodiversity threat, are those of natural resource-use such as mineral and water extraction, forestry and agriculture as well as fishing and hunting.

## **Section 6. Governmental administration and legal framework in the sphere of biodiversity conservation**

Russia's specificity, apart from its large territory (it is the largest country in the world) and the good condition of most of its ecosystems (65% of Russia's territory is composed of virgin or healthy ecosystems), is the country's federal political organization. The relative independence of Russia's regions allows them to independently approach the problems of sustainable biodiversity use and to establish the optimal level of centralization in these spheres of activity. Previously, Russia was composed of 89 federal entities each of which could be compared to a European country in terms of size. Over the past few years, referendums held in 5 of these entities have led to some of them to merge together, currently leaving 83 such formations. The republic of Crimea and the Federal city of Sevastopol have also been added to the Federal composition of the country.

The division amongst the spheres of responsibility amongst the Federal Government and the Entity authorities is largely defined by the Constitution of the Russian Federation and is also detailed in the Federal law on the "General Principles of the Organization of Legal and Executive Competencies of the Entities of the Russian Federation". The competencies of local regulatory bodies are included in the Federal system and is regulated by a separate Federal law on "Local Self-Governance". However, the federal entities do not possess real power in the sphere of sustainable biodiversity use.

The executive power at the federal level lies within the President of the Russian Federation, the Government of the Russian Federation and the federal agencies that they establish. The authority of the latter is determined according to their accountability to either the President or the Government of the Russian Federation. At the level of federal entities of the Russian Federation, the executive power lies in the highest official of the entity (the head of the highest executive body of the federal entity), the Administration or Government of the federal entity as well as in the executive body of the entity.

Since 2004, according to the Presidential decree № 314 (March 9 2004) "On the System and Structure of Federal Executive Bodies", a new system of federal executive bodies has been formed. The law includes three types of executive bodies: ministries (tasked with the creation and implementation of governmental policies and legal regulations in specific spheres of activity), governmental bodies (respon-

sible for certain types of governmental control) and governmental agencies (control of government property). Most governmental bodies and agencies are administered by the ministries and have independent regional branches. However, a number of them are directly responsible to the Government of the Russian Federation or to the President.

**The federal executive body responsible for environmental protection and for the implementation of Russia's commitment to the Convention on biological diversity is the Ministry of natural resources and environment of the Russian Federation.**

The following are under the jurisdiction of the ministry: the Federal Service for the Supervision of Natural Resources, Federal Service for Hydrometeorology and Environment Monitoring, Federal Agency of Water Resources, Federal Subsoil Resource Management Agency and the Federal Forestry Agency. It is important to note that the conservation and sustainable use of biodiversity is a cross-sector problem which must be approached by other federal executive bodies as well. For example, the Ministry of Agriculture of the Russian Federation is not only responsible for the sustainable development of agriculture and agricultural lands but also must also ensure sustainable fishing practices and the conservation of aquatic biological resources. Another example is the Ministry of Education and Science of the RF that is responsible for policies concerning science-related policies and education.

The second factor that should be noted is that the majority of the responsibility for the conservation and sustainable use of wildlife, fishing in internal waters, hunting and game species conservation as well as aquatic and forest ecosystem management lies within the separate governmental entities of the Russian Federation. This is a positive factor according to the Convention on Biological Diversity which promotes decentralization in the sphere of biodiversity conservation. The latter allows for timely and optimal administrative decisions to be made when it comes to land-use and creates a direct link between governmental bodies and the local state of the environment.

Russia has a legal framework targeting environmental protection and natural resource use, including the conservation of biodiversity. The following Federal bills have been signed and are being implemented: "On Environmental Protection", "On Protected Areas", "On Ecological Expert Appraisals", "On Wildlife", "On Fishing and Conservation of Aquatic Bioresources", "On Aquaculture", "On Hunting, Game Species Conservation and Enactment of Alterations to Specific

Legal Bills of the Russian Federation” as well as the Forest and Aquatic Codes of the Russian Federation and other federal laws. An important institution influencing territorial development is the signed City Building Code of the Russian Federation which includes provisions for integrated project planning at all administrative levels. The code takes into account the social, economic, ecological and other factors and their influence on sustainable land development.

The legal framework in this sphere is constantly improved so as to create and implement efficient economic measures which would adequately take into account the current socio-economic situation of the country and the most advanced environmental protection practices.

**In this manner, the existing legal framework and governmental control system in the field of environmental protection allow to overcome existing problems in the sphere of sustainable biodiversity use in accordance to national priorities and capabilities.**

At the same time, the legal framework targeting environmental protection and sustainable natural resource-use is not codified in the field of biodiversity. The federal law “On Environmental Protection” contains definitions of the following terms: “the environment”, “components of the environment”, «anthropogenic objects», «natural ecosystem» «ecological natural systems» and “natural landscape” which correspond to definitions provided in the Convention on Biological Diversity. However, the framework does not contain detailed regulating descriptions of these definitions. The only exception are the in-depth definitions of protected areas, rare and endangered species of plants animals and other organisms, the protection of urban and rural environmental protection and the protection of soils.

According to appendix 3 of the federal bill from January 10 2002 (№ 7-Φ3) “On Environmental Protection”, the conservation of biological diversity is only of several key principles of environmental protection. No special definitions, descriptions or implementation practices of this principle are included in the bill. It is in part because of this fact that the development of protected areas as well as the protection of wildlife species of plants, animals and fungi, especially those that are rare or endangered, remain to be the main efforts taken for the conservation of biodiversity.

At the same time, the monitoring and definitions of biodiversity are included into governmental strategic planning programs. The latter are developed within the framework of governmental forecasting and territorial planning which are done to

determine and target national priorities for the socio-economic development of the country and the strengthening of national security at both the medium (up to 6 years) and long term (over 6 years) scale.

An important document that determines the prospective development of Russia is the Concept for the Long-term Development of the Russian Federation Until the Year 2020 which was enacted according to the decree of the Government of the Russian Federation on November 17 2008 (№ 1662-p.). The document asserts the fact that environmental protection and the sustainable use of natural resources are one of the key social public goods. The document states that they create the conditions for the long-term socio-economic development of future generations. The role of the government, as a regulatory body within the sphere of public relations, in environmental protection is amongst its most important functions, alongside with national defense and the insurance of law and order. The goal of governmental ecological policies is the improvement of the ecological factors that influence the life of the population, the creation of a balanced ecologically-oriented model of economic development and the promotion of ecologically-component industrial production. The successful implementation of Russia's ecological development program is a crucial contribution of the country to the global biosphere potential and to the preservation of a global ecological balance.

Along with the Concept described above the following have been enacted: the Strategy for the Innovative Development of the Russian Federation Until the Year 2020 (enacted by the Government of the Russian Federation on December 8 2010, № 2227-p), the Strategy for National Security of the Russian Federation Until the Year 2020 (ratified by the Presidential decree of May 12 2009, № 2227-p) and the Strategy for Governmental National Policies of the Russian Federation Until the Year 2020 (enacted by the Presidential decree of December 19 2012, № 1666).

The Ecological Doctrine of the Russian Federation, approved by the Governmental Decree of August 31 2002 (№ 1225-p) and by the President of the Russian Federation on April 28 2012 (№ Пп-1102), includes the Principles of Governmental Policies in the Sphere of Ecological Development of the Russian Federation Until the Year 2030. The latter is a key document which outlines the main areas on which environmental protection efforts will concentrate in the long term. The key goals of the government in this area is to their socio-economic goals while ensuring ecologically-oriented economic development, preservation of a positive ecological situation, conservation of biodiversity and natural resources that would satisfy the



needs of both current and future generations, the provision of every individual's right to a positive environmental situation, the strengthening of the legal framework targeting environmental protection and the provision of ecological security. The document outlines the key goals of governmental policies in the sphere of ecology. These are conceptually similar to the five strategic goals outlined by the Strategic Plan in the Field of Conservation and Sustainable Use of Biodiversity in the period 2011-2020, ratified during the members of tenth Conference of the Convention on Biological Diversity. The renewed system of ecological regulation has become the new institutional basis of governmental ecological policy.

The following have been signed into action by the Government of the Russian Federation to promote the goals listed above: the Concept for the Development of Protected Areas of Federal Significance Until the Year 2020 (decree from December 22 2011, № 2322-p) and the Strategy for the Conservation of Rare and Endangered Species of Animals, Plants and Fungi Until the 2030 (decree of the Government of the Russian Federation from February 17 2014 № 212-p). The President of the Russian Federation has also ordered for the preparation of the Strategy of Ecological Security of the Russian Federation.

The past years have seen the creation of a large number of Strategies and national programs aimed at the development of specific sectors of the economy: agriculture, fishing, forestry, hunting, the transport and energy sectors, mineral and oil extraction sectors as well as tourism. The amelioration of the environmental situation, including the state of biodiversity can only be achieved through the "greening" of the various sectors of the economy. This is done through the implementation of new industrial models and the spread of ecologically-oriented methods of production.

In this manner, documents concerning the development of the agro-industrial sector, and agriculture specifically, prescribe activities aimed at the conservation of the natural composition of soil as well as the conservation and support of agricultural landscapes.

The Strategies and other documents concerning the development of the forestry sector outline the need for sustainable forest-use, fire-preventing measures, the maintenance of the resource, recreational and ecological potential of the ecosystems through the implementation of advanced logging practices that would ensure the maximized conservation of the ecosystems and the biodiversity which they contain.

Strategic and governmental documents concerning the development of the fishing industry prescribe measures aimed at the conservation, reconstruction and efficient use of aquatic bioresources, the halting and elimination of illegal resource extraction activities and the development of sustainable resource-use practices which would also contribute to the conservation of biodiversity.

The development of the hunting industry of Russia is also guided by the principles of biodiversity conservation. The strategic goal of the development of the industry is to ensure its sustainable development and the accessibility of game resources for Russia's population through the increase of populations of game species while conserving the stability of ecosystems.

One of the main goals of the documents concerning the aquatic ecosystems is the protection and restoration of water systems. To accomplish the goal, a number of measures have been prescribed which are aimed at the ecological state of aquatic ecosystems through the decrease of anthropogenic pressures that are put on waterways and their inhabitants.

The conservation and use of genetic resources is associated with the goals of biotechnology development as determined by the Forecast of the Scientific-Technological Development of the Russian Federation until 2030 (enacted by the Government of the Russian Federation) and by the Comprehensive Program for the Development of Biotechnology within the Russian Federation Until 2020.

It is important to note that there have been a number of strategic and policy documents enacted that are concerned with the socio-economic development of specific territories (the Arctic, Baikal-dependent ecosystems, Russian Far East, Russian South and a number of Federal Okrugs and entities of the Russian Federation). The conservation of biodiversity is not the direct goal of these strategies because of the much broader scope of problems that they address. However, all of these documents prescribe a set of measures aimed at environmental protection. The latter include the implementation of resource and energy-conserving practices, the improvement of the systems of ecological payments, the development of economic incentives that stimulate environmentally sustainable practices and the development of environmentally-conscious businesses, the organization of governmental ecological monitoring, the creation of a system aimed at informing the population about the environmental state of their surroundings, the development of system of protected areas and raising the environmental awareness of the general population.

According to the decision made by the Government of the Russian Federation concerning the implementation of strategic governmental planning within the industrial-policy planning system, documents concerning the development of specific industries until the year 2020 have been ratified. These documents address the solution of cross-industry problems and outline the systematic basis for the actions of governmental executive bodies in accordance with the budget process.

It is important that such governmental programs have been put into action for the separate natural resource-use sectors: forestry, hunting and fishing. The programs outline sustainable bioresource use for the three sectors mentioned.

In the sphere of environmental protection, the Government of the Russian Federation has issued the Governmental Program “Environmental Protection” for the period 2012-2020. The resolution was created according to the governmental priorities in the sphere of environmental protection and ties together the system of legal regulations aimed at the economic stimulation of “green growth” and practical measures aimed at improving the ecological situation. The following qualitative results are expected to take place as a result of the implementation of the resolution: the creation of an efficient system of governmental regulation and governance in the sphere of environmental protection, the establishment of ecological security, the stimulation of businesses that are undergoing a process of ecological modernization and ecological rehabilitation of adjacent territories, the creation of the right conditions for the development and implementation of innovative green technologies which will decrease the emission of pollutants, efficient waste disposal, the development of a market for ecological products and services, the creation of an ecologically safe and comfortable situation in areas of concentrated population areas and their areas of leisure, decrease in the rates of illness caused by negative ecological conditions, increase in life expectancy amongst urban populations, decrease in differences amongst various regional protected area networks, the conservation and restoration of population numbers of rare and endangered plant and animals species, increase the level of protection of vital human, social and governmental processes against threatening environmental occurrences such as that of climate change (providing hydrometeorological security), the provision of hydrometeorological and heliographic information to individuals, governmental agencies and sectors of the economy as well as the provision of information concerning the state of the environment and the acquisition of fresh

scientific insights in the field of climate change which would serve as the basis for new governmental policies in the field of environmental protection.

The governmental program includes specific sub-programs for the main areas of activity that it outlines. The conservation and restoration of biodiversity in Russia is the subject of a special sub-program called “Biological Diversity in Russia”. The following are the priorities outlined by this program: the development and efficient functioning of a network of protected areas, the conservation and restoration of rare and endangered species of plants and animals, the enactment of scientifically-rationed decisions in the field of biodiversity conservation and bioresource use, the fulfilment of Russia’s international commitments to the conservation of biodiversity as well rare and endangered species that stem from the Convention on Biological Diversity and other international agreements.

**In this manner, the outlined strategic and policy documents sufficiently fulfill the need to complete the goals of the Convention on Biological Diversity and the five goals of the Strategic plan for the conservation and sustainable use of biodiversity during the 2011-2020 period.** From the perspective of the strategy for the conservation of biodiversity through the protection of ecosystems, species and genetic diversity, the priorities lie in the development and sustainable functioning of a system of protected areas and the protection of rare and endangered species of plants and animals. Apart from the development of protected areas, the priorities lie in the development of sustainable biological resource use by relevant sectors of the economy (agriculture, forestry and fishing). This goal is also in line with the second goal of the CBD which dictates the sustainable use of biodiversity. The final strategic goal is the increase of benefits received by all individuals from biodiversity and ecosystem services.

The planned and implemented measures in the sphere of environmental protection and in the development of the of the agricultural, forest, hunting and fishing sectors ensure the necessary base for the elimination of the causes the lie at the route of biodiversity loss (goal A: to combat the main causes of biodiversity loss through the introduction of biodiversity discourse into the public and governmental agencies), the decrease of direct pressures on biodiversity (goal B: Decreasing the direct pressures on biodiversity and stimulating sustainable resource-use) as well as the strengthening of protection mechanisms for the creation of potential. The latter includes effectively raising awareness about biodiversity as an important component of social and economic discourse (strategic goal E: increased ef-

iciency is achieved through social planning, the implementation of knowledge and the creation of potential).

It is important to note that there are different planned and implemented biodiversity measures that stem from various governmental strategic documents and programs that have developed for different purposes. This fact creates obstacles when attempting to monitor the efficiency of a specific program catered to the realization of specific biodiversity goals and makes it more difficult to use a single methodological base that is outlined in the Convention on Biological Diversity.

## **Section 7. The main sections of the previous biodiversity strategy and the description of the process which took place when preparing the current version**

According to Article 6 of the Convention on Biological Diversity, “each Contracting Party shall, in accordance to its particular conditions and capabilities, develop national strategies and program for the conservation an sustainable use of biological diversity or adapt for this purpose existing plans, strategies or programs which shall reflect, inter alia, the measures set out in this Convention relevant to the Contracting Party concerned”.

According to the instructions outlined in the Convention on Biological Diversity, the identified “strategies, plans and programs” in Article 6 of the Convention are not limited in content. It is recommended to view them as a part of a wider cyclical process which includes the development of the strategy, its implementation on the basis of according plans and programs, the evaluation of the achieved results and the re-evaluation and adjustment of the strategy according to the received results.

The national strategy for the conservation of biodiversity in Russia was developed with the help of the GEF/World Bank project “Conservation of Biodiversity in Russia”. The project was controlled and monitored at the national level by the Ministry of Natural Resources of the Russian Federation.

The discussion of the included materials was done with the inclusion of opinions and suggestions from all interested parties: governmental bodies, NGO’s, the private sector and scientific organizations. One of the leading roles in the development of the Strategy was played by the Institute of Ecology and Evolution of the Russian Academy of Sciences, one of the chief thematic institutes established by the RAS.

The national strategy for the conservation of biodiversity in Russia was ratified in June of 2001 at the National Forum of Biodiversity Conservation and was identified as a flexible and appropriate base for governmental policy in the field of long-term biodiversity conservation by the Ministry of Natural Resources (ministry responsible for the execution of the strategy).

This is why the Strategy was framed, on one hand, as a document that can be used for long-term planning but also as a framework document that can be used by all the interested parties as a base for the development and implementation of individual

strategies and programs. In this manner, the Strategy reflects the general societal interest in the conservation of biodiversity allowing for all interested parties to join the process. At the same time, this Strategy has no legal binding power as it was not officially ratified by the Government, an aspect that is considered as serious flaw by certain organizations. However, at the time, the chosen legal format of the Strategy was optimal as there were yet no objective legal, institutional and financial conditions for it to be done otherwise.

The goal of the Strategy has been formulated as the following: “The conservation of biodiversity of natural ecosystems at a level that ensures the stability of the populations and allows for its sustainable use. Also the conservation of the diversity of domesticated and cultivated organisms and human-created ecologically-balanced natural systems at a level that ensures the efficient development of the economy and the formation of optimal conditions for human life”.

The Strategy was based on biological principles of biodiversity conservation within the framework of two different conceptual approaches:

- Population-species (organism, population, specie)
- Ecosystem (a community of organisms, ecosystem, territorially interrelated system of ecosystems).

In this manner, it included all the main organizational levels of biological systems.

The Strategy includes the priority species, ecosystems and regions that require specific conditions for their survival. It includes outlines of the efforts that must be undertaken to effectively protect biodiversity under the existing threats thus displaying the socio-economic mechanisms of the Strategy completion. In 2001, the Strategy seemed to be a comprehensive document that took into account the priorities and socio-economic realities of Russia. It was also based on long scientific traditions of environmental research that was conducted within the country.

The priority areas of the National Plan for the Conservation of Biodiversity in Russia were identified at the same time that the Strategy was ratified. This fairly detailed plan was developed with the format of the Strategy and proposes the coordination of existing programs and projects as well as the development of new projects that would complement existing ones. The implementation of the National Plan was planned to take place with the cooperation of all parties involved in the implementation of the Strategy (all sections of the society and government).

The ratification of the Strategy and Priority Areas did not create a completely new sphere of work in Russia. Environmental protection has a deep scientific base and history of implementation within the country. This is why the creation of the Strategy was more of a result of previous work done in the field and acted as a positive stimulus for the development of various different areas in environmental protection.

It is especially important to note that the articles included in the Strategy and the Priority Areas was fully in accordance to the ideology promoted by the Convention on Biological Diversity. The main principles and their discussion in the articles of the Strategy corresponded to the main conceptual documents signed at the CBD: Principles of the Ecosystem Approach (decision V/6 and the following related decisions), the Addis Ababa Principles and Guidelines for the Sustainable use of Biodiversity (decision VII/12), the Bonn Guidelines on Access to Genetic Resources and Fair and Equitable Sharing of Benefits Arising from the Use (decision VI/24).

In this manner, they included all the goals of the Convention. On top of that, a comparison of the articles of the Strategy with the existing at that time Temporary System of Goals and Priorities of the Strategic Plan of the Convention on Biological Diversity are also well correlated amongst each other. The only exception to that statement are the additional articles in the Strategy which were aimed at the conservation of socio-cultural diversity of indigenous populations.

The CBD provides the signed parties large amounts of flexibility in the development and implementation of national strategies for the conservation and sustainable use of biodiversity based on national capabilities, priorities and financial resources. The necessity of a flexible structure of the Convention that would provide a framework for the development of national strategies in accordance to national priorities and capabilities was also mentioned in decision VII/30.

In this manner, the goals, targets and priorities of the National Strategy can be described as adequately coherent with the conceptual documents, designed projects and other decisions undertaken under the framework of the Convention of Biological Diversity.

At the same time, the Strategy does not contain a sufficient amount of indicators that would allow to evaluate the efficiency of its implementation.



Section 6 of the Strategy, the one that addresses the mechanisms of its implementation, only states the necessity of their existence:

- a) The creation of the plan for the conservation of biodiversity
- b) Control and Strategy completion evaluation criteria

The section recommends that the evaluation of the results of the Strategy be done throughout the process of its implementation and after the completion of specific projects according to the following criteria:

- Indicators that characterize the quantitative and qualitative changes in the state of biodiversity resources at various hierarchical levels: populations, species, biotic communities and ecosystems;
- Changes in the fields of societal understanding, legal frameworks and economic approaches that influence the state of biodiversity;
- Changes in the concepts and technologies of natural resource use;
- Efficiency criteria of Strategy projects: evaluation of the economic impact per unit of used resources.

However, the specific criteria and the methodology of their evaluation have not been developed since the ratification of the Strategy. It is because of this fact that there has been no evaluation of the efficiency of the Strategy conducted over the past years. Today, due to the adjustments being made in the updated document, only a qualitative assessment of the Strategy can be conducted.

The process of the implementation of the Strategy has been reflected by the national reports presented by Russia since the year 2001 according to the demands made by the Convention. The latest information was presented at the 5<sup>th</sup> National Report.

It is important to note the following most important re-evaluations of the Strategy:

1. The Strategy and Priority Areas were fully in demand during the development of the Ecological Doctrine of the Russian Federation that was approved by the Governmental Decree № 1225-p on August 31 2002. In the sphere of environmental conservation and restoration, one of the three governmental focuses in the field of ecology, the conservation and restoration of biological and landscape diversity has been acknowledged as a key priority. The intended result of these efforts is for the diversity to be sufficient to withstand and self-compensate for all anthropogenic activity. This indirect influence of the Strategy has had a conceptual influence on

a whole number of policy-forming documents and legal frameworks enacted by the Government of the Russian Federation and according Ministries.

2. Considering the fact that the Strategy has encompassed a wide spectrum of biodiversity conservation concerns, the elaboration of some of its articles has become relevant. These elaborations have been done in following subservient strategies, a fact that has created a hierarchical framework and, more importantly, has allowed the use of its articles in other sector-specific documents of long-term governmental planning. A number of such documents have been enacted since 2001, where there was a clear continuity with the ideology of the Strategy in the sphere of biodiversity concentration. This is despite the fact that the creators of the Strategy did not hold the independent use of individual Strategy articles as a goal. During the period since 2001, the main achievements of the Strategy have been the general acceptance of its principles of the new ecological politics as an important component of establishing a sustainable future.

3. Taking into account the wide diversity of natural and socio-economic conditions throughout the large territory of Russia, there has been a defined necessity of a constant accounting for regional contexts when planning measures aimed at the conservation and sustainable use of biodiversity.

4. The Strategy has logically integrated itself into the existing processes and perspectives of national environmental conservation activity. It had a positive effect on the conservation and sustainable use of biodiversity in Russia.

5. At the same time, the main shortfall of the Strategy has been the fact that objective-management methods that were tied to temporal frameworks were not included into the document. Because of this fact, there were no target quantitative and temporal goals that would allow to accurately assess the success of the Strategy. Because of this fact, the Strategy was more of a “doctrine” in the sphere of long-term sustainable biodiversity use that described the necessary and desirable policies. It is worth noting that the processes within the Convention itself did not provide clear indicators in this field.

The situation changed considerably with the enactment of the Strategic Plan for the Conservation and Sustainable Use of Biodiversity during the 2011-2020 Period and a number of objective-oriented documents on biodiversity conservation enacted at Aichi (decision X/2). This plan is designed for implementation over a specific time

frame and contains 20 key targets allocated amongst 5 strategic goals. The goals and targets of the plan create a well-defined and flexible base for the preparation of future national strategies in this field. One of the goals of the discussed plan is the creation and ratification of a renewed national strategy and action plan for the conservation of biodiversity by the year 2015.

It is also important to note that during the period following 2001, Russia has experienced the development of well-functioning practice of strategic planning which is set forth in concentrated form in the Federal law № 172-Ф3 of June 28 2014 “On Strategic Planning in the Russian Federation”. In this manner, a format and understanding of such documents, taking into account international practices, has been created and these are now called “sector strategies”.

Together, these documents provide for a new base for the preparation of a renewed National Strategy for the conservation of biodiversity.

In this manner, the targets, goals and priorities of the previously developed strategy are adequately coherent with the conceptual documents, actions plans and other decisions made within the Convention on Biological Diversity until the relevant period. Not only that, but the principles promoted by the Strategy are also now perceived as a sort of “national standard” of actions and programs in the field of biodiversity conservation. This is why the goal of the reassessment and renewal of the national strategy lies in the development of previously introduced principles and the creation of concrete, measurable and temporally defined national strategies and action plans that are in accordance with the Strategic plan of the Convention for the period 2011-2020.

## **II. National Strategy for the Conservation of Biodiversity: principles, priorities and goals**

### **Section 8. The long-term vision**

The realization of the three goals of the CBD: conservation of biodiversity, sustainable use of its components and the fair and equitable benefits received from its use, create the fundamental base of the future visions in the development of biodiversity conservation.

According to the 2002 decision of the Rio+10 summit conducted in Johannesburg, the achievement of the three goals of the Convention was characterized as an ambitious future target. The goal was to considerably reduce, by 2010, the rate of biodiversity loss at the global, national and regional levels as a way of combating poverty and for the benefit of all life forms on the planet. In the third edition of the Global Perspective on Biodiversity (will be referred to as the Perspective), which was presented at the 10<sup>th</sup> CDS conference, it was stated that the targets of biodiversity conservation that were meant to represent progress in the conservation of certain species and ecosystems, were not met. The five widely accepted factors that lead to the loss of biodiversity: loss of habitat, unsustainable use and overexploitation of resources, climate change, invasive species and environmental pollution not only did not approach the desired targets but strengthened their negative effect.

One of the key reasons for the failure to meet the 2010 targets on a global scale has been that the enacted measures were primarily used as reactionary actions addressing existing problems. An example of such activity was the creation of protected areas, the implementation of programs aimed at specific species and the enactment of programs aimed at the decrease of certain threats which effect biodiversity (for example environmental pollution). According to the conclusions made in the Perspective, the main reasons for the failure to achieve the 2010 targets lies in existing economic systems which continue “business as usual” and do not take into account the value of biodiversity.

Taking into account the majority of various long-term forecasts, it is anticipated that the high levels of biodiversity loss will be maintained throughout this century as well as the decrease in the amount of ecosystem services which play an important role in the provision of human wellbeing. The prevention of anthropogenic effects which cause the mentioned decrease in biodiversity will be an increasingly difficult task.

Taking the year 2100 as a benchmark of evaluation, the Perspective states that the efficiency of measures aimed at the prevention of biodiversity loss will be determined by the success with which they address both the primary and indirect negative causes.

It is important to quote the vision outlined in the Perspective that addresses such measures:

- Considerable increase in the efficiency of land, energy, freshwater and material resources that will answer to the increased population demand;
- The use of market stimuli and abandonment of perverse subsidies with the goal of minimizing unsustainable resource use and overconsumption that leads to excessive waste;
- Strategic use of land, internal water bodies and marine resources to combine the goals of economic development together with the conservation of biodiversity and support of numerous ecosystem services;
- Ensuring and fair and equitable distribution of benefits which arise from genetic resource use;
- Raising awareness about the value of biodiversity and the need to alter consumption models.

At the same time, an important component of this system is for the benefit arising from biodiversity and the expenditures associated with its loss to be properly reflected within the economic and market framework.

The suggestions for the 21<sup>st</sup> century proposed in the Perspective were used by the Strategic Plan for Sustainable Use of Biodiversity for the period 2011-2020 signed at the 10<sup>th</sup> Convention on Biological Diversity as well as in the target goals for the sustainable use of biodiversity signed in Aichi. Despite the fact that the Strategic Plan ends in 2020, its underlying concept is based on the perspective vision that by 2050 will be adequately evaluated, conserved, restored and sustainably used. This will, in turn, support ecosystem services that will ensure the health of the planet and

provide benefits for the entire population. This vision presumes that all 5 strategic targets will be achieved by 2050. At the same time, it is difficult to plan concrete actions for a period that over 10 years.

National strategic documents and program documents have a planning horizon of a period until the year 2030. This is generally correspondent to the periods examined at the CBD.

From the point of view of the proposed global long-term perspectives on the conservation and sustainable use of biodiversity, the most important documents are the ones that target specific industries. Primarily, these are documents enacted by the President of the Russian Federation and the Government of the Russian Federation: The Ecological Doctrine, the Principles of Governmental Policy in the Field of Ecological Development of the Russian Federation Until the Period 2030, the Principles of Governmental Policy on the Use, Protection and Restoration of Forests in the Russian Federation Until the Year 2030, Concept of Sustainable Development of Agricultural Lands of the Russian Federation until the year 2020 and the Governmental Program for the Development of Agriculture and the Regulation of Markets for Agricultural Produce, Raw Materials and Food during the 2013-2020 period, Concept of the Development of the Fishing Industry of the Russian Federation until the year 2020, the Water Strategy of the Russian Federation until the year 2020, Strategy for the Development of the Marine Economy in the Russian Federation until the year 2030, The Climatic Doctrine of the Russian Federation, Concept for the Development of a System of Protected Areas of Federal Significance until the year 2020, Strategy for the Conservation of Rare and Endangered Species of Animals, Plants and Fungi in the Russian Federation until the year 2030, Strategy for the Development of the Hunting Industry in the Russian Federation until the year 2030 and, finally, the currently developed, Strategy of Ecological Security.

A short description of the documents listed above as well as others is presented in the 5<sup>th</sup> National Report to the Convention on Biological Diversity. Long-term priorities, which are primarily based on the Principles of Governmental Policy in the Field of Ecological Development of the Russian Federation Until the 2020 Period and various industry-development strategies (which are based on the sustainable use of biodiversity elements), do not have any significant gaps with the accepted global standards. These priorities allow to expect significant progress in the conservation and sustainable use of biodiversity by the year 2030 which is also

in line with the global vision of the field. It is also important to make the right conclusions from the failure of efforts to sufficiently curb the loss of biodiversity by the year 2010. The most important of these conclusions is that apart from blocking direct threats to biodiversity, there must also be a national efforts aimed at the establishment of ecologically-oriented economic growth and the conservation of national resources. Both of the latter will positively influence the deepest causes of biodiversity loss.

## Section 9. Forming principles of this Strategy

The National Strategy for the Conservation of Biodiversity of Russia from the year 2001 was based on biological principles of biodiversity conservation within the framework of two chief conceptual approaches.

- **Species-population** (organism, population species)
- **Ecosystem** (community of organisms, ecosystem, territorially interconnected system of ecosystems, biosphere)

The fact that these approaches were included in the Strategy was important for the solidification of the definition of “biodiversity”. This is because the definition provided at the CBD did not allow for each hierarchical level of ecosystems to be unanimously scientifically understood which, in turn, hampered the formulation of specific goals and approaches for their conservation.

At the same time, it was noted that **with a systematic scientific approach to biodiversity, the problem had to be solved at the highest hierarchical bio-system level – the socio-economic one which included both a socio-economic and an environmental components.**

It is for this reason that the Strategy includes the principles of socio-economic mechanisms which aid the implementation of the Strategy (wide approach, partnerships, availability of information, inclusion of the general population and organizations, optimization of the relation between natural and socio-economic subsystems, assessment of temporally and spatially distant consequences, minimizing the risk of wrong decisions, expanding the application of known and tested socio-economic mechanisms, evaluating the state of the environment and systemizing the evaluation of human impact).

**The described approaches and principles created a large scientific base for the systematic understanding of biodiversity conservation goals and for a shift from a conservation world view that concentrated only on wildlife conservation to a wider context as described at the CBD.**

**Second important element.** In the 2000-2008 period, there were two fundamental approaches that were developed and implemented at the CBD: the principles of the ecosystem approach (decision V/6 and other related decisions) and the principles of sustainable use (decision VII/12).



The 12 established principles of the ecosystem approach make up a comprehensive strategy for the management of terrestrial, aquatic and living resources that ensures their conservation and sustainable use. The ecosystem approach is based on scientific methodology which encompasses all levels of biological systems including their main structures, processes, functions and interconnection between organisms and their habitat. In this regard, the principles outlined in the National Strategy for the Conservation of Biodiversity in Russia largely correlated with the principles outlined with the methodology described above.

In addition to the ecosystem approach, the Addis-Abebi principles and instructions for the sustainable use of biodiversity (14 principles) were also made official in 2004. These principles created a deep functional structure that ought to be referenced when using elements of biological diversity so as to ensure their sustainability.

The ecosystem approach highlights the fact that the given approach must ensure a balance between the conservation and sustainable use of biodiversity and its integration into the economy. This again points to the fact that the two goals of the CBD are mutually dependent and it is impossible to achieve practical results without coordinating efforts in both spheres. When analyzed from a practical standpoint, the conservation of biodiversity is associated with the development and functioning of an effective system of protected areas. In terms of national priorities, the provision of sustainable use of agricultural, forest, fish and game resources are most relevant to the authorities since these industries currently provide large benefits for the government.

**Third.** When establishing the principles of the renewed national strategy for the conservation of biodiversity, it is important to understand that biodiversity is not solely important as a way of protecting the biosphere and basic life throughout the planet but also as a crucial element of sustainable development. The deciding role of biodiversity in sustainable development has been outlined in the final document of the Rio +20 Conference, “The Future We Want”.

**Fourth.** One of the widely acknowledged global ecological threats is **climate change**, the effects of which will have very negative consequences for the wellbeing of humanity. In this light, the conservation of biodiversity, the diversity of plant and animal species that make up natural ecosystems, are an important factor for the stabilization of the climate and the change that it is undergoing due to greenhouse gases. Russia contains more than 20% of all of the planet’s forest resources and another

1.5 square kilometers is covered by wetlands. The ecological significance of forest and wetland ecosystems lies in their uptake of atmospheric carbon dioxide and their sequestration of carbon. Even more important is the fact that forests act as an oxygen factory. In this manner, forest play an important role in the maintenance of balance of atmospheric carbon dioxide concentrations as well as in the stabilization of the biosphere and global climate systems. This is why **any efforts aimed at the conservation of biodiversity, even if there is no visible link to its role in climate change, will actually play a role in the implementation of a comprehensive policy for the prevention of climate change.**

## Section 10. The main goals and priority areas of the Strategy

The goal of the 2001 National Strategy for the Conservation of Biodiversity in Russia is the following:

**“The conservation of the biodiversity of bio-systems at a level that ensures their stable existence and sustainable use as well as the conservation of the diversity of domesticated and cultivated forms of living organisms and human-created ecologically-balanced environmental-cultural complexes at a level that ensures efficient economic growth and an optimal environment for human life”.**

The goal described above was understood as a general long-term objective and was not limited by any time frames.

The conservation of biodiversity presumes a set of actions aimed at the achievement of two goals. The first is the direct conservation, restoration and sustainable use of biodiversity. The second is the implementation of socio-economic mechanisms which determine the impact that various segments of the population and the economy have on biodiversity.

According to the understanding of the Strategy for the period after 2001, a number of measures were implemented aimed at the conservation and sustainable use of biodiversity. These measures were reflected in national reports (including the last one) on the actions taken to fulfill the responsibilities undertaken at the CBD. The measures allowed to make considerable progress at solving the main problems in this field.

A comparison of the Strategy with the targets determined at the Aichi meeting, demonstrate the fact that Russia’s national strategy takes into account all the necessary global targets making them relevant.

In this manner, the goal of the Strategy contains a sufficiently wide framework that allows for continuous work towards the conservation of biodiversity. The renewed national strategy ought to retain this element.

The main priorities of governmental policy in the sphere of the conservation and sustainable use of biodiversity, taking into account global targets and priorities set at Aichi, are derived from the enacted strategic documents and programs.

The Framework of the Governmental Policy in the Field of Ecological Development of the Russian Federation until the year 2030, approved by the President of the Russian Federation on April 28 2012 (№ Пп-1102) have the following targets:

- The creation of an efficient management system that foresees the cooperation and coordination of various governmental bodies;
- The improvement of the legal framework targeted at environmental protection and ecological security
- Ensuring ecologically-oriented economic growth and the ecologically-efficient innovative technology;
- The prevention and decrease of the existing negative impact on the environment;
- The restoration of destroyed ecosystems;
- Ensuring an ecologically-safe waste disposal system;
- The conservation of the environment, including ecosystems and plant/animal species;
- Developing of the economic regulation and of market tools for environmental protection and the provision of ecological security;
- Improving the system of governmental ecological monitoring (environmental monitoring) and forecasting of natural and human-induced disasters as well as climate change;
- The provision of informational support for environmental protection and ecological security efforts;
- Creating a culture of ecological awareness, the development of ecological education;
- Ensuring the efficient involvement of citizens, public organizations, non-profit-organizations and businesses in solving problems associated with environmental protection and ecological security;
- Fostering international cooperation in the field of environmental protection and ecological security.

Each target entails a certain set of actions. It is important to note the following targets that are most closely related to the goals outline at Aichi:

**Solving problems associated with environmental protection** including ecosystems as well as plant and animal species utilizes the following mechanisms:

- Improving the protection and development a system of protected areas of federal, regional and local significance in strict accordance with their designated roles;

- Creating an efficient system of measures aimed at the conservation of rare and endangered species of plants and animals;
- Forming and ensuring the stable functioning of systems of protected areas of various levels and categories with the goal of conserving biological and landscape diversity;
- Preventing the uncontrolled spread of invasive species of animals, plants and microorganisms throughout the Russian Federation;
- Conserving the genetic fund of wild animals;
- Solving the ecological problems of the Baikal ecosystem, Northern and Arctic regions as well as other territories used for traditional lifestyle by indigenous populations of the North, Siberia and Far East.

**Ensuring ecologically-oriented economic growth and the mass introduction of innovative green technologies entails:**

- The creation of an efficient, competitive and ecologically-oriented economic model which provides the best results while protecting the environment through sustainable use and the minimization of negative environmental effects;
- Introduction of innovative, resource-efficient, ecologically safe and efficient practices and technologies through the cooperation amongst the government, business community, scientific and educational organizations, public organizations and non-for-profits.
- Accounting total and per-unit indicators of the efficiency of using natural resources and energy, the negative environmental impact after the introduction of governmental regulations and measures aimed at environmental protection as well as the evaluation of economic efficiency in general as well as specific industries.

**The prevention and decrease of the existing negative impact on the environment entails:**

- Limitation of acceptable ecological impact according to scientifically-determined standards with the purpose of establishing a tolerable impact on the environment and general population;
- Establishing a mandatory governmental ecological expertise for all ecology-threatening projects ;
- Improving the methodology and system which account for ecological damage at all the different decision-making levels. This includes the alignment of Russian ecological assessment standards with those established by

- international agreements and the creation of a legal framework for a strategic ecological evaluation;
- Increasing the amount of building and projects that are certified according to the voluntary ecological certification of real estate that has been developed according to the best “green” international practices;
- Implementing measures outlined in the Climate Doctrine of the Russian Federation and in other thematic documents.

**The restoration of destroyed ecosystems entails:**

- Creating an inventory of territories with the purpose of identifying areas with a negative ecological situation. These areas will be subject to programs aimed at the minimization of environmental damage and the removal of all ecological damage associated with previous economic activity;
- Organizing work for the evaluation and step-by-step elimination of ecological effects of previous economic and other human activity;
- The development of economic, organizational and methodological mechanisms for the remediation of negative ecological influences;
- The conservation and restoration of the habitat ecosystem services outside the boundaries of protected areas;

**Ensuring ecologically-safe waste disposal entails:**

- Prevention and decrease in the creation of waste, maximizing the reuse of resources through recycling processes, decreasing the creation of waste at the source of production, decreasing the level of ecological threat of the created waste, the reuse of waste through reprocessing, regeneration and recuperation;
- Introduction and implementation of efficient practices and technologies that decrease the volume of waste created;
- The creation of an infrastructure that deals with the ecologically-safe disposal of waste as well as the decrease of its ecological threat;
- Step-by-step implementation of a ban on the burial of waste that has not undergone sorting, mechanical and chemical treatment as well as waste that can be reused (metals, paper, glass and plastic, car, batteries, etc.);
- Making producers responsible for the ecologically-safe disposal of both their produce that is no longer of consumer value as well as any packaging associated with the product;

- Ensuring ecological safety during the storage and burial of waste as well as the ecological restoration of areas that have been used for waste disposal.

**The development of economic regulations and market instruments for environmental protection and the provision of ecological security entails:**

- Establishing a fine system for having a negative environmental impact which internalizes the expenditures associated with restorative ecological measures;
- Replacing the practice of paying for exceeding ecological pollution limitations with a system whereby one pays for all ecological damage done;
- Stimulating businesses which modernize their production processes and ecologically restore affected territories as well as those that undertake ecological remediation activities under a governmental-private partnership whereby the government co-finances such activities. The latter include such measures as the restoration of ecologically damaged territories and mitigation of ecological damage associated with previous economic activity;
- The creation of a market for ecological produce, practices, technologies and ecosystem services;
- Supporting technological modernization that will ensure the decrease of the anthropogenic burden on the environment, the sustainable use of renewable resources and the rational use of non-renewable natural resources;
- Development of market instruments that promote environmental protection and the provision of ecological security;
- Establishing an advantage (with all other aspects being equal) to all products, projects and services that are “green” when making governmental and municipal purchases;
- Stimulating an increase of investments that would ensure the rational and efficient use of natural resources, the decrease of negative environmental impacts, the production of environmentally-clean products and the introduction of resource-efficient technologies that are in accordance to the environmental standards of the Russian Federation;
- Step-by-step implementation of a system of declaration of compliance with ecological demands and the conducting of ecological audits;
- Increasing the ecological and social responsibility of businesses;

- Stimulation of measures aimed at the collection, sorting and use of waste as sources of secondary materials and energy carriers;
- Governmental regulation of technological import into the Russian Federation which must be in accordance to both national and international ecological standards.

The expert-defined priorities and associated actions described above aimed at ecological development, demonstrate a comprehensive set of measures that are aimed at the prevention of direct threats to biodiversity, combating the sources of biodiversity loss, the protection of ecosystems, species and genetic diversity as well as the increase of benefits derived from biodiversity and ecosystem services.

On top of what was mentioned earlier, part of the measures described above are in accordance to the Aichi targets: the step-by-step elimination of incentives which harm biodiversity (target A3), sustainable production and consumption well within safe ecological limits (A4), decreasing the rate of loss of natural habitats (B5), combatting pollution (B8), combatting the spread of invasive alien species (B9), decreasing anthropogenic pressures on vulnerable ecosystems (B10), developing a system of protected areas (C11), conserving endangered species (C12), the restoration and conservation of ecosystems that provide essential services (D14), the growth of carbon stock accumulated by ecosystems and their adaptation to consequences of climate change (D15), protecting the rights of indigenous and local communities of the North, Siberia and Far East as well as biodiversity (E18), promoting the scientific base and technologies associated with biodiversity (E19).

The Concept for the Development of a System of Protected Areas Until 2020 (by decree of the Government of Russia from December 22 2011, № 212-p) and the Strategy for the Conservation of Rare and Endangered Species of Animals, Plants and Fungi (from February 17 2014, № 212-p) have been enacted to promote the goals for environmental protection, including of natural ecosystems as well as plant and animal species. The two documents serve as testament to the importance that the government places on the described fields of biodiversity conservation.

The Russian Federation contains a quarter of all global forests which is why Russian forest ecosystems play a special role in the global biosphere. Despite the fact that the conservation and sustainable use of forests is only outlined in sections B5 and B7 of the Aichi Biodiversity Targets (forest areas are sustainably



managed which ensures biodiversity), this target is one of the main indicators of the degree of success of biodiversity strategies within the Russian Federation. The Principles of Governmental Policy in the Sphere of Utilization, Protection and Renewability of Forests in the Russian Federation Until 2030 (enacted by the Governmental decree № 1724-p on September 26 2013) largely predict the trajectory upon which forest protection will evolve.

The goal of governmental policy in this area is aimed at the conservation and increase of forest ecosystems, the maximization of utility that Russian citizens receive from forest ecosystems as well as the creation of governmental conditions that promote the sustainable and dynamic growth of the Russia forest industry. In this manner, **it is planned to achieve a balance development of the economic, social and ecological spheres associated with forestry.** It is important to note that the provision of a positive environmental situation for Russian citizens and the conservation of the biosphere role of Russia's forests remains a top priority. The document named above identifies the necessity to achieve the following tasks:

- Increasing the efficiency of economic forestry management;
- Intensifying the utilization and regeneration of forests;
- Developing an internal market paper products, this includes the growth of the production of consumer products and creating a market for forestry ecosystem services;
- Increasing the competitiveness of the Russian forest industry which includes the increase in the quantity of produced paper products with high value-added, satisfying internal market demand for high-quality paper products and increasing exports;
- Increasing the efficiency of forest protection from fires, pests, diseases and other negative factors such as illegal logging activities;
- Increasing the productivity of forest lands across territories with varying economic designations;
- Conserving the ecological potential of forests;
- Increasing the scientific, technological and human potential associated with forests and the forestry industry;
- Developing international cooperation and communications for questions related with forest management and the forestry industry;
- Creating the conditions to stimulate the participation of citizens in decision-making processes which will have an impact on forests;

It is important to expand on some of the targets mentioned above. The goal for the intensification of the utilization and regeneration of forests entails:

- Improving the system for renting forests for private use and ensuring the implementation of the regulation on the priority rights of entering into new temporal agreements with prospective forest users;
- Further developing the principles upon which forests are designated for different economic purposes, the way that their legal status is decided as well as their protection, conservation and regeneration statuses;
- Developing of new legal frameworks for forests and environmental protection which would take into account the specifics of forest regions and ecologically valuable forests;
- Stimulating the multi-aspect use of forests, including the production of non-timber resources, eco-tourism and the development of indigenous forms of forest-use;
- Determining the maximum sustainable yield while taking into account the economic availability and the economic designation of forests as well as the development of transport infrastructure while accounting for the commercial and age structure of the forests;
- Increasing the volume of timber harvested from selective felling in areas where the activity is justified by ecological considerations. This process entails the development of improvement of related practices (such as regulations and enforcement of regulations);
- Assisting the multipurpose use of forests which includes the timely inclusion of forest areas into appropriate cadaster listings;
- The use of public-private partnerships to develop transport, energy-production and social infrastructure;
- The development and implementation of new forest-use stimulating mechanisms such the designated uses of forest lands which ensure the efficient management of forest lands and the competitiveness of the forest sector of the economy (primarily this will be used to support high-value added timber products);
- The development and ensuring of conditions for medium and small forestry enterprises as well as forest farming;

The goal of developing an internal market for paper products, including the stimulation of the production of consumer goods and the formation of an ecosystem service market, entails:

- Supporting internal market players when they use timber products for construction, furniture production, at biofuel production plants, in the pulp-and-paper industry as well as stimulating governmental purchases of timber produce;
- Stimulating new production processes which reuse previous timber products that were attained from low-quality and low-value timber (pellet productions, commercial and household bioenergy productions and others);
- stimulating the production of high-quality consumer goods, supporting the formation of a market for ecological forest produce as well as other forestry ecosystem services, the growth of a “green economy” and the development of the bioenergy industry;
- creating the right conditions for the development of a system of voluntary certification of legal timber products and sustainable forest management practices.

The goal for the protection of forests against fires, pests, diseases and other negative factors such as illegal logging, entails:

- Improving the system of prevention, detection and extinguishing forest fires as well as the mitigation of damage that they cause;
- Developing a system for terrestrial, aerial and space monitoring of fire threats and ongoing fires through the use of advanced surveillance technology and innovative practices;
- Technologically reequipping specialized fire-combatting organizations;
- Developing a system of communication amongst various governmental bodies when extinguishing forest fires and coordinating the efforts of involved teams;
- Improving the system for planning and implementation of measures for forest pathology monitoring, forest pathology inspections, measures aimed at increasing forest health, measures aimed at the localization and elimination of hotspots of detrimental organisms through forest regionalization as well as through integrating a system of forest protection based on modern technologies;
- Development and implementation of modern, ecologically-safe practices, technologies and drugs for efficient localization and elimination of hotspots of detrimental organisms;
- Ensuring the availability of information concerning forest fires, forest damage by organisms and other negative factors;

- Development and implementation of a unified governmental informational system for the monitoring of timber production and logging;
- Improving the interdepartmental system of cooperation in the sphere of illegal logging prevention;
- Creating a system whereby all pulp-paper produce purchased by the government is made from timber harvested in sustainably-managed ecosystems.

The goal for increasing the productivity and improving the composition of forests throughout lands of varying economic designation includes:

- Creating a federal system for the monitoring of forest regeneration;
- Developing regional governmental standards on forest regeneration;
- Ensuring the technological modernization of the forest regeneration process;
- Developing and implementing a system of financial and economic mechanisms for the promotion of forest regeneration and forest planting, both of which would ensure the continuous nature of forest ecosystems and an increase of forest areas in areas with low forest covers;
- Increasing the proportion of forests that are planted with the use of specimens which have improved hereditary and specie characteristics (including a closed root system);
- Increasing the qualitative composition of forests based on regional logging and maintenance standards;
- Implementing modern practices for the creation of forest plantations designated for commercial logging and the bioenergy industry;
- The development and implementation of a national strategy of sustainable forestry within the Russian Federation;
- Developing and implementing a set of comprehensive scientific, practical and production measures aimed at the support and creation of new protected governmental forest areas and state defensive forests;
- The development regional programs for protective forest use which entail the financing of projects through funds provided by entities of the Russian Federation and agricultural producers.

The crucial goal of **maintaining the ecological potential of forests** entails:

- The conservation of the genetic, specie, ecosystem and landscape diversity of forests and the prevention of forest fragmentation (especially of forests that are of high ecological value);

- The creation of a National Forest Heritage of the Russian Federation, a list of forest areas not subject to economic exploitation;
- The development and implementation of measures that will ensure forest use that accounts for climate change and that will adapt the forest industry to the changes that occur as a result of a shifting climate
- The development and use of practices which ensure the conservation of the ecological functions of forests and their biodiversity, including methods for the use of forests which imitate their natural dynamics and which ensure the formation of multiage stands.

The comprehensive, multipurpose, system outlined in the Principles of Forestry Policy, targeting the development of the forest industry is in full alignment with the forest-related goals set at Aichi. The most overlap is seen with the following targets: A3, A4, B5, B7, B10, C11, C12, D14, D15, E19 and E20.

**Lands designated for agriculture compose approximately 23% of the total area of Russia.** Considering the important role that agricultural ecosystem play in the conservation and sustainable use of biodiversity, it is important to note the main elements of the long-term policies in this field. These are presented in the Concept for the Sustainable Development of Agricultural Lands of the Russian Federation until 2020 (ratified by the Governmental decree № 2136-p from November 30 2010).

**Governmental policy in the sphere of sustainable development of rural areas** includes a system of legal, monetary-economic and organizational measures. These determine the role of federal governmental bodies, their regional branches as well as regional and municipal authorities who have the goal of increasing the efficiency of the rural economy, the standards of living for rural inhabitants as well as the rational use and regeneration of the natural resource potential of rural areas.

Because of the factors listed above, one of the goals of the policy outlined in the Concept is the rationalization of natural resource use, environmental protection as well as the conservation and increase in the cultural potential of rural areas.

The ecological policy in this field is aimed at the ecological rehabilitation of rural areas and the “greening” of the main sectors of rural economies.

There are a number of actions that must be undertaken for this policy to be successful: create an inventory of the ecological state of rural territories, develop their

ecological passports and environmental-ecological maps as well as a system of evaluative socio-ecology-economic criteria. The latter will allow to solve problems associated with ecologically-determined production allocation decisions, the creation of methodological standards which will allow to make optimal decisions when creating environment-conservation projects, the distribution of investments designated for environmental conservation amongst various rural territories and projects as well as the territorial location of industrial productions.

The **development of an ecologically-friendly output production industry** entails: new standards of ecologically-safe agricultural produce, certification of agricultural producers, improve the system of certification for raw alimentary materials and food stocks as well as development of measures for the financial support of ecologically-clean output.

**The development of zero-waste technologies is an important part of the ecological policy.** The main goal in this field is to create completely new technological processes which will ensure the minimization of waste during the production process and the proper disposal of all waste created. This goal entails the creation of zero-waste and waste-efficient technologies, the improvement of according technological processes and equipment as well as promoting the cooperation amongst industrial and agricultural organizations in their effort to efficiently use raw materials and created waste.

The problem of ecological rehabilitation requires a comprehensive approach. It is important to develop regional programs that contain a system for measures aimed at environmental protection. This includes measures aimed at creating an inventory of all existing garbage dumps with the goal of their consequent elimination as well as the organization of a system for the tracking and elimination of all solid waste created by rural and municipal formations.

Despite a lack of an action plan for the conservation and sustainable use of biodiversity in this area, the described system of actions will promote the fight against agricultural pollution and will promote the conservation of agricultural landscapes with high biodiversity because of the overlap of anthropogenic and natural habitats. In this manner, there will be a contribution to the following Aichi targets: A4, B5, B7, B8, C13 and D15.

It is important to mention the **Basics of the State Policy of the Russian Federation in the Arctic for the Period Until 2020 and for Further Perspective** (adopted by the President of the Russian Federation on September 18 2008, № Пп-1969) as part of

the systematic listing or Priority Areas in the field of the conservation and sustainable use of biodiversity. One of the main targets in the sphere of ecological security in the document mentioned above is the conservation and protection of the environment of the Arctic and the elimination of any environmental impact caused by increased economic activity and global climate change.

This is why the document includes the target for the conservation of the biological diversity of arctic flora and fauna. This is to be done, in part, through the increase of the system of protected terrestrial and aquatic areas while considering the national interests of the Russian Federation and the necessity of environmental protection in the midst of expanding economic activity and global climate change.

On top of what is mentioned above, other long-term documents relating to governmental strategic planning outline the separate **need for the conservation of the Baikal ecosystem.**

**The long-term policy for the development of the fishing industry is outlined in the Concept for the Development of Fishing in the Russian Federation Until 2020 (adopted by the Governmental decree № 1265-p. from September 2, 2003).**

The goal of the development of the fishing industry in the Russian Federation is to achieve **the sustainable functioning of the fishing industry through conservation, regeneration and rational use of aquatic bioresources and the development of aquatic and marine farming.** The two will ensure that the internal demand for fish products is met, the food independence of the country and the socio-economic development of regions that are dependent on the fishing industry.

The achievement of these goals requires the formation of a comprehensive approach to the governmental planning of the fishing industry within the Russian Federation, the creation of an efficient management system and entails the solution, amongst others, of the following problems:

- The development of a legal framework for the fishing industry which will answer to the goals of its efficient development;
- The creation and implementation of a mechanism for the efficient long-term management of aquatic bioresources that will ensure transparency in their distribution;
- The conservation and rational use of aquatic bioresources and the decrease of the industrial burden that they face;

- Increase in the amount of scientific research done in the field of fishing, improving methods for the calculation of maximum sustainable yields of bioresources, the development of the scientific-technological potential and educational system of the fishing industry;
- Improving the system of protection of biological resources and their ecosystems, ensuring the real governmental control over the use and protection of aquatic bioresources with the purpose of preventing and halting illegal fishing, punishing those who break the set rules and preventing the export of illegal aquatic produce;
- The development of practices for the farming of aquatic bioresources, the formation of genetic collections and breeding stock of the relevant valuable species;
- Development of comprehensive measures for the growth of aqua and marine cultures;
- Further development of the system of informational accessibility for the fishing industry;
- Development of a governmental social strategy for the fishing industry which will ensure the optimal employability and profit of individuals involved in this industry located in various shore-line entities of the Russia Federation

The main goals of the proposed concept are:

- Improving the system of control over bioresources;
- Regulating the fishing industry and creating the right condition to promote the sale of domestic fish produce in the Russian Federation;
- Organization and development of fishing in terrestrial waters that target aquatic and marine cultures;
- The creation of the right conditions for the Russian fishing vessels to have access to exclusive economic zones of other nations, in areas affected by international fishing conventions and in ocean open waters;
- Improving the system of conservation and protection of bioresources;
- Improving the process of scientific research and education in this field;

Considering what was proposed above, the implementation of a long-term governmental policy in this field will allow to achieve the following Aichi targets: B6 and B7 as well aid with achieving goals outlined in A3, A4, C12, C13, D14 and E19.



Hunting is an important component of natural resource use within the Russian Federation. The decree of the Government of the Russian Federation, № 1216-p from July 3 2014 adopted the Strategy for the Development of Hunting within the Russian Federation Until 2030.

**The goal of the Strategy for the Development of the Hunting Industry is ensuring the sustainable growth of the industry and the accessibility of hunting to citizens through the increase of game species populations and the conservation of stable ecosystems.**

The main goals of the Strategy are aimed at the following:

- Increasing the populations of game species up until the ecological capacity of their habitats, maintaining the genetic and species diversity of animals found within the Russian Federation and the decrease in poaching;
- Ensuring the accessibility of hunting to the general population, supporting public organizations and groups of hunters;
- Increasing the informational and scientific provision of governmental bodies that are decision-makers in the field of hunting and the implementation of the principles of the strategy;
- Getting various legal and private entities that are involved in the hunting industry, motivated in the increase in population and long-term sustainable use of game species;
- Maintaining and developing traditional forms of hunting;
- Protecting traditional lifestyles of small indigenous populations of the North, Siberia and Far East of the Russian Federation.

One of the qualitative results of **the implementation of the strategy is the guaranteed conservation of biodiversity throughout the entire Russian territory.**

The last aspect that requires mentioning is the **Aichi targets for the development of a monetary evaluation of biodiversity and their inclusion into the development strategy (A1 and A2)**. The documents listed above, except for the Basics of Governmental Policy in the Field of Use, Conservation, Protection and Regeneration of Forests of the Russian Federation Until 2030, do not directly propose the development of a market for forest ecosystem services. However, it is planned, within the framework of the Federal Service of Governmental Statistics, to include national estimations of the value of biological resources as well as other types of projects associated with biodiversity.

The following can be seen as a general summary of what was said above:

1. Documents pertaining to long-term governmental planning have outlined a considerable number of various goals and targets that are either directly and indirectly related to the goals of conserving and sustainably using biodiversity as well as to the strategic plan of the CBD for the 2011-2020 period.
2. The attainment of the mentioned targets and can be regarded as a combination of cross-cutting and thematic directions for the strategic goals in the field of biodiversity conservation and sustainable use. They include the fields of preventing direct and secondary burdens on biodiversity and preventing the loss of the latter. It also includes the protection of ecosystems, species and genetic diversity primarily through the development of protected areas and the conservation of valuable ecosystems (the Arctic zone, Baikal Lake) as well as the conservation and sustainable use of forest, agricultural, fishing and hunting biodiversity which are all priorities for the Russian Federation.
3. The discussed goals and targets associated with the conservation and sustainable use of biodiversity are in full accordance with the 5 strategic goals of the strategic plan of the Convention on Biological Diversity for the 2011-2020 period and can, if necessary, be reformatted into the described five strategic goals. In this case the national strategies derived from Aichi targets should be regarded primarily as being of an analytical and coordination nature that reflect planned long-term activities.

## Section 11. National Targets

Despite the large quantity of goals that are derived from national long-term strategic documents and Aichi targets associated with the conservation and sustainable use of biodiversity, biodiversity targets tend to be hierarchically secondary. Achieving national long-term goals outlined in section 10 allows to create the necessary conditions for the conservation and sustainable use of biodiversity. However, some urgent and efficient measures aimed at the fulfilment of the Strategic Plan for the Conservation and Sustainable Use of Biodiversity for the 2011-2020 period, remain to be lacking. At the same time, the diversity of currently accepted national long-term targets allow to fully integrate the principles outlined in the strategic plan mentioned above when developing new programs.

Because of this fact national targets that use the Strategic plan and take into account the Aichi targets have been created and are presented below.

Global targets 13 and 19 have been excluded from national biodiversity goals since, at the national level, they pertain to different areas of activity. The global target number 17 is also not considered below as it addresses the renewal of national strategies and thus pertains to all points listed below.

### ***11.1. Strategic Goal A: Address the underlying causes of biodiversity loss by mainstreaming biodiversity across government and society***

#### ***11.1.1. Global Target 1: By 2020, at the latest, people are aware of the values of biodiversity and the steps they can take to conserve and use it sustainably.***

#### **Justification of the national target**

The majority of Russians do not recognize the problems of ecology as well as ecological education and upbringing as crucial to their long-term wellbeing. Out of a total list of available problems, only 13% of the population identifies ecology as important. This is the basic number which indicates the low level of awareness and ecological activity of the population.

Only 29% of the population is willing to have out-of-pocket expenses for measures aimed at ecological improvement. Out of the 48% of individuals participating in ecological-oriented activities, 26% are prepared to do so in the future.

57% of Russians believe that they are unable to influence ecological changes and another 12% were not sure where they stood.

At the same time, large awareness-raising and educational projects in the field of biodiversity conservation and sustainable use are being conducted within the framework of federal protected areas such as national parks and nature reserves. The existing number of volunteers that are organized around protected areas, relevant universities and colleges are evidence to the fact that volunteers can be an integral and efficient component of environmental projects. The leading role in raising awareness about the need to conserve biodiversity is traditionally played by involved NGOs.

However, there is no systematic model for raising awareness on biodiversity conservation, and especially on its monetary value, amongst the population. It is also not included in the systems of ecological education and upbringing, professional training sessions or mass media messages. Studies of sources of mass media and sociological questionnaires relevant to this field are not coherent and nonsystematic making it difficult to monitor the problem.

When approaching this task, it is suggested to avoid the use of the words “biodiversity conservation” by replacing them with those that are more accessible to a wider audience “protecting the environment” or “protecting nature”.

#### **National target:**

**By 2020 citizens of the country are informed that the conservation of biodiversity is a prerequisite for their wellbeing and economic prosperity. Individuals and their social groups undertake concrete steps to further the conservation of biodiversity.**

To evaluate the extent to which this target is met, experts have put forward the following indicators:

- a. The problems of biodiversity and environmental protection are amongst the priority sections identified by a proportion of Russian citizens when asked to list personally-relevant problems;
- b. The proportion of various groups (social, regional or professional) that express interest in attaining information on the state of biodiversity and environmental protection;
- c. Proportion of the population involved in activities aimed at the conservation of biodiversity and environmental protection, who come forward with environmental

initiatives, support NGOs and who are involved in professions related to biodiversity and environmental protection;

d. Proportion of businesses which have attained ecological certification suggested by Russian and international standards;

e. Proportion of commercial companies which consistently provide non-financial reports;

f. Proportion of businesses which provide support for environmental projects

g. The number of ecologically-oriented projects and initiatives conducted by governmental bodies and local authorities.

***11.1.2 Global Target 2 – 2020, at the latest, biodiversity values have been integrated into national and local development and poverty reduction strategies and planning processes and are being incorporated into national accounting, as appropriate, and reporting systems.***

#### **Justification of the national target**

Today, the main problem lies with the threats to biodiversity. The main reasons for this is the increase in consumption and, as a result all of the following: increased demand for resources, increased volume of unprocessed waste, increase in environmental pollution, the increase in population numbers which in turn determine the increased demand for food production, economic globalization and the construction of new infrastructural projects. The decrease in biological capacity, the degradation of ecosystems and the increase of the environmental footprint are not only results of human activity but, in the end, negatively influence the wellbeing of individuals and national economic development in the medium and long term. This is why, to ensure sustainable development, it is necessary to evaluate and monitor the state of ecosystems. The latter includes taking into account the provided ecosystem services.

The traditional market system is unable to adequately evaluate biodiversity as the value of the latter is undervalued or absent altogether. International studies have demonstrated the fact that the benefit of biodiversity is substantially higher than the value calculated from the hypothetical market value of available animal and plant species or from the fines that are placed on those who damage the functioning of the ecosystem. International and Russian experience demonstrates that the

total value of forest ecosystems can be 2-4 times higher than the market price of available timber that they can provide. When evaluating the ecosystem functions of wetlands, the estimated benefit can be substantially higher than the market value of the services and goods that these ecosystems provide. This fact is supported by an evaluation of ecosystem services conducted in Russia. For example, an evaluation of the economic value of the wetland area in the Dubna region (“Craneland”) has demonstrated that the benefit of the ecosystem from the direct use of bioresources (hunting, fishing and collecting of non-timber products such as mushrooms, berries and nuts) as well as the esthetic and scientific use of rare species accumulates to 3.2-5 million rubles per year. At the same time, the indirect value of the ecosystem that estimated only a portion of the ecosystem services (carbon sequestration, water-filtering functions or wetlands and the health effect of outdoor recreation) was estimated to be 7-9.4 million rubles per year, that is almost 2 times as high as the direct value (Bobilev et al., 2001, 2012)

Evaluating national progress based on traditional economic indicators (growth of GDP, national income, etc.) is often ecologically and socially inadequate. These types of evaluations can ignore biodiversity exhaustion and growth of societal problems. It is crucial for Russia to change the indicators upon which progress is evaluated and monitored at the national and regional levels so as to take into account the ecological factor. The monetary value of biodiversity and other according indicators must become important elements during the creation of a new, ecologically sustainable, model of the economy.

Today, statements about the importance of conserving biodiversity, ecosystems and their functions are found in the Ecological Doctrine of the Russian Federation and the Basics of Governmental Policy in the Ecological Development of the Russian Federation until 2030 as well as in a number of other documents. However, the need for the development of a complete economic evaluation of biological diversity and its services is not explicitly stated.

From a scientific and methodological perspective, there are a large number of important studies being conducted in Russia on the topic of ecosystem services evaluation and the development of a payment mechanism for the use of ecosystem services.

Amongst other aspects, it is noted that methods for the evaluation of the value of biodiversity must include both the value of the organisms themselves as well

as the benefit of their functioning. In this case, the most important services are the habitat ones. The methodologies must take into account the international experience and follow the principles of using “the best existing practices”. At the same time, it is important to remember the specificity of Russian biodiversity and ecosystem services. For example, there is wide international use of the concept of *total economic value* which allows to account for not only for the provisioning services of biodiversity and ecosystems but also their regulating, informational recreational and other functions. The implementation of this concept in Russia has demonstrated a gross undervaluation of biodiversity in the decision-making process (Bobilev et al., 2012).

An important step on the way to implementing methods for the evaluation of ecosystem services has been the development and acceptance (in 2012) of the international statistical standard for eco-economic accounting “System of Environmental-Economic Accounting” (SEEA). This system is aligned with other standards such as the 2008 UN System of National Accounts, the Balance of Payments and International Investment Position Manual, International standard industrial classification, Central product classification and the Framework for the Development of Environmental Statistics. In this manner the foundation for the integration of ecological-economic accounting in the system of national statistics has been created.

However, Russia does not currently have a formed understanding of the optimal ways to develop the relevant legal framework, the best ways to implement the existing experience and practices of governmental management and the optimal use of market instruments.

The development of a system for a comprehensive economic evaluation of biodiversity, and the ecosystem services that it provides, is necessary not only for the efficient conservation of wildlife in Russia but also for the provision of ecological security and acceptable socio-economic development of the country.

**Национальная целевая задача:**

**К 2020 году стоимостная оценка биоразнообразия и экосистемных услуг включена в стратегии, программы и процессы планирования социально-экономического развития на национальном и региональном уровнях.**

Для оценки выполнения данной задачи экспертно выделен следующий набор индикаторов:

- а) число показателей СЭЭУ, включенных в систему национальных счетов по разделу «услуги»;
- б) экосистемные услуги регионов получили стоимостную оценку;
- в) число регионов, предоставляющих данные в соответствии с методологическими рекомендациями по расчету показателей СЭЭУ;
- г) число региональных стратегий развития (социально-экономического, территориального), содержащих разделы с оценкой стоимости экосистемных услуг;
- д) показатели динамики стоимости экосистемных услуг включены в число индикаторов оценки эффективности деятельности региональных органов исполнительной власти.

*11.1.3 Global target 3: By 2020, at the latest, incentives, including subsidies, harmful to biodiversity are eliminated, phased out or reformed in order to minimize or avoid negative impacts, and positive incentives for the conservation and sustainable use of biodiversity are developed and applied, consistent and in harmony with the Convention and other relevant international obligations, taking into account national socio economic conditions.*

#### **Justification of the national target**

The given target is composed of two important elements. The first is the elimination of subsidies that may bring harm to biodiversity. The second is the evaluation of the efficiency of the current system aimed at the support of biodiversity and the improvement of said system.

The problems of subsidies and other stimuli which may potentially harm the environment are increasingly discussed at the expert and international, government levels. However, one of the most difficult problems is the definition of what entails a subsidy. A **subsidy** (from the Latin *subsidium* – aid or support) is an allowance, generally in monetary form, which the government retrieves from the available budget and distributes to local authorities, individuals and organizations as well as to other governments. The Russian legal framework has a specific, albeit too narrow, definition of a subsidy. According to the Budgetary Code of the Russian Fed-



eration, there are two types of cross-budget transfers: subsidies and subventions. However, this approach does not only strongly limit the scope of the problem but also does not fully provide an understanding of how the government can affect the implementation of initiatives that are potentially harmful to biodiversity.

The basic definition of a subsidy from the WTO Subsidies and Countervailing Measures Agreement is used when evaluating subsidies for fossil fuels:

- (a) There is a financial contribution by a government or any public body within the territory of a Member (referred to in this Agreement as «government»), i.e. where:
  - (i) A government practice involves a direct transfer of funds (e.g. grants, loans, and equity infusion), potential direct transfers of funds or liabilities (e.g. loan guarantees);
  - (ii) Government revenue that is otherwise due is foregone or not collected (e.g. fiscal incentives such as tax credits);
  - (iii) A government provides goods or services other than general infrastructure, or purchases goods;
  - (iv) a government makes payments to a funding mechanism, or entrusts or directs a private body to carry out one or more of the type of functions illustrated in (i) to (iii) above which would normally be vested in the government and the practice, in no real sense, differs from practices normally followed by governments;

In this manner, the government controls a sufficient amount of monetary, fiscal and other instruments that may be used for both the protection and the harm of biodiversity. Harm to biodiversity can be brought in the case when a potentially harmful project receives some form of governmental support without which the project would not be economically attractive. These type of projects inflict an obvious negative effect on ecosystems and create substantial threats for biodiversity found in the affected ecosystems. Examples of such projects include: large infrastructural projects (hydroelectric plants) transportation projects (pipelines or roads in vulnerable areas), the exploitation of large natural resource deposits in territories previously unharmed by economic activity (for example arctic oil-drilling projects).

The second element of the problem is associated with the financial and fiscal tools of biodiversity conservation. At present, there are certain mechanisms in place that may be used to protect biodiversity (subventions, implementations of federal targets

and others). One of the goals of the Ecological Doctrine of the Russian Federation is the “... economic regulations of market interactions with the goal of establishing sustainable environmental use, decreasing the environmental burden, environmental protection as well as the fostering of governmental and private investments into environmental protection”. However, the field of ecology pertains largely to the domain of public goods. For this reason, existing market mechanisms may be able to regulate natural resource use (to a certain extent) but are unable to provide the sufficient conservation of biodiversity and ecosystem stability. Today, the value of ecosystem services is almost entirely disregarded during territorial planning and the creation of regional development strategies. In regards to stimuli that the government controls, it is important to note mechanisms that stimulate the sustainable and responsible use of renewable natural resources. This mechanism requires the support of certifications which ensure the sustainable resource use (primarily applies to forest and renewable marine resources). According to the decree № 326 of the Government of the Russian Federation from April 15 2014, the Federal program for “Environmental Protection for the 2012-2020 Period” was adopted. This is, without doubt, an important element of creating a system that would decrease the anthropogenic burden on the environment. This primarily applies to the decrease in pollution since the program is focused on ecological production and consumption practices.

Taking into account what was mentioned above, it is important to note the following aspects of the give target.

The problem of fossil fuel subsidies is discussed increasingly often at the international level. In this manner, the commitment to abolish/rationalize such subsidies was stated both at the G20 in 2009 (in 2013 this initiative was again supported and the member nations agreed on the development of national roadmaps and the option of then referencing said roadmaps with partner nations) and by the Asia-Pacific Economic Cooperation forum. For Russia, this initiative is important both as a consumer of carbon fuel as well as an exporter of fossil fuel. The latter is important because the possibility of exploitation of inaccessible oil reserves is made possible by governmental subsidies which transfer extraction costs from fuel prices to direct budget expenditures and decreased governmental revenue.

It crucial to create a comprehensive list of all mechanisms used to support the extraction and consumption of hydrocarbons within Russia, identify the relative efficacy of such instruments and develop a plan for the elimination of inefficient and

non-systematic (those that are provided for individual projects) mechanisms of governmental support.

There must be more attention paid to the three crucial resources: forests, fish and game animals. The latter are important both as renewable resources as well as habitats (forests) and indicators of ecosystem resilience (fish and game species). To achieve the goal, it is suggested to concentrate on the promotion of sustainable forms of forest, fish stock and game animal use. To accomplish all three, it is necessary to:

- Conduct an analysis of existing mechanisms which support responsible utilization of forests, fish stocks and game species;
- Develop financial and/or tax incentives for the promotion of sustainable resource use and the prevention of illegal use of said resources.

In 2014, the first research project estimating the ecological footprint and biological carrying capacity of Russian regions was conducted. The results of the study can be used to monitor the ecological burden caused by economic activity in specific regions and to identify entities of the Russian Federation that exhibit the highest levels of biological carrying capacity. It is suggested to develop financial and/or fiscal instruments which would create incentives for the conservation of carrying capacity in regions where such indicators are high, not only through budget transfers but also by securing investments into sectors of the economy with low ecological footprints. Investments into “traditional” sectors should be attracted to regions with an existing high ecological footprint. To achieve the goals mentioned it is necessary to:

- Develop methodological approaches for the identification of regions with high biological carrying capacity;
- Conduct an analysis of existing inter-budget transfers aimed at the support of biodiversity and environmental protection;
- Develop suggestions for the stimulation of “green” investments into regions with high biological carrying capacity.

**National target:**

**By the year 2020, the existing mechanism for the governmental support of those that use ecosystem services and biological resources and who cause damage to biodiversity, are improved with the goal of preventing negative impacts. Positive stimuli aimed at the promotion of ecosystem services and sustainable uses of bioresources are developed.**

To evaluate the progress of the given target, the following indicators have been identified by experts :

- a) Cadaster of governmental support instruments for those who utilize ecosystem services and biological resources and damage biodiversity. Includes agriculture;
- b) Mechanisms for strategic ecological evaluations are included into regional economic development programs for all industries;
- c) List of economic stimuli aimed at ensuring sustainable bioresource use organized according to different types of resources;
- d) The amount of financial support given to entities of the Russian Federation for the purpose of conservation or restoration of ecosystem services. This is to be done through mechanism which evaluate through the use of monetary values, including markets for ecosystem services and mechanisms for the compensation for lost ecosystem services compared to total ecosystem service costs.

***11.1.4 By 2020, at the latest, Governments, business and stakeholders at all levels have taken steps to achieve or have implemented plans for sustainable production and consumption and have kept the impacts of use of natural resources well within safe ecological limits***

#### **Justification of the target**

In many countries, plans aimed at sustainable production and consumption practices are being implemented both at the governmental and business levels. The concept of sustainable procurement (ecologically-responsible governmental purchases) is being implemented both at the federal and municipal levels. This concept ensures that during governmental purchases, ecologically-responsible products are favored and investments into “green” economic sectors are promoted. This policy allows to support producers with ecologically-sustainable production processes by creating demand for their products.

For example, the European Union has adopted directive 2004/18/EC “On public works contracts, public supply contracts and public service contracts”, the chief document regulating governmental purchases within the EU. Article 26 of the directive states that the client has the right to include special terms into contracts, especially in relation to ecological or social aspects. This has led to the law # 1980/2000 on ecological labels – the branding is awarded to products which are

made in accordance to ecological demands. The goal of the latter is “the promotion of products which, compared to products in the same group, may potentially decrease the environmental impact and in this manner promote the efficient use of resources and environmental protection.”

The Development Strategy until 2020 adopted by the European Commission, identifies ecologically-responsible governmental purchases as one of the methods for achieving the growth targets. The European Commission has also developed a manual for governments who wish to make sustainable purchases as well as criteria for identifying “green” purchases. The criteria are set for 18 types of products and services: office paper, cleaning products and services, office IT equipment, construction, transportation, furniture, electricity, food products and services, textiles, products and services for landscaping, windows and glass doors, thermal insulation, hard wood covers, wall panels, heating plants, construction of roads and street signs and mobile phones.

Many governments of member nations of the OECD have established sustainable purchase policies. For example in Canada, the Policy for Environmentally-Responsible Purchases was signed in 2006. According to the policy, preference is given to products that have a decreased environmental impact from the time of its production up until and including its disposal. The policy also takes into account economic efficiency (price/quality criterion) and ecological indicators at the time of the purchase.

Non-governmental organizations play an important role in relation to sustainable purchases. The leader amongst NGOs in the field of responsible governmental purchases is the ICLEI – International Council for Local Environmental Initiatives. This organization works directly with the EU, de facto becoming a partner in the development and implementation of sustainable purchases concepts. The ICLEI has also published the guide “Procurement + Guide to Sustainable Efficient Governmental Purchases” which does a good job of explaining how governmental purchases ought to be made.

Businesses are also adapting mechanisms which promote responsible production practices. For example, organizations implement mechanisms stimulating policy aimed at corporate social responsibility. At the same time, companies certify their products so as to demonstrate that the latter are in accordance with ecological-responsibility standards (Forest Stewardship Council – sustainable forest use, Marine

Stewardship Council – fishing, Fairtrade Certification – fair treatment of producers, farmers from developing countries, etc.).

The given target also presumes that “the use of natural resources is well within ecological limits”. The term of “ecological limits” pertains to the ability for natural systems to regenerate. Currently, the ecological limits of the Earth are exceeded signifying that humanity utilizes more resources that can be naturally regenerated. There have been studies done at the global scale by organizations such as the Global Footprint Network. It is important to note that the ecological footprint of most West European countries currently exceeds natural rates of regeneration while Russia, at present moment, operates within said limits. Nevertheless, the ecological footprint of the Russian Federation is increasing and it is important to decrease it through the “greening” of production processes.

Despite a highly developed legal framework in the area of environmental protection, experts admit that, within the Russian Federation, the level of ecological consciousness amongst the general population is relatively low. Amongst other aspects, the concepts of sustainable development and of a green economy are relatively new to Russian society. However, positive change is taking place. For example, at the 2014 Saint-Petersburg Economic Forum, the topics of increasing the ecological responsibility of business as well as that of enhancing of political initiatives and mechanisms for the regulation and stimulation of new, “green” practices, were discussed.

Considering the limited time allocated to the achievement of this target, it is necessary to give priority to those mechanisms which provide the best results while demanding small changes within the society. To accomplish this goal, it is important to take into account specifics of the Russian society whereby the government is heavily involved in the business community and economy of the country. The Government of the Russian Federation and governments of individual entities of the RF have the ability to exert a strong influence on the market for ecologically-responsible products as they are important clients. Shifting priorities during governmental purchases towards more ecologically-sustainable products has the potential to heavily change the situation on the market by creating demand for “green” products and thus supporting their producers.

The main law in the sphere of governmental purchases is the Federal bill from April 2013 № 44-ФЗ “On the Contract System in the Sphere of Purchase of Products

and Services for Governmental and Municipal Needs”. Article 32 of the bill allows using the ecological characteristics of the product as criteria for deciding the purchase. The list of laws, technical regulations and EASC standards which contain ecological demands/parameters that can be referenced during tenders for the supply of products or services for governmental and municipal needs may be found on the official website of the Russian Ministry of Natural Resources. So while the legal framework for taking into account ecological characteristics during governmental purchases has been created, it is important to create further mechanisms that would incentivize customers to consider such characteristics and to generalize them across the board.

The cooperation amongst Russia and the EU holds a high potential for sharing the best practices and exchanging knowledge. It is also important to develop cooperation amongst NGOs which work in the sphere of sustainable governmental purchases in Russia.

The next important component for achieving the outlined target is the members of the business community itself. The national distinction of the Russian business community is the presence of a big amount of large companies with governmental involvement which often determine the development tendencies of the entire economy. Relatively small changes in the policies concerning the ecological responsibility of these players may have a cascade effect on other members of the business community. In this manner, the implementation of ecologically-responsible purchases in governmental companies will have a positive effect on all partners affiliated, including suppliers and contracts. The same applies to policies on non-financial accountability. At present day, the system of non-financial statements has begun to develop within Russia with some companies providing such statements on a regular basis. However, these are deemed exceptions, rather than the rule within the Russian economy. It is important to develop and adopt a Concept for Non-Financial Accounting which presumes obligatory non-financial statements for all companies that are dependent on governmental purchases. It is important to start with large companies in which the government is involved so as to initiate the spread of the practice amongst other market players.

The banking sector can also be regarded as an important tool for achieving the given target. By providing loans for some organizations and rejecting them to others, banks have the capability to influence the development of ecologically-sustainable production within the country. There are a number of programs already existent

in other parts of the world, a participation in which requires banks to consider the socio-ecological policies of companies asking for loans. Today, only two banks operating in Russia have become involved in such a program (Equator Principles). Moreover, banks may also promote ecologically-sustainable economic trends through the implementation of ecological purchases policies.

**National target:**

**By 2020 at the latest, the government, business community and participating members at all levels have taken measures or implemented plans with the purpose of achieving sustainable production and consumption while not allowing for the results of natural resource use to damage ecological sustainability.**

To evaluate the progress made towards the target, experts have put forth the following set of indicators:

- a) Number of regions which have implemented policies of ecologically-sustainable purchases by the year 2020 that take into account questions concerning the conservation and sustainable use of biodiversity.
- b) The number of nationally-owned companies and corporations as well as companies with partial governmental ownership which have implemented ecological purchasing policies which take into account questions on the conservation and sustainable use of biodiversity.
- c) The existence of a ratified concept for the development of non-financial accountability for nationally-owned companies and corporations as well as companies with governmental involvement which take into account questions on the conservation and sustainable use of biodiversity.
- d) The number of banks which have implemented policies of responsible financing that takes into account questions about the conservation and sustainable use of biodiversity.
- e) The number of companies which operate in sectors that seriously damage biodiversity that have implemented corporate policies and standards for the conservation and sustainable use of biodiversity.



***11.2. Strategic Goal B: Reduce the direct pressures on biodiversity and promote sustainable use***

***11.2.1 Global target 5 - By 2020, the rate of loss of all natural habitats, including forests, is at least halved and where feasible brought close to zero, and degradation and fragmentation is significantly reduced.***

**Justification of the national target**

**The Forest biome**

Russia continues to contain large territories with untouched ecosystems and areas with unique biological diversity. While the level of biodiversity found in northern ecosystems is substantially lower than in their tropical counterparts, the complexity of their spatial organization and time span during which they have existed renders these ecosystems unique on a global scale. Despite the substantial territory covered by protected areas, the existing system of PAs cannot fully ensure the preservation of natural ecosystems and biodiversity of the country. Russia contains regions and ecosystems with high levels of biological diversity that are important on the world scale. Their importance is primarily associated with natural conditions that they are found in.

WWF has identified the “200 global WWF ecoregions”. These are ecoregions included in the WWF Global 200 list – 233 ecoregions that are most valuable for preserving biodiversity at a global level. Conserving the biodiversity of the identified regions will permit the preservation of 95% of the entire global biological diversity. The list of WWF ecoregions has been formed after a thorough analysis of all terrestrial and marine biodiversity which has allowed to determine the regions with highest levels of biodiversity. The criteria of selection were, amongst others, the diversity of species present in the regions, the level of endemism as well as the presence of unique ecological or evolutionary occurrences.

Amongst the WWF ecoregions found in Russia, the following territories with global ecological value can be found within the forest belt:

- Broad-leaved and mixed forests of the Russian Far East (code number 71). It includes the terrestrial ecoregions of “Ussuriysk broadleaved and coniferous-broadleaved forests” (terrestrial code PA0443) and the “Mixed forests of Southern Sakhalin and Kuril Islands” (code PA0438).
- European-Mediterranean mountainous mixed forests (code 77) which includes the terrestrial ecoregion of the “Crimean sub-Mediterranean

- forest complex” (code PA0416) a portion of which can also be found in the north-western portion of the Northern Caucasus;
- Caucasus-Anatolia- Hirkan temperate forests (code 78) which includes the terrestrial “Mixed Caucasus forests” ecoregion (code PA0408);
  - Mountainous forests of the Altai-Sayan (code 79) which includes the terrestrial ecoregions “Mountainous forests and forest-steppes of the Altai” (code PA0502) and “Mountain coniferous forests of the Sayan” (code PA0519);
  - Mountainous forests of Ural (code 83)
  - East-Siberian Taiga (code 84);
  - Taiga and grass ecosystems of the Kamchatka (code 85) which includes the “Terrestrial ecoregions of meadows and rare-stand forests of the Kamchatka and Kuril Islands” (code PA0603), “Kamchatka and Kuril Taiga” (code PA0604) as well as the “Mountainous tundra and forest-tundra of the Kamchatka” (code PA1105).

On top of what was mentioned above, in 2008 the WWF adopted a new global program (WWF Global Programme Framework) which identifies 35 priority global regions on which most of the WWF effort is concentrated. The Arctic has been added to the list in part due to the increased concerns caused by climate change and the increased regional vulnerability caused by it and growing economic activity in the region.

Russia contains a single territory which, according to Conservation International, is identified as a global “hotspot of biodiversity”: the Caucasus. The concept of “biodiversity hotspots” was proposed in 1998 as an answer to the question of which areas are most important to biodiversity at a global level. These areas an increased amount of endemic species while only composing 2.3% of total land mass area of the planet. Each such area is subject to considerable threat and has lost no less than 70% of natural vegetative growth. There are a total of 34 such areas each of which is home to at least 1500 endemic species of plants.

The Caucasus region encompasses several different nations with a total area of over 500 000 square kilometers. In Russia these are the republics of Adygea, Dagestan, Ingushetia, Kabardino-Balkaria, Karachaevo-Cherkesia, North Osetia-Alania, the Krasnodar and Stavropol Krajs and the Rostov region.

Russia contains a large number of key ornithological territories. The program of identifying key ornithological territories of Russia (KOTRs) is conducted by the

National Bird Association of Russia. The international component of the program is part of the Important Bird Areas (IBAs) developed by the international association for the protection of birds (Birdlife International) during the 1980s. The KOTs are the most important areas of land and water that birds use for nesting, molting, wintering grounds and as rest areas during migrations. The preservation of these areas will have a great effect on conserving populations, subspecies and entire species of birds.

The inclusion of an area into the list of KOTR is dependent on the fulfillment of quantitative criteria developed by Birdlife International and standardized for large regions. Russia is subject to four such divisions: 1) Europe 2) Western Siberia (from the Ural to Yenisei rivers), East Siberia and the Russian Far East 4) the Caucasus. The KOTR are also distinguished as having one of the three statuses: international, national and regional.

By 2006, there were 1 100 distinct KOTR identified within the country of which 700 are of international importance. Information concerning 208 KOTR found in the European region and 170 located in the Eastern region are included in the published Birdlife International catalogues of European and Asian KOT of international importance. At present day, the first step of cataloguing KOTR of international significance is almost complete. These publications contain, amongst other aspects, information about specific KOTR including protective measures undertaken. Information concerning the KOTR of East Siberia and Russian Far East are yet to be published. Further development of the KOTR network is suggested.

As part of Russia's commitment to the Ramsar Convention, there have been 35 wetlands identified within the country which are of international significance due to their value for waterfowl. Some of these territories coincide with existing protected areas.

The full inventory of valuable wetlands within Russia is not yet complete. According to specialists, there are a few thousand such areas located within Russia each having an area ranging from dozens to hundreds of millions of hectares.

166 perspective territories were suggested to be added to the Perspective List of Ramsar Territories by the Russian Institute for Environmental Research (VNIIPrirody) and the Governmental Committee on Ecology of the Russian Federation.

Large territories of untouched ecosystems are not only excellent example of preserved wildlife but also play crucial ecosystem roles on both the regional and inter-

national levels (such as climate regulation). The most studied areas found within the forest belt are the intact forest landscapes, a term coined by the Russia Forest Watch. Intact forest landscapes are defined as being whole natural territories within the forest ecosystem with sizes exceeding 50 thousand hectares that do not have permanent human residences, functioning transportation systems and unharmed by modern economic activity. The size and state of such territories ensures the sustainable existence of almost all viable populations that are found within them and largely counteract local anthropogenic effects. These landscapes can be formed by mosaics of different ecosystems (including non-forest ones) and are characterized by natural fire dynamics. A detailed map of intact forest landscapes can be found in the “Atlas of intact landscapes of the Russian Federation”.

Many natural forest ecosystems have become rare due to a large number of different reasons but especially due to human activity. For example, maple and ash forests are now hard to find, along with forests that have substantial numbers of oak and larch both as young and mature stands. Shade-tolerant conifer (spruce, mixed spruce-fir and fir) forests with a presence of seminatural vegetation and/or boreal tallgrass species are rare within the European portion of Russia and the Ural region. Intact Chern taiga ecosystems with fir-aspen tallgrass forests with seminatural and relic vegetation are now rare in Siberia.

There have been separate lists of rare ecosystems developed for individual regions. For example, they Outer Manchuria and Primorsky Krai have been selected separately, a fact reflected in the “Methodological instructions for the selection of protected forest territories in areas of habitat of rare and protected species of plants and animals as well as of economically-valuable animals of the southern Russian Far East forests” which were prepared by the Far East Forestry Research Institute. The list and parameters of rare regional ecosystems have been developed as part of the project aimed at the identification of forests with high conservational value within the Kirov Oblast. This list of parameters has been made into law and is now legally binding.

The publication “Identifying and studying biologically-valuable forests in the North-Western European region of Russia”, develops a methodology for the identification, studying and mapping of biologically-valuable forests. The methodology is intended for application in the Republic of Karelia, in the Leningrad, Pskov and Novgorod Oblasts as well as in Saint-Petersburg.

The state of environmental damage of Russia is largely associated with the extensive exploitation of natural resources. The historic practice entails that after the depletion of resources in one region, the exploitation is shifted to the next area and the previous territory is de facto excluded from all such economic activity. The existing practices of resource-use pay little attention to the implementation of ecologically-sustainable methods. This is especially applicable to the timber-harvesting and agricultural industries. The crisis in the system of forest management during the 1990s and 2000s has created new threats to the conservation of natural ecosystems: increased forest fires with catastrophic outcomes and the wide spread of illegal logging activities. Additional risks have arisen due to plans pertaining to the construction of infrastructural projects such as roads and pipelines.

As a result, the total area of natural ecosystems found within Russia has been steadily decreasing with some rare ecosystems being at the threat of extinction. There is no reliable data as to the rate of disappearance of ecosystems. At the same time, the total area of intact forest landscapes, according to preliminary estimations for the 2000-2013 period has decreased by approximately 6% (from 277 to 261 million hectares) which is at a rate of 0.04% per year of the initial area. According to studies conducted on the European and Siberian portions of Russia, the most contribution (over half of the total) to the destruction of intact forest landscapes has been done by forest fires with another third being caused by logging and the rest by the extraction of natural resources.

### **The steppe biome**

The steppe biome does not comprise more than 3% of all ecosystems found within Russia. Historically, steppe ecosystems were predominant in landscapes of the steppe belt on the plains which stretched from the western borders of Russia until the eastern limits of Eastern Siberia. They were also found on all highland steppe ecosystems found from the mountainous systems of the Caucasus in the west until the Zabaykalsky Krai in the east. In the broad sense of the term, the steppe zone includes the forest-steppe and semi-desert together with their mountainous analogs. Small areas of steppe ecosystems can also be found outside of “their” zone: relic steppe areas are found in the northern regions alongside broadleaved forests and taiga as well as in the tundra zone (the north-east of Siberia) and in southern, subtropical regions. Most of the steppe zone is concentrated within the region marked in the southern border of Russia (approximately by the 55<sup>th</sup> parallel) and in the west by the 119.5 meridian. The total area within Russian occupied by the steppe biome

(steppe ecosystems) is estimated at 500 thousand square kilometers and comprises less than 20% of global steppes and corresponding highland ecosystems. This area composes slightly more than 15% of total country area.

Despite a small area within the Russian borders, the steppe biome has a disproportionately high significance for the socio-economic situation of the country. The agricultural belt of Russia is predominantly located within the steppe biome. Steppe ecosystems created the natural base which supports, for almost two centuries now, the majority of all Russian agriculture. Humus and brownearth are the foundation of Russian agriculture. These soils, which are amongst the most fertile in the world, have been created by steppe ecosystems. No other ecosystems have the capability to form humus soils. Steppe grazing grounds are a vital component of the Russian cattle industry. The steppe regions provides no less than 85% of all Russian grains, over 70% of large cattle populations and over 90% of national production of goat and sheep wool.

Despite encompassing a proportionally small area within Russia, steppe ecosystems are found in significant amounts in 37-40 entities of the Russian Federation, which is almost half of the total number. These regions are home to 50.1% (half) of the total Russian population.

In accordance with the data provided above, the majority of the Russian population and most of the chief agricultural producers are most dependent on steppe ecosystems. These systems provide the natural base for production and provide ecosystem services such as the stabilization and self-restoration of landscapes as well as the ensuring of favorable living conditions for locals inhabitants.

Over the past years, the role of the steppe biome within the carbon cycle has come to light together with its important contribution in combatting climate change. Steppe ecosystems serve as important long-term storages of carbon: there are approximately 130 million tons of carbon stored in steppe soils. This is almost 30% of all carbon sequestered within the soils of Russia despite the fact that these soils compose only 13.5% of total Russian territory.

Steppe ecosystems are associated with a considerable and specific level of biodiversity that includes species and populations which are endemic and sub-endemic for Russia. Many globally endangered species and species considered at risk within Europe have their main populations within Russia (such as the little bustard, Siberian crane, Eastern Imperial eagle and others). A special analysis of the contribution of

various European nations into the conservation of 27 steppe bird species has shown that Russia is the primary most important nation in this regard (followed by Turkey and Spain). The steppes of Russia are crucial for the survival of 8 globally endangered species of mammals (another 2 species are classified as extinct in Russia) and 10 such species of birds.

The global environmental significance of Russian steppes has been demonstrated by their inclusion into internationally-acknowledged networks of areas which play a crucial role in the conservation of biodiversity. In this manner, steppe ecosystems are widely represented in 3 of the 8 of the Russian UNESCO Natural World Heritage Sights. All are located in Siberia: “Golden Mountains of Altai”, “Lake Ubsunur Basin” and the “Lake Baikal Basin”. Another such area, “The Steppes of Dauria” is currently under consideration. Steppe landscapes encompass 6 out of 13 Russian wetlands of international significance (Ramsar wetlands). A perfect example is the network of key ornithological territories of global significance. Russia contains 746 identified KOTR of which 462 (over 60%) are located within the steppe biome (within the steppe belt and highland ecosystems) and 170 (23%) of which include portions of steppe ecosystems. Out of ecoregions identified by the WWF as being especially important for the conservation of global biodiversity Russia contains 11 either partially or in full. However, nominally, only one such region can be considered a steppe (Dauria/Mongol steppes) and another two (“Mountainous forests and tundras of Ural” and “Altai-Sayan mountainous forests”) contain areas of mountainous-steppe ecosystems.

The reverse side of having an exceptional economic value is the high level of destruction that has been brought to the steppe biome. Almost all remaining steppes within the Russian Federation are legally conserved agricultural lands (grazing grounds and sometimes hay stacks). Over half of all historical steppe ecosystems located within Russia have been destroyed by ploughing and are now overtaken by agricultural fields. The agricultural use of steppe soils presumes the total destruction of steppe ecosystems and even hay/gazing grounds are often “improved” by agro-technical practices such as the introduction of fertilizer and alien species which ruin and degrade existing ecosystems. Other important factors responsible for the destruction of Russia’s steppe ecosystems are: afforestation, extraction of minerals (fossil fuels, coal and ores of various minerals) and construction. Overall, the most damage has been brought upon the European portion of Russia’s steppe biome. Here, entire types of steppe ecosystems, such as meadow and meadow steppes have been destroyed on over 90% of their original territory. Even in certain regions of Si-

beria, the level of scarifying was as high as 70% (such as in the steppe regions of the Omsk and Altai Krai). The remaining steppe territories were, for decades, subject to over-grazing, pollution by agricultural chemicals and other “border effects” of agriculture as well the fragmentation by roads and canals.

There are two factors identified as being a particular threat to the livelihood of certain species of steppe plants and animals. Both legal and illegal resource extraction has threatened the existence of certain species in some regions (the Saiga antelope of Kalmykia, Saker falcon in Altai, Tuva and Khakassia regions and the *Scutellaria baicalensis* in the Zabaykalsi Krai). Certain low-voltage electric power lines (6-10 kV) threaten the existence of a number of species of large and medium-sized birds of prey that exist in steppe habitats throughout the entire steppe biome.

The factor of steppe fires must be noted separately. Unlike in the case of forests, fires do not cause the destruction of the steppe ecosystem and generally do not serve as the trigger for a long-term restorative succession. The chief parameters of the steppe ecosystem take approximately 2-3 years to restore after a “medium” fire. The resulting ecosystem does not significantly differ in its composition of species. However, fires that are too frequent, too strong or occurring in late spring or early summer are an important factor leading to the degradation of the steppe ecosystems. On top of what is mentioned above, fires are particularly dangerous for shrub and forest ecosystems that are linked with steppes. Forest fires within Russia have played an important destructive role from the beginning of the 18<sup>th</sup> to the 20<sup>th</sup> centuries and during the post-1991 period.

The peak of active steppe ecosystem destruction in Russia took place during the virginal land program of the 1950s-60s but the total anthropogenic burden on the steppe biome continued to increase until 1990 despite the fact that the area of plough lands did not significantly increase post 1960.

After 1991, the anthropogenic burden on the steppe biome temporarily decreased. The nature, rapidity and depth of these changes are comparable to those that occurred in Russia during the 1918-1928 periods. 1) Due to an overall decrease of cattle populations, the pressure on hay stacks and grazing grounds was generally decreased. This positive trend was accompanied by an overall redistribution of burdens throughout the steppe biome. As a result, while the overall burden was decreased, certain steppe ecosystems became subject to unsustainable grazing while others suffered from a complete lack of the latter (which is also a negative factor for steppe



ecosystems). 2) For the first time since the 1940s, there was a significant increase in the area of secondary steppe ecosystems that appeared on set-asides and abandoned fields of fodder grasses. The post-2000 period has seen a gradual return to previously abandoned fields but the 1990 levels have not been reached and probably will never be (due to the economic infeasibility of ploughing low-productivity lands). 3) The chemical pollution of steppe ecosystems has significantly decreased due to the overall decrease in pesticide and agro-chemical use due their efficient application which allows them to largely remain within the bounds of targeted fields. 4) Almost all hydrotechnical amelioration activities were halted for a decade and a half (the digging of canals, clearing of rivers and other). Overall, this has had a positive effect on the state of steppe ecosystems and landscapes. 5) The planting of new protective forests was halted as was the maintenance of existing protective strips. In most regions, all maintenance activities aimed at the control of aspen and birch as well as broadleaf temperate forests was also stopped. While the disappearance of protective forest strips is a positive factor for steppe ecosystems, the destruction of natural steppe forests has played a definitive negative role. 6) The frequency and severity of forest fires have rapidly risen which was the natural effect of the decrease in cattle populations on top of a lack of wild ungulates. The accumulated volume of dry grass on grazing fields and hay stacks that was not consumed by cattle, coupled with low levels of humidity, high summer temperatures and constant winds has led to the increase in fire threats.

The past decade has seen the growth of factors which threaten steppe ecosystems. However, their combination is different than those existent during the 1970s-80s period in part because of the new types of threats that arise. For example, there is now the threat of fragmentation of the remaining large steppe regions due to the privatization of agricultural lands.

Global climate change is also playing a distinct role in the process. Climatic processes within Russia do not have a defined trend and cause varying direct and indirect changes in steppe ecosystems. Overall, the aridization and warming of climate is favorable for the portion of Russia's steppe ecosystems that are located at the northern and upper (mountainous) limits of the biome. However, de facto, climate change is mediated by changes in economic activity which results in negative impacts on steppe ecosystems: increasing the area of utilized agricultural lands, accelerating the degradation (various forms of soil erosion as well as the salinization and deterioration of soils) of economically-exploited soils, the expansion of aggressive alien species of plants and animals into steppe ecosystems, mass growth of forest

fires (alongside with the cause of changing land-use). The set of negative occurrences associated with the changes mentioned above is known as desertification. The threat of desertification in Russia has been acknowledged at the governmental level: in 2003 Russia joined the UN Convention to Combat Desertification.

Steppes are not only the most damaged but are also the least legally protected biomes of the country (and the world). There is no specific governmental policy for the use and conservation of steppe ecosystems. The Russian legal framework does not identify steppes as a separate unit of regulation, completely lacking the term of “steppes”.

The proportion of the steppe biome located within federal protected areas is insignificant: not more than 0.3% of all steppes (which composes 1% of total protected areas). Out of more than 100 nature reserves, only one (“Orenburg” with 4 cluster areas) is fully within the steppe biome with another 9 reserves including at least one steppe cluster area (most of these are small in size). Only one national park (“Pribaikal”), out of more than 40, includes a significant steppe portion. Out of the 70 federal zakazniks, steppe ecosystems can be found in 16 with only 6 of them containing significant areas of steppes. The representation of steppes in regional protected areas is higher but still fully insufficient. These PAs can only be evaluated according to expert estimations due to a lack of credible national data on the quantity, area, spread and protection status of regional steppe protected areas. It is also important to note the level of actual ecosystem protection in most federal zakazniks and regional protected areas is considerably lower than in nature reserves and national parks. The specificity of steppe ecosystems as an item of conservation is often not accounted for by protected area managements which renders the system inefficient in conserving steppes. Such specificities include: the necessity to sustain and regulate the levels of grazing, bans on afforestation, the permissibility of fires under certain conditions and limitations of certain fire-combatting measures (such as the creation of mineralized strips).

The IUCN Red List of the Russian Federation includes up to 14 species of steppe mammals and birds, 2 of which are also included in the “List of valuable wild animals and aquatic bioresources which are included in the IUCN List of the Russian Federation and/or which are protected by international agreements enforced by articles 226.1 and 258.1 of the Criminal Code of the Russian Federation” that has been signed by the decree of the Government of the Russian Federation on October 31 2013 (№ 978) (Altai argali and Saker falcon). This list also includes another

steppe specie: the Saiga antelope which is not yet included in the IUCN Red List of the Russian Federation

### **National Target**

**By the year 2020 the rate of natural habitat loss, including those of forests and grass ecosystems, are cut by at least half and completely halted where it is necessary. The degradation and fragmentation of habitats is also significantly decreased.**

To evaluate the extent to which this target is met, experts have put forward the following indicators:

- a) The total area of forests within the Russian Federation/ within specific entities of the Russian Federation;
- b) Area of intact forest landscapes;
- c) Area of the National Forest Heritage of the Russian Federation;
- d) The area of steppe and similar grass ecosystems within the range of the steppe biome;
- e) Area of idle fields within the range of the steppe biome.

***11.2.2 Global Target 6 – By 2020 all fish and invertebrate stocks and aquatic plants are managed and harvested sustainably, legally and applying ecosystem based approaches, so that overfishing is avoided, recovery plans and measures are in place for all depleted species, fisheries have no significant adverse impacts on threatened species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.***

### **Justification of the national target**

The conservation of biological diversity during the performance of economic activity which has an impact on the environment is amongst the main priorities of environmental conservation of the Russian Federation (Federal bill from January 10, 2002 (№ 7-Φ3) “On Environmental Protection”). Out of the main legal principles concerning fishing and the conservation of aquatic bioresources, those that are most important for the conservation of biodiversity are the considerations of aquatic bioresources as necessities for human livelihood, the priority given to the conservation of bioresources and their national use over other rights (such as those

pertaining to private property), priorities concerning the conservation of valuable species of aquatic bioresources and the determination maximum sustainable yields of aquatic bioresources while considering ecological, social and economic factors (Federal bill from December 20, 2004 (№ 166) “On Fishing and the Conservation of Aquatic Bioresources”, referred to later in this text as the FB “On Fishing”).

The Russian Federation has a legal framework concerning fishing and the conservation of aquatic bioresources that is in accordance to the goals of targets of the Convention on Biological Diversity. According to the FB “On Fishing”, for the purposes ensuring the conservation and rational use of bioresources there may be: limits set as to the amount of permissible fishing, special regulations for the harvest of rare and endangered species of bioresources, the establishment of limitations of the total allowable catch (TAC) of aquatic bioresources. It allows for the conducting of governmental monitoring of aquatic resources. Data from such activity is to be used for the organization of rational use and conservation of aquatic resources and punishing those individuals which have broken laws in this field. Each fishing basin is to have separate fishing regulations – a set of demands which are to form the basis for the conservation bioresources. With the purpose of preserving bioresources and their habitat the following is to be done: amelioration of bodies of water for fish populations, the man-made reproduction of aquatic bioresources, establishing legal norms for the quality of water in aquatic bodies used for fishing and establishing demands for hydrological regimes of such aquatic bodies. Fish-protecting areas which limit and regulate economic activity are established with the purpose of preserving conditions for the reproduction of aquatic bioresources. Aquatic bodies used for fishing and other areas that are important for fishing and fish reproduction can be proclaimed as natural reserves if it is necessary to conserve fish populations which inhabit the given areas. The legal status of aquatic bodies dictates that if any economic activity is done within their boundaries, there must be measures taken aimed at the conservation of bioresources and their habitats. According to the Federal Bill “On Environmental Protection” and the FB “On Fishing”, there are measures that must be taken aimed at the protection or rare and endangered species of aquatic bioresources.

Despite the fact that the Russian Federation possesses a specific legal framework in the field fishing and aquatic bioresource conservation, individual questions in the management of aquatic bioresources, including their conservation, require further legal regulating.

Amongst others, this applies to the specifics of governmental monitoring of aquatic bioresources, the development and implementation of methods of estimating the quantity of bioresource storages and the rate at which they are extracted. For example, there is a lack of a unified method for the selecting methods and models that are applied during bioresource studies and during the evaluation of the received data. As a result, it is not always possible to evaluate the validity of calculated TAC and volume of resources extracted. Because of the latter, there have been occurrences when it is difficult to objectively evaluate whether the level of bioresource extraction is sustainable.

When it comes to fishing as a form of economic activity, the procedure of evaluating its impact on the on the environment is based on the materials which use the TAC and maximum sustainable yield as a base.

The biological justification of the allowed levels of resource extraction, which targets specific industry-statistical regions, must be formed with the purpose of achieving sustainable resource use. Because fishing is a traditional form of economic activity in all of Russia's regions and because it has a city-forming significance in many coastal communities, the entire set of expert procedures must be conducted in the case when new tools and practices of fishing are introduced.

Despite existing problems in the field of implementing the articles of the Convention on Biological Diversity within the Russian Federation, it would be unfair not to note the fact that over the past years, measures undertaken by the regulatory and executive branches of the national government have been aimed at increasing the efficiency of the conservation and rational use of natural resources.

It is also planned to develop the system of ecosystem service accounting, a new concept within the Russian practice of organizing resource use. In the forest, aquatic and hunting sectors, the goal of creating a market for both consumer and habitatecosystem services has already been outlined. However, an analysis of strategic and conceptual documents used in the sphere of fishing and aquatic bioresource conservation, has shown that the term of ecosystem services is yet to be widely utilized.

Throughout the last years, there have been changes made in the legal framework concerning environmental protection. These changes address the expansion of governmental ecological monitoring and the creation of a unified database which includes the following annual information concerning aquatic bioresources:

- Observations on regular evaluations of the distribution, population size, quality and reproduction of aquatic bioresources (and their habitats) which are economically exploited;
- Data collected from regular observations of fishing and the conservation of aquatic biological resources;
- Data from evaluations of the state, distribution, population size, quality and reproduction of aquatic bioresources and their habitats;
- The state, distribution, population size, quality and reproduction of aquatic bioresources and their habitats under the influence of natural and anthropogenic factors.

Today there is still no system for the monitoring of the quality of bioresources and products made from them. There is no developed form for the presentation and storing of data on the state and prognosis on the changes of the state of bioresources as well as for the data collected on fishing and the conservation of aquatic bioresources.

For this reason it is necessary to improve the legal and legal-procedural framework for the conducting of governmental monitoring of aquatic bioresources, including the evaluation and forecasting of the state of stocks which will render obvious the volumes of permissible harvests. In the sphere of monitoring of fishing activities and the conservation of aquatic bioresources, it is necessary to form a system of supervision of recreational fishermen who are responsible for the extraction of considerable volumes of aquatic resources from the internal waters of the Russian Federation but who are not accounted for.

One of the main problems in the world in the sphere of fishing and the conservation of aquatic bioresources is the illegal, unreported and unregulated fishing (IUU fishing). With the purpose of combatting IUU fishing, the government of the Russian Federation has issued a decree on December 25, 2013 (№ 2534-p) which ratifies the National Plan for the Prevention, Containment and Elimination of Illegal, Unreported and Unregulated Fishing. The document is in accordance with the international documents that exist in this field and ensures a considerable amount of measures which address the problem.

An important element of ensuring sustainable fishing is the implementation within Russia of a process that was previously completely absent from the country: the ecological certification of fishing according to the MSC (Marine Stewardship Council).

It is important to note that a number of Russian fishing companies which operate at a mass scale, including that of the Alaska Pollock in the Sea of Okhotsk, have undergone all the stages of the voluntary certification and have been deemed as compliant to the rigid international standards of sustainable fishing.

On top of what is mentioned above, it is necessary to ensure the formation of a national system of ecological certification of fishing and products made from biological resources. The target of creating an internal national system of ecological control has already been voiced in reports made by bodies of the executive branch working with the fishing industry but the project is yet to move forward.

In this manner, measures in the sphere of governmental regulation of fishing aimed at the conservation of bioresources and their habitats have been developed and are in the process of being implemented. These measures are in accordance with the actions prescribed by the global target calling for the conservation of ecosystems and various populations of bioresource species which compose them.

**National Target:**

**By the year 2020, fishing within the exclusive economic zone, territorial waters and internal (including marine) waters of the Russian Federation is conducted in accordance with the principles of sustainability. All such activity is done within the framework on fishing and the conservation of biodiversity with the condition of minimizing the negative impact of fishing on aquatic bioresources (including rare and endangered species) and their habitat. There are measures taken for the prevention, containment and elimination of illegal, unregulated and undeclared fishing and for the regeneration of aquatic bioresources which have been damaged as result of anthropogenic and natural causes.**

Experts have identified the following set of indicators to evaluate the progress made towards achieving this target:

- a) The dynamics of the volume of total allowable catches and possible (recommended) harvest volumes of aquatic bioresources within the interior waters of the Russian Federation, the territorial seas of the Russian Federation as well as on the continental shelf an exclusive economic zone of the Russian Federation (compared to the base year);
- b) The level (extent) of fulfilment of total allowable catches and maximum sustainable yields of aquatic bioresources within the interior waters of the Russian Federa-

- tion, the territorial seas of the Russian Federation as well as on the continental shelf an exclusive economic zone of the Russian Federation (compared to the base year);
- c) Dynamics of the instances of illegal activity in the sphere of fishing and the conservation of aquatic bioresources and their habitats (compared to the base year);
  - d) Number of fishing enterprises which are certified by one of the voluntary fishing certification programs;
  - e) Number of units of stock of industrial species of aquatic bioresources which are subject to governmental monitoring;
  - f) Dynamics of the numbers of industrial returns of aquatic bioresources that are cultivated by humans for commercial use (compared to a base year).

***11.2.3 Global Target 7: By 2020 areas under agriculture, aquaculture and forestry are managed sustainably, ensuring conservation of biodiversity.***

**Justification of the national target**

**Lands used for agriculture**

On top of completely artificial ecosystems (plough lands, gardens and vineyards), agricultural lands include natural and seminatural ecosystems of grazing grounds and hay stacks as well as long-term idle fields. Legally-defined agricultural lands do not solely include lands actually used for agriculture, there is a heavy presence of other types of natural and seminatural ecosystems. On top of the latter, despite the fact that plough lands, gardens and vineyards are not natural ecosystems, they nevertheless serve as important habitats for many species of wildlife, especially birds and insects.

The area of such lands within Russia is extremely large as they cover a substantial portion of the country. Natural and seminatural ecosystems found on agricultural lands compose at least 100 million hectares (spread throughout types of lands with varying legal designations). According to evaluations made by different methods, another 30 million hectares are taken up by perennial idle fields which are now home to restoring secondary ecosystems (only approximately 4.9 million hectares are officially accounted for). In addition, another 124.7 million hectares of lands with agricultural designations are taken up by marshes and other natural and semi-natural ecosystems. On top of all the non-forest ecosystems described above, an-



other 19 million hectares of forests and shrub ecosystems that are not part of the forest fund can be found within the agricultural lands. In total, natural and seminatural ecosystems which are found on legally-defined agricultural lands take up over 270 million hectares (16%) of the national territory. This number does not include tundra deer grazing grounds found in the Arctic.

There are several large regions and even entire full ecological zones within Russia where agro-landscapes are practically the only habitats for biodiversity. Within 17 entities of the Russian Federation (over 20% of all entities; mostly in the Central Black Earth economic region, Volga and North-Caucasus regions), agriculturally-designated lands compose over 70% of the entire area, in 12 entities – over 80% and in 6 – over 85%. At the same time, in 16 of them the forest cover does not exceed 15% of the region territory (in 14 – less than 11% and in another 6 less than 5%). There are 26 entities of the Russian Federation where the forest cover does not exceed 25%. The majority of these are regions located in the steppe zone where a lack of forests is a natural characteristic (although forests are further diminished by human economic activity). For entities of the Russian Federation located in Siberia (Siberian Federal Okrug), are characterized by high forest covers and low proportions of agricultural lands. The latter occurs largely because of the large areas of these regions and their propensity to stretch from the south to the north. Almost all regions of Siberia contain large forest-free segments which are often larger in size than entire entities of the Russian Federation located within the country's European portion. For example, agricultural lands compose over 70% of the area of half (32 of 63) of the municipalities of the Altai Krai (in 10 municipalities this number exceeds 85%) while, overall, agricultural lands compose 65% of the region. The total area of the 32 municipalities mentioned above is 7939.2 thousand hectares which is several times greater than most of the regions of the Russian Federation found in the Central and North-Caucasus Federal Okrugs. Throughout the territories mentioned above, natural and seminatural terrestrial ecosystems and the biodiversity with which they are associated exists almost exclusively on lands with agricultural designations. The role of agro-landscapes is particularly important for the support of biodiversity within the steppe (including semi-desert and forest-steppe) ecological zone and analogous mountainous regions of southern Russia.

Biodiversity which exists on both functional agricultural lands and legally-defined agricultural lands is high and composes a considerable and unique portion of the total biodiversity found within the Russian Federation. A number of types of ecosystems which exist within the Russian Federation can only be found on agricul-

tural lands. Examples of this phenomenon are almost all types of steppe ecosystems, aspen and birch as well as broadleaf temperate forest ecosystems of steppe and mountainous shrubs, the majority of fens and relic bogs of Western Siberia, northern saltwort deserts of Eurasia (Caspian region and Western Siberia).

A number of rare and endangered species of plants and animals of Russia can only be found on agricultural lands. Examples of such species are the Demoiselle crane, Great bustard, little bustard, Steppe eagle, Eastern Imperial eagle, Saiga antelope, Altai argali, Bobak marmot and Palla's cat. The number of such insect species number in the hundreds. On top of that, some of these speies are endemic (subendemic) to Russia.

In addition, the agricultural lands of Russia play a key role in the support of many rare and endangered species of wildlife which are not limited by agricultural landscapes. For example, Siberian cranes and Lesser White-Fronted geese are vitally dependent on fields and meadows found in steppes for fodder and rest during migrations. The Snowy owl also uses the agricultural lands found in central Russia as important winter habitats. While a number of fairly common species can be found outside of agricultural lands but it is there where their populations numbers are the largest and most successful. Examples of such species are the Corn crake, Gray and Daurian Partridges, European bee-eater, etc.

Natural and seminatural ecosystems are widely utilized in Russian agriculture as fertile grounds and serve directly as sources of agricultural produce. For example , there are over 70 million hectares of natural grazing grounds found in Russia (not counting tundra deer grazing grounds). These serve as the main fodder base for cattle breeders, providing 40-60% of the nutritional uptake of large cattle and almost 100% for sheep and goats (also for camels and yaks). It is the existence of such natural grazing grounds which determines cattle production as the predominant form of economic activity for the republics of Altai, Tuva, Buryatia, Yakutia, Kalmykia, Dagestan and others. Natural ecosystems and wild plant species found on agricultural lands serve as honey flows for domestic bees while at the same time being a vital source of pollinators (primarily bumblebees and bees) for several agricultural plant species.

Even more importantly, natural and seminatural ecosystems stabilize agricultural landscapes and ensure the continued fertility of plough lands. This role is critically vital for regions where the forest cover is insignificant (in 16 entities of the RF for-

ests take up less than 11% of total area). Almost all ecosystem services within the regional agro-landscapes are provided by ecosystems which exist on plough lands and agriculturally-designated lands (these ecosystems are predominantly non-forest).

Amidst the agricultural crisis of the 1990s, the biodiversity of agricultural lands played an important role in ensuring the spontaneous regeneration of abandoned plough lands alongside with their ecological and productive qualities. For example, the formation of steppe ecosystems on idle fields leads to a halt of soil erosion, increases the composition of humus (largely lost during ploughing), ensures an improvement in the structure of soils by increasing their fertility and simultaneously improving the hydraulic and wind patterns of nearby active plough lands.

The biodiversity associated with agricultural lands provides additional renewable resources both for the local communities as well as for commercial use. One of the most profitable bioresources are wild medicinal plants, many of which are found on agricultural lands (for example licorice founds on steppe grazing grounds, ginseng, rhodiola, Baikal skullcap and others found on the fields of Altai, Sayan and Zabaykalsky Krai).

The biodiversity of agricultural lands serve as a recreational resource, particularly for leisure and competitive hunting and leisure fishing.

The biodiversity of natural ecosystems serves as a source of genetic material for the development of farming. This is primarily applicable for wild strains of cultivated plant species. The European portion of Russia alone contains 647 species of wild analogues of cultivated plants the majority of which (over 400) are associated with non-forest ecosystems that exist on agricultural lands.

Natural ecosystems are also a source of natural agricultural pest enemies. In Russia, this phenomenon is most important for the control of such mass pests as the Italian locust and other types of locusts, the webworm moth and corn bug. Even without specific efforts meant to increase their efficiency, natural enemies of pests are able to considerably lower their population size. For example, during the 1992 invasion of locusts in the Saratov region, all human activities at combatting the problem were cancelled as flocks of Common starlings annihilated the pests. Another such example is the 1999 epidemic of Italian locusts in the Novosibirsk region where 60% of all locust egg pods were destroyed by blister beetles and another 10% by diseases.

Agricultural production and the associated transformation of affected territories present a serious threat to the biodiversity of Russia. The main threats are the following:

- The ploughing of all physically accessible territories which destroys immense areas of natural ecosystems and associated biodiversity;
- Erosion of soils which destroys not only fields but also natural ecosystems that exist on inarable lands, hillsides, field edges, etc.;
- The fragmentation of natural ecosystems by fields, roads, canals and other linear infrastructural projects (such as pipelines);
- The degradation of natural grazing grounds due to unsustainable grazing;
- Eutrophication of bodies of water and low-lying terrestrial ecosystems by the wash-offs from fields that bring excess organic matter and fertilizer;
- Pollution of lands by pesticides and excessive amounts of mineral fertilizers;
- The disruption and destruction of wild animals (that have otherwise adapted to the agricultural landscapes) by agricultural works and by infrastructural projects (such as roads and power lines);
- The loss of natural biodiversity as a result of hydro amelioration (irrigation). In the north of the agricultural belt this is caused by the destruction of wetland ecosystems and in the south by the salinization of irrigated and otherwise affected lands;
- The destruction of populations of species considered as agricultural pests. This includes species that previously brought harm to farmers but are now rare (examples of such species are ground squirrels, marmots and various species of prey birds);
- Changing nature of afforestation processes. The mass destruction of aspen and birch as well as temperate broadleaved forests which leads to the interruption of hydraulic and wind conditions and the disappearance of rich biodiversity. However, the creation of forest is also a threat as they are not well integrated into the existing landscape and do not support the species of plants and animals that are indigenous to aspen and birch as well as temperate broadleaved forests. The creation of forest strips also destroys natural grass ecosystems.
- The decrease in biodiversity and the degradation of ecosystems as a result of higher frequency/intensity of fires, especially those that occur in late spring and early summer. Steppe fires occur both as a result of intentional

human activity aimed at the clearing of hazing grounds and field leftovers as well as due to a vast array of different accidents.

- The spread of alien species from agricultural fields to natural ecosystems. The phenomenon applies to not only wild species but also to synanthropes such as various species of weeds, corvidae birds (hooded and carrion crows, rooks), brown rats and others;
- The degradation of key types of natural ecosystems.

Today, some of these threats are less pressing. At the same time, the potency of others (such as fires) has increased. Nevertheless, all remain important and all influence the state of natural and seminatural ecosystems located on agricultural lands.

A number of the threats listed above, together with occurring climate change, create a multi-faceted threat of desertification in the south of Russia. In one manner or another, desertification affects somewhere around 100 million hectares of agricultural lands in 35 entities of the Russian Federation.

At the same time, a specific trait of biodiversity found on agricultural lands is its complex relationship to the established practices of farming. It is for that reason that the halting of traditional farming practices and/or their replacement with modern technology can also lead to the disappearance of both specific species as well as of entire ecosystems. For example, when the grazing of cattle on natural fields was largely halted in the 1990's, this led to the disappearance of many endangered birds of prey (Steppe eagle, Short-toed Snake eagle, Long-legged buzzard and others) from several regions. The same cause has led to the sharp decrease and localized extinction of previously immense populations of spermophili species (little ground squirrel, speckled and red-cheeked ground squirrels). The changing practices of field maintenance and the appearance of idle fields have led to a deterioration of the quality of nesting grounds for great bustards and demoiselle cranes. The halting of grazing on the slopes of arroyos in the Central Black Earth and Volga regions has been the cause of the decrease in communities of Cretaceous and rocky steppes which include dozens of plant species included in the IUCN Red List of the Russian Federation and according lists of various entities of the Russian Federation.

There have been no specific environmental measures aimed at the conservation of biodiversity on agricultural territories undertaken in Russia. The existing land, agricultural and tax legal frameworks do not take into account the multi-faceted functionality of such territories. For that reason, these lands are only evaluated

as territories for the conducting of agricultural activity. The corresponding legal framework does not provide any incentives (including taxes) for the conservation of biodiversity and ecosystem services of agricultural lands.

In contrary, the legal framework incentivizes modes of land management which are destructive to biodiversity. For example the legal ban on having idle agriculturally-designated lands does not make exemptions for the halting of economic activity for environmental reasons. The criteria put forward by the Government of the Russian Federation (on July 19 2012, № 736), which are used to evaluate environmental deterioration as a result of irrational land-use, do not include considerations for the state of biodiversity on agricultural lands and corresponding ecosystem services. The legal framework also does address the conservation of biodiversity of agricultural lands despite the fact that the latter is crucial to the continued fertility of soil, a factor which is considered essential in the management of agricultural land. On the contrary, the legal codes demand, amongst other aspects, that agricultural lands be protected against “the overgrowth by trees, shrubs and weeds” (sub-section 3 of section 1 of the 13 article of the Land Code of the Russian Federation). Additionally, the legal code does not provide qualitative distinctions between weed plants and other wild species of plants,

Overall, the conservation of biodiversity and natural ecosystems located on farm lands and legally-designated agricultural territories, is considerably worse than it is in forest ecosystems. However, the difference is played by non-specific measures. For example, agricultural and other non-forest ecosystems are part of regional protected areas. The majority of regional protected areas which protect terrestrial ecosystems do not alter the legal designation of the lands that they encompass thus including both operating farmlands and legally-designated agricultural lands. However, currently, there is a lack of data on the total area of such territories in regional networks of protected areas. Such data is not only missing for the country as a whole but even for many entities of the Russian Federation.

Another set of non-specific measures for the conservation of biodiversity which operates in rural areas is the legal protection of species which are member of the IUCN Red List of Russia and according lists of entities of the Russian Federation.

### **Territories and water areas used for aquaculture**

Aquaculture (aquafarming) – is a crucial sector for the production of highly valuable fresh food. Throughout the past 30-35 years, this has been the fastest growing

sector of the fishing industry (according various Russian and international documents, this includes the entire agriculture industry).

The economic efficiency of this sector is associated with the high reproductive rates of fish and specifics of their energy metabolism. Fish do not utilize the energy derived from food to support a constant body temperature and instead put it all towards growth in size, the renewal of tissue and support of life processes. This is why the expenditure on the production of 1 ton of fish produce must be several times lower than that of beef, lamb or pork.

However, the majority of the entities of the Russian Federation are located in the zone of risky agriculture where it is too cold to engage in aquafarming. The colder the temperature of the water, the lower the accessibility of nutrients by fish and, accordingly, the profitability of the venture. For a kilogram of gain in trout mass, it is necessary to expend a kilogram of imported, fairly expensive, fodder. For carps, a kilogram increase in mass requires 3-3.5 kilograms of domestically-produced fish food. There are other ingredients that require expenditure apart from fodder. Fish farming is more technologically intensive than the farming of birds or cattle due to the closed nature of the ecosystem the conditions of which must be constantly regulated. For example, to decrease the acidity brought by mires and the decomposition of organic matter in fatty tissues, it is necessary to add tons of calcium oxide. In addition, it is necessary to add organic fertilizer to stimulate the growth of natural nutrient sources: phito and zooplankton. Fish farms which are located at a distance from large cities, which consume the most produce, must face high transportation costs. The profitability of such enterprises can be increased by vertically integrating the production and processing of fish as well as the simultaneous cultivation of plants on the territories of temporarily dried water reservoirs. Another stable source of income is the organization of leisure and competitive fishing. Many such entities have the status of an agricultural, fish-producing enterprise.

Together with the agriculture and forest industries, aquafarming has existed for several centuries, evolving through various stages of development.

The first mentions of fish farming in Russia can be found dating back to the 15<sup>th</sup> century: monks from the Solovetsk monastery cultivated the European cisco and other species, and a map of Muscovy, dating back to the same period, demonstrates graphic representation of many ponds with cultivated species of fish. It was during the same period that the “Guide to the Earth” was published in Spain which

includes descriptions of fish that were cultivated in Muscovy. During the rule of Ivan 3<sup>rd</sup>, (end of 15 and beginning of 16<sup>th</sup>) centuries, there was an operating School of Fish Farmers which educated foreigners. The rule of Ivan the Terrible brought the construction of aquafarming ponds onto a governmental level with a separate commission on fishing being established. In October of 1700, a report on the state of fish farming conducted by F.Y. Romodanovsky, there are 49 species of cultivated fish listed.

During the late 18<sup>th</sup> and early 19<sup>th</sup> century, A.T. Bolotov, one of the fathers of Russian agronomy sciences, including that of aquaculture, published a series of works dedicated to the construction of ponds and the organization/intensification of aquafarming. During the first half of the 19<sup>th</sup> century, V.P. Vrassky established the foundation for the development of industrial aquafarming in Russia. 1855-56 witnessed the creation of the Nikolsky Fish Hatchery, the first experiments to hybridize salmon species and the development of a new method for artificial insemination of spawn. During this period, the Russian Association of Aquaculture saw active development.

Active efforts towards the restoration of the productivity of fish through re-acclimatization and artificial reproduction are being made in the second half of the 19<sup>th</sup> century. This is done through the relocation and release of salmon, hucho, trout, cisco, zander, common carp and catfish. By this period, the Nikolsky Hatchery had the best production indicators in all of Europe and in 1865 came under the jurisdiction of the department of agriculture, i.e. became national.

In 1915, a new hatchery was opened in Kamchatka, on a river flowing into the Nerpitchi lake, out of which flows the Ozernaya River, confluent of the Kamchatka River. There were 469 hatchlings of Sockeye Salmon and 83 thousand hatchlings of Chum salmon released.

It is important to note the production of Caspian sturgeons which decreased in the post-revolutionary years, was restored during the 1930's and decreased sharply in the 1940's partially due to the unsustainable burden the immature portion of the marine population. It was at this time that the USSR aquafarming met with a serious problem of organizing and management of fish farms to maintain fish stocks while experiencing a lack of scientific data about the process. The decrease in fishing during the years of WW2 allowed populations of sturgeons to restore to the levels of the mid-30's. At the same time, a key role in the increasing of sturgeon populations was



played by the amelioration of the food base by the 1934-35 program which introduced fodder species into the Caspian sea. The 1937-41 period saw the conducting of the first experimental works aimed at introducing juvenile fish into the Volga and Kura rivers. In 1948-52, Soviet scientists solved the problem of cultivating living fodder for the growth of juvenile sturgeon populations and were the first in the world to develop and industrially implement single-stage pasteurization of black caviar, which allowed to maintain a high quality of sturgeon caviar for 8-12 months. During the 1940s and 1950s, because of planned dam construction, there was work conducted to scientifically justify and organize measures for the artificial reproduction of sturgeon. The building of the hydro-electric power-plant in the lower portion of the Volga-Kama cascades in 1958 started a new period in the existence of sturgeon populations in the Volga-Kama basin. The period was characterized by a sharp deterioration in the conditions for their natural reproduction. The loss of beluga sturgeon spawning grounds reached 100%, 80% for the Russian sturgeon and 40% for the Starry sturgeon. For this reason, the sturgeon hatcheries were opened almost simultaneously to the opening of the dam. The construction of these hatcheries was made possible by the high-scale funding of scientific research. The latter reaped results: the aquafarming industry reached its Soviet-period peak in the late 1970's with an output of 26-27 thousand tons. By the 1980's, there was a peak in the release of juvenile sturgeons.

Despite the substantial progress of Soviet science in the field of aquaculture, since the 1960s, which saw the rapid expansion of the marine fishing industry, the majority of the fish produce supplied to the country's population was trapped in the open waters. Aquafarming was considered to be a secondary source of local food supply which predetermined the slow development of the sector that did not take advantage of the potential benefits (climate-geographic conditions). The resulting aquafarming industry was unable to answer to the growing population demand for high-quality fish products. The main efforts of the sector were concentrated on the conservation and restoration of stocks of sturgeon and salmon species.

During the post-Soviet period, due to a sharp decline in the financing of aquafarming research, there were almost no new aquafarming technologies developed. The elements that saw progress were the already developed, promising, technologies aimed at the amelioration of specific stages of the process. Such an example was the implementation closed water systems for the breeding of sturgeons. The ocean fleet was reoriented to operating solely in the exclusive economic zone of Russia and there was a sharp decrease in the production of quality fish meal which is essential for the production of foodstuff in aquaculture.

While in 1990, aquaculture produced 260 thousand tons of produce, by 1995 the number dropped to 60 thousand tons, largely due to the decrease of pond hatcheries. The production of aquaculture has begun to increase since 2002 but has yet to reach pre-1991 levels (not taking into account the production of salmon which is considered ranching aquaculture).

By the end of the 20<sup>th</sup> century, the world fishing industry had reached its technological and biological limits, halting growth at around 100 million tons of total yearly catch. Most reports and forecasts foresee limited possibilities for the growth of the open-water fishing industry. Despite the fact that evaluations for the possible quantity of potentially available bioresources range from 70 to 200 million tons per year, most experts consider the total allowable catch to range between 110-120 million tons, a level that is already attained.

At the same time, most agriculture has also reached its production capabilities frontier, limited by the amount of available territories that can be used for farming, their fertility and objective economic factors concerning the profitability of agricultural production.

All these factors have led to the fact that to fulfil the growing world demand for food produce, the food industry will have shift increasing amounts of attention towards the development of aquaculture. The latter is the fastest and more cost efficient method for producing protein.

As a result, over the past 20 years, the amount of fish produce provided by aquaculture has considerably grown and reached 60-70 million ton per year, which composes approximately 44% of all consumed fish produce.

According to the most recent FAO data, aquaculture is approaching 50% of total world fish production. China and Norway are leaders in this field. These numbers point to the fact that, on a global scale, aquaculture is becoming comparable to industrial fishing.

In 2013, Russia only produced 155 thousand tons of aquaculture while catching more than 4.3 million tons making aquaculture contribute only 3% to the total national produce of fish.

When developing plans for the development of aquaculture, it is important to take into consideration the geographic specifics of Russia. It is unreasonable to expect

positive results from the simple copying of practices used in countries with a different economic system, a more favorable climate, different traditions and governmental policies. It is also unreasonable to expect to achieve the level of aquaculture production that exists in countries with a more consistent, warmer climate.

However, the experience of China can be useful to Russia as the latter shows that the key role in the development of aquaculture is played by a well-planned governmental policy and sound planning. The Chinese legal framework is well developed in the field of aquaculture, the government supports all types of aquaculture businesses (national, private and mixed) and there is a practice of allocating bodies of water for long-term aquaculture use (up to 50 years).

In contrary, the growth of Norwegian aquaculture is primarily associated with development of efficient technologies associated with aquafarming and the vast scientific-technological support provided by the government coupled with strong protectionist measures. In Norway, aquaculture is viewed as method of ensuring employment for the population, a source of export revenue and as an alternative to industrial fishing. In addition, Norway has taken into account such country-specific aspects as the support of small rural communities. For Russia, the Norwegian experience in the development of fishing in the northern seas can be beneficial. It is important to take into account the ambitious plans of Norway to increase the volume of farmed cod, a project that has already required massive national investment. The project has yet to be successful as the technology of farming cod has not been implemented into economic practice due to low economic feasibility of the latter.

To understand the effect that industrial aquaculture has on the biological diversity of various ecosystems, it is first necessary to classify all the types of activities which are collectively classified as “aquaculture”.

Aquaculture is in the middle between forms of gathering economic activity (fishing, hunting, picking herbs) and agro production. As a complex form of economic activity, aquaculture is currently being addressed by a host of biological, economic and engineer studies.

There are three separate types of aquaculture which are defined: extensive aquaculture whereby aquatic organisms are kept at a low density and are fed natural fodder, semi-intensive whereby there is a higher density of organism which are fed mixes of natural and artificial fodder and hyper-intensive with the highest density of organ-

isms that are fed purely artificial nutrients. It has been calculated that when applying the most intensive methods of aquaculture, the industry can bring 200-250 tons of produce per hectare which is considerably higher than any analogous indicator for animal breeding.

The types of aquaculture are:

- 1) Ranch aquaculture
- 2) Industrial aquaculture
- 3) Pond aquaculture

Ranch aquaculture is based on the efficient use of natural nutrient sources of aquatic bodies and the introduction into these water bodies of various types of fish species with different types of nutrient-uptake processes (phytoplankton, zooplankton, mollusks, submergent plants, and small course fish).

Pond aquaculture is characterized by the use of semi-intensive and hyper-intensive methods of cultivated or highly reproductive species or hybrids of fish.

Industrial aquaculture is differentiated by the cultivation of valuable breeds and species of fish that are adapted to survival in restricted conditions, high population densities and absorption of artificial fish fodder.

Each of these types of aquaculture has different impact on existing biodiversity.

### Industrial Aquaculture

This type of aquaculture, operating predominantly in marine areas, has the highest impact on the biodiversity of the host ecosystem. Due to the large volume of cultivated fish and a limited area, the operation of marine industrial farms inevitably has an impact on the structure of surrounding biological communities.

There are two types of approaches that exist in the world to regulate the impact of industrial aquaculture.

As the multi-year experience of Norwegian salmon farms demonstrates, these enterprises have a negative (eutrophic) impact on the environment with the ecological capacity of most fjords now being strained. For this reason, there have been practically no new licenses given to salmon growers given over the past several years.

In these cases, the aquatic areas adjacent to the marine farm may be excluded from the list of areas subject to traditional resource-use (such as fishing, navigation and recreation). In effect, these become “sanitary zones”, where the ecosystems are degraded in comparison to surrounding areas. In aquatic areas designated as sanitary zones, the only indicators for the quality of the ecosystems are those aspects that do not lead to the decrease in the physiological state of the cultivated species.

There may be a decrease of biodiversity observed within the plume as a result of the eutrophication of water flows. The boundary of the plume often witnesses an increase of biodiversity through the development of opportunist specie populations that have adapted to the organic pollution.

An additional factor through which industrial farms may influence surrounding ecosystems is the intensive economic activity associated with activities aimed at the maintenance of fish pens.

A mediated factor of the influence of industrial mariculture is the genetic pollution of local populations by fish which have escaped the pens and the leaking of genetically modified ingredients into the natural food chain.

For example, in China, where sea cucumber has been cultivated for several years, it is widely accepted that the domesticated populations, for several generations now, are a separate species. Because of this reason, there are intensive measures taken to prevent the leaking of the domesticated trepang into natural ecosystems.

### Pond Aquaculture

This type of economic activity brings no harm to the biological diversity of natural ecosystem as it is conducted within artificial bodies of water which have been specifically created for the cultivation of domesticated species and inherently separate from natural ecosystems.

The only possible effect that pond aquaculture may have on the surrounding environment are the occasional mixing of water flows from the farm with natural aquatic systems in which case the degree of the anthropogenic effect is determined by the quality of emitted waters.

An expected effect of pond aquaculture on the biological diversity of surrounding ecosystems is the “manger effect” which affects the bird populations which are in

proximity of the pond farm. However, the experience of existing pond farms (for example near the Nar ponds in the Moscow region) has shown that no such problem exists.

### Ranch aquaculture

When using ranch aquaculture methods, access to juvenile fish is achieved through their cultivation in closed water systems through the use of breeding stock, through the trapping of wild populations (of Pacific salmon) and the collection of larvae on open-water marine collectors (for mollusks and algae). At this stage, the given type of aquaculture is not much different than hatcheries in terms of having an impact on biodiversity. At the later stages of the production processes, the juvenile fish are released into natural ecosystems where it mixes with the natural populations or, as in the case of herbivore fish (*Hypophthalmichthys* and carp), the stocking does not take place in the body of water. In this manner, when engaging in ranch aquaculture, there are no pressures on ecosystem biodiversity as long as there is genetic diversity maintained within the breeding stocks.

The only pressure that can occur is during the harvest of aquatic bioresources which were cultivated in natural ecosystems. However, this pressure has no distinct characteristics that would differentiate it from analogous effects of industrial fishing.

The priorities of aquaculture development in Russia are the following:

- Efficient use of natural nutrient resources in bodies of water through the introduction and cultivation of highly reproductive species of aquatic organisms;
- Decreasing the costs of aquaculture production through the implementation of resource-conserving practices and technologies, decreasing losses during the catch process, transportation, processing and sale of produce;
- Improving the management practices of aquaculture production through the modernization of production processes, implementation of marketing and increasing the qualification of the personnel.

A crucial element of ensuring the development of Russian aquaculture is the creation of a civilized market of aquaculture produce and non-discriminant economic interactions amongst the entities of the Russian Federation as well as amongst them and the federal government. At the same time, as the government limits its functions as an economic entity, it increases its role in the replenishment and exploita-

tion of biological resources from federal bodies of water, the improvement of the ecological situation and the creation of a market infrastructure to regulate market interactions.

The main mechanisms of governmental regulation in the sphere of aquaculture are:

- Measures for the conservation and reproduction of aquatic bioresources which inhabit aquafarms;
- Measures aimed at the creation of a rational market framework including the coordination of tax, customs, anti-monopoly regulation and institutionalization of the process;
- Increasing the efficiency of biological aqua-resource management, including those species reproduced within artificial ecosystems;
- Introducing a system of perspective technical principles, national standards and norms aimed at increasing the efficiency of fish hatcheries and the quality/safety of aquaculture produce;
- Stimulating and supporting strategic incentives of operating businesses aimed at increased investment and innovation.

Currently, aquaculture is regulated by an independent federal bill from July 2 2013 (№ 148-Ф3) “On aquaculture (fish farming) and introduction of amendments into individual bills of the Russian Federation”.

The existing law dictates that aquaculture (fish farming) is characterized as agricultural production and is thus identified as fish rearing with the intent to sell. This sphere is regulated according to the federal bill mentioned above, other federal laws, laws pertaining to individual entities of the Russian Federation, Presidential decrees, decrees of the Government of the Russian Federation as well as normative and legal acts put forward by federal executive bodies, governments of entities of the Russian Federation and municipal authorities.

Aquaculture (fish farming), including the acclimatization and artificial reproduction of aquatic bioresources, which is part of the effort of the conservation of aquatic bioresources, is regulated by the federal bill on aquaculture to the extent that it is permitted by the federal bill from December 20 2004 (№ 166-Ф3) “On Fishing and the Conservation of Aquatic Bioresources”.

One of the principles of the federal law just mentioned is that aquaculture activities must be conducted in a manner that does not harm the environment and aquatic bi-

resources. In addition, one of the main conditions that must be met in order gain permit for the use of a body of water for aquaculture is the provision of extensive measures aimed at environmental protection as well as the conservation of aquatic bioresources and other elements of the ecosystem.

### **Areas utilized by the forest industry**

The sustainable management of forests presumes multipurpose, continuous and non-depleting use of forest resources, functions and other elements. This pertains to both those elements which have economic value (timber, non-timber commercial products, etc.) as well as those that do not (for example influences on the mental health of the population or the preservation of historic traditions). Modern day legal frameworks of the Russian Federation declare the adherence to sustainable forest management practices and the conservation of biodiversity but do not contain almost any normative acts which ensure that these principles are implemented.

At the same time, the implementation of sustainable forest management practices within the Russian Federation is largely supported by the development of voluntary forest certification systems. These contain fairly specific requirements for sustainable forest management practices. Part of these requirements coincide with requirements established by legal frameworks and others are “additional”. It is assumed that forest areas which have certified by the FSC and the PEFC are subject to sustainable forest management practices, or, at least, are in the process of transitioning towards them. The outcome of the session of the Presidium of the State Council regarding the question of “Increasing the efficiency of the forest industry within the Russian Federation” which was held on April 11 2013 in Ulan-Ude, has been the decree calling for the Government of the Russian Federation and the executive branches of regional authorities to enact measures aimed at the creation of the conditions for the stimulation of forest-users to undergo the voluntary forest certification process in accordance with national and international standards.

However, it is incorrect to label a certified forest area as being completely sustainably managed. This is at least in part due to the fact that the certification standards have only minimal demands for sustainable management but require that the process be constantly refined. Problems that are under the jurisdiction of the government are generally impossible to solve through the certification efforts.

The question of conserving biodiversity is not well developed within framework pertaining to specific economic sectors (including the forest industry). The latter



brings the necessity of introducing practical demands aimed at the conservation of biodiversity into normative acts dealing with forest use and forest management. It is also important to note that existent requirements for the conservation of biodiversity are often not implemented at all or implemented only partially. For this reason it is necessary to ensure the across-the-board inclusion of information about biodiversity and the necessary measures for its conservation into documents concerning forest planning and management. This will create a practical base for the conservation of biodiversity during forest use not only for certified companies but for all of those who use forest resources.

At the same time, an important component of the ecologically and economically sustainable use of forests is the lack or low percentage of illegal logging activities or of logging that is not done in accordance to legal regulations. The illegal harvest of timber is an acute problem within Russia, a fact that is acknowledge by the government. There have been several steps taken in attempt to combat the problem. It is important to note that there is a worldwide trend of increasing efforts to combat illegal logging activities. This is primarily done through stricter control over the sale of timber produce.

Another crucial question that remains to be solved is the calculation of the volume of illegal logging activities within the country. There are large differences in the estimations provided by official governmental agencies and independent experts. According to the Ministry of Agriculture of Russia, illegal logging composes approximately 1-2% of the total level of harvested timber (in 2011 this would be 1.8 million cubic meters according to distance monitors), the amount of “unaccounted logging” calculated through the balance method of accounting ranges between 15-30 million cubic meters (approximately 10%). At the same time, estimations provided by independent sources (the World Bank through the ENPI FLEG Program, Greenpeace Russia and WWF Russia) point to the fact that illegal logging volumes are much higher than it is presented by official sources. These sources state that the quantity of illegally harvested timber composes 15-20% of all timber production in the country which accounts dozens of millions of cubic meters of timber.

The development of sustainable forest use requires a considerable decrease in the volume of illegal logging. This pertains to those activities conducted with no documentation whatsoever as well as those loggings which are conducted with violations of forest regulations. In order to accurately evaluate illegal timber harvest, it is necessary to develop a unified system which would be accepted both by officials as

well as by independent experts. Remote sensing techniques are the most promising when they are coupled with on-location inspections. Another important component of the system is the comparison between consumed and exported timber produce and the volume of declared timber harvests.

At the same time, if one is to ensure a decrease in the volume of illegally-harvested timber, it is necessary to not only organize a method for the identification but to also organize the effective physical protection of forests. To accomplish the latter, it is necessary to restore the efficient “on the ground” protection of forests by increasing the number of forest inspectors, increasing the number of man-hours spent on terrestrial forest inspections and the implementation of USAIS accounting for logs and other measures.

Protected forests play an important role in the conservation of forest ecosystems within the Russian Federation. This category includes forests that are aimed at the conservation of habitat-forming, water conserving, protective, sanitary-hygienic, restorative and other valuable functions of forests while simultaneously permitting the use of forest resources if these activities do not impede the protective status of the forests and do not inhibit their valuable functions.

In 2012, protected forests took up a total area of 309 million hectares, or 26% of total national forest area, 277 million hectares of these forests were part of the forest fund (24% of the entire fund area). According to the Forest Code of the Russian Federation, clear-cuts are forbidden in protected forests and some categories strictly limit or even ban any type of commercial logging. Formally, the resource-use policies in protected forests are quite strict. However, in many cases, selective cutting, which is permitted in many protected forests, causes damages to these forests which render them unable to provide their positive functions. In addition, the unjustified permission of sanitary cutting in protected forests and the masking of commercial logging under the label of sanitary cuts causes serious harm to forests. These factors make it necessary to change the permissible types of protected forest use so as to fully eliminate commercial logging and to formally define the necessary measures for conserving biodiversity during logging activities in protected forests. The session of the Presidium of the State Council on April 11 2013 in Ulan-Ude concerning “Increasing the efficiency of the forest industry in the Russian Federation” has called for the Government of the Russian Federation to introduce changes into the legal framework of the Russian Federation. These changes would make changes to the procedures of identifying and establishing various protective

categories to forests as well as of establishing the legal status of identified forest areas which would prevent commercial logging and the renting of these forests with the purpose of timber harvest.

A separate problem is the transfer of protected forests into other categories (industrial, transportation, cities) which can lead to construction on their territory and the degradation of the ecosystems. The reverse problem also exists: is almost impossible to achieve protected forest status for valuable land strips pertaining to lands designated for exploitation. Thus, it is important to limit the possibility of transferring forests that are valuable for biodiversity conservation into economically-exploited categories and to ease the process of transferring valuable forest areas previously designated for exploitation into protective status. It is also important to create new protected forests on areas subjected to afforestation as these areas will have considerable habitat-forming, will increase the stability of the agriculture industry and will act towards water conservation.

**The national target consists of 3 sub-targets:**

**By 2020 no less than 20% of all agricultural lands are managed and used in accordance to biodiversity conservation goals;**

**By 2020 all bodies of water used for aquaculture must be managed in a sustainable manner that will ensure the minimization of the influence on biodiversity found in adjacent territories and in natural ecosystems.**

**By 2020 no less than 50% of exploited and protected forest are sustainably managed which ensure the conservation of biodiversity.**

To evaluate the extent to which the target is being fulfilled, experts have identified the following set of indicators:

- a) The amount (proportion from total) of entities of the Russian Federation which have signed normative and legal acts on the protection of biodiversity on farm fields and agricultural lands;
- b) The total area of high value agricultural lands;
- c) Area of landscape fires outside of the forest fund;
- d) Dynamics on the amount of aqua-resources that were grown within aquaculture confinements that were harvested (compared to the base year);
- e) The expansion of the number of artificial reproduction enterprises;

- f) Increase in the in the volume of produced aquaculture (compared to the base year);
- g) Increasing the proportion of aquaculture consumed out of the total amount of aquatic bioresource products consumed (compared to the base year )
- h) The number of aquatic bioresource species for which there have been developed technologies for the creation of breeding stocks;
- i) The number of entities of the Russian Federation which have included information about biodiversity and the necessary measures for its conservation into forest-planning and management documents;
- j) The area of protected forest areas created specifically for the purpose of conserving biodiversity and habitats;
- k) The area of forests certified according to the requirements of international methods of voluntary forest management certification;
- l) The volume of illegal logging activities;
- m) The volume of timber harvested in protected forests;
- n) Area affected by anthropogenic forest fires.

***11.2.4 Global target 8: By 2020, pollution, including from excess nutrients, has been brought to levels that are not detrimental to ecosystem function and biodiversity.***

#### **Justification of the national target**

Chemical pollution is one of the most dangerous types of human influences on the environment. The appearance of chemical substances in much larger concentrations than were previously found within the ecosystem, or the appearance of new chemical substances (xenobiotics) can spur various geochemical or biochemical processes. These impact the species and natural communities both immediately as well as over a prolonged time span. Both organic and inorganic chemical substances may have a toxic effect that causes rapid death and degradation of living organism in the immediate and medium time frame. These same substances can be the cause of such long term effects as: carcinogenesis, mutagenesis, immunosuppressant activity, teratogenicity and embryo toxicity. These effects are especially potent for so called resistant organic matter which include some polycyclic aromatic hydrocarbons, pesticides and byproducts of their decomposition, polychlorinated biphenyls, polychlorinated dibenzofurans, para-dibenzofurans and others.

Chemical substances (xenobiotics) may be present in various concentrations in living and non-living elements of the ecosystem and may travel through its trophic chains accumulating within the links. Under pressure from chemical and physical factors, these elements may also transform into substances that are even more dangerous than their originals. The long-term presence of anthropogenic chemical substances in the environment is the “delayed-action mine” that has a negative impact on biodiversity and the environment.

The presence of a large volume of organic substances (microorganisms and decomposing organic waste) in river or marine water can lead to a decrease in the chemical and biological quality of the latter. The sources of organic substances are water-filtering systems, industrial discharges and discharge from agricultural fields. Organic pollution is conducive to the acceleration of metabolic processes which require oxygen. In turn, this can lead to a lack of oxygen (anaerobic conditions).

Denitrification which occurs in anaerobic conditions in turn leads to increases in the concentrations of ammonia nitrogen which is toxic for aquatic communities past a certain concentration level depending on the temperature, mineralization and water pH level. The large-scale influx of biogenic substances can lead to the eutrophication of water bodies. These occurrences may be accompanied by the loss of certain plant and animal species (due to a change in ecological conditions) and by a decrease in water quality.

High concentrations of nitrogen and phosphorous in freshwaters and in shoreline marine waters can cause a chain of unfavorable events. It begins by the excessive growth of zooplankton which leads to the increase in organic water floor deposits. This process accelerated with changes in the species composition and in the functioning of the trophic chain. Subsequent increases of oxygen consumption in regions with stratified water masses can lead to oxygen depletion, increased changes in the structure of biological communities and the death of floor fauna. Eutrophication may also lead to the increased risk of algae blooms including of those species which are dangerous and can cause the further degradation of fauna.

According to the Russian Federal State Statistics Service, there was a substantial increase in the volume of specific polluting elements which were released into the atmosphere. These include: methane, soot, toluene, hydrogen sulfide, xylol, acetone, buthylacetate, fluorine gaseous elements, acetic ether, 1,2 –dichloroethane,

formaldehyde, isopropyl alcohol, hydrogen cyanide, copper oxide, phenol, styrene, nonorganic compounds of arsenic, cadmium oxide and some others.

A considerable increase in the pollution of atmospheric air in 2012 compared to 2007 was caused by the operation of thermal power stations and the metallurgy industry. The weighted index of the pollutant emissions of thermal power stations was 104.4% and 94.3% for the metallurgical industry. The target emission levels established by the governmental program (environmental protection) for the 2012-2020 period for these industries (89.2% and 89.6% accordingly) were not achieved.

According to data provided by the Federal Service for Hydrometeorology and Environmental Monitoring of Russia, in 138 of the nation's cities (57% of the total urban population) the level of air pollution is characterized as high or very high.

Despite the fact that in the past few years there has been a positive tendency in the decrease of the anthropogenic burden on individual bodies of water, there has been no adequate improvement of surface water quality within the country. The main reasons are the following: many enterprises lack appropriate waste management facilities, the influx of unfiltered rain flows from urban centers as well as industrial and agricultural compounds and large amounts of pollutants accumulated in sedimentary waters floors which are a source of secondary pollution for surface waters.

Throughout the years, the quantity of bodies of water with a high level of pollution (average yearly concentration of one or more pollutants exceeds 10 maximum accepted concentrations) fluctuates between 670 and 700. Most of these (630-660) have a stable highly-polluted state of water and only a few of them are experiencing tendencies in water amelioration.

The role of agriculture as source of biogenic substances is growing for a number of reasons: increasing area of ploughed territories, the alteration of natural ecosystems through industrial machinery and hydro-amelioration and the development of mass chemical use through extended application of both mineral and organic fertilizer. These factors alter the size and direction of the flows of biogenic elements found within the agricultural landscape.

All processes which transform existing landscapes, both those that intestinally alter the state of ecosystems (ploughing, harrowing, domestication of hay stacks and grazing grounds and the division of lands) as well as those where ecosystem influ-

ences are a byproduct (results of travelling through plough lands during the sowing period, cultivation and harvest of crops and chemical treatment of fields) all lead to the mechanical re-distribution of properties throughout the agricultural landscapes. This the chief difference amongst the urban-industrial and agricultural organic burdens on waterways.

The first is a new, completely anthropogenic process, through which organic matter pollutes the water. It requires pivotal measures aimed at preventing the discharge of runoff water from industrial and energy-producing processes as well as from transportation systems and the urban housing sector into bodies of water.

The second, agricultural process, has an analogous problem with the increase in commercial cattle farming and the use of intensive technology. At the same time, the farming sector is a separate component of the problem which has conserved historically-established flows of organic matter. However, changes which have encompassed large areas and destroyed the natural structure of soils, has led to water and wind erosion, washouts and leaching out of organic substances.

According to the Ministry of natural resources and the environment of Russia, there are 6456 identified areas of polluted underground waters of which 3386 are defined as water reservoirs utilized for consumption/industrial purposes. These are overwhelmingly individual wells which do not produce more than 1 thousand cubic meters of water per day.

The pollution of 3483 bodies (38% of the total) is associated with industrial activity, 967 (15%) with agricultural activity, 863 (14%) with municipal services, 410 (6%) as a result of off-spec water use with a breach in the regulations, 733 (11%) associated with the activity of industrial, municipal and agricultural enterprises (“mixed” underground water pollution) and another 1000 bodies (16%) of underground aquatic bodies have an unidentified source of water pollution.

The main substances which pollute underground water bodies are various form of nitrogen (nitrate, nitrite, ammonia or ammonium in 2939 cases), petrochemicals (1812 cases), sulfates and chlorides (located in 889 areas), heavy metals (copper, zinc, lead, cadmium, cobalt, nickel, mercury or antimony in 479 cases) and phenols (407 areas). For 4745 (73%) areas, the intensity of the pollution ranged between 1-10 maximum accepted concentrations, on 1221 areas (19%) the change ranged between 10-100 MACs and in 490 cases (8%) exceeded 100 MACs.

The results of the monitoring of marine water and shoreline sea floor sediments according to hydro- chemical indicators are testimony to the lack of change in the quality of marine water over the past years. In general, the quality of water has shifted from “moderately polluted” to polluted.

The results from measuring the average and maximum concentrations of (micrograms/liter) of nitrates (NO<sub>3</sub>) and phosphates (PO<sub>4</sub>) in the coastal waters of the Russian Federation have demonstrated their increase in the majority of regions throughout the 2010-2012 period.

During the 2003-2012 period, the monitoring of pollution caused by industrial toxins such as heavy metals, arsenic, fluorine, petrol and petrochemical, sulfates, nitrates benzo(a)pyrene has been conducted throughout a number of entities of the Russian Federation. The latter include the republics of Bashkortostan, Mordovia, Udmurtia, Chuvashia, Tatarstan, Primorsky Krai and the Irkutsk, Kemerovo, Kirov, Moskovy, Nizhohirskiy, Novosibirsk, Omsk, Orenburg, Penza, Samara, Saratov, Sverdlovsk, Toms and Ulyanovsk Oblasts. Each territory has an individual list of industrial toxins monitored.

Approximately 2.8% of all inspected urban centers, individual neighborhoods and one-five kilometer zones surrounding sources of pollution are considered to be dangerously polluted by industrial toxins. Another 8.3% are considered moderately dangerous. The soil measured in 88.9% of localities has the average indicators which place them within the permissible limits of pollution. However, certain regions of



**Diagram 11.2.4.1.** The role of various industrial sectors in polluting the atmosphere

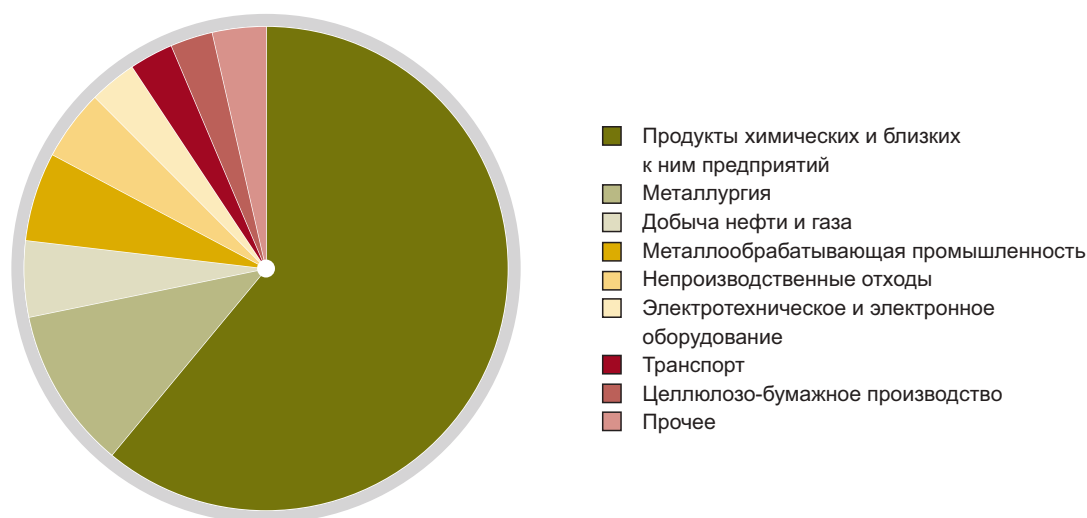


localities may have higher pollution indicators than the average across the city. The coefficient of variation of mass portions of industrial toxins in soil fond near large sources of atmosphere pollution can exceed 200%. This fact points to the high variability in the pollution of soils by industrial toxins.

The Russian Federation contains a considerable amount of enterprises pertaining to various sectors of the economy which are a source of environmental pollution. According to the available statistics, the main sources of atmospheric pollution (diagram 11.2.4.1) are facilities related to the thermal energy sector, ferrous and non-ferrous metallurgy, petrol and chemical sectors as well as vehicle transport. If we are to mention the creation of dangerous industrial waste (diagram 11.2.4.2), then the leaders are enterprises related to chemical, petro-chemical, fossil fuel, metallurgy as well as the paper and pulp industry.

From the organizational and technical perspective, the goal of achieving a maximum decrease in the chemical pollution of the environment entails the development and implementation of measures which will target the industries mentioned above. On the other hand, that even in the industries listed, there are facilities with varying production capabilities and thus with non-uniform threat to the environment.

According data provided by the Ministry of Environment and Resources of the Russia Federation, there are 11 500 ecologically-dangerous industrial facilities in Russia (out of the 1 million) which together are responsible for 99% of the total anthropogenic chemical pollution. At the same time, it has been established that



**Diagram 11.2.4.2.** The role of various industrial sectors in contributing to the presence of dangerous production waste in the atmosphere

approximately 50% of all atmospheric pollution can be traced to 64 specific facilities and 50% of all water way pollution is caused by 110 enterprises. It is towards this relatively small group of enterprises (11 500) that require the development and implementation of efficient measures which would limit their negative impact on the environment.

There have been a number of various environmental, organizational, administrative and economic mechanisms developed and implemented which are meant to decrease the danger of anthropogenic chemical pollution. These mechanisms include: ecological assessment, governmental ecological overview, evaluations of environmental impacts, ecological audits and ecological insurance, payments for damaging the environment and various forms of administrative and criminal retributions for those who violate environmental laws. The prevention of environmental pollution is one of the priority targets of the Governmental program “Environmental protection” for the 2012-2020 period. The federal law from July 21 2014 (№ 219-Ф3) “On changes in the Federal law “On Environmental Protection” and individual legal frameworks of the Russian Federation” is aimed at increasing the environmental quality of enterprises previously responsible for chemical pollution. This bill mandates the further development of the normative base in the field of environmental protection and the economic stimulation of existing enterprises to adopt the latest technologies. At the same time, today it is clear that the fight against pollution, including pollution by organic substances, requires constant attention and a systematic approach to combat the problem.

**National target:**

**By 2020 ensure the decrease of pollution emissions, including that of organic substances, into the environment by improving the appropriate legal framework of the Russian Federation.**

To evaluate the extent to which the target is being met, experts have put forth the following set of indicators:

- a) The portion enterprises that have a considerable negative impact on the environment and pertaining to fields where improved technology is available (in 2014 this was 11 500 enterprises) and which have been subject to the latest technological upgrades;
- b) The proportion of enterprises which have had negative impacts on the environment and pertaining to fields where improved technology is available (in 2014 this

was 11 500 enterprises) which have received permission for integrated environmental management;

- c) The proportion of municipal formations which do not have chronic violations of environmental quality.
- d) The proportion of urbanized territories (cities and other urban communities) which have waste treatment facilities;
- e) The proportion of phosphate-containing cleaning supplies out of the total amount of available cleaning supplies;
- f) The proportion of legally-designated agricultural lands subject to erosion;
- g) The proportion of surface bodies of water influenced by eutrophication;
- h) The proportion of agricultural enterprises which have invested into modern systems for the utilization of large cattle and poultry manure;
- i) The proportion of SDW landfills and other waste disposal organizations found in urbanized areas (cities and other urbanized communities) which have systems of filtrate utilization (disinfection)
- j) Proportion of eliminated enterprises which have previously caused ecological damage.

***11.2.5. Global Target 9 - By 2020, invasive alien species and pathways are identified and prioritized, priority species are controlled or eradicated, and measures are in place to manage pathways to prevent their introduction and establishment.***

#### **Justification of national target**

The existing diversity of organisms found in different continents and regions has come to be not only due to a lengthy process of evolution but also due to the migration of existing species – the biological invasion of foreign species. The invasion of alien species has always taken place. However, while in the past species migration was largely caused by global ecological and climatic changes, during the last 400-500 years almost all such migrations have direct or secondary links to human activity. Humans have intentionally and accidentally transported organisms from one continent to another; built canals, tunnels, roads and bridges which were used by animals to expand their range of habitat as well as destroyed and altered natural ecosystems making them vulnerable to new invasions. Today, alien species are able to invade new habitats as a result of a number of factors. (1) The first are natural migrations associ-

ated with populations fluctuations and climatic changes. (2) The second is the introduction and reintroduction of economically valuable organisms (plants, insects, fish, birds and mammals). (3) The third is the accidental introduction of species via ballast waters, ship fouling, imported agricultural produce, “valuable” species, luggage and many others. (4) The fourth way is through the breeding of decorative plants and animals (park gardening, containment of plants and animals within aquariums), etc.

Alien species which have infiltrated new organism communities (aboriginal ones) and which inflict considerable damage on the aboriginal community are generally referred to as “invasive species”. The damage is composed of a number of various influences that the non-indigenous species has on the aboriginal community. These include:

- 1) Considerable changes in the habitats of indigenous species (especially when non-indigenous populations are keystone species);
- 2) Competing with native species, decreases their population numbers and pushes them out;
- 3) Becoming predators towards the native species thus decreasing their population numbers;
- 4) Carrying or causing diseases as well as acting as parasites towards the aboriginal species;
- 5) Altering the genetic structure of aboriginal species, influencing their population numbers and creating hybrid populations.

All the changes listed above often lead to changes to not only organism population but also to changes in the structure and function of the ecosystem as a whole. The effect of non-indigenous species became especially visible during the 20<sup>th</sup> century when the expanding habitat ranges of organisms have led to the mass invasion of indigenous communities.

Today, biological invasions threaten biodiversity at a global scale. Alien species include all the taxonomic groups of living organisms: viruses, bacteria, fungi, algae, moss, ferns, embryophytes, invertebrates, fish, amphibians, reptiles, birds and mammals. Alien species invade and influence the state of local biota in almost all regions of the Earth. The spread and mass reproduction of alien species disturbs the genetic isolation of indigenous species of plants and animals that have undergone a long process of coevolution. In this regard, islands, isolated ecosystems found in mountains and bodies of water are particularly vulnerable. At the same time, these ecosystems are especially valuable for the conservation of biodiversity as these areas

are host to endemic species which have undergone isolated evolutionary processes for a long period of time. These endemic species often have small population sizes and are exceedingly vulnerable to extinction as a result of competition or predatory activity by invasive species.

Studies have shown that there are five factors which determine the success of some species in invading a new habitat:

- 1) The presence of transit routes (invasive corridors);
- 2) The presence of transportation methods (invasion vectors);
- 3) The adaptive capabilities of the invading specie;
- 4) Phenotypic plasticity;
- 5) Vulnerability of the aboriginal ecosystem.

The invasive process has become a global ecological problem and has not bypassed the Russian Federation.

Despite the fact that the majority of the Russian Federation is located in the zone of temperate and cold climates (most studies show that invasive species are most active in southern regions), a number of factors contribute to the invasive process onto the Russian territory. One of the key factors is the size of the country which encompasses a number of biogeographic divisions. In addition, Russia lacks the appropriate control over the movement of living organisms. This is caused by a number of factors: there are intensive economic transportation activities taking place, for prolonged periods of time, throughout the entire USSR, there was a mass policy (followed in lesser amounts to this day) of deliberate introduction (acclimatization) of organisms with the purpose of increasing ecosystem productivity and expanding the range of products which can be produced from said ecosystems, there are faults in the existing legal framework in this sphere, etc.

An analysis of publications made by the Academy of Sciences of the USSR and by the Russian Academy of Sciences, conducted in the end of the 1990's has shown that there were 500 invasive species found within the Russian Federation. Without doubt, the real number of non-indigenous species is considerably higher if we are to take into account the overall decrease in the amount of field studies done in the field of biodiversity that occurred in the last decade of the 20<sup>th</sup> century.

The fact that governmental organizations and individuals were involved in the introductions of alien species into aboriginal habitats for years on end has had a seri-

ous impact on the state of biodiversity. These and other ways of introducing alien species into ecosystems has led to the fact that, in the European portion of Russia alone, there are 1150 alien species of plants (these plants were found outside the region and it was not the case that they simply expanded their habitat range); 191 species of insects (the overwhelming majority of which are agricultural, forest and park pests) species of fish and 62 species of mammals.

The end of the 20<sup>th</sup> century saw the development of a number of invasive corridors within Russia through which invasive species migrated into and throughout the country. For terrestrial organisms (primarily plants and insects), these corridors were associated with the transportation routes of agricultural produce and timber. For aquatic organisms these corridors came when intensive hydro construction and ship navigation developed in the basins of large rivers. In the last scenario, a key role was played by man-made canals which often served to connect these basins amongst each other. Water reservoirs also played an important role in providing organisms with invasive corridors as they allow for limnophile organisms to travel considerable distances.

Today, there are four large trans-continental aquatic invasive corridors that can be found in Russia: Black Sea – Caspian Sea – Volga, Ob-Irtysh, Baikal – Yenisei and Amur River. It is characteristic that all the basins which serve as corridors for invasive species are composed by at least 20% of non-indigenous fauna, an indicator which reaches 30% for the Black Sea – Caspian Sea – Volga corridor.

Considering that the majority of large rivers in Russia flow either from the north to the south (Volga) or from the south to the north (Ob, Yenisei, Lena), global climatic changes (global warming) has played an important role in the spread of invasive species over the past decades. In the Volga basin, the period of water reservoir creation was accompanied by intense activity in the introduction of aquatic organisms.

Throughout a long period of time in the USSR and Russia, there was a view that when having an extensive economy (including the exploitation of hunting and fishing resources), the output of ecosystems can be improved through the introduction of foreign species. In accordance with this approach, there were, amongst other aspects, strong human efforts to spread resource organisms into previously unused habitats.

It is for this reason that Russian biologists did not begin to actively discuss the problem of invasive species until relatively recently, in the 1990s. Nevertheless, some aspects of the problem of invasive species have been studied for over 100 years in Rus-

sia. At first, studies were aimed at the identification of valuable organisms which could be transported from faraway regions and introduced to local habitats. The species considered were both those which could bolster the productivity of existing ecosystems by expanding the list of available resources as well as those which would aid humans in combatting agricultural pests. The next step of the process was the analysis of the years of work and observations on the results of species introduction.

There were monographs published about the Colorado potato beetle, zebra mussels, muskox and a series of other species introduced into Russia and the USSR. Some of the studies attempted to evaluate the effect that introduced species had on indigenous habitats.

The end of the 20<sup>th</sup> and beginning of the 21<sup>st</sup> centuries saw an intensification of the invasion process throughout Russia. There was an according increase in the amount of research conducted in the field. Emerging studies described both the invasive process as well as the effects the specific invasive species had on aboriginal species and ecosystems. Such work was done, amongst others, for the Canadian waterweed which, over the course of 100 years spread through the entire country. Comb jellies, fishhook waterfleas akartia and polychaetes which spread through the entire Baltic sea, Baikal amphipods which were introduced into the freshwater bodies of north-western Russia, the Red King crab which was introduced into the Barents Sea, the Chinese sleeper which spread throughout European Russia, West Siberia and the Baikal Lake after only a few individuals were introduced, Black Sea sprat which spread through Volga water reservoirs, the European smelt which spread through a number of lakes and water reservoirs found in the north-west of the Russian Federation as well as the Eurasian beaver reintroduced and spread throughout the entire Russian territory.

The studies described above helped to establish the fact that the most vulnerable ecosystems are those that were previously harmed. Most often, the degradation took place as a result of human activity. The latter caused alterations in existing habitats, the overexploitation of certain bioresources and increase in biogenic inflows. Global climate change was also identified as having a role in the invasive process.

An important achievement of the latest studies is the identification of the main transit routes used by invasive species. The most is known about the mechanisms which allow for invasive plant species and insect pests to enter the country. Most of these mechanisms are associated with the flows of agricultural produce. The expansion of

aquatic organisms which occurred over the past 20-30 years is associated with the construction of canals, dams and the intensifying of aquatic transport activity. The Black Sea – Caspian Sea – Volga transit route has been identified as being the most important source of invasive species within the European portion of Russia. There has been work initiated for the monitoring of invasive aquatic species throughout the entire course of the route. It has been established that the invasive process for aquatic organisms occurs in distinct steps, each of which sees the establishment of stable, self-reproducing populations.

Over the past few years, considerable progress has also been achieved in modeling the invasion process. The method utilizes zooplankton populations as prototypes and takes into account specific characteristics of zooplankton species. This approach has demonstrated that the successful invasion of invasive species can only be predicted when taking into account the most important factors (the presence of abundant fodder, the presence of predators and species which compete for the same resources) which influence the competitive processes between native and non-indigenous species. These models demonstrate the fact that there is no simple correlation between the biodiversity of a community and its resistance to invasive species. Instead, any prediction requires case-specific analyses of biological and mathematical parameters.

In recent years, there have been initial steps made towards creating an inventory of invasive species within the Russian Federation and its subsequent presentation in an accessible form to researchers and regulatory bodies. There have been data bases created for the chief groups of organisms for Russia's regions (European portion of Russia, the basins of the Baltic Sea and seas found in the Far East as well as for the Volga River). It is worth noting the publically available, problem-oriented web resource "Invasive species found in Russia". The main goals and targets of the resource mentioned above are: raising awareness amongst the population, governmental bodies and the scientific community about the problem of invasive non-indigenous species, the coordination of various specialists and organizations within the framework of a selected center for invasive species research and the creation of a unified information space for the coping with the problem of invasive species.

In recent years, due to scientific work done by the specialists of the Russian Academy of Sciences, universities and a number of industry-specific institutes, there has been increasing attention given to theoretical and practical questions associated with the invasion of non-indigenous species into Russia. Over a short period of



time, a series of studies (including programs by the Presidium of the RAS, Russian fund for fundamental research and the Ministry of Education and Science of the Russian Federation) were able to identify the main invasive routes. They were also able to create a data base which included all non-indigenous species, evaluate their effect on indigenous ecosystems, develop a monitoring a system, and crucially, developed monitoring stations in a number of invasive corridors.

A large role in the development of research on the topic of biological invasions was played by the national and international thematic conferences organized in the past few years. Many of these conferences were culminated by the publication of thematic collections and monographs. The “Russian journal on biological invasions” has been electronically published since 2008. Since 2010 the journal is published (both electronically and on paper) in English and is distributed by Springer publishing house.

The following definitions, which are meant to create a unified understand of the problem, have been developed according to the decision VI/23 of the Conference on Biological Diversity:

**Alien species** refers to a species, subspecies or lower taxon, introduced outside its natural past or present distribution; includes any part, gametes, seeds, eggs, or propagules of such species that might survive and subsequently reproduce;

**Invasive alien species** means an alien species whose introduction and/or spread threaten biological diversity (For the purposes of the present guiding principles, the term «invasive alien species» shall be deemed the same as «alien invasive species» in decision V/8 of the Conference of the Parties to the Convention on Biological Diversity.);

**Introduction** refers to the movement by human agency, indirect or direct, of an alien species outside of its natural range (past or present). This movement can be either within a country or between countries or areas beyond national jurisdiction;

**Intentional introduction** refers to the deliberate movement and/or release by humans of an alien species outside its natural range ;

**Unintentional introduction** refers to all other introductions which are not intentional;

**Establishment** refers to the process of an alien species in a new habitat successfully producing viable offspring with the likelihood of continued survival;

**Risk analysis** refers to: (1) the assessment of the consequences of the introduction and of the likelihood of establishment of an alien species using science-based information (i.e., risk assessment), and (2) to the identification of measures that can be implemented to reduce or manage these risks (i.e., risk management), taking into account socio-economic and cultural considerations.

**National target:**

**By 2020, invasive alien species and methods of their introduction and spreading are identified and ranked. There are measures aimed at the elimination of all introductions and spreading activities of priority invasive alien species.**

To evaluate the extent to which this target is met, experts have put forward the following indicators:

- a) Total quantity of identified alien species with divisions along the main taxonomic groups and habitats;
- b) The proportion of identified alien species (% of total number of flora and fauna species);
- c) Total quantity of identified invasive alien species with divisions along the main taxonomic groups and habitats;
- d) The proportion of identified invasive alien species (% of total number of flora and fauna species);
- e) The proportion of invasive alien species which are subject to measures aimed at their population regulation and extermination (% of all identified alien invasive species);
- f) Proportion of invasive corridors which are controlled and subject to measures aimed at the regulation of the spread of alien species.

***11.2.6 Global Target 10: By 2015, the multiple anthropogenic pressures on coral reefs, and other vulnerable ecosystems impacted by climate change or ocean acidification are minimized, so as to maintain their integrity and functioning***

**Justification of the national strategy**

There are occurrences taking place within the Russian Federation which point to the vulnerability of certain ecosystems to climate change. For example, earlier ice

melts during the spring in the Arctic (faster retreats of icecaps to the north) create problems for the polar bear. A thinner ice layer in the White Sea presents a threat for the normal reproductive cycle of the harp seal. Earlier and deeper thawing of permafrost layers as well as changing schedules for the forming of ice layers on rivers creates threats for the caribou. The increase in average snow covers has threatened ungulate populations. In each case, it is possible to identify anthropogenic burdens the alleviation of which will help to decrease the damage caused by climate change. It is for this reason that the Russian national target, which corresponds to the 10<sup>th</sup> Aichi target, must be adapted to the fact that country is not host to highly vulnerable ecosystems which require urgent decreases in the anthropogenic burden to maintain the integrity and functioning of the ecosystems (such as coral reefs).

Russia has not yet formed a systematic and detailed understanding of which of the existing ecosystems are most vulnerable in the case of unfavorable weather conditions, which are vulnerable to the constantly developing factors of climate change and which specific forms of human activities must be limited in which scenarios. There is yet to be developed a systematic approach to decision making in this field.

On the other hand, the 10<sup>th</sup> Aichi target principle (with adjustments made according to Russian specifics) is fully in accordance with the Climatic Doctrine of the Russian Federation. At the practical level, it is in accordance with the general goals of the Governmental program for “Environmental Conservation” for the 2012-2020 period.

In this manner, there are currently premises for the development of measures aimed at fulfilling the given target. The primary goal is the systemization of information and the mapping of vulnerable ecosystems so as to determine a specific course of action.

The systemization of information and the mapping of vulnerable ecosystems is advantageous in two separate senses which are determined by two drastically different types of climate change influences. The latter two are paired with two types of efforts aimed at decreasing the anthropogenic burden.

**First** – the effects of extreme weather conditions such as dangerous hydro meteorological events. In this scenario, actions need to take place only in response to a negative situation. For example, high forest fire danger (due to heat waves, abnormal lack of precipitation and others) is countered by bans to visit forests and limitations on economic activity. In the scenario of abnormally deep forest covers, not only is

it necessary to limit the anthropogenic burden on the affected ungulate populations (for example boosting efforts to combat poaching) but also to undertake measures aimed at ensuring additional nutrition and preventing epizooty.

**Second** – the effects of constant (annual) implications of climate change. The degradation of permafrost species, aridization, changes in the cycle of arctic ices and other effects take place almost annually. As a result, measures aimed at the mitigation of these occurrences must take place on an ongoing basis. Without doubt, some of these measures will be of seasonal nature but they must be applied every year.

The division of climatic threats into two categories is fully in accordance with the IPCC report as it separately analyzes the effect of extreme occurrences (increase in the frequency and severity of dangerous hydro-meteorological events (IPCC report SREX, 2013) ) and those that are relatively slow and develop in stages. The latter includes rising sea levels, the degradation of permafrost soils, erosion of shorelines, shrinking of ice fields, shift in the boundaries of natural zones and others.

The systematization and mapping of vulnerable ecosystems will allow to eventually determine the necessary practical measures and to undertake pilot projects aimed at decreasing the anthropogenic burden on the most vulnerable ecosystems. At the same time, it is presumed the tolerable level of anthropogenic burdens is that which allows ecosystems to naturally adapt to climate change.

However, taking into account the current state of affairs, it is most rational to plan full-scale measures for the post-2020 period.

**National target:**

**By 2020 Russia has minimized the anthropogenic pressures on ecosystems and implemented adaptive measures in regions which are especially vulnerable to climate change: the Arctic, subarctic, Far East, mountainous and steppe ecosystems.**

To evaluate the extent to which this target is met, experts have put forward the following indicators which are in accordance with the suggested sequence of measures:

- a) List of ecosystems which require decreases in the anthropogenic pressures during particularly unfavorable weather-climatic situations (List 1);
- b) List of ecosystems in need of consistent decreases of anthropogenic pressures (List 2)

- c) Action plan for the adaptation to climate change;
- d) Action plan is sanctioned and the legal-normative registration of the plan is complete;
- e) Positive results from the pilot projects in ecosystems from List 1;
- f) Positive results from the pilot projects in ecosystems from List 2;
- g) By 2020 the appropriate articles of the Governmental program of “Environmental Protection” for the post-2020 period are prepared. According to these articles, no less than 80% of the total ecosystem area from Lists 1 and 2 have experienced a decrease in anthropogenic pressures either completely or to an extent which allows them to cope with climate change. For the rest of the country, there is an established level of allowable anthropogenic pressures.

***11.3. Strategic Goal C: Improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity***

***11.3.1 Global target 11 – By 2020, at least 17 per cent of terrestrial and inland water, and 10 per cent of coastal and marine areas, especially areas of particular importance for biodiversity and ecosystem services, are conserved through effectively and equitably managed, ecologically representative and well-connected systems of protected areas and other effective area-based conservation measures, and integrated into the wider landscape and seascapes.***

**Justification of the national strategy**

In Russia, the creation of natural protected areas (PAs) has been the traditional and most effective form of environmental protection.

The existing system of PAs has been created over the past 100 years and currently includes 13 thousand protected areas of various conservation status with a total area of 213 million hectares (11.8% of the total national area). The base of the protected area system is composed of 47 national parks and 69 governmental zakazniks of federal status. The total area of affected marine bodies of water, is 55.6 million hectares, and the total area of terrestrial and freshwater ecosystems is 45.4 million hectares which is 2.7% of the total area of Russia. Regional protected areas compose 84% of the total number of protected areas and 58% of the total system. Protected areas of local status compose 13 and 14 percent accordingly.

The 12 governmental nature reserves, 1 national park and 6 governmental federal zakazniks include a protected marine territory with a total area of 10.21 million hectares which encompasses 2% of the continental shelf of the Russian Federation. In four of the nature reserves, the marine area is greater than those of terrestrial ecosystems. Two nature reserves contain protected marine zones. Two nature reserves and 2 national parks include coastal territories. One nature reserve and 1 national park include part of the Baikal Lake with a total area of 53.8 thousand hectares.

The 10 UNESCO Nature Heritage Sights located within the Russia Federation contain 12 nature reserves, 4 national parks, 3 federal governmental zakazniks and 12 protected areas with regional status. 1 national park is a UNESCO World Heritage list.

The 39 UNESCO biosphere reserves found in Russia contain 40 federal protected areas – 34 nature reserves and 6 national parks.

According to the Ramsar Convention, there are 35 wetlands within Russia which have been identified as globally-important habitats for waterfowl located within 12 nature reserves, 1 national park, 11 governmental federal zakazniks and 18 regional zakazniks. The total area of Ramsar areas is 11.411 million hectares (or 0.67% of total Russian territory) of which 5.3 million hectares are located within protected areas. Three nature reserves are part of the transnational protected areas.

The functioning of all nature reserves and national parks (including federal zakazniks) is ensured by appropriate federal agencies which have the necessary financial support, professional expertise, multi-year experience and established traditions in environmental, scientific and educational work.

The creation of a unique system of protected areas is one of the key environmental accomplishments of the country.

At the same time an analysis of the representativeness and environmental efficiency of the existing protected area system in Russia has shown the following: The landscape and biogenic representativeness of the existing PA network is insufficient. The PA network contains all physic-geographic “countries” of Russia but only 60% of physic-geographic “provinces”. In addition, federal protected areas account for only 50% of all landscape biodiversity found within the country. The federal protected areas are most present in tundra, desert and steppe subtropical zones as well as in mountainous regions characterized by meadow-forest and tundra-forest eco-

systems. There is an insufficient representation of federal protected areas in semi-deserts and steppes. They are fully absent from arctic deserts. The federal protected area network is best at representing tundra ecosystems, forests and rare-stands and are the worst at representing steppes and various types of hydromorphic vegetative covers (for example bogs). Many aquatic bodies are underrepresented in federal protected areas. The Laptev and Okhotsk Seas, which are valuable from the landscape, biodiversity and bioresource point of view are represented by thin strips of protected areas which are adjacent to terrestrial PAs.

An analysis of the representativeness of flora and fauna in protected areas has demonstrated that out of the biological diversity found within the Russian Federation, federal PAs are best at hosting mammals (95% of all species found in Russia), amphibians (93%), birds (86%) and birds (86%). The most unprotected by this system are vascular plants (65% of their species can be found in PAs). The representativeness of the PA system is clearly insufficient in regards to rare and endangered (those in the IUCN Red List of Russia) species of plants and animals. The existing system of protected areas is only able to provide protection for only half of species' habitats.

An analysis of the representativeness of regional protected areas has only been conducted in certain regions of Russia.

In this manner, the task of expanding and developing the system of protected areas is relevant for the goal of protecting the unique biological heritage and diversity of the Russian Federation.

To further develop the geographical system of federal protected areas, the Concept for the Development of Federal Protected Areas for the period until 2020 (ratified by the decree of the Government of the Russian Federation (N 2322-p) on December 22, 2011). The Concept is aimed at the creation of new and expanding of existing protected areas as well as at increasing the efficiency of organizations which manage protected areas.

The Concept calls for the following to be achieved before 2020:

- The creation of 11 nature reserves, 20 national parks and 3 federal zakazniks;
- Expand the area of the existing 11 nature reserves and 1 national park;
- Ensure the existence of protected zones which are in proximity of all nature reserves and national parks.

In total, it is planned to expand the entire system of protected areas to include **13.5%** of the entire nation with federal PAs alone composing up to **3%**. It is assumed that by expanding the network of protected areas, there will be: a substantial increase in the representativeness of natural systems protected by federal PAs, guaranteed protection of unique ecosystems, landscapes plants and animals (including rare and endangered species which are part of the IUCN Red List of Russia) as well as enhanced population awareness in part due to the expansion of the eco-tourism industry.

Apart from the Concept mentioned above which aims to develop the system of federal PAs, in 10 entities of the Russia Federation (12% of all entities) there are Strategies developed for the expansion of regional protected areas and another 19 entities of the Russian Federation (23%) have adopted other documents aimed at the development of the PA network. In addition, another 15 entities of the Russian Federation (18%) have adopted environmental strategies and concepts which include measures for the development of the PA network.

In general, the question of creation and ensuring the functioning of protected areas of various categories within Russia is well developed. There is a sufficient legal base in the sphere of protected areas, there is a deep experience of creating PAs and ensuring their proper functioning and there are plans adopted which aim to expand and develop the existing system and increasing its representativeness. There is work being done for increasing the efficiency of protected areas.

At the same there is a certain set of problems when it comes to the protected areas network.

The existing network of protected areas is not evenly distributed along the country. Protected areas exist in all entities of the Russian Federation. However, two-thirds of all PAs are located in the European portion of Russia. They are mostly concentrated in the North-West, Central and Volga federal regions (65% of all Russian protected areas). Three entities of the Russian Federation (Krasnodarsky Krai, Orenburg and Sverdlovsk Oblasts) contain three times the average national number (144) of protected areas per entity. The Tver Oblast contains the record number of protected areas (1024) while the Khanty-Mansi Autonomous Okrug only contains 24 PAs.

The maximum total area of protected areas is found in the Far East Federal Okrug (60.3% of total protected areas). Protected areas found in the Republic of Sakha (Yakutia) account for approximately half of the total area of PAs found in Russia (93.5 million hectares or 47.5%) and the Krasnoyarsk Krai contains 8%. In 13



entities of the Russian Federation, the area of protected areas ranges from 1 to 3% of total area of protected areas within the country. The remaining 69 regions range from 0.001% (Saint-Petersburg) to 0.9% (Zabaykalsky Krai).

The low number of protected areas in regions with high human populations or those subject to intensive economic activity creates a deficit of habitat-stabilizing territories as well as of recreational and ecology-educational resources.

Another problem in the sphere of protected areas is the insufficient extent to which they are linked by migration corridors into a cohesive ecological unit. This impedes the transfer of genetic information amongst individual areas. It is important to note that the terms “ecological network” and “ecological corridor” is absent from the federal legal framework.

When completing the 11<sup>th</sup> Aichi target, it is important to take into account that according to article 2 of the Convention on Biological Diversity, a protected territory is defined as a “geographically determined territory which is identified, regulated and used to fulfil specific environmental goals”.

When identifying protected territories in Russia, the term is primarily applicable to PAs. However, according to the federal bill “On Protected Areas”, PAs are areas of land, water and air space which are host to natural ecosystems and objects that have a special environmental, scientific, cultural, esthetic, recreational or wellbeing related value. These areas are either fully or partially removed from the list of economically exploitable lands by the government and are subject to varying degrees of protection. The given definition considerably narrows the international understanding of protected territories to only those which are subject to “special protection”. The definition used by the CBD, is broader than the definition of PAs. It includes other types of protected territories which are subject to regulations set by documents from various industrial legal acts of the Russian Federation:

- Protected and conservation zones which are established by the federal bill “On Environmental Protection”
- Areas that are legally defined as being of environmental value, recreational, historically-culturally important and valuable territories as defined by the Land Code of the Russian Federation;
- Protected forests and forest strips as established by the Forest Code of the Russian Federation
- Protected bodies of water and coastal protected areas – by the Water Code of the Russian Federation;

- Protected territories of bodies of waters which are necessary for the life cycles of valuable wildlife species (for reproduction, growth of offspring, pasturing, rest, migration and others) – by the Federal Code “On Wildlife”
- Protected fishing areas and fishing ground reserves – by the Federal law “On Fishing and the Conservation of Biological Resources”
- Areas protecting hunting resources – by the Federal law “On Hunting and the Conservation of Hunting Resources”.

In addition one can add protected areas (as established by the federal bill on “Protected Areas”) to the territories that are subject to limitations in the possible economic activity which they may host.

There are terrestrial, internal water, coastal and marine territories which are particularly valuable for the conservation of biodiversity and provision of ecosystem services, which are preserved not only through protective measures but also due to efficient resource management. When identifying the latter, it is important to take into account all listed categories of protected areas and natural objects. However, there is still no unified information-analytic system which would use GIS and connect various separate informational data bases about protected areas. This impedes the bringing together of decentralized informational resources, their verification and adaptation into formats which would be useful to managers, various economic units and the wider public.

It is necessary to conduct a full analysis of all types of protected areas which have the purpose of conserving biodiversity. Their territories must be surveyed and the appropriate indicators ought to be included into statistical reports which, amongst other, could be used for reports on the 11 Aichi target.

**The national target is composed of two sections:**

**By 2020 there is an efficiently managed system of protected areas which composes no less than 13.5% of the Russian Federation. The role of the system is to ensure the protection of unique ecosystems and landscapes as well as of fauna and flora, including those species which are rare or endangered and part of the IUCN Red List of the Russian Federation.**

**By 2020 the total area of terrestrial and aquatic territories with regulated resource-use policies and which play a key role in the provision of ecosystem services is increased to the point where it composes 17% of all terrestrial territories and 10% of all aquatic bodies under the jurisdiction of the Russian Federation.**

To evaluate the extent to which this target is met, experts have put forth the following indicators:

- a) The proportion of the Russian Federation taken up by both regional and federal protected areas, %;
- b) The proportion of the territories of the Russian Federation that have regulating land-use policies aimed at the conservation of the environment, (aquatic and fishing reserves, protected areas, protected forests which have undergone voluntary certification and others);
- c) The proportion of flora and fauna species found in Russia (includes plants, mammals, birds, reptiles and amphibians) which are represented in federal protected areas;
- d) The proportion of higher plants and vertebrates (includes mammals, birds reptiles and amphibians) which are part of the IUCN Red List of Russia and which can be found in protected areas out of the total number of species of higher plants and vertebrates (includes mammals, birds reptiles and amphibians) which are part of the IUCN Red List of Russia;
- e) The proportion of protected areas which have been tested for efficient management practices out of the total number of protected areas divided by the proportion of protected areas with proven efficient management practices out of the total number of protected areas in Russia;
- f) Landscape and biodiversity representativeness of protected areas;
- g) The proportion of protected areas
- h) The proportion of entities of the Russian Federation which regulate protected areas found on their territory through appropriate legal frameworks (the proportion of entities which have a leading normative-legal document that is responsible for the creation and functioning of regional protected areas).

***11.3.2. Global Target 12 : By 2020 the extinction of known threatened species has been prevented and their conservation status, particularly of those most in decline, has been improved and sustained.***

#### **Justification of the national strategy**

There are 320 species of mammals found within the Russian Federation (18% of total world mammal species), 732 species of birds (8% from world total), 80 species of reptiles (1.2%), 29 species of amphibians (0.6%), over 340 species of freshwater

fish (2.5%), around 1500 species of fish, over 150 000 species of invertebrates, over 20 000 species of higher plants (over 5% of world total) of which there are 12 500 species of vascular plants, 2 200 species of moss, 3000 species of lichen and no less than 11 000 species of fungi. Approximately 20% of all fauna of the Russian Federation is composed of endemic species. The highest level of flora and fauna diversity is found in the Far East, southern Siberia and north Caucasus.

A number of species are categorized as rare and endangered. These are species with naturally low populations that are vulnerable due to their biological characteristics (low numbers, small habitat range, low reproduction rates) and species that currently have large populations but which are under threat of becoming rare due to a decrease in the population numbers or habitat range caused by anthropogenic pressures. Rare and endangered species of animals, plants and fungi play an important role in many ecosystems and are reliable indicators of the state of these ecosystems.

The tendencies of species extinction in the Russian Federation are similar to average world indicators: the proportion of rare and endangered species of mammals and birds out of the total number of mammal and bird species in the Russian Federation is 20%. Over the past 400 years, there have been 9 species and subspecies which have become extinct within the Russian Federation as a result of human activity. Out of those species now extinct, there are certain one which could have been used to ameliorate existing species of domesticated animals: aurochs, steppe and forest Eurasian wild horses, sea cows and others.

The main causes for the extinction of plant, animal and fungi species are the degradation of habitats (as a result of the economic exploitation of forests and steppes as well as fires), direct extermination by humans due to some economic value of the plant or animal (for example expensive pelt, meat, body parts and others) and, more rarely, global climatic changes.

Questions concerning the conservation of rare and endangered species of plants, animals and fungi are under the specific supervision of the government. The conservation of biodiversity is one of the key policies of the Russian Federation.

According to commitments undertaken at international conventions and agreements, the Russian Federation has the global responsibility of conserving the Siberian tiger, Amur leopard, snow leopard, polar bear, Siberian crane and others.

Many rare and endangered species of animals, plants and fungi are part of the IUCN Red List of the Russian Federation or of regional IUCN lists, both of which are integral mechanisms for the conservation of these species.

Today, the IUCN Red List of the Russian Federation includes: 413 species of animals (including 155 species of invertebrates (0.1% of all invertebrate species identified within the RF) and 258 species of vertebrates), 41 species of cyclostomata and fish (7% of all such species found within the Russian Federation), 8 species of amphibians (30%), 21 species of reptiles (28%), 123 species of birds (17%) and 65 species of mammals (20%). 676 species of plants (5% of all plant species found within Russia) including:

- 514 species of vascular plants including: 474 species of flowering plants, 14 species of conifers, 23 species of ferns and 3 species of lycopodiophytae.
- 61 species of bryophytes;
- 35 species of marine and freshwater algae;
- 42 species of lichen
- 24 species of fungi.

At the same time, some species are included in the national Red List at the level of a subspecies or even a population with various taxons (subspecies or populations) of the same species can have differing protective statuses. This is why the taxon (species, subspecies, population) is the unit of measurement and not the species.

In this manner, the existing list of wildlife species included in the IUCN Red List of the Russian Federation includes 437 taxons: 155 taxons of invertebrates and 282 taxons of vertebrates: 48 taxons of cyclostomata and fish, 8 taxons of amphibians, 21 taxons of reptiles, 128 taxons if birds and 77 taxons of mammals.

168 species of animals and 250 species of vascular plants that are found in Russia are part of the IUCN Red List.

Today, all 83 entities of the Russian Federation have signed normative and legal acts which acknowledge the IUCN Red List of Russia and 80 of the 83 entities have established their own, regional, Red Lists. Another 2 entities are planning to establish the Red Lists by 2014.

At the same time, the existing approaches to identifying the members of the Red List of the Russian Federation (as well as of individual regions of the RF) do not

have a strict system (criteria) for the inclusion of species (subspecies, populations) in the Red List. This is in contrary to the system of criteria utilized by the international IUCN Red List of Threatened Species. The lack of an appropriate system of criteria and the use of subjective, “expert”, evaluations has led to a considerable increase in membership of the Russian Red List. This has led to the impossibility of effective monitoring and protection of all member species which is legally required by Russian laws. It would be beneficial to reevaluate the approaches to the management of Red Lists, to prioritize rare and endangered wildlife species and decrease the size of the Russian Red List by increasing the efficiency of regional Lists as well as through the creation of a cadaster of rare and endangered wildlife species. This Cadaster will include all evaluated wildlife species which require special attention. At the same time, being included in the Cadaster will not have legal consequences for the taxon. This will allow to ensure those species included into the Red List with the maximum protection and warrant retribution to those who violate their status. It will also provide for the appropriate monitoring of species included in the Cadaster with the possibility, if necessary, of taking preventative measures such as their inclusion into the Red List of Russia.

The priority goal for the conservation of rare and endangered species of plants and animals is the preservation of their habitats. To ensure the conservation of key habitats of rare and endangered species of plants and animals, Russia has created a system of protected areas. These are of both regional and federal statuses with an area exceeding 200 million hectares, spread over 12 000 segments.

Since 2009, the total area of federal protected areas was increased by 10% and now composes 59 million hectares. There are those protected areas which deserve special notice: the “Leopard Land” national park created in the Primorsky Krai for the conservation of the Amur leopard and Amur tiger, the “Sailugem” national park created in the Republic of Altai for the conservation of the snow leopard and argali, the national park “The Russian Arctic” created in the Arkhangelsk Oblast for the conservation of the polar bear and walrus as well as the federal zakazniks “Pozarim” and “Mongolian Gazelle Valley” which were created in the Republic of Khakassia to protect the migration routes of the snow leopard and for the restoration of the Mongolian gazelle in the Zabaykalsky Krai, respectively.

At the same time, an analysis of the representativeness and environmental efficiency of the existing protected area network has shown that when it comes to rare and endangered species of flora and fauna that are part of the Red List of the Russian Fed-

eration, the representativeness of the federal PA network is not yet sufficient. The representation of Red List wildlife in federal protected areas is fairly high: 65% of all mammals, 89% of birds, 67% of reptiles and 75% of amphibians. However, the existing network is able to protect the habitats of less than half of the endangered species that are part of the IUCN Red List of Russia: 51% of mammals, 41% of birds, 36% of reptiles and 25% of amphibians. For example, in the Republic of Tuva, almost all key habitats of the snow leopard are located outside of the “Ubsunur Hollow” governmental biosphere reserve, a factor which does not allow for their sufficient protection. There is an insufficient amount of analogous data for fish species which are part of the Russia IUCN Red List. However, the fact that the process of establishing protected areas almost never takes into account water basins, it can be assumed that there is a low level of protection of fish species that are part of the Red List.

An analysis of the representativeness of regional protected areas has only been conducted in individual entities of the Russian Federation. In general, the state of affairs is analogous to that of the federal PA system. It is necessary to continue the further development of the network of protected areas.

Apart from creating new protected areas, it is necessary to increase the efficiency of the functioning and management of existing PAs. Today, there is an uneven distribution of modern transportation tools and other machinery equipment. While almost all governmental agencies which work to ensure the functioning and management of federal protected areas have the necessary equipment, many entities do not adequately finance operations related to the management of protected areas.

A separate problem is the lack of governmental inspectors of regional protected areas that would have the authority to draw up protocols about administrative breaches of the law “On the Breaching of the Rules of Conservation of Protected Areas”. This significantly decreases the efficiency of the functioning of regional PAs.

The majority of habitats of rare and endangered species of plants and animals are located outside the boundaries of protected areas in regions subject to active economic activity. In this case the state of the rare and endangered species of animals and plants as well as of their habitats is largely dependent on the intensity of the anthropogenic effect of the various sectors of the economy. Primarily this relates to forestry, fishing, subsurface resource extraction and the energy sectors.

Increasing the scale of forestry and subsurface resource extraction as well as the implementation of large infrastructural projects leads to a decrease of the habitat

range of many rare and endangered species of fauna and flora. There are currently no effective mechanisms for compensating the damage done to the habitats of flora and fauna. Cases of restorative activities after large infrastructural projects are very rare to come by. Recent positive examples have been the expansion of the PA system and the resettling of rare species of plants, reptiles and amphibians as part of the preparation to the Sochi Olympics and the construction of a tunnel under the Razdolnoe-Khasan freeway in the Primorsky Krai so as to protect the migration corridors of the Amur leopard and Amur tiger. Incentive measures which would foster such restorative mechanism are not well developed which hampers the decrease of ecological risks during the completion of such large projects.

Moreover, the protection of habitats outside PA boundaries is performed by state inspectors from empowered executive authorities of the Russian Federation in the sphere of fauna conservation and use. The number of state inspectors performing state supervision in the sphere of fauna protection and use in federal entities of Russia is insufficient. Practically in all the regions, the inspector units are poorly equipped with modern means of transportation and other technical means such as equipment and gear. In view of the existence of a profitable poaching industry (comparable in profitability to selling drugs or weapons) with a capacious “black” market, the lack of effective mechanisms for counteracting poaching inevitably stimulates large-scale, illicit, hunting of rare species.

Over the past two years the state has taken measures to increase the effectiveness of combating poaching and the illegal trade in rare animals and their derivatives; in particular, the penalties have been substantially increased not just for illicit hunting of rare and endangered animals and their derivatives, but also for buying, storing and transporting them. However, poaching and illicit trade are still substantial in scale and have an extremely negative impact on the survival in the wild of rare and endangered species. What is needed is to maximally increase the riskiness of the poaching business and maximally decrease its profitability and accessibility. It is necessary to ensure the possibility of blocking websites where ads for selling rare animal species and their derivatives are posted, to limit the number of customs ports of entry for CITES living objects and also to develop rules for keeping rare animal species in captivity as well as ensuring their enforcement.

With the goal of long-term preservation and recovery of rare and endangered fauna and flora species, the Strategy for the preservation of rare and endangered species of animals, plants and fungi in the Russian Federation through 2030 was adopted



and approved by decree № 212-p of the Government of the Russian Federation of February 17, 2014.

Apart from the Strategy for the preservation of rare and endangered species of animals, plants and fungi in the Russian Federation, strategies were adopted for the preservation of particular animal species in the Russian Federation: the Amur tiger, the Amur leopard, the snow leopard, the polar bear, the European bison, and the Sakhalin musk deer. Also adopted and implemented is the program for the recovery (re-introduction) of the Persian leopard in the Caucasus mountains.

On the whole, the issue of conservation of rare and endangered animal and plant species in Russia is sufficiently well studied. A sufficient legal base has been created; scientific research and regular monitoring are being developed. The latter includes the use of satellite tracking, radio tagging, photo and video recorders. Biotechnical measures are being implemented, the work of specialized nurseries and breeding centers for rare species is being supported, specialized ecological education programs are being conducted.

Still, there are a number of serious problems remaining to be solved in the area of preserving rare and endangered fauna and flora objects, including the following:

- high level of poaching and illegal trade in rare and endangered animal and plant species, and insufficient counteraction to them;
- insufficient effectiveness of the existing system for protection of rare and endangered animal and plant species;
- a insufficiently representative PA system in areas of rare and endangered animal and plant species habitation as well as a poorly developed system of protected areas with a limited nature use policy;
- insufficient integration of issues of preservation of rare and endangered animal and plant species and their habitats into Russia's legislation on the natural resources area, as well as the legislation regulating the activities of various economic subjects;
- insufficient methodological support of monitoring activities, as well as insufficient scientific support of the measures implemented for the preservation of rare and endangered animal and plant species;
- insufficient information provided to the general population on the state and importance of preserving rare and endangered animal and plant species;

- insufficient international cooperation for the preservation of rare and endangered animal and plant species which exist both within and outside the Russian Federation.

**The national target is:**

**To ensure, on a long-term basis, the conservation and recovery of rare and endangered animal, plant and fungi species in the interest of the Russian Federation's stable development.**

To evaluate the extent to which this target is met, experts have put forth the following indicators:

- a) ratio: total number of animal taxa included in the Red List of the Russian Federation / total number of endangered animal taxa / total number of critically endangered animal taxa;
- b) ratio: total number of animal and fungi taxa included in the Red List of the Russian Federation / total number of endangered plant and fungi taxa / total number of critically endangered plant and fungi taxa;
- c) well-being index for the animal, plant and fungi taxa included in the Red List of the Russian Federation;
- d) the share of the rare and endangered animal, plant and fungi species included in the Red List of the Russian Federation in the total number of animal, plant and fungi species registered within the boundaries of the Russian Federation;
- e) number of animal, plant and fungi taxa included in the Red List of the Russian Federation for which there are separate conservation strategies developed and approved by Russia's Ministry of Natural Resources and the Environment;
- f) the share of rare and endangered animal, plant and fungi species included in the Red List of the Russian Federation and inhabiting federal-status PAs in the total number of corresponding animal, plant and fungi species included in the Red List of the Russian Federation;
- g) the number of animal, plant and fungi taxa included in Russia's Red List for which programs of reintroduction, settling and recovery are implemented in accordance with the adopted strategies and programs;
- h) the share of mammal and bird species included in the Red List of the Russian Federation and preserved in nurseries, breeding centers and zoos in the total number of mammal and bird species included in the Red List of the Russian Federation;

- i) the share of plant species included in the Red List of the Russian Federation and preserved in nurseries, botanical gardens, and arboretums in the total number of plant species included in the Red List of the Russian Federation;
- j) the number of mammal taxa included in the Red List of the Russian Federation for which officially approved methodological recommendations exist for organizing and performing counts and monitoring of populations;
- k) index of the numbers of “model” animal species included in the Red List of the Russian Federation (the Amur tiger, the Amur leopard, the snow leopard, the polar bear, the European bison, the Oriental white stork, the Siberian crane);
- l) the number of international treaties and programs in the area of preserving rare and endangered animal, plant and fungi species in accordance with which Russia prepares and submits materials.

***11.4. Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services.***

***11.4.1 Global target 14 – By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and wellbeing, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable***

**Justification of the national target**

Russia’s ecosystems perform functions and services which are of key importance for assuring ecological security, stable development of the economy, health protection and improvement of the population’s living standards. The climate-regulation services of Russia’s ecosystems are of global importance. Despite the extreme importance of ecosystem services for the country and for the world as a whole, in Russia the task of evaluating and sustaining the most important ecosystem services has still not been set.

In Russia, accounting is only set up for the main provisioning services which consist of timber production, fishing, catch of other marine organisms and hunting game animals. However, these services are regarded as the result of the functioning of the target animal populations, not the ecosystems. Ecosystem properties are partially taken into account primarily within the framework of “sustainable

forest use” projects. Specialists in the fishing and hunting sectors of the economy admit the importance of conserving the habitats of game animals, but, on the whole, the ecosystem approach is poorly represented in the practice of biological resource use.

The most important ecosystem services are the habitat-forming ones. They provide support for stable environmental conditions and are thus the necessary condition of ecological security, stable development of the economy, health and well-being of the population. As shown by foreign and domestic studies conducted on the evaluation of ecosystem services (Pavlov et al., 2009; Bobylev and Zakharov, 2009), the value and importance to humans of habitat-forming services is much greater than the value of the biological resources which we extract from nature. In spite of this, environment-forming services to this day have not received systemic evaluation in Russia. Only the habitat-forming role of forests is partially taken into account when singling out the category of protective forests.

In order to accomplish this task, the following main steps are proposed:

- Develop the National Report on the state of ecosystems and ecosystem services in Russia, in which the state and value of ecosystem services in Russia is to be analyzed. Identify the ecosystems which must be preserved in priority order for supporting the most important ecosystem services; determine the main measures needed to form in Russia the system for the evaluation of ecosystem services and accounting for their value in the decision-making process.
- Ensure the effective protection of those ecosystems which are already known to have a key role in supporting ecosystem services. These include, first of all, the protective forests and wetlands which perform the most important climate- and water-regulating functions. This group of ecosystems includes also the traditional land-use territories which perform ecosystem services necessary for supporting the traditional way of life of Russia’s indigenous populations..
- Develop systems for inventory and evaluation of regional ecosystem services as the main part of economic decisions affecting the environment is made based on regional data and affects primarily the ecological situation in the regions.
- Develop the PA network with consideration for the task of supporting the main ecosystem services. This element is extremely important since it is

precisely the organization of PAs of different levels and categories that is the most effective way of conserving ecosystems and supporting ecosystem services. In foreign countries, the support of ecosystem services is one of the main justifications for organizing PAs. For example, there are many instances when PAs were established to preserve ecosystems which provide the population with water (examples are given in the TEEB project documents). Depending on the scale of the service, the status of the PA may differ: global services may be supported by federal-level PAs; regional and local services may be supported by regional PAs.

- Develop an economic mechanism for compensation to regions of the cost of preserving ecosystem services (payments for ecosystem services) in order to support the population of economically subsidised regions, indigenous and local communities, and involve the population in conservation projects (sustainable forest use, ecologically safe agriculture, ecological tourism, etc.).

**National target:**

**By 2020 the ecosystems which provide the most important services for ensuring the population's life, health and well-being are identified and protected.**

To evaluate the extent to which this target is met, experts have put forth the following indicators:

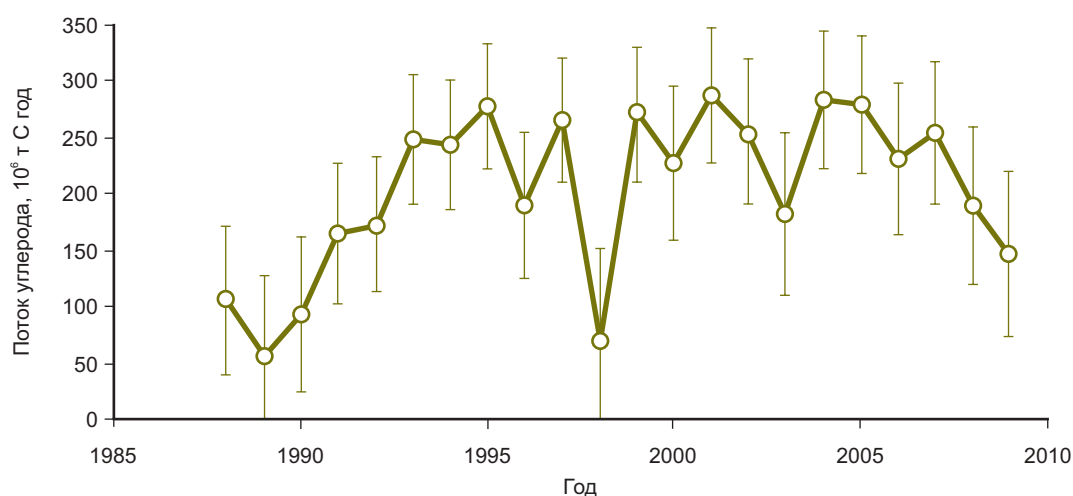
- a) National Report on the state of ecosystems and ecosystem services in Russia that will identify the ecosystems which have the most importance for supporting ecosystem services;
- b) area of protective forests (which by 2020 should not be smaller than in 2014);
- c) area of forests leased for harvesting and gathering of non-timber forest products, for harvesting forest food sources and gathering medicinal plants, for scientific research activities and for educational activities;
- d) area of protected wetlands of international importance and of other nature areas which have a key importance as habitats (key ornithological territories, key botanical territories, water bodies important as spawning grounds for valuable and commercial fish);
- e) area of rehabilitated wetlands which were earlier disturbed by economic activity;
- f) methods for ecosystem inventory and ecosystem evaluation, and actual inventory-taking;

- g) number and area of federal- and regional-importance PAs organized in order to support the stable provision of ecosystem services;
- h) creation of compensatory PAs.

**11.4.2. Global target 15: By 2020, ecosystem resilience and the contribution of biodiversity to carbon stocks has been enhanced, through conservation and restoration, including restoration of at least 15 per cent of degraded ecosystems, thereby contributing to climate change mitigation and adaptation and to combating desertification.**

### Justification of the national target

The great majority of terrestrial ecosystems contain substantial stores of carbon in their pools of phytomass, dead plant biomass, and soil. This carbon is tied in different forms of organic matter. Anthropogenic impact on terrestrial ecosystems manifests itself, as a rule, in a decrease of pools (stores) of organic matter, and mobilization of carbon which enters the atmosphere in the form of carbon dioxide and certain other greenhouse gases. Thus the plowing and agricultural conversion of steppe ecosystems, drying of peat bogs and technogenic disturbances of plant covers in tundras lead to the activation of destruction processes under the ground surface, decrease of organic matter stores in soils and to CO<sub>2</sub> emissions releasing into the atmosphere. The following general rule can be formulated with respect to terrestrial ecosystems: the expansion of efforts to conserve ecosystems manifests itself either in the prevention of emissions or in increased sequestration of the atmosphere greenhouse gases. Considering that national tasks for forming a network of protected



**Fig. 11.4.2.1. Dynamics of the carbon balance in Russia's forests**

areas, as well as territories and aquatic areas with special land-use regulations, are examined in section 3.1, the present section is focused on measures which contribute to biodiversity conservation and carbon stores buildup in ecosystems outside the limits of the indicated territories and aquatic areas. Such measures are of priority importance with respect to Russia's forest cover.

The dynamics of carbon capture by Russia's forests are shown in Figure 11.4.2.1. Carbon flow into Russia's forests in the early 1990s was about 50 Mt C per year; by the mid-1990s it increased to 250 Mt C per year and stayed at that level, with some variances, until 2005 when it started decreasing. This trend is set by the dynamics of timber production which fell sharply (almost by a factor of 3) during the period of socio-economic reforms (Fig. 11.4.2.2). The drops in carbon deposits in forests in 1998 and 2003 are explained by the high level of forest fires which engulfed substantial areas in Russia's Asian part.

The above information is evidence that the changes in Russian forests' carbon balance are controlled by the scale of the disturbances. Prior to the early 1990s, the largest disturbances had to do with logging. Since then, it has been forest fires. The noticeable increase in the impact of fires in the last twenty years is explained by the under-funding and the ill-devised reforms in the system for protection of forests from fires, and also by the intensifying climate changes which increase the length and severity of fire-hazard seasons. Intensification of prophylactic work



**Fig. 11.4.2.2.** Dynamics of clear-cut areas and forest fires in the Russian Federation

and fighting forest fires is the obvious way to prevent greenhouse gas emissions, preserve carbon stores and contribute to forests' adaptation to climate changes. This objective conforms to the provisions of the Russian Federation's State Program "Development of the forestry" for the years 2013-2020, which envisions strengthened protection of forests from fires; this must be manifested in a 22% decline of the share of fires caused by citizens, and in the halving of the share of large-scale forest fires. The degree of effectiveness of fighting forest fires and the nature of the means used is regimented according to the forest fire monitoring zone: ground, aerial, space - level I, space - level II. The boundaries of the zones are approved by Russia's Ministry of Natural Resources and the Environment. Fighting forest fires is done most effectively throughout the ground monitoring zone. It should be recognized as desirable that ground and aerial monitoring zones be expanded at the expense of the space monitoring zone.

Prior to the period of socio-economic reforms in the Russian Federation, logging was the more important factor in the process of forest carbon losses. In recent years, a certain growth in timber harvests is observed (Fig. 4.2.2). This increases its contribution to forest carbon losses. It is necessary to take into consideration that timber is a renewable natural resource, therefore its increased use should be considered a positive phenomenon, on the condition of strict adherence to logging rules and the norms of subsequent forest recovery which compensate for the carbon losses. Carbon stores are most negatively affected by illegal logging done without regard for norms and frequently involving the most valuable and rare species of trees. By different estimates, 10-25% of all timber volume harvested in Russia is logged illegally, which results in 9 to 22 million tons of annual carbon losses in forests. Apart from having a positive impact on the state of forest biodiversity, more active efforts aimed at the combating of illegal logging and illegal timber trade, will lead to decreased carbon losses. The successful implementation of measures to limit forest fires and prevent illegal logging may reduce carbon losses in Russia's forests by 17%.

From the perspective of more long-term carbon accumulation, it is important to contain the volume of "pioneering" logging and gradually reset the forest economy toward more efficient exploitation of forests already used by timber companies. This is about a conservative approach toward logging remote stands of reserve forests, primarily in Siberia and the Far East. Within the framework of the task for conserving the forests' economic capacity, set in the "Foundations of the State Policy in the field of Forests Use, Conservation, Protection and Regeneration till



2030”, adopted by decree № 1721-p of the Government of the Russian Federation on September 26, 2013, there is this promising direction: “the forming of Russia’s national forest heritage, that is, the stock of forests which are not to be subjected to economic exploitation”.

One of the specific traits characterizing the changes in Russia’s land use is the large-scale abandonment of plough lands that began in the early 1990s. The total area of cropland removed from use since then is estimated to be 40 million hectares. A large part of that land area is in the non-black-soil zone of the European part of Russia, where agriculture proved to be of low profitability in a market economy. In the abandoned fields restorative successions started, which in many cases have already resulted in young forest growth. Summary carbon capture in the overgrown croplands is currently at 42 million T C per year. However, the self-restored forests do not count as such officially, since the overgrown areas are still listed as agricultural lands. It is necessary to create regulations which assure the transfer of these areas to forest stock lands, or else develop other forms which guarantee the constancy of forest cover presence. The state program for the development of agriculture and regulation of the markets of agricultural products, raw materials and foodstuffs in 2013–2020 includes quantitative indicators for the return of previously abandoned lands to agricultural use. This creates a capacity for a conflict of interest with the objectives of increasing the contribution of biodiversity to carbon accumulation. Still, the planned scale of agricultural-use recovery is considerably smaller than the area of actual abandonment of agricultural use. It is right to recognize the possibility and desirability of transferring 15% of the abandoned lands area to the forest stock (6 million hectares). The forests growing on these lands will over several decades consume no less than 12 million tons of carbon per year.

The Russian Federation annually submits reports to the bodies of the United Nations Framework Convention on Climate Change (UNFCCC) on the balance of greenhouse gases in the managed forests included in the National Greenhouse Gas cadastre. The managed forests amount to about 70% of the forested areas (managed forests do not include the reserve forests). The measures proposed within the framework of the present target apply to the managed forest areas. The decline in carbon losses from forest cover disturbances must be reflected in the National greenhouse gases cadastre and become the indicator of the extent to which national goals are achieved.

**National target:**

**By 2020 the recovery of forests and their stable accumulation of carbon has been ensured on 15% of all degraded agricultural lands. Owing to increased efforts for conservation of existing forests, their carbon losses have been decreased by 17%.**

To evaluate the extent to which this target is met, experts have put forth the following indicators:

- a) increase in forested areas by region and in the country as a whole (absolute increase in forest area);
- b) area of lands transferred to the forest fund (area of former agricultural lands transferred to the forest fund);
- c) decrease in the scale of forest disturbances, including forest fires and illegal logging (change in average forest fire areas and in illegal logging volumes compared to the 2010-2014 figures);
- d) decrease in carbon losses in Russia's forests (according to the National greenhouse gases cadastre data);
- e) land area of the Russian Federation's National Forest Heritage (upon legal formalization of this forest category).

***11.4.3 Global target 16 – By 2015, the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization is in force and operational, consistent with national legislation***

**Justification of the national target**

The Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization to the Convention on Biological Diversity was adopted by the Conference of the Parties to the Convention on Biological Diversity (henceforth “CBD”) at its tenth meeting on October 29, 2010 in Nagoya, Japan (henceforth “the Nagoya Protocol”).

The Nagoya Protocol contributes in substantial measure to further accomplishments of the Convention's third core objective as it provides clearer legal certainty and increases transparency both for suppliers as well as users of genetic resources. The Nagoya Protocol's important innovation is that it establishes concrete obliga-

tions to the compliance with domestic legislation or regulatory requirements for the Party supplying the genetic resources and of the treaty obligations stated in the mutually coordinated terms. The provisions concerning the compliance with all necessary requirements, as well as the provisions which create more predictable conditions of access to genetic resources, will contribute to a guarantee of joint access to benefits. Moreover, the protocol's provisions for access to the genetic resources-related traditional knowledge of indigenous and local communities will expand the possibilities of those communities in reaping benefits from the use of their knowledge, innovations and practices.

The Convention on Biological Diversity understands genetic resources to mean genetic material (any material of plant, animal, microbial or other origin that contains functional units of heredity) which has actual or capacity value. Thus the sphere of genetic resource use is fairly wide: agriculture, fisheries, forestry, biotechnologies, pharmaceuticals, cosmetics, innovative industries, research-and-development, and scientific research.

The goal of the Nagoya protocol is to ensure joint use on an equal and equitable basis the benefits from utilizing genetic resources, which includes ensuring proper access to genetic resources and proper transfer of technologies, accounting for all rights to those resources and technologies, and also includes appropriate funding, thus contributing to biodiversity conservation and to sustainable use of its components. The Nagoya Protocol deals with issues of access to genetic resources not only for commercial use, but also for non-commercial research purposes.

It is stated in the Nagoya Protocol that it is implemented in a way that is mutually complementary with other international documents which are of importance to the present protocol.

Very substantial work on creating corresponding voluntary codes and standards has been performed in recent years by various professional international communities (microbiologists, botanists, biotechnologists, etc.). Meriting individual mention are the following documents, guiding principles, codes of conduct, conceptions and other instruments developed for different types of genetic resource users for the purpose of furthering the implementation of CBD provisions on access to genetic resources and joint utilization of benefits through the satisfaction of the concrete needs of those they represent:

## **Agricultural sector**

The International Treaty on Plant Genetic Resources for Food and Agriculture is an international agreement with the overall goal of supporting sustainable agriculture and global food security. The Treaty, which entered into force in 2004, allows governments, farmers, research institutes and agro-industries to work together by pooling their genetic resources and sharing the benefits derived from their use. Facilitated access is granted for the first time at the international level through its Multilateral System and its Standard Material Transfer Agreement to 35 food crops as well as 29 genera forages listed in the Treaty. The fair sharing of benefits arising from the use of these resources is also granted thanks to the Funding Strategy and the financing of small scale projects, particularly in developing countries.

International code of conduct for plant germ plasm collecting and transfer – aims to promote the rational collection and sustainable use of genetic resources, to prevent genetic erosion, and to protect the interests of both donors and collectors of germ plasm. This document was adopted by the FAO conference in 1993. Among other elements, it sets out minimum responsibilities of collectors, sponsors, curators and users of collected germ plasm, in the collection and transfer of plant germ plasm. The Code is addressed primarily to governments and is to be implemented in harmony with the Convention on Biological Diversity and other legal instruments protecting biological diversity or parts of it.

Guidelines on Access and benefit sharing in research projects – developed based on the outcomes of the GEF project “In situ/On farm Conservation and Use of Agricultural Biodiversity (Horticultural Crops and Wild Fruit Species) in Central Asia”. They were developed taking into account the CBD, the Nagoya Protocol and the International Treaty on Plant Genetic Resources for Food and Agriculture in order to facilitate the implementation of access and benefit-sharing agreements in the context of the In situ/On farm agricultural biodiversity project. The Guidelines also propose a model prior informed consent agreement, a model benefit-sharing agreement and a model information-sharing agreement.

## **Botanic gardens**

Online resource for access and benefit sharing between botanic gardens around the world - [www.bgci.org/](http://www.bgci.org/) – the site has been developed in conjunction with Royal Botanic Gardens Kew, the International Plant Exchange Network (IPEN) and Botanic Gardens Conservation International (BGCI).

Principles on Access to Genetic Resources and Benefit-sharing - 28 botanic gardens and herbaria from 21 countries developed a common approach on access and benefit-sharing that includes Principles on Access to Genetic Resources and Benefit-sharing for Participating Institutions; Common Policy Guidelines; and an explanatory text. The Principles promote the sharing of benefits arising from the use of genetic resources acquired prior to the entry into force of the Convention, in the same manner as for those acquired thereafter.

International Plant Exchange Network (IPEN) and its Code of Conduct for botanic gardens governing the acquisition, maintenance and supply of living plant material - established by the European botanic gardens consortium in order to comply with the access and benefit-sharing provisions of the CBD. It covers the non-commercial exchange of plant material between botanic gardens. It covers acquisition, maintenance and supply of living plant material by the gardens as well as benefit-sharing issues.

#### **Micro-organisms culture collections**

Micro-organisms Sustainable Use and Access Regulation International Code of Conduct (MOSAICC) – developed by the Belgian Coordinated Collections of Micro-organisms (BCCM) in 1997, with the support of the European Commission. It is a voluntary code of conduct which covers the terms of access to microbial genetic resources, including the terms of agreement on benefit-sharing, access to and transfer of technology, scientific and technical cooperation as well as technology transfer.

#### **Academic research community**

Guidelines for Funding Proposals Concerning Research Projects within the Scope of the Convention on Biological Diversity (CBD) – drafted the German Scientific Research Society (Deutsche Forschungsgemeinschaft – DFG). These guidelines aim to enable scientists to comply with the principles of the CBD when designing research projects in order to avoid problems later during implementation, as well as to promote transparency and trust. Since 2008, adherence to these guidelines is a prerequisite for DFG funding.

#### **Professional societies or organizations**

A number of professional research societies in fields such as anthropology, ethnobiology, pharmacology and ecology have developed documents to articulate ethical

values embedded in research and set standards for best practice. These documents are variously referred to as codes of ethics, voluntary codes, codes of practice, statements on ethics, guidelines and research protocols. Elements of these codes of ethics and research guidelines generally address, inter alia, prior informed consent, research behaviour including benefit-sharing and the publication and distribution of data. Examples of these include:

- Society of Economic Botany (SEB): Guidelines of Professional Ethics
- International Society of Ethnobiology (ISE): Code of Ethics
- Society for Applied Anthropology (SfAA): Ethical and Professional Responsibilities

### **Private sector**

Guidelines for Biotechnology Industry Organization (BIO) Members Engaging in Bioprospecting – these guidelines are a set of general principles and practices that BIO believes are appropriate to follow when an entity engages in bioprospecting activities. They identify certain «best practices» that can be followed by companies that elect to engage in these activities. These guidelines also direct BIO members to identify any applicable requirements to follow in any specific jurisdiction in which they engage in bioprospecting.

Guidelines for the International Federation of Pharmaceutical Manufacturers and Association (IFPMA) Members on access to genetic resources and equitable sharing of benefits arising out of their utilization - list certain “best practices” to be followed by companies engaging in the acquisition and use of genetic resources.

According to the Nagoya Protocol, the mechanism of access to genetic resources and equitable sharing of benefits is based on a Party’s written consent to access to genetic resources (i.e. permit system) and mutually agreed terms of access and sharing of benefits which are formalized as agreements and treaties. To service the procedures envisioned by the Nagoya protocol, the Party appoints one national focal point (coordination center) on issues of access to genetic resources and equitable sharing of benefit. It also appoints one or several competent national authorities on issues of access to genetic resources and equitable sharing of benefits, which are responsible, in accordance with the applicable national legal, administrative or political measures, for granting access or issuing (in appropriate cases) written confirmations of compliance with access requirements. These are responsible for consulting on matters of acting procedures and requirements which regulate prior

informed consent and mutually agreed terms; it also establishes control points for monitoring genetic resource use.

By now over 50 countries are Nagoya Protocol Parties. These include the European Union and Norway among the developed countries. The USA, Canada and Australia have not yet ratified the treaty. Among former republics of the USSR, Belarus and Tajikistan are parties to the Nagoya Protocol.

There are substantial differences between CBD member countries concerning the current state of affairs with regard to the implementation of measures for access to genetic resources and benefit sharing, existing human resources, organizational capacity and needs and priorities in creating the capacity. It should be noted that, at present, most of the CBD Parties, which are developing countries, in particular the least developed countries and the small island nations among them, as well as Parties with economies in transition, do not possess the capacity needed for the effective implementation of the Protocol. For example, many of them have not yet implemented the domestic legal, administrative or political measures for regulating the access to genetic resources and benefit sharing. They have also not yet established organizational mechanisms in support of implementing the Protocol on the national level. Many of them also lack experts in the area of access to genetic resources and benefit sharing as well as in adjacent matters. Moreover, the key subjects of the activity, including state officials, indigenous and local communities, the private sector and the public, are not fully informed about the Protocol's provisions.

Many countries also lack clear and coordinated organizational mechanisms and rules for regulating access to genetic resources and benefit sharing, including procedures for obtaining prior informed consent and mutually agreed terms. Also lacking is expert knowledge for effective performance of organizational-command functions with respect to access to genetic resources and benefit sharing and the capacity for the collection, regulation and sharing of information on access to genetic resources and benefit sharing. Moreover, in most countries the level of awareness of the Nagoya Protocol and its provisions remains very low. The key subjects of the activity, including state officials, indigenous and local communities, the private sector and the public, are not fully informed about the obligations under the Protocol. Most countries also need to create and develop the capacity for monitoring the use of genetic resources, including checkpoints.

It is important to note that while Russia is a country of origin for genetic resources, it also possesses a number of genetic resource collections obtained from other countries.

Located within the country are the habitats (in whole or in substantial part) of many commercially important species, of which a substantial part are objects of forestry, hunting, trapping, fishing, the pharmaceutical and perfumery-cosmetics industries, ancestor species or relatives to domesticated animals and plants which are actively used in selection work. For certain species and groups of species, centers of their origins and diversity are located in Russia. Examples include the Siberian pine, the Siberian fir, the complex of paleo-arctic larches, *Rhodiola rosea*, *Leuzea carthamoides*, whitefish species, Asian populations of Pacific salmon, grouse species, grouse family species, many groups of waterfowl, the Asian beaver, the sable, the Siberian and Far Eastern subspecies of the red deer, the Siberian musk deer, and many others.

A substantial part of all species are extremely important to the ecosystems' stable existence, even if they are not subjected to mass use for direct extraction of benefits – for example, the key species, or edificatory species, or regulators of other species' numbers (predators, parasites, etc.).

Many commercially or ecologically important species are represented by complexes of intra-species forms, part of which are geographic subspecies recognized by systematics, and a substantial share are forms of debatable taxonomic status. One can list with the latter plants' phonological forms or ecotypes, seasonal races, color morphs and other groupings of organisms singled out based on morpho-anatomic or ecologic parameters. In recent decades, great attention has been paid in all of the world to the taking of inventory of biodiversity on the species and intra-species levels. As well, an ever-increasing role in this process is played by molecular-genetic markers and modern population-genome approaches. In this regard, the usual elevated interest in taxonomic biodiversity, which could be satisfied with the analysis of museum collections, is replaced by a new wave of collecting with emphasis on genetic tissue samples: from live organisms to frozen or otherwise fixed specimens, their organs and tissues. All these collections can potentially be used not just for scientific research purposes. Living organisms can be handed over to commercial use; knowledge of genetic interrelationships can be used in selection work; and genetic material (DNA from living, frozen and fixed tissues and organs) can be used as an agent of genetic modification and transformation of species both related and far removed in taxonomic respect.



In many regions beyond the country's borders, the genetic resources of commercially important species widespread in Russia have been sapped. These species' populations have been subjected to significant erosion through excessive exploitation in some regions, reduced to the status of threatened or critically endangered in other regions, or to the status of locally extinct in still other regions. Thus in a number of cases the prospects for a species' survival depend on the mobilization of that part of genetic funds which have survived in relatively native state in Russia. No less important is the timely acquisition of knowledge about the state of gene funds both for the native or little-disturbed populations of species and the narrow-range endemics for organizing gene conservation measures and programs for the recovery of species the gene funds of whom have been subjected to gene erosion. In a number of cases, it is not only the success of conserving gene funds outside the Russian Federation that hinges on the involvement of these gene fund reserves, but also the success of the selection or "gene engineering" work which is called on to increase profits from gene resources use, enter new markets or form new markets.

Thus developed countries of Europe and North America, as well as Japan, Korea and China, are showing increasing interest in the genetic resources of Russian Federation. The export of plants and animals in their living state, as well as their organs and tissues in a fixed state, has been taking place for a long time and constantly. Genetic resources uses for scientific purposes have as their end product the publication of studies in scientific periodicals, monographs and reports on grant-funded topics. Whereas in many leading scientific periodicals the authors are required to present explicitly their methods of biological material collection, especially with regard to species included in the IUCN Red List of Threatened Species, national Red Lists or the CITES list the rules are not as strict for the wide-spread species or the species entered in regional Red Lists. Still less strict are the publication rules in second- and third-tier magazines, monographs and reports. In a number of countries, the publication of the methods of obtaining biomaterial is not regulated. These methods are often not specified in the rules for the authors.

The concrete economic benefits obtained from the conservation and use of, say, forest genetic resources are rather hard to single out when putting together a general traditional economic monetary value for trees planted or for the forest/wood-processing industry, though, on the whole, this estimate depends directly on the quality of the forest genetic resources.

The general conclusion is this: the use of more effective seed sources (both in the sense of their concrete selection properties and, for example, division of forests into seed Okrugs) frequently produces an increase of 10-25%, sometimes even several hundred percent, with above-average wood volume production or seed (tar, etc.) productivity. Considering that seed material accounts for a small portion (0.1 to 3%) of the cost of creating a plantation, the main economic benefits currently accrued from using appropriate germ plasm in plantation creation and in agro-forest-amelioration.

Of enormous economic value are the natural populations of species related to fruit and nut trees, in other words, the genetic diversity preserved in these populations. For example, the germ plasm of Central Asian wild and disappearing rare apple species, *Malus sieversii*, collected in Kazakhstan in the 1990s, demonstrated resilience to apple scab, bacterial burn, drought and numerous soil pathogens. This specie is currently being put to use by the Agricultural Research Service of the US Department of Agriculture for improving modern apple breeds' resilience to diseases. It has been calculated that this enabled the US economy to receive additional revenue of US\$2.7 billion in 2011.

Genetic resources are a vitally important contribution in different industries; for example, no less than 26% of all newly approved medicines in the past 30 years are either natural products or derived from natural products.

Thus it is desirable, in principle, that Russia join the international regime of access to genetic resources and benefit sharing, since national genetic resources can be sources of monetary and non-monetary benefits in the event of their use abroad, including contributions to the development of national biotechnology.

However, the Russian Federation currently does not have codified legislation on the Nagoya Protocol topics. The regulations which currently apply to exports of live animals and plants, their parts or derivatives from the Russian Federation, apart from the veterinary and phytosanitary requirements, are based on the permit system of exporting specimens which are covered by the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), are listed as endangered (under CITES) and are listed in the Red List of the Russian Federation, and also on the issuance of foreign economic licences for resources of animal and plant origin included in the United list of goods which are covered by the export or import bans or limitations in trading with third party countries by the customs union member states within the Eurasian Economic Community, and by the provisions on limitations ap-

plication approved by Decision № 19 of the Interstate Council of the Eurasian Economic Community of 27 November 2009 and Decision № 132 of the Customs Union Commission of 27 November 2009. These regulations are mostly directed at resolving conservation issues. The goal is to ensure that the exporting/importing of live animals and plants, their parts and derivatives does not do harm to natural populations of animal and plant species, especially those that are rare and endangered.

Thus, as of today, there are no national juridical regulations developed and adopted that satisfy the Nagoya Protocol requirements; the organizational and personnel capacity has not been created; domestic legal, administrative or political measures for regulating the access to genetic resources and benefit sharing have not been implemented; organizational mechanisms in support of the Protocol's implementation on the national level have not been established; and on the whole, the consequences for Russia of joining the Nagoya Protocol have not been comprehensively evaluated, including the financial-economic consequences.

In accordance with order № 166-p of the Government of the Russian Federation of 11 February 2002, the Ministry of Natural Resources and the Environment of the Russian Federation is the Russian Federation's federal body of executive authority which coordinates the fulfillment of the Russia's obligations under the Convention on Biological Diversity.

Despite the fact that the Nagoya Protocol was developed within the framework of the Convention on Biological Diversity, the Protocol is a separate international treaty, and, in this connection, the question of the possibility for the Russian Federation to join it should be examined in accordance with the requirements of the Russian Federation's legislation, including Federal Law № 101-Φ3 of 15 July 1995 "On international treaties of the Russian Federation" based on an analysis of the possible positive and negative consequences of joining. Considering the above, achievement of the indicated global target cannot be accomplished by 2015, and it is expedient to complete its stepwise realization by 2020, considering, among other things, that consideration of the question of Russia joining the indicated international treaty is expedient once the Parties have accumulated experience of its implementation.

**National target:**

**By 2020 the Nagoya Protocol on the regulation of access to genetic resources and the fair and equitable sharing of benefits arising out of their utilization has entered into force and is functioning in accordance with national legislation.**

To evaluate the extent to which this target is met, experts have put forth the following indicators:

- a) the procedure of the ratification of the Nagoya Protocol by the Russian Federation has been performed;
- b) the legal, administrative and/or political measures for the regulation of access to genetic resources and benefit sharing have been revised/developed for the purpose of performing Russia's obligations under the Nagoya Protocol;
- c) the organizational structure necessary for implementing the Nagoya Protocol in the Russian Federation has been created, including the following:
  - the suitable participants (industries/target groups<sup>1</sup>, suppliers and consumers of genetic resources) for implementing the Nagoya Protocol have been identified;
  - the existing juridical and organizational expert knowledge for implementing the Nagoya Protocol has been identified;
  - the national organizational structures have been created (in accordance with the Nagoya Protocol provisions: Establishing national focal points and competent national authorities to serve as contact points for information, grant access or establish cooperation between Parties);
  - the standard (industry) agreements, regulations, codes of conduct, directions and methods and/or standards, registration systems and mechanisms for documenting the order and terms on which genetic resources are acquired/transferred, have been developed, i.e. the domestic regulatory requirements regarding access to genetic resources and benefit sharing have been created;
  - the (industry-specific) registration systems and mechanisms for documenting the order and terms on which genetic resources are acquired have been created;
  - suitable platforms for information exchange have been developed;
  - monitoring of genetic resources use and the use of traditional knowledge related to them has been organized (together with the CBD mediation mechanism);

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<sup>1</sup> Target groups:

- industry (forestry, agriculture, fruit and vegetable gardens, seeds, pharmaceutical, biotechnological, feed, food, cosmetics, pesticides and other production enterprises);
- academic/research/higher learning institutions – universities, laboratories and gene banks;
- various collectors of genetic resources (public or private), museums, zoos, botanical gardens, arboretums, etc.)
- indigenous and local communities.
- NGOs.

d) the strategy for increasing awareness has been developed:

- the share of industries/sectors with developed awareness strategies, mechanisms for evaluation/monitoring and registration of genetic resources;
- the number of measures for increasing awareness about the importance of genetic resources and traditional knowledge related to genetic resources, and also about related issues of access to genetic resources and benefit sharing;

e) the capacity in support of ratification, soonest entry into force and implementation of the Protocol has been created and is being developed:

- the number of texts for different sectors of the economy on business models for genetic resource use;
- the number of professional training measures for different sectors on business models for genetic resource use, conduct of scientific and taxonomic research having to do with conservation and monitoring of genetic diversity, with sustainable use of its components and with bioprospecting;
- the number of federal entities of Russia which have launched the mechanism for offering information/monitoring in accordance with the Nagoya Protocol;
- the number of industries in which genetic resource databases have been developed and are maintained;
- development of methods/technologies for bioprospecting and development of entrepreneurship based on bio-resources;

e) the value of genetic diversity has been incorporated in national/industry and regional strategies and in the processes of planning socio-economic development, including:

- the number of major infrastructure companies whose ecological policies ensure submission of information in accordance with the Nagoya Protocol;
- number of topical research projects on issues of agreements on access to genetic resources and benefit sharing (AGRBS), including examples of beneficiaries, monetary and non-monetary benefits, the terms of benefit sharing and benefit use;
- development of the research capabilities of research institutions and universities for the purpose of adding value to genetic resources;
- development of approaches and mechanisms for incorporating the value of genetic resources and traditional knowledge in decision-making processes.

***11.5. Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building***

***11.5.1. By 2020, the traditional knowledge, innovations and practices of indigenous and local communities relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources, are respected, subject to national legislation and relevant international obligations, and fully integrated and reflected in the implementation of the Convention with the full and effective participation of indigenous and local communities, at all relevant levels***

**Justification of the national target**

In Russia, the definition of “indigenous small populations” (henceforth “IP”) applies to peoples who live in the areas of their ancestors’ traditional settlement, keep the traditional ways of life, economy and hunting/fishing, number fewer than 50,000 in the Russian Federation and self-identify as independent ethnic communities. The ISP list in the Russian Federation includes 45 peoples; 40 among their number are indigenous small populations of the North, Siberia and the Far East (henceforth “peoples of the North”).

More than half of these peoples lead a nomadic or semi-nomadic way of life tied to deer-breeding, breeding of other aboriginal species of domesticated animals, hunting, fishing, trapping, hunting of sea mammals and gathering. According to Russian legislation, the guarantees of the rights of ISPs extend to representatives of other peoples who live constantly in places of ISP traditional settlement and practice traditional economic activities as defined by the laws of the federal entities of Russia. The list of places of ISP traditional settlement and traditional economic activities was approved by the Government of the Russian Federation; they are located in the Republics of Altai, Buryatia, Komi, Karelia, Sakha (Yakutia), Tuva, Khakassia; in the Altaysky, Zabaykalsky, Krasnoyarsky, Kamchatsky, Primorsky, Khabarovsk Krajs; in the Amur, Vologda, Kemerovo, Leningrad, Murmansk, Magadan, Sakhalin, Sverdlovsk, Tomsk, Tyumen oblasts and the Nentsy, Khanty-Mansiysk (Yugra), Chukchi and Yamalo-Nenets autonomous Okrugs.

Traditional knowledge is the basis of sustainable interaction with nature and of rational, careful use of its resources for supporting the life as well as the social and spiritual practices of the peoples of the North who live in extreme natural and climatic conditions.

The different kinds of traditional knowledge related to biodiversity conservation form the following system:

- knowledge of the territory with its biological resources; the composition of the populations of wild and domesticated animals; the species and properties of wild-growing edible and medicinal plants; the special features of economic use of different areas in the territory and in the nature-climate zones; the system of seasonal and spatial location of stationary and temporary settlements, pastures, roaming routes;
- knowledge of technologies for natural resources use and the forms of organizing activities tied to deer-breeding and other forms of breeding local and aboriginal species of domesticated animals, fishing, hunting of mammals in rivers, lakes and seas, hunting for meat and for pelts, gathering of wild-growing plants, methods of catching, gathering and processing products, skills in making tools and household items, the system for removing from economic use parts of the territory as sacred places and other ethnically and ecologically important information which ensures that renewable natural resources can be used for a long time;
- norms of regular law which regulate the use of land and other biological natural resources of the ISPs.

The traditional world view of the peoples of the North is based on the worship of the spirits of nature (animistic beliefs) and the spirits of ancestors. Belief in spirits-of-the-place and the reverence for ancestors are embodied in the custom of honoring sacred places. From the point of view of ISPs, the rules of conduct in sacred places and the rituals performed there are necessary to maintain man's spiritual connection to the environment and to ancestors through the spirit world. The defilement of a sacred place or the impossibility of performing a ritual there leads, in their opinion, to the dangerous destruction of these connections. The sacred places are located along the roaming routes; in these places, it is forbidden to hunt, fish, gather berries, or make noise. Thanks to the rules of conduct in these places, they are natural nature reserves. In this connection, the sacred places of the peoples of the North and the rules of conduct associated with them can be viewed not just as cultural heritage objects, but also as potential areas for developing a special category of protected areas.

Russian and foreign researchers view the traditional knowledge ISPs not just as a cultural and natural heritage, but also as a creative material of the ISPs which is

the foundation of their self-development and self-sufficiency, contributing to biodiversity conservation and sustainable use, especially in the extreme climatic and natural zones.

In the Russian Federation, legislation has been adopted which guarantees the ISPs' right to their traditional way of life and protection of their native environment. Federal law № 82-ФЗ of 30 April 1999 "On guarantees of the rights of the indigenous small populations of the Russian Federation" gives the ISPs a number of rights for the purpose of protecting their native environment, their traditional ways of life, economic activities and hunting, including the right to participate in "the performance of ecological and ethnological expertise when developing federal and regional state programs of natural resource development and environmental protection in areas of the indigenous small populations' traditional habitation and traditional economic activity". Federal law № 49-ФЗ of 7 May 2001 "On territories of traditional nature use by the indigenous small populations of the North, Siberia and the Far East of the Russian Federation" secures the legal foundation and the order of creating areas of traditional natural resource use.

Despite the fact that the ISPs' right to conservation, protection and transfer of traditional knowledge are contained directly or indirectly in a number of federal laws, the norms on the ISPs' forms of participation in decisions which affect their native environment and traditional way of life, the establishment of traditional land use areas (henceforth "TLUA"), and the performance of ethnological expertise have not been developed due to the absence of a mechanism for their implementation.

The concepts "traditional knowledge" and "sacred places of the ISP" are currently absent from federal legislation. In Russia's legislation on conservation norms, spelling out obligations for taking into consideration the indigenous peoples' traditional knowledge when performing ecological expertise in places of ISP traditional occupancy and economic activity are likewise not provided.

The Government of the Russian Federation has approved the Concept for the Sustainable Development of the Indigenous Small Populations of the North, Siberia and the Far East of the Russian Federation for the period until 2025 (order № 132-p of 4 February 2009). Listed among the goals of the concept are the following: conservation of the traditional occupancy environments, establishment of a legal policy for the TLUAs, determination of the procedure for performing ethnological



expertise, preservation and popularization of the cultural heritage of ISPs. However, the indicated goals have not been yet attained.

Regional legislation has advanced a little further in this area. The premises of protection for the traditional knowledge of ISPs as the foundation of culture and life support are contained in the legislations of the Sakha (Yakutia) Republic, the Khanty-Mansy (Yugra) Autonomous Okrug and the Yamalo-Nenets Autonomous Okrug. For example, in the Sakha (Yakutia) Republic the Law “On special protection nature areas of the Sakha (Yakutia) Republic” introduced the concept of specially revered lands “*Ytyk sirder*” or protected landscapes “*Uluu tuolbeler*” which are defined as protected landscapes of land areas and water bodies, valleys, rivers, *alases*, lakes, forests, mountains which are considered sacred by the indigenous peoples. Also adopted is the law “On Ethnological Expertise” which establishes the obligation to take the traditional landscape use into consideration when doing planning work.

The Yamalo-Nenets Autonomous Okrug Law “On cultural heritage objects of the Yamalo-Nenets Autonomous Okrug” lists the following as cultural heritage objects of the peoples of the North who reside in the autonomous Okrug: 1) family, clan and ethnically sacred, cult places of the indigenous small populations of the North in the autonomous Okrug; 2) family and clan burial places of the indigenous small populations of the North in the autonomous Okrug; 3) family, clan and nation places of commemoration; 4) places that are host to the peoples’ hunting/trapping practices; 5) other objects of exceptional value to the indigenous small populations of the North. According to Article 9 of this law, the indigenous peoples have the right to exercise social control over the state of the sacred places in accordance with their customs. Certain entities of the Russian Federation have adopted laws on folklore.

At the same time, the lawfulness of the regional legislation requirements which have no corresponding foundations in federal laws is subjected to doubt, both by subjects of economic activity and by representatives of the federal authorities’ territorial bodies. For example, a project was realized in the Yamalo-Nenets Autonomous Okrug (YNAO) and in the Kamchatka Krai in 2001-2002 titled “The importance of protecting sacred places of the indigenous peoples of the Arctic: a sociological study in the North of Russia”, executed jointly by international organizations (CAFF, IPS) and by the Association of the Indigenous Small Populations of the North, Siberia and the Far East of the Russian Federation. 263 sacred

places were identified and put on the map in the Tazovsky district of YNAO and 84 in the Olyutorsky district of the Kamchatka Krai. Due to the problems indicated above, only a small part of the identified sacred places are currently listed in the regional register of YNAO cultural heritage objects, and not a single one in Kamchatka. As a result, industrial corporations which receive official information about the absence of listed cultural heritage objects in their licenced areas of operation frequently destroy sacred places.

The problems in realization of regional initiatives for the conservation, consideration and integration of traditional knowledge testify to the necessity of not only increasing these efforts, but also improving federal legislation in this sphere.

Based on the analysis of the situation, the following is necessary in order to accomplish the present target:

- Creating and securing in Russian legislation (on the federal and regional levels) the mechanisms for taking into consideration the traditional knowledge and practices of ISPs, in the development of plans, programs, projects for PA creation, protection, monitoring and utilization of biodiversity (including hunting resources and aquatic biological resources) and in the development of state plans, programs, projects of economic activity which are planned and implemented in places of traditional occupancy and traditional economic activity.
- Ensure the evaluation of the impact on the traditional way of life and the native environment of the indigenous and local communities and the minimization of this impact in the course of development and implementation of state plans, programs, projects of economic activity which are planned and implemented in places of traditional occupancy and traditional economic activity, and also projects for PA creation, protection and utilization of fauna objects, including hunting resources and aquatic biological resources, in places of traditional occupancy and traditional economic activity.
- Further the dissemination of information about demonstration projects and best practices of documenting, taking stock of, respecting and integrating traditional knowledge for the purpose of biodiversity conservation and sustainable use, and interaction in this area between government authorities, the society and the ISPs.

**The national target consists of two subtasks:**

**By 2020 Russian legislation and practice ensure that in the planning and implementation of activities connected with utilization of and impact on biological resources and biodiversity conservation in areas of traditional occupancy by indigenous small populations, their traditional knowledge and traditional ways of economic activity and hunting are taken into consideration, and conditions are created for them to lead their traditional way of life.**

**Created, secured in legislation and applied are the mechanisms for the effective participation on all appropriate levels by the indigenous small populations and local communities in the resolution of issues relating to the use of and impact on biological resources, biodiversity conservation and consideration of traditional knowledge.**

To evaluate the extent to which this target is met, experts have put forth the following indicators:

- a) legislative acts and regulations have been adopted on the federal and regional levels which secure the mandatory nature and procedure of performing ethnological expertise and other mechanisms for taking into consideration traditional knowledge and practices for the purpose of biodiversity conservation and sustainable use in the planning and implementation of activities related to the utilization of and impact on biological resources in areas of traditional ISP occupancy and nature use;
- b) changes to legislative acts have been introduced which provide effective mechanisms for the creation, protection and functioning of traditional nature use areas on the federal and regional levels;
- c) regulations, methodical recommendations and instructions have been adopted for the utilization of the indigenous small populations' traditional knowledge and practices in ecological monitoring and biodiversity management;
- d) the number and area of the created traditional land use territories on the federal and regional levels;
- e) the number of created and effectively functioning advisory bodies (councils, committees, commissions) of representatives of the indigenous peoples of the North for developing recommendations based on traditional knowledge for management of biological resources constituting the foundation of traditional life support (resources of game animals, fish, sea mammals, wild-growing plants), for taking traditional knowledge into consideration when implementing projects, plans and programs in places of the indigenous small populations' occupancy;

f) the number of completed ethnological expertise projects and evaluations of impact on native environments, with inclusion of sections on traditional knowledge and taking it into account in the development and implementation of industrial development projects and projects for utilization and conservation of biological resources and biodiversity;

g) the number of implemented projects for documenting and utilizing traditional knowledge, for developing practices for traditional knowledge use in managing populations of game animals, of protected animal and plant species, of special protection nature areas based on the integration of traditional knowledge with scientific knowledge.

***1.5.2. Global target 20 – By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan 2011-2020 from all sources and in accordance with the consolidated and agreed process in the Strategy for Resource Mobilization should increase substantially from the current levels. This target will be subject to changes contingent to resources needs assessments to be developed and reported by Parties.***

The main provisions of the national target are presented in Section 17 of the National strategy and action plan for biodiversity conservation (NSAPBC).

## III. National action plan

### Section 12. Action plan for the implementation of the Strategy of biodiversity conservation of the Russian Federation

Title of measure	Responsible agencies	Time frame for implementation
<b>1. Objective (global strategic objective) A: Combating the main causes of biodiversity loss through inclusion of biodiversity topics in the activities of governments and the society</b>		
1.1 Ensuring the presence of ecological social advertising in the amount of 20% of all social advertising	Russia's Ministry of Natural Resources and the Environment (Minprirody of Russia), Russia's Federal Supervisory Natural Resources Management Service (Rosprirodnadzor)	The years 2015 - 2020
1.2 Provision of constant accessible information on the state and importance of biodiversity conservation, environmental protection and ways for the population to participate in these issues, in federal mass media and mass media of the federal entities of Russia	Minprirody of Russia, Russia's Ministry of Communications and Mass Media (Minkomsvyazy of Russia), Rosprirodnadzor, executive agencies of the federal entities of Russia	2015 - 2020
1.3 Holding of open and accessible events tied to biodiversity conservation and environmental protection (Earth Hour, Ecologist Day, Day of the Tiger, et al.)	Minprirody of Russia, Rosprirodnadzor, Russia's Federal Forestry Agency (Rosleskhoz), Russia's Federal Fisheries Agency (Rosrybolovstvo), executive agencies of the federal entities of Russia	2015 - 2020
1.4 Ensuring the social recognition of citizens who participate in events related to biodiversity conservation and environmental protection, advance and implement successful conservation initiatives	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz, Rosrybolovstvo, executive agencies of the federal entities of Russia	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
1.5 Creation of the system and development of principles for ecological rating of mass media which dedicate materials to topics related to biodiversity conservation and environmental protection	Minprirody of Russia, Minkomsvyazy of Russia	2015 - 2020
1.6 Development of ecological education activities and educational tourism	Minprirody of Russia	2015 - 2020
1.7 Development of an ecological volunteer movement based on schools and institutions of higher learning	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz	2015 - 2020
1.8 Conducting of competitions among businesses for the successful implementation of initiatives related to biodiversity conservation and environmental protection	Minprirody of Russia, Rosprirodnadzor	2015 - 2020
1.9 Creation of an official Web portal on biodiversity conservation and sustainable use for ensuring access to information on the state, conservation and sustainable use of biodiversity	Minprirody of Russia	2016
1.10 Development and implementation of a statistical data collection system for evaluating the population's awareness of and participation in biodiversity conservation	Minprirody of Russia, Minkomsvyazy of Russia, Rosprirodnadzor, Rosleskhoz, Rosrybolovstvo, executive agencies of the federal entities of Russia	2015
1.11 Development of methodological recommendations for evaluating ecosystem services. Performance of pilot evaluations of ecosystem services	Minprirody of Russia	2015 - 2017
1.12 Inclusion of indicators related to ecosystem services evaluation in government statistical reporting	Minprirody of Russia, Russia's Ministry of Economic Development (Mineconomraz- vitiya of Russia), Russia's Federal State Statistics Service (Rosstat)	2018
1.13 Performance of an evaluation of ecosystem services for all regions, creation of a system for monitoring ecosystem services	Minprirody of Russia, Mineconomrazvitiya of Russia, executive agencies of the federal entities of Russia	2019
1.14 Monitoring of the regional bodies' submission of statistical data in accordance with the methods of ecosystem services valuation	Mineconomrazvitiya of Russia, Rosstat	2018 - 2020

Title of measure	Responsible agencies	Time frame for implementation
1.15 Amendments to the list of indicators for evaluating the effectiveness of activities by executive agencies of the federal entities of Russia for the purpose of including indicators of ecosystem services' values dynamics	Mineconomrazvitiya of Russia	2019
1.16 Development of methodological recommendations for the inclusion of sections on the management of ecosystem services in regional development strategies	Mineconomrazvitiya of Russia, Minprirody of Russia	2018
1.17 Monitoring of the inclusion of sections on ecosystem services management in regional development strategies	Mineconomrazvitiya of Russia	2020
1.18 Inventory of state support mechanisms for those users of ecosystem services and biological resources whose activities lead to biodiversity loss and damage ecosystem services (by branch of the economy), and development of proposals for the elimination of ineffective and non-system incentives with consideration for ecosystem services and their value	Russia's Ministry of Finance (Minfin of Russia), Minprirody of Russia, Mineconomrazvitiya of Russia, Russia's Ministry of Energy (Minenergo of Russia), Russia's Ministry of Agriculture (Minselkhos of Russia)	2016
1.19 Development of methodical recommendations for evaluating the effectiveness of state support instruments for users of ecosystem services and biological resources, with consideration for alternative avenues of state support provision which create incentives for biodiversity conservation and sustainable use	Mineconomrazvitiya of Russia, Minprirody of Russia	2016
1.20 Development and implementation of a road map for the abolition of those state support mechanisms for users of ecosystem services and biological resources which lead to biodiversity loss and damage ecosystem services	Mineconomrazvitiya of Russia, Minfin of Russia, Minprirody of Russia	2017 - 2020
1.21 Analysis of the existing mechanisms for inter-budget transfers oriented toward biodiversity support and environmental protection in federal entities of Russia. Development of criteria for budgetary support of ecosystem services preservation and responsible use of biological resources	Minfin of Russia, Minprirody of Russia	2017

Title of measure	Responsible agencies	Time frame for implementation
1.22 Development and implementation of mechanisms for economic stimulation of ecosystem services conservation	Mineconomrazvitiya of Russia, Minfin of Russia, Minprirody of Russia	2015 - 2017
1.23 Perfection of ecological requirements/ parameters for the delivery of goods, execution of work orders, provision of services for state and municipal needs in view of the issues of biodiversity conservation and sustainable use	Minprirody of Russia, interested federal executive agencies	2015 - 2018
1.24 Creation of effective incentives for state corporations to implement policies of ecologically-responsible purchases of products produced in ecologically sustainable ways in view of the issues of biodiversity conservation and sustainable use	Minprirody of Russia, interested federal executive agencies	2015 - 2020
1.25 Development and implementation of the conception of non-financial reporting by companies which take into consideration the issues of biodiversity conservation and sustainable use	Minprirody of Russia, interested federal executive agencies	2015 - 2020
1.26 Creation of conditions for implementing responsible ecological financing programs which take into account the issues of biodiversity conservation and sustainable use based on the policies and practices of international financial institutions	Minprirody of Russia, interested federal executive agencies	2015 - 2020
1.27 Creation of conditions for implementing corporate policies and standards for biodiversity conservation and sustainable use in those branches of the economy which have a substantial negative impact on biodiversity	Minprirody of Russia, interested federal executive agencies	2015 - 2020
1.28 Amendments to legislative acts of the Russian Federation in order to secure the concepts of "biodiversity" and "ecosystem services" and create a legal base for the regulation of issues of biodiversity conservation and sustainable use and implementation of a system for putting monetary value on biodiversity and ecosystem services	Minprirody of Russia, interested federal executive agencies	2016
1.29 Creation of a national state-operated coordination center for problems of biodiversity conservation and sustainable use	Minprirody of Russia, The Russian Academy of Science (RAN)	2017



Title of measure	Responsible agencies	Time frame for implementation
1.30 Development and realization of a program for the monitoring of biodiversity and the step-by-step scheme of its implementation	Minprirody of Russia, RAN, interested federal executive agencies	2015 - 2020
1.31 Perfection of the system of objective forecast indicators for determining the effectiveness of measures implementation in the area of biodiversity conservation and sustainable use	Minprirody of Russia, RAN	2015 - 2017
1.32 Development and implementation of methodical recommendations for the development of the component dealing with biodiversity conservation and sustainable use in the Strategy of Socio-Economic Development of the Federal Entities of Russia	Minprirody of Russia, Mineconomrazvitiya of Russia	2015 - 2020
<b>2. Objective (global strategic objective) B: Reduction of direct pressures on biodiversity and stimulation of sustainable resource use.</b>		
2.1 Perfecting of the state forest inventory system	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.2 Measures for the cadastral registration of forests	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.3 Measures for decreasing the logging areas in vulnerable categories of protective forests (forests near the tundra, forests in the steppe and semi-desert zones)	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.4 Provision for special measures for the reforestation and afforestation in non-forest areas (including lands designated for agricultural use)	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.5 Perfecting of the system for the anticipation, detection and suppression of wildfires, as well as liquidation of their consequences	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.6 Regular inventory of intact forest areas	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2017 - 2020

Title of measure	Responsible agencies	Time frame for implementation
2.7 Setting of legal policies for protective forests which exclude industrial logging in these forests and their lease for logging purposes	Minprirody of Russia, Rosleskhoz	2017
2.8 Creating of conditions which give forest users incentives for voluntary certification of forest management in accordance with national and international standards	Minprirody of Russia, Rosleskhoz	2016 - 2020
2.9 Development and approval of the legal basis for forming the National Forest Heritage of the Russian Federation	Minprirody of Russia, Rosleskhoz, interested federal executive agencies	2015
2.10 Classification of forests with the National Forest Heritage of the Russian Federation	Minprirody of Russia, Rosleskhoz	2016 - 2020
2.11 Inclusion of priority value areas (including intact forest areas) from operational forests in the National Forest Heritage of the Russian Federation	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2016 - 2020
2.12 Development and implementation of proposals for perfecting the legal and regulatory framework in the sphere of tightening the requirements for biodiversity conservation in forest management, agriculture and infrastructural construction in natural habitats	Minprirody of Russia, interested federal executive agencies	2015
2.13 Taking inventory of steppe ecosystems (including the other ecosystems tied to them)	Minprirody of Russia, Minselkhoz of Russia, executive agencies of the federal entities of Russia	2016
2.14 Monitoring the state of the most valuable steppe ecosystems	Minprirody of Russia, executive agencies of the federal entities of Russia	2016 - 2020
2.15 Organization of PAs in all priority steppe territories	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
2.16 Development and application of methodical recommendations for the conservation of steppe ecosystems in PAs in their protective zones and in the cooperation areas of the UNESCO biosphere reserves	Minprirody of Russia, executive agencies of the federal entities of Russia	2017 - 2020
2.17 Harmonization of land and agrarian legislation with the tasks of biodiversity conservation	Minprirody of Russia, interested federal executive agencies	2018
2.18 Development and promotion of the voluntary ecological responsibility system for agro-industrial and pharmaceutical companies which use parcels of agricultural lands and farmland	Minprirody of Russia, Minselkhoz of Russia	2016 - 2020

Title of measure	Responsible agencies	Time frame for implementation
2.19 Development and implementation of ecological labeling systems for agricultural products which take into account not only the sanitary-hygienic characteristics, but also biodiversity preservation in the making of the product	Minprirody of Russia Minselkhoz of Russia	2020
2.20 Annual determination of the scientifically justified volume of the maximum allowable catch of commercial species of aquatic bioresources in the Russian Federation based on the data of state monitoring of aquatic bioresources	Minselkhoz of Russia, Rosrybolovstvo, Minprirody of Russia, Rosprirodnadzor	2015 - 2020
2.21 Development of multi-species fisheries and enabling of the use of the allowed catch of aquatic bioresources	Minselkhoz of Russia, Rosrybolovstvo, Minprirody of Russia	2015 - 2020
2.22 Implementation of the list of measures approved by the national action plan for the prevention, containment and liquidation of illegal, unreported and unregulated fishing	Minselkhoz of Russia, Rosrybolovstvo, interested federal executive agencies, associations and unions of fisheries organizations of the Russian Federation	2015 - 2020
2.23 Development and approval of the industry methodological guide for evaluating the state of aquatic bioresource' reserves when doing resource studies and state monitoring of aquatic bioresources (application of the methods for evaluating the state of the stock and calculating the feasible catch amounts)	Rosrybolovstvo	2015 - 2016
2.24 Development of the methodological guide for evaluating the catch of associated species of aquatic bioresources or species dependent on the aquatic body, and for evaluating the discard volumes of specialized fishing entities (by the main aquatic bioresource species and by kind of fishery)	Rosrybolovstvo	2015 - 2016
2.25 Analysis of conformity of Russian legislation in the area of fisheries and aquatic bioresources conservation to the norms of international law in the area of sustainable fisheries and the FAO Code of Conduct for Responsible Fisheries	Minselkhoz of Russia, Rosrybolovstvo, interested federal executive agencies	2015 - 2016
2.26 Analysis and evaluation of the importance of fisheries as a kind of economic activity in sustaining socio-economic stability in the maritime regions of the Russian Federation	Mineconomrazvitiya of Russia, Minselkhoz of Russia, Rosrybolovstvo, interested federal executive agencies	2015 - 2016

Title of measure	Responsible agencies	Time frame for implementation
2.27 Development and approval of the regulatory legal acts for the purpose of implementing Federal law № 148-ФЗ of 2 July 2013 “On aquaculture (fish farming) and on amendments to certain legislative acts of the Russian Federation”	Minselkhoz of Russia	2015 - 2016
2.28 Development and implementation of methodological recommendations for reducing the impact of the technologies used in the aquaculture area in fish farms on the environment and biodiversity	Minselkhoz of Russia, Minprirody of Russia, Rosrybolovstvo	2015 - 2019
2.29 Development and implementation of regulatory-methodical documents which provide for the release of the young of valuable bioresource species in bodies of water which are of importance to fisheries (in accordance with the ecosystem carrying capacity)	Minselkhoz of Russia, Minprirody of Russia, Rosrybolovstvo	2015 - 2020
2.30 Development and implementation of regulatory norms and other requirements regulating fish farm location in water bodies so as to ensure zero damage to biodiversity	Minselkhoz of Russia, Minprirody of Russia, Rosrybolovstvo	2015 - 2016
2.31 Ensuring that up-to-date versions of forest plans and forestry regulations can be accessed by the public on the websites of forest managements agencies in all federal entities of Russia	Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.32 Inclusion in the standard forest plan form of a section on PAs on forest fund lands and on the PAs being designed	Minprirody of Russia, Rosleskhoz	2016
2.33 Inclusion of information on biodiversity species and measures for their conservation in forest planning and design documents	Minprirody of Russia, Rosleskhoz executive agencies of the federal entities of Russia	2015
2.34 Setting of criteria and regulations for defining the categories of specially protective forest parcels for the purpose of biodiversity and habitats conservation	Minprirody of Russia, Rosleskhoz	2016
2.35 Amendments to the forest legislation which enable the creation of new categories of protective forest areas for the purpose of biodiversity and habitats conservation	Minprirody of Russia, Rosleskhoz, interested federal executive agencies	2015 - 2016
2.36 Harmonization of forest regulation with the requirements of voluntary forest certification systems, including the introduction of proposals for amending normative legal acts directed at ensuring sustainable forest management to the Government of the Russian Federation	Minprirody of Russia, Rosleskhoz, interested federal executive agencies	2016 - 2018

Title of measure	Responsible agencies	Time frame for implementation
2.37 Introduction of a state policy for responsible timber purchasing	Minprirody of Russia, Rosleskhoz, interested federal executive agencies	2015 - 2020
2.38 Perfection of criteria for the classification of logging as clear-cuts or selective, and of territories which are in need of thinning cuts and health-and-sanitary measures	Minprirody of Russia, Rosleskhoz	2015 - 2017
2.39 Introduction of standard routing for the development of the cutting area, including a section on biodiversity conservation measures, as an appendix to Logging Rules	Minprirody of Russia, Rosleskhoz	2016
2.40 Perfection of the system for the detection and volume evaluation of illegal logging for the purpose of forming a single system recognized both by state agencies and independent experts	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2017
2.41 Intensification of measures aimed at combating illegal logging, including the organization of effective on-the-ground forest protection and increase of forest inspectors' numbers	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.42 Strengthening of control over compliance with forest management and timber trade regulations for the purpose of combating illegal logging	Minprirody of Russia, Rosleskhoz, Russia's Ministry of Internal Affairs (MVD of Russia), Russia's Federal Tax Service (FTS of Russia), executive agencies of the federal entities of Russia	2015 - 2020
2.43 Development of regulations for forest management and protective forest maintenance which more fully take into account their purpose and role in biodiversity conservation	Minprirody of Russia, Rosleskhoz	Minprirody of Russia, Rosleskhoz
2.44 Improvement of reliability of data on areas covered by fires and of statistical accounting for forest and non-forest areas covered by fires	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.45 Reduction of anthropogenic wildfire areas through the provision of effective fire monitoring using ground based remote sensing technologies and effective wildfire fighting, including the development of preventive measures	Minprirody of Russia, Rosleskhoz, Russia's Ministry of Emergency Situations (MES of Russia), executive agencies of the federal entities of Russia	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
2.46 Development and implementation of proposals aimed at the expanding of zones of ground and air wildfire monitoring	Minprirody of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2019
2.47 Amendments to the laws of the Russian Federation directed at the conservation of biodiversity on farmland	Minprirody of Russia, Minselkhoz of Russia, interested federal executive agencies	2016 - 2018
2.48 Inclusion of biodiversity conservation measures in the criteria used for the selection of projects for state investment in agriculture	Minprirody of Russia, Minselkhoz of Russia	2017
2.49 Amendments to the laws of the Russian Federation which would secure the concept of "high nature value farmland areas" (HNVFA) and inventory of HNVFAs in order to provide for their conservation through measures such as the organization of PAs	Minprirody of Russia, Minselkhoz of Russia, executive agencies of the federal entities of Russia	2016 - 2020
2.50 Improvement of reliability of data on areas covered by landscape fires outside the forest fund and of statistical accounting for non-forest areas affected by fires	Minselkhoz of Russia, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2020
2.51 Decrease of landscape fire areas outside the forest fund through effective fire-fighting, including the development of preventive measures	Minprirody of Russia, MES of Russia, executive agencies of the federal entities of Russia	2015 - 2020
2.52 Development and approval of regulatory legal acts for the purpose of implementing Federal law № 219-ФЗ of July 21, 2014 "On amendments to the Federal law "On environmental protection" and to certain legislative acts of the Russian Federation" and other documents for the step-by-step implementation of the indicated Federal law's norms.	Minprirody of Russia, interested federal executive agencies	2015 - 2018
2.53 Development and approval of regulatory legal acts for the purpose of implementing Federal law № 458-ФЗ of December 29, 2014 "On amendments to the Federal law "On industrial and consumer waste", to certain legislative acts of the Russian Federation, and on repeal of certain legislative acts (provisions of legislative acts) of the Russian Federation"	Minprirody of Russia, Mineconomrazvitiya of Russia, Minfin of Russia, Russia's Ministry of Industry and Trade (Minpromtorg of Russia), Russia's Ministry of Construction, Housing and Utilities (Minstroj of Russia), Minkomsvyazi of Russia	2015

Title of measure	Responsible agencies	Time frame for implementation
2.54 Development of the Federal Law “On ecological audits, ecological audit activity and amendments to certain legislative acts of the Russian Federation”	Minprirody of Russia, interested federal executive agencies	2015
2.55 Implementation of the action plan for making decisions which would ensure that the Russian Federation join the Convention on Access to Information, Public Participation in Decision-making and Access to Justice in Environmental Matters (the Aarhus Convention) (Minprirody of Russia order № 1-p of 14 January 2014)	Minprirody of Russia, interested federal executive agencies	2015
2.56 Amendments to the laws of the Russian Federation in the part of regulating the issues of liquidation of past ecological damage	Minprirody of Russia, interested federal executive agencies	2016
2.57 Development and implementation of proposals for the perfection of the regulatory legal framework in the sphere of land fertility increase through the decrease of biogenic matter losses and effective use of fertilizers and agrochemicals	Minselkhov of Russia, interested federal executive agencies	2015 - 2020
2.58 Development and implementation of proposals for the perfection of the laws of the Russian Federation with the goal of including statutes aimed at the prevention of the penetration and spread of invasive foreign species in the Russian Federation as well as measures for their regulation, extermination and control	Minprirody of Russia, Minselkhov of Russia, Rosleskhov, interested federal executive agencies	2015 - 2020
2.59 Creation of a National Center for foreign species (NCFS) for providing the coordination of efforts to study, monitor, forecast, prevent and control invasive foreign species in the Russian Federation’s territory	Minprirody of Russia, Minselkhov of Russia, Rosleskhov, RAN	2016
2.60 Creation of a national problem-oriented Internet portal bringing together all information concerning the problems of invasive species so as to provide access to this information to state bodies, interested organizations and the public	Minprirody of Russia, Minselkhov of Russia, Rosleskhov, RAN	2017
2.61 Development and implementation of a purpose-oriented scientific program for the study, monitoring, risk assessments and control of invasive foreign species	Russia’s Ministry of Education and Science (Minobrnauki of Russia), Minprirody of Russia, Federal Agency of Scientific Organizations (FANO of Russia)	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
2.62 Implementation of measures for the regulation and eradication of priority invasive foreign species and measures for the regulation of the mechanisms by which they are introduced	Minprirody of Russia, Minselkhoz of Russia, interested federal executive agencies, executive agencies of the federal entities of Russia	2015 - 2020
2.63 Development and introduction of special training courses, tutorials, publication of popular books, brochures, posters and implementation of other educational measures dealing with the problem of invasive foreign species introduction as well as their negative impact on biodiversity	Minobrnauki of Russia), Minprirody of Russia, FANO of Russia	2015 - 2020
2.64 Development of an ecosystem classification system for the purpose of singling out ecosystems vulnerable to climate change	Minprirody of Russia, Rosprirodnadzor, Federal Service for Hydrometeorology and Environment Monitoring (Rosgidromet)	2015
2.65 Development of the list of vulnerable ecosystems (Arctic, sub-Arctic, Far Eastern, mountain and steppe regions) which, when subjected to anthropogenic impact in combination with unfavorable extreme weather conditions due to climate change, will experience serious damages to their biodiversity, including those that may be catastrophic (List 1). Localization of their location on maps to the scale of 1:100 000	Minprirody of Russia, Rosprirodnadzor, Rosgidromet	2016
2.66 Development of the list of vulnerable ecosystems (Arctic, sub-Arctic, Far Eastern, mountain and steppe regions) which, when subjected to anthropogenic impact in combination with unfavorable progressively developing consequences of climate change, will experience serious damages to their biodiversity, including those that may be catastrophic (List 2). Localization of their location on maps to the scale of 1:500 000	Minprirody of Russia, Rosprirodnadzor, Rosgidromet	2017
2.67 Development of an adaptation-measures plan for the reduction of anthropogenic pressures on the identified ecosystems which are vulnerable to climate change	Minprirody of Russia, Rosprirodnadzor	2018
2.68 Development and coordination of the organizational-legal design of the action system for the reduction of anthropogenic pressures on the identified ecosystems that are vulnerable to climate change	Minprirody of Russia, Rosprirodnadzor	2019 - 2020



Title of measure	Responsible agencies	Time frame for implementation
2.69 Implementation of pilot projects aimed at the reduction of anthropogenic pressures on the identified ecosystems which are vulnerable to climate change, and at the corresponding adaptation measures	Minprirody of Russia, Rosprirodnadzor	2017 - 2020
2.70 Preparation of sections in the new State program of the Russian Federation "On Environmental Protection" for the period after 2020 which contain measures for: the reduction of anthropogenic pressure to a permissible level on no less than 80% of the area of List 1 and List 2 ecosystems; assessment of the permissibility of anthropogenic stress on ecosystems in other territories of Russia as well as for the creation of a continuous monitoring system	Minprirody of Russia, Rosprirodnadzor, Minenergo of Russia, Mineconomrazvitiya of Russia, Minselkhoz of Russia, Ministry for Development of Russian Far East (Minvostokrazvitiya of Russia), Russia's Ministry of Crimean Affairs, Russia's Ministry of North Caucasus Affairs	2017 - 2020
<b>3. Objective (global strategic objective) C: Improvement of the status of biodiversity through protection of ecosystems, species and genetic diversity</b>		
3.1 Development of a representative geographic network of special protection nature areas (PAs) of different levels and categories	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
3.2. Optimization of Russian legislation in the sphere of: - regulation of terrestrial land management in PAs; - improvement of the effectiveness of the management and functioning of PAs of regional and local importance; - creation of a legal framework for development of "private" (non-state) PAs; - voluntary establishment by users on parcels granted to them of a special resource-use policy for the purpose of biodiversity conservation	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2016
3.3. Organization of inventory of fauna and flora entities in PAs of different levels, including the species listed in the Red List of the Russian Federation and the Red Lists of Federal entities of Russia	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
3.4 Ensuring the creation of the Single register of rare and unique nature entities in PAs of different statuses	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
3.5 Provision of the employees of PAs of different levels with modern material and technical equipment as well as gear for the effective performance of conservation activities, monitoring and scientific research, organization of ecological education and ecotourism	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
3.6 Development of the technique for performing and organizing the effectiveness evaluation of PA management and the conservation effectiveness evaluation of PAs of federal and regional importance	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2016
3.7 Organization of the system for training and re-training of personnel for PAs of different levels	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
3.8 Creation of a system of corridors connecting PAs of different levels, represented by protected areas with different policies of regulated nature use	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2010
3.9 Provision for the presence of protection zones around the territories of all nature reserves and national parks	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
3.10 Creation of the Single Register of the system of protection land and water areas with a regulated resource use policy which play a key role in ecosystem services provision and biodiversity conservation	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
3.11 Provision for the creation of protected nature areas and protected areas in regions which are of most importance for the maintenance of ecological balance, ecosystem services and biodiversity conservation	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
<p>3.12 Perfection of the regulatory and legal base in the area of conservation of rare and endangered species of animals, plants and fungi, including:</p> <ul style="list-style-type: none"> <li>- counteracting illegal production, trade, import into the Russian Federation and export from the Russian Federation of such species;</li> <li>- inclusion in the state ecological expertise list of design documentation for large construction projects of production and non-production purpose, infrastructural projects in key habitats of rare and endangered species of animals, plants and fungi;</li> <li>- explanation of the concepts “key habitats”, “critical habitats” of rare and endangered species of animals, plants and fungi, establishment of the mechanisms for their singling out and conservation;</li> <li>- harmonization of conservation legislation with legislation in the natural resources sphere</li> </ul>	Minprirody of Russia, interested federal executive agencies	2015 - 2017
<p>3.13 Development and presentation, following the established procedure, of the draft Federal law “On the plant world”</p>	Minprirody of Russia, interested federal executive agencies	2016
<p>3.14 Increase in the number of people participating in fauna protection through:</p> <ul style="list-style-type: none"> <li>- empowerment to protect all fauna objects for full-time employees of legal persons and for individual entrepreneurs who entered into commercial hunting agreements or have the right of long-term fauna use;</li> <li>- creation of the institution of public inspectors tasked with ensuring fauna protection</li> </ul>	Minprirody of Russia, Mineconomrazvitiya of Russia, Minfin of Russia, MVD of Russia	2015 - 2016
<p>3.15 Provision for cooperation and information exchange between the state agencies authorized to perform control and supervision for counteracting illegal production, trade, import into the Russian Federation and export from the Russian Federation of rare and endangered animal and plant species, game resources, their parts or derivatives. To be accomplished by entering into appropriate cooperation agreements</p>	Rosprirodnadzor, FTS of Russia, MVD of Russia, Federal Security Service of Russia (Border Service), Federal Service for Supervision of Consumer Rights Protection and Human Well-Being (Rospotrebnadzor), Federal Service for Veterinary and Phytosanitary Surveillance (Rosselkhozadzor), executive agencies of the federal entities of Russia	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
3.16 Perfection of the system for funding conservation activities concerning rare and endangered species of animals, plants and fungi. The latter includes the increase of subventions to federal entities of Russia to well execute the powers transferred to them in the area of fauna protection and use, as well as ecological fund creation	Minprirody of Russia, Mineconomrazvitiya of Russia, Minfin of Russia, RAN	2015 - 2017
3.17 Increase in the representativeness of the PA system through the creation of new PAs and expansion of existing PAs of different levels and categories for the purpose of conserving key habitats of rare and endangered species of animals, plants and fungi	Minprirody of Russia, Rosprirodnadzor , executive agencies of the federal entities of Russia	2015 - 2020
3.18 Creation of a spatial-functional network of protected areas with different resource use policies which provide for the conservation of key habitats of rare and endangered species of animals, plants and fungi (including migration routes, breeding grounds, for raising young and for grazing)	Minprirody of Russia, Rosprirodnadzor , Rosleskhoz, Rosrybolovstvo, executive agencies of the federal entities of Russia	2015 - 2020
3.19 Implementation of conservation measures and introduction of technologies aimed at the prevention of the death of fauna species during the implementation of production processes, in the operation of transportation highways, pipelines, communication and power transmission lines, and during the large-scale construction of production and non-production facilities	Minprirody of Russia, Mineconomrazvitiya of Russia, Minenergo of Russia, Mintrans of Russia, Rosprirodnadzor, Federal Road Agency (Rosavtodor), executive agencies of the federal entities of Russia	2015 - 2020
3.20 Implementation of measures for the reclamation (re-cultivation) of lands removed from agricultural use which have ecological value as possible habitats for rare and endangered species of animals, plants and fungi	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz, Rosselkhozadzor, executive agencies of the federal entities of Russia	2015 - 2020
3.21 Provision for measures for the conservation and recovery of the Amur tiger, the Persian and Amur leopards, the snow leopard, the polar bear, the European bison, the Saiga antelope as well as other rare and endangered animal species within the framework of species-specific strategies of conservation	Executive agencies of the federal entities of Russia, Minprirody of Russia, Rosprirodnadzor, Rosleskhoz	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
3.22 Development and implementation of the set of biotechnical measures which ensure the conservation and recovery of rare and endangered species of animals, plants and fungi	Executive agencies of the federal entities of Russia	2015 - 2020
3.23 Incentivizing legal entities to engage in activities whose purpose is to ensure the reproduction of rare and endangered animal species for reintroduction purposes	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz, Mineconomrazvitiya of Russia, executive agencies of the federal entities of Russia	2015 - 2016
3.24 Ensuring the expansion and strengthening of the network of nurseries, fish hatcheries, botanical gardens and arboretums under different types of ownership for the purpose of the conservation of rare and endangered species of animals, plants and fungi, including animals which have been rescued, detained and confiscated. The latter also includes their inclusion in programs aimed at the reintroduction and resettlement of certain species.	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz, Rosrybolovstvo, executive agencies of the federal entities of Russia	2015 - 2020
3.25 Development of technologies for the conservation of rare and endangered species of animals, plants and fungi in artificially-created environments	Minprirody of Russia, Rosprirodnadzor, executive agencies of the federal entities of Russia	2015 - 2020
3.26 Implementation of regular accounting for, and monitoring of, rare and endangered animal species with coordinated participation of all interested organizations and scientific institutions	Minprirody of Russia, Rosprirodnadzor, RAN, executive agencies of the federal entities of Russia	2015 - 2020
3.27 Development and approval of methodical recommendations for creating an inventory and monitoring of the status of key habitats of rare and endangered species of animals, plants and fungi	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2016
3.28 Development of the scientific and methodical bases for the system of data collection, processing and analysis; creation of a united data base and an information-analytical system on rare and endangered species of animals, plants and fungi and their habitats	Minprirody of Russia, Rosprirodnadzor, Rosleskhoz, executive agencies of the federal entities of Russia	2015 - 2016
3.29 Development and implementation of a single methodological base for maintaining the Red List of the Russian Federation and the Red Lists of the federal entities of Russia	Minprirody of Russia, Rosprirodnadzor, executive agencies of the federal entities of Russia	2015 - 2020

Title of measure	Responsible agencies	Time frame for implementation
3.30 Ensuring regular updating of the lists of species included in the Red List of the Russian Federation and the Red Lists of the federal entities of Russia; preparation and publication of the Red List of the Russian Federation and the Red Lists of the federal entities of Russia using a single methodological base	Minprirody of Russia, Rosprirodnadzor, executive agencies of the federal entities of Russia	2015 - 2020
3.31 Ensuring that the Russian Federation fulfills its obligations arising from international conventions and agreements, and also from Russia's membership in international organizations and programs for the conservation of rare and endangered species of animals, plants and fungi	Minprirody of Russia, MID of Russia, Rosprirodnadzor, Rosleskhoz	2015 - 2020
3.32 Intensification of Russia's participation, on a bilateral and multilateral basis, in international cooperation in the area of conservation of rare and endangered species of animals, plants and fungi	Minprirody of Russia, MID of Russia, Minfin of Russia, Interested federal executive agencies	2015 - 2020
<b>4. Objective (global strategic objective) D: Increase in the volume of benefits for all people which are provided by biodiversity and ecosystem services.</b>		
4.1 Preparation of the national report on the status of Russia's ecosystems and ecosystem services in which the ecosystems will be determined which are of priority importance for maintaining ecosystem services, and high-priority measures for their protection are proposed	Minprirody of Russia	2016
4.2 Amendments to the forest legislation which ensure that protective forest areas are not reduced, including a provision for the compensation of areas removed in cases when parcels of protective forests are transferred to production forests	Minprirody of Russia, Rosleskhoz, interested federal executive agencies	2015 - 2017
4.3 Amendments to the forest legislation which ensure favorable conditions for those who lease the forest fund for the purpose of harvesting food and medicinal forest products as well as for other kinds of forest use which do not involve logging	Minprirody of Russia, Rosleskhoz, interested federal executive agencies	2015 - 2017
4.4 Approval of the updated regulations for the established Ramsar sites	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2018
4.5 Creation of the system of accounting for areas which are of key importance as animal and plant habitats (key ornithological areas, key botanical areas), and maintenance of the system	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
4.6 Enhancement of the policies of woodland belts protecting spawning grounds. The latter includes the reduction of timber-harvest volumes	Rosleskhoz, Rosrybolovstvo, executive agencies of the federal entities of Russia	2015 - 2018

Title of measure	Responsible agencies	Time frame for implementation
4.7 Flooding of previously drained peat lands in areas where their ignition is highly likely	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
4.8 Development of the of methodology for the creation of an inventory of ecosystems and valuation of ecosystem services	Minprirody of Russia	2016
4.9 Inventory and valuation of ecosystem services in the regions of the Russian Federation	Minprirody of Russia, executive agencies of the federal entities of Russia	2016 - 2020
4.10 Creation of mechanisms for the conservation of the resilience of ecosystem services provision by different ecosystems	Minprirody of Russia, executive agencies of the federal entities of Russia	2016 - 2020
4.11 Setup of PAs for the conservation of ecosystems which perform important ecosystem services	Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2020
4.12 Development and implementation of the mechanism for the creation of compensation PAs (the land user whose activities resulted in the loss of valuable natural areas pays for the work of creating and maintaining a PA; to compensate for the damage caused, an area similar in its characteristics is taken under protection in another geographical location)	Minprirody of Russia, interested federal executive agencies, executive agencies of the federal entities of Russia	2015 - 2020
4.13 Development and perfection of the regulatory-reference information on the status of Russia's forests, including the carbon budget parameters, and enhancement of its openness	Minprirody of Russia, Rosleskhoz	2015 - 2020
4.14 Development and submission for review to the Government of the Russian Federation of the draft plan for the provision of the making of decisions which ensure that Russia join the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	Minprirody of Russia, interested federal executive agencies	2015
4.15 Step-by-step implementation of legal, organizational-technical and personnel measures which ensure that Russia join the Nagoya Protocol on Access to Genetic Resources and the Fair and Equitable Sharing of Benefits Arising from their Utilization	Interested federal executive agencies	2016 - 2020

Title of measure	Responsible agencies	Time frame for implementation
<b>5. Objective (global strategic objective) E: Increase of implementation effectiveness through social planning, knowledge management and capacity creation.</b>		
5.1 Amendments to the legislation of the Russian Federation regarding taking into account and integrating the traditional knowledge of the indigenous peoples of the Russian Federation which matters for biodiversity conservation and sustainable use in the implementation of planning and activities associated with the use and impact on biological resources in the areas of traditional settlement and land use of the indigenous small populations of the North, Siberia and the Far East of the Russian Federation: <ul style="list-style-type: none"> <li>- regarding the definitions of “traditional knowledge”, “sacred places of the indigenous small populations”;</li> <li>- statutes setting the mandatory nature and procedure for performing ethnological expertise and other mechanisms for taking stock of traditional knowledge;</li> <li>- amendments to the Federal law “On traditional nature use areas of the indigenous small populations of the North, Siberia and the Far East of the Russian Federation” for the purpose of perfecting the legal status of the traditional nature use areas, the mechanism of their creation and functioning</li> </ul>	Russia’s Ministry of Culture (Minkultury of Russia), Minprirody of Russia, interested federal executive agencies	2015 - 2017
5.2 Development and adoption of regulations, methodological recommendations, instructions for using the traditional knowledge and practices of the indigenous small populations in ecological monitoring and biodiversity management	Minprirody of Russia, Minkultury of Russia, interested federal executive agencies	2015 - 2017
5.3. Creation of traditional nature use areas at the federal and regional levels	Minkultury of Russia, Minprirody of Russia, executive agencies of the federal entities of Russia, associations of the indigenous small populations	2015 - 2020
5.4 Creation of advisory bodies (councils, committees, commissions) of indigenous small populations’ representatives for developing recommendations based on traditional knowledge for: the management of biological resources which form the base of traditional livelihood (resources of game animals, commercial fish, sea mammals, wild plants); for taking traditional knowledge into account in the implementation of projects, plans and programs in the indigenous small populations’ settlement areas	Minkultury of Russia, Minprirody of Russia, executive agencies of the federal entities of Russia	2015 - 2017



Title of measure	Responsible agencies	Time frame for implementation
5.5 Performance of expertise and assessments of impacts on native environments, with inclusion of sections on traditional knowledge and taking it into account, in the development and implementation of industrial development projects, projects for the utilization and conservation of biological resources and biodiversity, creation and functioning of traditional nature use areas	Minkultury of Russia, Minprirody of Russia, interested federal executive agencies , executive agencies of the federal entities of Russia, corporations active in indigenous small populations' settlement areas	2015 - 2020
5.6 Development and implementation of demonstration projects for documenting and using traditional knowledge, for developing practices of traditional knowledge use in management of the populations of game animals, protected animal and plant species, special protection nature areas based on integration of traditional knowledge with scientific knowledge	Minkultury of Russia, Minprirody of Russia, executive agencies of the federal entities of Russia, associations of indigenous small populations	2015 - 2017
5.7 Dissemination of information on the best practices of cooperation between state agencies, the public, the business community and the indigenous small populations in the planning and implementation of activities related to the utilization of and impact on biological resources in the indigenous small populations' traditional settlement and nature use areas, taking their traditional knowledge into account	Minkultury of Russia, Minprirody of Russia, executive agencies of the federal entities of Russia, associations of indigenous small populations	2015 - 2020
5.8 Inclusion of the section on indigenous small populations' traditional knowledge in the professional training curriculum for training specialists whose activities may affect the indigenous small populations' rights and lawful interests	Minobrnauki of Russia, Minkultury of Russia	2018

## Section 13. Implementation of NSAPBC on the regional level

Russia's vast territory, high diversity of natural and socio-economic conditions, great length of her land and sea borders, and the state's federal structure determine the need for active the development of regional policies in the sphere of biodiversity conservation and sustainable use when preparing and implementing NSAPBC.

**In connection with the substantial diversity of natural and socio-economic conditions in the federal entities of Russia, approaches were determined in the National Strategy of Biodiversity Conservation in Russia (2001) for the development of regional biodiversity conservation strategies and action plans. As well, the main stages of this work were determined.**

In a number of federal entities of Russia attempts were made to develop regional biodiversity conservation strategies but they did not spread and did not have a deep systemic impact on regional policy implementation.

Substantial changes which took place since that period in the sphere of creating a state planning system in Russia and the development, on a global level, of new tasks in the area of biodiversity conservation and sustainable use. Despite that fact, tasks aimed at creating regional state policy in this area on the level of federal entities of Russia and making corrections on its basis to regional state programs in the area of conservation and natural resource use, remain relevant.

This is why there exists a legal and factual need to apply uniform approaches to biodiversity conservation and sustainable use in every federal entity of Russia as well as the need for obligatory planning of this activity while taking into account the prospects of the country's development. The revised NSAPBC must constitute this base for the federal entities of Russia.

At present, the planning basis for the development of the federal entities of Russia is formed, together with the Strategies of socio-economic development of federal districts and the plans for their implementation, by the long-term (no less than 20 years) Strategies of socio-economic development of the entities of the Russian Federation, by medium-term programs of socio-economic development of the entities of the Russian Federation which they adopt, and also by the implemented regional state programs for the development of certain industries. As of today Strategies of socio-economic development have been adopted in 75 subjects of the Russian Federation.

In this regard, the regional strategies and action plans in the area of biodiversity conservation and sustainable resource use which are being developed based on the revised NSAPBC must fit into the accepted modern format of strategic planning.

For the purpose of ensuring the design of multifaceted socio-economic development of the entities of the Russian Federation, Russia's Ministry of Regional Development issued order №14 on February 27, 2007 "On the approval of requirements of a Strategy of socio-economic development of an entity of the Russian Federation". This document states that the strategy of socio-economic development of an entity of the Russian Federation is a system of public administrative measures relying on the long-term priorities, goals and objectives of state authorities. Biodiversity is not identified as an independent element of these strategies, but it is mentioned that the strategies must take into account the territory's natural resource capacity.

In view of the above, it is advisable to develop a separate component in the regional development strategy to deal with biodiversity conservation and sustainable use. A comprehensive review of this component in the forecast-analytical stage and its results will make it possible to include biodiversity topics on a systemic basis in standard models of regional development strategies and corresponding socio-economic development programs as additions to the content of their main sections. The implementation of this approach requires including in the NSAPBC action plan the preparation of Methodological Recommendations for the development of the component related to biodiversity conservation and sustainable use for Strategies of socio-economic development of subjects of the Russian Federation.

In the preparation of the sections of the recommendations dealing with biodiversity conservation and sustainable use, it is possible to use the approaches and stages of regional strategies development stated in the National Strategy of Biodiversity Conservation in Russia of 2001, and add the stage of determining on the regional level the development of national targets and target forecast indicators of the revised NSAPBC.

The indicated approach is already being partially implemented in certain development strategies of the federal districts and their component federal entities of Russia. It is, however, mainly concentrated, as a rule, on the creation of the regional system of protected areas.

The second direction of action on the regional level in the area of biodiversity conservation and sustainable use is the utilization of spatial planning tools arising out of the implementation of the rules of the Urban-Planning Code of the Russian

Federation and the sector-specific legislation of the Russian Federation (primarily legislation dealing with forests and hunting). The tools to be singled out are: the development and approval of the forest plan of the federal entities of Russia; schemes of location, use and protection of hunting grounds in the territories of federal entities; spatial planning documents, including zones with special terms of land use (water-protective, sanitary-protective, etc.); land-use policies; policies for the development and location of protected areas. These policies must be coordinated with each other. The main spatial planning document for a federal entity of Russia is the Policies of Spatial Planning of the Federal Entities of Russia. At present, such policies have been adopted in 79 entities of the Russian Federation. The spatial planning tools provided by the existing legislation of the Russian Federation can present an effective sphere for the introduction of spatial measures of biodiversity conservation and sustainable use as well as the creation of a land-use system that is optimal for biodiversity conservation.

**Thus, considering the substantial diversity of natural and socio-economic conditions in the federal entities of Russia, the effective implementation of the revised NSAPBC is only possible if corresponding regional policies are actively developed and implemented. To that end, issues of biodiversity conservation and sustainable use as well as corresponding NSAPBC national targets, ought to be included in strategies of socio-economic development of entities of the Russian Federation, the medium-term programs of socio-economic development of the entities of the Russian Federation as well as the implemented regional state programs of certain industry development and the spatial planning tools operating at the entity level should be used to introduce spatial measures in this field.**

## **Section 14. Inter-agency cooperation – taking into account and including biodiversity issues in development plans of other sectors of the economy**

The attainment of biodiversity conservation and sustainable use targets and objectives affects not only the conservation area but, to a no lesser degree, all branches of the economy which are related to biological nature use. It also affects those branches of the economy which in their traditional mode of development can increase threats to biodiversity.

The Russian Federation ratified the Convention on Biological Diversity through decree № 669 of the Government of the Russian Federation on July 1, 1995 “On measures for compliance with the Convention on Biological Diversity”. After that, the organization of the fulfilment of the Russia’s obligations under the Convention was made the responsibility of the former Ministry of Environmental Protection and Natural Resources of the Russian Federation, currently called the Ministry of Natural Resources and the Environment of the Russian Federation. That same decree created, based on the proposal by the former Ministry of Environmental Protection and Natural Resources of the Russian Federation, the Inter-Agency Commission for Biological Diversity Problems. However, due to the changes in the structure of the federal executive agencies and the changes in the work schedules of the Government of the Russian Federation and the federal executive agencies, this commission has practically ceased to exist.

It was noted in sections 6 and 10 that in modern conditions, too, a whole number of biodiversity conservation and sustainable use issues are related directly to the development plans of other sectors of the economy. In view of this, inter-agency cooperation in this area is an important mechanism for achieving the new targets of the Convention’s Strategic Plan for the years 2011-2020 and of the revised National Strategy of Biodiversity Conservation.

At present, the main regulatory document in this area is the Standard Regulations for Cooperation Amongst Federal Executive agencies (henceforth “the Standard Regulations”), approved by resolution № 30 of the Government of the Russian Federation on January 19, 2005.

The Standard Regulations set the general rules of organization of the activities of federal executive agencies and of the cooperation between the agencies, including the rules for organizing cooperation between federal ministries and their subordinate federal services and agencies.

Wherein the federal executive agency is independent in the exercise of its powers set by federal laws and by acts of the President of the Russian Federation and of the Government. In the exercise of their powers, the federal bodies of executive authority, including federal services and federal agencies administered by a federal ministry, interact directly with other bodies of state authority and with bodies of local self-government. This is unless other procedures are established by federal laws and by acts of the President of the Russian Federation and of the Government.

However, importantly, in the implementation of legal regulations in its established sphere of activity a federal ministry is not authorized to establish such functions and powers of federal executive agencies, executive agencies of federal entities of Russia, and local self-government bodies as are not provided for by federal constitutional law, federal laws, acts of the President of the Russian Federation and of the Government.

For the purpose of implementing inter-agency cooperation, the Standard Regulations stipulate that if a federal ministry's draft regulatory legal act contains provisions of inter-branch importance or provides for joint activities of federal bodies of executive power, it must be coordinated with those federal bodies of executive power which perform normative regulation in the corresponding sphere of activity. Alternatively, the bodies involved issue a joint act. For the purpose of preparing draft acts of an inter-agency nature, the chief of the federal ministry responsible for their preparation can create inter-agency working groups in agreement with the interested federal authorities. In case the federal authorities have differences over the draft documents, the Standard Regulations provide for holding conciliatory meetings in accordance with established procedure, and, should an agreed position fail to emerge, a list of disagreements is drawn up.

According to the Standard Regulations, for the purpose of ensuring coordinated actions in the accomplishment of a certain set of tasks, the interested executive authorities can create coordinating bodies which are called inter-agency commissions.

Advisory bodies are called councils and are formed for the preliminary consideration of issues and preparation of proposals which are recommendatory in nature.

Coordinating and advisory bodies are formed on a representative basis. Depending on the issues they are created to resolve, representatives of corresponding executive authorities may be included in the coordinating and advisory bodies. So can representatives of legislative authorities, scientific organizations, public associations

and religious organizations who have advisory votes in the coordinating bodies. The Standard Regulations also resolve matters included in the statute of the inter-agency commission (council), and the procedure for its approval. The bodies and organizations which have approved and coordinated the statute introduce proposals on the composition of the inter-agency commission (council). The composition is approved by order of the chief of the federal executive body which provides for the activity of the inter-agency commission (council).

**Thus, the existing regulations ensure effective inter-agency cooperation in the consideration of inter-sectorial issues of biodiversity conservation and sustainable use.**

Moreover, by now the system of an “Open Government” has been created which allows citizens, experts and public organizations to take an active part in the development and examination of state policy and management issues. Practically all drafts of fundamental documents and normative legal acts being developed by federal authorities are published in a special Internet portal for public discussion. All federal authorities have formed public councils where discussions of draft documents likewise take place. This provides, as a result, **a mechanism for open public discussion of the main issues of biodiversity conservation and sustainable use.**

## IV. Mechanisms for the implementation of the strategy

### Section 15. Plan for the buildup of capabilities for NSAPBC implementation, including an assessment of technological needs

The NSAPBC is planned as a long-term state sectorial planning document based on those elements in already adopted state strategic documents which touch on biodiversity conservation and sustainable use. In this regard, the issue of increasing the capabilities for NSAPBC implementation cannot be considered separately from systemic approaches in the implementation of other state strategic documents.

State strategies, which were discussed in sections 6 and 10, are implemented through special plans for the realization of existing strategies or the realization of state programs for individual sectors adopted by the Government of the Russian Federation. The list of these was likewise approved by the Government of the Russian Federation.

Approved at present by order № 1950-p of the Government of the Russian Federation on November 11, 2010 is a list of state programs of the Russian Federation (41 programs), including the earlier mentioned “Environmental protection”, “Development of the fisheries complex”, “Reproduction and utilization of natural resources” and “Development of forestry” – the most important ones for biodiversity conservation and sustainable use. Unlike the special plans for implementation of the adopted strategic documents, **state programs** satisfy to the greatest degree the effectiveness requirements for introduction of target-oriented planning to the development of the socio-economic sphere.

The procedure for the development, implementation and effectiveness evaluation of state programs of the Russian Federation, approved by order № 588 of the Government of the Russian Federation on August 2, 2010, makes provisions the following requirements the content of state programs:

- characteristics of the current state of the corresponding socio-economic development sphere of the Russian Federation; the main indicators and an analysis of the social, financial-economic and other risks of the implementation of the state program;



- indication of priorities and state policy goals in the corresponding sphere of socio-economic development; description of the state program's main targets and objectives; development forecast for the corresponding sphere of socio-economic development and the planned macroeconomic indicators as a result of the state program's realization;
- forecast of the state program's final results characterizing the target state (change of state) of the population's standard and quality of life, the social sphere, the economy, social security, institutions of the state, the degree of fulfilment of other socially-important interests and needs in the corresponding sphere;
- list of the state program's target indicators with a transcript of planned values by year of realization, as well as information on the interconnection between the measures and the results of their execution as well as the state program's generalized target indicators;
- justification of the state program's corresponding target indicators' composition and values by stage of implementation, and evaluation of external of the influence of factors and conditions on their achievement;
- inclusion of the technique for evaluating the effectiveness of state program.

Included in the state programs are also federal target programs formed for the solution of inter-branch problems belonging to the competence of the corresponding federal authorities responsible for the implementation of state programs.

**Federal purpose-oriented programs** likewise remain an important and sufficiently effectively practiced target-oriented tool for completing the priority tasks of national development. The procedure for their development and implementation was approved by order № 594 of the Government of the Russian Federation on June 26, 1995.

As an example, we point out the state program of the Russian Federation "On Environmental Protection" for the years 2012-2020 approved by resolution № 326 of the Government of the Russian Federation on April 15 2014 (earlier implemented based on a decree of the Government of the Russian Federation). The main goal is the elevation of the level of ecological security and the conservation of Russia's nature systems. This document is called on to become the basis for solving key ecological problems. It ties into a single system the legal regulation measures directed at economic stimulation of ecologically oriented "green growth" as well as the practical measures for improving the state of the environment.

This program includes five subprograms: “Regulation of the quality of the environment”, “Biological diversity in Russia”, “Hydrometeorology and monitoring of the environment”, “Organization and provision for works and scientific studies in the Arctic”, “Ensuring the realization of the state program of the Russian Federation “Environmental protection” for the years 2012-2020”, and also the federal purpose-oriented program “Protection of Lake Baikal and socio-economic development of the Baikal nature territory for the years 2012-2020”, approved by decree №847 of the government of the Russian Federation on August 12, 2012.

Another example: resolution № 322 of the Government of the Russian Federation, of April 15 2014, approved the state program “Reproduction and utilization of natural resources”. The key objectives of the program’s implementation (it was earlier implemented based on a decree of the Government of the Russian Federation) are the following: creation of modern geological maps of Russia’s territory; introduction into production of modern water-saving technologies (reduction of water losses in transportation, introduction of an accounting system at water intakes and in residential buildings); systemic work for protection and reproduction of fauna and natural resources – federal state hunting supervision must become more effective. Within the framework of the program, the most important issues related to the use and conservation of mineral, water and hunting resources must be resolved. The unification of these target directions is tied to the transition to purpose-oriented budget planning principles for the purpose of increasing the effectiveness of the spending of federal budget funds.

**Purpose-oriented agency** programs are developed and implemented in accordance with the federal regulatory base. Programs of the federal entities of Russia – in accordance with their legislations.

For the purpose of ensuring the effectiveness of these programs, the Government of the Russian Federation has approved the Rules for the Creation and Implementation of a Federal **Target Investment Program** (decree № 716 of the Government of the Russian Federation of September 13, 2010), the Rules for Performing the Validation of **Investment Projects** to check the efficiency of federal budget funds use **for capital investment** (decree № 590 of the Government of the Russian Federation of August 12, 2008) and the Rules for Using Budget Allocations of the Investment Fund of the Russian Federation (decree № 134 of the Government of the Russian Federation of 1 March 2008).

Moreover, the Ministry of Regional Development of the Russian Federation has approved the Methods of Indicator Calculation and Application of Efficiency Cri-

teria for regional investment projects applying for state funding from the budget allocations of the investment fund of the Russian Federation (approved by order № 493 of Minregion of Russia of October 30, 2009).

Thus, the adoption of state strategic documents is always linked to the approval of the tools for their implementation, including the available financial resources. This is why it is so important, when resolving the issue of the ways to implement the revised national strategy of biodiversity conservation, to decide on the main tool for its implementation. In this respect, the forming of a separate implementation plan will be less effective than the development and adoption of a corresponding state program. Considering that a number of measures for biodiversity conservation and sustainable use for the long-term period have already been planned within the framework of other documents, this kind of state program could have a mainly analytical and coordinating nature. However, its development requires separate attention and efforts, including temporary expenditures.

The base for NSAPBC implementation is the administrative, managerial, scientific and technological capacity as well as the currently available regulatory legal level in the field of biodiversity conservation and sustainable use. A specific purpose-oriented assessment of Russia's capacity in the area of biodiversity conservation and sustainable use has never been performed. At the same time, the main characteristics of this capacity have been presented in the national reports on the Convention on Biological Diversity, primarily in the 3<sup>rd</sup> National Report. Added to this should be the new elements which took place recently and were outlined in the previous sections. One more aspect which was not previously pointed out is the reform of the Russian Academy of Science in accordance with the Federal law № 253-Ф3 of September 27, 2013 "On the Russian Academy of Science, the Reorganization of the State Academies of Science and Amendments to Certain Legislative Acts". This federal law determines the organizational and legal shape of the RAS in accordance with the current legislation, the academy's statutory goals and authority within the framework of science and technology policy, the rights and duties of the RAS toward the state, and also specifies the special terms of state regulation and the state's participation in different aspects of the activities of the RAS. The reform of the RAS is carried out for the purpose of improving the effectiveness and performance of fundamental science as well as also for the purpose of separation of scientific research functions from the administrative ones, with transfer of the latter to a new agency subordinate to the Government of the Russian Federation – the Federal Agency for Scientific Organizations. With respect to problems of biodiversity conservation and sustainable use, this reform of the RAS has not yet

had a noticeably increased the effectiveness of problem resolution in this field and the previously outlined, sufficiently high, evaluation of the corresponding scientific and technological capacity.

Based on the characteristics of the personnel, informational, organizational, financial, material and technical elements of the available capacity presented earlier in the National reports, the conclusion can be made that its level is sufficient for achieving the goals and objectives of the revised national strategy of biodiversity conservation. At the same time, in terms of capacity building aimed at the implementation of the revised strategy, it is advisable to focus the attention on the available organizational element of the capacity as the latter is insufficient in modern conditions. To this day, there is no institutionalized state national center for biodiversity conservation and sustainable use issues which could perform analytical and coordination functions with respect to all issues formed by the Convention on Biological Diversity and arising out of the Convention's Strategic Plan for the years 2011-2020. Due to this, despite the large number of available national websites dedicated to different issues of biodiversity conservation and sustainable use, there still is no official single web portal where users could receive all the needed information concerning these problems. **The creation of this state national center and web portal would substantially increase the national capacity for implementing plans in this field.**

## Section 16. Financial resources mobilization plan for NSAPBC implementation

The strategy of resources mobilization for the goal of attaining the goals of the Convention for the years 2008-2015 were adopted by a decision of the IX/11 Conference of the Parties to the Convention on Biological Diversity. Its objective is a substantial increase in international financial flows for biological diversity and an expansion of domestic financing. Both are proposed in order to ensure a substantial reduction of the current deficit of the financing provided for the attainment of the Convention's three core objectives and the target set for the year 2010.

The Strategy includes the following tasks:

- improvement of the information database on the needs, deficit and funding priorities;
- enhancement of the national capacity for resource use and mobilization of domestic financial resources in order to accomplish the Convention's three core objectives;
- strengthening of the existing financial institutions and stimulation of the reproduction and scale increase of the successful financing mechanisms and tools;
- study of new and innovative financing mechanisms on all levels for the purpose of increasing financing volumes for the accomplishment of the Convention's three core objectives;
- inclusion of biological diversity and associated ecosystem services topics, including interconnections between the work programs within the Convention's framework and the Millennium Development Goals in the plans and priorities of cooperation which target development projects;
- creation of a capacity for resource mobilization and use as well as the stimulation of cooperation along the south-south border as a supplement to the accomplishment of the necessary cooperation along the north-south line;
- ensuring more effective implementation of the initiatives and mechanisms for the regulation of access to genetic resources and benefit sharing in support of resource mobilization;
- elevation of the global participation level for resource mobilization to promote the fulfilment of the Convention's three core objectives.

According to the Strategy, **these tasks for the global mobilization of resources should be viewed as a flexible structure** for developing measurable targets and/or indicators which take into account all corresponding financing sources in accordance with the national priorities and capabilities. Such measurable targets and/or indicators have not yet been developed. Therefore, from the perspective of national priorities and capabilities, in Russia's conditions, the present Strategy has more substantial meaning for the global mechanisms of financing.

Different financing mechanisms for the implementation of measures in the area of biodiversity conservation and sustainable use are already existant in Russia. The **existing funding mechanisms** include the government sector, non-governmental organizations (including associations of the indigenous small populations of the North, Siberia and the Far East), autonomous non-commercial organizations; the business community as well as international sources of funding, primarily through implemented projects of the Global Environment Fund. In total, they unite the budgetary and non-budgetary sources of financing and create the necessary base for implementing various measures in the area of biodiversity conservation and sustainable use. Wherein the budgetary sources are those which are system-forming and are directed primarily at: the development and implementation of state policy and legal regulation in this field, at ensuring state supervision and management of state property (including funding of the functioning and development of the system of protected areas). However, the budgetary system is rather conservative, strictly regulated and frequently unable to react to the rapidly emerging needs and practical problems. Considering Russia's scale, the non-budgetary sources are more mobile and most effective in providing for short-term concrete problem-solving measures in the area of biodiversity conservation and sustainable use in different sectors and in the territories of different federal entities of Russia.

In the state expenditures of the Russian Federation, the expenditures on biodiversity conservation and sustainable use are not singled out and are included primarily in items concerning environmental protection and of certain kinds of land-use.

The issues the management of state expenditures, including the sphere of environmental protection and nature use, are regulated by a number of legal acts pertaining to the sphere of budgetary legislation.

The distribution of state expenditures (budgetary allocations) are provided by the federal law on the federal budget for the corresponding fiscal year and the subse-

quent two years by section, subsection, target budget item and expenditure class of the budgetary classification of the Russian Federation.

At the same time, the federal budget for 2014-2016 was initially created based on the 39 state programs corresponding to the main directions of activity approved by the Government of the Russian Federation. In the latter, the share of program expenditures is over 90%.

Thus, in connection with the transition to the budgeting methods of target program, the bulk of the federal budget's expenditures are planned, at present, within the framework of the above-mentioned long-term (to the year 2020) state programs. For example, the subprogram "Biological Diversity of Russia" of the state program "On Environmental Protection" for the years 2012-2020 provides for federal budget funding annually through the year 2020 in the amount of 5 to 7 billion rubles depending on the specific year of the subprogram's implementation.

The second important sphere of federal budget expenditures affecting biodiversity conservation and sustainable use are subventions to all entities of the Russian Federation. These are provided for the powers transferred to them in the spheres of fauna protection and use, hunting and conservation of hunting resources, aquatic biological resources (within the unified subvention to the subjects of the Russian Federation), forest use and water use. The latter two are subject to individual specific subventions. Considering the importance of the forest-related field of biodiversity conservation and sustainable use, it should be noted as an example that this category of subventions totals 24 billion rubles annually to all entities of the Russian Federation.

In connection with the task of forming a budget with a surplus or with zero foreign borrowing, substantial additional federal budget expenditures and funding of transferred powers should be expected in the area of biodiversity conservation and sustainable use compared to the ones already contained in different state programs.

An entity of the Russian Federation forms its own regional budget based on its regional-level revenues; this budget is likewise adopted as a law of that federal entity of Russia. Its execution is performed primarily through the implementation of the adopted regional state programs which correspond to the goals and objectives of the state programs and federal target programs adopted by the Government of the Russian Federation. The regional budget is likewise formed in deficit conditions,

as a rule, and this source of funding measures in the area of biodiversity conservation and sustainable use has its objective limitations on growth, same as the federal budget.

Despite the objectively existing limitations on the volume of state funding for the area of biodiversity conservation and sustainable use, it is important to note that the existing system of budgeting and control in this area itself promotes the formation of stable tools and rules which substantially influence and promote effective use of non-budgetary funding sources as well. The implementation experience of over ten State Environment Fund projects in the area of biodiversity in Russia has shown that the existing financial institutions and the available capacity for resource mobilization and use make it possible to use these resources efficiently and effectively. The latter also create additional possibilities for biodiversity conservation and sustainable use not only on the federal level, but also everywhere on the regional level. In this connection, it is worth noting that the acquired positive experience of SEF project results testifies to the presence of sufficient institutional capabilities for the reproduction and scale expansion of successful funding mechanisms as well as tools within the framework of the existing legal base.

Thus of all above tasks of the Resource Mobilization Strategy, the most immediate task for Russia appears to be this: **study of new and innovative financing mechanisms** on all levels with the purpose of increasing funding volumes in order to achieve the Convention's three core objectives. The Strategy proposes the following task specification in this area:

- popularization in appropriate cases of payment programs for ecosystem services in accordance and in coordination with the Convention's clauses and with other corresponding international commitments;
- study of mechanisms for the compensation of unfavorable impacts on biodiversity when it is appropriate and advisable, while not allowing these mechanisms to destroy unique components of biodiversity;
- study of possibilities provided by ecological reforms of taxation, including innovative taxation models and tax incentives with the purpose of fulfilling the Convention's three core objectives;
- study of possibilities provided by promising innovative financing mechanisms, such as markets for environmentally friendly products, partnerships based on entrepreneurship and biodiversity, and new forms of charity;
- inclusion of aspects of biological diversity and the ecosystem services tied to it in the process of developing new and innovative sources of interna-



tional financing of development, while taking into account expenditures on nature protection;

- encouragement of the Parties to the United Nations Framework Convention on Climate Change and the Kyoto Protocol for them to take into account aspects of biodiversity in the process of developing any mechanisms for funding activities related to climate change.

Certain conclusions from the development of certain elements of this task can already be made.

The ministry of Agriculture of the Russian Federation and the Committee on Agrarian Policy of the State Duma of the Federal Assembly of the Russian Federation are developing, in partnership with the Organic Farming Union, the draft federal law on organic agriculture which is directed at priority development of the ecologically-pure agricultural products sector and the practice of environmentally friendly agriculture in Russia. In case this law is adopted, principles of agricultural production of “biologization” and “ecologization” will receive further development, which is certainly important for the achievement of the Convention’s three core objectives on almost 23% of Russia’s territory.

The Government of the Russian Federation adopted decree № 87 of February 16, 2008 “On the Composition of Design Documentation Sections and Requirements for their Content” for the purpose of implementing article 48 of the Urban-Planning Code of the Russian Federation that regulates architectural and construction design.

In accordance with items 25 and 40 of this Composition of design documentation, respectively section 8 “List of environmental protection measures” and section 7 “Environmental protection measures” must contain in their text measures for the protection of flora and fauna species and their habitats. It must also include measures which ensure the conservation of aquatic biological resources (including the prevention of fish and other aquatic biological resources from getting into water intakes) and their habitats, including the conditions of their reproduction, feeding and migration routes (if necessary). For large infrastructural projects located near the elements mentioned above, if there are flora and fauna species included in the Red List of the Russian Federation and the Red Lists of the federal entities of Russia, measures for the protection of these species are indicated separately. For linear infrastructural projects, this section contains measures concerning the protection of animal habitats, their migration routes, and access to fish spawning grounds.

The project's location skeleton chart must also include information on habitats of animals and plants included in the Red List of the Russian Federation and the Red Lists of the federal entities of Russia.

Together with the environmental protection measures, sections 8 and 7 provide for lists and calculations of expenditures on the implementation of all environmental measures, including those for the protection of fauna and its habitats as well as for compensation payments in cases provided for by the laws of the Russian Federation.

Thus, the **fulfilment of the requirement of the environmental legislation for full compensation of damage from economic and other activity is ensured. The mechanism of compensation of unfavorable impacts on biodiversity through the implementation of compensational measures by the economic entities themselves is implemented.**

Work is done on issues of accounting for the value ecosystem services in the development of the educational tourism market in protected areas of federal importance, primarily national parks, as a non-budgetary a funding source for the development of these areas.

Studies of new and innovative financing mechanisms with the purpose of increasing funding volumes for the implementation of biodiversity conservation and sustainable use measures, on all levels, will be continued in the long term.

Also close in meaning and urgent for Russia is the Strategy's task of resource mobilization for the enhancement of national capacity for resource use as well as the mobilization of domestic financial resources aimed at achieving the Convention's three core objectives in the following substantial parts:

**Firstly**, in the 1990s the Environment Fund was created in the Russian Federation, but as of 1 January 2001 it was abolished. In the time it was functioning, the Fund proved to be a sufficiently effective tool for non-budgetary funding of work on ecological problems, including measures for biodiversity conservation and sustainable use. The question of studying the possibility of recreating the Environment Fund has been posed recently at the highest level. However, in connection with the changes which took place in the budget and tax legislation of the Russian Federation, the recovery of this financing tool proved to be problematic. At the same time, the issue has not been removed from the agenda, and its study will apparently continue.

**Secondly**, the buildup of the capacity for the introduction of economic tools for biodiversity conservation and sustainable use appears to be more important in this connection.

The socio-economic, political, legal and institutional foundations for the introduction of economic tools of biodiversity conservation have been created in the Russian Federation.

**The economic mechanisms of regulation in the area of biodiversity conservation and use are included in the regulatory legal and instructional as well as methodological acts of the Russian Federation.**

The general methods of economic regulation in the area of environmental protection are listed in article 14 of the Federal law “On Environmental Protection”. The natural resource legislation in the corresponding purview likewise develops the methods used for economic regulation of conservation and sustainable use of individual components of biological diversity. This is done primarily with respect to forests, fauna, hunting resources, and aquatic biological resources. Taking into account the institution of state ownership of biological resources existing in Russia, the following methods should be mentioned separately: development of lease relations between the state and natural-resource users, economically justified system of payments for the use of resources, economically and ecologically justified system of fines and lawsuits for the violation of Russia’s laws in this sphere.

The measures used for economic regulation of biodiversity conservation and sustainable use are the most suitable ones for the modern conditions and the acting market mechanisms.

In connection with this task, special attention must be given to the involvement of the resources of the business community in the activities aimed at biodiversity conservation and sustainable use. The conceptual basis for this is formed by one of the results of the global study “The Economics of Ecosystems and Biodiversity (TEEB)” – the report for the business community which contains recommendations to businesses on how they can align their actions relating to biodiversity and ecosystem exploitation with consideration for the broad social responsibility of corporations. One of the important aspects of this report is the recognition of the necessity to account for the benefits and costs of biodiversity conservation as a component of effective use of natural resources. In Russia, this sphere is not yet sufficiently developed in the systemic aspect.

The business community, however, is beginning to get involved in the solution of these problems in partnership with state authorities, scientific institutions and the Russian Geographical Society. There is the good practice of corporations implementing in their production processes, at their own expense, programs and projects for the study and conservation of rare and endangered animal species included in the Red List of the Russian Federation. The companies Exxon Neftegas and Sakhalin Energy are implementing a program of studies and conservation (including tagging) of grey whales of the Okhotsk-Korean population and of Steller's sea eagles; the company Yamal LNG is implementing an action plan for the conservation of the Atlantic walrus subspecies. Considering that the task of conservation and recovery of rare and endangered animal species - especially the Amur tiger, the leopard, the polar bear and the Okhotsk-Korean population of grey whales - has the direct attention of the President of the Russian Federation, the autonomous non-profit organizations (ANPO) "Center for the Study and Conservation of the Amur Tiger" and "Eurasian Centre for the Study, Preservation and Rehabilitation of the Leopard Population" have been recently formed. Their projects are funded through sponsorships from private corporations. In the latter case, the partnership between the state, the business community and the public is realized through a structure formed for this purpose – the supervisory boards of the above-mentioned ANPOs.

Deserving of a separate mention is the activity of the Russian Geographical Society (RGS) which is reviving the long tradition of philanthropy and establishment of grants, including those for projects of biodiversity conservation and sustainable use. The RGS has signed a special agreement on cooperation with the Ministry of Natural Resources and the Environment of the Russian Federation for the purpose of nature protection. The activity of this Society and its Board of Trustees, which is headed by the President of the Russian Federation, is likewise a new example of partnership between the state, the business community, the science community and the public in the area of biodiversity conservation and sustainable use.

**Summing up** this section, it is necessary to note:

Different mechanisms for financing the implementation of measures in the area of biodiversity conservation and sustainable use are already functioning in Russia.

The indicated mechanisms are in different stages of development. Most promising against this background are: the tasks for the study of new and innovative financing mechanisms on all levels for the purpose of increasing financing volumes for this area, enhancement of the national capacity for resource use and mobilization

of domestic financial resources through the development of economic tools in the area of biodiversity conservation and sustainable use, involvement of the business community in the area of biodiversity protection as well as the development of different forms of partnership between the state, the business community, the science community and the public.

Considering the above, and also the fact that development of financing in this area depends, to a large degree, on the systemic development of the state budgeting sphere as a whole and of economic market incentives of a higher order, the creation of a separate plan for the mobilization of financial resources is not advisable in Russia's conditions. Individual issues in this area can be reflected in the Action Plan for the implementation of the revised strategy of biological diversity conservation.

## **V. Organization, monitoring and reporting**

### **Section 17. National coordinating structure**

Decree № 669 of the Government of the Russian Federation of July 1, 1995 “On measures for compliance with the Convention on Biological Diversity”, issued after the Russian Federation ratified the Convention on Biological Diversity, created the Inter-Agency Commission for Biological Diversity Problems under the former Ministry of Environmental Protection and Natural Resources of the Russian Federation. This commission was created for the coordination of activities of federal authorities and executive authorities of the federal entities of Russia with the aim of ensuring non-depleting use and conservation of biological resources as well as environmentally safe handling of animal and plant genetic resources. Certain entities of the Russian Federation created commissions of the same kind at their level.

Considering the inter-sectorial nature of the issues arising from the Convention on Biological Diversity, and the lack of experience of other federal authorities in the early stages of fulfilling the obligations under the Convention, this Inter-Agency Commission has played a substantial positive role in the implementation of measures for biodiversity conservation and sustainable use as well as in the development of the National Strategy of Biodiversity Conservation in Russia of 2001. However, in 2004, taking into account the need to standardize the activities of a large number of coordinating bodies created by the Government of the Russian Federation, decree № 215 of the Government of the Russian Federation of April 16, 2004 “On the standardization of the composition of coordinating, advisory, and other bodies and groups created by the Government of the Russian Federation” abolished the Inter-Agency Commission for Biological Diversity Problems, along with 146 other coordinating commissions and groups, (including those related to problems of ozone layer and climate change).

At present, the Government of the Russian Federation has over 45 functioning coordinating and advisory governmental bodies for the most problematic inter-sectorial areas of the economy and the social sphere. The area of environmental protection, including biodiversity, is not included in this list, since the powers of Russia’s Ministry of Natural Resources and the Environment and its subordinate federal services and agencies enable it to ensure effective work in this area.

It was pointed out in section 14 that, at present, the acting regulations enable Minprirody of Russia to ensure effective inter-agency cooperation in relation of the inter-sectoral issues of biodiversity conservation and sustainable use, as well as open public discussion of the main issues of biodiversity conservation and sustainable use. Moreover, the adopted format of the implementation plan for the revised national strategy of biodiversity conservation within the existing framework of regulations likewise does not require a special coordinating structure for ensuring its implementation. In these conditions, there is no objective need for creating a specialized national coordinating structure for NSAPBC implementation which would be similar to the inter-agency commission which functioned during the initial period of the Convention's implementation. At the same time, should such a need be identified, there are no obstacles to the creation of such a structure within Minprirody of Russia.

At present, Minprirody of Russia already has the following functioning bodies: the Expert council on special protection nature areas, the Council on hunting and its economics, the Council on development and implementation of state policy and legal regulation in the area of forest relations. Order № 533 of Minprirody of Russia of December 2, 2014 created also the Federal Environmental Council which is a standing advisory body under the Ministry and ensures cooperation between federal and regional bodies of legislative and executive power of the Russian Federation in carrying out activities in the area of environmental protection, development of proposals on urgent issues of state environmental policy and legal regulation in this sphere. The Council is authorized to create standing commissions on individual activity areas in the environmental protection sphere. Thus Minprirody of Russia has the needed advisory bodies whose capacity can be used, should the need arise, for consideration of issues related to coordination of NSAPBC implementation.

The issue of advisability of coordinating structures creation on the regional level in the event of the development of a separate component in the regional socio-economic development strategies which is related to biodiversity conservation and sustainable use is the responsibility of the federal entities of Russia and will be resolved based on the real needs of the entities of the Russian Federation.

## Section 18. Monitoring and reporting

**Monitoring in the area of biodiversity conservation and sustainable use is an important element of adaptive management. One component of monitoring is the development of biodiversity indicators which are informational tools that make it possible to generalize the corresponding information for the purpose of identifying the state of and trends in the area of biodiversity in order to increase the effectiveness of the measures being implemented for managing biodiversity.**

Federal law № 7-Φ3 of January 10, 2002 “On Environmental Protection” provides for the creation of a single system of state environmental monitoring (state monitoring of the environment).

The single system of state environmental monitoring includes the following subsystems:

- state monitoring of the state and pollution of the environment;
- state monitoring of air;
- state monitoring of the radiation situation in Russia;
- state monitoring of lands;
- state monitoring of fauna;
- state monitoring of forest pests;
- state monitoring of reforestation;
- state monitoring of underground resources;
- state monitoring of bodies of water;
- state monitoring of aquatic biological resources;
- state monitoring of the internal sea waters and the territorial sea of the Russian Federation;
- state monitoring of the exclusive economic zone of the Russian Federation;
- state monitoring of the continental shelf of the Russian Federation;
- state environmental monitoring of the unique ecological system of Lake Baikal;
- state monitoring of hunting resources and their habitats.

**State monitoring of biodiversity as such, as a separate subsystem of state environmental monitoring, is not provided for by the existing laws of the Russian Federation.** At the same time, the monitoring of components of the environment



and of individual natural ecological systems can provide quite a lot of information for assessing the state of biodiversity and its trends. However, the absence of an independent biodiversity subsystem requires the development of a separate set of indicators which can be borrowed from the existing subsystems of environmental monitoring or integrated, based on the existing ones, into new indicators for the evaluation and monitoring of biodiversity. Based on previous experience, in order to create a limited number of simple, easy to use and cost-effective indicators, the latter must have a logical justification, be sufficiently simple to develop, account for the scale of application, have accessible data sources,

**The revised national strategy of biodiversity conservation in the sphere of national tasks and corresponding indicators** is based on the Strategic plan in the area of biodiversity conservation and sustainable use for the years 2011–2020 and by analogy with the preliminary list of global indicators for IT purposes given in decision X/13 of the Conference of the Parties to the Convention. The values of the target indicators are defined to year 2020. Thus a system of national targets and measurable objectives is created, which is important for the use in the national public administration system.

At present, Federal law № 172-Φ3 of June 28, 2014 “On Strategic Planning in the Russian Federation” is in effects. It provides for the need to ensure the monitoring and control of the implementation of strategic planning documents and entities which organize the monitoring and control of the implementation of strategic planning documents as a component of strategic planning. In accordance with article 3 of this federal law, the monitoring and control of the implementation of strategic planning documents is defined as: a strategic planning activity of those involved in the comprehensive assessment of the progress and results of the implementation of strategic planning documents as well as in the activity of assessing strategic planning coordination in compliance with the principles of strategic planning and of the exercise of powers in the sphere of socio-economic development and provision of national security. The inclusion of indicators for the measurement of an industry’s development in strategic planning documents is likewise required by national legislation.

**Thus, the creation of a system of national targets and measurable objectives satisfies the requirements of national legislation in the area of strategic planning as well.**

The national action plan for the implementation of the revised national strategy of biodiversity conservation is created in a format which allows for the monitoring of its implementation on a regular basis.

Taken together, the fixed target indicator values and the adopted format of the action plan for the strategy's implementation will allow to perform constant monitoring of the revised strategy's implementation and to make adjustments if needed.

Based on the established practice, reporting on the action plan for the implementation of the revised strategy is done annually as its individual items are executed.

In accordance with the concluding provisions of the Federal law 2014 "On Strategic Planning in the Russian Federation", by January 1, 2016 the legal acts will be developed which determine the procedure for the development and adjustment of strategic planning documents and for the performance of monitoring and control of strategic planning documents' implementation. Once these acts are published, the monitoring and reporting system for the revised national strategy of biodiversity conservation will be finally determined.

