MINISTRY OF ENVIRONMENT AND
WATER RESOURCES OF THE REPUBLIC OF KAZAKHSTAN

THE FIFTH NATIONAL REPORT ON PROGRESS IN IMPLEMENTATION OF THE CONVENTION ON BIOLOGICAL DIVERSITY

LIST OF ABBREVIATIONS

ABD	Agrobiodiversity
JSC	Joint stock company
АСВК	Association for the Conservation of Biodiversity of Kazakhstan
GDP	Gross domestic product
SINR	State inventories of natural resources
SFF	State Forest Fund
SNNP	State national natural park
SNR	State natural reserve
SNR	State natural reservat
SA	State agency
GEF	Global Environment Facility
EBRD	European Bank for Reconstruction and Development
UNECE	United Nations Economic Commission for Europe
IAC EP	Information and analytical environment protection centre
IBA	Important Bird Area
KazFRDI	Kazakh Fishery Research&Development Institute
TIC MINT РК	Committee of the tourism industry of the Ministry of Industry and New Technologies of the Republic of Kazakhstan
FHC	Forestry and Hunting Committee
SC MES	Science Committee of the Ministry of Education and Science
FC	Fishery Committee
КТА	Kazakhstan Tourist Association
MFA RK	Ministry of Foreign Affairs of the Republic of Kazakhstan
MES	Ministry of Education and Science of RK
MEWR RK	Ministry of Environment and Water Resources of the Republic of Kazakhstan
МА РК	Ministry of Agriculture of the Republic of Kazakhstan
NAP ESD	National Action Plan for environmental / sustainable development
NGO	Non-governmental organization
UN	United Nations
SPA	Specially protected natural areas
GR	Government resolution
UNDP	United Nations Development Programme
RSE	Republican State Enterprise
RK	Republic of Kazakhstan
RPA	Republican public association
LLP	Limited Liability Partnership
UNESCO	United Nations Educational, Scientific and Cultural Organization

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EXECUTIVE SUMMARY

Kazakhstan is the 9th largest country in the world with an area of 2.72 million km^2. The country enjoys the unique set of landscapes, ranging from deserts to high mountains and ecosystems of inland seas. Moreover, arid and sub-humid lands cover more than 75 % of the area of the Republic of Kazakhstan.

The flora of Kazakhstan integrates more than 13 thousand species, including - more than 5750 species of vascular plants, about 5000 - fungi, 485 - lichens, more than 2000 - algae, about 500 - bryophytes. Centers of endemism of the flora (the Karatau mountains, the Western Tien Shan) and a number of unique natural complexes and communities, which are original in their floristic composition, are located in Kazakhstan. The country has a full range of subzonal vegetation of steppes, deserts and mountain belts, typical for the Central Eurasia.

The State Forest Fund (SFF) of RK as of 1 January.2013 covers 28,787,7 thousand hectares or 10.6% of the country area. The lands covered with forests amount to 12,548.6 thousand hectares or 43.6% of the total land area of SFF, the percent of the forest cover is 4.61%.

According to reliable sources, the fauna of Kazakhstan is presented with 846 species of vertebrates, including mammals - 178, birds - 499 (of which 396 nesting birds; other 38 species that are not included in the above figure, need to be confirmed), reptiles - 51, amphibians - 11, fish- 104 and cyclostomes -3.

Two major migration routes - the West Siberian -African and Central Asian- Indian, which millions of birds fly through every year, cross the territory of the country; 121 recognized key ornithological areas of international importance confirm the global significance of these areas for the conservation of birds of Kazakhstan. To date, at least 80,000 species of invertebrates, including no less than 60,000 species of insects belonging to 28 groups, inhabit in the country, while the lists of a number of groups are far from being complete.

A number of localities of the Paleozoic, Mesozoic and Cenozoic eras is found on the territory of Kazakhstan; findings in the Chu-Ili mountains (the first vascular plants, 420 million years old) and Karatau ("fish slates") have global significance.

Agroecosystems integrate landscapes, which are created and regulated by people; about 222.1 million hectares of 272.49 million hectares of the total area of the country lands, in principle are suitable for agriculture, while the category of agricultural lands as such relate to 93.4 million hectares, and most of other areas can be used for pastures without their assignment to certain users. About 31.9 million hectares are used for pastures, 5.05 million hectares - for hayfields, about 2.8 million hectares - for deposits.

Kazakhstan concentrates unique plant genetic resources of agricultural biodiversity (ABD) of global significance. According to data obtained in 2013, they include 226 species of wild counterparts of cultivated plants, determining the genetic potential of 24 agricultural plants. Fruit ABD and, above all, a wild apple (Sivers apple - *Malus sieversii*), Niedzwiecki apple - *Malus niedzwetzkyana*) and common apricot (*Armeniaca vulgaris*) are recognized globally. Almost all modern effective commercial types of this plant contain genes of the wild apple.

Kazakhstan genetic resources of natural pistachio (*Pistacia vera L.*), common almond (*Amygdalus communis L.*) and wine grapes (*Vitis vinifera L.*) have good prospects for further development.

Kazakhstan has 10 types of currant (*Ribes spp.*) and gooseberry (*Glossularia spp.*); 120 species of wild counterparts of carrots, purslane, asparagus, onions and garlic grow in the country. Enormous genetic diversity of tulips - 31 species of the Tulipa type, is registered in the country.

Natural ABD technical plants (*Linum spp., Carthamnus spp., Eruca spp., Brassica spp*.) and forage (primarily, alfalfa - *Medicago spp.*) have good potential.

More than 70 types of cereals, 68 types of fruit and cherries, more than 60 varieties of vegetables and melons, more than 20 varieties of potatoes have been cultivated and zoned in Kazakhstan.

The annotated list of medicinal plants, including 1525 species, that grow on the territory of Kazakhstan, was finalised in 2013. The collection, made in the Aral experimental station, of plant genetic resources includes 10,765 samples of crops. The country develops forest and seed stations with identified units for selection and genetic purposes, including the Almaty and Kokshetau forest breeding centers and the Priaralsk experimental station of genetic resources.

Agrobiodiversity of the wildlife is almost never used in breeding. Among wild ancestors of domestic animals mouflon (*Ovis vignei*), five subspecies of argali (*O.ammon*), wild boar (*Sus scrofa),* wild ass *(Equus hemionus),* jackal *(Canis aureus),* wolf *(C.lupus),* spotted cat *(Felis lybica*) and several others, inhabit in the country. Among the birds - these are, above all, a family of ducks and chicken. One of examples of the successful use of the genetic material of wild animals - the creation in Kazakhstan, more than 30 years ago, of a sheep breed "arharo- merino", based on species of wild mountain sheep. The country used a number of local species, including cattle - 4, sheep - 9 , goats - 3, horses - 2. The aboriginal breeds of dogs - pots and tobet - also represent a valuable type.

It should be noted that a number of wild animals are used in the country without breeding agricultural species; these are deer and a number of fur-bearing animals. However, fur farming is not actively developed in the country.

Among wild birds, some hunting farms successfully breed pheasants; a breeding farm of houbara bustard (*Chlamydotis undulata macqueeni*) was established in 2011 in the South Kazakhstan regionwith the support of the UAE.

About 7-10 forms, including hybrids of fish and cyclostomata are currently artificially grown. Pond fishery, in the last five years, steadily develops. The genetic resource of amphibians and reptiles is also interesting.

After years of economic downturn that followed the collapse of the Soviet Union in the past 10 years the economic growth, along with increasing pressure on ecosystems, is quite sustainable. In the recent 5 years anthropogenic effects, including pollution, particularly visible in mining regions, recirculation of deposits and development of agriculture, as well as in the areas of mass recreation emerged with the improved wealth of population, are becoming more intensive. Moreover, the following effects are still in place: the local rangeland degradation, depletion of plant resources resulted from primitive harvesting, maintained by local population, and existed for many years - as a result of various influences - violations in ecosystems of entire regions. Processes of desertification intensified in the conditions of the climate change are still underway.

Kazakhstan has adopted **the Concept of transition of the Republic of Kazakhstan to a "green economy”**, approved by the Decree of the President of the Republic of Kazakhstan № 577 on May 30, 2013 with the aim to harmonize relations between people and the nature. The conceptual framework of the strategy includes the following documents: the Strategy of Development of Kazakhstan until 2030; the Strategic development plan of the Republic of Kazakhstan untill 2020; the Sectoral Programme "Zhasyl damy" for 2010-2014, the Strategy of Industrial and Innovation Development for 2003-2015 and other programs and documents.

The "green economy" is an important tool for the sustainable development. Transition to a "green economy" will allow Kazakhstan to achieve, by 2050, its goal of becoming one of the 30 most developed countries in the world. Overall, the level of investments needed for transition to a

"green economy" will make up about 1% of GDP annually, equivalent to 3-4 billion U.S. dollars per year. The main priorities for the transition to a "green economy" are as follows: 1) more efficient use of resources (water, land, biological etc.) and their effective management; 2) modernization of the existed infrastructure and construction of new infrastructure; 3) improved welfare of the population and the quality of the environment through cost-effective ways for mitigation of pressure on the environment; 4) enhancing of the national security, including water security.

One of the priority areas, specified in the concept, is the "Conservation and efficient management of ecosystems". Integrated management of natural ecosystems should be implemented in accordance with the principles of sustainable development to increase significance and the economic potential of natural ecosystems. In forestry, the need in projects aimed at the effective conservation of forest resources, regulation of deforestation, introduction of modern methods of forest management and development of appropriate skills were emphasized.

With regard to the management of wildlife it was noted that the wildlife sphere is unique and attractive for the development of sustainable hunting and sport fishing, ecotourism, safari photography, reproduction of wild animals in captive and semi-free conditions and in other aspects, that, in fact, are "green" investments. Ecological tourism was identified as one of the most promising tourist products and the essential condition for its development is conservation of landscapes designed for ecotourism.

Challenges of conservation and sustainable use of biodiversity as such have been reflected in the concept just in a summarised form, without further details.

Currently, the major programme document of the country, directly aimed at biodiversity conservation, is the **“Zhasyl damy”** (in Kazakh “Green Development "), approved by the Decree of the government of the Republic of Kazakhstan № 924, of September 10, 2010, and planned for implementation during 2010-2014.

With a view of optimizing the current programme documents, the Zhasyl damy integrated some of their goals, including the ecological security, development and allocation of specially protected natural areas, environmental protection, increase of plantation areas, use of wildlife etc..

The goals of the programme are realised in line with the Strategic plan of the Ministry of Environment and Water Resources of RK for 2009-2011 and 2011-2015 and measures, specified in the ecological code of the Republic of Kazakhstan.

The program is focused on application of the principle of a "green economy", which provides for elimination of dependence of resource use and environmental impacts on the economic growth.

It was planned to conduct activities to develop international relations, scientific support to environment use and protection, the system of monitoring of environment and natural resources, environmental education and raising public awareness.

The program includes a section of forestry and wildlife, special protected areas. One of the main objectives of the country, as stated in the Program, is the conservation of biological diversity and the sustainable development.

The program is interdisciplinary and binding, actions are shown per each year, specifying the responsible agency, reporting deadlines and indicators.

The total budget of the Program is 161,714.06 million KZT (or about 1 billion U.S. $ 80 million at an average currency rate for 2010-2013.), including contributions from the republican and the local budgets, international grants, loans, funds of natural resource users.

Kazakhstan is a party of five priority interstate agreements, directly applicable to conservation and sustainable use of biodiversity: the Convention on Biological Diversity (CBD, August 19, 1994), the Convention for the Protection of the World Cultural and Natural Heritage, the Convention on the Conservation of Migratory species of Wild Animals, the Convention on Wetlands of International Importance, the Convention on International trade of Endangered Species

of Wild Fauna and Flora, CITES, as well as the United Nations Convention to Combat Desertification (UNCCD).

In addition to direct integration of goals, implemented under conventions relating to biodiversity, sectoral and cross-sectoral programmes and plans are developed, special measures are taken to ensure their coordination and joint reporting procedures.

In the period from 2010 to 2013 several changes were introduced in the environmental legislation and structures, responsible for the conservation of biodiversity in Kazakhstan.Kazakhstan introduced a number of changes in the environmental legislation according to the law of RK "On making amendments and additions to some legislative acts of the Republic of Kazakhstan on issues of forestry, wildlife and protected areas.", signed by the President of RK on 25 January, 2012. Changes and additions were made into the Law of the Republic of Kazakhstan "On protection, reproduction and use of wildlife", the Law of the Republic of Kazakhstan "On specially protected natural areas", and a number of other laws and codes. The changes were made to specify some provisions, exclude double interpretation and strengthen market mechanisms of biodiversity conservation. The adopted amendments and additions allowed to essentially improve the environmental legislative framework. However, some problems, especially in the hunting sector, remained unresolved - these are guarantees for hunters and compensation for their capital investments in case of withdrawal of lands of hunting farms for state needs, reimbursement of their losses in case of illegal hunting on their territories, conflicts of interests between hunters and land users etc.

The Strategic Plan of MEWR RK for 2011-2015, in accordance with the approved concept of the “green economy”, determines a transition of the country to hydrocarbon development, which provides conditions for trading of greenhouse emissions and formation of principles of the “green” economy. The amendments to the Environmental Code stipulate market-based mechanisms to reduce emissions and absorption of greenhouse gases, procedures for monitoring and environmental ("green") investments. In order to realise market-based mechanisms of regulation of carbon emissions, the Government of the Republic of Kazakhstan and MEWR RK adopted relevant rules and regulations.Positive incentives for use of fish resources are realized by granting fishery ponds to users on a long-term basis. To date, 1791 fishery ponds (sites) are secured for 1004 users who have signed fishery contracts for 10 years. Users invest their own funds for the protection and reproduction of fish resources, researches and strengthening the material - technical base. During 2006-2013 users invested over 10 billion tenge (about $ 67,000,000) to these spheres.

Extensive measures, stimulating the **forestry sector,** were taken in the framework of the project "Conservation of forest and increase of the forest cover in the country ", implemented with the support of the World Bank and GEF, along with grant programmes. As part of the project a series of measures were taken on the conservation and reforestation of ribbon woods in Priirtyshja, East Kazakhstan and Pavlodar regions and saxaul plantations in the Kyzylorda region, including phytomelioration on the dried bottom of the Aral Sea. The private forestry fund, based on legislative preconditions, successfully operates. Its area, even being small and insignificant, was extended over the 3 years in 4 times, showing steady upward growth.

In order to develop the **ecological tourism** the Memorandum of Understanding was signed between the Committee of Tourism Industry of the Ministry of Industry and New Technologies of the Republic of Kazakhstan (CTI MINT), FHC, the Kazakhstan Tourist Association (KTA). Conservation of biodiversity is highlighted in all tourism development programmes. However, it should be noted that lands in SPAs could be withdrawn for building of touristic sites. This negative motive has appeared since 2008, and the experience has shown that it brings serious risks to the integrity of the SPAs system, especially near large cities with very high land prices. One of the main problems in the ecotourism development is the lack of real interaction between travel companies, SPAs and government authorities.

Positive incentives for biodiversity conservation in **the hunting sector** are based on the active inclusion in this process of hunting users with assignment of the lands to them for a long term period from 10 to 30 years. Hunters invest their own funds to the development of hunting, including costs of payments to rangers and conducting biological activities. In total, the country has 675 hunting farms with the area of 120.0 million hectares (44.2 % of the country); in 2013 hunting users contributed 1801.6 million tenge (about $ 12,000,000) into the development of hunting farms. The number of hunting farms, their technical infrastructure and maintenance costs, regularly increased during 4 years.

In order to ensure the implementation of the country obligations arising out of the Cartagena Protocol on **biosafety**, the draft law "On state regulation of genetic engineering ", the draft law of the Republic of Kazakhstan "On amendments and additions to some legislative acts of the Republic of Kazakhstan on state regulation of genetic engineering ", the project " Concept of state regulation and control of genetically modified organisms in the Republic of Kazakhstan" were elaborated. The projects are currently under consideration in the Parliament of the Republic of Kazakhstan. Discussion of these documents aimed at ensuring the control in the field of GMOs, including elimination of incentives, with a potential negative impact on biodiversity, have become stalled.

The biodiversity, as a value of ecosystem services in Kazakhstan, has not been evaluated from the economic perspective at the legislative level. The first pilot assessment was conducted in 2013 in the Karkarala SSPA, in order to determine the economic value of SSPA based on the assessment of some of its ecosystem services in monetary terms for the subsequent replication of this practice in the system of protected areas in Kazakhstan. The total annual value of ecosystem services in SSPA, as per these estimates, made up 86 million 371 thousand dollars.

Total **changes in ecosystems** in Kazakhstan occurred more than 50 years ago as a result of extensive plowing up of steppe and forest-steppe zones. The degree of ploughing up of grassland steppes in plains reaches 90%, in hummocks - up to 30 %. Dry steppes were plowed up by 50-60 %, and in hummocks- by 10-15%. Other types of landscapes, suitable for grazing, demonstrate rapidly degrading of pastures. After the collapse of the USSR and the economic collapse in the 1990s, ecosystems in grasslands and abandoned pastures naturally started restoring. In the last 5 years, on the one hand, ecosystems continued to be naturally recovering, on the other hand, previously abandoned areas were back for the economic use. With the growth of livestock there was a growing overgrazing near settlements. According to data for 2013, 15% of agricultural lands are not used efficientlz, about 125 million hectares of pastures are not watered and abandoned, more than 20 million hectares of pastures adjacent to settlements, are classified as **degraded**.

As a result of inadequate regulation, 5.6 million hectares of arable lands in the northern and central Kazakhstan suffer from water erosion and the crop yields reduced by 20-30%; in 9 out of 14 regions of Kazakhstan degraded agricultural lands, including pastures, constitute 30-50 % and higher. Salinization, water and wind erosion, reduction of humus, secondary salinization with water discharge after irrigation occur in more than 90 % of the arable soils of the country. Ineffective use of lands, whilst grazing and livestock breeding is compounded now with creation of numerous small agro and livestock units, that do not have sufficient resources for complete administration of areas.

The Land Management Committee of the Ministry of Regional Development of the Republic of Kazakhstan in 2012-2013 conducted an inventory of agricultural lands, including pastures with the total area of 30.6 million hectares. It was revealed that throughout the country more than 9,900 water sources need to be restored, renovated or constructed. Irrigation works in pastures are underway within the state program "Agribusiness in 2020." Watering of distant

pastures and dispersal of livestock will allow to reduce the local load on pastures and degradation of habitats.

Other causes of degradation of desert habitats are as follows: haphazard road network, regulation of rivers, illegal logging of saksaul as a firewood for sale. As a result of urbanization and intensive agricultural development in the foothills in the south and east of the country the natural vegetation still remained strongly damaged. In the valleys of the rivers in the desert zone - Syr Darya, Shu, Talas - due to the limitation of a river flow, highly productive floodplain communities are almost completely degraded; floodplain forests in the west of the country, riparian forests in the south and the south - east of the country, forest steppe and steppe zones in the north are under a strong pressure. Because of the threat of increased water intake from the Ili river in its upper reaches in China for irrigation, there is a danger that the water level can drop dramatically and the lake ecosystems in Balkhash and in the valley of the Ili river will be degraded. The same problem is relevant to transboundary Irtysh and Syr Darya rivers with a steady decline of the annual inflow of 2-3%. The increasing pace of construction of roads, pipelines, power lines, make a great impact on the fauna. The area occupied by mining enterprises is extending steadily; from 2008 to 2012 by 14% and reached 910,000 hectares. In the last 5 years the area of oil and gas production and uranium mines, etc. drastically extended in the western Kazakhstan, the eastern Caspian Sea region, the Betpakdala desert etc.. The use of a current resource model of economic development leads to inefficient economic development and constantly rising pressure on ecosystems.

The country was able to achieve good progress and decrease degradation rates (not considering natural restoration of abandoned ploughlands and creation of SPAs) in a number of local sites of livestock dispersal from villages and also in two other spheres - restoration of the Aral Sea and increase of the forest coverage. Built in 2005, the Kokaral dam, which separated the Small Aral from the main aquatorium, allowed to balance and raise the level of this, currently isolated, water reservoir and also to reduce its salinity. As a result, fish (along with an introduced flounder) appeared in the Small Aral, fishery was revived in the area. In 2012 the Small Aral sea and delta lakes of Syr Darya were included into the list of the Ramsar lands.

In the period from 2008 to 2013 the total area of **the state forest fund** increased by 1 mln 10.4 thousand hectares (3.5%). Within the project "Conservation of forest protection and increase of the forest cover " in the ribbon forests in the " Semei ormany " and " Yertis ormany " forest restoration and improvement were conducted on the area of 20200 ha; on the dried out bottom of the Aral Sea - saksaul plantations on the area of over 70,000 ha; 20 pilot plots on the area of about 200 hectares each to restore saxaul and adjacent rangelands with involvement of the local population. Overall in the country, the number of forest fires has been dramatically reduced.

The **contamination of the environment** is being intensified and presents a serious problem in general and a very dangerous threat at a local level. The situation resulted from the lack of treatment facilities and low level of control, and because of ineffective standards on emissions of pollutants in Kazakhstan. In the concept of transition to a "green economy" decrease of sulfur oxides and nitrogen emissions to the European level by 2030 is used as an indicator of the control over pollutants. In the program "Zhasyl damy" it is planned to decrease the level of emissions of pollutants at least by 5.9 % in the period from 2009 to 2014, the level of pollutants discharged - not less than by 3.5 %.

Trends for different types of pollutants are quite different. For instance, from 2009 to 2012 the volumes of the following pollutants decreased: crude wastewater discharged into water bodies - by 7.6%, and their share in the total volume of waste waters - by 12.9%; emissions of dust - by 7.1%, lead - by 29.3%, mercury - by 33.3%, arsenic - by 46.2%, dichloroethane - by 67.1%.

During the same four years, from 2009 to 2012, the following indicators increased: emissions of nitrogen oxides - by 20.7%, ammonia - by 29.4%, non-methane volatile organic

compounds - by 33%, hydrocarbons - 30.7 %, cadmium - by 168.5%, toluene - by 50.2%, benzapyrene - by 6.9%.

The total volume of pesticides decreased by 5.2% during four years, while the introduction of insecticides increased by 16.5%, plant growth regulators - in 4 times, with reduced amount of rodenticides by 55% and herbicides - by 2.1%. However, although the total area of cultivated lands was reduced by 40%, the load on the used lands was not decreased, on the contrary, it was intensified. The content of nutrients (phosphorus and nitrates) on the Irtysh River and in the Caspian Sea is declining in some areas; the content of nitrates in the Caspian Sea in the summer period doubled, and in the spring time - increased in 22 times.

Pollutants worsen a quality of drinking water, air and make an adverse impact not only on biodiversity, but also on human health. With the existing resource-dependent economy and intensived agriculture it is very difficult to regulate pollutants, but more active efforts of the government in this direction and the inclusion of these issues into the state program give hope that the situation will be changed for the better in 2020.

Invasive and alien species are not properly considered in Kazakhstan. There are no special programmes on their control and regulation measures developed in the country. According to the survey, conducted in 2012, in the country there are various numbers of potential endangered species of natural biodiversity, namely - 26 types of fish, 1 type of birds, 5 types of mammals, a number of invertebrates and a high number of deliberately and incidentally introduced types of plants.

Only pests and agricultural diseases are under a targeted control: about 50 species of polyphagous and over 100 types of specialized pests, more than 70 kinds of diseases, 300 weed species, 10 species of quarantine units, damaging the agricultural production. Phytosanitary monitoring and phytosanitary measures are conducted against especially dangerous pests and quarantine objects with budget resources within the government programs "Plant Protection" and "Plant quarantine."

The use of fish and aquatic invertebrates is regulated by the Fishery Committee of MEWR RK and by its 8 site territorial inspections, organized by basins of major rivers and reservoirs. The challenges of regulation in the Caspian Sea are discussed annually with other Caspian regional states at the meeting of the Committee on aquatic bioresources of the Caspian Sea. Since 2006 fishery resources are regulated by securing fishery ponds with users for long-term periods (see above). The country takes regular efforts to prevent, detect and suppress facts of illegal fishing in the form of organized criminal activities, which is observed in all regions and in places, especially in the Caspian Sea (sturgeons).

Research and development activities are conducted every year on reservoirs and (or) areas of international, national and local importance in the framework of the budget program 039 "Conservation and reproduction of fish resources and other aquatic animals". The Programme for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013-2020 "Agribusiness 2020" includes measures of the state support to the commercial fishery. The main challenges are inadequate effectiveness of the local control over the observance of quotas and the inefficient procedure for the use of fish and other aquatic resources, and also not yet fully adjusted rules and regulations.

In order to conserve the biodiversity under increasing anthropogenic pressure it is necessary to establish a **representative system of protected areas**, ensuring their connectivity when protected key areas (reserves, national parks, reservats) are interconnected with less protected areas (nature reserves , protected areas) , as well as with elements of the ecological network - ecological corridors, forests, water protection zones and stripes and with other, to any extent, protected natural areas. Since 2010 until the present time, new SPAs have been opened and existing protected areas

have been extended under the Programme "Zhasyl damy" for 2010-2014. According to the programme during this period 13 new will be created and 7 PAs will be extended.

By the end of 2013 the system of PAs in the country includes 10 state nature reserves, 12 national natural parks, five state natural reservats, 50 state nature reserves; 26 monuments of nature; 5 state botanical gardens; 5 state reserve areas. Reserves, national parks and reservats among the types of protected areas aimed at conservation of biodiversity in-sity, have the status of a legal entity (i.e., its own administration, security staff, etc.).

From 2009 to 2013 the area of administrations of special protected areas increased by 1 million 16,6 thousand hectares, two new national parks and state nature reservats were created, a number of national parks were expanded. The total area of all 108 PAs of the republican (national) significance makes up 23,290,471 hectares, that is **8.6 %** of the country area. However, among them only 27 PAs (not counting botanical gardens) have the status of a legal entity, with a total area of 6,272,766 hectares , or 2.3 % of the country. Obviously this number is not sufficient. While there is a good positive trend - in 2009 the area of these categories of protected areas was 3769.1 thousand hectares , or 1.4 % of the entire territory of the country , and in 4 years, it increased by 66.5 %.

Regional ecological networks in Zailisk Alatau, Zhongarsk Alatau and the Altai region are under development. With the creation of the SNR "Altyn Dala" in 2012 it was initiated to start establishing a real ecological network in the arid steppes of Central Kazakhstan, with - for the first time in the country - mechanisms for creating ecological corridors between the SNR "Altyn Dala" and the Irgiz Turgay SNP. Elements of ecological networks are introduced also at the international level - these are the Western Tien Shan and Altai- Sayan ecological regions. These measures and methods should be then replicated in all natural complexes in Kazakhstan - mountain regions, forest-steppe, steppe, deserts, semi-deserts, coastal and aquatic ecosystems.

In the end of 2013, for strengthening the system of protected areas in the desert zone, a special project implemented by UNDP/ GEF/government was launched. Over the past 5 years the following projects of GEF UNDP/Government of the Republic of Kazakhstan played a significant role in the development of the SPAs system: "Integrated conservation of globally significant wetlands as waterfowl habitats", "Conservation and sustainable management of steppe ecosystems", "Conservation in-situ of mountain agro-biodiversity in Kazakhstan", "Conservation and sustainable use of biodiversity of Altai -Sayan Ecoregion".

The legislation of Kazakhstan has not a concept of a "biosphere reserve" as such. Nevertheless, two areas were listed in the UNESCO biosphere reserves in 2012-2013 - the state natural reserve "Korgalzhy" and "Alakolsky" and the nomination of the third territory - the state nature reserve "Akzhaiyk" is pending.

In order to ensure the conservation of wetlands, the country lists of wetlands of international and national importance were approved by the Order of the Ministry of Environment of RK on 6 September, 2013. The lists include all 10 Kazakhstan Ramsar areas, as lands of international importance, with the total area of 3,281,398 hectares and 44 areas of lands of republican (national) importance with the total area of 1,773,408 hectares. All these 54 sites are key bird areas of international importance (IBA), confirmed by the BirdLife International.

15 species, including 5 critically endangered *(Berberis karkaralensis, Calligonum triste, Lonicera karataviensis, Populus berkarensis, Sibiraea tianschanika*), 8 endangered and 2 vulnerable species of the flora in Kazakhstan attributed to **the globally endangered** species (categories CR, EN, VU, NT).

The list of rare and endangered plant species, at national level, approved in 2006, contains 387 species of plants. Rare plant species are actually conserved only in protected areas; special measures in other areas are not taken. As an exception, Sivers apple and common apricot can be considered; activities to conserve this type were conducted not only in protected areas, but also in the adjacent areas in 2006-2012 under the UNDP/GEF project "Conservation in-situ of the mountain agro-biodiversity in Kazakhstan."

In 2006 the national list of rare and endangered species (since 2006 the list has not been updated) include the following species: mammals - 40, birds - 57, reptiles - 10, amphibians - 3, fish - 18, annelids - 2, molluscs - 6, crustaceans -1, arachnids - 2 and insects - 85 species. 78 species of globally threatened species of categories CR, EN, VU, NT inhabit in Kazakhstan. The following 12 species of category CR are recorded in the country and this list include six species of fish *(Acipenser gueldenstaedtii* - Russian Sturgeon, *Acipenser nudiventris* - Ship Sturgeon, *Acipenser persicus* - Persian Sturgeon, *Acipenser stellatus* - Stellate Sturgeon, *Huso huso* - Beluga, *Pseudoscaphirhynchus fedtschenkoi* - Syr-darya Shovel-nose Sturgeon), 3 species of birds (*Leucogeranus leucogeranus - Siberian Crane, Numenius tenuirostris - Slender-billed Curlew, Vanellus gregarius - Sociable Lapwing*), 2 species of mammals *(Mustela lutreola - European Mink, Saiga tatarica - Mongolian Saiga),* and one type of (*Dreissena caspia*).

It should be noted that up to 90% of the world number of the globally endangered amphibian species *Ranodon sibiricus (*Semirechensk Salamander, EN*), Sandpiper black-sided lapwing Vanellus gregarius (*Sociable Lapwing, CR*)* and saiga antelope *Saiga tatarica* (Mongolian Saiga, CR) inhabit in Kazakhstan. Therefore, Kazakhstan is particularly responsible for their conservation.

The main threats for the sturgeon are illegal fishing, against which regular measures are taken, and the pollution of the Caspian Sea. Rare species in the Caspian Sea are restored due to breeding of new fish and releasing of fish juveniles but these measures and anti-poaching activities are not sufficient to state that the danger for these species is over. In basins of Syr Darya and Ili rivers Syr Darya shovelnose (*Pseudoscaphirhynchus fedtschenkoi*) and *Acipenser nudiventris* are still under the threat of total disappearance.

Only sociable lapwing, one of three critically endangered bird species, nests in Kazakhstan. The monitoring of the population showed growth and stabilization of its number in the last 5 years. The threat to the existence of these species dramatically reduced. There is a threat to populations of the saker falcon (*Falco cherrug*), the amount of which was dramatically dropped the south-east of the country in the late 1990s and in the west - in 2005-2009, as a result of illegal trapping.

Kazakhstan demonstrates visible success in restoration of the Kazakh saiga population, which numbers fell down from more than a million heads in the early 1990s to about 30 thousand in 2002. The main reason was illegal hunting for horns to be exported to China. Hunting for saiga has been completely banned for already 15 years and this requirement was extended until 2020. Since 2003 the government has taken increasing efforts to save these species and cooperate with hunters, research and public organizations. The GEF/UNDP project "Conservation and sustainable management of steppe ecosystems," contributed to conservation of these species, primarily through participation in the expansion of the network of protected areas (the new reserve "Altyn Dala"). The total number of saga more than doubled within 4 years, and constitutes 187 thousand of heads; however, the saiga population is Usturt is still extremely endangered.

Under state programmes for the conservation of rare ungulates the following species, threatened at the national level, are successfully preserved: tugai deer (*Cervus elaphus bactrianus*),

Asiatic wild ass (*Equus hemionus*), goitred (*Gazella subgutturosa*), mountain sheep or argali (*Ovis ammon ssp., Complex subspecies*).

With regard to certain species, memorandums under the Bonn convention were signed, several national action plans were approved (Single Species Action Plan). Some aspects of conservation of certain species (including action plan development) were supported by a number of GEF/UNDP projects.

Regular monitoring of rare species is currently implemented only in SPAs; vertebrate animals are partially recorded in hunting farms; and only ungulate and sturgeon species are registered within special programmes. There is no a unified system of monitoring of wildlife and its specific species in Kazakhstan.

Both government and non-government sectors represent **the scientific potential** of Kazakhstan in the sphere of biodiversity. Researches are funded based on the state procurement programme or using grant resources, including international ones. Applied researches are regularly funded by programmes of MEWR RK. The biodiversity issues occupy a relatively small place in the programmes of the Ministry of education and science in RK. Since 2012 procedures for assessment of ecosystem services have been started developing. Methods of regulating recreational loads, measurement of damage to wildlife, whilst destructing habitats etc., are being developed.

In order to accumulate and effectively use knowledge on biodiversity conservation since 2010 the creation of the system of cadastre on biodiversity has been accelerated. This project is implemented upon the state procurement programme with the potential involvement of a number of databases that have been already created in Kazakhstan on various projects: the database on ecosystem monitoring in protected areas, on forests, the mountain agro-biodiversity, steppe ecosystems and others.

In 2009-2013, good results were achieved in some aspects of the CBD implementation, namely: conservation and restoration of some threatened species (the best example is saiga); the local ecosystem restoration (the Small Aral Sea, local recovery of pastures); creation of new and expansion of existing protected areas, starting up of ecological networks; extension of the list of protected wetlands; reforestation and improvement of management plans in forestry; acceleration of commercial activities in hunting and fishing sectors. The environmental legislation was improved and this work is still in progress. However , due to a predominantly resource-oriented nature of the economy, the load on ecosystems is still increasing.

Regulation of the pollution and man-made destruction of ecosystems is connected with enormous challenges; increase of land areas, used for mining, related highways etc.. There are apparent gaps in the network of protected areas, covering different types of habitats, especially in deserts. In addition to the continued ineffective legislative and regulatory framework, serious problems associated with execution of the legislation and the lack of control on the ground for various reasons; including corruption and lack of skills, still remain. There are obvious problems in the forestry sector (forests are distributed at the national and regional levels), in fishery and hunting sectors. For adequate assessment of the state of biodiversity and ecosystems and for appropriate decisions there is a lack of timely and quality information. The " Zhasyl damy " programme, although playing a very important role, does not cover all key issues related to the conservation of biodiversity, and can not substitute the lack of the national strategy and the action plan for the conservation of biodiversity.

At the national level it is necessary to fulfil the following tasks:

- Complete implementation of already adopted state programmes (the Concept of a green economy, «Zhasyl damy» and others);

- Further improvement of the legislation, rules and regulations to support hunting, fishery and forestry entities;
- Creation and acceleration of systems of monitoring and state inventories on ecosystems, wildlife, forestry and hunting sectors etc..
- Enhance environmental requirements for the use of water, forest, land, biota, with the improvement of evaluation methods of ecosystem services and biodiversity damage, as well as strengthen capacity of the state and public environmental expertise;
- Conduct advocacy activities on conservation of biodiversity and environment, as well as customised training programs in the sphere of biodiversity both at the governmental and non-governmental levels;
- Join the Nagoya Protocol and, preferably, other most important international instruments in the framework of ratified Conventions (AEWA, Memorandum for the conservation of birds of prey, etc.).

Finally, there is an urgent need to adopt **the National Strategy and Action Plan on biodiversity conservation,** which will ensure the coordinated efforts of all departments and will take into account all those aspects, which, currently, are not practically reflected in other policy documents.

SECTION I. GENERAL OVERVIEW OF SITUATION WITH BIODIVERISTY, RELEVANT TRENDS, THREAT FACTORS AND CONSEQUENCES FOR HUMAN BEING

General description of natural conditions and biodiversity

Kazakhstan is located deep inside of Eurasia and occupies central and southern latitudes of the temperate zone from 55 ° 26 n. to 40 ° 59 n. and from 46 ° 05 ' e. to 87 ° 03 e.. The length of the country is 1,600 km from the north to the south and 3,000 km from the east to the west; the area is 2.72 mln km^2.

Kazakhstan enjoys the unique set of landscapes, ranging from deserts to high mountains and ecosystems of inland seas. Moreover, arid and sub-humid lands cover more than 75 % of the area of the Republic of Kazakhstan. They account for over 40% of the species composition of the entire biodiversity.

Flora

According to various assessments, the flora of Kazakhstan amounts to more than 13 thousand species, including more than 5754 species of higher vascular plants, about 5000 - mushrooms, 485 - lichens, more than 2000 - algae, about 500 - bryophytes. Species of mushrooms and higher plants went through the complete inventory.. Among them, 14% of plant species, including a lot of relicts, are endemic species in various degrees.

The vegetation of Kazakhstan is very diverse. Above all, those species, which are widespread in Eurasia, should be noted among the main plants grown in the country. The largest area is occupied with steppe and desert types of vegetation. Besides, species, typical for tundra (cold deserts), meadows, forests, bush and marsh species, are specific for the country. Among the few distinctive types related to arid regions of Central Asia it is necessary to list the following: juniper woodlands, umbellate, savanna, phryganoid (thorn-bush and mountain wormwood) species, and with the mountains of the continental Asia – cryophyte and cushion plant types.

Kazakhstan has centers of endemism of the flora (the Karatau mountains, the Western Tien Shan), unique natural ecosystems - pine forests in sands (Ara-and Aman Karagai, Naurzum); forest and steppe sites in lowlands of Central Kazakhstan, original, in terms of the floristic composition, desert communities in Betpak Dala, the South Pribalkhashje, the Ili basin; a set of xyliums, shrub and steppe communities of the Southern Altai and Kalbinskyi Tarbagatay mountains; middle land Jungar Alatau and Tien Shan mid-mountains with spruce forests and fragments of apple forests; wetland ecosystems in the Lower Urals, Torgay hollows, Tengiz, Alakol lakes; floodplain forests (riparian forests) in Syr Darya, Ili and Charyn.

The State Forest Fund of RK (hereinafter - SFF), according to the records of the forest fund, as at 1 January 2013, makes 28,787.7,0 ha or 10.6% of the total area of the country. The forest lands cover 12,548.6 ha or 43.6% of the total land area of SFF, the forest cover is 4.61%.

The forest vegetation communities include wide composition of tree species (over 20 species) and shrubs (over 40 species).

Kazakhstan's forests are divided into birch pins in the northern regions, island forests in the north-west, pine forests in Kazakh uplands, ribbon forests on the right bank of the Irtysh River, mountain

forests in Altai and Saura, the Jungar Alatau and Tien Shan mountains, saxaul forests, riparian, floodplain intrazonal forests.

Agrobiodiversity of flora

Kazakhstan concentrates unique plant genetic resources of agricultural biodiversity (ABD) of global significance. According to 2013 they include 226 species of wild counterparts of cultivated plants, determining the genetic potential of 24 crops. Some of them represent significant value both to agriculture, and expansion of the export capacity.

Fruits ABD, primarily, wild apple trees (Silvers' apple tree - *Malus sieversii* (*Ledeb.*) *M.Roem.*, Niedzvetskyi's apple tree - *Malus niedzwetzkyana Dieck.*) and ordinary apricot (*Armeniaca vulgaris Lam.*) are globally recognized. They grow in mountain forests of the Western Tien Shan, Karatau, the Kyrgyz Alatau, Zailisky Alatau, Ketmen, Jungar Alatau and Tarbagatay. Almost all modern effective commercial cultivars of these crops contain genes of wild apple trees.

Kazakh genetic resources of natural pistachio (*Pistacia vera L.*), common almond (*Amygdalus communis L.*) and wine grapes (*Vitis vinifera L.*) have the most far-reaching importance, primarily, from the economic point of view. The most northern land areas of these species are located in Kazakhstan. This creates the genetic basis of winter and cold resistance in their natural populations.

Kazakhstan has 10 types of currant (*Ribes spp.*) and gooseberry (*Glossularia spp.*), which can and must provide expanded efficient use of these fruit crops in fruit farming that experiences the lack of production of berry products. Since the previous National Report on Biodiversity the situation with underused resources is the same.

The vegetable ADB of Kazakhstan includes carrot (*Daucus carota L.*), purslane (*Portulaca oleracea L*), asparagus (*Asparagus*), onion and garlic (*Alliums spp.*). 120 species of wild counterparts of these crops, including their grandparent species, grow in Kazakhstan. This richest genetic material has both national and global value. The most promising species are alliums *(Allium spp.).*

Agro-biodiversity of floral and ornamental plants has great prospects. For example, Kazakhstan concentrates enormous genetic and species diversity of tulips - 31 species in the *Tulipa* species.

Natural ADB of technical plants (flax - *Linum spp.*, safflower - *Carthamnus spp.*, indus - *Eruca spp.*, summer rape, mustard - *Brassica spp.*) and fodder (primarily, alfalfa - *Medicago spp.*).

The country has nurtured and zoned more than 70 varieties of cereals, 68 varieties of fruit and berries, more than 60 varieties of vegetables and melons, more than 20 varieties of potatoes.

In 2013, the annotated list of medical plants, growing on the territory of Kazakhstan, which includes 1525 species of 622 genera, belonging to 136 families of higher flowering plants, was finalized.

1.1.2. Fauna

The fauna of Kazakhstan is represented by a variety of species both strictly protected and widely used for commercial and economic purposes. According to reliable sources, 846 species of vertebrate animals, including mammals – 178, birds - 499 (of which 396 nesting; another 38 species to be confirmed), reptiles - 51, amphibians - 11, fish – 104, cyclostomes –3 species inhabit in the country.

Insignificant changes in the number of species of birds, reptiles and amphibians, compared to the previous biodiversity report (2009), relate to either revision of the systematic position of some taxons, or registered birds and critical analysis of previous findings.

According to the legislation of RK, the category of valuable species, which are fishery, relate to 52 species, 34 вида mammals and 59 species of birds are targets in hunting.

The inventory of fauna of invertebrates is still underway and apparently, only about half of actually existing species has been identified. To date, it appears that Kazakhstan has at least 80,000 species of invertebrates, including no less than 60,000 species of insects, relating to 28 groups with beetles alone no less than 10 thousand species.

At the moment, only about 100 of 550 families of insects, represented in the fauna of Kazakhstan, were fully studied, and just 40% of the species composition was identified, not mentioning an extremely poor knowledge of biological, ecological characteristics of species and their expansion. There has been a little progress in researches of invertebrates for the last 5 years.

Agrobiodiverisity of fauna

Agrobiodiversity of fauna (wild counterparts of domestic animals) of Kazakhstan, as five years ago, was insufficiently studied and is still hardly used in breeding.

Vertebrate species, which relate to wild ancestors of domestic animals, inhabit on the territory of the country: mammals - mouflon (*Ovis vignei*), five subspecies of argali (*O.ammon*), wild boar (*Sus scrofa*), Asiatic wild ass (*Equus hemionus*), jackal (*Canis aureus*), wolf (*C.lupus*), spotted cat (*Felis lybica*) and several others. Among birds, first of all, ducks (*Anatidae* - ducks, geese) and chicken (*Gallidae*) inhabit in Kazakhstan.

One of the famous examples of successful use of the genetic material of wild animals to improve the economic qualities of domestic animals is breeding of sheep "Arkharo Merino" in Kazakhstan, which were raised out of a wild mountain sheep (*Ovis ammon*). These hybrids have valuable qualities of the breed "merino" and they are resistant to climatic factors and diseases specific for wild sheep.

Local breeds of domestic animals, including Kazakh breeds: cattle - 4 (*Alatauskaya. Aulieatinskaya, Kalmyk, Kazakh white-headed*), sheep - 9 (Edilbekskaya, Kazakh fat-tailed and coarse-wool, semi-coarse-wool, Tsygayskaya, Kazakh fine wool, South Kazakhstan and North –Kazakhstan merino, Kazakh argali-merino, Karakul sheep), goats - 3 (local coarse-wool, woolly, downy), horses - 2 (Adaevskaya, Kazakh horse of the toad line).

It should be noted that a number of wild animals is used in the country without breeding of agricultural species, since they have necessary consumer properties; they don’t need to be divided into zones and do not require adaptation to the Kazakhstan conditions and can breed in captivity. One of the most successful examples of the above is artificial breeding of a red deer (*Cervus elaphus*) in conditions of the Eastern and Central Kazakhstan.

Various wild fur-bearing animals, some of which have been successfully grown in captivity, are actively used, namely the following: mink (*Mustela vison, M.lutreola*), sable (*Martes zibellina*), fox (*Vulpes vulpes*). The breeding and genetic potential of other valuable wild fur-bearing animals has good prospects in Kazakhstan: stoat (*Mustela erminea*), bobac (*Marmota bobac*), grey marmot (*M. baibacina*), muskrat (*Ondatra zibethicus*), otter (*Lutra lutra*), domestication processes of which are quite successful. However, due to the relatively low demand in furs and weak traditions of fur farming, this industry is not well developed in the country.

When developing appropriate biotechnical measures, it is possible to use semi-free or creep grazing of saiga (*Saiga tatrica*), experiments on domestication of which have been made for many years in Kalmykia. The unsuccessful first attempt so far of creating a saiga breeding farm was made in Western Kazakhstan with the support of a grant from MES in 2012-2013.

There are enough great prospects for breeding of popular hunting species in farms, primarily, bustards *Otis*, *Tetrax* and *Chamydotis*, pheasants (*Phasasnius colchicus*) and other rasorials. The pheasant has been already successfully bred in a number of hunting farms in the Almaty and the Akmola regions. The farm for breeding of houbara bustard (*Chlamydotis undulata macqueeni)* was opened with the UAE support in the Southern Kazakhstan region, with plans to release up to 5000 birds per year into the wild.

Such popular species as ringed (*Streptopelia decaocto*), mild (*S.turtur*), large (*S.orientalis*) and small (*S.senegalensis*) turtledoves, a black lack (*Melanocorhypha yeltoniensis*), mottled rock thrush (*Monticola saxatilis*), lane (*Acridotheres tristis*) and other species of passerine birds, can be bred as "exotic" ones.

Currently, about 7-10 forms, including hybrids of fishes and cyclostomes, are being bred. They include sturgeon (*Acipenseridae*) in the Caspian Sea, whitefish (*Coregonidae*) in Northern and Eastern Kazakhstan, far eastern herbivorous (grass carp - *Ctenopharyngodon idella* and silver carp - *Hypophthalmichthys molitrix, Aristichthys nobilis*) - mainly in the southern regions, carp (*Surshsh carpio*) virtually everywhere (actually, a mixture of wild and domestic forms of carp), as well as some hybrids. Pond fishery, in the last five years, is steadily developing.

The following species are interesting as a genetic fishery resource: herrings (*Clupeidae*), nelma (*Stenodus l.nelma*), white salmon (*Slleucivhthys*), grayling (*Thymalus arcticus*), trout (*Huso taimen*), pike (*Esox lucius),* Caspian roach (*Rutilus rutilus caspius*), kutum (*R.frisii*), tench (*Tinea tinea*), barbels (*Barbus brachycephalus and V.capita*), schizothorax (*Schizothorax spp.),* Balkhash perch (*Perca schrenkx*). These types can be used both in pure breeding and for genetic purposes to increase productivity of wild populations, however, it is necessary to take into account the danger of altering the genetic structure of the latter.

As targets of aquarium breeding, the following fish fauna species in Kazakhstan are interesting, primarily small cyprinids (*Cyprinidae*) and loaches (*Cobitidae*), among which there are endemic and sub-endemic forms. The most interesting species, in this regard, are loaches (*Noemacheilus conipterus, N.strauchi, N.kuschakewichi etc.*), adequate south-eastern Asian representatives of *Acanthophthalmus* and limnophilic and endemic species of minnows (*Phoxinus brachyurus, Ph.poljakowi, Ph.percnunis ignatowi*). Potentially, this group may include tench (*Tinea tinea*) and stickleback of *Pungitius*. However, at present this group of species is almost not used.

Amphibians and reptiles are important as genetic resources, primarily species of poisonous snakes: adder, the eastern steppe, Altai (*Vipera berus, V.renardi, V.altaica*) and copperhead snake (*Gloydius halys*), and also the species used in traditional oriental medicine: Semirechye salamander (*Ranodon sibiricus*), eastern boa (*Eruh tataricus*) and other species. Distinctness of herpetofauna provides an opportunity for its breeding and exporting as exotic ones. Among them there are different types of lizards (*Sauria*), of the genera of *Teratoscincus, Crossobamon, Alsophylax, Cyrtopodion, Mediodactylus, Trapelus, Phrynocephalus, Ablepharus, Asymblepharus and Eremias,* snakes (*Serpentes);* genus of *Eryx, Elaphe, Hemorrhois, Hierophis, Platyceps, Psammophis and Spalerosophis*. Reptiles with a commercial demand, for example, are Central Asian tortoise (*Agrionemys horsfieldi*), previously exported in large quantities (currently production of these species is terminated).

1.1.3. Main types of ecosystems

Kazakhstan, due to its unique combination of natural complexes of steppes, deserts, mountains, major inland waters with rivers draining into them and the vast deltas, has a great diversity of ecosystems and relevant types of flora. There is a full range of subzonal options of steppe vegetation, deserts and mountain zones, typical for central Eurasia, in Kazakhstan.

1.1.3.1. Low land ecosystems

Distribution of ecosystems in plains are subject to the law of the latitudinal zonation that leads to consecutive change of 3 zonal types of ecosystems: forest-steppe and meadow-steppe, steppe and desert.

Forest and steppe and meadow-steppe ecosystems

The forest&steppe and meadow&steppe zone occupies 5.8 mln ha. The vegetation cover is represented by forests (0.7mln ha) and rich grassland transformed steppes. Forest&steppe ecosystems, located only in the north of Kazakhstan, have combinations of birch and aspen- birch forests on grey forest soils with non-forested land, which are covered in the northern part with gramineous-mixed herbs and mixed herbs-gramineous meadow steppes on leached black soil. Ecosystems of forest outlier are dominated in the southern part. Aspen-birch (*Populus tremula, Betula pendula)* forests in dishes on malts, are rotated with red mat grass, rich in herbs and carrot and red mat grass (*Stipa zalesskyi, Peucedanum morisonii*) steppes. Meadow and steppe area are ploughed up to 60-90 %.

The fauna of forest-steppe and meadow-steppe zones includes 48 species of mammals. The greatest number of species relate to the group of rodents (*Rodentia*) - 21, followed by predators (*Carnivora*) - 11, insectivores (*Insectivora*) - 7, bats (*Chiroptera*) - 5, cloven-hoofed (*Artiodactyla*) - 3 and lagomorphs (*Lagomorpha*) - 2. Only red-backed mouse (*Clethrionomys glareolus*) inhabits in the forest, the other species are distributed in the territory of two or more natural areas. Along with wild forms, such as roe deer (*Capreolus pyga*rgus), moose (*Alces alces*), common hedgehog (*Erinaceus europaeus*), forest birch mouse (*Sicista betulina*), there are also inhabitants of open (steppe) landscapes in the forest-steppe - steppe polecat (Mustela eversmanni), corsac (*Vulpes corsac*), etc.

More than 167 or 42.9% of all species, nesting in the country, nest in the forest-steppe zone. In systematical terms these birds belong to 9 groups: shore birds (*Charadriiformes*), rasorial (*Galliformes*), predatory (*Falconiformes)*, owls (*Strigiformes*), pigeon type (*Columbiformes*), cuculiformes (*Cuculiformes*), goat suckers (*Caprimulgiformes*), piciformes (*Piciformes*) and passerines (*Passeriformes*). Most of them are forest birds, connected with trees and shrubs.

There are 20 key ornithological areas of international importance in this zone (Important Bird Areas, or IBA) out of 121, described in Kazakhstan (Sklyarenko et al., 2008) – the map of location and the list attached in Appendix II. They inhabit mostly in wetlands, including small preserved unplowed steppe areas, and also forests. The total area of IBA is 614828 ha, or 10.6% of the total land area. They are of the utmost importance, primarily as a halting points of migrating waterfowl anseriformes, including the globally threatened red-breasted goose (*Rufibrenta ruficollis*) and lesser white-fronted goose (*Anser erythropus*), and forest areas as nesting sites for carnivorous birds.
The most common amphibians are green toad (*Bufo viridis*) and moor frog (*Rana arvalis*). Siberian salamander (*Hynobius keuserlingii*) and a grass frog (*Rana temporaria*) are specific to the forest-steppe zone.
Snakes are dominated by the number of species of reptiles (7 species).
About 3,500 species of insects have been identified, but they can amount to at least 5-7 thousand species.

Steppe ecosystems

Steppe ecosystems occupy a vast area in Kazakhstan (110.2 mln ha, about 28% of the total area of Kazakhstan), covering the entire northern half of the country.
Turf grasses dominate in plant communities of steppe ecosystems and the soil cover has a special structure with maximum accumulation of organic matter in its upper part (sod horizon).

Land cover ecosystems are gradually changing from north to south, resulted from a change of the hydrothermal regime. These changes appear both in an interchange of ecological groups of species, from slightly drought-resistant to normally drought-resistant, and in general reduction of the grass density, as well as in changes in the thickness of the humus horizon and content of the organic matter. All this determines sub-zonal breakdown of steppe ecosystems in the latitudinal alignment.

The following types of subzonal steppe ecosystems exist in Kazakhstan:
• ***Ecosystems of arid steppes*** (moderately dry – rich grassland-feather grass steppes, arid, grass and feather grass steppes);
• ***Dry steppe ecosystems*** (moderately dry sod-grass gramenous; xerophytic, rich in herbs and humus gramineous);
• ***Desert- steppe ecosystems*** (deserts, sagebrush – bunchgrass, sod-grass gramineous) .

The arid steppe ecosystem (area 20.1 mln ha) are distributed in the spur of the Common Syrt, Under-Urals, Trans-Urals, in the plains of the West Siberian Plain, the northern outskirts of the Turgay plateau and the Central Kazakhstan Hummocks.

Natural plant communities are rich – red feather grass, carrot – red feather grass. They are distinguished by the richness of the floristic composition and the large grass closeness. Red feather turf grasses (*Stipa zalesskyi*), fescue (*Festuca valesiaca*), ovsets (*Helictotrichon desertorum*), less kovylok (*Stipa lessingiana*) dominate and there is a high diversity of forbs as moisture-loving and dry grasses. During the mass development of virgin lands in the 1950s - 1960s arid steppes were under cultivation almost entirely. After the collapse of the USSR some arable lands were abandoned, but now they are gradually back in use.

Dry steppe ecosystems (the area 57.2 mln ha) cover the general Syrt, a part of the Caspian Lowlands, Subural plateau, Mugodzhar, the Turgay Plateau, Central Kazakh Hummock and the southern edge of the West Siberian Lowland (pre-Irtyshsk plains).

Natural communities of arid steppe ecosystems are represented by fescue and feather grass steppes and xerophytic - feather grass steppes, in which tussock grasses of Stipa Lessing or sandy needle grass (*Stipa lessingiana*) dominate on loamy soils, fescue (*Festuca valesiaca*), on light-textured soils (loamy and sandy loamy) - Stipa (*Stipa capillata*), and on rocky undeveloped - Kyrgyz feather grass (*Stipa kirghisorum*), oat grass (*Helictotrichon desertorum*). Grasses play a subordinate role in building communities and the share of its participation in communities does not exceed 10-15 %. It is represented only by steppe xerophytes, which are characterized by high abundance of Tatar goldylocks (*Galatella tatarica*) and pyrethrum (*Tanacetum achillaefolium*).

Desert-steppe ecosystems (**ecosystems of desertified steppes**) spread out from western borders of Kazakhstan to the foothills of Altai, Saur and Tarbagatai for over 2,500 km and cover the Caspian lowland plains, the Subural and Turgay Plateau, as well as a significant part of the south central Kazakhstan Hummocks (the area is 32, 9 mln ha).

Sagebrush and feather grass steppes dominate in plant communities. Sandy needle grass (*Stipa Lessing, Stipa lessingiana*), tyrsik (Stipa sareptana) and oat grass (Festuca valesiaca) predominate among the sod grasses. Mandatory co-dominants are suffrutescent desert-steppe and desert species of wormwood: wormwood Lessing (*Artemisia lessingiana*), in the west - Lerch wormwood (*Artemisia lercheana*), fine wormwood (*Artemisia gracilescens*), in the east - semi-lessing wormwood (*Artemisia sublessingiana*), on saline soils everywhere - black sagebrush (*Artemisia pauciflora*). Wild grasses are few and include only xerophytes. Ephemeroids and ephemers here play a more active role than in dry steppe ecosystems.

The fauna of the steppe zone is represented by 73 species of mammals, including 35 rodents (*Rodentia*), 13 carnivores (*Carnivora*), 9 bats (*Chiroptera*), 7 insectivores (*Insectivora*), 5 artiodactyls (*Artiodactyla*), 4 lagomorphs (*Lagomorpha*) species.
156 species of birds (40.2% of the total number in the country) nest in the steppe zone (including intrazonal ecosystems). They include representatives of 12 groups, mainly anseriformes (*Anseriformes*), falconiformes (*Falconiformes*), owlformes (*Strigiformes*), galliformes (*Galliformes*), gruiformes (*Gruiformes*), goatsuckers (*Caprimulgiformes*) and passeriformes (*Passeriformes*).

Characteristic species and groups are as follows: cranes (*Gruidae*), bustard (*Otis tarda*), steppe eagle (*Aquila nipalensis*), pallid Harrier (*Circus macrourus*), sociable lapwing (*Chettusia gregaria*), short-eared owl (*Nyctea scandiaca*), common nighthawk (*Caprimulgus europaeus*), wagtails (*Motacillidae*), larks (*Alaudidae),* including specific for ecosystem black (*Melanosorypha yeltoniensis*) and white-winged *M. leucoptera* larks), titlark (Anthus spp.).

Typically steppe biotopes are diversified with upland hummock, populated with species-petrophyle - from the steppe kestrel (*Falco naumanni*) and pied wheatear (*Oenanthe pleschanka*) to such mountain dwellers as a mottled rock thrush (*Monticola saxatilis*), desert bullfinch (*Bucanetes mongolicus*) or Indian warbler (*Phylloscopus griseolus*).

Nests of golden eagles (*Aquila chrysaetos*) and steppe eagles (*Aquila nipalensis*) are also located here.

Two globally threatened species turn to be grown in number: significant with regard to little bustard (*Tetrax tetrax*), and slow - the great bustard (*Otis tarda*).

Zones of arid, dry steppe and desert-steppe ecosystems have 39 key ornithological areas (IBA) in the total area of 5,662,147 ha, or 5.2% of the total area of these zones (Appendix II). Besides

wetlands, these are land island forests, as well as some mountain groups and hummock with surrounding areas of well enough retained steppe landscapes.
The amphibian fauna includes six species, reptiles - 14 species.
Targets of amateur hunting of mammals in forest-steppe and steppe landscape zones are brown hare (*Lepus europaeus*), blue hare (*L.timidus*), wild boar (*Sus scrofa*), roe deer (*Capreolus pygargus)*, moose (*Alces alces*); targets of fur trapping - fox (*Vulpes vulpes*), korsak (*V.corsac*), wolf (*Canis lupus*), ermine (*Mustela erminea*), weasel (*M. nivalis*), steppe polecat (*M. eversmanni*), badger (*Meles meles*), squirrel (*Sciurus vulgaris*), bobac (*Marmota bobac*).

Traditional targets of hunting birds are primarily span geese and ducks, as well as the grey partridge (*Perdix perdix*), wood grouse (*Tetrao urogallus*), black grouse (*Lyrurus tetrix*), pigeons, large species of sandpipers.

Desert ecosystems

Deserts (the area of 124.6 mln ha) cover the regions of the Caspian lowlands, the Mangyshlak peninsula, the Ustyurt plateau, the southern Turgay mesa country, the Kazakh hummock (the eastern Betpak-dala and pre-Balkhash), Turan lowland (the Aral Sea region), Kyzyl Kum sands, Moin-kum, Alakol depression and Ili basin and in the south deserts reach the foothills of the Northern Tien Shan, Zhetysusky (Dzhungarskiy) Alatau and Tarbagatai mountains.

The desert vegetation, with a high proportion of semi-shrubs and shrubs, features low species diversity, small projective cover and absolute dominance of drought-resistant species of xerophytes and hyper-xerophytes. The main dominant communities of desert ecosystems in Kazakhstan are sagebrush and perennial halophytes, in the sands - psammophyte shrubs and Haloxylon, salt marsh - halophytic succulent saltwort, both annual and perennial. Large areas with a predominance of wormwood (*b. Artemisia*) are found mainly in the northern foothills and deserts.

Plains in Kazakhstan represent the following three subzonal, climate-driven types of desert ecosystems: the northern, middle and southern, as well as a special climate type of piedmont deserts. .

The northern (steppificated deserts) are in the brown desert soils (the area - 40.0 mln ha). They are characterized with semishrub communities, mostly sagebrush, rarely long-term salty communities. The specific feature of plant communities is available steppe grasses of feather grass (*Stipa sareptana*), Kyrgyz Stipa (*Stipa kirgisorum*), Richter feather grass (*Stipa richteriana*) on the sands of wheatgrass (*Agropyron fragile*).

Middle deserts (the area is 51.2 mln ha) on the grey-brown desert frozen soils. Perennial grasswort dominate here - Anabasis salsa (*Anabasis salsa)*, black boyalych (*Salsola arbusculiformus*), tasbiyurgun (*Nanophyton erinaceum*), saltwort eastern (*Salsola orientalis*), and sagebrush species such as Artemisia white earth (*Artemisia terrae-albae*) and Turan (*Artemisia turanica*). White Haloxylon (*Haloxylon persicicum*) and black (*H. aphyllum*) are widespread in sands and psammophilous shrubs and semi-bush types of Calligonum (*Calligonum*), ephedra (*Ephedra*), sand acacia (*Ammodendron*) are very typical.

Southern deserts (the area is 30.3 mln hectares) occupy the southern part of the arid- denudation Ustyurt plateau and the sand massif - Kyzyl Kum. The hydrothermal regime is sharply changed in the direction of heat and dryness. Soils are grey-brown and briefly frozen or non-freezing. Semi-shrubs and bushes dominate in the southern deserts, but their species composition is changing. There is domination of the communities of *Salsola gemascons* and *Artemisia kemrudica*. The

phytocenotic role of ephemera and ephemeroids, especially sedge physocorpaus (*Carex physodes)* in sands in halyhylon deserts and dzhuzgunniks is increasing.

Foothill deserts (the area is 14.8 mln ha). The leading factor in the formation of ecosystems in foothill areas (plains, hummocks, sandy massifs) is a significant increase in rainfall as a result of effects of the foothill moisture that forms a “humid foothill " zone. In the foothill areas rain falls 2-3 times more than on the plains outside the influence of the mountains. Foothill deserts are found in the foothills of all mountain systems of Kazakhstan - from Tarbagatay to Karatau and the Western Tien Shan. The main types of soils in ecosystems in piedmont deserts are light grey desert soils (northern and southern).
The main dominant of communities of desert ecosystems in Kazakhstan are wormwood and grasswort. In the sands - psammophyte shrubs and saxaul. Salt marshes have both annual and perennial halophyte and succulent halophyte. Large areas predominant with wormwood (*p. Artemisia)* can be found mainly in the northern foothills and deserts. Foothill deserts, except for communities of semishrubs and shrubs, are characterized with well-defined layer of ephemeroids formed with bulbous meadow grass (*Poa bulbosa*) and sedge (*Carex pachystilis*).

Intermountain hollow-desert ecosystems. Intermountain basins (Ili, Zaysanskaya) is characterized with a special concentric pattern of shifts of subzonal ecosystems, the so-called ring inversion structure of zoning. Typically, the central, which is the lowest part of the basin, is occupied with the most arid desert ecosystem; the median part is represented by ecosystems indicating a zonal position of the hollow. The areas, adjacent to the mountains, are usually represented with less arid piedmont types of communities.

The fauna in the desert zone has 119 species of mammals, including groups: rodents (*Rodentia*) – 53, carnivores (*Carnivora*) – 21, bats (*Chiroptera*) – 20, insectivores (*Insectivora*) - 12, artiodactyls (*Artiodactyla*) – 7, lagomorphs (*Lagomorpha*) - 5, equids (*Perissodactyla*) - 1 type.

The desert zone is characterized with 36 species, the most typical representatives of which are a long clawed ground squirrel (*Spermophilus leptodactulus*), a yellow squirrel (*S. fulvus*), most species of sand lance (*Rhombomis, Meriones*) and gerbils (*Allactaga etc.*), piebald shrew (*Diplomesodon pulchellum*), eared hedgehogs and Brandt’s hedgehog (*Erinaceus auritus and E. aethyopicus*), tolai hare (*Lepus tolai*), sand gazelle (*Gazella subgutturoza*), saiga (*Saiga tatarica*), urial (*Ovis vignei*) - in the low desert mountains in Mangyshlak and Ustyurt, a dune cat (*Felis margarita*), caracal (*F. caracal*). Endemic of deserts of the south-east Kazakhstan is selevinia (*Selevinia betpakdalensis*).

The desert area has about 200 species of nesting birds - 51.4 % of the total number in Kazakhstan. The background types of nesting types are as follows: a long-legged buzzard (*Buteo rufinus*), a common nighthawk (*Caprimulgus eiropeus*), steppe (*Melanocorypha calandra*) and gray (*Calandrella rufescens*) larks, Isabelline chat (*Oenanthe isabellina*), red-headed bunting (*Emberiza bruniceps*) and others. *Specific zone types* are as follows: houbara bustard (*Chlamydotis undulata*), saker falcon (*Falco cherrug*), Caspian dotterel (*Charadrius asiaticus*), black bellied (*Pterocles orientalis*) and white bellied (*Pt. alchata*), sandgrouse, Pallas sandgrouse (*Syrrhaptes paradoxus*), Egyptian nightjar (*Caprimulgus aegyptius*), desert warbler (*Sylvia nana)*, saxaul sparrow (*Passer ammodendri*) , etc.

The desert zone identifies 38 key bird areas (IBA) on the total area of 6,983,093 ha, or 5.6% of the total area of these zones (Appendix II). In addition to intrazonal wetlands, these are certain

mountain groups, upland areas with well-preserved adjacent desert areas and vast deserts themselves.

Deserts are inhabited with 65.2% of all species of reptiles and 25% of amphibian species in Kazakhstan. The sandy desert includes the most extensive collection of reptiles - 20 species of lizards and 7 species of snakes. However, the species composition of amphibians is poor - only 2 types. The stony deserts contain 10 types of lizards, 3 types of snakes and 1 type of amphibians, in the clay desert - 13 species of lizards, 7 species of snakes and 2 species of amphibians. Most amphibians and reptiles avoid saline deserts.

The desert zone of Kazakhstan reveals more than 2,500 species of insects of Orthopterd insects (*Orthopterd*) - about 200, homopterd (*Homopterd*) - about 900, coleoptera (*Coleoplera*) - more than 900, hymenoptera- about 900, diptera - about 500. The most diverse population of insects is in the desert clay (about 2000 species).

The targets of the amateur hunting in the desert zone (including intrazonal biotypes) are Tolai hare (*Lepus tolai*), in some places hare (*L.europaeus*) and the hare (*L.timidus*), and wild boar (*Sus scrofa*), roe deer (*Capreolus pygargus*), moose (*Alces alces*) - in the floodplain of the Ural river; targets of fur trapping - fox (*Vulpes vulpes*), corsak (*V. corsac*), wolf (*Canis lupus*), jackal (*Canis aureus*), raccoon dog (*Nyctorentes procyonoides*), ermine (*Mustela erminea*), weasel (*M. nivalis*), steppe polecat (*M. eversmanni*), mountain weasel (*Mustela altaica*), badger (*Meles meles*), spotted cat (*Felis libica*), yellow ground souslik (*Spermophilus fulvus*). The main trade animal, until the end of the 90- ies of XX century, was saiga (*Saiga tatarica*) (in the 70ies years - 100-300 thousand animals produced, in some years – up to 500 thousand of animals per year), but because of the decrease of their quantity fishery of them has been forbidden since 1999; currently hunting of saiga is prohibited until 2020. Traditional targets of hunting birds - mostly migrating waterfowl and semi-aquatic birds and in floodplains - pheasant and also quail, pigeons etc.

1.1.3.2. Mountain ecosystems

Ecosystems of mountains of Kazakhstan (area-18.6 mln ha) is considerably more complicated by structure and diverse in set of ecosystems than plain ecosystems. According to the nature of the structure and a set of (range) the zonality mountain ecosystems in Kazakhstan at the highest level can be divided into 3 groups of by the zonality types:

- Tarbagatay-Saura-Altai, which is typical for the mountains located within the steppe zone.
- Dzungar-North Tien Shan group of zonality, specific for ridges located in the within the ecosystems of medium (moderately cold) deserts.
- West Tien Shan group of the zonality types, characteristic for the mountains located within the warm-temperate southern deserts.

Main types of vegetation in mountain ecosystems

Mountain plant communities are very diverse and relate to different types of vegetation. Main types of vegetation are widespread in Eurasia include tundra, meadow, forest (dark coniferous, light coniferous, small-leaved and broad-leaved forests), shrub, steppe, as well as rare, characteristic for mountains of Central Asia, found only in the Western Tien – Shan: arid juniper light forests umbellates, savanna, phryganoid (thorn bushes and mountain wormwood) types of vegetation.

Only in the highlands of Central and Southern Altai, vegetation of mountain tundra has plants of mountain tundra: moss, lichn, grass-moss, grass-dwarf-birch and dryad tundras.

Meadow communities, formed by mesophytic moisture-loving cereals and herbs, form vegetation of alpine and subalpine zones. They are also wide spread in midlands in combination with forest arrays.
Alpine low grass, colorful cereal herbs meadows, became widespread in humid highlands (the northern Altai, Western Tien-Shan). The special type of criophyte low grass of alpine meadows of kobresia (often called wastelands) occurs in dry and cool highlands (Southern Altai, Saur, Tarbagatay Jungar Alatau).
Subalpine middle grass meadows are common in all mountain ranges below the Alpine meadows. Among them there is a variety of mixed herbs-cereals, as well as lady's mantle geranium meadows which are often interspersed with thickets of juniper. Both conifer and deciduous forests are well-spread in mountain systems in Kazakhstan.

Dark conifer fir and cedar forests with green moss and herbs are found only in the north-western Altay. Dark-Conifer of Shrenka spruce are spread in the North Tien Shan on the middle slopes. In the upper part of the forest belt – it is elfin wood-fur and spruce in the central part of the forest with grass and moss cover. In the lower part of the forest belt hardwood-sprice forests are common.

Light coniferous larch forests with dominance of Siberian larch are common in moderately humid conditions of the Central and Southern Altai. The southern Altai and Saur mountains are represented with park larches.

Pine forests (dead soil, green moss, lichen, grass, shrub-grass) and small woodlands with petrophyte-steppe species can be seen in the Altai mountains Kalba and in lowland granite massifs of Central Kazakhstan. Wet pine forests are the repository of the northern (boreal) elements of flora.
Birch and aspen forests are found in all regions.

Mesophytic moisture-loving brush woods are extremely diversified in mountain ranges. The most widely distributed brush woods are rosaries, spiraeic, pea shrubs (of Karagan tree in the Altai and Tarbagatai and multifoliate Karagan in Terskey Ala-tau), ground cherries. The attraction of Tarbagataya is bushlands which are formed with almonds - Ledebur and Hoven kalofaka.

Mountain steppes are found in all mountains of Kazakhstan from Altay to Karatau. They include three subtypes: cryophyte steppes in highlands, real bunchgrass steppes in midlands, lowlands in the Tien Shan and Karatau with original composition of ephemeral and bunchgrass, savanna bunchgrass (with barley, wheatgrass, ferule) and mountain xerophytic cereals (involving species of cousins, prickly thrift, khafidophytum) steppes.

Juniper light woodlands are found only in middle mountains of the Western Tien Shan and in the gorges of the Kyrgyz ridge. Juniper stands with tropical grasslands and meadow, meadow-steppe cover.
The special type of forest plantations is heat-loving light forests of hawthorn Pontian, wide-spread in high foothill ridges and in lower parts of mountains around the perimeter of the Western Tien Shan ranges. Light forests of hawthorn Pontian (the so-called piedmont semi-savannas) dominated in plains and foothill areas before agricultural period and currently they are destroyed in large areas.
In the Karatau mountain there is domination of a particular distinctive types of vegetation – mountain wormwood and Karatau wormwood. They form a particular vegetation zone in Karatau. Floral composition of them is original and includes low grass ephemeroids and savanna high grass, steppe grasses and mountain xerophytes elements (types of r. Lepidolef, pricky thrift).

Savanna high grasses occupy vast areas of high foothills of the Western Tien Shan. They are characterized by high dominance of cereals ephemera hairy coach grass, bulbous barley with high grasses (species of ferule, althea, desert-candle, Jerasulem sage).

Shrubs (almond, rose, cherry) are typically found on the slopes of lowlands.

Low savanna grasses (with dominance of bulbous bluegrass, ephemers and ephemeroids) occur at low foothills of Western Tien Shan.

The fauna mountain ecosystems represented 110 species of mammals, including rodents (Rodentia) - 45; bats (Chiroptera) - 22, carnivorous (Carnivora) – 20; insectivores (Insectivora) - 10, artiodactyls (Artiodactyla) - 7, lagomorphs (Lagomorpha) - 6 species. Mountains are represented with 14 species, others are found in other areas. Mountain forests are inhabited with the forest fauna - brown bear (*Ursus arctos*), lynx (*Lynx lynx*), wolverine (*Gulo gulo*), sable (*Martes zibellina*), musk deer (*Moschus moschiferus*), moose (*Alces alces*), red deer (*Cervus elaphus sibiricus*), chipmunk (*Eutamias sibiricus*), squirrel (*Sciurus vulgaris*), blue hare (*Lepus timidus*), etc.The typical inhabitants of mountain steppes are as follows: marmot Menzbir (*Marmota menzbieri*), long-tailed marmot (*M. caudata*), grey marmot (*M. baibacina*), relict gopher (*Spermophilus relictus*), argali (*Ovis ammon*), inhabitants of rocky habitats - red pika (*Ochotona rutila*), large-eared pika (*O.macrotis*), silver vole (*Alticola argentatus*), stone marten (*Martes foina*), Siberian ibex (*Capra sibirica*), snow leopard (*Uncia uncia*).

The mountainous area is inhabited with 255 species of birds, or 65.6% of the fauna of the cluster nest. Representatives of Falconiformes (Falconiformes), Galliformes (Galliformes), Columbiformes (Columbiformes) and Passerines (Passeriformes) groups dominate.

Background species: rock ptarmigan (*Lagorus mutus*), capercaillie (*Tetrao urogallus*), hazel grouse (*Tetrastes bonasia*), Altai snowcock (*Tetraogallus altaicus*), snipe (*Gallinago gallinago*), forest grouse (*G.megala*), Asian snipe (*G.stenura*), marsh snipe (*G.solitaria*), grey woodpecker (*Picus canus*), Siberian Jay (*Perisoreus infaustus*) (for a siberian mountain type) , bearded vulture (*Gypaetus barbatus*), black vulture (*Aegypius monachus*) and griffon vulture and Himalayan griffon (*Gyps fulvus and G . himalayensis*), Himalayan snow cock (*Tetraogallus himalayensis*), chuckar (*Alectoris kakelik*), bearded partridge (*Perdix dauuricae*), yellow-billed chough (*Pyrrhocorax graculus*), chough (*P. pyrrhocorax*), rufous-tailed rock thrush (*Monticola saxatilis*) and blue rock thrush *(M. solitarius)*, paradise flycatcher (*Terpsiphone paradisi*), painted tit-warbler (*Leptopoecile sophiae*) (for the Central Asian mountain type).

Specific species: bearded (*Gypaetus barbatus*), vultures (*Aegypius*), griffons (*Gyps fulvus*), Himalayan griffon (*G. himalayensis*), snowcocks (*Tetraogallus*), ibis-bill (*Ibidorhyncha struthersii*), killigrew (*Pyrrhocorax pyrrhocorax*), bluebird (*Myophonus caeruleus*), pearl-colored finch (Leucosticte brandti), Hodgson's rosy finch (Leucosticte nemoricola), rock nuthatch Sitta europaea), wallcreeper (Tichodroma muraria), etc.

In total 23 key ornithological areas of global importance with the total area of 2,800,941 ha, which is 15.1% of the total area of this ecosystem type (Appendix II), are identified in mountain regions. At the same time, it is not mainly intrazonal habitats, namely mountain areas, covering different ranges and types and providing enough representative coverage.

The key ornithological territory of the "bottleneck" type, which is the only in Kazakhstan under this criterion, is the Chokpak pass as a place of flight of the mass of birds between the ridges Dzhabaglytau (Talas Alatau spurs) and Borolday (the system of Syr Darya Tau).

7 species of amphibians and 22 species of reptiles are found in mountain systems in Kazakhstan.
Для каждой горной системы, в связи со своеобразием биотопов, характерен определенный набор видов. В Джунгарском Алатау обитает эндемик этой горной страны –, который населяет горные ручьи на высотах от 1800 до 2500 м.
The set of species are specific for each mountain system, in connection with the originality of habitats. Siberian salamander *(Ranodon sihiricus)* which is endemic of this mountainous country, inhabit in the Jungar Alatau (*Ranodon sihiricus*) in mountain streams at altitudes of 1800 to 2500 m.

The fauna of arthropod of mountain landscapes in Kazakhstan is very diverse. The fauna is not studied enough. It includes a lot of endemic and relict species and subspecies. The exact number of species is unknown. For example, only beetles of 906 species belonging to 358 genera and 41 families are registered in the Aksu-Dzhabagly reserve. At least 60 dominant species can be specified, replacing each other in a variety of biotypes and stations.

Targets of hunting mammals - Siberian ibex (*Capra sibirica*), red deer (*Cervus elaphus sibiricus*), roe deer (*Capreolus pygargus*), moose (*Alces alces*), musk deer (*Moschus moschiferus*), wild boar (*Sus scrofa*), brown bear (*Ursus arctos*), fox (*Vulpes vulpes*), wolf (*Canis lupus*), sable (*Martes zibellina*), stoat (*Mustela erminea*), weasel (*M.nivalis*), columns (*M.sibirica*), badger (*Meles meles*), wolverine (*Gulo gulo*), lynx (*Lynx lynx*), tolai hare (*Lepus tolai*), white hare (*L. timidus*), squirrel (*Sciurus vulgaris*), long-tailed marmot (*Marmota caudata*), grey marmot (*M.baibacina*). Since the mid of 1990s and by now trophy hunting of ungulates (horns) is regularly and gradually carried out, mainly by foreign hunters.

Basic hunting birds are as follows: grouse (*Lyrurus tetrix*), Hymalayan snowcock (*Tetraogallus himalayensis*), capercaillie (*Tetrao urogallus*), hazel grouse (*Tetrastes bonasia*), keklik (*Alectoris kakelik),* bearded partridge (*Perdix dauuricae*), pigeons, etc.

1.1.3.3. Coastal aquatic ecosystems and plant communities

Hydromorphic ecosystems of the steppe zone. The steppe zone of Kazakhstan has more than 9.5 thousand lakes with their relative area of 2-4%. The size ranges from several dozens to hundreds of km2, with 72% of the total area of large lakes (Tengiz, Shalkar, Kushmurun, Siletiteniz, Inder). Their depth does not exceed 3.4 m

Normally water area of lakes overgrow with wild reeds (from 20 to 90 %) (*Phragmites australis),* and there are less lakes with open water surface.Communities in conjunction with other air-water macrophytes are formed at the shallow reeds: *Typha angus-tifolia, T.laxmanii*, bulrush (*Scirpus lacustris, S.tabernaemontanii*), Susak (*Butomus umbellatus*), chastuha (*Alismaplantago aquatica, A.gramined*) rarely *Sparganium stoloniferum.* In the lower-tier submerged aquatic macrophytes are typical: Hornwort (*Ceratophyllum demersum, C.submersum*), pondweed (*Potamogeton perfoliatus, P.pectinatus, P.lucens*), Urrutia (*Myriophyllum spicatum, M.verticillatum*). On the reaches, and in the lagoon the surface of water overgrow with *Lemna minor, L.trisulca, Polygonum amphibium,* sometimes *Chara foetida, Ch.contraria, Chfragilis, Ch.kirgisorum and Cladophora glomerata.*

Freshwater lakes have the greatest botanic diversity (Boschekul, Koybagar - Tyuntyugur and Teniz-Karakamys system of lakes, etc.). Here, along with the above types of macrophytes, relict species

inhabit in freshwater lakes: spatterdock (Nuphar luteum), bladderwort (Utricularia vulgaris), fresh water soldier (Straliotes aloides).
Many lakes usually have floating bogs in defined water areas. Single sample and groups of birch (*Betulapendula*), willow (*Salix cineria, S.viminalis*), sedges (*Carex*) and various grasses (*Comarum palustre, Asparagus officinalis*), sometimes ferns adapted to these floating bogs.

In vegetation of the coastal area there is a diversity of species and communities. In summary, the belt around a number of environmental freshwater lakes is represented by the following set of communities: reed {*Phragmites australis*); hygrophytic, herbal and gramenous (*Phalaroides arundinacea, Alopecurus arundinaceus, Beckmannia eruciformis, Sonchus arvensis, Mentha arvensis, Stachys palustris, Potentilla anserina*); mesophytic grass-mixed gramenous (*Calamagrostis epigeios, Elytrigia repens, Poa pratensis, P.angustifolia, Sanguisorba officinalis, Glycyrrhiza glabra*); wormwood (*Artemisia nitrosa, A.proceriformis*).

The shores of salt lakes are dominated with halophytic communities: *Salicornia eruropaea, Suaedaprostrata, Phragmites australis, Saussurea salsa, Puccinellia hauptiana, Hordeum brevisubulatum, Limonium gmelini, Halocnemum strobilaceum* or marsh-beet (*Limonium suffiuticosum*), *Atriplex glanders, Camphorosma monspeliaca, C.lessingii*, sometimes involving salwort (*Kalidiumfoliatum, K.schrenkianum*).

Some sections of the coast are often bogged and represented by sedges (*Sareh omsniana, C.riparia, C.fusco-vaginata*) and *species Eleoharis* communities in freshwater lakes, tuberous bulrush (*Bolboschoenus maritimus*) and juncaceous (*Juncus gerardii*) - around salt lakes.

Floodplain forests and bushlands dominate in the upper delta; in the middle delta - different types of meadows in combination with shrub thickets and grassy marshes on deep depressions, and in the bottom delta - grass marshes, reed beds combined with delta lakes. These patterns reflect environmental series of ecosystems with relevant plant communities.

In the valleys of large rivers (Ural, Ishim, Tobol, Irtysh) the following communities are presented: shrub-osier at the channel (Salix triandra, S.alba, S.viminalis, species Rosa, Rhamnus cathartica); (Salix alba) and (Populus nigra, P.albd) floodplain forests in combination with rich herbs cereal (Elytrigia repens, Calamagrostis epigeios, Bromopsis inermis, Sanguisorba officinalis, Vicia cracca, Senecio jacobaea), and these sedge-herbs cereal (Phalaroides arundinacea, Alopecurus arundinaceus, Carex vulpina, Stachys palustris, Lythrum virgatum) marshland meadows in the central floodplain, sagebrush herbs-cereals (Artemisia dracunculus, Medicago falcata, Astragalus longipetalus, Potentilla bifurca, species Leymus, Poa angustifolia) steppe grasslands, combined with scrub (Lonicera tatarica , species Rosa, Spiraea hypericifolia) in terrace parts.

In the subzone of dry steppes the generalized ecological series of floodplain communities are as follows: riverine thickets of willow (*Salix triandra, S.alba, S.purpurea, S.rosmarinifolia*); mixed grass gramenous (*Elytrigia repens, Bromopsis inermis, Calamagrostis epigeios, Glycyrrhiza uralensis, Thalictrum simplex*) present and halophytic (*species Puccinellia, Hordeum brevisubulatum, Triglochin maritima, Glaux maritima*) meadows; (*Achnatherum splendens*) and grass -wormwood (*Artemisia serotina, A.nitrosa, A.pauciflora, Psathyrostachys juncea, species Leymus)* steppe grasslands in conjunction with permanent saltwort (*Atriplex glanders, Halimione verrucifera, Camphorosma lessingif*). Black poplar trees (*Populus nigra*) are also common in valleys of large rivers (Ural, Irtysh) are also common.

Communities with willows (*Salix alba, S.cineria*) and desert shrubs (*Tamarix ramosissima, Halimodendron halodendron*) dominate in desert steppes in the riverine, while the central

floodplain are occupied mainly with halophyte club-rush (*Bolboschoenus maritimus*) and juncaceae *(Juncus gerardii, J.compressus)* meadows.

The floristic diversity of floodplain communities in the steppe zone contains an average of 20-45 species. The flora of valleys in steppe rivers is poorly studied, the analysis of available data shows their great species richness: Ural - 627, Big Hobday – 546, Ilek – 432, Kaldygaity - 381, Irtysh - 698, Tobol - 583.

Hydromorphic ecosystems of the desert zone. The largest inland waters of Eurasia are located in the desert zone of Kazakhstan: the Caspian and the Aral Sea, the Balkhash lake, and intermountain basins – the Zaisan lake and the Alakol- Sasykkol lake. Kapshagay, Tasutkol, Shardary and Bugun water reservoirs occupy a large area. The composition and structure of the vegetation in these reservoirs have both similarities and differences. Aquatic ecosystems are the most similar ones. The following species - *Potaniogeton, Myriophyllum, Ceratophyllum* - dominate in communities of submerged water macrophytes of higher plants, in the Caspian Sea marine eelgrass (*Zostera marina*), green (*Oedogonium, Mougeolia, Cladophora)* and red (*Polysifonia, Ciramiurri*) algae are very common.

The delta front sites with reed marsches (*Phragmites australis*) have the highest species diversity. In delta basins, protected from wave actions, along with the above listed submerged aquatic macrophytes, the following species are available everywhere: Canadian elodea (*Elodea canadensis*), bur-reed (*Sparganium stoloniferum*), reed mace (*Typha latifoliu, T.angustifolia, T.minima*), and also relict species, such as floating fern Salvinia (*Salvinia natans*), in the Ural delta - also water chestnut (*Trapa kasachstanica*) and Aldrovandi vesiculosa (*Aldrovanda vesiculosa*), in the Kazakh part of the Volga delta – Hindu lotus (caspian) (*Nelumbo nucifera*), in deltas of rivers of Balkhash - white water lily {*Nymphaea alba*), candock (Nuphae lutea). Ponds are bordered with broad bands of strip reedstrands {*Phragmites australis*), their composition usually include mixed grasses in drying sites (*Sonchus arvensis, Aster tripolium*) and herbaceous lianas (*Cynanchum sibiricum, Calistegia sepium).*

All major water bodies are characterized by periods of transgression and regression, accompanied by complete restructuring of the composition and community structure of water area and the coast. Since 2000, during 10 years the level of the Caspian Sea was increased to 2 m, it is now established at a relatively stable level, extensive shallows etc. are overgrown with reeds. Within the Kazakh part of the Caspian Sea about 40 species of macrophytes (higher plants and large algae), including no more than 10 species of flowering plants, are registered. Deep waters of the middle Caspian sea have no bottom vegetation, sparse red algae communities occur locally at depths of 5-12 m: polisophonia (Polysiphonia elongata, Psertularioides) and tsiramiuma (Ciramium graminea). Pondweed dominate in the range of the depth from 0.5 to 4 m (Potaniogeton pectinatus, P. perfoliatus) and Urrutia (Myriophyllum spicatiim, M. verticillatum), and from 3 to 10 m - eelgrass (Zostera marina).

Since 1960s the Aral Sea has been shrinking; during this period the water salinity in Big Aral increased to 75% and the sea became an extra saline water reservoir. This has affected the biodiversity, only two out of previously encountered 25 species of aquatic plants remained: a small eelgrass (*Zostera notlii*) and green filamentous algae (*Cladofora rupestris*). By the beginning of the 21 century the flora of reservoirs in delta of Syrdarya became very poor and there are only 12 species of higher plants attributed to the families *Typhaceae, Potamo-getonaceae, Zosteraceae, Zannicheliaceae, Najadaceae, Cyperaceae.*

After construction of the Kok-Aral dam, between the Small and Large Aral in 2004, the level of the Small Aral Sea (the Kazakhstan part of the sea) started rising. To date, the level of the Small Aral Sea increased by 4 m (now - 42 m above sea level), the water surface was increased by 874 square kilometers and amounted to 3288 square kilometers, the salinity was decreased from 23 to 17 g/l, the situation in the Syr Darya delta and delta lakes was improved, the fish yield have been increased dramatically.

All kinds of aquatic and riparian flora have high resource value. Tangles of aquatic macrophytes and macroalgae of *Potamogeton, Chara, Lamprotamium, Turgila* species and others serve as a place of a feeding ground of commercial fish species. Aquatic plants are the main suppliers of oxygen in the aqueous medium, and also plays an important role in the purification of water. Reeds as a biogenic filter between ecosystems sea (lakes) and dry lands, as well as a valuable fodder and technical raw materials.

The fauna of water systems includes 10 specific types of mammals with the group of insectivores (*Insectivora*): 2 - Russian Desman (*Desmana moschata*), ordinary shrew (*Neomysfodiens*); to group of carnivores (*Carnivora*) - 4: European mink (*Mustela lutreola*) and American mink (*Mustela vison),* otter (*Lutra lutra*), the Caspian seal (*Phoca caspica*); to rodents group (*Rodentia*) - 4 types: beaver (*Castor fiber*), nutria (*Myocastor coypus*), muskrat (*Ondatra zibethicus*), water vole (*Arvicola terrestris*).

There are about 115 species, or 29.5% of the total number of birds in nesting sites in Kazakhstan. Among them are representatives of 9 groups of waterfowl and semi-aquatic birds: loons (*Gaviiformes*), grebe (*Podicipediformes*), cormorants (*Pelecaniformes*), stock or long-legged (*Ciconiiformes*), Phoenicopteriformes (*Phoenicopteriformes*), anseriformes (*Anseriformes*), Gruiformes (*Gruiformes)* and wading birds (*Charadriiformes*).

Background species: great crested grebe (*Podiceps cristatus*), great cormorant (*Phalacrocorax carbo*), grey heron (*Ardea cinered*) and great white egret (*Egretta alba*), grey goose (*Anser anser*), shelduck (*Tadorna tadorna*), ruddy shelduck (*T. ferruginea*), dabbling ducks (*Anas spp*.) and diving ducks (*Aythya spp*.), various shorebirds (*Charadridae*), etc.

Water reservoirs of Kazakhstan are crucial for birds not only as nesting sites, but also as a stopping point on migration and molting for millions of migrants from Western Siberia, etc., as Kazakhstan passes through two major migration routes: West Siberian and Central Asian- African and Indian. Waters in the north and central Kazakhstan which are vital for migrants, including globally threatened species such as fronted goose (*Anser erythropus*), red-breasted goose (*Branta ruficollis*) and the Siberian crane (*Grus leucogeranus*). In southern Kazakhstan there are several important winter sites such as the Shardarinskoe reservoir. Wetlands for birds emphasizes that 73, or 60 % out of 121 of key ornitological area of international importance (IBA) are important as wetlands and their total area is 4,248,368 ha. They are distributed on different landscape zones as intrazonal ecosystems, and are included in the area of these areas, plains and mountains (see above), since they include, as a rule, not only water reservoirs as such, but also the surrounding landscapes. Three IBA are islands - it is the Tuyleni island in the Caspian Sea, the Turtle islands on the Irtysh River and the Stone Islands on the Alakol lake; the total area of these three sites is 175,339 ha.
The aboriginal **ichthyofauna fauna** of Kazakhstan initially consisted of no more than 100 species and subspecies of fish (*Pisces*) and round-mouthed fishes (*Cyclostomata*). It was significantly enriched due to large-scale activities aimed at the acclimatization of new species. Last century in 30-80 years 65 fish species, including accidental invaders, were delivered to waters in Kazakhstan. Currently, fish and cyclostomes include at least 130-140 various species and subspecies belonging to 24 families. Several species (subspecies) of fish are endemic to individual basins and regions.

The part of endemics (Balkhash perch - *Perca schrenki*, Aral salmon - *Salnw trutta aralensis*, Aral barbel - *Barbus brachycephalus brachycephalus* etc.) are carriers of the gene pool of a global scale. The fish fauna of the Caspian Sea is considered as especially unique.
4 endemic genus, 31 endemic species and 45 endemic subspecies inhabit there. The Caspian Sea is a reserve of the world's genetic resources and commercial reserves of sturgeon stocks.

The composition of the benthic fauna of the Caspian Sea includes 635 taxons of organisms of 11 types of animals: *Sarcomastigophora* - 13 taxons; ciliates (*Ciliophora*) - 330; sponges (*Porifera*) -1 specie; coelenterates (*Coelenterata*) - 5 species; flatworms (*Plathelminthes*) - 25 species; nemertines (*Nemertini*) - 1 species; roundworms (*Nemathelminthes*) - 8 taxons; annelid worms (*Annelida*) - 31 species; arthropods (*Arthropoda*) - 143 species; shellfish (*Mollnsca)* - 71 taxons; tentacle (*Tentaculata*) - 7 species.

The invertebrate fauna in Balkhash is represented with 233 taxons of organisms of 4 types of the animal kingdom: Sarcomastigophora -1 specie; Ciliophora -73 taxons; Nemathelminthes -86 taxons; Arthropoda -73. The zoobenthos of the Balkhash lake is represented with 126 taxons of 3 types of animals. 14 species of worms (Annelida) are identified. Arthopods (Arthropoda) are the most diversified -100 taxons. The lake is also a home to 12 species of gastropods and bivalves. .

There are 142 species and subspecies of crustaceans and 274 species of rotifers in waters in the country. The species composition of crayfish in the country includes 3 species and 2 subspecies. 139 species of water beetles and 35 species of stoneflies are identified. The fauna of mollusks in the middle and lower streams of Syr Darya 60 species of gastropods and bivalves are identified. After the construction of Kok-Aral and lowering the salinity of the Small Aral in the delta of Syr Darya aboriginal fish fauna is being restored, some species (walleye, sabrefish) penetrate deep into the Small Aral.

1.1.3.4. Agrosystems

Agrosystems include man-made and man-managed plough lands, orchards and vineyards, forest park lands, soil-protection and roadside tree belt areas, deposits, improved pastures etc. The lands, which are in principle suitable for agriculture, cover about 222.1 mln ha of
272.49 mln ha of the total land area, while the category of agricultural lands actually cover 93.4 mln ha. Most part of other areas, included into the category of lands of the state land reserve, can be used for pastures without their assignment to users. Pastures occupy about 31.9 mln ha, 5.05 mln ha - hayfields, about 2.8 mln ha - deposits. The fund of irrigated lands contains 2.3 mln ha of lands, which provide over 30% of the gross agricultural output, but now actually only slightly more than half of this area is irrigated. In the last 5 years, the process of the active return of deposits in circulation in those regions where it is economically feasible, has been started.

Below is the general structure of the land fund of RK.

Категории земель	Иллюминовка
Земли сельскохозяйственного назначения	35,8
Земли населенных пунктов	9,1
Земли промышленности, транспорта, связи, обороны и иного несельскохозяйственного назначения	1.0
Земли особо охраняемых природных территорий, земли оздоровительного, рекреационного и историко-культурного назначения	2.2
Земли лесного фонда	8.8
Земли водного фонда	1,6
Земли запаса	41.5

Picture 1. Distribution of lands of RK by categories, in % of the total area of the country.
as of 1 November, 2012
Text: categories of lands – illumination
Agricultural lands
Lands of settlements
Lands for industrial, transport, communication, defense and other non-agricultural purposes
Lands of special protected natural areas, land of health improvement, recreation and historical and cultural purpose.
Lands of the Forestry fund
Lands of the Water fund
Reserved lands

According to data of the Committee on land management for 2013 up to 15% of agricultural lands are used ineffectively. About 125 mln ha of pastures are not watered and are not used; more than 20 mln ha of pastures adjacent to settlements, due to ineffective use, classified as degraded lands. Accordingly, biodiversity in degraded lands is decreased and sharply transformed, compared to natural landscapes.

1.1.3.5. Fossil flora and fauna

Some locations of fossil remains of the Paleozoic, Mesozoic and Cenozoic eras have been found on the territory of the Republic of Kazakhstan.
In Chu- Ili mountains the earliest remains of vascular plants older than 420 million years were discovered.
The most ancient, in Asia, remains of vertebrate animals, which had lived about 280 million years ago, were found in the south- east of Kazakhstan. Also in the south of Kazakhstan in the Karatau mountains abundant finds of the Jurassic period, with plentiful imprints of insects, plants as well as fish, crocodiles, flying reptiles covered with wool, which had lived about 150 million years ago, were discovered. In the west and north-west of the country there are locations with remains of plants, marine and terrestrial reptiles of the Jurassic and Cretaceous periods, as well as paleoflora and mammals of the Cenozoic era. In the north-eastern Aral Sea region there are the largest locations of dinosaurs and Cretaceous plants, which are unusual for Asia.

Samples of fossil flora and fauna allow to define processes of the biological diversity of plants and animals from the past geological eras, causes and factors of the mass extinction of some groups and the emergence of new ones.

The main location of remains of plants and vertebrates of the Paleozoic, Mesozoic and Cenozoic eras: the Chu-Ili mountains (the oldest plants on Earth), Kuldenentemir (chalk flora with angiosperms), Takyrsor (the eocene subtropical flora with palms), Erzhilansay, Altyn- Shokysy (the Turgay forest deciduous flora), Utegen (the oldest in Asia late carbonic - early permian vertebrates), Shah Shah (dinosaurs and other vertebrates and plants of the Cretaceous period), Aulie and Karabastau (jurassic flying lizards, crocodiles, insects, plants), Kushmurun; Lakeside (mosasaurs and other cretaceous marine reptiles), Karaturgay, Aktau (indricotherium), Pavlodar ("Proto - African " fauna - giraffes, ostriches).
To date in Kazakstan there are about 225 main locations with remains of flora and fauna of terrestrial vertebrates of the Paleozoic, Mesozoic and Cenozoic eras. Fingerprints of species of paleozoic vertebrates and 100 species of plants were found in one of these sites. Remains of fauna are found in 36 localities and the flora of the Mesozoic and Cenozoic eras still exists in 126 localities.

Currently there are only three protected sites: two within the Aksu Dzhabagly reserve and the natural reserve in Pavlodar. Some locations of remains were partially or completely destroyed because of natural and anthropogenic factors. Some others are destroyed as a result of using lithic stocks with remains of animals and plants as a building material and during construction of roads and settlements. Among locations of the remains of global significance the following are completely destroyed: Galkino (Uspenskoe) - Jurassic insects, vertebrates and plants; Kuldenentemir was the first location of remains of capciphyte in Central Asia.

It is necessary to conduct special researches to ascertain the status of conservation of flora and fauna Kazakhstan from past geological epochs and take relevant actions to protect them.

1.2. Trends of changes, threat factors and impact on human being

In order to evaluate the resource potential of the country the state cadaster (a land registry) of natural resources, including a database of forest and fishery resources, specially protected areas and flora (www.ecokadastr.kz), is formed based on the GIS technologies and it is constantly updated. The leading agency on the cadaster is the Ministry of Environment Protection and Water Resources of RK. Since 2012 the cadaster has been actively improved, the sections on fauna, forests, hunting lands etc., will be further developed. The sections should be merged into a single portal. It will

enable access to timely, structured information appropriate for conducting analysis for management decisions. Currently not all information held by various agencies is available for analytical reviews.

1.2.1. Change trends

1.2.1.1. Ecosystems

The bbaseline state of ecosystems provides the basis for floristic and faunal biodiversity, while vegetation serves as its most visible indicator. The vegetation in mountain areas stabilizes a relief and plays a resource role (hayfields, drug-induced pastures). In case of natural disasters, trees and shrubs can be a barrier to mudflow. In the desert zone the main functions of vegetation of ecosystems are as follows: landscape protection, grazing, forestry (if saxaul is available), and haying, halo-meliorative and soil-forming processes. Further, the vegetation along river valleys acts as a water regulator.

After years of economic downturn, followed the collapse of the Soviet Union and accompanied by a drop in production both in industrial and agricultural sectors, the last decade demonstrates sustained economic growth along with increased pressure on ecosystems. In the last 5 years increased anthropogenic impacts are particularly noticeable in areas of mining, turnover of deposits and intensification of agriculture, as well as in the sites of massive recreation, emerged with growth of welfare.

However, local rangelands and plants have been degraded and depleted for many years as a result of primitive ways of providing fodder used by local population, and various violations in ecosystems of the entire regions (the Aral Sea region, the Caspian Sea, Pribalkhash, Priirtysh, Rudnyi Altai, Southern Kazakhstan etc.).

In general, natural conditions of Kazakhstan, with its harshly continental arid climate and relatively low productivity of virtually all types of terrestrial ecosystems, result in poor resistance of biocoenoses to anthropogenic influences. The areas, covered with sands, make up to 30 million hectares, alkaline and saline lands - more than 93 million hectares.

Technologic lands are identified in all natural zones and are associated with arable dehumification with prolonged use, salinity and alkalinity, the development of wind and water erosion, destruction of man-made pollution of soils and overgrazing. Land degradation occurs under the impact of relief forming processes - erosion and deflation. The population density also has the human impact on the environment and desertification.

The integral assessment of natural and anthropogenic disturbance of ecosystems demonstrates influencing factors, degrees and types of degradation (Fig. 2). Biological natural self-regulation is specific for all ecosystems with various degrees of damage. But the damaged natural zonal systems rarely could be fully restored.

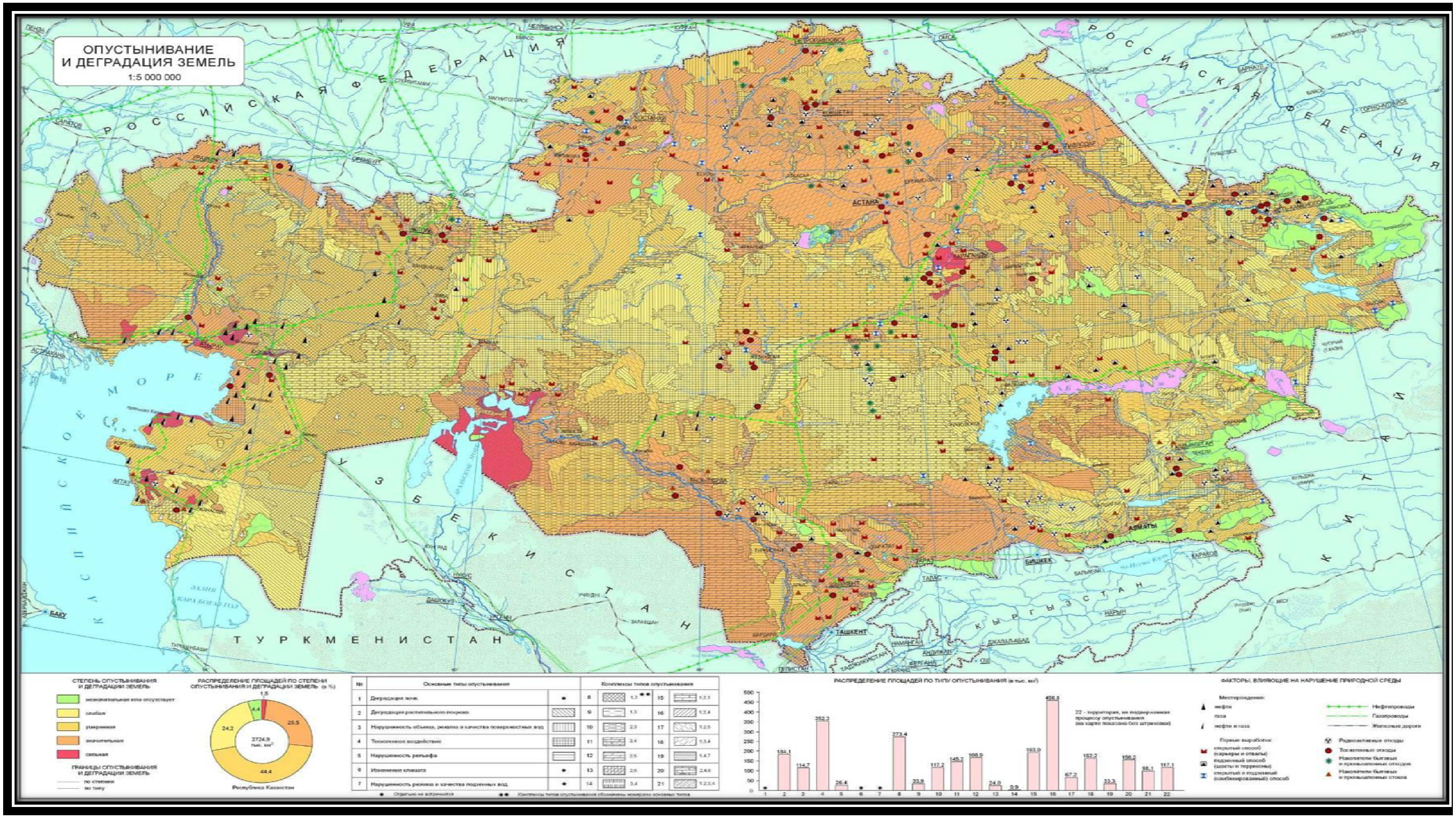
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Fig.2. Map of desertification and degradation of lands

Fig. 3. Distribution of areas of Kazakhstan by degree of desertification in 2012 (%)
Degree of desertification and degradation

No or low
Weak
Medium
Significant
Strong

Almost the entire territory of the country (Fig. 3) underwent desertification in various degrees. Risk of biodiversity loss is probable even at a weak degree of desertification, and further it regularly intensifies. .

Mountain areas initially contain high internal danger of desertification, which results in cracks, landslides, rockfalls, mudslides etc., and can lead to emergency situations and bring severe unpredictable consequences. Recent constructions in low mountain and foothill zones along all the mountain ranges of the southern Kazakhstan (especially the Northern Tien Shan) are accompanied with destruction of forests and shrubs. This causes landslides, soil erosion, which is particularly dangerous in the context of the climate change.

Retrospective analysis of data on desertification emphasizes the predominance of anthropogenic impacts on destabilizing the environment.

The Aral and Ile-Balkhash regions with a population of 5.4 mln people are exposed to desertification to the fullest extent. Regulation of rivers resulted in cessation of floods, decrease of the ground water level, increase of the amount of saline lands and reduction of the cattle stock. Water shortage has negatively affected the development of the economy and living conditions of the population. Habitats of terrestrial and aquatic animals have been deteriorated. In the Northern and Central Kazakhstan 5.6 million hectares of arable lands were exposed to water erosion and crop yields decreased by 20-30%.

357 hectares of fertile coastal pastures and hayfields were flooded in the Pri-Caspian area. Lands around industrial centers were contaminated with emissions of enterprises. About 10 million hectares of pastures were derived from rotation at sites of the military-industrial complex, largely leased by the Russian Federation.

The scope of damage from desertification in Kazakhstan is estimated at hundreds of millions of dollars. Early in the 1990s the depletion of water resources caused a decline in production, reduction of jobs, worsening of the standard of living of the population. People from areas of the ecological crisis had to move to other places, and this trend continues to develop.

In five (Aktobe, Mangistau, North Kazakhstan, Karaganda and Kostanay) regions of 14 regions of the country, 30% of forage lands demonstrate negative qualities (i.e. desertification). In other areas the degradation is 30-50% and more.

Erosion and dehumidification were intensified throughout crop lands. The humus content decreased by 25-30%. Consequently the soil fertility, crop yields fell off. 17 million hectares of arable lands were withdrawn into laylands and pastures. Besides, laylands with wild grasses, overgrown with tall weeds, contribute to growth of the number of insects - pests of crops. More than 90% of the soil in the country demonstrate salinization, water and wind erosion, reduction of humus, secondary salinization with water discharge after irrigation of lands in neighboring areas.

Currently, problems in land use for livestock and grazing farming became more obvious as a result of numerous small agro and livestock units, which are unable to ensure cost-effective use, purchase of machinery, fertilizers, veterinary services for livestock transhumance, provide reserves of fodder, processing of agricultural products. This leads to socio-economic problems associated with reorientation of farms. Under these conditions, adequate natural areas are used more randomly, without observing norms of withdrawal of resources, i.e. the degree of their degradation and desertification is intensified.

East Kazakhstan region as an example

The territory of East Kazakhstan with significant species ecosystem and landscape diversity spread for 283.2 thousand km^2. In the north-east of the country mountain ranges of the Kazakhstan Altai are located; the south- east region is framed with middle ridges of Tarbagatay and Saura. The central part of the area, bordering the Zhaisan lake, is presented with accumulative plains of the Zhaysansk depression. The East Kazakhstan region has 75 major ecosystems, including fir cedar forests, pine forests, aspen-birch forests, along with sand-feather grass and forb steppes; meadows in mountain -meadow alpine and subalpine soils; mountain tundra; fragments of steppe and desert vegetation.
Ecosystems suffer significant man-made impact and it leads to slowdown of biological functions and eventually to their complete destruction. Shrinking of the relic Ridder wood in the Ridder town can be given as an example. The category of threatened ecosystems includes rich grass-cereal, desert steppes and larch forests. In extensive areas of unique ribbon forests in Pri-Irtysh the forest area was decreased as a result of fires, predatory illegal logging infestation of forest species.

Overall, only about 10% of the unique diversity of ecosystems in East Kazakhstan meets their background state, more than 25% are moderately transformed and 4% of the area is close to a crisis state (Fig. 4). The technological impact is very significant in mining fields. Many field roads negatively affect the environment. Emissions of pollutants into the air also have a negative impact on people and the environment.

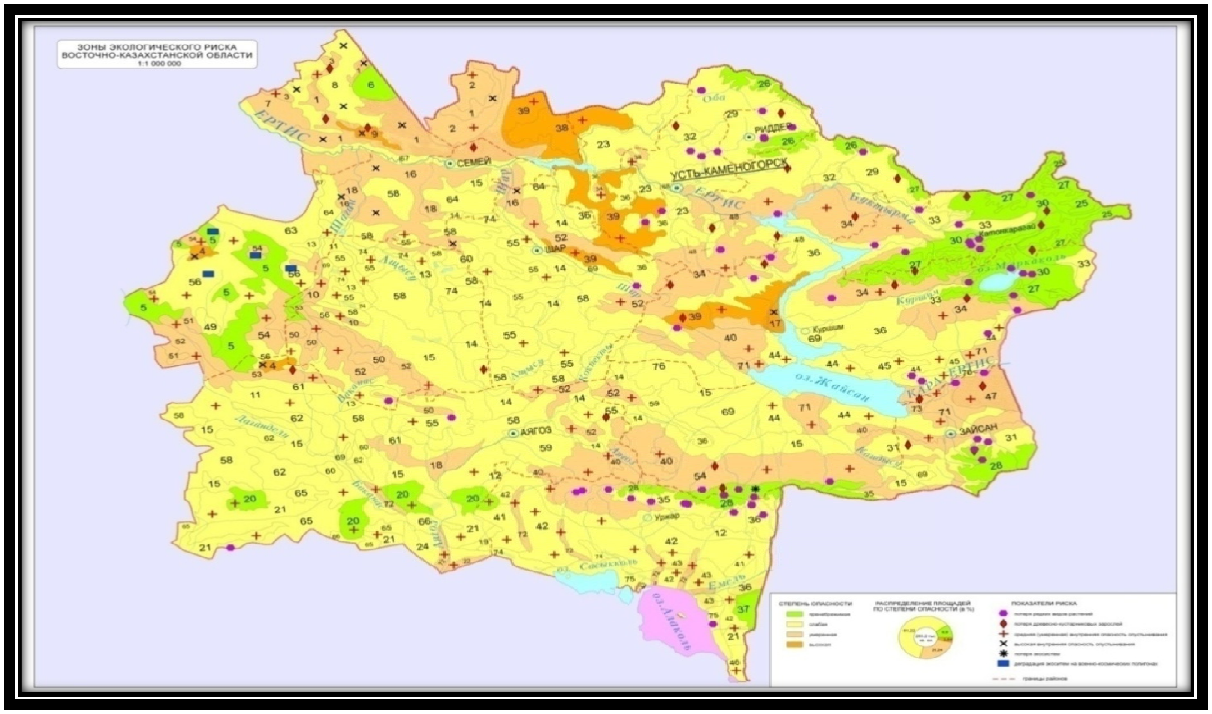


Fig.4 Zones of ecological risks of the Eastern Kazakhstan oblast

The analysis of areas of an ecological risk in the country (Northern, Western, Southern, Central and Eastern Kazakhstan) shows that the total area of desertification of various degrees is 91.6 % of the area of the country, only 8.4% of the area was not exposed to desertification. 510.91 km^2 or 19.1 % of the territory are under significant and very strong degree of desertification. The areas of critical risks of damage are considered as zones of crisis. The central and eastern Kazakhstan (53, 9 and 19, 9% accordingly – Fig. 5) are identified among the worst regions with relative areas of strong and critical degree of degradation.

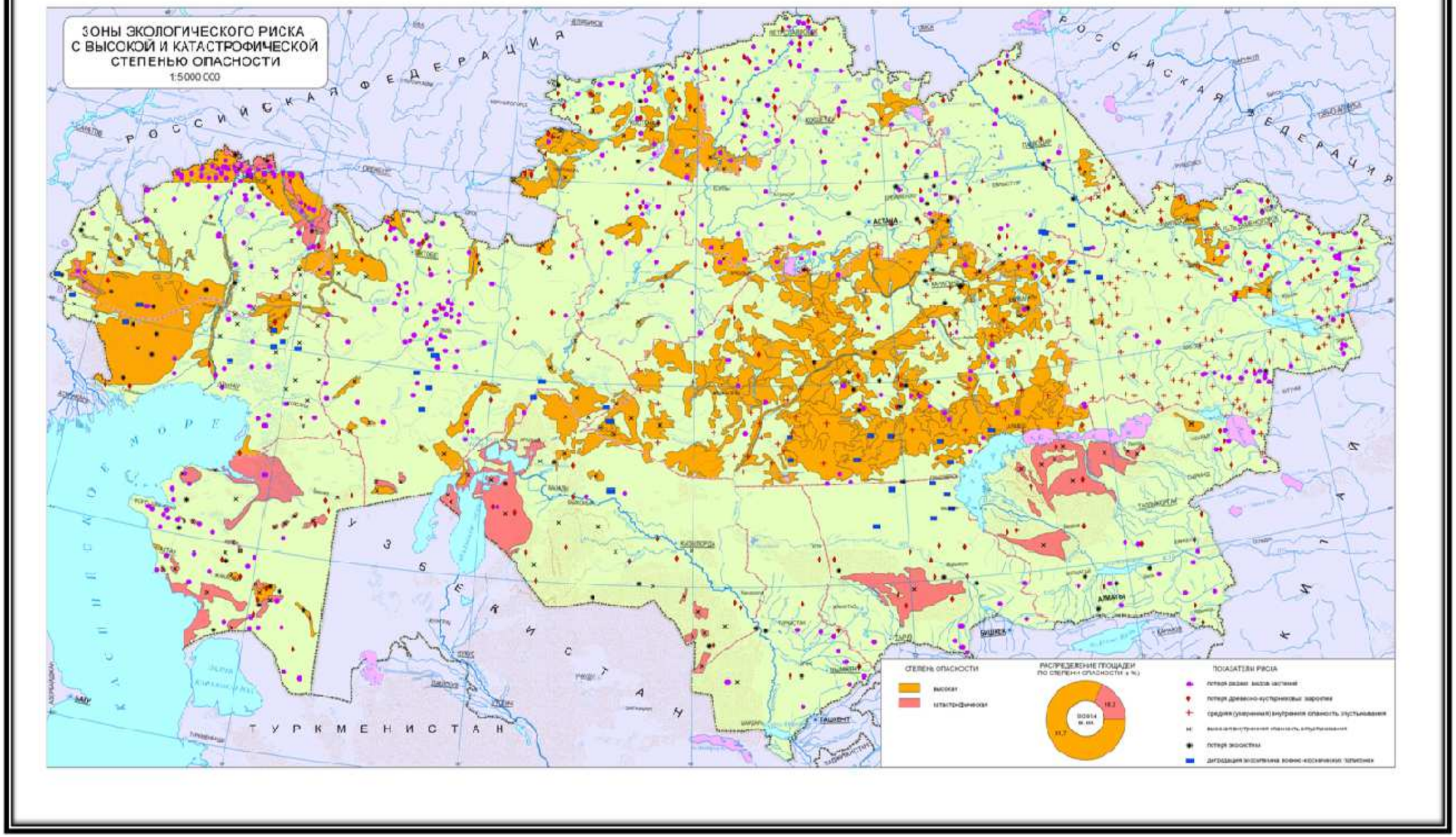


Fig 5. Zones of ecological risks with high and catastrophical degree of danger

The map of ecological risk zones of Kazakhstan shows quite a complicated and diverse picture of ecosystem degradation in terms of the degree of hazards and risk of loss of species, ecosystems, the degree of internal danger of desertification of ecosystems, their soil cover under intensive anthropogenic impact. In general, based on the analysis of the map of ecological zoning, five degrees of danger were identified, in principle, relevant to the degree of desertification - land degradation, ecosystems and, especially, the land cover.

According to the assessments, about 75% of the area of the country is exposed to a high risk of environmental destabilization. Depletion of biodiversity and signs of ecosystem degradation are specified in about two-thirds of the area of the country, especially in deserts and steppes.

As a result of the ecological zoning in Kazakhstan the overall picture of desertification of ecosystems and the degree of severity under further destabilization of the environment emphasize predominance of moderate severity - 42.3 % of the area of the country. But this is the ultimate border of human impact and further withdrawal of resources (soil and vegetation, in particular) should be limited in a number of ecosystems. Reduction of norms of use to 10-20 % is necessary for self-regulation of ecosystems and conservation of resource reproducibility. Terms of moderate severity represent the limit of resilience of ecosystems to anthropogenic impact, for instance, to withdrawal of plant biomass. With additional factor of droughts in dry years and seasons there is a danger of threat for rare species, drying out of soils, decrease of species diversity of ecosystems, productivity and replacement of ecosystems.

The most obvious examples are degradation of pastures, adjacent to settlements and water sources. Overall in the country, 26,5% of pasture areas were degraded in various degrees, during more than 10 years, but these pastures are still used while they should be withdrawn from circulation. The general trend to worsening the state of pastures still exists but there are successful examples of decrease of degradation due to return into circulation of a number of distant pastures and dispersal of livestock from settlements. At present the state programme on restoration of water wells in distant pastures with shared participation of land users was started that allows to arrange the circulation of pastures and mitigate impact on biodiversity.
Degradation of grazing lands aggravates the effect of ongoing desertification, accelerated due to the current climate change. The latter makes winters warmer, distribution of rainfall throughout the year is more uneven and summers are drier. In mountainous areas, there is a risk of natural disasters - mudfloods, etc., which also can cause local destruction of existing landscapes and ecosystems.

Ecosystems, mainly in a desert area, are deeply degraded as a result of ongoing developments of natural resources – oil, gas, uranium etc.. Such degradation processes are intensified in some areas. There are vast sites of such landscapes, transformed under human impact, with the degraded vegetation and technogenic contamination, losing virtually all valuable elements of biodiversity, in Western Kazakhstan, Eastern Pri-Caspian region, the Betpakdala desert and others. It is difficult to quantify its impact.

Water ecosystems are degraded as a result of toxic contamination, causing death of aquatic organisms and entry of biogenic substance in water units, that intensifies eutrophication and reduction of oxygen concentration. The self-purification capacity of aquatic ecosystems was decreased.
The major ‘hot spots’ are observed near businesses, discharging industrial wastes and waste waters on the surface or in the river system without pre-treatment (mining enterprises, certain industrial enterprises and urban agglomerations) with unreliable system of treatment of industrial and domestic wastes.

Enterprises in Karaganda, East Kazakhstan and Aktobe oblasts have the largest impact on ground waters. Ground waters are polluted with oil products in the areas of all oil and gas sites in Kazakhstan.

Due to recreational pressure, sharply increased in the last 5 years, from "wild" and organized tourists, mountain ecosystems and wetlands (coastal waters) were locally degraded. Some areas are used for construction of recreation facilities, and the biodiversity in vast areas suffered from virtually unregulated flows of tourists, creating a powerful factor of concern. It happens in the most significant extent on the coasts of the Alakol, Buorovoe lakes and in other attractive local reservoirs in the Northern Tien Shan, Altai , etc.

The outlined process of restoration of steppes, followed the reduction of grain production in the 1990s, in the recent 5 years continues because of commercial unattractiveness of agriculture in these areas, but significant, quite fertile land areas are introduced again into circulation.

In general, small positive changes have occurred in relation to conservation of forest lands (see below), in terms of improving the structure of pastures, but mostly the state of ecosystems in unprotected areas in recent years either has not changed or deteriorated to various degrees.

Results of ecological zoning in Kazakhstan confirm that the natural environment is not healthy in significant areas of the regions (19,05%). The category of relatively unfavourable areas relates to moderately deserted ecosystems – of a moderate degree of danger (57, 82%), since their utilization has already required observance of strict standards and seasonal monitoring of the environment, especially in periods of droughts.

Prospects for improvement of the environment, combating desertification and improving the conditions for sustainable development directly relate to ecosystems: their biodiversity dynamics, use, resistance to external impact and self-regulation at various degrees of violations. Analysis of ecological zoning of the territory of Kazakhstan and a degree of severity of transformation of ecosystems (background, weak, moderate, high, catastrophic), including a list of major ecosystems, their general condition, comparative-evaluation specifications and data on use, confirms the need for improvement of lands.This includes the following: creating a system of the unified ecological monitoring of certain ecosystems in regions when expanding meteo-service posts; development of a number of ecological maps using satellite shots in GIS format to assess disturbance of ecosystems; development of regional land use maps based on zonal ecosystems; development of a database on changes of biodiversity of specific ecosystems, their state and productivity; working out corrective annual and seasonal standards of using certain, especially ecosystems, disturbed in various degrees, spots of rare ecosystems and species.

It is also necessary to limit use of rare, globally significant, valuable resource units of flora, fauna and ecosystems; providing population and subsoil companies with information, warning about risks of environment degradation; taking measures on recultivation of disturbed lands and maintaining the balanced environment for sustainable development.

The actual information basis for combating desertification to conserve biodiversity should be standards and restrictions on utilization of certain natural ecosystems, not their complexes. In case of varied landscape (locations, territorial unit, complex meso-ecosystem) restrictions should be identified by content, type, standards of utilization, seasons and other indicators. For this purpose it is necessary to make amendments into the ecological code on issues of SPA, zones of ecological risks to stop regression and on measures to conserve biodiversity of current ecosystems.

1.2.1.2. Vegetation

The list of rare and endangered species of plants is approved by the government of RK. The recent list # 1034 was approved on 31 October 2006 and it already needs to be reviewed. The list includes 387 species of plants. Under systematic groups they relate to the following groups: gymnosperms - 2; fern-shaped 2, lycopsids - 2, bryophytes - 3 mushrooms - 13, lichens - 1, angiosperms - 364 species. The Red Book of RK illustrates the list with cadaster information. The Red Book of RK, part 2. Plants were published only once, in 1988, it includes 303 rare and endangered species. The new edition of the Red Book on plants, compliant with modern lists, has been prepared for publication, but it's not published yet.

Globally threatened (categories CR, EN, VU, NT) species in the flora in Kazakhstan include 15 species, as well as 5 critically endangered (*Berberis karkaralensis, Calligonum triste, Lonicera karataviensis, Populus berkarensis, Sibiraea tianschanika*), 8 endangered и 2 vulnerable.

Conservation of unique plant communities, not just protection of individual species, is critical. Insignificant part of communities is protected, to some extent, in specially protected areas, but no a common reference list or summary of endangered and rare plant communities is developed. Many communities have very narrow ranges and therefore their random death can lead to the loss of the species.

Rare plant communities of natural origin, which need to be protected, should be included into the Red Book of RK, Volume 2, Part 2. Plant communities, Publication 1" ("Green Book") planned to be issued yet 6 years ago. The draft was prepared several years ago. The list of rare, endangered and typical plant communities which are being transformed due to extensive anthropogenic activities, requiring complete protection and restricted use or decrease of negative natural and anthropogenic impact, was made.

The list of syntaxons, proposed to be included into the "Green book", has 41communities: forest (wood) communities – 4; desert-forest communities – 11; frutescent and suffruitcose communities – 22; meadow and helium communities – 4. The "Green Book" has not been published yet although all the work was done about 4 years ago.

Within last four years vegetation in Kazakhstan was transformed in line with changes of the state of ecosystems due to various factors. In some places there is a noticeable degradation of vegetation, in other places - overgrowth of deposits, etc. Effects of climate change are marked in the form of a gradual change in composition and boundaries of different plant associations, especially on the borders of landscape zones in the southern and central Kazakhstan.

Changes on the structure of vegetation are described below in section 1.2.2 «Threat factors».

As regards the system control, it is relatively adequately maintained in the state forest fund, with its system of special institutions ("State institutions on protection of forests and wildlife"), subordinated to regional authorities, with the general supervision of the FHC MEPWR RK.

Forests in Kazakhstan are divided into birch forests in the northern regions, island forests in the north-west, pine forests in the Kazakh Hummock, ribbon forests on the right bank of the Irtysh River, mountain forests in the Altai and Saur, Jungar Alatau and Tien Shan mountains, saksaul, riparian, floodplain intrazonal forests. Fig. 6 shows the areas, controlled by the local authority on protection of forests and wildlife, and the area of the State Forest Fund itself is much less.

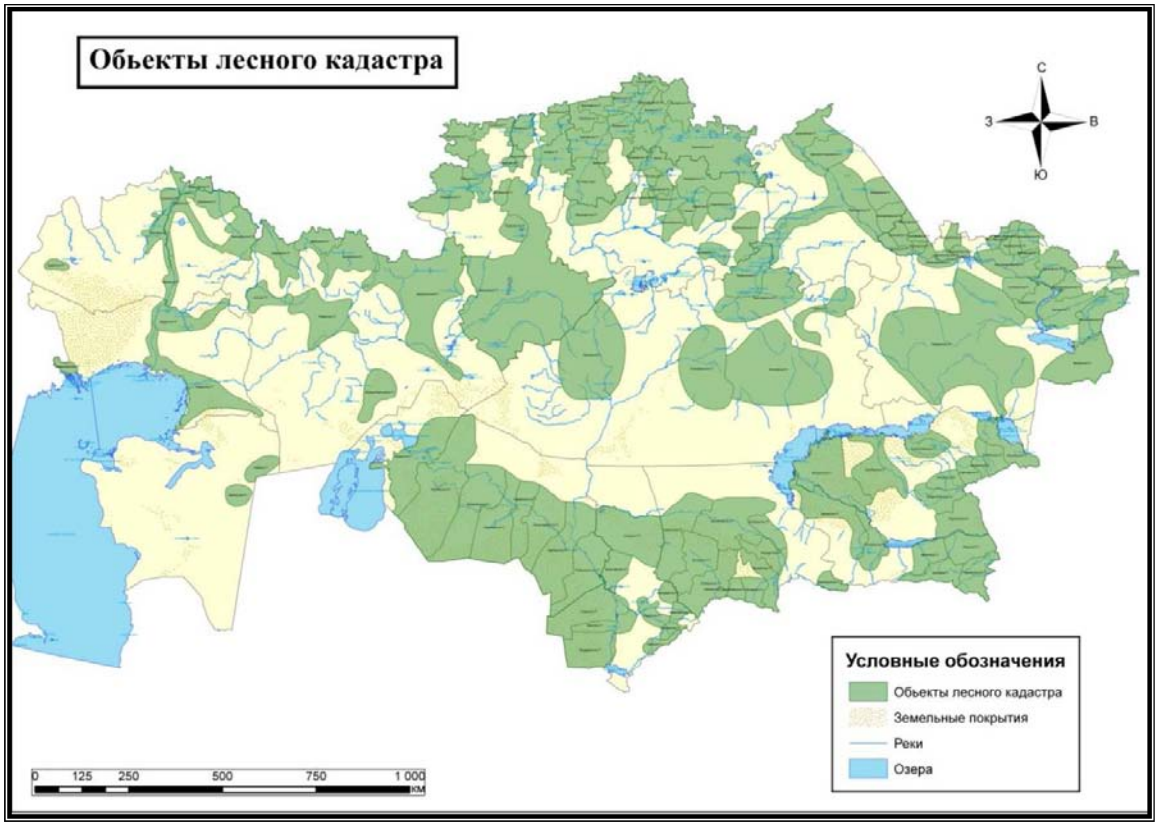


Fig. 6. Units of forest cadaster – areas, subordinate to state administration on protection of forests and fauna

Forest plant communities are represented by a broad composition of tree species (over 20 species) and shrubs (over 40 species). Forests in the Republic of Kazakhstan are owned by the State and under jurisdiction of the State. The total area of the State Forest Fund (hereinafter - SFF), as at 01.01.2013, is 28 mln 787.7 thousand ha and occupies 10.6% of the country, the private forest area is 397 hectares. The forest lands occupy 12 mln 548 thousand hectares or 43.6% percent of the total area of forest lands. There are not lands covered with forest in the private forest fund. In general, the forest cover is 4.61%. Changes in the land area in the last 4 years were small (Table 1).

Table 1. Main indicators of the forestry in Kazakhstan

Names	Unit of measurement	years			
		2010	2011	2012	2013
The area of the State Forest Fund	thousand ha	28419,4	28662,0	28786,7	28787,7
The area covered with forest	thousand, ha	12293,8	12317,8	12451,9	12548,6
Forest cover	%	4,5	4,5	4,6	4,6
The area of special protected areas (SPA) with a status of a legal entity	thousand, ha	5271,8	5719,9	5808,6	5808,4
The forest fund transferred under jurisdiction of local authorities	thousand, ha	22984,7	22766,1	22800,6	22802,1

The forest fund transferred under jurisdiction of the authorized forestry body	thousand, ha	5269,5	5683,3	5772,3	5772,3
The forest fund transferred under jurisdiction of other state bodies	thousand ha	165,2	212,6	213,8	213,3
The private forest fund	thousand ha	0,1	0,1	0,2	0,4
Reproduction of forests	thousand ha	51,4	56	67	67,4
Transferred to long-term use, including	thousand ha	1463,5	1486,5	1483,7	1562,0
Logging	thousand ha	940,4	955,0	927,7	1014,6
Felling volume	thousand m^3	1820,9	1493,8	1502,4	1362,7
Including principal felling	thousand m^3	245,8	248,2	237,7	356,8
The total area of forest fires	thousand ha	11,7	3,2	6,6	1,2
Volume of illegal felling	thousand m^3	6,1	4,2	3,9	3,4

The positive changes occurred in the forest fund of the country during the reporting period from 1 January 2008 to 1 January 2013. The total area of the State Forest Fund increased by 1 mln., 10,4 thousand ha (3,5%). The area of administrations of specially protected areas increased by 1 mln. 16,6 thousand hectare due to opening a new administration and joining, under relevant resolutions of the government, of new lands in addition to existed ones.

Areas of the forest lands were extended mainly due to areas of not interlocked forest plantations, restored backlog lands, burnt areas and bottom glades.

Haloxylon deserts dominate in the lands covered with forests. Plantations of white and black saksaul occupy 6 mln. 132, 4 thousand. ha, covering almost half of the forest area of the country (48, 9%), following with bushes - 23,5% .

Indicators of main forest-forming species are as follows:

coniferous – 13,6% (1 mln. 691,6 thousand. ha), soft-wooded broadleaved – 12,1% (1 mln. 010,3 thousand ha), plantations of other species – 1,2% (158,7 thousand. ha) and solid foliaceous plantations– 0,8% (2,6 тыс. га).

The area of plantations, which are valuable in silvicultural terms, of main forest forming species in the forest fund of the country is 9 mln. 440, 4 thousand ha. The largest part of these plantations grows in areas of forestry administrations, moved under jurisdiction of oblast akimats – 8 mln. 304, 1 thousand. ha or 88% of the total area of the country.

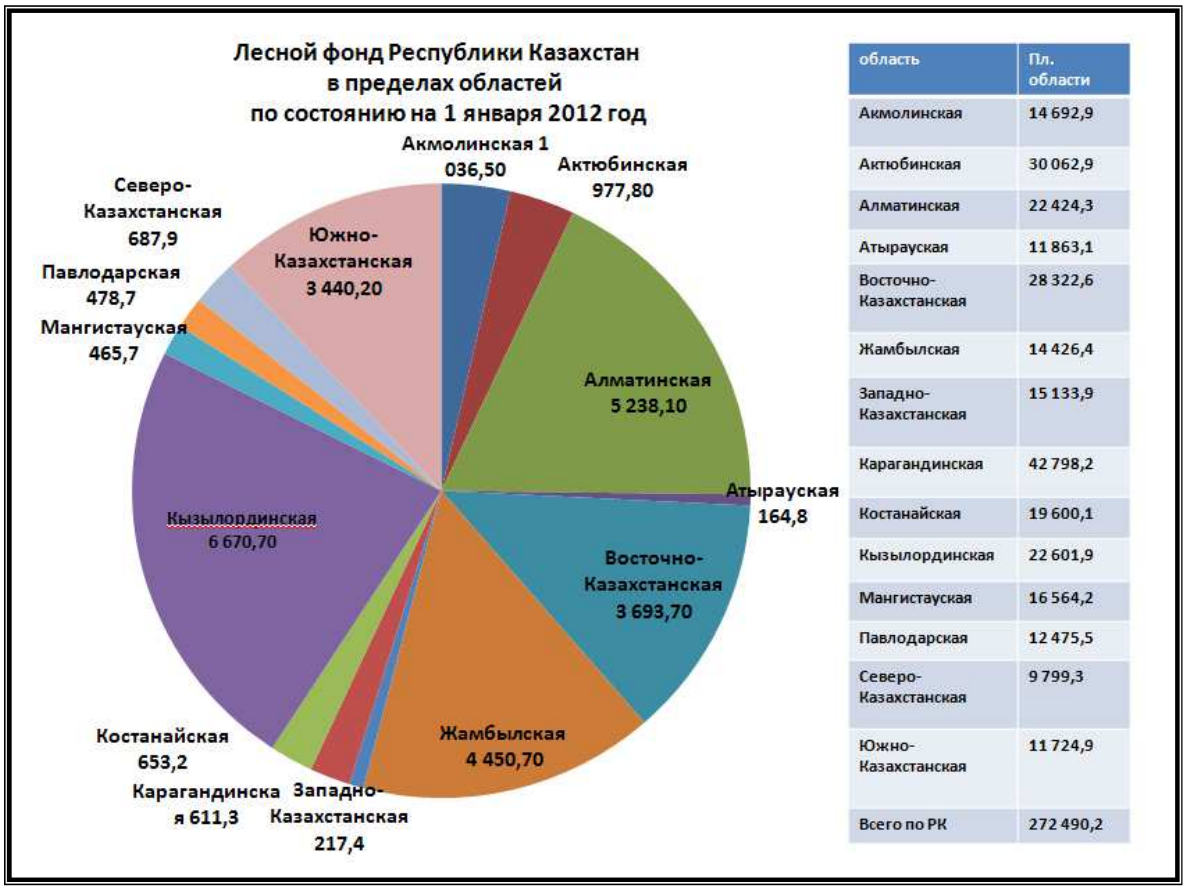
Saksaul plantations dominate in the area of main forest forming species, as well as in general in forest lands and cover 65% of the area. The area of main forest forming species extended by 2, 9%, including coniferous species - 5, 3%, broadleaved - 10, 0%, solid foliaceous and saksaul accordingly by 0, 9 and 0,7%. The area of fur increased the most significantly – by 8, 5%, larch – by 10, 2%, cedar – by 33, 8%, birch – by 10, 0%, aspen – by 13, 8%.

The total reserve of wood in main forest forming species in the country amounts to 412, 25 mln. $м^3$. Predominant in terms of reserves are coniferous forest crops – 61,9%, including pine woods – 42,3%, soft-wooded broadleaved – 33,7%, mainly birch forests, covering 63,6% of the reserve

of all soft-wooded broadleaved. Saksaul plantations, covering 65% of the area of main forest forming species, amount only 3,6% of the total reserve, due to biological specific qualities of saksaul with a low content of wood per 1 ha – 2,4 m^3.

The total reserve of plantations of main forest forming species increased by 31, 51 mln. m^3. The total reserve was increased primarily due to significant increase of middle age plantations of coniferous and soft-wooded broadleaved species. The areas of lands, non covered with forests, decreased by 215, 9 thousand ha. The area of glades decreased by 5, 8%, burn and dead plantations – by 4, 6%. The area of identified forest restoring activities was decreased accordingly. The area of the forest plantation fund is 3 mln 587, 2 thousand ha.

Forests in Kazakhstan are located extremely unevenly. Species of forest plantations depend on diversity of natural zones. Saksaul forests grow in the desert zone. The main part of mountain forests is represented by dark coniferous plantations in Altay, Jungar and Zailiskyi Ala-Tau. Birch and aspen forest outliers, island pine woods, ribbon forests of Pri-Irtysh grow in a plain part of steppe and forest-steppe zones. Forest lands dominate in regions with saksaul plantations, accordingly the share of forest lands here is high, namely in Jambyl oblast – 15, 4%, South-Kazakhstan – 13, 8%, Kyzyl-Orda – 13, 5%. The lowest degree of the forest cover is in Atyran oblast - 0, 1%, Aktyubinsk – 0, 2% and Mangistau – 0, 7% (Fig. 7).



область	Пл. области
Акмолинская	14 692,9
Актюбинская	30 062,9
Алматинская	22 424,3
Атырауская	11 863,1
Восточно-Казахстанская	28 322,6
Жамбылская	14 426,4
Западно-Казахстанская	15 133,9
Карагандинская	42 798,2
Костанайская	19 600,1
Кызылординская	22 601,9
Мангистауская	16 564,2
Павлодарская	12 475,5
Северо-Казахстанская	9 799,3
Южно-Казахстанская	11 724,9
Всего по РК	272 490,2

Fig. 7. The country forest fund within oblasts as of 1 January 2012

In Kazakhstan forests play important roles in climate regulation, nature formation, and field, and soil and water protection, sanitary and hygienic functions. Therefore, large-scale efforts aimed at restoration of forest massifs and extensions of forest plantations areas are required.

At present, works are conducted to increase a forest cover with plants and crops, as well as taking measures to create favorable conditions for natural regeneration of forests in plains in different climatic zones (forest, steppe, and desert) and mountain systems.

It is still difficult to ensure protection of forests from fires and illegal logging in the territory of the state forest fund, in spite of more active targeted efforts, which resulted in dramatic reduction of fires from 2010 to 2013. (Table 1). The main reasons of forest fires in 4 years were: natural factors (lightning) - about 40%; anthropogenic (caused by actions of population, unidentified reasons) - about 60%. Causes of major fires are the transition of steppe fires to the state forest area, in view of inefficient measures of local administrations to prevent wildfires, poor level of staffing and material-technical base of the state forest protection system.

1.2.1.3. Fauna

As for rare species of animals, the Appendix to the CITES Convention includes 107 species of fauna in Kazakhstan, Appendix I – 20 species and Appendix II – 87 species.

According to the resolution of the government of RK # 1034 as of 31 October 2006 the list of rare and endangered animals include the following: mammals – 40, birds – 57, reptiles – 10, amphibian – 3, fish – 18, annelid worms – 2, shellfish – 6, crustaceans -1, aranedian -2, and insects – 85 species. The recent 4th edition of the Red Book of Kazakhstan 4 is based on the above list and was prepared in 2011 and published in 2012. At present the lists of rare species need to be updated, using modern IUCN standards and categories (currently not quantitative, but qualitative criteria to the sample of the Red Book USSR, 1984, are used; they are virtually similar to previous IUCN standards).

78 species of globally endangered types of categories CR, EN, VU, NT inhabit in Kazakhstan. 12 types of the category CR are represented in the country, including 6 types of fish (Acipenser gueldenstaedtii - Russian Sturgeon, Acipenser nudiventris - Ship Sturgeon, Acipenser persicus - Persian Sturgeon, Acipenser stellatus - Stellate Sturgeon, Huso huso - Beluga, Pseudoscaphirhynchus fedtschenkoi - Syr-darya Shovel-nose Sturgeon), 3 types of birds (Leucogeranus leucogeranus - Siberian Crane, Numenius tenuirostris - Slender-billed Curlew, Vanellus gregarius - Sociable Lapwing), 2 types of mammals (Mustela lutreola - European Mink, Saiga tatarica - Mongolian Saiga), and one type of shell-fish (Dreissena caspia).

Category EN relate to 14 types, including 2 types of fish, 1 - amphibia, 5 – birds and 6 - mammals; category VU - 27 types, including one type of shellfish, 5 - fish, 14 - birds, 7 - mammals; category NT - 25 types, including 2 types of insects (dragonfly), 1 - fish, 12 - birds, 10 - mammals.

It should be noted that up to 90% of total populations of globally endangered species of amphibian Ranodon sibiricus (Semirechensk Salamander, EN), sand piper black sided lapwing Vanellus gregarius (Sociable Lapwing, CR) and saiga antilope Saiga tatarica (Mongolian Saiga, CR) inhabit in Kazakhstan. Therefore, the country is especially responsible for their conservation.

Monitoring of the number of terrestrial animals, implemented in the country, related only to a few rare species and a number of species that are targets of hunting. However, the monitoring of hunting targets should be implemented by hunting farms, providing records to territorial units of FHC MEPWR RK. On the basis of these materials the number of species in the whole country and trends are identified, to determine limits of hunting of these species. Note that the quality of surveys in different farms and regions is controversial, from actual data to expert estimates or

just “guess” numbers, similar to previous years. It is connected with completely different resources, available personnel in hunting farms and their qualifications. However, this information allows to define, at least, the order of digits (at least for obvious types) and their trends. Table 2 MEPWR RK below was submitted to the government in 2008-2013.

Table 2. Dynamics in number of types of animals which are targets for hunting, in 2008-2013

Type	year					
	2008	**2009**	**2010**	**2011**	**2012**	**2013**
Boar	18377	19458	20981	23451	27169	29061
Musk deer	400	351	376	378	466	485
Red deer (maral)	8234	7930	8486	9312	10771	10860
Roe deer	62420	61104	60477	65110	69323	74025
Elk	2717	2768	2443	2816	3627	4354
Siberian ibex	16207	18903	19002	20763	16688	16773
Brown beer	1558	1567	1539	1610	1859	2199
Sable	5412	5906	5378	4158	6000	7351
Steppe polecat	90006	88433	120542	112959	122014	131367
Ermine	19968	26523	28605	30597	35288	34642
Siberian striped weasel	2573	2333	972	1102	1332	1934
American mink	5037	7131	6026	5156	5213	6131
Badger	50726	55822	48596	57945	64474	65863
Wolverine	?	?	127	164	183	210
Lynx	636	785	545	800	735	834
Fox	140291	131251	129649	139132	137475	155328
Corsac	56551	51837	50434	55678	55196	58389
Racoon dog	663	946	1222	1377	1608	1533
Hare (all types)	1030129	1046747	805278	804742	866733	861147
Marmot (all types)	1989133	2066239	1730420	1673265	1783331	1582401
Yellow souslik	34100	107800	395286	381834	275912	431850
Squirrel	26830	22948	11779	12217	13659	14974
Musk-rat (ondatra)	744081	546673	273963	216501	264604	324278
Beaver	2692	2831	3022	3194	2651	2853
Goose (all types)	9711962	12145584	6522470	5973405	7964745	6531973
Ducks (all types)	28354274	16558587	10032237	11282714	12272628	12842474
Bald coot	7234867	2750766	2625766	2535563	2410045	2449609
Sandpiper (all types)	4281335	1470698	994282	1037767	1013016	986513
Black grouse	276427	271020	145867	161820	174201	178084
Great grouse	3318	3659	3500	3442	2598	4248
Hazel grouse	2634	3109	6360	6532	10645	15837
Partridge (all types)	869042	878153	590270	564262	641067	700095
Pheasant	263586	316233	250253	311449	309903	293059
Himalayan snowcock	4165	4389	4451	4619	5483	3428
Chukar	363596	294754	245309	355864	393980	369548
Quail	369698	363120	289782	312536	365157	400892
Pigeon (all types)	1128304	996495	536316	457057	413221	483098

We will consider some of these species. As seen from Table 2 and Fig. 8 and 9, the number of elk and boar has a fairly stable growth trend that is shown on the trend line. Firstly, for natural reasons, because of its settlement in a forest-steppe zone, secondly - mainly due to

biotechnologies used in a number of hunting farms that are interested in increasing quantity of animals for profit.

Fig. 8. Number of elks in Kazakhstan in 2008-2013

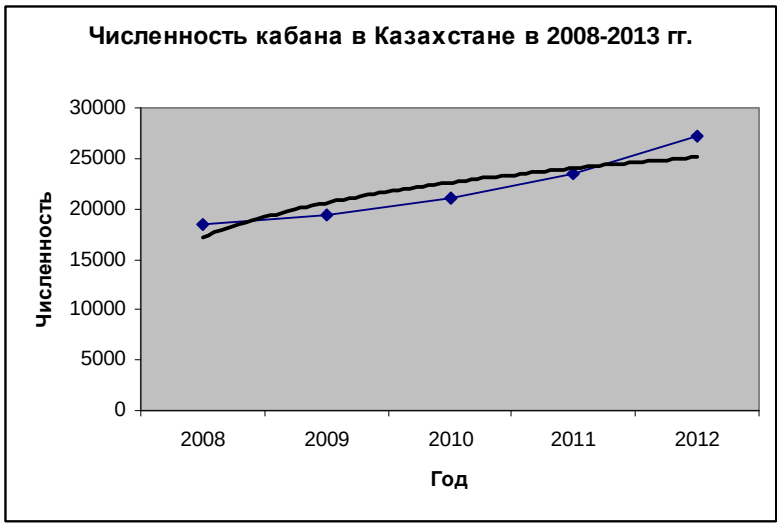


Fig. 9. Number of boar in Kazakhstan in 2008-2013

The number of ducks and geese, which are not divided in records by species, is decreasing. And it is still unclear why it's happening. (Fig. 10, 11). This information coincides with experience of hunters, who complain about the decline in number of waterfowl and hunting. One possible reason is reduced water levels in reservoirs, as well as increased factor of disturbance due to commercial fishing in lakes. The same downward trend is observed in Western Siberia, from where most of ducks and geese, recorded in Kazakhstan, fly.

Fig. 10. Number of goose in Kazakhstan, 2008-2013 (all types)

Fig. 11. Number of ducks in Kazakhstan, 2008-2013 (all types)

The number of black cock in 2010 dropped sharply, then it demonstrated a stabilization and growth trend; on the contrary the number of grouse continued to rise throughout its habitats.

Fig. 12. Number of black cocks in Kazakhstan, 2008-2013

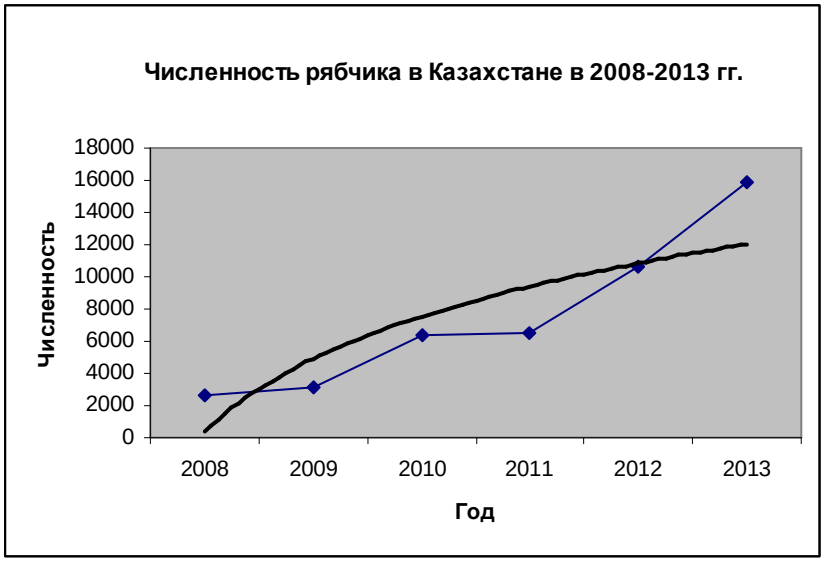


Fig. 13. Number of hazel grouse in Kazakhstan, 2008-2013

The number of the majority of species appears to be relatively stable with fluctuations, but with full confidence, as noted above, it is difficult to define. With regards to the number of hunting species and continued degradation of habitats, the situation is not as dramatic since habitats are most visibly changed in deserts and semi-deserts, where there are very few hunting farms; and records are made in the hunting farms, in general located in the areas less affected by desertification.

Records of the number of rare ungulates, unlike surveys on hunting species surveys, are made by the state order, using aircraft facilities, with common methods. It involves professional zoologists, so the data are more reliable.

It may be noted that the number of all of these five species - tugai deer (*Cervus elaphus bactrianus*), goitered gazelle (*Gazella subgutturosa*), Asiatic wild ass (*Equus hemionus*), mountain sheep, or argali (*Ovis ammon ssp.*, set of subspecies) and saiga antelope (*Saiga tatarica*) - is steadily growing with different rates (Table 3). The growth is associated with fairly effective anti-poaching measures, taken by RSE "PU Okhotzooprom" - a special unit of FHC MEPWR RK in the framework of the state program. The government annually increases funding for inspection teams, patrolling vast areas with habitats of rare species.

Table 3. Dynamics of number of rare species of wild ungulate animals in Kazakhstan, 2010-2013

№	Name of species/subspecies	Number (of species) per years			
		2010	2011	2012	2013
1	Tugai deer	418	421	451	465
2	Goitered gazelle	12054	12100	12623	12888
3	Asiatic wild ass	2477	2500	2920	3222
4	Wild sheep	13246	13597	13872	14525
5	Saiga antelope	85500	102000	136600	187000

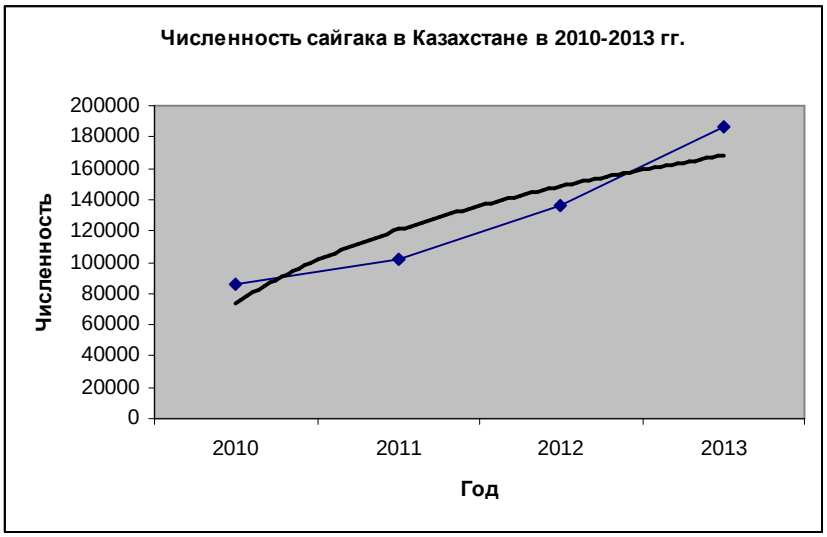


Fig. 14. Number of saiga antelope in Kazakhstan, 2008-2013

Achievements of Kazakhstan are especially visible in restoring of saiga population, which numbers fell from more than million heads in the early 1990s to about 30,000 in 2002. The main reason is illegal hunting for horns, to export to China and use in traditional Chinese medicine. Hunting of saiga has been completely banned for already 15 years, the ban extended from 2003 to 2020; the government takes more active efforts to save the species and funds, as mentioned above, and special mobile units " Okhotzooprom".

Hunting organizations, as well as scientific and public organizations, such as, for example, "Kazakhstan association of biodiversity conservation" (KABC) are involved in conservation of saiga. KABC conducted both advocacy activities and researches, including satellite telemetry, improvement of recording methods and etc.. This is a good example of joint activities of non-governmental and state organizations. GEF/UNDP projects, in particular, the "Conservation and sustainable management of steppe ecosystems" project, made a significant contribution to conservation of saiga, primarily through participation in operation of SPAs.

Within 4 years the total number of species increased in more than 2 times, up to 187 thousand heads. Unfortunately, the Usturt population is still endangered and its number does not exceed several thousand species. It increased mainly due to a large Betpakdala population. The Ural population shows good recovery rates.

Despite the seemingly quite stable overall situation with hunting species of animals and rare ungulates, there is a local displacement of animals caused by disturbance factors, destruction of habitats for various reasons, and in coming years, if negative impacts continue to be in place, populations of a number of species would fall down.

1.2.2. Threat factors

Some threats to biodiversity exist in Kazakhstan over the last few decades, from the 1960s. Their impact remains quite stable in some areas, and sometimes it is intensified. At the same time, some threats, which have been local before, aggravated within last five years.

As a result of large-scale ploughing up of lands, that happened 50 years ago, there were total changes of many ecosystems, deep anthropogenic transformation of steppe and forest-steppe zones. Rich mixed herb - feather grasses - 8.5 million ha and mixed herb - feather grass steppes - 13.6 million ha, suffered particularly seriously as a result of plowing. The area of ploughed up lands reached 90% in plains, and up to 30 % - in hummocks. Dry steppe plains (their area - 52 million hectares) were ploughed up by 50-60 %, and in hummocks - by 10-15%. The rest, in these subareas, steppe areas (rocky and complex steppe in slopes) were significantly transformed. As a result of overgrazing in the steppe regions there was a significant loss of biodiversity.

Vegetation in mountain steppes has undergone significant changes as unploughed lands are subject to impact of grazing and haying.

Depletion of biodiversity in sub-zones of deserts occurs unevenly. In the northern deserts, mostly sagebrush, there is focal (local) overgrazing around winter sites, villages and focal - line - on routes of livestock passes. In middle and southern deserts (long-standing saltwort), except for overgrazing, disturbances (especially in the west of the country) are associated with human impact and haphazard road network, regulation of rivers, illegal logging of saksaul for sale.Vegetation in sandy deserts is especially disturbed. As a result of urbanization and intensive agricultural development in foothills the vegetation was seriously disturbed, original Kazakh ephemeroid- sagebrush deserts were virtually destroyed in vast areas.

Particular sudden changes of grassland vegetation occurred in floodplains of the Ili, Syrdarya, Shu, and Talas rivers. Highly productive floodplain communities were almost completely destroyed. As a result of the limited river run-off the vegetation is degraded everywhere; meadows disappear as a type of vegetation. Their diversity is reduced, the yield decreases by 10-15 times (15-40 to 1.5-2 t / ha).

In the north-western region of Kazakhstan floodplain forests - (oak groves, ash forests, maple forests, elm forests, willow forests, etc.) are degraded due to violation of the hydrological regime. Riparian forests of poplar, willow sites, tamarisk, and ash forests that grow in narrow strips along rivers are subject to strong anthropogenic pressure (unregulated haying, unstructured grazing, and construction of irrigation networks, plowing of floodplains). The flooded area has been also reduced; the groundwater level fell down.

Plowing of steppes around forest massifs affected forests in forest-steppe and steppe zones, resulting in changes in the hydrological regime. Regular aerial treatments of agricultural fields with herbicides, as well as logging in birch forests, aimed at their coppice regeneration, essentially affected their biodiversity and led to formation of low productive plants.

Steppe pine forests are depleted due to intensive logging, major forest fires. Ribbon woods in Pri-Irtyshie undergone long-term impact of radio nucleotides as result of nuclear weapons tests in the Semipalatinsk nuclear site; wood massifs were destroyed in the Torgai region and other regions of Central Kazakhstan.

Mountain forests are also under pressure of overgrazing of livestock that led to degradation of actual above-soil cover and worsening of the natural restoration. Logging conducted under such conditions decreased thickness of plantations, replacement of coniferous species with foliaceous and bushy species (Eastern Kazakhstan oblast). The lower border of the fur belt in the Iliskyi Alatau moved up about 200 m within last 100-150 years, silver fur in Jungar (Jetisy) Alatau - up to 100 m.

Fauna of terrestrial and soil-dwelling insects, spiders, birds and mammals and other animal groups was seriously damaged as a result of
Mass plowing of virgin lands, drastic reduction of natural vegetation areas, soil erosion, technological and agricultural pollution. About 80% of the zonal steppe fauna in the northern regions of the country was destroyed. The similar situation is in the steppe zone of the Tien Shan and its foothills, where in some areas many species of phytophagous insects, wild bees - pollinators of plants, predatory and parasitic arthropods, reptiles, birds and mammals became rare or totally is appeared as a result of land development, wide application of pesticides, overgrazing and fires. Areals and numbers of many animal species (including, endemics) were reduced because of overgrazing in highlands of Tien Shan, Jungar Alatau and Tarbagatai and also in deserts Taukum, Moiynkum and Saryesik -Atyrau.

The anthropogenic impact changed the structure of zoocenoses: along with the depletion of species and reduction of the total number of animals the number of eurybiontic plastic types (many of them are pests for agriculture and forestry) was increased. The fauna in suburbs of large industrial cities, on the territory of military sites and mining areas has undergone significant changes. Very significant degradation of pastures is observed around villages due to overgrazing. At the same time, some pastures are being neglected due to migration of people from small villages to larger (about 60% of agricultural land) settlements.

Building of roads, pipelines, power lines have a great impact on the fauna. They not only directly destroy habitats, but also create conditions for the penetration of alien elements in landscapes that can have adverse impact on aboriginal fauna.

The "traditional" direct factor of impact on fauna - is overexploitation of resources. This is primarily poaching that is realized in three forms: either catching wide fowl for own consumption (i.e., to save money for food), or hunting for fun or - the most dangerous - commercial production for sale. The last form applies primarily to saiga, birds of prey (saker falcon, etc.), large predatory animals of all kinds, as well as ungulates for sale of meat. The growing threat is hunting of animals and even birds of prey for illegal export to China and use in Chinese traditional medicine

Ineffective management of hunting, associated with poor skills and lack of advanced plans of hunting farm management and the system of wildlife monitoring has also led to overexploitation.

Rare species of insects (butterflies, beetles, etc.) are caught for collections and sales abroad.

There is a range of threats to aquatic fauna, primarily fish; in addition to deteriorating conditions of their habitats for various reasons, unsustainable fishery organization, the use of destructive fishing methods (electrofishing, cheap plastic nets, etc.), exceeding quotas, illegal fishing, etc. Overexploitation also applies to plant resources; in addition to logging for various purposes, it is uncontrolled harvesting of medicinal plants for sale (including legal and illegal exports), as well as picking flowers for fun and also for sale (especially tulips and crocus in suburbs of large settlements).

The Caspian Sea as an example

Impact on the biological diversity of the Caspian Sea is an example of diverse and powerful anthropogenic pressure. The Caspian Sea is the world's largest salt lake, with an area - 371 000 km ², the maximum depth - 1025 meters. In the Caspian Sea a large number of interconnected ecosystems coexists. The uniqueness of the Caspian Sea is a wide variety of habitats, biotic and abiotic conditions. For example, limits of salinity around the Caspian Sea support freshwater, oligohaline, mesohaline and hypersaline ecosystems. Freshwater ecosystems are formed in deltas of rivers flowing into the Caspian Sea. Oligohaline ecosystems are typical in the North Caspian Sea where the salinity ranges from 0.5 - 5 grams / liter (g/l). Waters of Middle and South Caspian relate to mesohaline ecosystems with an average salinity of 12 g/l, and strongly mineralized waters in the Karabogasgol Bay on the east coast of the Caspian Sea relate to the hypersaline ecosystem with the salinity above 40 g/l.
Biodiversity is characterized with a high level of endemism and unique combination of ecological processes and systems. More than 500 species of plants and 854 species of fish and other aquatic animals are found in the Caspian Sea.
In the depths of the Caspian Sea rich deposits of oil and gas resources are discovered (Table 4).

Table 4. Major oil fields in the Caspian region of Kazakhstan

№	Field	Year of discovery	Assumed complete reserves, mln. tones	License
1	Kashagan Eastern and Western	2000	6400	Agip KCO
2	Tengiz	1979	3100	Tengizchevroil
3	Uzen	1961	1100	Kazmunaigas
4	Karachaganak	1979	1000	Karachaganak Petroleum Operating B.V.
5	Kalamkas	1976	510	Mangistaumunaigaz
6	Zhanazhol	1978	500	CNPC-Aktobemunaigas
7	Zhetybai	1961	330	Mangistaymunaigas
8	Aktoty	2003	269	Agip KGO
9	Kalamkas- sea	2002	156	Agip KGO
10	Kairan	2003	150	Agip KGO
11	Kenkiyak post-salt	1959	150	CNPC-Aktobemunaigas
12	Kumkol	1984	90	Torgai Petroleum, PetroKazakhstan
13	Northern Buzachi (including Zhalgiztube)	1975	70	Buzachi Operating Ltd, Zhalgistubemunai
14	Karazhanbas	1974	50	Karazhanbasmunai
15	Karakuduk	1971	40	Karakudukmunai

Development of offshore oil and gas fields of the Kazakhstan sector of the Caspian Sea entails increasing anthropogenic effects that pollutes and destroy the environment. These are:

- emissions to atmosphere during operation of construction equipment, engines of equipment used in seismic exploration and drilling; from

excavation and movement of construction materials; from furnaces and boilers, burning of hydrocarbons in the flare; from tanks of petroleum

products and production equipment; heat into the atmosphere;

- withdrawal of surface waters for domestic and industrial needs; violation of the runoff in the basin water intake; complex impact in transportation of goods (roil, breaking wave); change of a hydrodynamic regime and icing regime;
- physical disturbance of geological structures, development of exogenous geological processes, violation of the hydrodynamic regime (injection into formation and use of groundwaters for drinking and industrial purposes), chemical pollution of groundwaters;
- withdrawal of land acquisition, mechanical damages, deposition of pollutants from the air, chemical pollution, planning, excavation, restoration, noise, light, vibrations;
- discharge of purified water into the sea; sediment spread - decrease of transparency and lighting; settlement of dust and bottom sediments.
- pollution of marine waters of the Caspian Sea (with the rise of the level) in case of flooding and underflooding of oil and gas and energy sites; pollution resulted from offshore oil production and transportation; pollutants, coming together with rivers, flowing into the Caspian
- exceedance of radiation safety standards

The results are as follows:

• Pollution and degradation of soil and vegetation;
• Groundwater depletion;
• Destruction of flora and fauna due to poisoning by oil, gas and petroleum products;
• Reduction of population, number of Caspian seals and other animals.

The problem of the change of the Caspian Sea level always created socio-economic and environmental problems in the coastal area. For example, in case of falling down the sea level there is a need to re-build all hydraulic installations, including ports. The shelf zone area, with flora and fauna of the Caspian Sea, is decreasing. Obstacles occur to the transition of fish in rivers for spawning. If the level goes up, then environmental conditions are also deteriorating, wetlands are formed; houses and lands remain under water.

The loss of biodiversity has already significantly destroyed the Caspian ecosystem. Another factor contributing to the depletion of fish stocks and ecosystem resilience is reduced access to fish spawning areas (construction of irrigation dams, barrages, development of the shelf). Fishing of sturgeons, herrings, anchovies, salmons are greatly reduced over the past three decades (sturgeon by 90 %). One of the major reasons for the decline of the number of sturgeons is their illegal production for sale of caviar. Measures against such illegal production are conducted regularly. Here poaching groups, including from neighboring countries, primarily Russia, are organized. Poaching affects the number of other valuable fish species. The decline of Caspian fish stocks impact on the well-being of the local population, but also entails significant socio - economic effects due to the extremely high value of the lost biological resources, in particular, caviar. The number of Caspian seals also continues to decline.

Naturally, the impact of mining is significant not only in the Caspian Sea , but also in Kazakhstan on the whole, and applies to all their types. Thus, the area of lands, occupied by mining companies, has been steadily extended; for the period from 2008 to 2012 - to 110,000 hectares, and in general, since 2000 from 580,000 ha to 910,000 ha (Fig. 15). In the last 5 years the oil and gas production areas, uranium mines, etc., were extended in the Western Kazakhstan, eastern PriCaspian region, the Betpakdala desert. The statistics does not reflect extensive areas of preliminary explorations of mineral resources, also causing displacement of, at least, cautious animals.

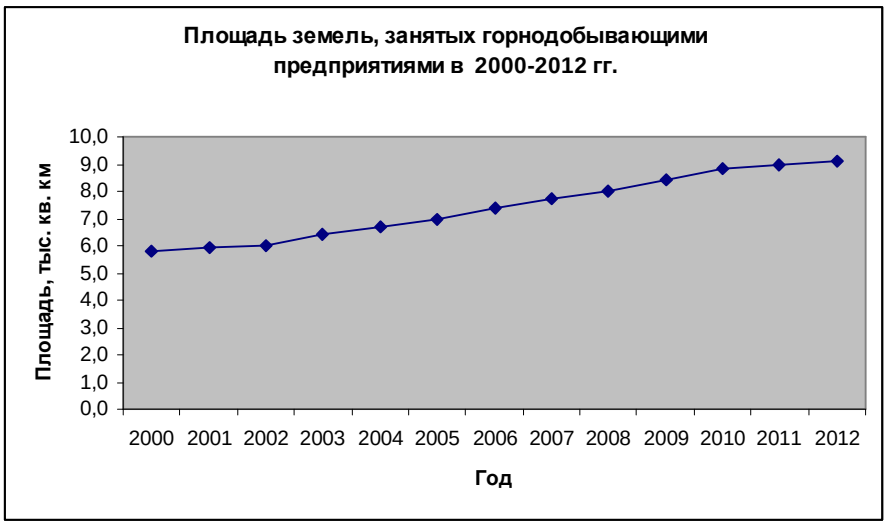


Fig. 15. The area of lands, occupied by mining companies in Kazakhstan, 2000-2012

Issues associated with drydown of the Aral Sea have been already mentioned and will be discussed below. Threats for the other largest lake – Balkhash and basins of large rivers in the south-east and the east of Kazakhstan (Ili, Irtysh), due to use of water for irrigation in China in upper reaches of these rivers and plans of China to dramatically increase irrigated areas and water intake are growing. This will inevitably lead to extreme consequences for relevant regions in Kazakhstan and their biodiversity; this problem needs urgent intergovernmental actions.

During five years such factors, as water and wind erosion of agricultural lands, remained the same and affect 0,5% and 0,3% of the total area accordingly. A growing problem - the accumulation of solid household wastes with contamination of natural landscapes, has worsened off in recent years due to widespread utilization of free plastic bags and disposable packaging. Solid mine tailings and other industrial wastes, especially given the raw nature of the economy, are being accumulated more intensively.

The local impact of tourism, more precisely, unregulated recreation, as a powerful factor of concern and pollution and habitat destruction, aggravated within recent five years. It is especially visible in suburbs of large cities, as well as in popular tourist areas, such as the coast of the Alakol, Burabai lakes etc.

Tourism in PAs is also developing more rapidly and needs regulation and standardization of loads. The concern is about attempts to derive lands from PAs to build touristic sites that affect not only the withdrawn lands, but also surrounding areas, dramatically reducing the conservation value of protected areas. The example is the discussion of the construction, starting in 2014, of the ski resort " Kokzhaylau " on the Ile-Alatau SNNP near Almaty, with the planned capacity of up to 10,000 people. The construction was initiated by the Almaty city administration; the public discussions of its feasibility and harm to biodiversity, including threats to globally threatened species and the loss of value of SNNP as a potential site of the World Heritage, included, back in 2002, into the Tentative List from Kazakhstan, are ongoing.

One more threat factor to biodiversity is pests and parasites of crops and wild plants. First of all, they are Asian, Italian, Moroccan locust; Colorado beetle, cotton bollworm, red spider, glass-grown whitefly, melon aphids, thrips, Hessian fly; brown, stem, yellow rust and septoria blight.

In general, the composition of pests is quite extensive. So, in relict forests in Priirtyshja SN according to SNR " Ertis ormany " and " Semei ormany" the following pests were recorded: 43 species of pests : 9 - conifer-chewing , 8 - leaf-chewing , 26 – stem borers and 46 species of entomophages and 5 kinds of diseases. The survey of 15 quarantine pests by a grade system (grain weevil with wide trunks, white-girdled beetle, cotton mole, eastern mealybug, leaf spot of corns, anthracnose of cotton, Texas root rot, yellow slime disease of wheat, toothed spurge, sunflower California, Comstock mealybug, fig wax tortoise scale wax, melon fly, pear moth, apple buprestid) showed that in Kazakhstan the pest risk to these organisms is above the average (1.25).

Diseases also affect the state of populations of some species, causing mass death at epizootic outbreaks. The following case can be given as an example - mass death of the Ural saiga population in 2010, with more than 10,000 dead animals (according to official figures, because of pasteurellosis), as well as other, smaller in size, deaths of saiga in Betpakdala in 2013. Epizootic outbreaks occur regularly in rodent's populations which act as a natural reservoir of a number of particularly dangerous infections, including plague. Natural spots of plague are controlled by a special service – the Kazakh Scientific Center for quarantine and zoogenous infectious diseases of the Ministry of Health of RK.

Invasive and alien species

The problem of invasive and alien species appeared in the country long time ago, it was not considered as a serious issue. The analyses conducted in 2012 (Kovshar, 2012) showed that species, potentially dangerous to natural biodiversity, are typical, in varying degrees, in Kazakhstan - 26 species of fish, 1 specie of birds, 5 species of mammals, several species of invertebrates.

Among the insects, a Colorado beetle, which still settles not only in areas of productive vegetable crops and summer house gardens, but also penetrate, in the last 5 years, even to the highlands of the Inner Tien Shan (3000 m above the sea level) is quite common in the country. The threat to biological resources in the Caspian Sea started about 10 years ago and became more acute in recent years due to Ctenophore mimeopsisa, that devours fodder supply and fish roe. In the east of Kazakhstan, Chinese sea mitten crab *(Erioheir senensis),in* the Black Irtysh river, periodically obviously, brought with the fish for cage culture fishery; but the danger is low, as crab roe develops only in salt water.

The serious problem for native fish fauna is both species, imported in bulk for acclimatization, and incidentally caught with them in ponds gobies *(Rhinogobius similis, Benthophiloides turcomanus),* chebachok Amur (*Pseudorasbora parva*), lozhnopeskar (*Abbottina rivularis*), etc. The number of reservoirs up to 50% of the fish fauna constitute unwanted invaders; along with intentionally acclimatized species, they fundamentally changed the fish fauna of the country, which has been preserved in its natural (or almost natural) state only in the upper reaches of mountain rivers.

For typical local species occasionally myna (*Acridotheres tristis*), can present a threat. It has relatively recently (1959) appeared in the fauna of Kazakhstan, first in the south, and currently has been already settling in the east and north of the country. This omnivorous synanthrope, due to its high number and aggressive behavior, displaces a starling, blackbird, etc. Importation and release of a pheasant (*Phasianus colchicus ssp.)* to hunting lands from European nurseries, that occasionally can affect the aboriginal form - Semirechensk pheasant *(Phasianus colchicus mongolicus)* should be strictly regulated.

Among mammals, jackal (Canis aureus), naturally entered the country and settled, acting as an additional predator for pheasant and other ground nesting birds and small mammals. Black (*Rattus rattus*) and gray (*R. norvegicus*) rats settle with a man - with goods, etc.. Raccoon dog (*Nyctereutes procyonoides*), acclimatized in Russia, penetrated Kazakhstan and settled in the east and the north of the country. As an example of ill-conceived acclimatization, an American mink (*Mustela vison*), brought to Altai in the 1950s - 1960s and Uzbekistan on the border with Kazakhstan in the 1970s, can be listed. At present this animal is widely spread over the mountain rivers of the Western Tien Shan, Altai, and in the last 5 years actively entered and populates in Jungar (Zhetysuskij) Alatau, destroying native species of fish, amphibians, and potentially threatening Dzungaria narrow areal - semirechye salamander *(Ranodon sibiricus).*

1.2.3. Economic effects of biodiversity change and impact on wealth and health Of population

The country's population, as of January 1, 2014, amounted to 17.2 million (Table 5). The highest population growth is observed in the cities of Astana and Almaty and the South Kazakhstan region. In the East Kazakhstan, Kostanai and Akmola regions causes of decline is the low natural population growth, the value of which does not cover migration loss in these regions. The North-Kazakhstan region, moreover, shows the natural decline.

Table 5. The demographic situation in Kazakhstan in 2009-2013

Indicators	2009	2010	2011	2012	2013
The number of the population at the end of the year (the current statistics), thousand people	16203	16440,1	16673	16 909,8	17 165,20
In percentage compared to the previous year	101,4	101,5	101,4	101,4	101,5
Birth rate (per 1000 thousand)	22,2	22,5	22,5	22,7	23,1
Death rate (1000 thousand)	8,9	9,0	8,8	8,5	8,1
Natural population growth					
people	213,140	221,572	227,857	238,125	255,791
for 1000 people	13,2	13,6	13,8	14,2	15,0

Kazakhstan achieved the significant economic growth. From 2009 to 2013, GDP increased by 91% and amounted to 12.9 thousand $ per capita.

However, the economic effect of Kazakhstan was achieved due to rich natural resources. The country on reserves of coal, oil, gas, chromium, uranium, zinc, and iron ore, copper, gold and their production is among the top 15 countries in the world. Revenues from natural resources constitute about half of the budget revenues and more than 70 % of exports. Oil revenues account for about half of the budget; export of mining products account for 76 %, of which 71 % are hydrocarbons (Fig. 15). In total 17 % of the economy relate to resource-dependent industries.

The current economic model leads to inefficient economic development and constantly rising pressure on ecosystems, especially given the steady growth of the population. The low efficiency of energy use, land degradation and water supply deficit, pollution and increased load on the

flora and fauna cause loss of biodiversity, deterioration of health and welfare of specific groups and local communities (despite of the overall increase in the average income statistics).

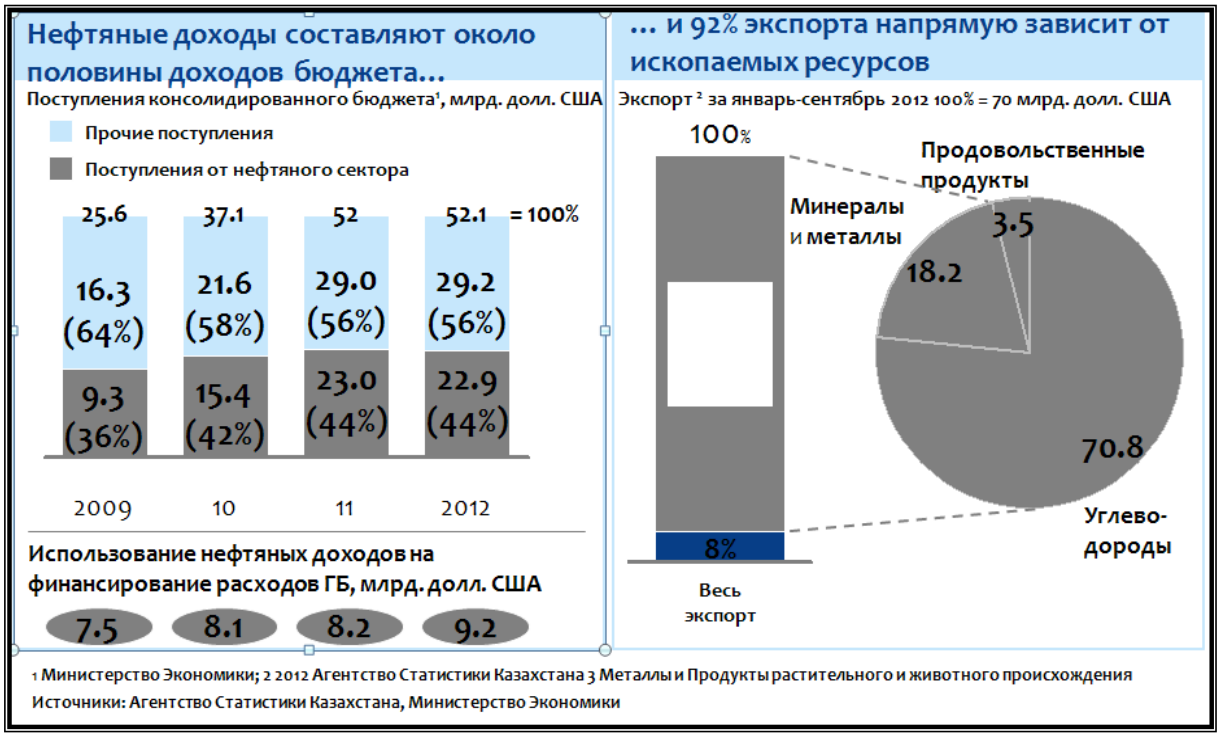


Fig. 15. Budget of industries in 2012 г.

Oil revenues constitute about half of budget revenues and 92% of export directly depend on raw resources

Blue box - other revenues

Grey box - revenues from oil industry

Use of oil revenues for financing of costs of SB, billion USA

Export for January - September 2012, 100% - 70 billion USD

Food products, hydrocarbons, minerals, metals

The important factor in the current economic model is the disparity of development of regions, leading to an imbalance in the level of incomes, living conditions and health. In addition, a significant level of emissions of pollutants into the environment, including greenhouse gases, may worsen the international image of the country as a follower of ideas of a "green" economy. Dependence of the country economy on fossil resources increases risks for the state budget because of fluctuations of resource prices in world markets.

Currently, all sectors of the economy are characterized by low productivity due to loss of energy (heating of homes, heat and electricity); low land productivity (yields of wheat, barley, rice and other crops); large losses of water in agriculture, industry and households due to non-use of benefits of water recycling.
Significant indirect subsidies for energy resources lead to loss of profits and cause the low efficiency of resource management programs, including those allocated to fossil fuels: oil, natural gas and coal (Fig. 16).

Fig. 16. Situation and perspectives of energy infrastructure development

Text: Consumption of power from primary source to produce 1MBt-h of electric power, mln brit, heat units

Current power system of Kazakhstan

Increase of efficiency to the level of modern electric stations

Reduction of losses on transfer and distribution to the EU level

Modern power system

Assumed reduction of costs for fuels per year, mln USD

1 Based on the structure of generating capacities in Kazakhstan in 2012

2. Assuming efficiency rate at the level of 32% for coal.gen; and 38% for gas, gen

3. efficiency rate coal gen - 44%; gas.gen - 56%

4. losses during transfer and distribution of energy are 13% compared to 8% in EU countries

5. assuming the price for gas in 2011, 2030 0 80 -100USD per 1000 cub.m. coal price- 12, 25 USD per I ton.

6. assuming development under a basic scenario

Source: “Samruk Energo”, the master plan of power system development in Kazakhstan, the developed McKinsey cost curve, related to reduction of CO2 emissions in Russia, analysis of the working group

One of the significant causes of the decline of economic profitability is poor quality of lands. Reduced productivity of agricultural and pastures caused by poor management of land resources (Fig. 17) with monoculture plantation, without optimal crop rotation, minimal use of fertilizers, overgrazing, outdated equipment and inefficient methods of operation.

Increasing diversity and productivity of agricultural and natural systems, in addition to purely economic effect, allow to fix a significant amount of carbon dioxide that is the main condition for reducing the greenhouse effect and thus mitigating effects of climate change.

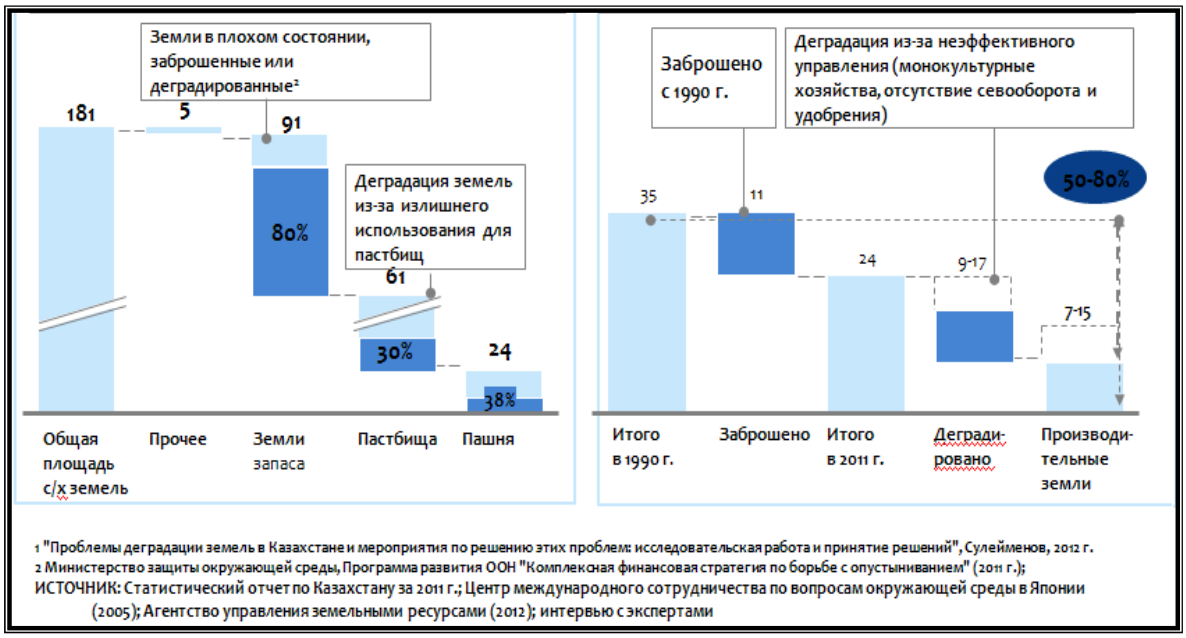


Fig. 17. State of agricultural lands in Kazakhstan

Text:

Left char:
Lands in bad conditions, abandoned or degraded
Degradation resulted from overuse of lands for pastures
Total area of agr. Lands.
Other, reserve lands
Pastures
Plough land

Right chart:
Abandoned
Degradation resulted from ineffective management (monocultural farms, lack of fertilisers and of crop rotation)
Total in 1990
Abandoned
Total in 2011
Degraded
Productive lands

1. Issues of land degradation in Kazakhstan and measures to address these issues : research and resolutions", Suleimenov, 2012
2. Ministry of Environment Protection, UNDP "Integrated financial strategy on combating desertification", 2011
Source: Statistical report of RK for 2011; Center of International Cooperation on environment issues in Japan (2005)
The Land Management Agency (2012); interview of experts.

Kazakhstan faces a number of serious environmental problems, leading to potential losses of the natural capital and economic benefits, as well as to increasing the social threats. Significant degradation of lands cause yield losses (over 30%).

Deficit of water resources, increased demand for water, inefficient water supply and water consumption determine the significant deterioration in life quality and threaten the country's food security. Currently, an average annual volume of water, required for cities, industry, agriculture makes up 21 billion cubic meter, and its demand in 2020 will be increased to 23 billion cubic meters. The rate of water consumption is constantly rising (Fig. 18). Under the current water supply and consumption system, water gaps at basin levels seem to be constantly increasing.

Fig. 18. Main indicators of water consumption in Kazakhstan

Given the current demand growth, by 2030, Kazakstan may face deficits of water resources on basin levels in the amount of 13 billion cubic meters, with the cost of 2 billion USD. Kazakhstan will need about 2 billion USD to close the water gap - according to international researches showing the cost of extending the water access through additional water supply at the level - 0,14 USD for cubic meter.

Water demand

Urban needs

Industry

Agriculture

Average annual growth rates, %, 2010-2030

Insdustrial demand is probably higher of the specified one, given forecasts of growth of mining, oil and gas industries and coal generation.

Surplus/gap of water in Kazakhstan, summary data on the level of basins, billion cubic metres.

Basins with water deficit - Aral sea, Syr Darya, Ural-Caspia basin, Nur-Sarysskyi basin, Chu-Talas basin, Ishim basin, Tobol-Turgai basin

Basin with surplus of water - 2030 (basic scenario); 2030 (including reduction of cross border water volumes); 2030 (including effect from increase of demand of China in Balkhash, restoration of the level of the Aral sea to the level in 1990)

1. **Runoff, including losses during water transportation**
2. **The model assumes reduction by 3 billion cubic metres due to increase of demand of China. Some sources forecast decrease to 7-8 billion c.m, that would have catastrophic effects for Balkhash.**

Source: Statistical Agency of RK; The model of the global proposal and demand in 2030, prepared by McKinsey; Forecasts of population change, UNDP; water resource Statistics given by the UN Food and Agriculture organization; media review

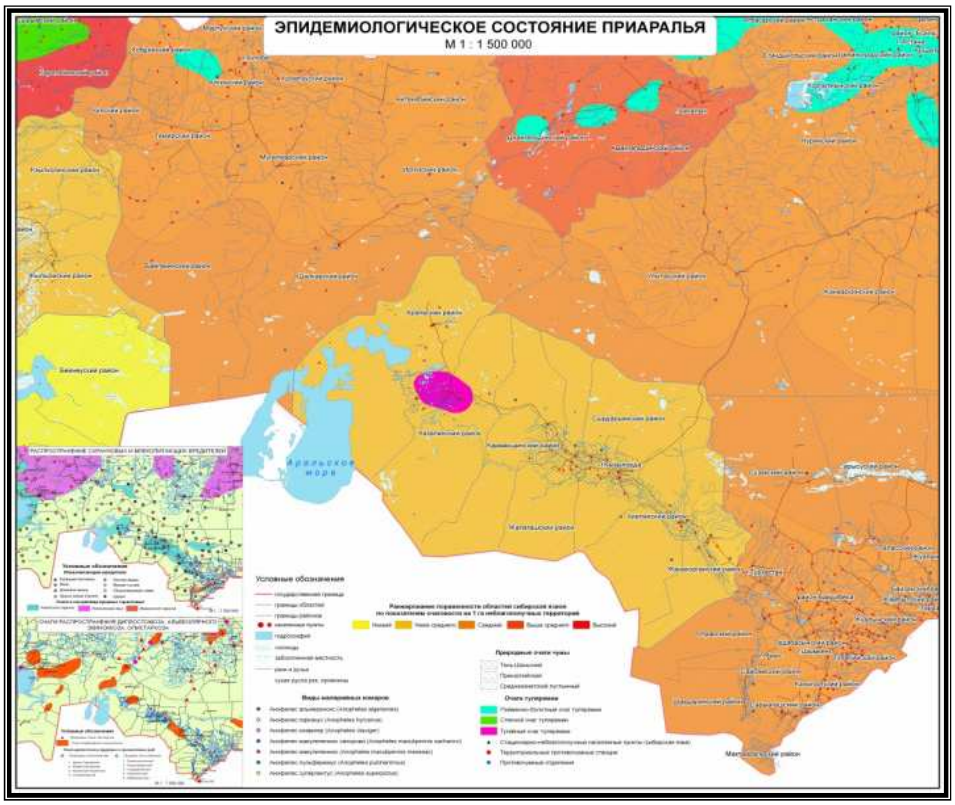
Water resource gaps greatly affected ecosystems in the Aral Sea. In just 40 years the Aral Sea lost 90% of its water reserves due to large-scale irrigation of rice and cotton fields (Fig. 19).

Fig.19. Dynamics of size of the aquatic area of the Aral Sea

Built in 2005, the Kokaral dam, separated the Small Aral from the main area, allowed to stabilize and raise the level of the reservoir, which is now isolated, and reduce its salinity. As a result, there is fish in the Small Aral (in addition to the introduced flounder) and fishing has started again. The economic situation in the region has slightly improved, as well as local biodiversity, but in general in the Aral Sea desertification processes are still underway and threats to biodiversity and the environment are still in place. They are intensified with the development of Kumkol oil fields, that, on the one hand, provides work for some part of the population in the region, on the other hand, can worsen landscapes and the welfare of the other part of the population which are dependent on biological resources.

The Balkhash lake could face the same problems if the current level of water consumption is maintained. With accelerating the development and increasing the irrigated area in Kazakhstan and China, there is a risk that by 2045 the Balkhash lake will lose 86 % of their water reserves. Significant risks to the water supply create dependency of the country on the runoff of transboundary rivers - Irtysh, Ili and Syr Darya; in general, there is a steady decline by 2-3% in the annual inflow. This creates an additional negative impact on the Aral Sea, on water supplies of Irtysh and Tobol, irrigation systems of the coastal areas of Ishim and Talas, reducing the productivity and biodiversity of aquatic, coastal and inland areas. Coupled with pollution, it negatively affects health of people, causing deterioration of the epidemiological status of the areas and thus stimulates the spread of intestinal diseases, deseases of urogenital system, etc.

These effects are fully displayed in the Aral Sea region, where the crisis has led to a sharp decline in the quality of the environment, significant degradation of ecosystems in the Aral Sea region and their individual components. On this background, there was a decrease of efficiency of the economy, the growth of social tension, worsening of the epidemiological situation and the health of the population (Fig. 20, 21).



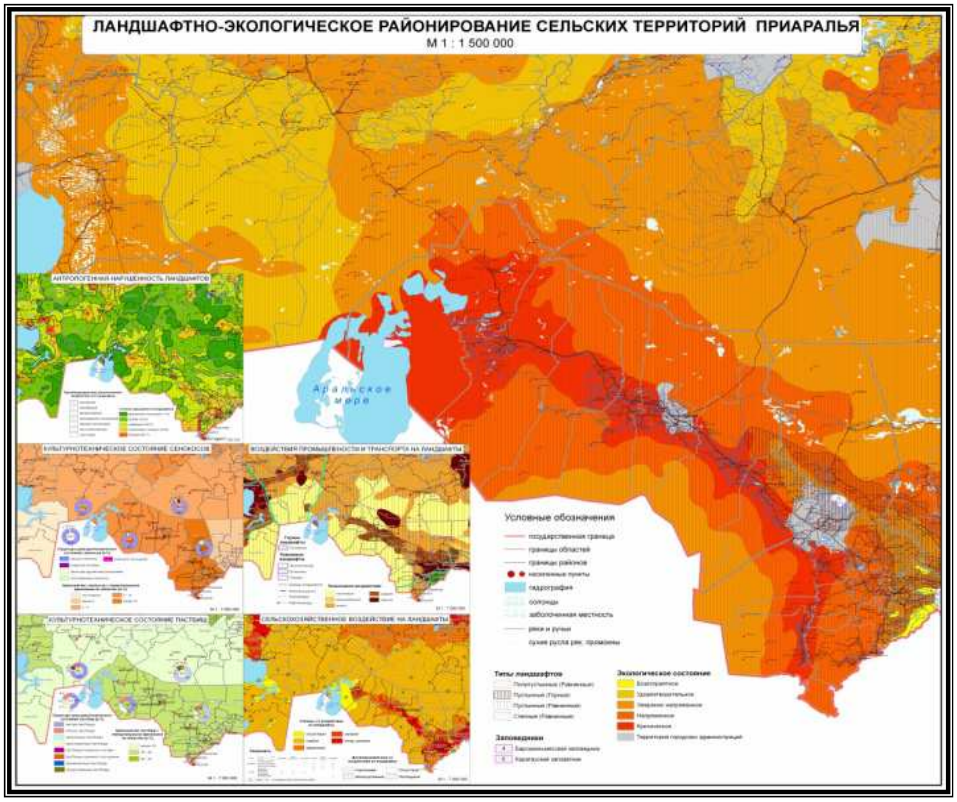
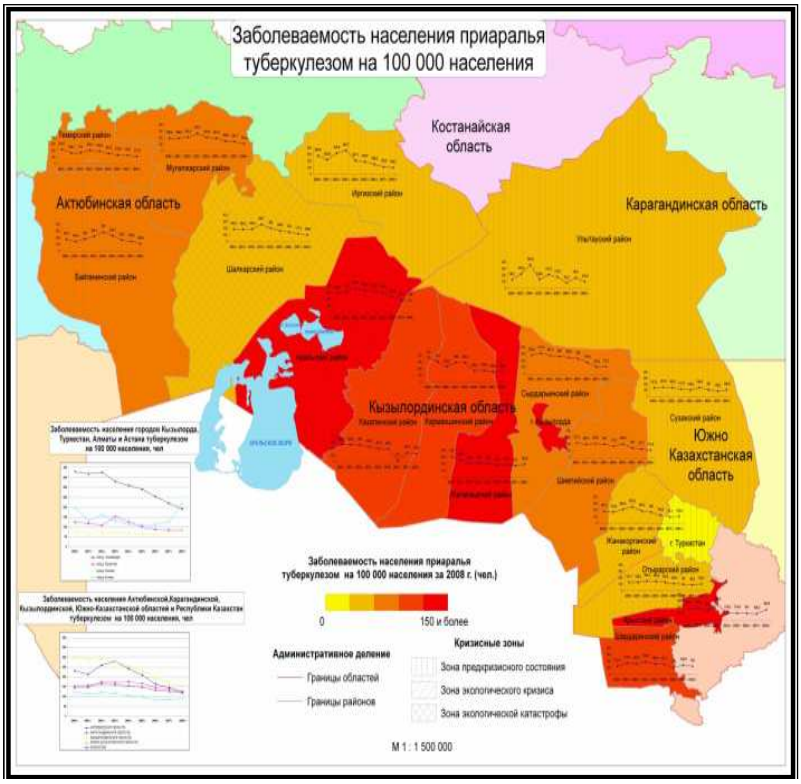


Fig. 20. Epidemiological Status of Priaral
Fig. 21. Landscape-ecological zoning of Priaral



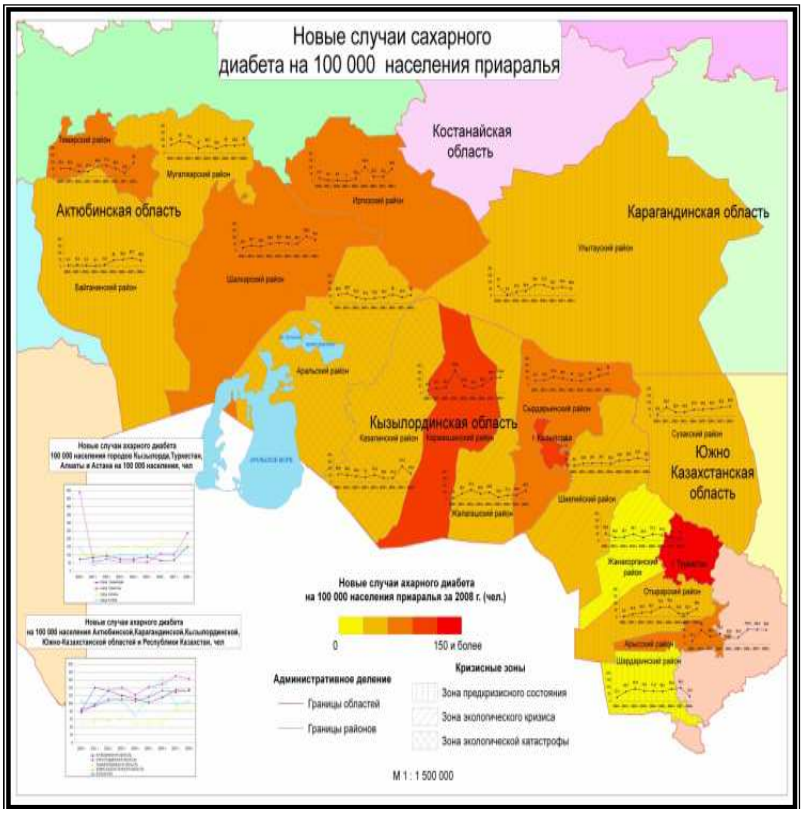


Figure. 21. Spread of tuberculosis in Priaral Fig. 22. Spread of diabetes mellitus in Priaral

In the Aral and Kazaly regions about 40% of mothers suffer a visible loss of body weight. Every second woman has deficit of vitamin “C”, 77-85% of infants has deficit of vitamins "B" and "E". Almost all pregnant women have an iron deficiency anemia as a result of protein and vitamin starvation, lack of fruit and vegetables. The prevalence of ricket among children is in 2-2, 5 times higher than in other regions. The major environmental factors that determine the quality of people’s health in the Aral Sea region are dry and harsh continental climate, high salinity, pollution and shortage of drinking water, as well as desertification of the areas. This brings difficulties for agriculture, lack of quality food and drinking water. Hence, it results in low immune state of the population, beriberi disease etc. Against this background, risks of cancer, tuberculosis, diabetes (Fig. 21, 22), intestinal infections, hepatitis A, etc. are higher now.

Under the existed medical and environmental situation the territory of Priaral is rightly considered as a disaster area, as evidenced by indicators of infectious, parasitic, and natural focal and somatic morbidity, which are significantly higher than the average indicator for Kazakhstan.

It should be noted that some negative factors, as discussed above, have been significantly mitigated in recent 5 years. Under government programs to provide drinking water for optimization of the agricultural industry and entrepreneurship the measures to improve the quality of life are taken. But the results of negative effects as health problems of people, that has already stated, will be manifested and intensified for many years.

A high level of air pollution in urban areas (cities, industrial centres), that is several times greater than the maximum allowable rate, causes the growth of morbidity, resulting in significant public spending on rehabilitation. This is a major factor in the reduction of resource potential / ecosystems biodiversity. Air pollution in urban areas of Kazakhstan causes about 40 deaths per 100 thousand inhabitants. The ttotal costs associated with the negative impact of air pollution on the health of the population make up about 1.7 % of GDP as of 2010, with 90 % of the costs related to the high mortality.

The rapid development of the mining industry, which is the basis of the country economy, leads to a constant increase in the volume of accumulated wastes. In this regard, it is necessary to take urgent measures for disposal of large volumes of mining (over 14,000 million tons), industrial (over 10,000 tons) and radioactive wastes (more than 9 tons). The highest level of pollution by industrial wastes is shown in Kostanai, Pavlodar, East Kazakhstan and Karaganda regions. Radioactive wastes are concentrated in the Eastern Kazakhstan, Kyzylorda and Mangystau.

Also in the country a large amount of wastes is accumulated. Outside of major cities waste cleaning services are very poorly developed (about 25 %). Wastes are collected at acceptable levels only in a few large cities, for example in Astana (90%) , Kokshetau (95%) , Ust-Kamenogorsk (85%). But outside major cities at least 75 % of wastes are not collected and appeared in illegal dump sites. Solid household wastes are utilised with violation of safety requirements and very low efficiency of their recycling. Landfills with backfilling ("sanitary") are 2% and only 1 % wastes are used to produce heat and secondary use of the material, including compost production (Fig. 20).

Fig. 20. Utilization of solid urban wastes

Unauthorized dumping sites worsen the sanitary-epidemiological situation in both major cities and small towns , not only affecting local landscapes and biodiversity, but also causing a high risk of infectious diseases and increase of respiratory diseases in the population. At that, in processing secondary resources,existed in wastes many benefits are lost. Germany is an example of profitable disposal of urban wastes with 99 % of the wastes used to produce thermal energy and recycling, based on new technologies. This approach results in high profitability of various industries and reduces anthropogenic pressure on urban and natural systems, improves the environment/biodiversity, health and welfare of people.

Local depletion of flora and fauna leads to large losses in agriculture, forestry, fishing and hunting. Degradation of fauna of soil invertebrates results in decrease of soil fertility and disturbance of natural regulatory processes in the soil, leading to lower productivity of agricultural lands.

The decline of pollinators causes a decrease in agricultural production; decrease in number and the species composition of insects - entomophages leads to a boom of insect pests, as a consequence - to loss of crop yields (use of chemical agents gives a temporary effect and leads to pollution of the environment).

However , the reduction of directly used resources of flora and fauna as such (except for the most important ones for thee economy of pasture resources!) explicitly affects relatively small groups of population which depend on these resources and get incomes from the use of wood, drug raw materials, fishing and hunting. However, for these groups and their families economic losses can be rather significant. For example, in fishery (excluding the Caspian Sea) limits of fishing were reduced from 73,262 tons to 55,656 tons, or 24% , from 2010 to 2011 with relevant reduction in industry revenues and number of employed people in the fishery sector (Table 6) .

Table 6. Development of fishing quotas and receipt of payments for the use of fishery resources in the country in 2010 and 2011 (excluding for marine fish species in the Caspian Sea)

NN	Name of water basins and oblasts	For 2010				For 2011			
		Limit th.	Development	%	Payments for use, thousand KZT	Limit th.	Development, th	%	Payments for use, thousand KZT
Water basins of global and national importance									
1	Ural-Caspian basin	41964,9	26115,9	62,2	258950,8	22802,0	8958,4	39,3	124938,1
2	Balkhash-Alakol basin	11944,61	8922,6	74,7	101467,6	12164,39	10137,0	83,3	121063,2
3	Zaisan-Itryshsk basin	8919,2	6759,0	75,8	60294,4	8909,3	8130,7	91,3	81223,5
4	Aral-Syrdarya basin	4467,8	4467,80	100,0	39341,6	5955,0	5955,0	100,0	56080,9
Water basins of local importance									
5	Akmola oblast	909,1	855,7	94,1	7877,8	771,21	512,5	66,5	4521,3
6	Aktubinsk oblast	221,815	136,4	61,5	1314,1	131,99	132,0	100,0	1371,8
7	Jambyl oblast	153,507	149,0	97,1	1800,2	170,76	166,3	97,4	2290,3
8	Western-Kazakhstan oblast	1185,182	1059,68	89,4	12313,8	1132,629	942,6	83,2	9929,9
9	Karaganda oblast	364,049	353,059	97,0	3507,4	387,123	377,3	97,4	4244,4
10	Kostanai oblast	916,45	795,0	86,7	7051,6	645,9	633,9	98,1	6155,4
11	Kyzyl-Orda oblast	785,003	760,953	96,9	6452,6	966,0	948,1	98,1	16490,2
12	Pavlodar oblast	290,881	288,7	99,2	2753,0	578,75	472,2	81,6	18613,2
13	Northern-Kazakhstan oblast	967,3	927,8	95,9	7919,1	879,6	810,2	92,1	7598,8
14	Southern Kazakhstan oblast	172,955	132,3	76,5	1658,3	162,0	162,0	100,0	2273,9
	Total	***73262,7***	***51723,9***	***70,6***	***512702,4***	***55656,692***	***38338,1***	***68,9***	***456794,8***

PART II. NATIONAL STRATEGIES AND ACTION PLANS AIMED AT BIODIVERSITY CONSERVATION AND BIODIVERSITY MAINSTREAMING

2.1. National strategies and action plans, international regulations

The first National Strategy and the Action Plan for the Conservation and Sustainable Use of Biodiversity in Kazakhstan were developed and approved in 1999 by the Ministry of Natural Resources and Environment. The conceptual framework of this document complies with the section of the “Strategy of development of the Republic of Kazakhstan 2030" on environmental issues, which clearly identifies priority goals and relevant objectives.

Strategic objectives are considered in the context of the priority in-situ, ex-situ conservation issues, the balanced reproduction and use of components of biological diversity in the country, the current preconditions to fulfill the set up tasks are assessed. The strategy is aimed at required improvement of the regulatory framework, the management structure and control of the use of biological resources and creating a network of protected areas.

In accordance with the strategic plan for the sustainable development of the country, the national strategy provides for the execution of a number of priority objectives, including:

- Assessment of the status of biological diversity and its specificity as a passing value and the common heritage of mankind
- Identification and elimination of the threat to species and ecosystems under anthropogenic impact
- Use of the sovereign rights of the State over their resources, especially their unique units, and the responsibility for their conservation
- Establishing traditional dependence of local communities on the conservation and sustainable use of biodiversity, including agricultural biodiversity to meet the population's needs for food, health care, fuel and construction, raw materials, commercial, industrial, recreational and other resources
- Revealing the best conditions for environment recovery and reduction of greenhouse effects due to the increase of CO2 (carbon emissions) for the conservation of biological diversity
- Development of the legal framework of withdrawal and protection of biological resources, determining the balance between economic and social environmental benefits for the sustainable use of biological resources at the regional national and local levels
- Reduction of threats and ensuring conservation of biological diversity
- Improvement of the system of coordination of actions aimed to resolve biodiversity issues
- Environmental reconstruction and rehabilitation of damaged ecosystems
- Ensuring awareness and broad education of the local population, public non-governmental organizations in problems of conservation and sustainable use of biological diversity. For the implementation of the strategy the action plan for the conservation of biodiversity was developed. Priorities have been identified on the basis of expert reviews under several criteria:
- rare, economically valuable and ecologically significant species and ecosystems, the need to complete the inventory of poorly studied units of biological diversity;
- a high degree of biological diversity, vulnerability to external impacts and degradation, resource and economic significance;
- richness of the gene pool of potential resources to develop sustainable cultivars and breeds of domestic animals (natural centers of the gene pool)

- The need to improve legal and economic preconditions for biodiversity conservation.

Among biodiversity units ribbon and island woods, wild fruit and riparian forests, mountain forests, arid steppes with chernozemic soils, rare ecosystems in deserts, river and lake ecosystems are relevant to these priority tasks.

The Action Plan focuses primarily on addressing common environmental cross-border and national issues, as well as priority fundamental aim to complete the inventory, improve management and monitoring.

The Action Plan on the conservation and sustainable use of biological diversity in the coming period included 27 projects within six sections: inventory, conservation, sustainable use, control, the institutional framework and strengthening international relations.

However, this national strategy, developed in 1999, as a policy document, supported by public funding and binding for execution, was not approved by the government. Many of the provisions of the National Strategy and the Action Plan on the conservation and sustainable use of biodiversity in Kazakhstan relate to different ministries and agencies, not subordinate to the former Ministry of Natural Resources and Environment (now - the Ministry of Environment Protection and Water Resources), therefore the provisions of this document are poorly reflected in sectoral plans.

In accordance with resolutions adopted at the 10^{th} and 11^{th} Conferences of the Parties on the conservation of biological diversity, currently a new National Biodiversity Strategy is about to be finalized, with support of UNDP/ GEF /the government of RK. The strategy should be submitted for approval in June 2014.

In general, the current Kazakhstan's programs aimed at conservation of the biosphere in all its diversity, coupled with the improvement of people's lives, should resolve issues of biodiversity and prevention of desertification and land degradation; rehabilitation of ecological disaster areas, testing sites of military space complexes; prevention of pollution of the Caspian Sea; prevention of pollution and depletion of water resources; elimination of historical pollutions, prevention of air pollution, radioactive, bacteriological and chemical contamination, including cross-border contamination; reduction of volumes of industrial and domestic wastes; prevention of natural and manmade emergencies.

These objectives are achieved also by the following: improvement and systematization of legislation of the country, economic mechanisms of environmental management, state environmental control and environmental monitoring; optimization of regulatory approval of environmental systems and environmental expertise; scientific researches on environmental protection, environmental statistics, environmental education, environmental advocacy and public involvement; extending the international cooperation, including on issues relating to conservation and sustainable biological diversity of ecosystems.

The national plans and programs consider the role of the country in the global context. Kazakhstan, as a constituent in international relations, joined a number of international legal acts on protection of the environment and biodiversity, and undertook a number of international commitments aimed at the rational, efficient and safe use of the natural environment. The country (before the reporting period) joined, signed and approved and/or ratified five priority international treaties, directly applicable to the conservation and sustainable use of biodiversity: the Convention on Biological Diversity (CBD, August 19, 1994), the Convention for the

Protection of the World Cultural and Natural Heritage (29 July 1994), the Convention on the Conservation of Migratory species of Wild Animals (CMS, or the Bonn Convention, December 13, 2005), the Convention on Wetlands of International Importance (Ramsar, or December 13, 2005), the Convention on International trade of Endangered Species of Wild Fauna and Flora, CITES (CITES, April 6, 1999), as well as relevant in terms of the subject - the United Nations Convention to Combat Desertification (UNCCD).

The supplementary agreement to the Convention on Biological Diversity has become the Cartagena protocol on biological safety, ratified by Kazakhstan in July 2008 and aimed to address a potential risk of cross-border trade and unexpected spread of living genetically modified organisms.

The preconditions for creating a favorable environment, conservation of the resource potential at a time of high speed of development were reflected in the foreign policy initiatives of Kazakhstan (the Energy and Environment Strategy, the Partnership Programme "Green Bridge"), that were supported at the largest ministerial conferences in Asia, the Pacific, Europe (2010, 2011), the Global Summit on Sustainable Development (2012).

Kazakhstan has adopted a new policy aimed at moving to a" green" economy. The conceptual framework of the strategy on the transition to a "green" economy includes the following: the Strategy of development until 2030; the Strategic Development Plan of the Republic of Kazakhstan until 2020; the Strategy of Industrial and Innovation Development for 2003-2015; the State Program on advanced industrial - innovative development for 2010-2014; "30 corporate leaders of Kazakhstan", as well as other industrial programs; President's message to people of Kazakhstan " New Decade - New Economic Growth - New Opportunities of Kazakhstan"; the Energy and environment strategy; Partnership Program with countries in Europe, Asia and the Pacific for the implementation of the Astana Initiative "Green Bridge" for 2010-2014; the Sectoral Programme "Zhasyl Damy" for 2010-2014.

One of the target indicators of programme documents aimed at biodiversity conservation and sustainable development of the country is to increase by 2-3 times the performance productivity in the agricultural sector. This leads to decrease of the adverse human impact on natural systems and human health, including improvement of air quality; reduction of water gaps and pollution of water resources. The main objectives in restoration and conservation of ecosystem sustainability provide for the following: conditions for the transition to sustainable development; climate change mitigation and adaptation; biodiversity conservation, prevention of desertification and land degradation; rehabilitation of ecological disaster areas and contaminated areas.

Ecologically efficient use of natural resources and investment in ecosystem services contribute to the stabilization of natural resources and increase of investments in the following program areas:

- Technical, information and expert support to the development and strengthening of transboundary cooperation for environmental monitoring. Comprehensive assessment and planning of ecosystems.
- Promotion of economic instruments for biodiversity protection, including for sustainable fishery; and prevention of anthropogenic pollution of land and water ecosystems.
- Promotion of best practices in the integrated ecosystem management, implementation of new models of ecosystem management and efficient use of natural resources.
- Development of a monitoring system for the efficient use of natural resources, which will be applied under international trade agreements
- Development and integration of sustainable methods for managing nature reserves and parks of global ecological significance, together with international organizations and other partners; improving access to knowledge about current reliable effective technologies of management of water resources and mechanisms for the transfer of these technologies.

In order to implement the new development country policy, **the Concept of the Republic of Kazakhstan for the transition to a "green economy** was approved by the Presidential Decree of Kazakhstan № 577 on May 30, 2013. The green economy is defined as an economy with a high level of life quality, the careful and rational use of natural resources for present and future generations, in accordance with the country international environmental commitment, including Rio de Janeiro principles, Agenda for XXI century, the Johannesburg Plan and the Millennium Declaration. The "green economy" is an important tool for sustainable development. Transition to a "green economy" will allow Kazakhstan to achieve its goal of becoming one of the 30 most developed countries in the world. It is estimated that by 2050 the transformation within the "green economy" will further increase GDP by 3%, create more than 500 thousand new jobs, new industries and services, ensure high quality of life for the entire population. Overall, investments, required for the transition to a "green economy", will amount to about 1% of GDP annually, which is equivalent to 4.3 billion U.S. dollars per year.

Table. 7. Goals and targets of the "green economy" (additional goals are highlighted)

Sector	**Description of the goal**	**2020**	**2030**	**2050**
Water resources	Elimination of water gap on the national level	Provide population with water	Provide water for agriculture (by 2040)	Once and for ever resolve problems of water supply
	Elimination of deficit of water resources on basin levels	Cover the deficit as quickly as possible on basin levels as a whole (by 2025)	No deficit in any basin	
Agriculture	Labour productivity in agriculture	3 fold increase		
	Wheat yields (thousand/ha)	1,4	2,0	

	Water resources for irrigation (m3/t)	450	330	
Energy efficiency	Reduction of energy output capacity on the level of GDP in 2008	25% (10% by 2015.)	30%	50%
Power sector	Share of alternative sources in power generation	Solar, wind: no less than 3% by 2020	30%	50%
	Share of gas power stations in electricity generation	20%	25%	30%
	Gasification of regions	Akmola and Karaganda oblasts	Northern and eastern oblasts	
	Reduction against the current level of carbon dioxide emissions in the power sector	Level in 2012	-15%	-40%
Air contamination	Emissions of sulfur oxides and nitrogen into the environment		European level of emissions	
Waste utilization	Coverage by the population of the solid waste removal		100%	
	Sanitary storage of wastes		95%	
	Share of recycled wastes		40%	50%

The main priorities for the transition to a "green economy" are as follows: 1) more efficient use of resources (water, land, biological, etc.) and their management; 2) modernization of the existing infrastructure and construction of new infrastructure; 3) enhancing welfare of the population and the quality of the environment using cost-effective ways to mitigate the pressure on the environment; 4) enhancing national security, including water security.

The cconcept, specifying the current situation and critical areas, suggests ways to achieve the set up goals. One of the priority areas, specified in the concept, is the "**Conservation and efficient management of ecosystems**." Integrated management of natural ecosystems should be implemented in accordance with the principles of sustainable development to increase significance and the economic potential of natural ecosystems. **In forestry**, the need in projects aimed at the effective conservation of forest resources, regulation of deforestation, introduction of modern methods of forest management and development of appropriate skills were emphasized.

In fishery, reduction of fishery was stated - for the period from 1960 to 1990 its scope was decreased from 111.9 thousand tons to 68.6 million tons and in 2010, this indicator was decreased to 51.7 thousand tons. There was a reduction in the number of employed staff in fishing sector from 110 thousand in the 40s to 4-5 thousand people. In the context of the downward trend in the number of individual fishery units the alternative is the development of commercial fishery. Therefore, the gradual reorientation of fisheries to commercial fish farming will allow to remove pressure from fish resources of natural water bodies. In turn, the commercial fishery will make multiplicative socio- economic impact. Thus, the growth of business activity on the development of trade fish farms will contribute to the creation of additional jobs, mostly in rural regions. It is necessary to implement projects aimed at increasing the economic potential of the fishing industry.

It should be noted that the **wildlife sphere** is unique and attractive for the development of sustainable hunting and sport fishing, ecotourism, safari photography, reproduction of wild animals in captive and semi-free conditions and in other aspects, that, in fact, are "green" investments. Good potential of hunting tourism was also emphasized. **Ecological tourism** was identified as one of the most promising tourist products and an essential condition for its development is conservation of landscapes designed for ecotourism.

There should be actions taken in terms of staffing, development of a new ecological public culture, environmental and economic responsible attitude to the use of energy, water and other natural resources, as well as full integration of topics related to environmental protection, into the curricula of educational institutions, conducting a wide communication campaign and educational programs to raise public awareness in resource use and environmental problems. For coordination of the execution of the Concept and control over transition to a "green economy" the Council on the transition of Kazakhstan to the "green economy" under the President of the Republic of Kazakhstan was established.

Currently, the major programme document of the country, directly oriented at biodiversity conservation is the “Zhasyl Damy” (in Kazakh “Green Development "), approved by the Decree of the government of the Republic of Kazakhstan № 924, and dated September 10, 2010. The sectoral Programme " Zhasyl Damy " for 2010-2014 (hereinafter referred to as the Program) is developed to implement the Decree of the President of the Republic of Kazakhstan № 922 dated February 1, 2010 “On the Strategic Development Plan of the Republic of Kazakhstan till 2020 " and within execution of the President's instructions, given during his visit to the West Kazakhstan and East Kazakhstan regions in September - October 2008.

With a view of optimizing the current programme, the following documents were included into the Program: the Ecological Security Concept of the Republic of Kazakhstan for 2004-2015, the Concept of development and allocation of specially protected natural areas of the Republic of Kazakhstan until 2030 , the Program of Environmental Protection of the Republic of Kazakhstan for 2008-2010 ", the Program " Zhasyl el " for 2008-2010 , the Programme for the conservation and sustainable use of fauna and development of a network of protected areas by 2010 , the Program on comprehensive resolution of issues in Priaralye for 2007-2009.

The goals of the program "Zhasyl Damy" will be achieved in accordance with the Strategic Plan of the Ministry of Environment Protection and Water Resources for 2009-2011 and for 2015-2011 and measures specified in the Environmental Code of the Republic of Kazakhstan.

The program focuses on application of the advanced principle of a "green economy", which provides for elimination of dependence of resource use and environmental impacts from economic growth.

It was planned to conduct activities to develop international relations, scientific environmental protection and management, systems of monitoring of environment and natural resources, environmental education, raising public awareness.
The program is interdisciplinary and binding, and should contribute to an integrated solution of many issues, including the following: greenhouse gas emissions, air pollution, environmental disaster zones, protected areas, and production and consumption wastes, water resources, greening.

The program includes a section of forestry and wildlife, specially protected areas. One of the main objectives of the society, as stated in the Program, is the conservation of biological diversity and the sustainable development of the country.

Activities are shown by industries per each year, indicating the responsible agency, forms and reporting deadlines.

To determine the overall success of the Program the following indicators are stipulated:

• The percentage of reduction of emissions of pollutants by 2014 compared to 2009 should not be less than 5.9%

• The level of reduction of emissions of pollutants by 2014 compared to 2009 will be at least 3.5%

• The proportion of recycled wastes by 2014 is 21.9%

• The dynamics of changes in greenhouse gas emissions by 2014 will be 1 % of reduction, compared to 1992

• Increase in the number of rare and endangered species of wild ungulates to 2014 is - 2% tugay deer, wild ass 4% ; sand gazelle-4%, argali - 2% , saiga - 10%

• released juvenile valuable fish in natural water units and reservoirs will be 170.0 million units by 2014.

• creation of 13 new protected areas and expansion of 7 areas

• increase of scope of forest plantactions in 2014 to 65.0 hectares.

• increase timing of warning messages about dangerous and extreme weather events up to 72 hours in 2014

The total budget of the Program is 161,714.06 million KZT (or about 1 billion U.S. $ 80 million at an average currency rate for 2010-2013.), including from the republican budget - 93759.21 million KZT; from the local budget - 46,351.6 million KZT, from international grants - 405.5 million KZT, including funds from loans - 3850.75 million tenge, from funds of natural resource users- 17,347.0 million KZT.

2.2. Changes in the national legislation and the management structure

In the period from 2010 to 2013 several changes were introduced in the environmental legislation and structures, responsible for the conservation of biodiversity in Kazakhstan.

Proposals for improving the legislation were developed for several years. As a result, on January 25, 2012 the President of Kazakhstan signed the Law of the Republic of Kazakhstan "On making amendments and additions to some legislative acts of the Republic of Kazakhstan on issues of forestry, wildlife and protected areas." Changes and additions were made to the Criminal Code of the Republic of Kazakhstan , the Code of Administrative Offences, the Land Code of the Republic of Kazakhstan, the Forest Code of the Republic of Kazakhstan, the Water Code of the Republic of Kazakhstan, in the Environmental Code of the Republic of Kazakhstan, the Code of the Republic of Kazakhstan "On Taxes and other obligatory payments to the budget, "the Law of the Republic of Kazakhstan " On Architectural, urban planning and construction activities in the Republic of Kazakhstan", the Law of the Republic of Kazakhstan "On protection, reproduction and use of wildlife", the Law of the Republic of Kazakhstan "On specially protected natural areas", the Law of the Republic of Kazakhstan "On State Control and Supervision in the Republic of Kazakhstan."

In general, the changes are intended to clarify some of the provisions exclude double interpretation of articles and strengthen market mechanisms for biodiversity conservation, tighten liabilities for violation of environmental laws, refine and divide authorities of state agencies at various levels, etc. It should be noted that an entirely new term a " key ornithological area » (IBA), as one of units of the state natural reserve fund, was introduced into the legislation. Particular large-scale changes were made in forestry. In summary, all adopted amendments and additions enabled to significantly strengthen the environmental legislative framework.

However, a number of problems, especially in hunting, still remained unresolved - these are guarantees for hunting users and compensation for their capital investments in case of withdrawl of lands of hunting farms for state needs, reimbursement of their losses in case of illegal hunting on their territories, conflicts of interests between hunting users and land users etc. In the beginning of 2014, more proposals for improvement and harmonization of the environmental legislation were prepared. They have been forwarded for approval to relevant ministries and the Parliament of Kazakhstan. Respectively, a number of amendments to existing rules and regulations are being prepared and new "Rules ...", “Procedures ... “etc. is being developed.

Two laws and codes from the above listed entirely relate to the conservation of biodiversity: the laws of the Republic of Kazakhstan “On protection, reproduction and use of wildlife", and "On specially protected natural areas."

The role of codes, the topics and planned measures for biodiversity conservation

The Forest Code of the Republic of Kazakhstan № 477 dated July 8, 2003 (Articles 3, 61, 68.

The forestry legislation of Kazakhstan is based on principles of restoration, conservation and protection of forests. State monitoring of forests, public participation and public associations in the preservation and protection of forest resources.

The Water Code of the Republic of Kazakhstan N 481 dated July 9, 2003 (Articles 40-63).

Provides for coordination of plans of local executive bodies of oblasts (cities with republican status, capitals) for the rational use of water units and documents related to water protection zones and strips; management of water resources in accordance with the approved general basin schemes of the integrated use and protection of water bodies. Restoration and protection of water resources, the state control over the use and protection of water resources. Requirements that ensure rational use, protection and improvement of water conditions.

Environmental requirements for use of water bodies and water facilities. State monitoring of water bodies.

On taxes and other obligatory payments to the budget (the tax Code) Code of the Republic of Kazakhstan N 99-IV dated 10 December, 2008 (Articles 499-502).

Establishes the fee for the use of wildlife: the payment procedure for issuance of permits for the removal of these animals from their natural environment, rates and dates of the payment.

The Environmental Code of the Republic of Kazakhstan N 212, dated January 9, 2007 (Articles 7-10 , 23, 24 , 29, 39, 40, 47,82,111 , 137, 142,149,173,176 , 195 , 203, 205, 207 , 219, 225, 227 , 236 -269). The Environmental Code specifies units of environmental protection, competencies of specially authorized state bodies in protection, reproduction and use of flora and fauna; environmental quality standards stipulated by the legislation of the Republic of Kazakhstan. The assessment of biodiversity within ecology expertise and environmental audits, the state control, the state environmental monitoring, maintenance of a unified system of state natural resource cadastres. Identification and actions in case of environmental emergencies and environmental disasters. The procedure for the development and approval of environmental requirements for economic and other activities. Environmental requirements for common use of wildlife.

The code of administrative offences of the Republic of Kazakhstan dated January 30, 2001 № 155 (Articles 35, 126, 282-300, 307). Administrative responsibility for violation of the rules: the protection of habitats of plants and wildlife habitat; forest fund use; fishery and conservation of fishery resources and other aquatic animals, hunting and other ways of using wildlife; maintenance and protection of green areas, protection of plants and animals during siting, designing and construction of settlements, and other projects. Damage of haylands and pastures, as well as illegal haying and grazing, collection of drug plants and technical raw materials in forests, damaging or destroying units for breeding and genetic purposes, rights of state ownership of flora and fauna.

The criminal code of the Republic of Kazakhstan N 167 dated July 16, 1997 (Articles 287-294). Illegal actions: production of fishery resources and other aquatic animals and plants, hunting, felling of trees and shrubs; treatment of rare and endangered plants and animal species and (or) their parts and derivatives, as well as plants and animals, and (or) their parts and derivatives, the removal of which is prohibited. Violation of rules for the protection of wildlife, regimes in specially protected natural areas. Destruction or damage of forests.

In case of offenses legal entities and individual are subject to administrative sanctions - administrative penalties; deprivation of a special right; termination of the license, a special permit, qualification certificate (certificate) or suspension of its validity on a particular activity or certain actions; suspension or prohibition of activities of an individual entrepreneur; forced demolition of illegally constructed buildings or constructions; administrative detention; administrative deportation from the Republic of Kazakhstan of foreign citizen or a stateless person. .

Individuals, who committed environmental offenses, are obliged to compensate the damage caused by them in accordance with the code and other legislative acts of the Republic of Kazakhstan.

For a criminal offense individuals are subject to penalties or correctional works for a period, set by the court, or to deprivation of the right to occupy certain positions or engage in certain activities, or imprisonment.

With regard to the governance structure, up to 2013 the Ministry of Agriculture is the central executive body of the Republic of Kazakhstan, that implements management and to the extent provided by law, ensures inter-sectoral coordination and implementation of the state policy in agriculture, forestry, fishing and hunting, protected areas, water management, plant and animal resources of the country, agricultural engineering, veterinary, phytosanitary, animal breeding, melioration, irrigation and drainage, manufacturing industry in terms of food production.

The Ministry of Environmental Protection is the central executive body of the Republic of Kazakhstan that governs and ensures inter-sectoral coordination and execution of the state control in the sphere of environmental protection. The ministry has territorial units as state institutions - regional administration, the Astana and Almaty environmental administrations and republican inspectorate administration.

Under the Presidential Decree of 16 January 2013 the Ministry of Environment Proteciton of the Republic of Kazakhstan has been commissioned with functions and authorities for the implementation and control over state development policy "green economy" with the transfer of functions and authorities in the area: protection and supervision of the management of natural resources, development of the state water management policy, as well as the functions and authorities of water resources management and development of fishery, except for melioration issues - from the Ministry of Agriculture of the Republic of Kazakhstan; solid waste management - from the Agency for Construction, Housing and Public Utilities; development of the state policy for renewable energy sources - from the Ministry of Industry and New Technologies of the Republic of Kazakhstan. Under the Ministry the Committee for Forestry and Hunting, the Fishery Committee with removal of these committees from the Ministry of Agriculture, were created. In fact, they are the same committees with the same internal structure and staffing, just they changed subordination.

According to the Presidential Decree of 29 October 2013 the Ministry of Environment of the Republic of Kazakhstan was reorganized into the Ministry of Environment Protection and Water Resources of the Republic of Kazakhstan (MEPWR), with transfer of functions and authorities on development and implementation of the state policy in the field of water supply to water users or their associations and water derivation for hydromelioration of lands - from the Ministry of Agriculture of the Republic of Kazakhstan; as well as functions of the rational and integrated use of ground waters, except for the geological research of subsoil in terms of groundwaters - from the Ministry of Industry and New Technologies of the Republic of Kazakhstan.

Thus, MEPWR RK currently ensure implementation of the state policy and regulation of in the sphere of management and conservation of wildlife, specially protected areas, forestry, hunting and fishery farms, as well as resolving issues of quality and preservation of the environment, water resources and others. At the moment it is the authorized body, fully responsible for the implementation of the Convention on Biodiversity, as well as fulfilling all other international agreements of Kazakhstan related to biodiversity conservation and the environment protection.

2.3. Implementation of plans and programs at the sectoral and cross-sectoral levels

Kazakhstan, as a party to the UN CBD, provides for close interaction between national and sectoral programs, as well as international conventions and agreements, to successfully carry out its obligations with respect to the conservation and sustainable use of biological diversity.

MEPWR RK is the central executive body that governs, ensures the inter-sectoral coordination on development and implementation of the state policy in the sphere of environmental protection and environmental management in Kazakhstan.

The Ministry of Agriculture coordinates agricultural land use activities. The Scientific Committee of the Ministry of Education and Science coordinates researches (provides scientific support to biodiversity conservation).

Activities directly related to the conservation of biodiversity are described below.

2.3.1. Activities to improve rangelands and watering

Conducting assessments of potential flooding in rangelands to develop distant pasture livestock breeding

This year, the Committee for Land Management of the Ministry of Regional Development of the Republic of Kazakhstan completed works planned for 2011-2013 on inventory of agricultural lands, including pastures with the total area of 30.6 million hectares. This has been done to determine the state of water cut and potential use of pastures for distant pastures, together with oblast akimats.

The preliminary results revealed 4.4 thousand plots of land with the total area of 2.0 million hectares of unused for its intended purposes, including 313 hectares of arable lands, 13.3 ha of irrigated lands and 1.6 million hectares of pastures. The largest number of lands not used for its intended purpose, were identified in the East Kazakhstan, Akmola and Karaganda regions. Most of the rangelands which were not used for intended purposes were withdrawn from the land users, with regard to others reports were submitted to the territorial inspections to take relevant administrative measures. Large areas of pastures started again used for intended purposes.

More than 40 % of the reviewed pastures were watered with natural ponds; the rest ones face a problem with watering. This causes under-utilization of transhumance, concentration of livestock in villages and in limited areas with overgrazing and degradation of pastures and biodiversity.

According to the inventory records it is revealed that on the whole in the country more than 9,900 of mining wells, boreholes and flowing wells need to be restored, repaired or built. This number is not final, it is planned to identify further needs. Activities on watering of pastures are planned under the state program "Agrobusiness 2020", and they are already underway in some areas. Watering of distant pastures and dispersal of livestock will reduce local load on pastures and degradation of lands that will have a positive impact on biodiversity.

2.3.2. Quarantine and Plant Protection

In Kazakhstan there are about 50 species of polyphagous and over 100 types of specialized pests, more than 70 kinds of diseases, 300 weed species, 10 species of quarantine units, damaging the agricultural production. Some of them (acridoid grasshoppers, grey grain burdock borer, chinch, Hessian fly, grain beetle, cotton bollworm and red spider, rust and septoria blight grain) are particularly dangerous and cause significant economic and environmental damage.

The spread of particularly dangerous pests with a population above economic threshold may lead to the loss of 15-30% of yields. In this regard, phytosanitary monitoring, as well as

phytosanitary measures against especially dangerous pests and quarantine units, implemented with allocated budget resources.

During the period from 2010 to 2013 in Kazakhstan under the program 003 "Plant Protection" phytosanitary measures, funded from the budget, against dangerous pests in various crops, were conducted on the area of 3212.5 thousand ha, 4030.4 thousand ha, 4379.2 thousand ha and 5833.6 thousand respectively.

Under the program, 004 "Plant Quarantine" activities aimed at identifying, locating and eliminating centers of quarantine facilities for the period from 2010 to 2013 were conducted on the area - 146.8 thousand hectares, 169.46 thousand hectares, 161.6 thousand hectares and 201.12 thousands hectares respectively.

2.3.3. Fishery

Main indicators and fishery management

The basis of the country's fisheries is the fishery fund, including significant areas of the Caspian and Aral Sea, the Balkhash lake, the Byhtarminskoe, Kapshagajskoe, Shardarinskoe reservoirs, the Alakol system of lakes and other water units with the total area of more than 3 million hectares, which are habitats for over 70 species of fish, including the most commercial valuable sturgeon, pike perch, carp, grass carp, silver carp and others. Besides, the reservoirs of the country have introduced species (peled, whitefish etc.) also of a high commercial value.

Fishery is very important as a source of income, as a basis for economic growth, employment, power supply and for other potential opportunities and it is a renewable resource. In order to carry out the functions of the state management of fishery in 2003 the government of the Republic of Kazakhstan by the resolution № 714, dated July 18, 2003, established the Fishery committee on Fisheries of the Ministry of Agriculture of the Republic of Kazakhstan. Since January 2013 the committee was transferred to MEP (now MEPWR RK).

In order to effectively carry out the functions of protection, reproduction and rational use of fishery resources structural divisions of the Committee were created under the basin principle.

The Committee currently has 8 interregional basin fishery inspections: Aral- Syr Darya, Balkhash- Alkol, Ertisskaya, Zhaiyk Caspian, Yesil, Tobol-Torgai, Shu - Talas and Nura- Sarysu interregional basin inspections.Granting a status of civil servants to inspectors of territorial bodies and basin principle of state management of fisheries resources and other aquatic animals in large fishery reservoirs of international and republican values, regardless of the administrative- territorial division allowed to more effectively implement the state control, protection, reproduction and use of fish and other aquatic resources animals.

Daily activities of the territorial inspections of the Committee focus on ensuring biodiversity conservation of fishery resources.

The Committee also plays a very important role in the international cooperation. For example, each year in the five-sided format fishery bodies of the Caspian countries hold meetings of the Commission on Aquatic Bioresources of the Caspian Sea. They discuss and adopt decisions on the conservation and sustainable use of biological resources of the Caspian Sea.

As part of the Interstate Commission on defining the legal status of the Caspian Sea the country is involved in establishing a fishing zone of the Republic of Kazakhstan. Activities aimed at prevention, detection and suppression of cases of illegal fishing are regularly underway.

About 9000 raids are conducted by inspection teams annually; more than 7 thousand reports on violations of the environmental legislation are compiled; in 2012-2013 about 50 million tenge in the form of fines and penalties were paid to budget; hundreds of vehicles were seized from violators (Table 8) .

The use of fish resources in 2006 is regulated through long-term allocation of fishery ponds among users. Back in 2006, the Fishery Committee undertook a lot of efforts to complete allocation of the fishery ponds (areas) among users for a period of 10 years, that is effectively underway up till now. The users are under regular control.

Up to date 1791 fishery ponds (sites) are reserved by 1004 users who have signed contracts on fishery management.

Users of reservoirs committed to invest during 10 years their own funds to the protection and reproduction of fish resources, conducting researches and strengthening the material - technical base.

.During the period from 2006 to 2013 users invested more than 10 billion KZT into these sectors (Table 9, Fig. 21).

The limit - a marginal volume of withdrawal of fish resources - is approved by the government annually, based on scientific biological feasibility and the state ecological expertise.

Thus, the balance of species of aquatic biological resources in fishery reservoirs is maintained, taking into account natural and anthropogenic factors.

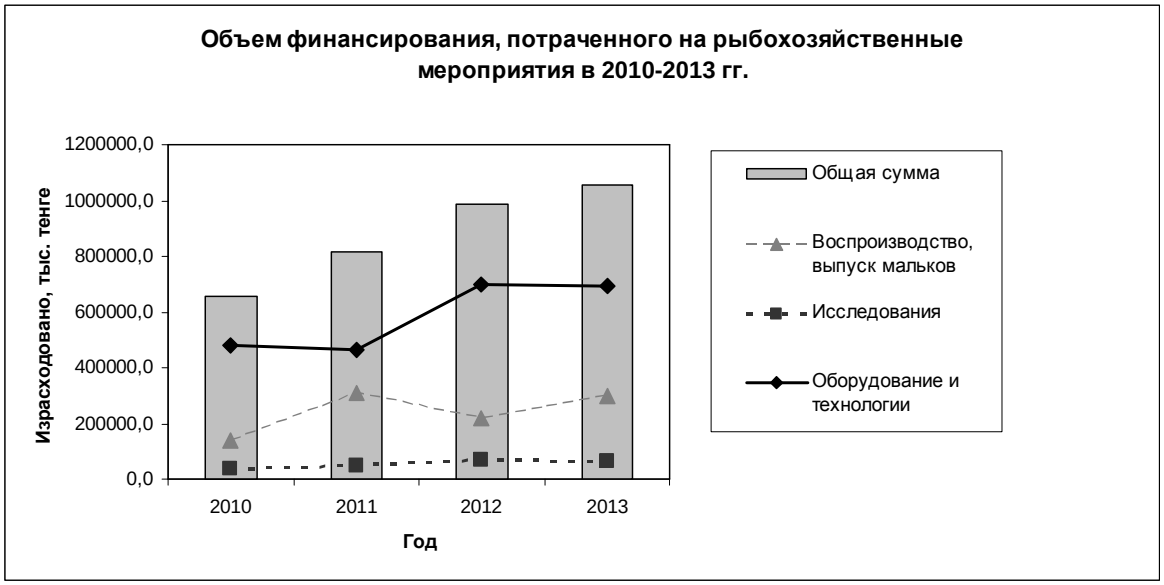


Fig. 21. The amount of financial resources (from all sources), spent for fishery activities in the period from 2010 to 2013

Total amount
Reproduction, release of fish juveniles
Researches
Equipment and technologies

At present the legal framework of fisheries as a whole is based on the Law of the Republic of Kazakhstan "On protection, reproduction and use of wildlife" adopted in 2004. In order to strengthen measures against violations of the environmental legislation, the legislation is being improved; a number of changes were made in January 2012, some more amendments are currently under discussion. Relevant regulations are under development, since the regulatory framework in fishery sector particularly has the largest number of gaps.

Table 8. Control and inspection activities of the territorial subdivisions of the Fishery Committee, 2010-2013

Main indicators	**2010**	**2011**	**2012**	**2013**
Conducted raids	9467	10886	9554	8467
Arranged fish protection posts	604	327	252	275
Compiled protocols on violation of fish protection legislations (protocol/person)	9949/9482	9547/9056	8094/7694	7639/7168
Discovered violations jointly with law enforcement bodies (protocol)	421	487	417	477
Cases sent to the court (number of cases)	790	412	393	551
Instituted criminal proceedings (person)	27	17	28	35
Instituted administrative proceedings	1269	303	194	875
Imposed fines (thousand KZT)	54057,2	57 525,0	48 956,00	53 186,79
Charged fines (thousand KZT)	44565, 2 (82, 4%)	46 061, 3 (80,1 %)	43 007 (87,8 %)	43 694,9 (82,1 %)
Made claims (thousand KZT)	14966,7	13 830,4	13 235,10	20 680,50
Charged claims (thousand KZT)	5724,0 (38%)	6 115,1 (44,2 %)	4 425,8 (33,4 %)	6 601,37 (32,9 %)
Promotional, communication activities (radio, TV items, presentations, publications, articles)	465 (222/243)	441 (154/287)	329 (113/216)	454 (139/262)
Withdrawn from violators (kg.)	63851,0	65664,5	46000,9	82516,5
Fishing gears (units)	10095	10912	8015	6954
Swimming facilities (units)	139	469	384	449

Table 9. Financial resources used for the development of fishery management by fishery organizations in 2010-2013.

Year	Amount of funding for research work to assess situation of the animal world (in thousand KZT.)			**Amount of financial resources for technical and technological modernization in accordance with the development plan with minimum 100 thousand KZT (in thousand KZT)**			**Amount of financial resources for reproduction, including release of juveniles, with minimum amount of 100 thousand KZT (in thousand KZT.)**			**TOTAL**		
	Planned	**Actual**	**%**	**planned**	**actual**	**%**	**planned**	**actual**	**%**	**planned**	**actual**	**%**
2010	60649,6	35679,6	58,8	467004,4	481283,3	103,1	154998,5	139093,7	89,7	682717,5	656056,6	96,1
2011	63090,6	46464,7	73,6	455268,9	462111,4	101,5	223669,2	308743,5	138,0	742028,6	817319,6	110,1
2012	82934,3	67781,7	81,7	553102,6	697822,7	126,2	311002,9	221047,2	71,1	947039,8	986651,6	104,2
2013	364436,8	62280,3	17,1	812900,2	692385,6	85,2	1075046,7	301182,8	28,0	2252383,6	1055848,8	46,9

Aquaculture Development

The Programme for the development of the agro-industrial complex in the Republic of Kazakhstan for 2013-2020 "Agrobusiness 2020" includes measures of state support for the development of commercial fishery.

Thus, in 2013, **8 regulatory and procedural acts** in commercial fish industry were developed, including :

– Recommendations for the development of cage culture fishery of salmons in the Caspian Sea;

– Guidelines for nature users and farmers to organize and provide a technological cycle of lake commercial fisheries

– Recommendations for the development of pasture aquaculture and lake commercial fisheries taking into account commitments of RK under the international conventions

– The fish breeding technological standard for Caspian salmon in marine cage farms in the basic technological stages;

– The fish breeding technological standard for whitefish in the lake- commercial farms in the basic technological stages;

– The fish breeding technological standard for grass carp in the lake- commercial farms in the basic technological stages;

– The fish breeding technological standard for silver carp in the lake-commercial farms in the basic technological stages;

– The fish breeding technological standard for the Caspian salmon farms in industrial farms using facilities of recirculation systems of water supply in the basic technological stages.

Also this year, the Ministry has developed **the concept of the draft law of the Republic of Kazakhstan** "On amendments and additions to some legislative acts of the Republic of Kazakhstan on the development of commercial fishery" and currently it is considered to include this draft law into a plan of legislative works for 2015-2016.

Applied researches and the main results.

Scientific-research activities are conducted every year in reservoirs and (or) areas of international, national and local importance under the budget program 039 "Conservation and reproduction of fish resources and other aquatic animals".

As part of these research works (biological feasibility) the maximum allowable volume of withdrawal of fish resources is defined, and recommendations for regime and regulation of fishery, volume, species, age composition, stockage, definition of fishery ponds and (or) areas as units of special value and establishing their boundaries, optimization of fishery regimes, including recommendations for restrictions and prohibitions in the areas of researches, etc.

Based on the above biological studies, a draft resolution of the government of Kazakhstan on the approval of catching limits for fish and other aquatic animals in fish ponds is developed.

2.3.4. Forestry

Units of the forest fund are mainly owned by various state agencies. Woodland entities are mostly state-owned with various level of subordination (Table 10).

20.1 % of the area of forest lands is under the jurisdiction of the Forestry and Hunting Committee. This area makes up 5 million 772.3 thousand hectares, of which 5 million 678.6 thousand ha are governed by administrations of specially protected areas (hereinafter- PAs), which include the following:

10 state nature reserves (hereinafter - SNR) - 1 million 612.0 thousand hectares;

11 state national natural parks (hereinafter - SNNP) - 2 million 249.2 thousand hectares;

4 state nature reservats (hereinafter - SNR) - 1 million 817.4 thousand hectares.

In addition, the following units are subordinate to the Committee:

2 forest breeding centers - 1,6 thousand hectares, the Sandyktau training and production forestry unit - 25.9 hectares and RSE "Zhasyl Aimak" - 66.2 thousand hectares.

The following institutions are under jurisdiction of other ministries and state agencies:

123 state forestry institutions, administered by local authorities, with the total area of 22 million 802.1 thousand ha or 79.2 % of the area of forest lands;

SNNP "Burabai" is under jurisdiction of the Presidential Office of the President of Kazakhstan - 129.6 thousand hhectares;

JSC "KazAgroInnovation", LLP “KazNIILKh of the Ministry of Agriculture - 14 hectares (forest nursery);

Plantations on right-on-ways of railways and highways of the Ministry of Transport and Communications - 83.8 thousand hectares, including JSC NC "Kazakhstan Temir Joly"- 62.1 hectares; the Highways Committee - 21.7 thousand hnectars.

By resolutions of the local authorities lands from the forest reserve with the total area of 277, 5 thousand ha were transferred to the state forest fund.

Table 10. Allocation of the forest fund of Kazakhstan as of January 1, 2013

NN	State bodies and private forest owners with the forest fund	The total area of lands of the forest fund (numerator – thousand.ha, denominator - %),	Forest lands	Including areas, covered with forest
1	2	3	4	5
1	Forestry&Hunting Committee, Ministry of Agriculture RK	5 772,28 20,1	1 870,85	1 318,16
2	Oblast akimat (regional administration)	22 802,1 79,2	16 910,44	11 000,78
3	Administration of the President of RK	129,6 0,5	91,22	79,29
4	Ministry of Agriculture of RK	0,01 0,0	0,01	0,00
5	Ministry of Transport and Communication of RK	83,75 0,3	72,37	53,74
6	The private forest fund	0,16 0,12	0,00	0,0

	TOTAL	28 787,7 100,0	18 945,01 65,8	12 451,98 43,3

The country forest fund underwent positive changes within the reporting period from January 1 2008 to January1 2013. The total area of the state forest fund increased by 10.4 1 million hectares (3.5%).

Issues of the forest fund conservation and associated biodiversity are taken into consideration not only in the activities of PAs (see below), but also in programs and plans (management plans) of FHC MEPWR, regional administrations (departments on forests and bioresources), other government and non-government bodies, managing the forest fund, and at the local level - in plans of the state forestry administration.

The most extensive activities have been conducted within the project "Conservation of forests and increase of the forest area of the RK", implemented in accordance with the Law of the Republic of Kazakhstan (№ 263-III of June 7, 2007) on the ratification of agreements on loans and the grant between the Republic of Kazakhstan and the International Bank for Reconstruction and Development, acting as an executive organization of the Global Environment Facility.

As part of the project a series of activities aimed at the conservation and restoration of forest ranges of ribbon woods in the Priirtyshie in the East Kazakhstan and Pavlodar regions and saxaul plantations in the Kyzylorda region, including phytomelioration on dry bottoms of the Aral Sea, were conducted.

Fig. 22. Areas of the Project «Conservation of forests and increase of forest lands of the country»; 1- ribbon woods in Priirtyshie, 2 - haloxylon deserts.

The project activities were mainly conducted in the state forest nature reserves "Semei ormany" and "Ertis ormany" and the state forestry institutions in the Kyzylorda region. The project was implemented during 7 years, from 2007 to 2013. The total project budget **is 64.1**

million USD, including for the restoration of ribbon woods in Priirtyshie - 39.6 million USD, the phytomelioration in the Kyzylorda region - 8.9 million USD, and for the national institutional development and the project management - 15.6 million USD.

The main objectives of the project:

• Conservation and restoration of biocenosis of ribbon woods in Priirtyshie and saxaul plantations in the Kyzylorda oblast

• Development and introduction of environmental standards of grazing in saksaul forests

• Improvement of the forest management system in general in the country

As a result, under the component of the "Restoration of ribbon woods in Priirtyshie":

• Built: FCS 1 (fire-chemical station) in the "Semei ormany" and 9 fire lookout towers;

• Started construction of the following:

- 2 FCS in SFNR 'Semey ormany "and" Yertis ormany";
- Started construction of the forest seed center in "Semei ormany";
- Laid basis for new forest seed plantations on the area of 10,5 hectares;
- Cleaned the area of SFNR ”Semei ormany" and "Yertis ormany” for afforest ation of the area of 8400 ha; conductin planting on 100 hectares; forests in total on the area of 20,200 ha were restored and improved;
- Purchased tractors, fire and patrol vehicles and equipment for tree planting, fire fighting equipment, etc..

Under the component “Phytoforestmelioration in the Kyzylorda oblast”:

- Made plantations of forest cultures of saksaul on the area of over 70 thousand ha on the dried up bottom of the Aral sea;
- Finalised construction of the complex of the forest nursery with the research station in Kazalinsk;
- Created, jointly with local community, 20 pilot sites with the area of about 200 ha each for restoration of haloxylon deserts and adjacent rangelands.

Under the component of the national institutional development and project management:

•designed and creating an information system to combat forest fires (ISCFF) using geographic information systems.

• conducting an evaluation of the existing information system applied in forest management , and introduced GIS technologies for continuous forest management;

• finalising a model of joint forest management with the local population involvement;

• improved skills of specialists SFNR "Semey ormany" and "Yertis ormany" and the state forestry institutions in the Kyzylorda region;

The information campaigns and training courses on the Competitive Grants Program, provided grants for innovative subprojects aimed at the protection, reproduction, reforestation, afforestation, totaling to $ 2.4 million.

• Created a web portal of the Forestry and Hunting Committee MEPWR RK.

As part of ongoing activities under industry and local programmes activities are conducted to increase the forest cover with plants and crops, as well as measures are taken to create favorable conditions for natural regeneration of forests in plains in different climatic zones (forest, steppe, desert) and mountain systems. The key quantitative performance indicators of activities in forestry are given in Table 1 (section 1.2.1.2. Flora).

Over the last 5 years the country succeeded to increase measures on combatting illegal logging; the volume of logging decreased from 6.1 thousand m3 in 2010 to 3.4 m3 in 2013. Fire control efforts were intensified and it allowed to reduce the number and scale of forest fires (see above in section 1.2.1.2.). The success was achieved not only due to efforts of woodland owners as such (there are still a lot of problems with the technical equipment etc), but above all, thanks to interaction with local authorities, law enforcement, and other hunting users of natural resources, local communities on joint activities aimed at prevention and extinguishing of fires .

The development of the private forest fund should be considered as the implicit achievement. Its area, although still insignificant, makes up 0.4 hectares, but it has been extended over the 3 years in 4 times, showing a steady upward trend. The private afforestation, as way of natural resources use, is new for Kazakhstan and its development seems to be quite promising.

2.3.5. Special protected natural areas

The most effective, internationally recognized, measure for conservation of endemic, rare and endangered species, unique and reference sites in the whole of natural ecosystems is creation of a system of protected areas (PAs).

Kazakhstan has been establishing PAs for almost 90 years: The first PA in the Central Asian region - the"Aksu Zhabagly" reserve was created in 1926. Then, in 1934 the Naurzum and Barsakelmes reserves were created. After nearly thirty-year break the following PAs were set up: in the 60s - the Almaty and Korgalzhy reserves, in 1970th - Markakolsky, in 1980th - Usturtsky; in the 1990th - the West Altay and Alakolsky.

The state national natural parks, as a new type of protected areas, were established later. The first park - the Bayanaul State National Natural Park - was created in 1985, the others were opened in the second half of the 1990-s and the beginning of this century.

Currently, creation of PAs, their modes, their management, ecological networks and others are regulated by the law of the Republic of Kazakhstan "On specially protected natural areas" adopted in 2006 (as amended and supplemented on January 25, 2012), as well as by relevant rules and regulations. The authorized state body in the sphere of protected areas is the Forestry and Hunting Committee of MEPWR RK.

In 2008 the system of national protected areas included 10 state nature reserves; 10 state national natural parks; 3 state forest nature reserves; 50 state nature reserves; 26 monuments of nature; 5 public botanical gardens in the cities of Almaty, Karaganda, Ridder, Zheskazgan, in the Bakanas village; 5 state reserve zones.

Reserves, national parks and reserves out of all types of protected areas, designated to conserve biodiversity in-sity, have the status of a legal entity (i.e., its own administration, security staff etc.).

С 2009 по 2013 г. площадь учреждений особо охраняемых природных территорий увеличилась на 1 млн. 16,6 тыс. га за счѐт образования новых учреждений и

присоединения земель к уже существующим соответствующими постановлениями Правительства. Появилось два новых национальных парка, два государственных природных резервата

From 2009 to 2013 the area of institutions of protected natural areas increased by 1 mln 16.6 million hectares due to the formation of new institutions and land accession to the existing areas under relevant government regulations. Two new national parks and two state natural reserves were created.

So, the following natural areas were established:

SNP "Akzhaiyk" (2009, the Atyrau region), with the area of 111.5 thousand hectares of agricultural and nonagricultural lands and water and land resources;

The Zhongar Alatau SNNP (2010, the Almaty region), the area of 356,022 hectares, by merger of the Lepsinsk (54.0 hectares) and Sarkandskiy (84.9 hectares) forest sites, a part of the Kokzharsk forest division of the Uygentassk forestry institution (61, 1 ha) and accession of 155962 hectares of the reserve land area; SNNP " Buiratau " (2011, the Karaganda region), the area of 88,968 hectares, which includes the Regional Natural Park "Buiratau", Belodymovsky and Ereimentau state wildlife reserves and the area, previously reserved by the Ereimentau State Reserve;

SNP «Altyn Dala» (2012, the Kostanai oblast), the area is 489766 ha, from the reserve regional lands, including an area of the Sarykopinsk state natural republican reserve.

The area of the reserves was significantly extended:

The area of the Alakol SNR was extended by 44.6 hectares of lands from state land reserve funds and by 0.9 hectares of water resources of the East Kazakhstan region;

30 hectares were transferred to the West Altai SNR from the Ridder (Cherno Ubinskoye forestry unit) and Ziryanovsk (Nizhne-Turgusunskoe forestry) forest institutions;

Korgalzhynsk SNR joined reserve lands and agricultural lands - 284.2 hectares;

Markakolsky SNR - 16.2 thousand hectares of the Markakolskiy forest institution and 11.7 hectares of reserve lands of the Kurchumski district.

The areas of the state national parks were extended as follows: Bajanaulsky SNNP - by 17.8 hectares of reserve lands of the Bayanaulsky region; the Karkaralinsk SNNP from reserve lands of the Karkarala regio - 7.2 hectares and 14.6 hectares of the Kuvskogo institution; the Charyn SNNP - 33.9 hectares of reserve lands of the Raiymbek district. The area of the Ile-Alatau SNNP increased by 110 ha under the order of the Committee (including 140-ha -"the Baum grove"), but by the resolution of the Government of RK 29.5 hectares of lands of the National Park lands were transferred to lands of the Karasai district.

The total area of the forest institutions, subordinate to the Committee, increased by 1 million 037.0 thousand ha or 21.9% , since in addition to increasing the area of the protected areas, the area of RSE " Zhasyl Aimag" increased by 20,3 thousand ha (Resolutions of akimats of Arshalinskiy, Tselinograd, Shortandy districts). The area of SNNP "Burabai" increased by 46.0 hectares with forest lands of the Bulandinsk institutions (43.4 hectares) of land and water resources of the Akmola region (3.0 hectares). In 2012 370 hectares were withdrawn from the same institution under the resolution of the Government Resolution.

In total, in Kazakhstan at the end of 2013 there are 108 PAs of republican (national) significance with the total area of 23,290,471 hectares, i.e. 8.6 % of the country. However, among them only 27 PAs (not counting botanical gardens) have the status of a legal entity, with a total area of 6,272,766 hectares, or 2.3 % of the country. This is still not enough , in spite of good positive trend of creating new protected areas - in 2009, the area of these categories of

protected areas was 3769.1 thousand hectares , or 1.4 % of the entire territory of the country, i.e. the area was extended by 66.5 % within four years.

Now these are 10 state nature reserves, 12 national natural parks, five state natural reserves (reservats).

Almost all of them are run by FHC MEPWR, except for SNNP "Burabai", managed by the Administration of the President of Kazakhstan.

It should be noted that in order to achieve actual results on biodiversity conservation it is necessary to create a representative system of protected areas and ensure their interaction, when key protected areas (reserves, national parks, reserves) are interconnected with less strictly protected areas (nature reserves, protected areas), as well as with a network of environmental elements - ecological corridors, forests, water protection zones and stripes and others natural areas, protected to some extent.

At present the PAs in the territory of the Republic of Kazakhstan is difficult to evaluate as " ecological network " in its global sense. However, now intra- regional ecological networks in the Ile Alatau, Zhungar Alatau and the Altai region are being created. With creation of the SNP "Altyn Dala" in 2012 the real ecological network in the arid steppes of Central Kazakhstan is being created , with development- for the first time in the country - of mechanisms for setting up ecological corridors (between “Altyn Adam” and SNP Irgi Turgay).

Elements of ecological networks are being formed also on the international level. They are the Western Tien Shan and Altai-Sayan ecological regions. These developments and approaches should be pursued throughout all natural complexes in Kazakhstan - mountain regions, forest-steppe, steppe, deserts, semi-deserts, coastal and aquatic ecosystems.

Current PAs do not ensure conservation of the unique flora and fauna diversity of Kazakhstan and support to sustainable state of the whole set of natural ecosystems.
It is a long overdue need to create additional reliably protected areas in the habitats of argali - Altai, Kazakh, Karatau and Kizilkum species. The number of protected areas for desert mammals - Persian gazelle, Asiatic wild ass, manul cat, caracal, marbled polecats is clearly insufficient. 37 species (21,1%) of mammals, including 12 species listed in the Red Book of the Republic of Kazakhstan do not inhabit in SPAs. These are muskrat, pine marten, European minks, giant mole rats, inhabiting in the Volga- Ural sands, and other species in different regions. With regard to rare species it is notable that many species of jerboas, which are so typical for deserts, are not available in the PAs in the country.

For the conservation of the biological diversity of mammals in Kazakhstan it is especially necessary to create protected areas with the status of legal entities in different types of deserts (sand, clay, loessial and rubbly, stony, halophytic deserts); each of them is characterized with its own set of common species. The particular attention should be paid to the western region, including the Ustyurt plateau and the valley of the Ural River.

In the end of 2013 the project, implemented by UNDP/GEF/the government of RK, was started with the aim to strengthen the system of protected areas in the desert zone.

The country has to resolve complicated issues of creating and extending SPAs in the face of increasing tough anthropogenic pressure, when every year it becomes more difficult to reserve plots of lands, withdrawn from economic circulation. Therefore, the role of protected areas that allow limited economic use of the territory, in line with the conservation of biodiversity similar to biosphere reserves (in the terminology of UNESCO) is becoming more important. Namely these are state nature reserves and state national (or regional) parks. They were created from

2009 to 2013. The concept of the " biosphere reserve , as such , in the Kazakhstan legislation does not exist, and now its inclusion to the law " On Specially Protected Natural Areas" is under discussion.

However, in spite of the lack of the concept “biosphere reserve» in the legislation of RK two areas is already included into the UNESCO list of biosphere reserves in 2012-2013. - these are state natural reserves «Korgalzhynsk» (Central Kazakhstan) and «Alakolsk» (Eastern Kazakhstan), the third area, the state nature reserve "Akzhaiyk" (West Kazakhstan, the delta of the Ural river) is awaiting for the decision of UNESCO. It should be noted that over the previous few years the GEF/UNDP/the government of RK Project “Comprehensive conservation of priority globally significant wetlands as places of habitats of migratory birds: demonstration in three PAs” implemented activities on interaction of local communities, authorities and other stakeholders, with administrations of these three protected areas, that somehow will streamline environmental management in the PAs and adjacent territories. This allowed to bring the status of these areas closer to the concept of UNESCO “Biosphere Reserve”. At the end of 2013 2 more nominations were submitted to UNESCO to grant the Caton Karagaisky SNNP and the Aksu - Zhabagly SNR the status of biosphere reserves. GEF/UNDP projects, aimed at sustainable use of natural resources around these protected areas, were also implemented in different years.

Kazakhstan is the most important country for millions of waterfowl and semiaquatic birds during nesting, moulting, seasonal migrations and wintering. Two major migration routes - the West Siberian- African and Central Asian- Indian - cross the country. In order to ensure the conservation of wetlands in the country within authorities of MEPWR by the Order № 273 of the Minister of Environment Protection of the Republic of Kazakhstan on September 6, 2013 - ө lists of wetlands of international and national importance were approved. They include all 10 Ramsar sites as wetlands of International importance, with a total area 3,281,398 ha (Table 11) and 44 areas as lands of republican (national) significance with the total area of 1,773,408 hectares.

Table 11. List of wetlands of global significance as of January 1, 2013, Kazakhstan

NN	Name	Date of inclusion to the Ramsar list	Oblast	Area, ha	SPAs
1.	Tengiz-Korgalzhyn lake system	11.10.1976	Akmolinsk	353 341	Korgalzhyn SNR
2.	Alakol-Sasykkol lakes system	25.11.2009	Almaty	914 663	Alakol SNR (partially)
3.	Delta of the Ili river and the southern part of the Balkash lake	01.01.2012	Almaty	976 630	PriBalkhash and Karoisk reserves (partially),the planned reserve
4.	Lakes in lower reaches of the Turgay and Irgiz rivers	11.10.1976	Aktybinsk	348 000	Irgiz-Turgai SNR and the Turgai reserve

5.	Ural River Delta with the adjacent coast of the Caspian Sea	10.03.2009	Atyrau	111 500	partially - SNP Akzhaiyak
6.	Zharsor Urkashskaya-lake system	12.07.2009	Kostanai	41 250	Zharsor-Urkashskyi reserve
7.	Koibagar Tyuntyugurskaya lakes system	07.05.2009	Kostana	58 000	no
8.	Kulykol Taldykolskaya lakes system	07.05.2009	Kostana	8 300	no
9.	Naurzum Lakes System	12.07.2009	Kostana	139 714	Naurzymskyi SNR
10.	Small Aral Sea and the Syr Darya River delta	02.02.2012	Kyzyl-Orda	330 000	Partly the Barsakelmesskyi SNR -

All these 54 sites are key ornithological areas of international importance (IBA), confirmed after the inventory conducted by NGO "Kazakhstan Association of Biodiversity" with the support of FHC MEP RK (see the full list of IBA in Appendix II). With the addition of these areas - especially not covered by the PA system - to the list of reservoirs of international and national significance the government committed to take measures aimed at their conservation.

Development of the ecological tourism

The potential of the nature in Kazakhstan provides great opportunities for the development of ecotourism in protected areas, as it is very diverse, unique, has attractive landscapes, not yet affected by urbanization and intensive agricultural production.

The eco-tourism can be developed in all kinds of PAs, but the regime of reserves as the most rigorous compared to other types of protected areas, imposes maximum limits on the development of the ecological tourism. Public national parks (SNNP), as a type of a specially protected area, have the greatest potential for the development of recreational and tourist activities.

With this aim, the state national nature parks and other SPAs organize routes in zones of tourist and recreational use with a view of picturesque attractive landscapes, natural monuments and other notable places of regulated attendance.

Meanwhile, in most protected areas located near major cities, not eco-tourism as such, but normal recreation without educational and informational components prevail. In fact, the statistics that enables to develop ecotourism in its classical sense, has just started developing and since the country is low competitive for the inbound tourism, the main group of potential tourists are citizens of Kazakhstan.

In order to promote eco-tourism in special protected areas the Memorandum of Understanding between the Committee of Tourism Industry of the Ministry of Industry and New Technologies of the Republic of Kazakhstan (CTI MINT RK), FHC, the Kazakhstan Tourist Association (KTA) was signed.

Under sectoral programmes of FHC MEPWR RK, at present all national parks have developed plans that enable to effectively define dedicated locations of major tourist sites, in line with ecological requirements and specific features. These institutions have departments of environmental education and tourism primarily aimed at the ecological tourism and cultural, raising awareness, recreational and tourism activities in PAs.

There are more than 90 tourist routes and excursion paths with the length of more than two thousand miles are organised in designated areas of national parks. They are equipped with observation bivouac sites, more than 800 notices and information boards and signs.

In order to promote eco-tourism in SNNP, the Scientific and Technical Council of FHC MA has a representative of CTI MINT RK, which deals with the development of ecotourism in protected natural areas and tourism infrastructure.

The Law of the Republic of Kazakhstan "On Specially Protected Natural Territories" as amended on January 25, 2012, set up the procedure for the development of the ecological tourism in the state national parks.

Lands in protected natural areas are provided to individuals and legal entities for up to 49 years to develop the regulated tourism and recreation only in accordance with the master plan for infrastructure development.

For further development of eco-tourism in protected natural areas, the following activities are conducted:

•development of master plans for infrastructure development of the state national natural parks and state natural reserves, presenting an interest for the development of eco-tourism;

• establishment of a system of regulation of a flow of visitors to PAs through selection of tour operators; development of a network of tourism routes in various directions with further its arrangement and certification;

• ensuring the safety, security and maintenance of tourist resources to PAs; development of infrastructure for tourism activities by attracting additional investors and interested economic entities, tourist organizations and local population;

- mprovement of tourist routes (arrangement of recreations, shelters, production and installation of small architectural forms, etc.); conducting promotional activities.

According to the administrative management system and the legal framework of Kazakhstan, **the Committee of Tourism Industry under the Ministry of Industry and New Technologies (MINT)** develops the national strategy for tourism development in Kazakhstan. Accordingly, the committee is also engaged in long-term planning in ecotourism, that directly affects biodiversity.

In its activities CTI MINT RK follows the the "Strategic Plan of MINT RK for 2011-2015", approved on February 8, 2011, which also sets up indicators of the development of tourism (including ecotourism). "The Concept of the tourism industry of the Republic of Kazakhstan till 2020" was also developed and it encompasses issues of tourism development in protected areas. The Tourism Council, acting as a consultative body of the government of the Republic of Kazakhstan, promotes the programme on the cross-sectoral level.

Among the measures for the development of tourism in protected areas and forestry the Concept envisages the following:

- Development of criteria for tourist attraction for priority projects for long-term use in PAs and the state forest fund, taking into account the maximum conservation of the natural reserve fund, protection of natural resources and genetic resources in partnership with the local population;
- •planning of tourism development in the lands of the state forest fund with tourist potential, through the development of a master plan for infrastructure development in such areas, on the basis of the management plan in accordance with the criteria;
- planning of the tourism development in the master plan for infrastructure development of PAs;
- harmonization of master plans with the authorised body in tourism, which can make suggestions for adjusting the master plans in terms of tourism development, while identifying balneological projects for the recovery of population and for the implementation of eco-tourism in priority protected areas and on the territory of the state forest fund;
- with the sustainable use and management of protected areas and areas of the state forest fund for the implementation of tourism projects it is necessary to enhance liability of users of protected areas and the state forest fund for the damage to the environment (illegal logging, water pollution, damage of natural layer of the earth), as well as consideration of mechanisms for the promotion of natural resource users with increase of the area of forest plantations, restoration of objects of the natural reserve fund.

Thus, FHC MEPWR is engaged in the actual creation of the natural basis for the development of tourism in protected areas of Kazakhstan and in the allocation of the state budget, the state strategic planning of ecotourism and recreation in PAs and the forest fund - CTI MINT RK. In practice, these institutions are not determinant in the development of tourism in the protected areas of Kazakhstan. Efforts of companies on internal and inbound tourism play a major role, ensure real paces and scale of tourism development in protected areas of Kazakhstan. Namely these companies bring thousands of tourist flows primarily on weekend routes. But these firms, irrespective on their number, do not invest to the protection of tourist and recreational resources and the development of tourism infrastructure in the PAs.

Thus, FHC controls the PAs, invests in their development and conservation of tourism and recreation resources. Actual users of these resources - touristic firms - also participate in these processes. CTI MINT makes efforts to determine the tourism development strategy in PAs.

As a result , the current ssituation of tourism in protected areas is far from being normal. Virtually, in all SNNP in Kazakhstan uncontrolled various recreation and amateur tourism are dominated. Tourism agencies of the nearest towns in areas of parks organize one - two-day bus tours. Tourist flows to SNNP located near large cities are practically not regulated; official data on these tourists are not complete. For example, ten thousands of tourists on their cars visit the Ile-Alatau SNNP (near Almaty, Kazakhstan's largest city) at weekends. However, duties of the park staff are limited just to sale of entry tickets and collection of garbage at working days. The flow of tourists is simply not managed and regulated by the park administration. In fact, the tourist flows to SNNP are spontaneous and depend very little on the activities of park administration, FHC and CTI MINT.

Meanwhile, in all tourism development programs, PAs, especially natural parks, are assigned with a major role in shaping planned tourist flows and revenues. Programmes of CTI MINT and regional programs of akimats specify existing PAs as a state recreation and tourism fund, and can be just used, without allocating funds for their protection and restoration.

Thus, the above mentioned "The concept of the tourism industry of the Republic of Kazakhstan until 2020" includes proposals for tourism development in some of the most promising tourism regions and cities of the country on the basis of master plans or clusters.

The example is the "Almaty Cluster". Almaty will be the center of the cluster with five key places attractive for tourists: the archaeological landscape of Tamgaly petroglyphs (the UNESCO site); SNNP "Altyn -Emel", included in the provisional list of UNESCO; SNNP "Charyn Canyon"; the Kapchagay water reservoir; ski areas of Almaty with SNNP " Ile- Alatau", included in the provisional list of UNESCO, the tourist center " Zhana- Ile". In the Almaty cluster out of 5 key places of tourist interest three sites already represent protected areas of national significance, which are the basis of the cluster as such.

However, the main tourism product, as in all other clusters, can be «MICE - tourism, cultural tourism and tours, vacations in mountains and on the lakes and short-term day offs." Naturally, these types of tourism will be maintained only with PA resources, including biodiversity.

It should be noted that all previously adopted programs and the current Concept of tourism development recognize the richness and diversity of natural landscapes and national parks of Kazakhstan as specific units, which should ensure the planned development of tourism. However, inspite of such significance of these areas it is not planned to allocate any resources for the development of these parks.

These policy documents do not consider sustainable development of protected areas in the situation of increasing tourist flows and growth of recreational pressure, already leading to loss of tourist attraction in the most visited parks. There are no even concepts of recreational resources, biological diversity, wealth and sustainability of ecosystems, allowable recreational loads. With this approach, the sustainable development of tourism in protected areas is simply impossible; the situation needs to be addressed and the planning process (including, joint contributions) with the participation of all stakeholders should be improved.

The growing demand for recreational resources of PAs represents a threat not only because it exceeds allowable loads on ecosystems (disturbance factor, habitat destruction, etc.), but also because of the possible progressive reduction of the areas of the PAs as a result of withdrawal of these lands for construction of tourism facilities. Despite the fact that the law allows such construction on lands of PAs in sites of limited economic use, the lands can be withdrawn for subsequent privatization that is impossible in the PAs.

Withdrawal of lands of the PAs for the construction of tourism facilities (in the broad sense) became possible from 2008, in areas of the limited economic use and if their construction is envisaged by state programs. Since July 2013 the reference to a " state program " has been replaced with a reference to " documents of the state planning system", which include a very wide range of documents, both on the national and local levels. This creates preconditions for uncoordinated actions of state agencies, akimats of local authorities and national companies regarding withdrawal of lands in PAs. It starts causing a real threat to the PAs system of the country. Currently the need to make amendments to this article in the law is under discussion.

The example of such threats is procedures, effective since 2013, on withdrawal of 1000 hectares of lands from the Ile-Alatau SNNP (included into the tentative list of the UNESCO World Heritage) for the construction of a ski resort " Kokzhaylau " under local plans of the Almaty akimat. At the same time, for withdrawal of the lands, the zoning of SNNP was first changed to move a part of this section from the zone of the "environmental stabilization " to the zone of the "limited economic use", justifying this decision just with the need to construct the resort. Thus, the imperfect legislation allows similarly to withdraw from any national park virtually almost any site required for privatization. This situation should be changed.

2.3.6. Hunting and protection of rare species of animals

The authorized body of the animal world is FHC MEPWR RK, and the basic program is the sectoral program "Zhasyl Damy" with indicative figures. The sectoral programs, existed before 2010, on forestry, hunting and fishery, including "The program for the conservation and rational use of water resources, wildlife and the development of a network of protected areas by 2010," have been integrated into "Zhasyl Damy".

In the current concept on wildlife conservation in Kazakhstan, wildlife units are protected directly by hunting users in the areas of hunting farms, protection services in the PAs (within their borders), and in unfixed lands - by the FHC territorial divisions and a specialized service of wildlife protection of RSE "PU Okhotzooprom" of FHC (authorised also to carry out activities in hunting farms).

The hunting lands in the Republic of Kazakhstan occupy 223.0 million ha (82 % of the country), of which 120.0 million hectares (53.0 % of the land, or 44.2 % of the country) are secured for hunting.

In 2010-2013, the country made arrangements in hunting farms (planning of boundaries and defining categories of hunting farms) on the area of about 20.0 million hectares.

In Kazakhstan there are 675 hunting farms assigned to the hunting users; the number of rangers is 2482, about 2286 vehicles are used for protection of these lands. Private hunting users invest financial resources into the development of hunting farms, including payments to rangers and for biological technical activities.

In 2013 1801.6 million KZT was allocated for development of hunting farms, including 822.7 million KZT- for the maintenance of hunting services and 278.5 million KZT - for biotechnical measures (Table 12). The number of hunting farms, their technical infrastructure and maintenance costs regularly increased within 4 years.

Table 12. The dynamics of private investments to development of hunting in the period from 2010 to 2013

№ п/п	Name	2010	2011	2012	2013
1	Percentage of fixed hunting lands	50,4	49,0	50,0	53,0
2	Number of hunting lands, units	665	694	668	698
3	Number of hunting services, persons	2714	2900	2718	2482
4	Number of patrolling vehicles, units	1391	1694	1885	2286
5	Total funding is allocated for the development of hunting farms, million tenge:	754,2	1415,3	1124,4	1801,6
	including allowances for rangers in hunting farms; financing of biotechnical measures	261,7	1229,2	435,1	822,7
		95,8	239,9	293,7	278,5

Hunting services continue securing the most promising areas of the reserve fund of hunting lands and ensure protection of wildlife in them.

In Kazakhstan, where hunting is permitted only in fixed hunting lands; limits of seizing wild animals is established only to the areas assigned for hunting users.

Accordingly, hunters have demonstrated interest in improving productivity in the assigned hunting lands by increasing the population of animals, and most importantly, by

providing their protection. Hunting farms, under standard contracts, are obliged to protect not only hunting species, but also rare and endangered types. However, in Kazakhstan there is a number of gaps in the regulatory framework, that puts hunting farms in a vulnerable position: lack of compensation in case of withdrawal of hunting lands for state needs, lack of payments to hunting farms for damage of wildlife or ecosystems in their areas (all payments are made to the state budget), lack of incentives for the protection of rare species, etc.. Currently amendments to the legislation, that will stabilize the hunting sector of the economy, are being discussed.

In Kazakhstan hunting is permitted only with respect to those species which are attributed to the category of hunting species; the list of these species is approved by the resolution № 625 of the government of the Republic of Kazakhstan, dated May 5, 2009 "On approval of the list of species representing a units of hunting and fishing". The list includes 34 species of mammals and 59 species of birds. Hunting farms are obliged to conduct census of the species on the basis of which, after a biological justification, the Government of the RK sets up limits of their extraction in the country as a whole and further, establishes quotas for users at the level of regions. Standards recording models, approved by FHC MEPWR, should be used. Unfortunately, due to the lack of staff in hunting farms the records are often unreliable; the comprehensive system of monitoring of wildlife (or individual groups) in Kazakhstan is not in in place. Currently several projects, including some projects commissioned by the government, are working on creating a basis of wildlife cadaster of the country.

The state enterprise "Okhotzooprom" ensures protection and monitoring of saiga, rare and endangered species of ungulate animals in 10 administrative regions. The protection activities are conducted by "Okhotzoprom" on vehicles in extreme off-road mountainous, desert and steppe areas of more than 120.0 million hectares. These activities involve more than 220 state inspectors on wildlife protection and 114 units of vehicles with good cross-country ability. Mobile units and inspectors are equipped with modern communication and navigation facilities, weapons and uniforms, as well as photo and video equipment.

For more prompt and efficient protection of saiga antelopes and other rare ungulates because of the length and inaccessibility of many habitats (mountains, deserts) helicopters and planes are used.

36 mobile units with 168 inspectors and 82 units of auto-moto facilities in SE "PU Ohotzooprom" are designated especially for saiga. The area of habitats of protected saiga makes up 123 million hectares in nine regions.

State inspectors of regional forestry and hunting territorial inspections, specialists of law enforcement and environmental authorities are involved in protection of saiga. In order to strengthen sanctions for illegal extraction of saiga in 2012 the criminal code and regulations of the administrative code, in particular, regarding penalties for the acquisition, sale and storage of animals, completely prohibited to be hunted, or products of them were amended. This norm deprives poachers and buyers of horns any chance to escape responsibility .

Saiga is particularly important for the country. The main part of the present areal and resources of saiga, represented by three distinct populations - Bekpakdala, Ustiurt and Ural population is located in Kazakhstan. In the fifties of the last century, the number of saiga in the country amounted to 1.5 million heads. In the 1960-1980-ies, there was an active, sustainable hunting of saiga that resulted in a major economic effect. However, recurrent snowy winters, diseases, predation (wolfs), the collapse of the state system of wildlife conservation in 90th of the last century, and as a consequence the emergence of mass poaching mainly for exportation of horns to China, saiga is on the edge of extinction. In 2003, its population was reduced to 21.1 thousand heads . Since this year active measures to restore the species were taken as follows:

increased annual funding of the State Enterprise "Ohotzooprom"; interagency cooperation with the internal affairs and customs services; advocacy activities relating to the saiga protection; toughenin penalties for illegal hunting of saiga. By the Order of the Acting Minister of Agriculture of the Republic of Kazakhstan № 704 of 10 November 2010 exemption of saiga is completely banned on the territory of the Republic of Kazakhstan (except for scientific purposes) until 31 December 2020 (during previous 7 years the similar ban requirement was effective). With regard to financing, then in 2013 678.8 million tenge (about $ 4.5 million) was allocated for the protection, monitoring and counting of the number.

Records of saiga were made in 2005-2007, with participation of members of the Institute of Zoology of Kazakhstan and have shown that reduction of the number of animals was stopped and seemed to be increased. In 2005, the number of saiga was 39.6 thousand of units; in 2006 - 49,3 thousand . In 2007, the number of saiga increased to 54.8 thousand individuals, against 21.2 million in 2003. According to results of the aerial survey in 2013 the number of saiga reached 187.0 thousand of units, i.e. increased 4 -fold compared to 2005. Records are made by the FHC organized annually; saiga population dynamics by populations is shown in Fig. 22.

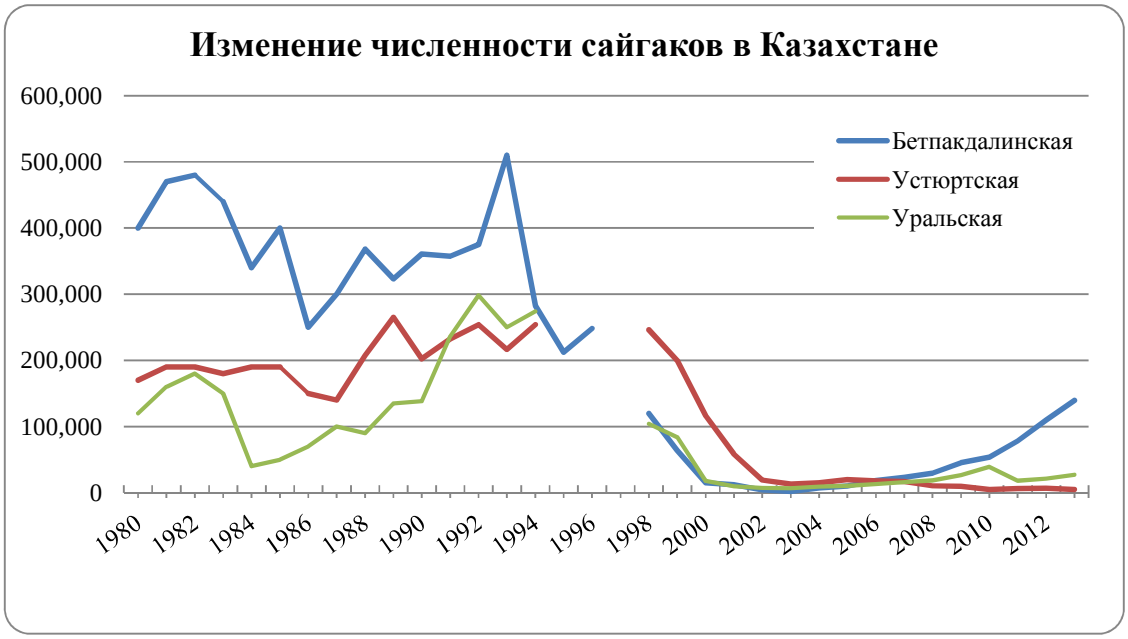


Fig. 22 Number of population of saiga in Kazakhstan for the last 30 years

Satellite telemetry with GPS- transmitters are used to study species and improve their protection. The Satellite tagging project is implemented from 2009 to 2013 by ACBK jointly with FHC and the State Enterprise "PU Ohotzooprom" with the financial support of international organizations. Since 2009, 78 animals in three populations were tagged with satellite transmitters; during the whole period weekly distribution maps of marked saiga for effective planning of security raids of the Okhotzooprom inspectors were developed to support justification of extensions of the Irgiz Torgai reserve with 410 000 hectares; obtained unique data on migrations and biology of species; prepared recommendations for bridge crossings for saiga through the planned railway.

As a result of the protective measures, the number of argali, Persian gazelle, Asiatic wild ass and tugai deer also increased compared to 2009. Twice in the last 4 years in accordance with the regulations of the Government of Kazakhstan groups of Asiatic wild ass were transported from SNNP "Altyn Emel" to the territory of the Andasai state nature reserve in the Zhambyl region. The biological feasibility of reintroduction of Kulan, gazelles, Bukhara deer, argali in different regions of Kazakhstan was conducted.

2.3.7. Fulfillment of international legal acts

As it was noted above Kazakhstan is a party to five priority intergovernmental treaties directly affecting the area of preservation and sustainable use of biodiversity: the Convention on Biological Diversity (CBD), the Convention for the Protection of the World Cultural and Natural Heritage, the Convention on the Conservation of Migratory Species of Wild Animals (CMS, or Bonn Convention), the Convention on Wetlands of International Importance (or Ramsar Convention), the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES), as well as the United Nations Convention to Combat Desertification (UNCCD).

Aside from direct inclusion of objectives on realization of biodiversity conventions into sectoral and cross-sectoral programs and plans, special efforts are undertaken to coordinate their implementation and reporting.

After entrusting functions of the state wildlife management, fisheries management and protected areas to the Ministry of Environment and Water Resources (MEWR) in 2013, this ministry became responsible for the implementation of all conventions related to biodiversity, with the exception of the UNESCO Convention Concerning the Protection of the World Cultural and Natural Heritage, which is supervised by the Ministry of Foreign Affairs.

The issues of the Convention Concerning the Protection of the World Cultural and Natural Heritage are under the supervision of the National Commission for UNESCO and ISESCO under the Ministry of Foreign Affairs of the Republic of Kazakhstan. For inclusion in the list of World Heritage Sites in 2013 there is a prepared transboundary serial nomination "Western Tien-Shan", which included seven PAs from Kazakhstan, Kyrgyzstan, and Uzbekistan. The UNESCO Cluster Office in Almaty played a coordinating role between the three countries , and the technical training was coordinated by the ACBK. Currently the application filed by Kazakhstan National Commission for UNESCO and ISESCO on behalf of the three countries to the World Heritage Committee is returned for revision and will be filed again in September 2014.

To facilitate efforts on biodiversity under this Convention, in 2011 the Kazakhstan National Committee of the UNESCO activated the program "Man and the Biosphere", MAB. The Committee was originally established in 1978, then virtually ceased operations after the collapse of the USSR, and began activities again after a nearly 20- year interval. The purpose of the Committee is to *"develop a national network of biosphere reserves in the Republic of Kazakhstan, its integration into the global and regional network of biosphere reserves, analysis and synthesis of international experience in the development of specially protected areas, as well as assessing issues of conservation of biological and ecosystem diversity, the relationship of a man and the environment and dissemination of environmental knowledge under the UNESCO "Man and Biosphere" program.*

In July 2012 at its 24th session the MAB International Coordinating Council approved the first application for inclusion Kazakhstan's Korgalzhyn Nature Reserve in the UNESCO World Network of Biosphere Reserves. During this session, Kazakhstan officially became a member of the European Network of Biosphere Reserves EUROMAB. In 2013, the application of Alakolsky SNR was confirmed, 3 more applications are pending. Thus, currently Kazakhstan

due to its vast territory and diversity of ecosystems is a member of the three networks of biosphere reserves - the East Asian, South Central Asian and European ones.

Within the framework of the Ramsar Convention, under the coordination of the FHC (Forestry and Hunting Committee) of the MEWR of the RK and with the support of international and national projects and partners, starting from 2009 to 2012 8 sites were described and included in the Ramsar list; thus, currently Kazakhstan has 10 Ramsar sites with a total area of 3 281 398 ha (Table 11). Their status is considered in the management plans for existing protected areas in these areas. At the same time, special measures are required to organize sustainable environmental use (management plans) and promotion of conservation of Ramsar sites in non-protected areas.

To comply with CITES, the CITES Management Authority operates in Kazakhstan - the Committee on Forestry and Hunting of the MEWR and three scientific bodies - on wildlife (Institute of Zoology of the Ministry of Education and Science of Kazakhstan), on vegetative world (Institute of Botany and Phytointroduction of the MES RK) and on aquatic animals ("Kazakh Research Institute of Fisheries" or KazRIF). There is all the relevant regulatory framework complying with the convention. Existing problems include inadequate training of customs and border guard services of the RK to work on control of moving CITES objects. Over the past 5 years no significant changes were made to the plans on implementing the convention.

Activities in the framework of the Bonn Convention (Convention on Migratory Species) are coordinated by the FHC mostly within memorandums and action plans on individual species. No special bodies were established for these activities. At the end of 2013, Kazakhstan signed memorandums for Saiga, Bukhara deer, White Crane and Slender-billed Curlew (all before 2009). In 2010, a memorandum on Saiga was also signed by the Kazakhstan Association of biodiversity as a supporting organization.

In addition, Kazakhstan's FHC and experts are involved in the implementation of several action plans for certain species (Single Species Action Plan, SSAP): on-fronted goose, red-breasted goose, Lapwing, Black-tailed Godwit, also a plan of action on mountain sheep (argali) is being discussed. Among these work in the latter two was started in the last 3 years.

Action plans and memoranda on certain species are considered in the FHC programs. At the initiative of Kazakhstan, at the last meeting of the Parties to the Bonn Convention (Norway, 2011) and its Schedule 2 all subspecies of argali were included.

2.4. Role of international projects and nonprofit sector participation

On realization of actions under environmental conventions and conservation of biodiversity in Kazakhstan there is a number of state-level international projects, which directly or indirectly relate to these issues. UNDP in cooperation with the MEWR started active support of enhancing the system of environmental governance since 1998. The Council on Sustainable development of the Republic of Kazakhstan (CSD) was established in 2005. In 2006 they developed and adopted the Concept of transition of Kazakhstan to Sustainable development for 2007-2024 (CSD), the Parliament adopted the Environmental Code, and completed the assessment of realization of international environmental conventions, as well as prepared a Plan of events on increasing the country's capacity in fulfilling obligations within these conventions. Kazakhstan has realized a number of projects supported by GEF/UNDP, either full-scaled or under the Small grants program by GEF (GEF SGP). Under the GEF SGP (up to 50 thousand USD) in 2009-2013 annually around 10-15 demonstration projects were supported for conservation of biodiversity, conservation of pastures, alternative energy resources, ecotourism, adaptation to climate change and so on. Administration of major projects was led by UNDP, with related state executive agencies.

As for the full-sized projects, in 2010-2013 (in addition to the World Bank project to increase forest cover, which was mentioned above) three of the GEF/UNDP projects have been successfully completed:

1. *In-situ* conservation of Kazakhstan's mountain agro-biodiversity;
2. Conservation and sustainable use of biodiversity of Altai-Sayan ecological region;
3. Integrated conservation of globally significant wetlands as waterfowl habitat.

In all three projects the FHC acted as an executive agency of the Government of the Republic of Kazakhstan.

***"In-situ* conservation of Kazakhstan's Mountain Agro-Biodiversity"** Project

Ecosystem of mountain wild fruit forests in the project area of Zailiyskiy and Dzungarian Alatau are the natural habitat for many plant species of agro-biodiversity of global significance. It is a home to about 100 species of wild relatives / ancestors of 24 agricultural crops, accounting for over 75% of the total vegetable agro-biodiversity in Kazakhstan.

Goal of the project: in-situ conservation and ensuring sustainable use of biodiversity of global importance for agriculture at two sites located in the Tian Shan mountains in Kazakhstan.

Project duration: Years 2006-2012

Total budget - U.S. $ 22,569,877, including the GEF funds of $3,022,967 and the contributions by the Government and other organizations of $19,546,910.

Achievements

- Completed inspection and inventory of wild fruit forests, an information database is under creation, prepared documentation for establishing Zhongar Alatau SNNP (the park has been already created) and reconstruction of forest nursery of Lepsinsk State Forestry.
- Increased capacity of PA management of the project territories, carried out work to develop alternative activities and awareness among the local population. Produced educational scientific video about mountain fruit forests "Precious necklace of mountains."
- Experimental work has begun to test the methods of cultivation of planting material of natural genotypes of globally significant Sivers apple and ordinary apricot, as well as the creation of live collections of formal diversity of these species. Improved communication and interaction with the local communities of rural settlements in the project area and non-governmental organizations working on biodiversity conservation.
- A new department for research works and mountain agro-biodiversity has been established in the Ile-Alatau SNNP.

***"Conservation and sustainable use of biodiversity of Kazakhstan's part of the Altai-Sayan region"** project.*

Mountainous forestlands of the Eastern Kazakhstan constitute an integral component of globally significant Altai-Sayan ecological region, which contains a significant number of rare animals and endemic plant species. Despite the fact that large areas of forest are under formal protection, management of these areas leaves much to be desired. Reserves and national parks of Kazakhstan share borders with territories, located in Russia and China, which serve for different use. Unified approach to the conservation of natural complexes of the region, as well as migratory animal species requires development and introduction of new mechanisms for transboundary cooperation. Also it is necessary to revise the existing management practices of forests and biological resources within each country.

Goal of the project: preserving globally significant biodiversity in the Kazakhstan part of Altai-Sayan ecological region. The main objective of the project is to enhance the effectiveness

of the national system of protected areas in Kazakhstan for biodiversity conservation by demonstrating sustainable and replicable approaches to the management of protected areas in the Kazakhstan part of Altai-Sayan ecological region.

Project duration: Years 2007 – 2012

Budget : $18 734 400, including the GEF funds of $2 395 700; UNDP $40 000; Government and other organizations in the Republic of Kazakhstan - $15758700; in-kind contribution - $ 7028500.

Achievements

- Expanded area of the West Altai and Markakol nature reserves, improved management efficiency of the system of protected areas; raised awareness of various stakeholders on conservation of biodiversity and operations of PAs;
- Improved existing legal and institutional framework of PA operations,
- Ensured conditions for engaging local communities in the process of conserving biodiversity and developing alternative kinds of activities in the PAs and buffer zones;
- Enhanced exchange of information and cooperation between PAs;
- Positive experience and project results are disseminated for replication in other regions of the national PAs system.

"Integrated conservation of globally significant wetlands as waterfowl habitat: demonstration at three sites" *project.*

The wetlands of Kazakhstan are essential for nesting and migratory bird species, for vegetation, and is life sustaining for the local population. Despite the fact that many of the key areas are under formal protection, their management remains problematic. Radical social and economic reforms have led to new challenges for the sustainable management of land and water resources. New models of land ownership, limited funding narrowly focused in addressing water issues, the lack of experience in the joint management of public resources require urgent reorientation in the management, strengthening funding mechanisms and establishing new relationships among stakeholders.

Goal of the project: Establish basis for development, integrated and collective approach in conservation and sustainable use of biological diversity of globally significant wetlands.

Project duration: Years 2003-2010

Budget and donors: GEF -$8,710,000, Kazakhstan's government - $24,270,000, third parties - $2, 965,000.

Achievements:

- Prepared and introduced proposals on enhancement of regulatory base for conservation of biodiversity of wetlands and implementation of the Ramsar and Bonn Conventions;
- Conducted wide-scale scientific research of three project areas (Alakolsky pond, Tengiz-Korgalzhyn lake system, the Ural river basin) with application of geoinformation systems (GIS) and ecosystem approach;
- Prepared rationale and expanded territories of Alakol and Korgalzhyn nature reservers, established state natural reserve "Akzhayik" in the Ural river basin;
- Developed and realizing Management plans of Alakolsky and Korgalzhyn nature reserves and the Akzhayik reserve;
- Conducted a number of training seminars in the area of ecological tourism and environmental education for employees of state institutions (Ministry of Agriculture of the Republic of Kazakhstan, Ministry of Industries and Technologies of the Republic of Kazakhstan), of executive authorities (administrations of Atyrau, Almaty and Akmola regions and districts) and public institutions;

- In villages located in project areas conducted a number of training seminars for local communities on production of milk products, felt crafts;
- The project prepared the Concept of establishing modern visit centers of Korgalzhyn and Alakol state nature reserves (visit center of Korgalzhyn reserve was established in 2010 at the expense of the state);
- Developed and using programs on environmental education for schools on preservation of wetlands;
- Have compiled a review on the state of managing farms, fisheries and hunting farms, analysis on the assessment of the modern state of the oil sector in the area of project territories of the Ural river basin with corresponding recommendations on preserving ecosystems;
- Have prepared and realizing the Concept on development of ecological tourism in the Alakol -Sasykkol system of lakes and the project area of "Basin of the Ural river and adjacent shore of the Caspian Sea";
- Established a **Kazakhstan's Fund for Conservation of Biodiversity** (including all its statutory and regulatory documents), which is the first specialized non-governmental environmental Fund not only for Kazakhstan, but also for the CIS countries. It must create a mechanism of additional financing for projects aimed at conservation of biodiversity through providing grants to legal entities. The Fund was created on the basis of analysis of advanced international experience in compliance with the generally recognized international norms and standards. At the stage of its establishment UNDP and GEF provide financial, organizational and technical support to the Fund (GEF allocates funds in the amount of $1.5 million).
- Published a three-volume publication "Globally significant wetlands of Kazakhstan" with full results of complex research and assessment of ecological and environmental significance of key wetlands of Kazakhstan: the Ural river basin, Teniz-Korgalzhyn and Alakol-Sasykkol lake systems.

The Biodiversity Conservation Fund, despite contributions of two Kazakhstan's companies ("Air Astana", "Kazakhmys") until now could not reach sufficient capitalization for full-scaled activities. It is connected to the fact that Kazakhstan's corporate sector still lacks stimulus for contributing funds to charities and environmental activities.

The program on ***"Small credits for rural entrepreneurs residing next to specially protected natural areas"*** has been initiated and is underway within the framework of the above named project on wetlands.

The program was launched by joint efforts of the "Fund for financial support of agriculture" JSC, the GEF, the FHC of the MEWR of the Republic of Kazakhstan, the Kazakhstan's Fund for Biodiversity Conservation and UNDP at three project territories: the Ural river basin, and the Tengiz-Korgalzhyn and the Alakol-Sasykkol lake systems.

The rural population demonstrates high interest in developing own businesses and receiving stable access to small credits and grant sources of financing. Privileged conditions for small loans under the Program in comparison to existing loan terms in Kazakhstan are the key components, as they stimulate the development of rural businesses based on nature preserving types of activities and technologies, as well as development of alternative types of activities.

Priority areas of financing projects include: 1) sustainable management of fisheries; 2) sustainable management of hunting farms; 3) sustainable development of ecological tourism, including development of ecological routes and tourist infrastructure and rural tourism; 4) sustainable use of natural sources of energy (renewable energy); 5) sustainable agriculture (possible joint financing); 6) sustainable forestry.

Initially the program was realized in 2008-2011, then small-credit program "Tabigi Orta" was adopted and has been realized in 2010-2015. The draft Program was approved by the FHC of the MA RK in August 2010 and the "Fund for financial support of rural agriculture" JSC.

Within the first phase of the program the following business projects were financed:

Alakol project area

- Tailoring of national clothing. 1000,0 thousand Tenge. Established a sewing plant, selling national crafts.
- Development of ecological tourism, interior development of a guest house. Constructed and expanded a new guest house.
- Established a small plant on kumys production. Bought a small facility, refrigerating equipment etc, repaired the building; the produce is being sold.

Ural basin territory

- Realized two projects on construction of small greenhouses: in Yerkinkalinsky rural district (1 million Tenge) and the Taskalinsky rural district (3 mln Tenge); growing cucumbers and tomatoes, selling produce on the markets of Atyrau city.

Tengiz-Korgalzhyn territory

- 6 borrowers received loans for the amount of 13 940.0 thousand Tenge, for development of ecotourism, guest houses, production of souvenirs, etc.

Out of other projects initiated after 2009 and directly related to conservation of biodiversity, the most noticeable are the following:

UNDP/GEF/Kazakhstan Government Project ***"Conservation and sustainable management of flatland ecosystems".***

Flatland ecosystems of Kazakhstan occupying over 1.2 mln sq. km, include unique tpes and families of plants, numerous globally threatened species of flatland fauna, however, the steppes are the least protected types of ecosystems in Kazakhstan.

Project goal - conservation of globally significant biodiversity of the steppes of Kazakhstan, through including steppe ecosystems in the system of specially protected natural areas, as well as applying mechanisms of planning and rational use of steppe ecosystems in the basins of the Irgiz, Torgai and Zhylanshuk rivers.

Project duration: Years 2008 - 2013

Budget: total of $23.758.300, including GEF's $2.215.000, UNDP's $2.265.000, Government of Kazakhstan, NGOs and other resources - $19.278.300

Achievements:

- Established the "Buiratau" state national nature park and the "Altyn Dala" State Nature Reserve;
- Prepared rationale for expanding the Irgiz-Turgay SNP and establishment of the "Ulytau" SNNP and the Ulytau-Arganatinsk nature reserve;
- Recommendations are submitted to the Parliament of the Republic of Kazakhstan on enhancement of legislation in relation to the SPNAs, part of which were adopted in January 2012, and part of which are being discussion;
- Established a system of monitoring and knowledge management on Irgiz-Torgay-Zhylanshik steppe ecosystems, its use for landscape planning of land use is being introduced;
- Determined mechanisms for managing ecological corridors and established a corridor between the Irgiz Turgay SNP and the Altyn Dala SNP;
- Prepared annual scientific reports on the habitat and biological parameters of Saiga population on the pilot SPA areas;

- Prepared assessment of different models of financing of steppe SPAs, and enhanced potential of pilot SPAs.

*UNDP/GEF/Kazakhstan Government Project "**Planning conservation of biological diversity at the national level to ensure realization of the CBD Strategic Plan by the Republic of Kazakhstan for the years 2011-2020".***

Project goal: Integration of obligations of Kazakhstan according to the CBD into the framework programs on development and sectoral planning at the national level through updated accompanying process of planning for biological diversity and strategy development.

Project duration: Years 2012 - 2014

Budget: total $485000, including GEF - $220000, UNDP - $65000, Kazakhstan Government - $170000, NGOs - $30000.

Expected results:

- Critical analysis of planning events in the area of biological diversity and target objectives on conservation of biological diversity at the national level in compliance with the targets developed in Aichi, Japan.
- National strategy on conservation of BD is revised and fully includes new aspects of strategic CBC plans, such as activation and strengthening the process of implementing the plan into the national framework programs of development, cost assessment of services in the area of ecological systems and assistance in adaptation and ability for restoration of ecosystems.
- Creation and strengthening the national concept on mobilizing resources and mechanisms on exchange of information and providing reporting on the Convention implementation.

*Kazakhstan Government/UNDP Project on "**Development and introduction of information system on monitoring of biological diversity in pilot specially protected natural areas".***

Project goal - improvement of the system of biodiversity monitoring in the SPNAs of Kazakhstan through creation of database applying GIS technologies as basis for making economically and scientifically justified solutions in the area of managing and preserving the resources of the flora and fauna.

The ecosystems approach will serve as the basis of this work, in which types of biodiversity are considered as an essential part of the habitat. This approach will allow both the ecological potential of habitat and the specificity of dissemination of different kinds of the vegetation and animals as well as determine the degree and the nature of anthropogenic displacement and present threats for biotic existence.

Project duration: Years 2012-2014

Total budget: $ 1.533.837, including from the Government of Kazakhstan $ 1.024.527, UNDP $ 508.860.

Expected results:

- Developed and implemented information system for monitoring the situation with BD in the pilot PAs
- Increased automation of existing business processes on monitoring biodiversity of PAs
- Institutional strengthening of FHC MEWR subdivisions involved in biodiversity monitoring
- Increased capacity of FHC staff and pilot PAs on monitoring biodiversity
- Established biodiversity monitoring system, ensuring making economically and scientifically sound solutions in the area of management and conservation of biological resources

*UNDP / MEP RK Project on "**Assistance to the Republic of Kazakhstan in strengthening inter-regional cooperation to promote "green growth" and the implementation of the Astana Initiative"***

At the Sixth Ministerial Conference on Environment and Development in the Asia Pacific (MCED- 6), the participating countries adopted the Declaration on strengthening inter-regional cooperation in conducting joint activities for transition from the current conventional models of economic development towards green growth to improve prosperity and achieve more sustainable development. The Astana initiative "The Green Bridge" was proposed by Kazakhstan to promote partnership between Europe and the Asia Pacific region in the development of policies and instruments to support green investments and green technologies.

Project goal: providing institutional assistance in strengthening inter-regional cooperation between the European region and the Asia Pacific countries pursuant to the above Ministerial Declaration adopted at the MCED-6.

Project duration: Years 2012-2013

Total budget: $ 454.000, including from the Government of Kazakhstan $294.000, UNDP $160.000.

Expected results:

- Development of management structure, implementation plan and indicators to monitor progress of the implementation of the Partnership Program for the Astana Initiative;
- Determine goals and objectives of the Republic of Kazakhstan on the transition to a "green" economy, the methodology for determining "green" projects;
- A strategy for mobilizing financial resources for the implementation of "green" projects;
- Assistance in the preparation of demonstration projects of the "green" economy for financing;
- Recommendations for the inclusion of measures for shifting to low-carbon development ("NUR") for the Kazakhstan's economy in sectoral and territorial development plans, the definition of indicators for the implementation of NUR for the Republic of Kazakhstan;
- Recommendations to the Government of Kazakhstan on financial and economic methods of stimulating subsurface users to reduce greenhouse gas emissions;
- Trainings and seminars; information courses and education programs for NGOs, businesses and the public to promote the principles of "green" economy in Kazakhstan.

All of the above completed and ongoing projects by UNDP are carried out in close cooperation with the state executive bodies - the FHC, MEWR of the RK, other governmental and nongovernmental organizations, depending on the profile of the project; they also involved in the Ministry of Economic Development and Trade of the Republic of Kazakhstan, the Ministry of Industry and New Technologies, the Ministry of Agriculture, the Samruk- Kazyna NWF JSC, "Union "Atameken" NEPK, "KazLesproekt" LLP, ACBK (Kazakhstan Association of biodiversity conservation" RPF and others. The realization of individual tasks attracted specialized research and consulting organizations. With the help of the project management committees (PMC) regular interaction is established between all participants, and project objectives are included in organizational work plans.

In 2009-2013, the following projects were initiated or implemented with a significant indirect impact on biodiversity:

Capacity building for sustainable development through integration of climate change issues into the strategic planning in the Republic of Kazakhstan. (MEP, UNDP)

Project goal - development of the National Strategy on sustainable development with involvement of stakeholders, its adoption and effective realization.

Implementation period - Years 2009-2010.

Results:

- Prepared a number of strategic documents for distribution among negotiating groups and the Conference of Parties at the national and international negotiating meetings.
- Submitted recommendations to the state Strategy and Programs for development sections on National Sustainable Development.
- Prepared Roadmap for measures to implement obligations of the Kyoto Protocol after 2012.
- Established an expert Secretariat to facilitate preparations for the Conference of the Parties.

International Project on increasing capacity at the national and international levels to develop and implement a unified approach and strategies to combat land degradation in the five Central Asian countries. (MEWR, MOA, UNDP).

Project goal - enhancing the potential in fighting degradation of land resources within the functions of the National framework program.

Implementation period - Years 2009 – 2013.

As a result of completing the project proposals have to be developed on enhancing the principles of sustainable use of land resources in the national policy and legislation; increasing interaction between the state authorities and land users through development of staff resources.

Strengthening accountable governance to accelerate the achievement of the Millennium Development Goals in Kazakhstan. (UNDP; Administration of the President of Kazakhstan; MEDT of the Republic of Kazakhstan; Working Group on evaluating the performance of state authorities).

Project goal - supporting the initiative of the Government of Kazakhstan on strengthening accountability of state authorities, increasing effectiveness of their work, creating favorable conditions for public participation in the assessment of work of the state bodies.

Implementation period - Years 2011-2015.

As a result conditions must be created for evaluation of the work of state authorities by the public and increasing its awareness about the reforms in the system of public administration.

Sustainable pasture management for development of rural areas and preserving the integrity of the environment. (GEF/UNDP, the Ministry of Agriculture of the Republic of Kazakhstan, MEWR of the Republic of Kazakhstan).

Project goal - revival of mobile pasture management in a pilot area near Almaty.

Implementation period- Years 2009-2015.

As a result favorable environment should be created for sustainable rangeland management at national and local levels, strengthened the capacity of local authorities, rural organizations and farmers on the application of integrated approaches to sustainable management of pasture resources and improved local infrastructure that supports the development of mobile livestock.

In general, the UNDP support in 2009-2013 played a very significant role in the promotion of international approaches and experiences in biodiversity conservation, new initiatives, organization of joint work among different agencies, in the demonstration of best practices, etc., which further contributed to the inclusion of the relevant areas of activities in government programs with appropriate public financing.

There is more significant interaction of the state bodies with the non-governmental sector. NGOs have performed and continue performing a number of independent projects, as well as participate in joint activities with the state. For example, the work of the ACBK NGO (Kazakhstan's partner of BirdLife International) on Saiga and other endangered species (sociable lapwing, white-headed duck, etc.), on conservation of steppe ecosystems and the like, with regular interaction with the FHC. Also, for instance, "Kazohotrybolovsoyuz" constantly cooperates with government agencies, and in 2013 the Republican Association of hunting entities " Kansonar" started its activities.

The activities of these two main hunting associations largely determine biodiversity conservation in the country. Several non-profit organizations - "Green Salvation" , "Avalon", "Ecomuseum" and many others work in the area of environmental protection (including organizing public environmental expertise), ecotourism, perform individual projects on biodiversity, etc. Representatives of non-governmental organizations are involved in the Public Councils under the MEWR and the FHC established in 2012-2013. At the same time, the working mechanisms of Public Councils are not yet streamlined, also there are some gaps in the law on public participation in decision-making on subsoil use, on participation in the assessment of the environmental impact, etc. , that is on the implementation of the Aarhus Convention

In general, as 5 years ago, yet there is weak involvement of the civil society, connected to, first, weak public awareness of biodiversity issues, leading to ecological nihilism of the population and reduces the efficiency of activities of both the state bodies and public associations. Second, there is a lack of a body that would coordinate the efforts of the government and the civil society for biodiversity conservation. The existing situation leads to differences in priorities, fragmented actions and dissipation of resources between the state and public organizations for the conservation and use of biodiversity. Weak interactions within NGOs and lack of consolidation of public associations prevents them from more active influence on the processes of implementing the CBD in Kazakhstan.

2.5. Scientific research on biodiversity challenge

The scientific potential of Kazakhstan in the field of biodiversity is represented both by public and non-governmental sectors. The system of the Ministry of Education and Science of the Republic of Kazakhstan includes the "Institute of Zoology", the "Institute of Botany and Phyto-introduction", the "Institute of Soil Science", the "Institute of Microbiology", and others. There is a number of specialized units and laboratories in major universities. A number of research and project organizations operates in the MEWR, the MA, the Ministry of Health; finally, there are dozens of specialized consulting organizations, or those transformed into commercial ones former state institutions - the "Institute of Geography" LLP, the "Research and Production Center for Fisheries", the "Kazecoproject", the "Kazakh Agency of Applied Ecology", the "Centre for Remote Zoning and GIS "Terra", the "Kazecology" and others. We should also name non-profit organizations - the ACBK, Ecomuseum, etc. The total capacity of all these groups of organizations is quite high, although there is a number of serious problems within.

Financing of scientific research and development of recommendations on use and conservation of biological resources is done at the expense of the state procurement as well as grants from abroad. At the same time, government expenditure exceeds external funds by tens, if not hundreds, of times.

Applied research is regularly funded by the plans of the MEWR of the Republic of Kazakhstan. Thus, in recent years the MEWR through public procurement process realized over 40 projects, including:

- "Science-based definition of environmental indicators in the Republic of Kazakhstan"
- "Ecological zoning of the Republic of Kazakhstan"
- "Ecological assessment of biodiversity in the Northern Kazakhstan and development of activities on its optimization".
- "Researching the ecological state of the border regions of Kazakhstan to address issues of transboundary nature."
- "Development of a system of environmental use regulation of the level of water and land resources in Kazakhstan."
- "Development of evaluation methods and measures to combat desertification in the core areas of environmental crisis."
- "Compile and prepare for publication a set of specialized ecological maps of the Republic of Kazakhstan, in the scale 1:1 000 000."
- "The development of measures to preserve the unique living heritage and restoration of natural ecosystems of West Kazakhstan region".
- "The scientific rationale of the creation of an integrated monitoring system of the Caspian Sea and the coastal area (Kazakhstan sector)."
- "The scientific rationale for the inclusion of the protected area of Kazakhstan's Altai into the UNESCO World National Heritage list" and others.

The plans of the Ministry of Education and Science of the Republic of Kazakhstan include comparatively small share on the themes in the area of biodiversity, nonetheless, a number of research works is being developed successfully in this direction. Let us demonstrate the realization of work on biodiversity in the example of the **Institute of Botany and Phytointroduction of the MES RK**. In 2010-2013 it led activities on the themes:

- ПФИ 2010 - "Replenishment, study and maintaining collections of plants, animals and microorganisms and unique genetic banks for conservation of biodiversity of Kazakhstan" (4 projects with established databases),
- "Enrichment of species diversity of cultivated plants with new representatives of the world flora and development of recommendations for the conservation of in-situ and ex-situ, the rational use of priority components of species diversity of plants in Kazakhstan" (2009-2011).

Ten projects are under implementation with the grant financing of the Ministry of Education and Science of the Republic of Kazakhstan.

- "Key botanical territories of Kazakhstan - basis of monitoring the state of vegetation (on example of near Northern Tian Shian Phytogeographical subprovince)"
- "Regularities of sustainability of plant introducers in a time of global climate change."
- "The main regularities of functions of flowers and ornamental plants of indoor and outdoor soil for commercialization in the South-East of Kazakhstan."
- "Revealing structural patterns of populations of rare endemic plant species of Shu-Ile Mountains (Northern Tien Shan) to ensure the safety of their gene pool."
- "The restoration potential of exploited thickets of Sistanche salsa (Sistanche salsa (S.A. Mey.) G. Beck) in Southern Balkhash."
- "Screening of wild cereals of Kazakhstan for resistance to pathogenic fungi as a scientific basis for selective breeding."
- "Screening of natural flora of Kazakhstan for the presence of plants with medicinal properties and the development of proposals to optimize their use."
- "Food types of onions in the natural flora of Kazakhstan, measures for their rational use and conservation."

- "The antioxidant activity of fruit varieties of the Sivers apple and ordinary apricot to contribute to food security of Kazakhstan."
- "Genetic modification of apricot culture in Almaty region: 1. Staging ordinary apricot crop variety testing from natural populations of Kazakhstan, fructification of which is resistant to returning spring colds."

Projects implemented together with other Institutes:

- "Creation and conservation of herbarium collection of rare species (vascular plants, algae and fungi), as the scientific basis for the study of the features of botanical diversity of Kazakhstan."
- "Ensuring the conservation and development of living plant collection funds of the Main Botanical Garden."
- "Ensuring the conservation and development of living plant collection funds of Zhezkazgan botanical garden."
- "Ensuring the conservation and development of living plant collection funds of Ili botanical garden."
- "The study of the genetic diversity of wild apple of Kazakhstan."
- "Inventory of mycobiota and algoflora of Altai Mountains" (jointly with Altai State University (Russia)).

In 2013 the Institute launched its Scientific technical program within the ПЦФ:

- "The botanical diversity of wild relatives of cultivated plants of Kazakhstan as a source of enrichment and gene pool conservation of agro-biodiversity of the Food Program" (2013-2015).

Not fewer themes are performed for the services to and grants from the MES by other institutions. The problem is the lack of funds for realization of a number of themes, as in most cases in case of their approval the requested amounts are reduced by 2-3 times, while maintaining the objectives, which naturally leads to their incomplete realization. Obviously, the practice of approval is therefore flawed. Lack of funding for themes leads to low pay to scientific researchers, which prevents the influx of young specialists into science field. A common problem of all institutions is the aging staff as a whole generation of scientists quit in 1990-2005, when the youth did not go into science at all. As a result, a relatively normal age structure was developed in consulting and other non-governmental research organizations, while the fundamental science suffers from a situation close a crisis, as significant share of staff of the institutions is represented by people over 60 years.

2.6. The main challenges in the implementation of the Convention on Biodiversity

The main challenges, or group of barriers preventing the full implementation of the CBD provisions in Kazakhstan in the years 2010-2013 persisted:

Imperfection of the system for biodiversity management

- Gaps in the law *(partly eliminated)* and its improper execution
- Lack of approved National Strategy and Action Plan on biodiversity (NSAPBD), which leads to under developed public policy and weakening of state influence on the processes connected with the use and protection of wildlife and agro-biodiversity *(strategy development is almost completed*).
- Lack of clear division of powers between the state bodies creates stalemate situations in some cases related to fulfillment of requirements of various departments by subsurface users.

- Lack of existing inventory and biodiversity monitoring system *(currently their establishment and implementation is underway)*.
- The weak influence of public authorities responsible for the preservation of biodiversity on the decisions taken by the Government, particularly in relation to fisheries and management of PAs. Raising the status of the authorities responsible for these areas would allow more intensive promotion of these interests at the governmental level.
- Low level of training of managerial and scientific personnel, which ultimately leads to a low quality level of environmentally significant decision-making at the state level.
- The reluctance of some officials to perform duties for the implementation of the CBD, which leads to the erosion of trust in public authorities by the performers and subsurface users.

Lack of interest of businesses in the realization of CBD

- Gaps in the legislation on attraction of private capital to the process of reproduction and protection of biological diversity; high taxation rates prevent businesses from developing activities in this area.
- Corruption among officials is a nationwide problem, leading to the erosion of trust in the state, and not only in this area; leads to inhibition of processes on implementing the protection, restoration and use of biological diversity.

Weak participation of the civil society in preserving biodiversity

- Weak informing of the civil society on the issues of biodiversity
- Lack of a body coordinating efforts of the state and the civil society on preserving biodiversity.
- Weak interaction among NGOs and lack of consolidation of public associations.

Part III. The results of implementing the targets for conservation and sustainable use of biodiversity for 2020, adopted in Aichi, and contribution to the achievement of relevant targets for 2015 Millennium Development Goals

In 2010, at the Tenth Meeting of the Parties to the CBD in Nagoya Prefecture, Japan, the parties adopted the document on "Strategic Plan for the conservation and sustainable use of biodiversity for 2011-2020 and targets for conservation and sustainable use of biodiversity adopted in Aichi." It was intended to translate the principles proclaimed by the Convention into practical actions of the participating countries.

The Strategic Plan has identified five strategic objectives:

a) the adoption of measures to address the underlying causes of biodiversity loss, including production and consumption patterns, providing mainstreaming biodiversity themes across government and society activities through information, education and awareness, appropriate incentive measures, and institutional changes;

b) Taking urgent action to reduce the direct pressures on biodiversity;

c) Continuing direct measures to protect and, if necessary, restore biodiversity and ecosystem services;

d) Efforts to ensure the permanence of ecosystem services and access to these services, especially for the poor who depend on them the most direct way;

e) Enhanced support mechanisms for capacity building; formation and use of knowledge and its exchange; and access to the necessary financial and other resources.

To achieve them at a meeting in Aichi 20 targets were developed to be included by the Convention Parties into the national action plans and strategies for biodiversity conservation.

Activities undertaken within the CBD contributes also to the "Millennium Development Goals", which have been formulated based on eight chapters of the UN Millennium Declaration, signed in September 2000. The eight goals are as follows:

1. Eradicate extreme poverty and hunger
2. Achieve universal primary education
3. Promote gender equality and empower women
4. Reduce child mortality
5. Improve maternal health
6. Combat HIV/AIDS, malaria and other diseases
7. Ensure environmental sustainability
8. Global partnership for development

The issues covered by the CBD corresponds with the Goal 7 - "Ensure environmental sustainability", which includes four tasks:

• Integrate the principles of sustainable development into country policies and government programs of countries; prevent the depletion of natural resources.

• Reduce biodiversity loss, achieving by 2010 a significant reduction of loss coefficient.

• By 2015, halve the proportion of people without sustainable access to safe drinking water and basic sanitation means.

• By 2020, achieve a significant improvement in the lives of at least 100 million slum dwellers.

At the same time, the first two directly correspond with the objectives of the CBD.

The first National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Kazakhstan were developed and approved in 1999 by the Ministry of Natural Resources and Environmental Protection. The conceptual framework of this document corresponds to the section "Strategy for Development of the Republic of Kazakhstan till 2030" on environmental issues, which clearly identifies priority objectives and related tasks.

Strategic objectives are considered in the context of the priority in-situ, ex-situ conservation issues, balanced use and reproduction of components of biological diversity, the country's existing conditions for the task have been evaluated. The strategy is aimed at the need to improve the regulatory framework, management structure and control over the use of biological resources and the organization of a network of protected areas.

However, this national strategy developed in 1999, was not approved by the Government as a policy document, supported by state funding and having a binding force. Many of the provisions in the National Strategy and Action Plan for the Conservation and Sustainable Use of Biodiversity in Kazakhstan are within the competences of different ministries and agencies, not subordinate to the former Ministry of Natural Resources and Environmental Protection (at present - the Ministry of Environment and Water Resources), therefore the provisions of this document were weakly integrated in the sectoral plans.

Kazakhstan is currently completing development of a new National Biodiversity Strategy, with the support from UNDP / GEF / the Government of the Republic of Kazakhstan. The strategy should be ready for approval in June 2014. The new "Strategy" and the corresponding "Action Plan" are based on the Aichi targets, and after adoption of these documents the implementation of the CBD in the country will become much more coordinated and systematic.

Since the Aichi targets have been formulated after the approval of virtually all existing state development strategies and sectoral programs, they could not be integrated into them in full. Nevertheless, over the past five years Kazakhstan has achieved significant progress in several areas of the CBD. Below are the main results of the work in accordance with the Aichi targets.

Strategic goal A.
Addressing the underlying causes of biodiversity loss

Target 1. ***By 2020, people are aware of the value of biodiversity and measures they can undertake to conserve and use it sustainably.***

Awareness of local communities and decision-makers about the need and measures for conservation of biodiversity during the years 2009-2013 increased significantly at the local level - mainly in the project areas of the GEF / UNDP / the Government of the Republic of Kazakhstan, as well as within the areas of activities under the GEF Small Grants Program. This primarily includes project areas by GEF / UNDP / Government of the Republic of Kazakhstan for "Integrated Conservation of globally significant wetlands as habitats for migratory birds: a demonstration on three areas" *(Korgalzhyn basin, lower reaches of the Ural River, Alakol Basin)*, "Saving in-situ mountain agro-biodiversity in Kazakhstan" *(Tien Shan)*, "Conservation and sustainable use of biological diversity of Kazakhstan's part of Altai- Sayan Region" *(Altai)*, "Conservation and sustainable management of steppe ecosystems" *(Central Kazakhstan)*.

In raising the awareness of decision-makers at the national level, and in advancing ideas of biodiversity conservation significant role was played by the projects on "Planning the conservation of biological diversity at the national level to support the implementation of the CBD Strategic Plan in the Republic of Kazakhstan for 2011-2020" (The Government of the RK/ UNDP/GEF), "Assisting the Republic of Kazakhstan in strengthening inter-regional cooperation to promote "green growth" and the implementation of the Astana Initiative" (UNDP / MEP RK), the International Project on capacity building at the national and international levels to develop and implement unified approach and strategies to combat land degradation in the five Central Asian countries (MEWR, MOA, UNDP), "Sustainable rangeland management for rural development and preservation of the environmental integrity" (GEF/UNDP, MOA, MEWR of the RK).

The economic valuation of biodiversity as a value of ecosystem services in Kazakhstan is still missing at the legislative level. Up until now the cost of biodiversity elements is being valued only by a single tariff of one-time compensation of loss in case of their direct destruction or devastation. Obviously, this valuation of ecosystem services allows decision makers to make more efficient, economical and fair decisions, as well as support the choice of certain actions or options. In Kazakhstan, attempts to evaluate assessment started with the PAs. It outlines the direct values (places for tourism, recreation, fishing, pastures, etc.), indirect values (preservation of water-intake basins, carbon sequestration, etc.), additional values (medicinal plants, etc.), existence value (beautiful landscapes, rare species of fauna and flora). The Karkaraly SNNP was chosen as the pilot area. The goal of the study was to determine the economic value of Karkaraly Park based on evaluation of some of its ecosystem services in monetary terms for the subsequent replication of the practice into the system of protected areas of Kazakhstan.

The valuation was performed in 2013 using the methodology developed by international financial expert Lucy Emerton under the GEF / UNDP projects. During the meetings with local stakeholders (employees of the SNNP, state agencies, representatives of guest houses and the local population) the most important ecosystem services of Karkaraly Park were identified, which later were systematized and evaluated according to the Concept of the total economic

value. These include preserves of mushrooms, hay, timber products, water protection role, binding carbon dioxide, tourism and recreation. The total annual value of ecosystem services of the SNNP amounted to 86 million 371 thousand US dollars.

The results of the economic valuation of ecosystem services of protected areas represent an information base to address a wide range of administrative tasks - determine the proportion of protected areas as part of Kazakhstan's GDP, the direction of development of protected areas, the definition of modes of nature use, financing of protected areas and the timely adoption of the necessary measures to conserve ecosystems biodiversity. Currently it is planned to carry out testing of valuation techniques and their application to other protected areas as well as their integration into the regulatory framework in Kazakhstan.

Thus, significant progress has been achieved in raising awareness, however, the issues of valuation of ecosystem services are just beginning to be developed. Clearly there is a lack of coverage of biodiversity issues and its value in the media. To improve the awareness it is necessary to include specific objectives to the state and other programs and projects for the conservation and use of biodiversity.

Target 2. ***By 2020, biodiversity values have been integrated into national and local development and poverty eradication strategies, as well as the planning processes and systems of national accounts.***

Work on methodologies for valuation of biodiversity started in 2012-2013 based on the example of one protected area so far (see above). The objective of implementing the valuation into the national and local development strategies and other relevant documents is included in the National strategy for biodiversity conservation, which is under development and must be approved by the Government in 2014.

Target 3. ***By 2020, incentives, including subsidies harmful to biodiversity are eliminated, gradually phased out or reformed in order to minimize or avoid negative impacts, and positive incentives are being develop and used for the conservation and sustainable use of biodiversity, consistently and in concord with the Convention and other relevant international obligations, taking into account national socio-economic conditions.***

A number of changes happened in the environmental law of Kazakhstan. The law of the Republic of Kazakhstan "On introducing amendments and additions to some legislative acts of the Republic of Kazakhstan on issues of forestry, wildlife and protected areas" was signed by the President of Kazakhstan on January 25, 2012. Amendments and additions were introduced to the Law of the Republic of Kazakhstan "On protection, reproduction and use of fauna", the Law of the Republic of Kazakhstan "On Specially Protected Natural Territories", the Criminal Code of the Republic of Kazakhstan, the Code of the Republic of Kazakhstan on Administrative Offences, the Land Code of the Republic of Kazakhstan, the Forest Code of the Republic of Kazakhstan, the Water Code of the Republic of Kazakhstan, the Environmental Code of the Republic of Kazakhstan, the Code of the Republic of Kazakhstan "On taxes and other obligatory payments to the budget," the Law of the Republic of Kazakhstan "On Architectural, town-planning and construction activities in the Republic of Kazakhstan", the Law of the Republic of Kazakhstan "On State Control and Supervision in the Republic of Kazakhstan". Changes were aimed at clarifying some of the provisions, with the exception of double interpretation of articles, strengthening of market mechanisms for biodiversity conservation - support of positive incentives, tightening liability for violation of environmental law, refinement and distinction of competences of public authorities at various levels, etc. Especially large-scale amendments were

made on the forestry issues. All together, the adopted amendments and additions have greatly strengthened environmental legislative framework.

However, a number of problems, especially in hunting sector, remained unresolved - namely the issues of positive incentives; it is a question of guarantees for hunters and compensation of their capital investments in the case of seizure of land of hunting users for state needs, questions of compensation for their losses in the case of illegal hunting on their territories, conflicts of interest of hunters and land users, etc.

In early 2014, additional suggestions were prepared for enhancement and harmonization of environmental legislation, which are currently undergoing approval of the relevant ministries and the Parliament of Kazakhstan. Respectively, a number of amendments are being prepared for introduction to existing bylaws and new "Rules ...", "Orders ... " etc. are being developed.

The **Strategic Plan of the MEP for 2011-2015**, in accordance with the approved concept of the "Green economy", defines the country's transition to a low-carbon development, which envisages the creation of conditions for the functioning of the carbon market quotas of greenhouse gas emissions and the formation of the principles of a "green" economy. The amendments to the Environmental Code envisage market-based mechanisms to reduce emissions and absorption of greenhouse gases, monitoring procedures and environmental ("green") investments. To realize market-based mechanisms of regulating carbon emissions the Government of the Republic of Kazakhstan and the MEWR of the Republic of Kazakhstan have adopted relevant regulations.

Positive incentives for the use of fisheries resources are realized by a long-term allocation of fishery ponds to users. Today 1791 fishery ponds (sites) are reserved for 1004 users who have signed contracts for fisheries management for the period of 10 years. Customers interested in fisheries resources, invest their own funds for the protection and reproduction of fish resources, scientific research and improvement of facilities. During the years 2006-2013 users in these sites invested over 10 billion Tenge (about $ 67,000,000).

Extensive work to create incentives in the forestry sector was conducted in the framework of the project on "Conservation of forests and increasing forest cover of the territory of the Republic" with the support of the IBRD and the GEF, with allocation of grants. As part of the project carried out a series of measures aimed at the conservation and restoration of pine forests near the Irtysh river of East Kazakhstan and Pavlodar regions and saxaul plantations of Kyzylorda region, including phytomelioration of the dried bottom of the Aral Sea. The development of Kazakhstan private forest fund should be considered a real achievement, which has established its legislative prerequisites. Even though its area is still insignificant - 0.4 thousand hectares, but it has increased over the 3 years by 4 times, showing steady growth dynamics. This kind of use of natural resources - private afforestation - is new for Kazakhstan and its development seems to be quite promising.

Companies engaged in **ecological tourism** are interested in conserving biodiversity. In order to develop ecological tourism in protected areas there is a Memorandum of Understanding between the Committee of Tourism Industry of the Ministry of Industry and New Technologies of the Republic of Kazakhstan (RK KTI MINT), the FHC, and the Kazakhstan's Tourist Association (KTA). In tourism development programs biodiversity conservation is greatly emphasized, which represents a positive incentive. At the same time, among existing negative incentive associated with PAs for tourism and recreation, we shall highlight the possibility of withdrawal of land from the PAs for the construction of tourism projects. It was created in 2008, and experience has shown that it carries serious risks for the PA system integrity of the country, especially near large cities with very high land prices. At present the possibility of changing this legal article is ongoing discussion.

Positive incentives for biodiversity conservation in **hunting sector** are based on the active inclusion in the process of hunting users in the long period of assigned land for a period of 10 to 30 years. Hunting users who care about the presence of wilderness in their farms, direct their own funds for the development of hunting farms, including the cost of maintaining rangers and expenses for biotechnical activities. In 2010-2013, in the country laid out new hunting farms plan on area of about 20.0 million hectares. In total, the country has 675 hunting farms occupying 120.0 million hectares (44.2 % of the country's area); in 2013 1801.6 million Tenge was allocated to development of hunting grounds (about $ 12,000,000). The number of hunting farms, their technical facilities and maintenance costs regularly increased over the period of 4 years. As it was mentioned above, the legislation still maintains a set of norms that dramatically complicate the financial stability and incentives for hunting estate, including game breeding, which are to be revised.

In order to ensure the implementation of obligations of the Republic of Kazakhstan arising from the Cartagena Protocol on **Biosafety**, the "National Center for Biotechnology" RSE of the Science Committee of the MES of Kazakhstan (the Coordination Center for Biological Safety) in 2010 developed a draft Law of the Republic of Kazakhstan "On state regulation of genetic engineering activities", the draft Law of the Republic of Kazakhstan "On introducing amendments and additions to some legislative acts of the Republic of Kazakhstan on the state regulation of genetic engineering activities." On the basis of analysis of international experience on the regulation and control over GMOs the draft "Concept of state regulation of circulation and control of genetically modified organisms in the Republic of Kazakhstan" has been prepared. Currently, the two draft laws are under consideration in the Majilis of the Parliament of the Republic of Kazakhstan. Discussion of these documents aiming to ensure control in the area of GMOs, including the elimination of incentives, potentially harming biodiversity, has been delayed.

Detailed questions of identifying, elimination or sharply reduction of disincentives (including subsidies), harmful to biodiversity in different sectors of the economy, as well as introduction of positive incentives are included in the National biodiversity conservation strategy that is currently being developed.

Target 4. ***By 2020, Governments, businesses and stakeholders at all levels will have implemented plans to achieve sustainable production and consumption, preventing destructive impacts of using natural resources on environmental sustainability.***

Kazakhstan has adopted the new policy of transition to a "green" economy development. The conceptual framework of the strategy for the transition to a "green" economy is comprised of: the Development Strategy of Kazakhstan until 2030; Strategic Development Plan of the Republic of Kazakhstan till 2020; the Strategy of Industrial and Innovative Development for 2003-2015; the State Program on Forced Industrial-Innovative Development for 2010-2014; the Program of "30 corporate leaders of Kazakhstan," as well as other programs promoting industrialization; President's message to the people of Kazakhstan "New Decade - New Economic Growth - New Opportunities of Kazakhstan"; the Energy and Environment Strategy; the Partnership Program for countries of Europe, Asia and the Pacific for the implementation of the Astana Initiative "Green Bridge" for 2010-2014; the "Zhasyl Damu" Sectoral Program for 2010-2014.

The main directions for addressing challenges in restoration and conservation of ecosystem sustainability envisage: creating conditions for the transition to sustainable development; climate change mitigation and adaptation; biodiversity conservation, prevention of

desertification and land degradation; rehabilitation of ecological disaster areas and contaminated areas.

To implement the new development policy of the country, the Decree of the President of the Republic of Kazakhstan dated May 30, 2013 № 577 has approved the **Concept of the Republic of Kazakhstan for the transition to a "green economy."**

The "Green Economy" is an important tool for sustainable development of the country. Transition to a "green economy" will allow Kazakhstan to achieve its goal of becoming one of the 30 most developed countries in the world. According to estimates by 2050 transformations within the "green economy" will allow further increase the GDP by 3%, create more than 500 thousand new jobs, establish new industries and services, provide generally high quality of life for the population. Overall, the level of investment needed to transition to a "green economy" will constitute about 1% of GDP annually, which is equivalent to 3-4 billion U.S. dollars per year.

The main priorities for the transition to a "green economy" are: 1) more efficient use of resources (water, land, biological, etc.) and their management; 2) modernization of existing and construction of new infrastructure; 3) increasing the welfare of the population and the quality of the environment through cost-effective ways to mitigate the pressure on the environment; 4) enhancing national security, including water security.

Among a number of priority areas the Concept specifies **"Conservation and efficient management of ecosystems."** Integrated management of natural ecosystems should be managed in accordance with the principles of sustainable development in order to increase their significance and economic potential. In terms of wildlife management it notes its uniqueness and attractiveness for the development of sustainable hunting and sport fishing, development of ecotourism, organization of photo safari, and reproduction of wild animals in captive and semi-free conditions and other areas that are, in fact, "green" investments. It underlines the potential of hunting tourism. Ecological tourism is marked as one of the most promising tourist products and as stated, the prerequisite in this regard is to maintain landscapes designed for ecotourism. But in general, the conservation and sustainable use of biodiversity as such are reflected in the Concept only generally, without going into detail.

To coordinate the realization of the Concept and control the transition to a "green economy", the Council on the transition of Kazakhstan to the "green economy" has been established under the President of Kazakhstan.

The main policy document of the country directly focused on the conservation of biodiversity is the "Zhasyl Damu" Program ("Green Development" in translation from Kazakh), approved by the Decree of the Government of the Republic of Kazakhstan on September 10, 2010 № 924, and intended for realization in 2010-2014. In order to optimize the existing policy documents the Program integrates a number of those with overlapping topics, including environmental security, development and locations of specially protected natural areas, environmental protection, increase of planted vegetation, use of wildlife, etc. Achieving the goals of the "Zhasyl Damu" Program is carried out in accordance with the Strategic Plan of the Ministry of Environment and Water Resources of the Republic of Kazakhstan for 2009-2011 and 2011-2015, and measures determined in the Environmental Code of the Republic of Kazakhstan.

The program focuses on the application of the progressive principle of "green economy", which envisages elimination of dependence between the resource use and environmental impacts of economic growth. Measures have been identified to develop international relations, scientific base of environmental protection and nature use, the system of monitoring of environment and natural resources, issues of environmental education and increasing public awareness.

The program includes a section on forestry and wildlife, and the specially protected natural areas. One of the main objectives of the society, as the Program states, is the conservation of biological diversity and the sustainable development of the country.

The actions by industries are itemized by years, indicating the responsible agencies, forms and reporting deadlines, as well as performance indicators. The program is interdisciplinary and of binding nature, and shall contribute to an integrated solution to many issues, including: greenhouse gas emissions, air pollution, environmental disaster zones, specially protected natural areas, production and consumption waste, water resources, landscaping and others.

The Program provides funding totaling 161,714.06 million Tenge (or about 1 billion 80 million US dollars at an average exchange rate for 2010-2013) for implementation, including funds from the republican and local budgets, international grants, loans and own equity of natural resource users.

Thus, the process of active implementation of ideas and plans for sustainable production and consumption is carried out at all levels; the lack of positive incentives at the local level for specific enterprises and natural resource users remains a problem. Provision of environmental sustainability at the local level is still achieved mainly by control actions, fines and sanctions.

Strategic goal B.
Reduction of direct pressures on biodiversity and promotion of sustainable use

Target 5. ***By 2020, the pace of loss of all natural habitats, including forests, is decreased at least by half and where feasible, are brought close to zero, and degradation and fragmentation are significantly reduced.***

Radical changes in many ecosystems of Kazakhstan happened more than 50 years ago after a massive plowing of the steppe lands and forest-steppe zones. Plowed grassland steppe plains reaches 90%, while plowed hummocky topography constitute up to 30 %. Dry steppes are plowed by 50-60 %, and in hummocky topography - 10-15%. The remaining steppes in these subareas (rocky and complex steppes of slopes) have been significantly transformed. Other types of landscapes, suitable for grazing, until the late 1980s suffered from rapidly growing degradation of pastures. After the collapse of the USSR and the economic collapse of the 1990s, which was accompanied by a fall in livestock and the overall reduction in agricultural production, the ecosystems began their natural restoration on neglected fields in the areas of economically inefficient farming and abandoned pastures. In the last 5 years there have been different trends in the situation of habitats. On the one hand, there continued a recovery of natural neglected fields and once degraded pastures, on the other - formerly abandoned territories were included back into the economic turnover and there was a growing local overgrazing near villages due to growth of the number of livestock. According to the data as of 2013, up to 15% of agricultural land is used inefficiently, about 125 million hectares of grassland have no water supply and are not used, over 20 million of hectares of grassland adjacent to settlements, are classified as degraded due to their irrational use.

The low productivity pastures of the desert zone are particularly vulnerable. To stop the degradation of rangelands the Committee for Land Management of the Ministry of Regional Development of the Republic of Kazakhstan in 2012-2013 conducted an inventory count of agricultural lands, including pastures on a total area of 30.6 million hectares. It was found that almost 60 % of the pastures have a problem with watering holes, which causes underutilization of rangelands, the concentration of livestock near villages and in limited areas with overgrazing in these areas and degradation of pastures and biodiversity. It was also found that on the whole

the country needs to restore, repair or construct over 9,900 water sources. Work on water supply to pastures are planned within the state program on "Agribusiness 2020", and has already started in some regions. Water supply to livestock transhumance and dispersal of livestock will reduce the load on local pastures and habitat degradation.

Other causes of degradation of desert habitats include haphazard road network, excessive regulation of river flows, illegal logging of saxaul for firewood for sale. As a result of urbanization and intensive agricultural development of foothills in the south and east of the country, strong devastation of the natural vegetation remains. In the river valleys of the desert zone - Ili, Syrdarya, Shu, Talas - due to limitation of river flow highly productive floodplain communities are almost completely degraded. In connection to violation of the hydrological regime the floodplain forests in the north-western Kazakhstan are also degraded. Riparian forests that grow in narrow strips along rivers are subject to strong anthropogenic pressure, which remains unchanged, preventing their natural regeneration. The forests of the forest-steppe and steppe zones also remain significantly depressed due to violation of the hydrological regime, occasional fires, illegal logging, etc. Due to threat of increasing the water intake from the Ili river in its upper flow in China for irrigation, there is a danger of sharp decrease in water level and degradation of lake ecosystems of Balkhash and the Ili river valley; the same problem remains for transboundary rivers Irtysh and Syrdarya with a steady decline of the annual inflow of 2-3%. The increasing pace of works on building roads, pipelines, power lines is having a great impact on the fauna. The area devoted to mining operations is steadily growing, having increased during 2008 to 2012 by 14% and reached 910 thousand hectares. In the last 5 years the areas for oil and gas extraction, development of uranium ores, etc. have soared in western Kazakhstan, eastern Caspian Sea region, the Betpakdala desert etc.

The use of existing resource model of economic development leads to inefficient economic development and constantly rising pressure on ecosystems.

Positive impact and reduced pace of degradation (excluding the natural recovery of abandoned arable land and the creation of protected areas) have been made possible in a number of places at the local level in livestock dispersal from villages, as well as in the other two directions - the restoration of the Aral Sea and increasing forest cover.

Built in 2005 the Kokaral dam, which divided the Smaller Aral from the main aquatic area, allowed to stabilize and raise the level of this reservoir, which is now separate, and reduce its salinity. As a result, fish came back to the Smaller Aral (besides flounder introduced to it) leading to revival of fishing. The territory of the Smaller Aral Sea and delta lakes of Syrdarya" in 2012 were added to the list of the Ramsar sites. The economic situation in the region has somewhat improved, as well as the local biodiversity situation, but in general the Aral Sea area suffers from continuing desertification and threats to biodiversity. They are aggravated with the development of oil deposits of Kumkol.

Positive changes took place in forests fund. The total area of the state forest fund of the republic increased from 2008 to 2013 by 1 million 10.4 thousand hectares (3.5%). The project "Conservation of Forest Protection and Reforestation of the territory of the Republic" ensured implementation of a set of measures aimed at the preservation and reforestation of pine forests near the Irtysh river in the East Kazakhstan and Pavlodar regions, as well as saxaul plantations in the Kyzylorda region, including phytomelioration on the dried bottom of the Aral Sea. In the pine forests of the nature reserves "Semey ormany" and "Yertis ormany" works to restore forests and improve their condition have been carried out on the area of 20 200 ha; planting of saxaul was conducted throughout the area of 70,000 ha on the dried bottom of the Aral Sea; 20 demonstration plots of about 200 hectares each in area were created to restore saxaul plantations and adjacent rangelands involving the local population. In the whole the number of forest fires has been dramatically reduced throughout the country.

In general, despite the successes at the local and at the industry (forest habitats) levels, in the whole habitats across the country continue to experience growing pressure with increasing degradation at sites of exploration of mineral resources. The lack of a unified system for monitoring of habitats impedes adequate assessment of the degree and pace of their degradation or restoration. All this requires formation of a unified state policy on monitoring and conservation of ecosystems and effective control over its actual execution.

Target 6. ***By 2020, management and harvesting of all fish and invertebrate stocks and aquatic plants are done sustainably, legally and with application of ecosystem based approaches to avoid excessive exploitation of fish resources, plans and measures for restoration of all depleted species have been introduced, and fish industry has no significant adverse impacts on endangered species and vulnerable ecosystems and the impacts of fisheries on stocks, species and ecosystems are within safe ecological limits.***

The regulation of the use of fish and aquatic invertebrates is overseen by the Fisheries Committee of the MEWR of the Republic of Kazakhstan and its 8 territorial on-site inspections organized near basins of major rivers and reservoirs. Regulatory issues in the Caspian region are discussed annually with other near-Caspian states in the Commission on Aquatic Bioresources of the Caspian Sea.

Regulating the use of fisheries resources since 2006 has been carried out by long-term allocation of fishery ponds to the users. Today 1791 fishery ponds (sites) is reserved for 1004 users who have signed 10-year contracts for fisheries management. Customers under agreements to secure fishery ponds, are investing their own funds for the protection and reproduction of fish resources, scientific research and strengthening the technical facilities. During 2010-2013, users in these directions invested more than 3 billion 500 million Tenge (over $23 440 000).

The work is constantly carried out to prevent, detect and suppress the facts of illegal fishing, which is observed in all regions and places, especially in the Caspian Sea (sturgeons), representing organized crime.

Every year scientific research works are carried out at reservoirs and (or) areas of international, national and local importance within the budget program 039 on "Conservation and reproduction of fish resources and other aquatic animals." Biological underpinnings determine maximum allowable level of withdrawing fish resources, provide recommendations on the order and management of fisheries, its optimization, etc., including recommendations for restrictions and bans.

On the basis of these biological studies the Government of the Republic of Kazakhstan annually prepares Resolutions on approving the limits for catching fish and other aquatic animals in fish ponds. This ensures sustainable use of marine biological resources (including aquatic invertebrates, namely Artemia salina) in waters subject to natural and anthropogenic factors.

The "Agribusiness 2020" Program for the development of agro-industrial complex in the Republic of Kazakhstan for 2013-2020 envisages measures of state support for the development of marketable fish farming. In 2013, 8 regulatory and procedural acts of marketable fish farming were developed, creating a legal framework for this kind of business.

In order to strengthen the fight against violations of environmental legislation, measures are undertaken to enhance the laws and regulations; a number of amendments were made in January 2012, another number of amendments is being discussed at the moment. Relevant bylaws are being prepared, as especially the regulatory framework for fisheries still has the largest number of gaps.

The full implementation of this Target is impeded by lack of effectiveness of local control over the observance of quotas and use of the fisheries and other living aquatic resources, as well as not yet fully streamlined legal regulatory framework.

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

Problems caused by agriculture for biodiversity are mainly associated with the destruction of habitat – pastures degradation, wind and water erosion, dehumidification of arable land, pollution by pesticides and herbicides. Thus, due to the lack of proper management in the Northern and Central Kazakhstan, 5.6 million hectares of arable land suffer from water erosion, and crop yields are reduced by 20-30%; in 9 out of 14 regions of Kazakhstan, the degradation of agricultural land, including pastures, equals 30-50% and higher. Over 90% of arable soil of the republic is proven to suffer from soil salinization, water and wind erosion, reduction of mould, re-salinization in the process of water discharge after irrigation. The problems of irrational use of land in livestock and pasture grazing are now compounded with numerous small agro-industrial and livestock entities, without sufficient resources to adequately manage the territories.

Currently, there is no consistent approach to work that directly links management of agricultural areas and preserving biodiversity. The activities to restore damaged land and pastures are in the process (*see in Target 5*), and are primarily focused on reducing the rate of desertification and improving the productivity of livestock and crop production. The "Concept of transition of the Republic of Kazakhstan to "green economy", approved on 30 May 2013, provides for an increase in labor productivity in agriculture by 2020 - by 3 times, with ecosystems pressure reduction, limited use of pesticides and herbicides etc., and improvement of land resources management system with a view to preserving the environment.

Commercial afforestation in Kazakhstan is realized on a very small scale, industrial logging in natural forests is prohibited, and thus, almost all forests are managed in a way to ensure the biodiversity conservation. The challenge is the quality of the governance and preservation of forests as such. Strengthening of forest management system at the national and local levels, the fight against illegal logging, fires; reforestation, etc. are conducted within the current intersectoral program "Zhasyl Damu" Program with the support of international projects, the matters of conservation and restoration of forests are included in the Concept of development of "green economy" (*see Target 5*).

Aquaculture is gradually developing in small impoundments and, currently there is no direct significant impact on the biodiversity.

The current interdisciplinary program "Zhasyl Damu" does not include issues of biodiversity conservation in development programs and agricultural management, neither it has a direct connection of biodiversity with the forestry and aquaculture. The need to integrate biodiversity management plans in these sectors will be reflected in the forthcoming national strategy for biodiversity conservation.

Target 8. ***By 2020, pollution of the environment, including from excess organic matters discharge will be brought to levels at which there will be no harm to ecosystem functioning and biodiversity.***

The issue of environmental contamination is escalating and poses serious threat at the local level. This happens both due to a lack of sanitation facilities and control, and insufficient strictness of Kazakhstan's standards on pollutant emissions. Thus, the current emissions by thermal power plants exceed emissions limits for particulate matter adopted in Europe by over 10 times, nitrogen oxides - by more than 20 %, sulfur oxides by over 2.5 times. The concept of transition to a "green economy" envisages an indicator of the contamination control, which

specifies emission reductions of sulfur oxides and nitrogen into the environment to the European level by 2030. In the period 2009-2014 the "Zhasyl Damu" program sets to reduce pollutants emission at least by 5.9%, the level of pollutants discharged – not less than 3.5 %.

According to statistics from 2009 to 2012 there was decrease in: the volume of untreated sewage discharged into water bodies - by 7.6%, and their share in the total volume of waste water – by 12.9%; emissions of sulfur dioxide into the atmosphere - by 1.3%, dust - by 7.1%, lead - by 29.3%, mercury - by 33.3%, arsenic - by 46.2%, dichloromethane – by 67.1 %.

During the same four years, from 2009 to 2012, there was increase in: emissions of nitrogen oxides - by 20.7%, ammonia - by 29.4%, non-methane volatile organic compounds - by 33%, hydrocarbons – by 30.7%, carbon monoxide – by 3.1%, cadmium - by 168.5%, toluene – by 50.2%, benzapyrene – by 6.9%.

The total volume of pesticides during the 4 years has been decreased by 5.2 %, while the introduction of insecticides was increased by 16.5%, plant growth regulators - 4 times, while reducing the use of rodenticides by 55% and by 2.1% of herbicides. However, taking into account the reduction of the total cultivated area by 40%, the load on the lands used was not decreased, but increased. According to biogenic of the Irtysh river, the content of phosphorus in the water at two points was dropped by 40-85%, one was increased nearly 5 times, the nitrate content was decreased by 13-83%; phosphorus content in the Caspian Sea remains stable or decreases, nitrate content increased 2 times in summer, and 22 times in spring.

Thus, the trends in various kinds of contaminants are quite different. Under the existing raw economy orientation and intensive agriculture, the goal towards contamination control is very challenging, but the increase in the state's efforts in this direction and the inclusion of these issues in the state program gives hope to change the situation for the better by 2020.

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.

The challenge of invasive alien species originated in the country long time ago, but it was not considered as an important issue. The analysis conducted in 2012 showed that Kazakhstan to varying degrees has common potentially dangerous for natural biodiversity 26 species of fish, 1 species of birds, 5 species of mammals, several species of invertebrates, and the high number of deliberately or accidentally introduced species of plants. There are no special tasks or programs for their control and management measures, except for attempts to count the number of individual species.

Specific control is performed only for pests and diseases in agriculture: about 50 species of polyphagous and over 100 kinds of specialized pests, over 70 kinds of diseases, 300 weed species, 10 species of quarantine objects, damaging agricultural production. Phytosanitary monitoring and phytosanitary measures against especially dangerous pests and quarantine objects are carried out with support of the budget, government programs "Plant Protection" and "Plant quarantine".

To prevent the introduction and spread of quarantine pests, the phytosanitary risk assessment was conducted for 31 species of pests, one nematode species, 11 kinds of diseases, 8 weed species using computer technologies of European and Mediterranean Plant Protection Organization (EPPO). To develop strategies to protect biogeographic zones of countries – members of the Customs Union, the penetration probability predictors has been developed, the acclimatization probability, the potential economic harmfulness of 13 species of quarantine pests

for the territory of Kazakhstan. The information is exchanged among research institutions of the Customs Union in all directions in the field of plant quarantine.

Outside agriculture, monitoring and regulation of the number of invasive alien species should be included in the national strategy for biodiversity conservation and the relevant sectorial programs.

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.***

Not applicable to Kazakhstan

Strategic Goal C: To improve the status of biodiversity by safeguarding ecosystems, species and genetic diversity

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 landscapes and seascapes.***

To achieve the real goals on biodiversity preservation under increasing anthropogenic pressure, it is necessary to form a representative system of protected areas (PA) providing them with connectivity when protected cores (landscape protection areas, national parks, reserves) are interconnected with less strict protection areas (wildlife refuges, protected areas), as well as units of the ecological network – ecological corridors , forests, water protection zones and stripes and others in more or less protected natural areas. From 2010 to present, the development of new and expansion of existing protected areas are under the "Zhasyl damu" Program for 2010-2014, whereby 13 new to be created and 7 PA to be expanded for this period. The goal for Kazakhstan in the CBD Convention framework, the target was to expand the PA up to 8.5% of the State territory ensuring protection of vital ecosystems.

By the end of 2013 the Country's PA system includes 10 state reserves, 12 national natural parks, 5 state natural reserves, 50 state natural protected areas; 26 monuments of nature; 5 state botanical gardens; 5 state reserves. Out of PA types aimed conserving in-situ biodiversity, the following have the status of a legal entity (i.e., its own administration, security staff, etc.): the reserves, national parks and protected areas.

From 2009 to 2013 the territory of PA institutions increased by 1 million 16,6 thousand hectares, two new national parks and state natural reserves appeared, a number of national parks expanded. A total area of all 108 PAs of republican (national) value is 23,290,471 hectares, which is 8.6 % of the country. However, among them only 27 PAs (not counting the botanical gardens) have the status of a legal entity with a total area of 6,272,766 hectares, or 2.3 % of the country that still is not enough. Whereupon there is a good positive trend - in 2009, the area of these categories of PA was 3,769.1 thousand hectares, or 1.4 % of the entire territory of the state, that is for 4 years it increased by 66.5 %.

At this stage, Kazakhstan PAs' placement is hard to qualify as "ecological network". In addition, the regional ecological networks in Zailiyskiy Alatau, Zhongarskiy Alatau and the Altai region are being formed. With the creation of the "Altyn Dala" State Nature Reserve (SNR) in 2012, the formation of the real ecological network in the arid steppes of Central Kazakhstan has

been initiated, with working - for the first time in the country – mechanisms for creating ecological corridors between abovementioned SNR and Irgiz Turgay SNR. The units of ecological networks on the international level are also being formed – the Western Tien Shan and Altai- Sayan ecological regions. Started work and developing approaches should be pursued by all natural complexes of Kazakhstan - mountain regions, forest-steppe, steppe, deserts, semi-deserts , coastal and aquatic ecosystems.

The PAs' inadequate conservation of the species diversity of mammals, for which protection PA formation is necessary with the legal status in different types of deserts, especially in the west of the country, including Ustyurt.

It shall be noted that to strengthen the system of protected areas in the desert zone a special project of the UNDP/GEF/Government started in late 2013. Over the past 5 years, the GEF/UNDP/Government of the Republic of Kazakhstan have been playing a huge role in the development of the PA system, enhancing their capabilities and management with projects: "Integrated conservation of globally significant wetlands as waterfowl habitat", "Conservation and sustainable management of steppe ecosystems", "*In-situ* conservation of mountain agro-biodiversity in Kazakhstan", "Conservation and sustainable use of Altai-Sayan ecoregion biodiversity".

There is a growing role of PAs allowing limited household use of the part of their territories, harmonized with the conservation of biodiversity goals, by the model of biosphere reserves (in the UNESCO terminology). These are state nature reserves and state national (or regional) parks. The concept of "biosphere reserve", as such, does not exist in the Kazakhstan legislation. Nevertheless, the two territories were listed as UNESCO biosphere reserves in 2012-2013, which are state natural reserves "Korgalzinskiy and "Alakolskiy", and the third nominated territory is the state nature reserve "Akzhaiyk", is under consideration.

To ensure the conservation of wetlands in the country within the competence of Ministry of Environment and Water Resources (MEWR), the Order of the Minister of Environment of the Republic of Kazakhstan approved the lists of wetlands of international and national importance on September 6, 2013. As wetland of international importance, they include all 10 Kazakhstan Ramsar territories with total area of 3,281,398 hectares and 44 territories as territories of the republican (national) value, with the total area of 1,773,408 hectares. All these 54 lands are key ornithological territories of International Bird Area (IBA), confirmed by BirdLife International. Thus, the state has committed itself to take measures to conserve them, therefore, increasing the network connections between the protected areas.

Currently, on a scientific basis, and taking into account the principles of representativeness and coherence, a perspective scheme of development of PAs and other sustainably managed territories is being developed until 2030, which will be included in the government program.

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.***

Among the globally endangered ones (CR, EN, VU, NT categories) in the flora of Kazakhstan are 15 species, including 5 Critically endangered (*Berberis karkaralensis, Calligonum triste, Lonicera karataviensis, Populus berkarensis, Sibiraea tianschanika*), 8 endangered and 2 vulnerable.

The list of rare and endangered to extinct plant species at the national level approved in 2006, contains 387 species of plants. Practically, conservation of rare plant species occurs only

at PA, there are no special measures undertaken in other areas. The exceptions are Sivers apple and ordinary apricot; work to preserve them was performed not only at PA, but also in the adjacent areas in 2006-2012 under the UNDP/GEF project "*In-situ* conservation of mountain agro-biodiversity in Kazakhstan". As a result, the threat of these two species slightly decreased, especially due to the inclusion of their growth areas in the protected areas. Separate areas of ranges (with varying completeness of coverage) of all 5 critically endangered species (CR) are also conserved in different PAs.

The following rare and endangered species were included in the national list in 2006 (since then the list was not updated): mammals – 40, birds – 57, reptiles - 10, amphibians – 3, fish - 18, annelids – 2, shellfish - 6, crustaceans -1, arachnids – 2, and insects - 85 species. Out of CR, EN, VU, NT categories of globally threatened species, 78 are met in Kazakhstan. From the CR category 12 species are recorded, including six species of fish (*Acipenser gueldenstaedtii* - Russian Sturgeon, Acipenser nudiventris - Ship Sturgeon, Acipenser persicus - Persian Sturgeon, Acipenser stellatus - Stellate Sturgeon, Huso huso - Beluga, Pseudoscaphirhynchus fedtschenkoi - Syr-darya Shovel-nose Sturgeon), 3 species of birds (Leucogeranus leucogeranus - Siberian Crane, Numenius tenuirostris - Slender-billed Curlew, Vanellus gregarius - Sociable Lapwing), 2 species of mammals (Mustela lutreola - European Mink, Saiga tatarica - Mongolian Saiga), and one species of shellfish (Dreissena caspia).

We shall note that the globally endangered amphibian species *Ranodon sibiricus* (Semirechensk Salamander, EN), Sandpiper Plover *Vanellus gregarius* (Sociable Lapwing, CR) and saiga antelope Saiga tatarica (Mongolian Saiga, CR) are inhabitants of Kazakhstan and make up to 90% of the world population, which imposes special responsibility for their conservation upon the country.

The main threat for the sturgeon is illegal fishing, which is constantly being fought against. For restocking of rare species in the Caspian Sea fish farming and release the fry is carried out there, but the degree of fry and anti-poaching measures are still not sufficient to eliminate the danger of extinctions for the species. In the Syrdarya and Ili the threat of full extinction of Syrdarya shovelnose (*Pseudoscaphirhynchus fedtschenkoi*) and spike (*Acipenser nudiventris*) persists.

Out of three critically endangered bird species in Kazakhstan, sociable plover is the only one nesting, which population monitoring showed growth and number stabilization of the species in the last 5 years, the threat to the existence of species is dramatically reduced. There is still a threat to population of Saker Falcon (*Falco cherrug*), which number dropped drastically due to illegal trapping in south-east of the country in the late 1990s, and in the west - in 2005-2009. To preserve it, a special program is necessary, including the possible reintroduction.

Kazakhstan has reached obvious success in restoring saiga population, which was decreasing from more than a million heads in the early 1990s to nearly 30,000 in 2002. The main cause - illegal hunting for horns to export to China. Hunting for Saiga has fully been prohibited for 15 years, the ban was extended until 2020. Since 2003, the state takes increasing efforts to save the species, financing special mobile units, and collaborating with hunting grounds users, scientific and public organizations. Contribution to the conservation of the species was made by GEF/UNDP project "Conservation and sustainable use of steppe ecosystems", primarily through participation in the expansion of the PA network ("Altyn Dala" new reserve). For 4 years, the total number of species has grown by more than 2 times, up to 187 thousand heads; however, population of Ustiurt saiga is still extremely endangered.

There are successful efforts for preservation of nationally endangered wide Bactrian deer (*Cervus elaphus bactrianus*), Asiatic wild ass (*Equus hemionus*), goitred gazelle (*Gazella subgutturosa*), mountain sheep, or argali (*Ovis ammon ssp*., complex of subspecies), whose numbers are also growing steadily at different pace due to quite efficient anti-poaching (for the first two - reintroduction), under the state program for the conservation of rare ungulates.

The issues of conservation of rare species are included in the "Zhasyl Damu" Program with indicative figures for several species, as well as mentioned in the Concept of transition to "green economy". For certain species, the memoranda under the Bonn Convention were signed; several national Action Plans (Single Species Action Plan) were approved. The issues of conservation of species (including the development of these plans) was supported in a number of GEF/UNDP projects (the same as those in Target 11). The control of import/export of rare species is conducted in accordance with the CITES provisions.

The regular monitoring of rare species is currently limited to PAs, vertebrates are partly accounted in hunting sector, and only ungulates and sturgeon are accounted for in the framework of special programs. For other types of plants and animals (notably their small part) an information collection is performed under the individual projects framework with no monitoring system. Without such a system, it is impossible to fill and efficiently use the establishing State system of natural registries: fish, forest; registry for specially protected areas and wildlife.

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.***

In Kazakhstan, there are concentrated unique genetic resources of agricultural biodiversity (ADB) of global significance. According to 2013 data, they include 226 species of wild relatives of cultivated plants, determining the genetic potential of 24 crops. worldwide recognition was received by the fruit ADB, first of all, the wild apple (Sivers apple – Malus sieversii), Niedzwetzcki apple – Maus niedzwetzkyana), and regular apricot (Armeniaca vulgaris). Wild apple genes are present in almost all modern effective commercial varieties of this crop.

Also very promising in Kazakhstan are genetic resources of real pistachio (Pistacia vera), regular almond (Amygdalus communis) and wine grapes (Vitis vinifera). Kazakhstan has 10 species of currant (Ribes spp.) and sea gooseberry (Glossularia spp.); there are 120 species of wild relatives of carrots, purslane, asparagus onions and garlic in this country. Concentrated here is enormous species and genetic diversity of tulips – 31 species in the genus Tulipa. Promising is the natural ADB of technical plants (Linum spp., Carthamnus spp., Eruca spp., Brassica spp.) and feed species (first of all alfalfa – Medicago spp.).

More than 70 varieties of grain crops, 68 varieties of fruit and berry crops, and more than 60 types of vegetable and gourds crops, and more than 20 types of potatoes were bred and zoned in the country.

In 2013, the forming of the annotated list was completed, of medicinal plants growing on the territory of Kazakhstan, which includes 1525 species of 622 genera that belong to 136 families of upper phanerophytes. The collection of Aral Experimental Station of Plant Genetic Resources has 10765 sample crops. Of them, 4539 samples of feeding crops, 1634 – vegetable, 3994-grain crops, and 598 sorghum crops. Forest seed plantations are being developed and include objects of selection breeding and genetic purpose, including Almaty and Kokshetau forest breeding centers, Aral Experimental Station of Agrucultural Plant Genetic Resources.

Agrobiodiversity of the wild life is almost never used in breeding. Of wild ancestors of domestic animals, the species that live in the country include muflon (Ovis vignei), five subspecies of argali (O. ammon), wild boar (Sus scrofa), gour (Equus hemionus), jackal (Canis aureus), wolf (C.lupus), spotted wild cat (Felis lybica), and several others. Among birds, first of all, it is families of ducks and chickens. One example of the successful use of genetic material of wild animals is the creation in Kazakhstan more than 30 years ago of the sheep breed "argali-merinos", using wild mountain sheep. The country has used a number of local breeding species,

including 4 cattle, 9 sheep, 3 goats, and 2 horses. Aboriginal breeds of dogs – tazy and tobet – are very valuable.

It should be noted that a number of wild animals of the country are used without removing agricultural breeds; this includes Maral and a number of fur-bearing animals. However, the fur farming is not very developed. Of wild birds in a number of hunting farming business, the successful is the breeding of pheasant; the breeding of houbara bustard (Chlamydotis undulata macqueeni) was established in 2011 with support of the UAE in the South Kazakhstan region.

Of fish and cyclostomes there are currently around 7-10 species grown artificially, including hybrids. Pond fish farming is steadily developing in the last five years. There is an interest in amphibians and reptiles as a genetic resource.

There are no strategies for minimizing genetic erosion and conserving genetic diversity of valuable species, except for the usual measures to support the genetic purity of domesticated livestock breeds.

Strategic Goal D: Enhance the benefits to all from biodiversity and ecosystem services

Target 14. ***By 2020, ecosystems that provide essential services, including services related to water, and contribute to health, livelihoods and well-being, are restored and safeguarded, taking into account the needs of women, indigenous and local communities, and the poor and vulnerable.***

Dedicated work on ecosystem restoration, directly affecting on large groups of the local population is conducted in three ways: restoration of degraded pastures, ecosystem restoration of the Aral Sea and improvement of forest lands. All these activities are described in greater detail in other parts of the report and in Target 5; we shall recall here very briefly.

In 2012-2013, the Committee for land management of the Ministry of Regional Development of the Republic of Kazakhstan conducted an inventory of agricultural lands, including pastures. It was found that in order to stop the pastures degradation, a massive flooding of their lands is needed to be performed remotely from villages. The work on the pastures flooding is done under the "Agrobusiness-2020" state program. Flooding of pastures and livestock dispersal will reduce the load on local grazing and habitat degradation.

Built in 2005, the Kokaral dam, which separated the Smaller Aral from the main aquatic area, allowed stabilizing and raising the level of now separated reservoir, and reducing its salinity. As a result, the fish reappeared in the Smaller Aral (besides the introduced flounder), fisheries were revived, and the conditions of Syrdarya delta farms were improved.

The total area of the state forest fund of the republic from 2008 to 2013 was increased by 1 million 10.4 thousand hectares (3.5%), governance in the forestry sector is gradually improving.

Certainly, these activities on restoration of ecosystems, especially of pastures and the Aral Sea, directly improve the livelihoods of local communities, including women and the poor and vulnerable sections of the population, ensuring shared access to increasing natural resources.

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.***

Restoration of degraded ecosystems in the country is performed in the framework of "Zhasyl Damu" program, as well as included in the concept of transition to a "green economy" and conducted according to industry programs in certain areas. Ultimately, it leads to control of desertification, restoration of pastures and reforestation of the country. For details, see targets 5 and 7. The concept of transition to a "green economy" mentions the importance of effective governance of ecosystems and consideration of the climate change consequences (for details see Target 4). It is not possible to indicate the percentage of restored ecosystems as of 2013; by the next National Report on Biodiversity this indicator will be in effect.

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.***

Kazakhstan has not yet signed or ratified the Nagoya Protocol. Since January 2014, with the support of the MEWR, a project to support the ratification and entry into force of the Nagoya Protocol was started, which plans to promote its ratification, as well as develop relevant amendments to the national legislation.

Strategic Goal E: Enhance implementation through participatory planning, knowledge management and capacity building

Target 17. ***By 2015 each Party has developed, adopted as a policy instrument, and has commenced implementing an effective, participatory and updated national biodiversity strategy and action plan.***

Currently, the "Zhasyl Damu" Program (2010-2014) is the main document guiding the state biodiversity conservation work in Kazakhstan. In the framework of the special project and support of UNDP/GEF, the development of the National Strategy and Action plan on Biodiversity is being finalized, which are to be submitted for consideration to the Government of the Republic of Kazakhstan in summer 2014.

Target 18. ***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.***

Currently, the national legislation lacks the target support of traditional knowledge, innovations and practices of indigenous and local communities that are relevant for the conservation and sustainable use of biodiversity, and their customary use of biological resources. In Kazakhstan, a system of nomadic transhumance of livestock may be treated as the traditional use of biological resources. Pastures use is regulated at the local level; currently, a draft law "On pastures" is under development, and it should fully take into account the traditional knowledge and practices.

The knowledge and practices of local communities are necessarily taken into account in the process that started in Kazakhstan on creating "ecological corridors", which are to be agreed, among others, with the local population. According to regulations, they should also be taken into account in Management Plans of PAs to ensure the ultimate consideration of interests and participation of the local population.

The National strategy and action Plan on conservation of biodiversity that are under drafting foresee interests and involvement of local communities.

Target 19. ***By 2020, knowledge, the science base and technologies relating to biodiversity, its values, functioning, status and trends, and the consequences of its loss, are improved, widely shared and transferred, and applied.***

The scientific potential of Kazakhstan in the field of biodiversity is represented both by public and non-governmental sectors. Funding for scientific research and development of recommendations for the use and conservation of biological resources is conducted at the expense of the state procurement, as well as within grants, including foreign ones. However, the state expenditures exceed foreign funds in tens, if not hundreds, of times. Applied researches are regularly funded by plans of the MEWR of the Republic of Kazakhstan. The plans of MES of the Republic of Kazakhstan on biodiversity subjects take relatively small place, nevertheless, a number of works in this direction has been successfully carried out. Technologies are being developed in research institutions as well as in business structures related to biological resources (wildfowl farms, aquaculture, nurseries, land productivity forecasting, etc.). The assessment development of ecosystem services started in 2012. Methodologies of recreational pressure, methodologies of assessing damage to wildlife upon habitats destruction, etc. are being developed.

For accumulation and efficient use of knowledge on biodiversity conservation and use, since 2010, there was enabled process of creating a unified system of registries on biodiversity: on forestry, wildlife, flora, etc. The work is being done under the state procurement, with the potential involvement of a number of databases, which are already established in Kazakhstan within various projects: database of monitoring ecosystems in PAs, on forest, on the mountain agro-biodiversity, on the steppe ecosystems and others.

Target 20. ***By 2020, at the latest, the mobilization of financial resources for effectively implementing the Strategic Plan for Biodiversity 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 resource needs assessments to be developed and reported by Parties.***

At the national level in accordance with existing state programs, in recent years there is a steady increase of the funds spent on the conservation and sustainable use of biodiversity. Thus, the current “Zhasyl Damu” Program for 2010 had total funding of 31914.1 million Tenge (about $ 212 800 000), the plan for 2014 – 38 089.9 million Tenge (about $ 253 900 000). Investments in the Concept of transition to a “green economy” will be made to an average of 1% of GDP until 2050.

Compliance with the Convention and The relevant Milennium Development Goals by 2015

Kazakhstan adopted a new policy aimed at transition to a "green economy" defined in the Concept of transition of the Republic of Kazakhstan to a "green economy", approved by the Decree of the President of Kazakhstan as of 30 May, 2013; the policy naturally supports to implementation of the Biodiversity Concept.

The "green economy" is a economy with high quality living conditions, cautious and effective use of natural resources for present and future generations. The concept of a green economy complies with international environmental commitments, including the Milennium Declaration Goals. The "green economy" is an important instrument of sustainable development of the country. The transition to a "green economy" will allow Kazakhstan to achieve the goal to become one of the top 30 developed countries in the world.

The main priority objectives in transition to a "green economy" are as follows:

1) increase of effectiveness of resource utilisation (water, land, biological etc.) and their management;

2) modernize the existed infrastructure and construction of a new infrastructure;

3) enhance the well being of population and the quality of environment through cost effective ways of mitigating pressure on the environment

4) strengthen the national security, including the water security.

All objectives on conservation of biodiversity which Kazakhstan was able to achieve in 2009-2013, promote implementation of "Milennium Development Goals". First of all, environmental sustainability is being achieved with various degrees of success (Goal 7): principles of sustainable development have been already integrated into policies and government programs, approaches are being developed; efforts to prevent exhaustion of natural resources are taken within sectoral programs ("Zhasyl damy", etc.). Some successes were achieved in reduction of biodiversity losses (restoration of the number of saiga and other ungulates, extension of the SPA system, restoration of ecosystems etc.).

Besides, restoration of ecosystems, reduction of harmful emissions and pollutants lead to improvement of the environment, water, air and will help achieve Goal 4 ("Reduce child mortality") and Goal 5 ("Improve maternal health"). The example is successful partial restoration of ecosystems of the Small Aral Sea. Unfortunately, changes in health indicators can not be yet supported with figures since positive effects are usually not revealed immediately once the environment is improved.

The CBD activities in Kazakhstan involved a number of national and international governmental and non-governmental organizations and thereby contributed to the achievement of Goal 8 ("Establish global partnership for development").

Practical conclusions in conjunction with the implementation of the Convention in Kazakhstan

In 2009-2013 in a number of aspects of the CBD implementation, Kazakhstan was able to achieve decent results:conservation and restoration of certain endangered species (the best example is saiga); local restoration of ecosystems (the Small Aral Sea, local restoration of pastures); creation of new and extension of existed SPAs; started establishing ecological

networks; expansion of a list of protected wetlands; increased the forest cover and improvement of management plans in forestry; acceleration of a private sector in hunting and fishery etc..

The environmental legislation was improved and the process of its improvement is still underway. Various existing public programs relating somehow to biodiversity, in 2010, were merged into the intersectoral program "Zhasyl damy" for 2010-2014 with clear indicators, responsibilities, funding schemes. The measures taken within the unified programme showed that the approach adopted has been correct. The government and international partners have cooperated effectively and implemented a number of successful programmes under the UNDP/GEF projects, with involvement of government and non-governmental organizations and commercial companies. Activities, aimed at implementation of CBD, contribute to activities conducted under other conventions - Ramsar, Bonn and SITES.

However, due to a predominantly resource-oriented nature of the economy load on ecosystems remains strong. Regulation of the pollution and man-made destruction of ecosystems is connected with enormous challenges; increase of land areas, used for mining, related highways etc.. There are apparent gaps in the network of protected areas, covering different types of habitats, especially in deserts. In addition to the continued ineffective legislative and regulatory framework, serious problems associated with execution of the legislation and the lack of control on the ground for various reasons; including corruption and lack of skills, still remain. There are obvious problems in the forestry sector (forests are distributed at the national and regional levels), in fishery and hunting sectors. For adequate assessment of the state of biodiversity and ecosystems and for appropriate decisions there is a lack of quality information obtained timely. The " Zhasyl damy " programme, although playing a very important role, does not cover all key issues related to the conservation of biodiversity, and does not substitute a lack of the national strategy and the action plan on the conservation of biodiversity.

- Complete implementation of already adopted state programmes (the Concept of a green economy, «Zhasyl damy» and others);
- Further improvement of the legislation, rules and regulations to support hunting, fishery and forestry entities;
- Creation and bringing into operation of systems of monitoring and state inventories on ecosystems, wildlife, forestry and hunting sectors etc..
- Enhance environmental requirements for the use of water, forest, land, biota, with the improvement of evaluation methods of ecosystem services and biodiversity damage, as well as strengthen capacity of the state and public environmental expertise;
- Conduct advocacy activities on conservation of biodiversity and environment, as well as customised training programs in the sphere of biodiversity both at the governmental and non-governmental levels;
- Join the Nagoya Protocol and, preferably, other most important international instruments in the framework of ratified Conventions (AEWA, Memorandum for the conservation of birds of prey, etc.).

Finally, there is an urgent need to adopt the National Strategy and Action Plan on biodiversity conservation, which will ensure the coordinated efforts of all departments and will take into account all those aspects, which, currently, are not practically reflected in other policy documents.At the national level it is necessary to do the following:

At the regional level, it is desirable to improve or create mechanisms for cooperation and coordination on establishing transboundary SPAs, sustainable use of divisible resources (waterfowl, etc.), on monitoring of biodiversity and ecosystems, etc**.**

At the global level, it is desirable to develop schemes of ecosystem monitoring, using remote sensing and information among all member countries of the CBD; access of stakeholders to databases and technologies for monitoring and management of ecosystems, as well as individual components of biodiversity, with advanced training; active support to coordination at the regional level.

At the global level, it is desirable to develop schemes of ecosystem monitoring, using remote sensing and information among all member countries of the CBD; access of stakeholders to databases and technologies for monitoring and management of ecosystems, as well as individual components of biodiversity, with advanced training; active support to coordination at the regional level.

Annex I. Information about the party, submitting the report and on preparation of the national report

Contracting party	Republic of Kazakhstan
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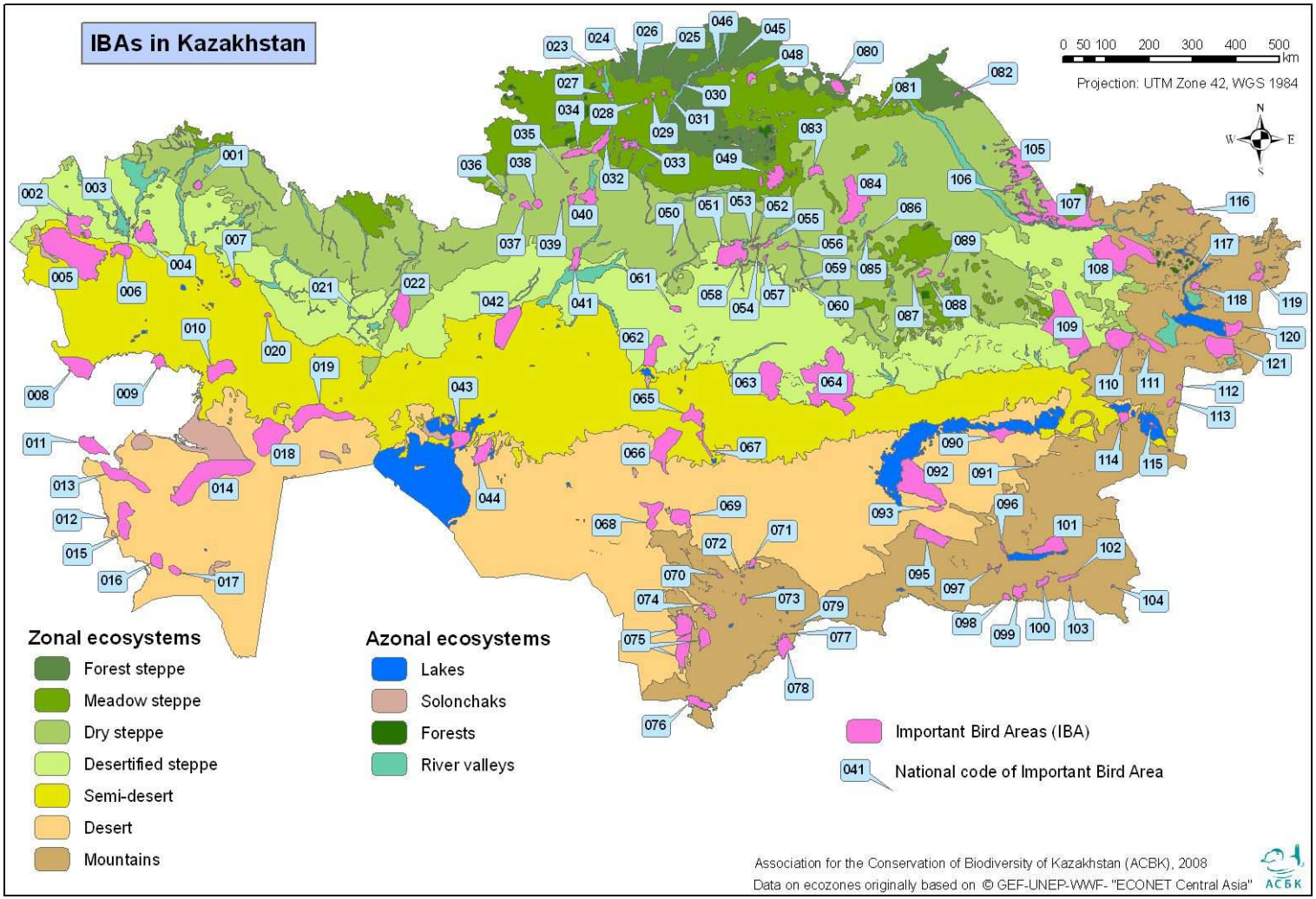
PRESENTATION OF THE REPORT	
Signature of the official, responsible for presentation of the national report	***K.Ustemirov***
Date of the presentation of the report	30.04.14г.

Annex II. Important Bird Areas in Kazakhstan (*the legend is below in the table***)**



Important Bird Areas (IBA) in Kazakhstan

National code (KZ....)	International name	Criteria	Area, ha	Central position			
				latitude		longitude	
				degree	min	degree	min
001	Shalkar Lake	A1, A4i, A4iii	27530	50	33	51	40
002	Lower reaches of the Ashchyozek River	A1, A3	217400	49	10	48	18
003	Sarshyganak Lake	A4i, A4iii	2978	49	26,5	49	51
004	Kushum Lakes	A1, A4i, A4iii	175315	49	20	50	25
005	Urda Sands	A1, A3	954830	48	37	48	30
006	Kamysh-Samarskie Lakes	A1, A4i, A4iii	114860	48	53	49	51
007	Uil River and Taysoygan Sands	A1, A3	32285	48	50	53	31
008	Kazakhstan portion of the river Volga's Delta - Zhambay	A1, A4i, A4iii	248480	46	20	49	30
009	Delta of the Ural River	A1, A4i	67115	46	55	51	41
010	Lower reaches of the Emba River	A1, A4i, A4iii	208990	46	59	53	34
011	Tyulen (Seal) Islands	A4i, A4iii	166880	44	55	50	22
012	Karakol Lake	A4i, A4iii	5270	43	32	51	18
013	Aktau cliff faces	A1, A4ii	235195	44	28	51	32
014	Western cliff faces of the Ustyurt Plateau	A1	790825	44	52	53	46
015	Karagie Depression	A1	215420	43	34	51	44
016	Kaundy Depression	A1	78220	42	55	52	56
017	Basgurly-Zhazgurly Depression	A1	42420	42	46	53	26
018	North-western cliff faces of the Ustyurt Plateau	A1, A4ii	430660	45	52	55	28
019	Donyz-Tau cliff faces	A1, A3	387110	46	29	56	38
020	Sagyz	A1, A3	11280	48	17	54	41
021	Zhagabulak Forest	A1, A3	6740	48	34	57	36
022	Mugodzhary	A1, A3	241925	48	45	58	48
023	Teniz-Karakamys Lakes	A1, A3, A4i, A4iii	12528	54	07	64	32
024	Akzhan Lake	A1, A4i, A4iii	3026	54	10,5	65	42
025	Sorbalyk-Maybalyk Lake System	A1, A4i, A4iii	3400	54	16	66	43
026	Kamyshovoe-Zhamankol Lakes	A1, A3, A4i, A4iii	3940	53	57,5	65	55
027	Shoshkaly Lake System	A1, A3, A4i, A4iii	13580	53	40	64	56
028	Bolshoy Kak Lake	A1, A4i, A4iii	11500	53	34	66	12
029	Aksuat Lake	A1, A4i, A4iii	4589	53	40	66	27

030	Zhaltyr Lake	A1, A4i, A4iii	2594	53	59	67	16
031	Maliy Kak Lake	A1, A4i, A4iii	9721	53	46	66	49
032	Kushmurun Lake	A1, A3, A4i, A4iii	92510	52	40	64	46
033	Koybagar-Tyuntyugur Lake System	A1, A3, A4i, A4iii	62345	52	39	65	38
034	Amankaragay Forest	A1, A3	84795	52	26	63	57
035	Sulukol Lake	A1, A4i, A4iii	3091	52	01	63	37,5
036	Kulykol-Taldykol Lake System	A1, A3, A4i, A4iii	11960	51	23,5	61	54
037	Tounsor Hollow Lakes	A1, A3, A4i, A4iii	35000	51	16	62	23
038	Zharsor-Urkash Salt Lakes	A1, A3, A4i, A4iii	35170	51	20,5	62	45
039	Sankebay Lakes	A1, A3, A4i, A4iii	4675	51	24	63	32
040	Naurzum State Nature Reserve	A1, A3, A4i, A4iii	191381	51	31	64	17
041	Sarykopa Lake System	A1, A3, A4i, A4iii	51200	50	13	64	08
042	Irgiz-Turgay Lakes	A1, A3, A4i, A4iii	348000	48	40	62	08
043	Lesser Aral Sea	A1, A4i, A4iii	139400	46	20	61	00
044	Syrdarya Delta Lakes	A1, A4i, A4iii	144165	46	04	61	42
045	Terenkol Lake	A1, A4i, A4iii	835	54	24	69	12,5
046	Zhylandy Lake	A1, A4i, A4iii	3410	54	14,5	68	44
047	Balykty Lake	A1, A4i, A4iii	4138	54	16	68	51
048	Shaglyteniz Lake and marshes	A1, A4i, A4iii	34750	54	06	69	52
049	Alekseevskie steppe pine forests	A1, A3	176090	51	58	70	38
050	Zharkol Lakes	A1, A4i, A4iii	8818	50	27	67	15
051	Korgalzhyn State Nature Reserve	A1, A3, A4i, A4iii	258963	50	25	69	14
052	Amangeldy	A1, A3, A4i, A4iii	5536	50	34	69	51
053	Zhumay-Mayshukyr Lake System	A1, A3, A4i, A4iii	12490	50	43	69	53
054	Vicinity of Korgalzhyn village	A1, A3, A4i, A4iii	10280	50	35	70	03
055	Uyalyshalkar Lake System	A1, A3, A4i, A4iii	20360	50	38	70	22
056	Kumdykol-Zharlykol Lake System	A1, A3, A4i, A4iii	20350	50	35	70	53
057	Aktubek	A1, A3, A4i	6175	50	13	69	30
058	Tuzashchy and Karasor Lakes	A1, A4i, A4iii	8582	50	21	70	17
059	Tassuat Lake	A1, A4i, A4iii	3589	49	50,5	71	18
060	Kultansor and Tatysor Lakes	A1, A3, A4iii	6204	49	46	71	28
061	Ashchykol and Barakkol Lakes	A1, A4i, A4iii	25930	49	17	67	24

062	Ulytau Mountains	A1, A3	186100	48	24	66	41
063	Ayak-Bestau Hills	A1, A3	340410	47	50	70	21
064	Ortau upland massif	A1, A3, A4ii	1071750	47	43	72	15
065	Middle reaches of the Sarysu River	A1, A3	142165	47	05	68	00
066	Lower reaches of the Sarysu River	A1, A3	331330	46	28	67	10
067	Western edge of the Karakoyin and Zhetikonyr Sands	A1, A3	49690	46	30	68	20
068	Telikol Lakes	A1, A4iii	159320	45	04	66	49
069	Lakes in the lower reaches of the Chu River	A1, A4i, A4iii	147950	44	55	67	42
070	Kenshektau Mountains	A1, A3	10915	43	45	68	48
071	Akzhar Lakes	A1, A4i, A4iii	25714	43	59	69	45
072	Kyzylkol Lake	A1, A4i, A4iii	4160	43	44,8	69	29,5
073	Arystandy	A1	19840	43	12	69	30
074	Shoshkakol Lakes	A1, A3, A4i, A4iii	53460	43	02	68	31
075	Arys-Karaktau State Reserved Zone	A1, A3	404000	42	20	68	00
076	Chardara Reservoir	A1, A4i, A4iii	96010	41	10	68	11
077	Chokpak Pass	A1, A4iv	10160	42	31	70	38
078	Aksu-Dzhabagly State Nature Reserve	A1, A3	131934	42	20	70	35
079	Ters-Ashchibulak Reservoir	A4i, A4iii	3310	42	41	70	54
080	Teke Lake	A4i, A4iii	70370	53	50	72	56
081	Korgankol Lake	A1, A3, A4i, A4iii	1097	53	08,5	74	09
082	Karasuk	A1, A4i	19610	53	30	77	08
083	Iskrinskie Pine Forests	A1, A3	63055	52	08	72	01
084	Ereymentau Mountains	A1, A3	364580	51	24	73	17
085	Irtysh-Karaganda Waterworks 10	A1, A4i, A4iii	5159	50	47,4	73	40,3
086	Irtysh-Karaganda Waterworks 9	A4i, A4iii	3782	50	47,5	73	50
087	Saumalkol Lake	A1, A4i, A4iii	2171	49	48,5	74	59
088	Karasor Lake	A4i, A4iii	37286	49	52	75	22
089	Balyktykol Lake	A4i, A4iii	10430	49	47,3	75	56
090	Lower reaches of the Karatal River	A1, A4i, A4iii	102195	46	22	77	18
091	Ushkol Lake	A1, A4iii	886	45	40	78	05,3
092	Ili River Delta	A1, A3, A4i, A4iii	574300	45	25	74	50
093	Topar Lake System	A1, A3	32530	44	58	75	09

094	Zheltoranga	A1, A3	938	45	02	75	17,5
095	Zhusandala	A1, A3	217135	44	27	74	57
096	Kapchagay Canyon	A1, A3, A4i	14950	44	03	77	00
097	Sorbulak Lake System	A1, A4i, A4iii	18540	43	40	76	36
098	Big Almaty Gorge	A1, A3	22305	43	04	76	59
099	Almaty State Nature Reserve	A1, A3	71700	43	06	77	19
100	Assy Plateau	A1, A3	41050	43	15	78	03
101	Altyn-Emel National Park	A1, A3	197600	44	00	78	25
102	Toraygyr Ridge	A1, A3	38565	43	18	78	45
103	Upper Charyn	A1, A3	4700	43	13	79	15
104	Tuzkol Lake	A4i, A4iii	3194	43	00	79	59
105	Ertis Ormany (Shalday Forest)	A1, A3	277961	51	50	78	50
106	Shcherbakty Lakes	A1, A4i	2955	51	21	78	15
107	Semey Ormany (Semipalatinsk Forests)	A1	662167	50	41	79	58
108	Western and northern foothills of the Kalba Range	A1, A3	657170	49	45	81	40
109	Chingiztau Mountains	A1, A3, A4ii	863490	48	25	79	40
110	Eastern Kazakhstan uplands	A1, A3	221130	48	00	81	12
111	Zhagalbayly and Tuyemoynak Hills	A1, A3	83125	47	49	82	13
112	Karabas Mountains	A1	12300	46	48	82	46
113	Arkaly Mountains	A1	21365	46	36	82	30
114	Delta of the Tentek River	A1, A3, A4i, A4iii	45855	46	25	81	00
115	Lake Alakol Islands	A1, A3, A4i	7400	46	10	81	49
116	“Paradise Valley” mountain plateau	A1, A3	18800	50	18	84	08
117	Tortoise Islands	A1, A4i	1059	49	00,5	83	46
118	Cherdoyak	A1	29620	48	49	83	49
119	Markakol State Nature Reserve	A3, A4i, A4iii	75048	48	44	85	47
120	Delta of the Cherniy (Black) Irtysh	A1, A4i	104200	47	49	84	38
121	Manyrak Mountains	A1, A3	259460	47	30	84	09
		In total, ha	*14986249*				

Annex III - Additional information sources

Websites of governmental bodies

- http://www.government.kz – the official portal of the government of RK
- http://www.eco.gov.kz – the website of the Ministry of Environment and Water Resources of RK
- http://www.minagri.kz – the website of the Ministry of Agriculture of RK
- http://www.stat.kz – the website of the Statistics Agency of RK
- http://www.meteo.kz – the website of Kazhydromet
- www.fhc.kz - the website of the Forestry and Hunting Committee of the Ministry of Environment and Water Resources of RK.

Web-sites of non-governmental and international organizations

- http://www.ecoidea.kz – the website of the public fund «EcoIDEA» - the Agency on development of ecological initiatives
- www.greensalvation.org - the website of the ecological society «Green rescue»
- www.acbk.kz – the website of the Kazakhstan Association of Biodiversity Conservation
- www.ecomuseum.kz – the website of PA «Karaganda oblast ecological museum"
- www.ecoforum.kz – the ecological forum of non-governmental organization of Kazakhstan
- www.earthwire.org/kz - Monitoring of ecological news in Kazakhstan
- www.redbookkz.info – the website of the Red Book of Kazakhstan
- www.birds.kz – website on birds in Kazakhstan.
- http://www.altai-sayan.kz – the website of the project "Conservation and sustainable use of biodiversity of the Kazakhstan part of the Altay-Sayansk ecoregion".
- www.econavigator.com/ibpp – Web-log of the TACIS Project «Strengthening the capacity of public involvement in development and implementation of environmental programmes in Kazakhstan»
- www.carecnet.org – the website of CAREC (the Regional Environmental Center for Central Asia).

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The National Report on Conservation and Sustainable Use of Biological Diversity in the Republic of Kazakhstan. Almaty, 1998.

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Research report "Development of a conceptual form of the foundations of desertification monitoring, using space information" RGP "ИАЦ ООС" MEP RK - Astana. 2008.

Research report "Development of methods of assessment and measures to combat desertification in the “hot spots” of the ecological crisis," RGP "ИАЦ ООС" MEP RK, Astana. 2008-2010.

Research report "Compilation and preparation for publication of a set of specialized ecological maps of the Republic of Kazakhstan 1:1 000 000 scale," RGP "ИАЦ ООС" MEP RK - Astana. 2008-2009.

Research report "Environmental Atlas of the cities of Kazakhstan," RGP "ИАЦ ООС" MEP RK. Astana. 2008-2010.

Report "Ecological zoning of the Republic of Kazakhstan", RGP "ИАЦ ООС" MEP RK, Astana. 2008-2010 ".

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Sklyarenko S.L., Welch G.R. and Brombacher M. eds. (2008*):* Important Bird Areas in Kazakhstan – priority sites for conservation. Almaty, Kazakhstan: Association for the Conservation of Biodiversity of Kazakhstan (ACBK). – 312 pp.