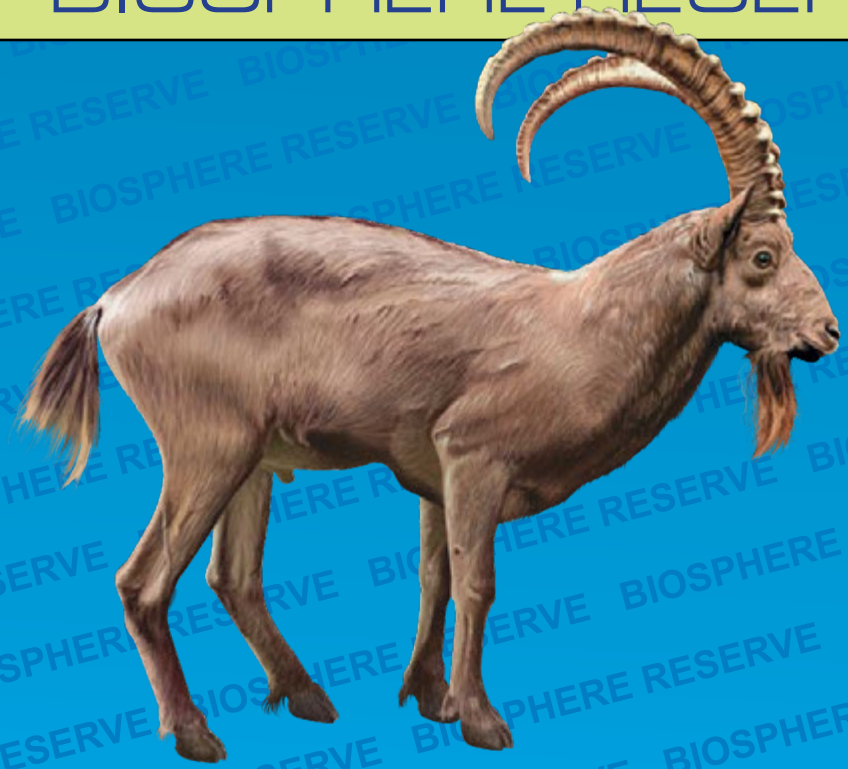
Katon-Karagay

BIOSPHERE RESERVE



United Nations
Educational, Scientific and
Cultural Organization

Almaty
Office

Kazakhstan
National
Committee

KAZAKHSTAN NATIONAL COMMITTEE
FOR THE UNESCO PROGRAMME
"MAN AND BIOSPHERE"

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KATON-KARAGAY

BIOSPHERE RESERVE NOMINATION

BIOSPHERE RESERVE

PART I: SUMMARY

1. PROPOSED NAME OF THE BIOSPHERE RESERVE:
Katon-Karagay Biosphere Reserve

2. COUNTRY:
Kazakhstan

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES.

(Article 3 of the Statutory Framework presents the three functions of conservation, development and logistic support. Explain in general terms how the area fulfills these functions)

3. 1 "Conservation — contribute to the conservation of landscapes, ecosystems, species and genetic variation".

(Stress the importance of the site for conservation at the regional or global scales)

Katon-Karagay Biosphere Reserve is situated in the upper part of Bukhtarma, Belaya Berel and Chyornaya Berel rivers, including Southern slopes of Listvyaga and Katunskiy ridges (with Eastern top of Belukha mountain), ridges of Bukhtarma river's left bank: Sarymsakty, Tarbagatay (Southern Altai part) and Southern Altai. Northern part includes a part of Katunskiy ridge and has altitudes from 2000 to 4506 m (Belukha mountain). Southern part – from 850 m (Bukhtarma river valley) to 3487 m (Southern Altai ridge). Altitudes near Belukha town reach 2500-3000 m. Relief is of alpine type: with very expressed valleys, steep rocky slopes, moraines. The same relief character is observed in the Eastern part of Southern Altai ridge. The rest of reserve's territory, including Sarymsakty, Tarbagatay and Listvyaga ridges, has mainly flat character of mountain relief. The territory of biosphere reserve has very expressed vertical zoning.

Highland nival zone – vegetation groups grow on mielkozem. Vegetation cover is formed by plants of periglacial complex (*Omalotheca supina*, *Pyrethrum pulchrum*, *Vaccinium*, *Primula nivalis*, *Eriophorum humile*, *Ranunculus altaicus*, etc.). In subnival zone there are two very distinct vegetation types – rocks and rocky alluvials. In the rocks the following shrubs – *Berberis sibirica*, *Ribes nigrum* and *R. fragrans* – are registered. Herbaceous plant's composition is quite diverse. Rocky alluvials and overgrowing screes are inhabited by shrubs: *Lonicera altaica*, *Juniperus pseudosabina*, *Salix myrsinites*, and herbaceous plants are represented by *Pyrethrum alatavicum*, *P. krylovianum*, *Thermopsis alpina*, *Lupinaster eximius* and etc.

Highland tundra – meadow zone. The main role in rocky or pebbles – lichen tundra is played by lichens of genera *Cetraria*, *Cladonia*, *Parmelia*, *Peltigera*, *Stereocaulon*. Higher flowering plant vegetation is very diverse, with domination of *Kobresia myosuroides* and *K. smirnovii*, and co-domination of *Carex* spp. and *Helictotrichon mongolicum.* In the limits of park's territory one may observe formations of herbaceous tundra: edificator of *Carex* – cereal tundra is Hedysarum austrosibiricum, *Thermopsis alpina*, *Gentiana algida* and other plants. Edificator of Kobresia wasteland meadows most often is *Kobresia myosuroides*. Edificator of tundra is *Dryas oxyodonta*.

Mountain-meadow alpine zone consists of probably about 100-120 flora species. Dominating species are brightly flowering plants, giving those bright colors to the meadows.

Mountain-forest zone - the territory of the park in the region rich in forest resources. The forests here are inconsider-

ably changed by economic activity and don't lose a lot from forest fires. According to the data of state forest fund account, the area covered by forest is 216,184 ha. Almost 80% is occupied by coniferous forests, 19% - by shrubs and only a little more than 1% is occupied by deciduous forests. The main forest-forming species are larch, cedar and spruce.

Abundance of meadow herbs and flowers comprises more than 1000 species of higher vascular plants, as well as mosses, lichens and fungi. Flora of Kazakhstan Altai includes 2450 species of 693 genera and 131 families, including: Southern Altai – 2052 species (83.8% of total species number of Kazakhstan Altai) of 608 genera (87.7%) and 116 families (88.5%). Supposedly, there are 1000 plant species on the territory of Katon-Karagay Biosphere Reserve, belonging to 78 families, 30 of them are listed in the Red Data Book of Kazakhstan. The families with most species are Poaceae, Asteraceae, Rosaceae, Ranunculaceae, Fabaceae, Cyperaceae, Caryophyllaceae.

"Development - foster economic and human development which is socio-culturally and ecologically sustainable".

3. 2

(Indicate current activities and the potential of the proposed biosphere reserve in fulfilling the objective of fostering sustainable economic and socio-cultural development, including by securing flows of ecosystem services from the biosphere reserve).

Katon-Karagay Biosphere Reserve is situated on the territory of Katon-Karagay administrative district of Eastern Kazakhstan oblast in the limits of the following borders: North and East – borders with Russia (Republic of Altai); South-East – borders with People's Republic of China; West – to Belkaragay and Soldatovo villages; South – Northern slopes of Southern Altai ridges: Sarymsakty, Tarbagatai, Narymskiy – bor-

Papilio machaon

Saturnia pyri

der of Muz-Bel forest station of Shyngistay forestry and along administrative border of Katon-Karagay and Kurchum districts to the border with China in the East.

Biosphere Reserve's length from North to South is about 60 km, from West to East about 150 km. Land plots with total area of 515,538 ha, belonging to Berel and Katon-Karagay state institutions for forest and animal world protection, were given for permanent use for organization of core and buffer zones of biosphere reserve. Also additional lant plots with total areas of 127,939 and 268,463 ha were given from reserve lands of Katon-Karagay administrative district of Eastern Kazakhstan oblast.

Biosphere reserve's transition zone includes large settlements, lands of rural districts, cattle roads, transport centers and channels. Central office of biosphere reserve is in Katon-Karagay village, 90 km from district center (Bolshenarymskoye village) and 350 km from oblast center (Ust-Kamenogorsk city).

Highways to Katon-Karagay Biosphere Reserve:

1) from Western side – highway of republican importance Ust-Kamenogorsk – Bolshenarymskoye village – Katon-Karagay village – Uryl village – Rakhmanovskiy Klyuchi village. This road has a good asphalt cover up to Uryl village. Then it is followed by gravel surface. The same road connects nearest railroad station Zubovka (Zyryanovsk town) and local airport in Katon-Karagay village. Distance from Ust-Kamenogorsk to Uryl village is 417 km; from Uryl village to Rakhmanovskiy Klyuchi resort – 45 km.

Katon

2) roads of oblast importance include Katon-Karagay – Korobikha road – 45 km; Pechi – Beloye – 24 km.

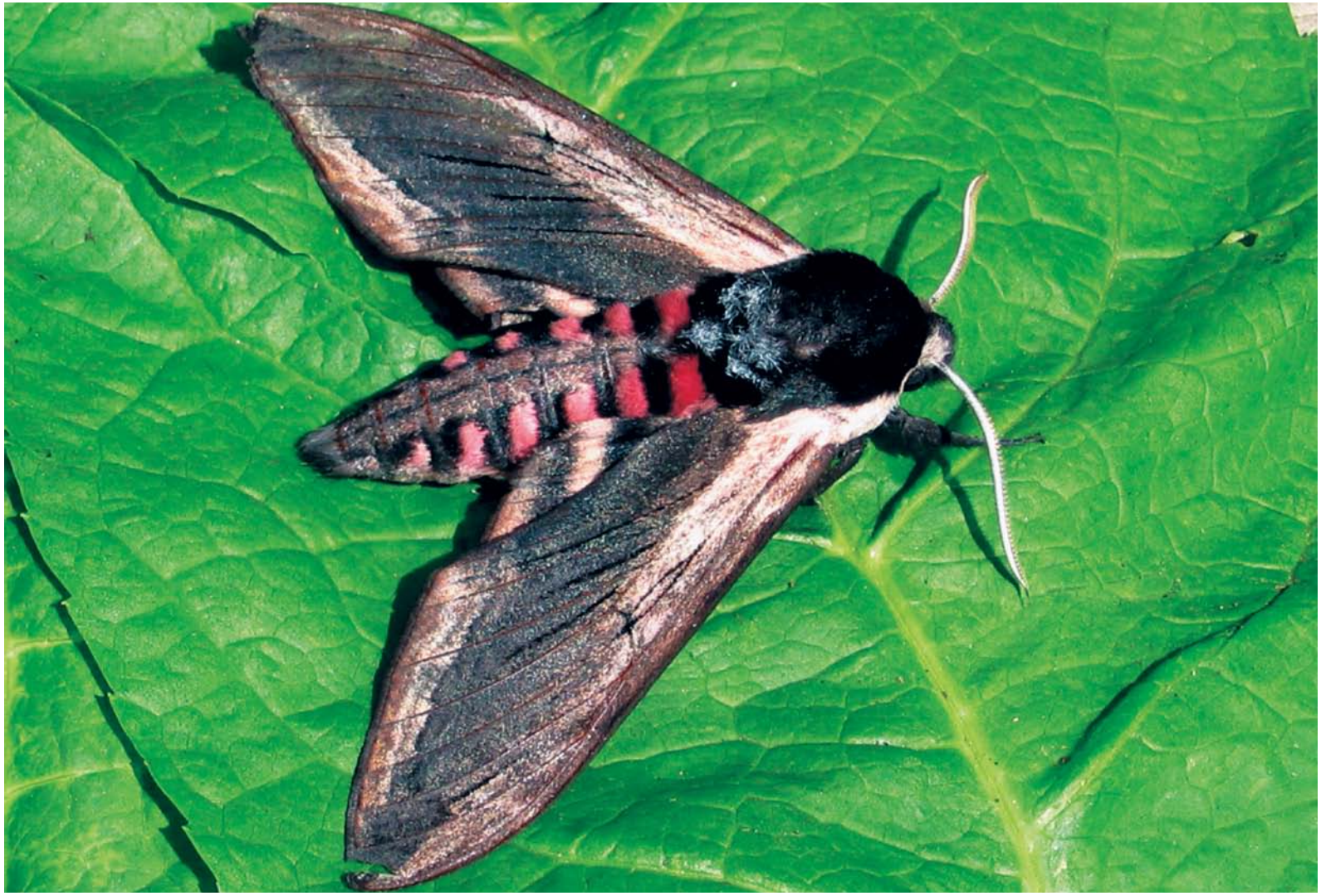
Local population, living in the transition zone of biosphere reserve, practices mainly breeding of cattle, sheep, deers, horses and Siberian stags. Plant production is an additional activity and the main plantations are occupied by fodder perennial and annual herbs and cereal fodder cultures (barley, oat) for feeding cows, Siberian stags, horses and sheep in winter period. Private farms are dominating in cattle-breeding sector of the region. The majority of those farms have small numbers of animals – less than 40 sheep. In the structure of land use the largest agricultural territories are located in Belovskiy rural district (39.6%), a little less – in Korobikhinskiy (14.5%) and Belkaragay (12.2%) rural districts, and smallest area of agricultural lands are situated in Urylskiy, Zhambylskiy, Chernovinskiy, Katon-Karagayskiy riral districts (from 7.9 to 9%). In the present time there are 881 registered and active agricultural formations on the territory of biosphere reserve. Organization of UNESCO biosphere reserve will stimulate development of promising sectors of the local economy – ecological and health tourism, attracting both Kazakhstan and foreign tourists. Now there are several health – spa complexes based on Siberian stag farms on the territory of biosphere reserve, but their potential is not developed yet.

3. 3 "Logistic support - support for demonstration projects, environmental education and training, research and monitoring related to local, regional, national and global issues of conservation and sustainable development".

(Please indicate current or planned activities).

Currently the main scientific – technical support of the biosphere reserve's territory is carried out by the staff of Katon-Karagay state nature national park. In the frames of GEF/UNDP international project «Conservation of Altai's biodiversity» (2005-2011) a part of equipment was donated (2 cars, computers and other office appliences, equipment for water quality control, photo cameras, video camera, echo sounder, binoculars, telescopes, GPS, etc.). In the frames of planned work different training seminars were conducted, dedicated to management plan preparation, biodiversity monitoring, state inspectors were trained in drawing up reports, complying with safety operating procedures and fire prevention, trips for experience exchange were organized to Korgalzhyn biosphere reserve, Karatau nature reserve (Kazakhstan), Berezinskiy

nature reserve (Belorussia), and to scientific-practical conferences inside Kazakhstan (Almaty, Astana) and abroad (Moscow, Russia and Minsk, Belorussia). Since the national park was established there is Nature Museum, which occupies several exposition halls with numerous dioramas and museum exhibits. Every year there are numerous ecological festivals, exhibitions and educational trainings, every 2 years there are cultural-ethnographic festivals of Turkic-speaking countries in the limits of TURKSOY international organizaiton's activity.



Sphinx ligustri

CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE. 4.

(Article 4 of the Statutory Framework presents 7 general criteria for an area to be qualified for designation as a biosphere reserve which are given in order below)

4. 1

"ENCOMPASS A MOSAIC OF ECOLOGICAL SYSTEMS REPRESENTATIVE OF MAJOR BIO-GEOGRAPHIC REGIONS, INCLUDING A GRADATION OF HUMAN INTERVENTION"

(The term "mosaic" refers to a diversity of natural habitats and land cover types derived from human uses such as fields, managed forests, etc. The term "major biogeographic region" is not strictly defined but it would be useful to refer to the map of the "World Network of Biosphere Reserves" which presents 12 major ecosystem types at a global scale.)

The territory of biosphere reserve in the upper part of Bukhtarma, Belaya and Chyornaya Berel rivers, including Southern slopes of Listvyaga and Katunskiy (with Eastern top of Belukha mountain), ridges of left bank of Bukhtarma river: Sarymsakty, Tarbagatay (Southern Altai part) and Southern Altai. Northern part, including part of Katunskiy ridge, has altitudes from 2000 to 4506 m (Belukha mountain). Southern part – from 850 m (Bukhtarma river valley), to 3487 m (Southern Altai ridge). Relative altitudes in the area of Belukha mountain are 2500-3000 m.

There are four main altitudinal zones on the territory of biosphere reserve, which include all characteristic landscapes of the region:

I. nival zone:
   - subnival belt

II. tundra - meadow:
   - mountain-tundra
   - mountain-meadow-alpine
   - mountain-meadow-subalpine

III. mountain-forest:

mountain-forest subalpine

mountain-forest taiga

IV. mountain-forest-meadow-steppe.

Highland nival zone provides magnificent landscape with mountain ridges of contrasting white ice and snow tops and deep canyons, partitioned by mountain rivers. The lower border of this zone lies at the altitude of 2800 m above sea level, vegetation inhabits mielkozem which is accumulated in the cracks of the rocks and between the rocks of alluvial deposits, and also in the depressions of the slopes along the ice and snow tops. This zone is characterized by fragmental vegetation associations, represented by lichens and highland herbaceous plant species: *Primula nivalis*, Macropodium nivale, *Eriophorum humile*, *Ranunculus altaicus*. The subnival zone is represented by Berberis sibirica, *Ribes nigrum* and *R. fragrans*, *Lonicera altaica*, *Juniperus pseudosabina*,in the rocks, and by herbaceous plants: *Bergenia crassifolia*, *Saxifraga sibirica*, *Potentilla nivea*, *Patrinia sibirica*, *Aquilegia glandulosa* and other plants.

Mountain-tundra zone. Its upper border lies at the altitude of 2800 m above sea level, and lower is 2100 m above sea level. Upper layer is occupied by rocky, moss – lichen, shrub and herbaceous tundra with mosses, *Poa altaica*, *Gentiana algida* and shrubs – *Betula rotundifolia*, *Lonicare hispida*, *Spiraea* and dwarf forms of willows.

Mountain-forest zone is situated in the vertical range of 1200-1250 m to 2200-2300 m above sea level. It includes 2 zones: mountain-forest subalpine, occupying upper position, and mountain meadow-taiga, located in its lower half. There are main forest-forming species in the limits of this zone: Siberian pine, larch, spruce. Smaller area is occupied by forests of fir, birch, poplar, aspen and willows. Herbaceous cover is formed by cereals, sedge, blueberries and motley grass.

Mountain-meadow-steppe zone is characterized by sparse spruce and mixed (birch – spruce – aspen) forests with cereal – motley grass herbs and shrubs. Under the trees and on the meadows there are shrubs: *Sambucus sibirica*, *Spiraea media*, *Caragana arborescens*, *Rosa acicularis*. Most common cereals include *Campanula glomerata*, *Brachypodium sylvaticum*, *Calamagrostis* spp. Motley grass is represented by Iris ruthenica, *Origanum vulgare*, *Bupleurum longifolium*, *Galium boreale* and other species.

The main pressure on the ecosystems from local population is observed in mountain forest-meadow-steppe zone, where there are settlements, roads, pastures and hayfields. The main tourist and health-spa bases are also situated here.

"Be of significance for biological diversity conservation".

4. 2

(This should refer not only to the numbers of endemic or rare species, but may also refer to species on the IUCN Red List or CITES appendices, at the local, regional or global levels, and also to species of global importance, rare habitat types or habitats with unique land use practices (for example traditional grazing or artisanal fishing) favouring the conservation of biological diversity).

Katon-Karagay Biosphere Reserve represents extremely important natural complex for conservation of South-Western Altai biodiversity. Plant life forms are represented by arboraceous, semi-arboraceous, herbaceous vegetation.

Field research on the territory of biosphere reserve registered 56 species of tree-shrub flora of 28 genera and 13 families, which is 5.4% of species composition of Southern Altai flora. Total area of reserve's forest fund is 267,202 ha. Forests are mostly mixed, composition of herbaceous and moss layers is often conserved when dominating tree species change. There are 40 forest types, recorded for the territory of national park, with domination of cedar (20.3%) and larch (21.4%) forest type plantations. Considerable area is occupied by shrub forest type – subalpine dwarf birch (37.7%). Among pine forests dominating forest type is herbal cedar (7.3%), which occupies medium and lower parts of mountain slopes at the altitudes of 1500-1700 m above sea level. In the dense undergrowth there is mostly currant and honeysuckle. Herbaceous cover is dense – *Calamagrostis*, *Carex*, *Aconitum*, *Equisetum*. Dominating forest type among spruces is cereal – motley grass spruces – 12%, which inhabits flat, often medium sloped mountain slopes at the altitudes of 1750-1800 m above sea level, in North-North-East, rarer – in North-West and West. Undergrowth is rare, with separate rose, spirea; herbaceous cover is well developed, with domination of *Calamagrostis*, *Brachypodium* and *Bromus*. Addition of xerophile motley grass - *Artemisia*, *Iris*, *Rubus* – is quite characteristic.

Dominating shrub type is subalpine dwarf birch, distributed at the altitudes of 2000-2300 m above sea level on different relief forms: from rocky flat ridges to flat and depressed slope parts. Dwarf birch tundra is distributed in all mountain ridges. Semi-arboraceous forms (semi-dwarf-shrubs) include almost all Artemisia, many species of Chenopodiaceae and other plants. Herbaceous form, or grass, is the most numerous group, with domination of perennial herbs, mainly xerophytes.

There are 30 species of rare and endangered plants on the territory of Katon-Karagay Biosphere Reserve: *Cladonia rangiferina* (L.) Harm., *Diphasiastrum alpinum* (L.) Holub, *Huperzia selago* (L.) Bernh ex Schrank et Mart., *Adonis vernalis* L., *Allium pumilum* Vved. in Bull. Univer. As. Centr., *Astragalus glycyphullus* L., *Cyprepedium calceolus* L., *Cyprepedium*

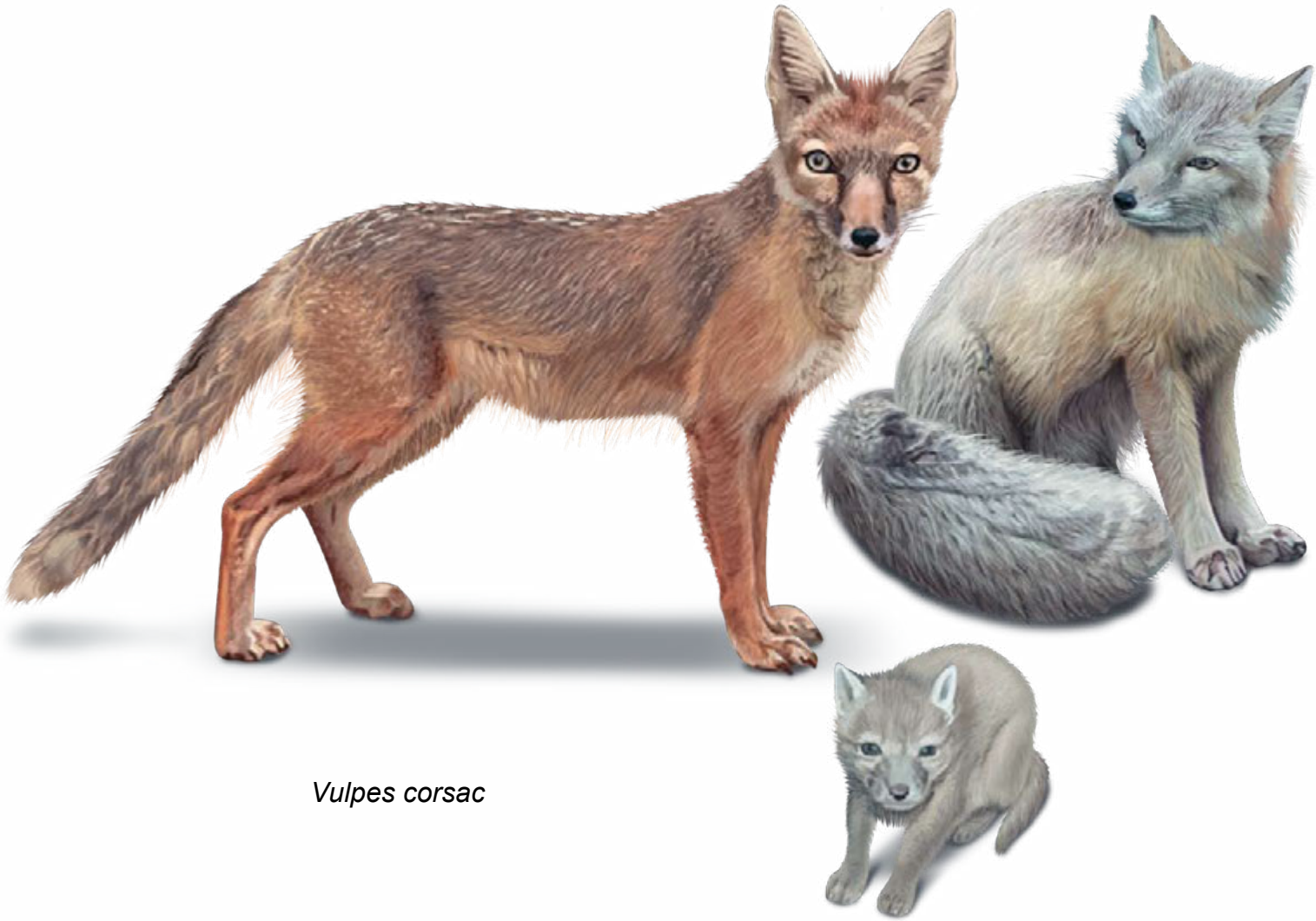
Anthropoides virgo

Capreolus pygargus

Sciurus vulgaris

Mustela nivalis

Ursus arctos



Vulpes corsac

Canis lupus

Vulpes vulpes

macranthon Sw., *Cymbaria daurica* L., *Dactylorhisa fuchsii* (Druce) Soo, *Daphne altaica* Pall., *Drosera rotundifolia* L., *Erythronium sibiricum* (Fisch. et Mey.) Kryl., *Epipogium aphyllum* (F.W. Schmidt) Sw., *Gymnospermium altaicum* (Pall.) Spach., *Lilium martagon* L., *Macropodium nivale* (Pall.) R. Br., *Orchis militaris* L., *Oxycoccus microcarpus* Turcz., *Paeonia anomala* L., *Paeonia hybrida* Pall., *Paris quadrifolia* L., *Pulsatilla patens* (L.) Mill., *Rhaponticum carthamoides* (Willd.) Iljin, *Rheum altaicum* Losinsk., *Rhodiola rosea* L., *Sanicula europaea* L., *Sibiraea altaiensis* L., *Stipa pennata* L., *Tulipa heteropetala* L.

Short characteristics of most valuable rare plant species with very important role in flora genetic diversity conservation and practical importance are given below.

Diphasiastrum alpinum (L.) Holub – Alpine Clubmoss. Status – rare species with decreasing population. Is recorded only in highlands of Altai and Saur. Area – tundra zone and high mountains of Eurasia and Northern America. Evergreen creeping perennial plant. Reproduces by spores, and the period from spore production to new adult plant is not less than 5 years.

Huperzia selago (L.) Bernh ex Schrank et Mart. – Fir Clubmoss. Status – very rare species. Is recorded only in the

Crataegus sanguinea

Rhodíola rosea

mountains of Altai, Dzhungarian Alatau and in one area of Kazakh melkosopochnik (Borovoye). Inhabits moist rocks with moss, among rocky alluvial deposits and in rocky tundra of highlands, rarer – in the upper part of forest zone. Herbaceous evergreen perennial plant, reproduces by spores and with brood buds, located in in the axils of the upper leaves.

Allium pumilum Vved. in Bull. Univer. As. Centr. Status – rare, endemic species of Altai. In the limits of Kazakhstan it is known in the limits of four sites: two of them are in Western Altai (Ivanovskiy ridge). One is on Ulbinskiy ridge (Chyornyi Uzel) and in Southern Altai (upper part of Bukhtarma river). Inhabits highland cryophyte and petrophyte steppe and tundra associations.

Adonis vernalis L. - Pheasant's Eye. Status – rare species. Is recorded only in North and North-East of the Republic – from Altai and Tarbagatai, although it is more widely distributed in Europe and Southern Siberia. Herbaceous spring-blooming perennial plant. It does not require specific soils, prefers areas with a lot of sunshine, life length of one specimen reaches 60 years.

Cyprepedium macranthon Sw. – Lady's Slipper Orchid. Status – rare species with decreasing area. Is recorded sporadically, in small groups in Northern Kazakhstan and in Altai. Large rhizomatous orchid, inhabiting spruce, rarer pine and mixed forests, meadows and moist meadows. Reproduces by seeds, restoration is weak.

Dactylorhisa fuchsii (Druce) Soo – Common Spotted Orchid. Status – rare species. Is registered by isolated populations in Northern regions of Kazakhstan and Altai (from Southern to Western Altai). Grows in Northern willow, birch, aspen and mixed forests, on meadows, along river and stream banks. Reproduces by seeds, provides self-sowing on damp meadows with abundant cover of mosses.

Daphne altaica Pall. Statis – rare, almost endemic, relict species. Is observed in the mountains of Altai, Tarbagatai, Manrak and Saur. Grows in shrub steppes on rocky slopes from foothills to midlands. Relict of tertiary forest (subtropic) flora of turgai type. Decorative shrub with fragrant white tubular flowers. Reproduces by seeds and vegetatively – by root stocks.

Erythronium sibiricum (Fisch. et Mey.) Kryl. Siberian Trout Lily. Status – rare species with decreasing area. Is observed only in the mountains of Southern and Western Altai. Grows on meadows of coniferous forests, on meadow slopes, among shrubs, sometimes even in highland tundra. Early blooming bulbous perennial plant.

Gymnospermium altaicum (Pall.) Spach. Status – rare, partly disappearing species. Is distributed from Western Altai through Tarbagatai and Dzhungarian Alatau to Zailiyskiy Alatau and Chu-Ili mountains. Is observed sporadically by separate, sometimes quite large populations in apple and fir forests, in shrub thickets from foothills to highlands. An early flowering bulbous perennial plant

Lilium martagon L. – Martagon. Status – rare species with decreasing population. Is recorded in mountains of Altai, Tarbagatai and on the Northern slope of Dzhungarian Alatau. Grows on grass moist meadows, in fields among birch, aspen, spruce and cedar forests.

Macropodium nivale (Pall.) R. Br. Status – rare, relict species. Is observed in the upper mountian zones of Altai, Saur and Tarbagatai. Grows on rocky slopes near snow, along river and stream banks, on alpine meadows. Ancient species, is characterized by some primitive features of flower structure.

Paeonia anomala L. Status – rare species with decreasing population. Is registered in a narrow stripe in Irtysh river valley and in Altai. Grows in deciduous, mixed and coniferous forests, in meadows and meadow slopes of foothills and mountains. Is characterized by big sizes, almost uniformly thickened roots and numerous stems.

Paeonia hybrida Pall. – Hybrid Peony. Status – almost endemic species with decreasing area. Is observed in mountains of Altai, Tarbagatai, Saur, on Northern slope of Dzhungarian Alatau, as well as in adjacent part of Eastern melkosopochnik. Grows on open pebbles and rocky steppe slopes, among shrubs from foothills to midland mountain zone. Is characterized by clear round tuberous thickened roots, low height and purplish or bright pink color of the flower.

Pulsatilla patens (L.) Mill. Prairie crocus. Status – species with decreasing population. Is distributed almost in all Northern half of the Republic, including mountains of Altai and Tarbagatai. Grows in dry steppes, on dry meadows, in sparse pine forests and on the meadows, dry slopes, often on sandy and clay soils.

Rhaponticum carthamoides (Willd.) Iljin. – Maral Root. Status – species with decreasing population. Is registered in mountains of Altai, Tarbagatai and Dzhungarian Alatau (Northern slope). Powerful rhizomatous perennial plant (more than a meter in height), most often grows on subalpine meadows, in sparse forests and in forest meadows, rarely going up to alpine tundra.

Rhodiola rosea L. – Golden Root. Status – valuable species with harshly decreasing population. Is recorded only in mountain regions of Altai, Saur, Tarbagatai and Dzhungarian Alatau. Grows on moist soils along river banks, in thickets of mountain pines and dwarf birches, on meadow parts at the upper limit of the forest, in the rocks and rocky slopes, sometimes in rocky tundra.

Rheum altaicum Losinsk. – Altai Rhubarb. Status – rare species with decreasing area. Is observed in mountains of Altai, Tarbagatai and Saur. Grows on pebbles and rocky dry slopes, sometimes in meadows and among shrubs in the upprt mountain zone.

Sibiraea altaiensis L. Status – rare species with decreasing population. Endemic of Altai, its distribution goes out of

Altai limits inconsiderably. Relict of tertiary deciduous forests. Blooms in May-June, fruits in July-August. Its leaves are sometimes used as substitute for tea, in traditional medicine for curing fever, liver diseases (hepatitis) and cardivascular system diseases. It is an effective decorative plant, grows well in the culture from seeds. It is very attractive not only during blooming, but also in autumn, when leaves are brightly red colored.

Stipa pennata L. – Feather Grass. Status – species with decreasing population and area. Is widely distributed in all steppe zone – from Western borders to Altai mountains. Grows in steppe, in forest meadows and dry mountain slopes. Prefers light sandy soils, rarely observed on clay sands. Is characterized by narrow leaves and long (20-40 cm) feather awns.

Tulipa heteropetala L. Status – rare species. Is recorded in the mountains of Altai and Tarbagatai. Grows on steppe and semi-desert, often rocky slopes from foothills to highlands. Populations are isolates, usually sites occupy several tens of square meters. Density sometimes reaches 10-33 generative specimens in one square meter.

Animal world of biosphere reserve is very interesting because it combines fauna species of European complex, which inhabited this region after the ice went from the West, with animals of taiga complex, which came from the East. *Mammals* are represented by 69 species, including insectivores – shrews; bats – Ikonnikov's Bat; predators - Lynx, Roe Deer, Marmot, Squirrel, Fox, Wolf, Stoat, Sable, Mink, Otter; rodents - Squirrel, Marmot; ungulates - Maral, Elk, Roe Deer, Musk Deer. Red Data Book lists 4 species. *Ornithofauna* includes 277 species of birds, including 20 species listed in the Red Data Book. *Reptiles* comprise 6 species, *amphibians* – 3 species, *fish* – 8 species, one of which is listed in the Red Data Book of Kazakhstan.

4. 3 "Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale".

(Describe in general terms the potential of the area to serve as a site of excellence for promoting the sustainable development of its region (or "eco-region")).

Potential of the region is connected, first of all, to the development of ecologic-recreational tourism, as well as with cattle breeding and plant growing. In regional scale the experience of ecologic-recreational tourism development on the territory of biosphere reserve may be successfully used in other parts of Kazakhstan, as well as in adjacent Altai territories of Russia, China and Mongolia. In the present time tourist services are dynamically developing on the territory of biosphere reserve (settlements in collaboration zone). This is mainly caused by development of small and medium business of additional services for the tourists from local people (organization of guest houses and small hotels and tourist bases, horse riding, etc.),

and selling local produce grown at home, and local souvenirs. The most perspective tourism types include: acquaintance, education, recreational, ornithological (birdwatchers), botanical, photographic, scientific and ethnographic tourism.

4. 4 "Have an appropriate size to serve the three functions of biosphere reserves"

(This refers more particularly to (a) the surface area required to meet the long term conservation objectives of the core area(s) and the buffer zone(s) and (b) the availability of areas suitable for working with local communities in testing and demonstrating sustainable uses of natural resources).

Total area of Katon-Karagay Biosphere Reserve's territory is 1,631,940 ha. The main core zone occupies 126,432 ha, buffer zone – 855,508 ha, development zone – about 650,000 ha. The main and buffer zones correspond to the territory of Katon-Karagay state national nature park.

4. 5 Through appropriate zonation:

"(a) a legally constituted core area or areas devoted to long term protection, according to the conservation objectives of the biosphere reserve, and of sufficient size to meet these objectives".

(Describe the core area(s) briefly, indicating their legal status, their size, the main conservation objectives).

The main zone of biosphere reserve is strictly protected *zone of nature reserve regime* of Katon-Karagay state nature national park, which represents natural mountain complex of Western Altai. Article 44 of Chapter 8 of the Law of RK «About specially protected national territories» gives clear definition of national nature park: «state national nature park is a specially protected natural territory with the status of nature protective and scientific institution, dedicated for conservation of biological and landscape diversity, use in nature protection, ecologic-educational, scientific, tourist and recreational goals of unique natural complexes and objects of state nature reserve fund, which have special ecological, scientific, historic-cultural and recreational value». According to Article 45 paragraph 2 of the same Law: «within the reservation conditions

zone of the state wildlife reserve any economic and recreational activities shall be prohibited under the reservation conditions established, which shall be corresponding to the protection regime of the state wilderness area».

Katon-Karagay state nature national partk corresponds with the highest category (A1) of natural territories of IUCN. Area of the core biosphere reserve›s zone is 126,432 ha, which represents 2 very large and 5 small parts. Altitudinal limits of biosphere reserve in the main part vary from 2000 to 4506 m (Belukha mountain).

"(b) a buffer zone or zones clearly identified and surrounding or contiguous to the core area or areas, where only activities compatible with the conservation objectives can take place".

(Describe briefly the buffer zones(s), their legal status, their size, and the activities which are ongoing and planned there).

According to Article 45 (paragraph 1) of the Law of RK «About SPNA» the buffer zone of Katon-Karagay Biosphere Reserve are 3 zones of Katon-Karagay state national park: a) ecological stabilization zone; b) zone of tourism and recreational activity; c) zone of limited economic activity, as well as specially established protective zone of the reserve, which includes 2-3 km stripe along national park's perimeter.

According to Article 45 (paragraphs 3, 4, 5 and 6), asnd Article 46-48 of this Law:

«3. Within the *ecological stabilization zone* the reservation regime shall be established, prohibiting economic and recreational activities except regulated ecological tourism and arrangements for the restoration of damaged natural complexes and objects of the state natural-preserved fund.

4. *The tourism and recreational activity zone* shall be classed as ones for regulated short- and long-term resting of visitors of the national natural park. Within the tourism and recreational activity zone the protection regime shall be established, ensuring preservation of the natural complexes and objects of the state natural-preserved fund, where regulated use for the purposes of tourism and recreation (except hunting) shall be allowed, including arranging for tourist routes, trails, bivouacs, and viewing points, taking into account the recreational load rates.

5. *Within the limited economic activity zone* administrative facilities shall be located, economic activities which are necessary for ensuring protection and operation of the national natural park, visitors servicing, including arrangement of amateur (sport) hunt and fishing shall be run along with construction and operation of recreation centers, hotels, camping sites, museums and other service objects.

6. Protection and restoration arrangements shall be implemented within the national park area as per the management plan thereof."

Carabus imperialis

Carabus michailovi

Protective zone is created to protect from unfavourable influence from around specially protected natural territories, with prohibition in the limits of these zone of any activity, negatively influencing the condition and restoration of ecosystems of the given territory.

There are lands not withdrawn from the main land users on the buffer zone of biosphere reserve's territory, they consist of agricultural use lands and are under administration of agricultural organizations and private land users. Economic activity on separate parts of the protective zone (haymaking, cattle pasture) is carried out by agreement with state authority (Forestry and Hunting Committee under the Ministry of Environmental Protection of RK) and under control of the administration of state nature national park. Buffer zone's area is 855,508 ha.

"(c) an outer transition area where sustainable resource management practices are promoted and developed".

(The Seville Strategy gave increased emphasis to the transition area since this is the area where the key issues on environment and development of a given region are to be addressed. Describe briefly the transition area(s), the types of questions to be addressed there in the near and the longer terms. The Madrid Action Plan states that the outer boundary should be defined through stakeholder consultation).

Transition zone (zone of development, collaboration) of Katon-Karagay Biosphere Reserve is located on the territory of Katon-Karagay administrative district of Eastern Kazakhstan oblast. Total land area of the transition zone is about 650,000 ha.

Highways to Katon-Karagay Biosphere Reserve are: 1) from Western, Kazakhstan side – highway of republican importance Ust-Kamenogorsk – Bolshenarymskoye village – Katon-Karagay village – Uryl village – Rakhmanovskiy Klyuchi village. This road has a good asphalt cover up to Uryl village. Then it is followed by gravel surface. The same road connects nearest railroad station Zubovka (Zyryanovsk town) and local airport in Katon-Karagay village. Distance from Ust-Kamenogorsk to Uryl village is 417 km; from Uryl village to Rakhmanovskiy Klyuchi resort – 45 km. 2) roads of oblast importance include Katon-Karagay – Korobikha road – 45 km; Pechi – Beloye – 24 km.

Transition zone of biosphere reserve comprises lands of 7 rural districts:

Aksu rural district: villages Aksu, Verkh-Katun, Fykalka, Chalovka;

Zhambyl rural district: villages Zhambyl, Rakhmanovskiye Klyuchi, Karaayryk, Shubaragash, Berel, Maraldy;

Belkaragay rural district: villages Belkaragay, Topkayik, Ornek, Sogornoye;

Katon-Karagay rural district: villages Katon-Karagay, Moyildy, Zhanaulgo, Shyngystay, Kabyrga;

Korobikhinskiy rural district: villages Korobikha, Pechi, Cheremoshka;

Urylskiy rural district: villages Uryl, Arshaty, Yenbek;

Chernovinskiy rural district: villages Chernovaya, Akmaral, Kyzylzhuldyz, Kayindi.

Administrative center of biosphere reserve is located in Katon-Karagay village, founded in the end of 18th century. Modern demographic situation is evaluated to be stable.

(d) Please provide some additional information about the interaction between the three areas.

All three zones are connected and complement each other. The core zone is closed for visits and represents reference areas of regional natural complexes, as well as important genetic reserve of wild flora and fauna species; this zone is a control in long-term monitoring.

The buffer zone is also under protective regime, but limited human activity is allowed taking into account conservation and restoration of objects of state nature-reserv fund and by corresponding agreement with state authorities. Tourist and recreational activities in this zone are carried out by state national nature park or physical and legal bodies if they have license to undertake tour operator activity. Physical and legal bodies are responsible for keeping the site in the condition to provide conservation of state nature reserve fund's objects, and comply with the environmental protection requirements.

Both zones serve for conservation of natural complexes and partially for sustainable development.

The transition zone is allows main types of traditional economica activity of land users, providing stable use of nature resources, but prohibiting or limiting types of nature use and economic activity, negatively influencing ecological systems. Limitation of economic activity of land plots owners and land users in the protective zone state national nature park are established by the resolutions of local authorities of oblast, cities of Republican importance, capitals in accordance with the present Law. This zone is used for living by local population, for development of economy, culture and education and provides function of stable development of the territory.

As a whole, this zoning provides conditions for elimination of the conflict between social-economic development and protection of wild natural complexes and gives an opportunity for stable development of economy and culture.

4. 6

"Organizational arrangements should be provided for the involvement and participation of a suitable range of inter alia public authorities, local communities and private interests in the design and the carrying out of the functions of a biosphere reserve".

For organization of partner relations a special Coordinational Council of Katon-Karagay biosphere reserve was created; its participants include representatives of state nature reserve, nature users, local authorities and public organizations.

4.6.1 Describe arrangements in place or foreseen.

(Describe involvement of public and/or private stakeholders in support of the activities of the biosphere reserve in core, buffer and transition areas (such as agreements, protocols, letters of intent, protected area(s) plans)).

Supported by two UNDP/GEF projects (Conservation of biodiversity of Sayan-Altai region), state nature reserve staff was sent to exchange experience and for training to Korgalzhyn Biosphere Reserve, Karatau Nature Reserve (Kazakhstan), Berezinskiy Nature Reserve (Belarus), «Zapovedniki» ecological center (Moscow, Russia), and to scientific-practical conferences in Kazakhstan and abroad (Minsk, Belarus). In 2005-2012 training seminars were conducted dedicated to management plan preparation, biodiversity monitoring, state inspectors were trained in drawing up reports, complying with safety operating procedures and fire prevention.

Local communities are involved in the biosphere reserve›s management through the Coordinational Council of Katon-Karagay Biosphere Reserve, created in 2012 and consisting of state agencies (territorial management of forestry and hunting), nature reserve, Akimats, local NGOs and land users. This management body is also important for collaboration and to overcome the contradictions between all stakeholders, as well as for development of scientifically based sustainable nature use.

4.6.2 Have any cultural and social impact assessments been conducted, or similar tools and guidelines been used?

(e.g. Convention on Biological Diversity (CBD)'s Akwé: Kon guidelines; Free, Prior, and Informed Consent guidelines, Biocultural Community Protocols, etc.). *(UNESCO's Programme on Man and the Biosphere (MAB) encourages biosphere reserves to consider and respect indigenous and customary rights through programmes or tools, in accordance with the United Nations Declaration on the Rights of Indigenous Peoples* (*http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf when relevant and appropriate)).*

During the GEF Project a group of sociologists carried out research of social-economic situation in rural settlements

of the proposed reserve. A review was compiled, providing an assessment of modern social-economic situation in the region's demography and migration, agriculture and social infrastructure, and giving proposals for territory's zoning, sustainable economic development zone, territory's development perspectives. Besides, every year local Akimat staff collects data on social-economic development with further submission to automated data base.

4. 7 Mechanisms for implementation:

Does the proposed biosphere reserve have:

"(a) mechanisms to manage human use and activities in the buffer zone or zones"?

If yes, describe. If not, describe what is planned.

According to Kazakhstan's legislation, management of economic activity on some parts of biosphere reserve's buffer zone (haymaking, cattle pasture) is carried out by agreement with state authority (Forestry and Hunting Committee under the Ministry of Agriculture of RK) and under control of state nature reserve's administration, all questions and arising problems are settled at the meetings of Coordinational Council of biosphere reserve. All activities on the lands of the protected zone and establishment of 2-3-km protective zone were negotiated with all land users in the course of preparation of the Resolution of Akim of Katon-Karagay district of Eastern Kazakhstan oblast. Private lands of the buffer zone were not withdrawn from the land users.

"(b) a management policy or plan for the area as a biosphere reserve"?

If yes, describe. If not, state how such a plan or policy will be developed, and the timeframe. (If the proposed area coincides with one or more existing protected natural area(s), describe how the management plan of the proposed biosphere reserve will be complementary to the management plan of the protected area(s)).

At the present time there is a Management Plan of Katon-Karagay State Nature National Park, which describes management of the core and buffer zones of Biosphere Reserve. The land users have their own management plans, which are in accordance with Management Plan of national nature park. So, simple combination of all these plans is in fact Overall Integrated Management Plan of the whole territory of Biosphere Reserve. All controversial issues are discussed at the sessions of Coordinational Council of Biosphere Reserve.

"(c) a designated authority or mechanism to implement this policy or plan"?

The biosphere reserve is managed through Katon-Karagay Biosphere Reserve Coordinational Council created in 2012. Before that the territory of the core and buffer zone was managed through Scientific-Technical Council of national park (up to September 2012). Coordinational Council is a collegial public body created to introduce policies of effective management and sustainable use of biosphere reserve's resources, alternative activities, resource-conserving and resource-restoring technologies. The Coordinational Council of biosphere reserve consists of representatives of state agencies (territorial agency of forestry and hunting, oblast territorial agency of fishery), state nature reserve, Akimats (department of land resources, agriculture, etc.), local NGOs and land users, and is necessary in providing collaboration and problem-solving opportunities for all stakeholders.

"(d) programmes for research, monitoring, education and training"?

If yes, describe. If not, describe what is planned.

There is a current monitoring of the condition and conservation of natural complexes on the territory of biosphere reserve, and monitoring of rare and threatened species to clarify the condition of the populations, ecological peculiarities of rare plant and animal species, providing a basis for evaluation of the species' conservation and restoration perspectives. The goal of the monitoring is to obtain regular objective data about the condition of plants and animals on the territory of biosphere reserve, as well as on the condition of their habitat. Based on monitoring data it is necessary to conduct current evaluation of the condition of populations and ecosystems, biosphere reserve's functioning effectiveness, and development of measures for critical and unfavourable situations' prevention. In the limits of monitoring there is an ongoing research for the Nature Chronicles, as well as counts of mammal, bird and invertebrate animal populations. According to the Management Plan, in the present time there is an ongoing inventarization and research of the objects of state nature reserve fund, as well as research of natural processes and ecological monitoring. These scientific works include observations of phenomena and processes for Nature Chronicles programme, flora and vegetation inventarization, research of raer and endangered vertebrate and invertebrate animals, biodiversity condition monitoring and indicator species populations' condition.

With the support from UNDP/GEF Project (Conservation of biodiversity of Sayan-Altai region) staff members of state nature reserve had a chance to raise their qualifications and exchange experience in different specially protected natural territories of Kazakhstan and abroad. Also different educational seminars were held for Reserve's staff concerning a variety of topics: management plant development, biodiversity monitoring, etc.

5. ENDORSEMENTS

5. 1 SIGNED BY THE AUTHORITY/AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE CORE AREA(S):

Full name and title: **Mustafin E.**, Director of Katon-Katagay State Nature National Park
Date: 14 August 2013
Address, email, phone number: 115 Bokeev Str., Katon-Karagay Village, East Kazakhstan
phone: +7(7234) 221 766

5. 2 SIGNED BY THE AUTHORITY/AUTHORITIES IN CHARGE OF THE MANAGEMENT OF THE BUFFER ZONE(S):

Full name and title: **Mustafin E.**, Director of Katon-Katagay State Nature National Park
Date: 14 August 2013
Address, email, phone number: 115 Bokeev Str., Katon-Karagay Village, East Kazakhstan
phone: +7(7234) 221 766

5. 3 Signed as appropriate by the National (or State or Provincial) administration responsible for the management of the core area(s) and the buffer zone:

Full name and title: **Ustemirov K.Zh**., Chairman of Forestry and Hunting Committee, Min. Env. Protection RK
Date: 07 August 2013
Address, email, phone number: 8 Orynbor Str., Min. House, Astana, 010009, Kazakhstan,
e-mail: ustemirov.k@eco.gov.kz

5. 4 Signed by the authority/authorities, elected local government recognized authority or spokesperson representative of the communities located in the transition area.

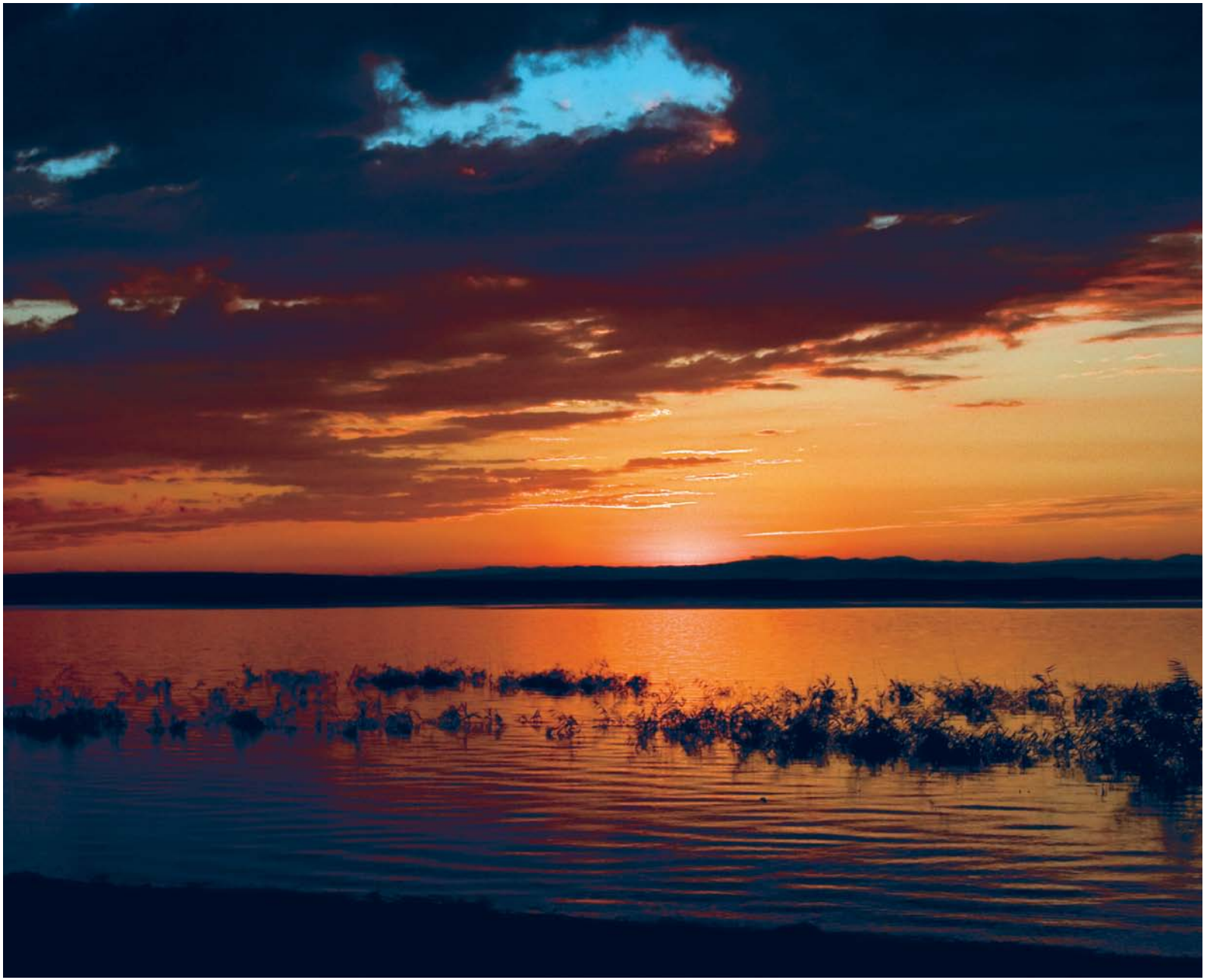
Full name and title: **Tynybekov Zhanbolat**, Akimat Katon-Karagay Dstr., East Kazakhstan
Date: 15 August 2013
Address, phone number:102 Ablaykhan Str., Ulken-Naryn Town, East kazakhstan,
phone: +7(72341)2-11-41, e-mail: katon.@mail.ru

Full name and title: **Alkenev Rafkhat**, Director “Teres Bulak” Farmer Company
Date: 15 August 2013
Address, phone number:25 Baykunakov Str., Katon-Karagay Village, East Kazakhstan,
phone: +7(72342) 21573

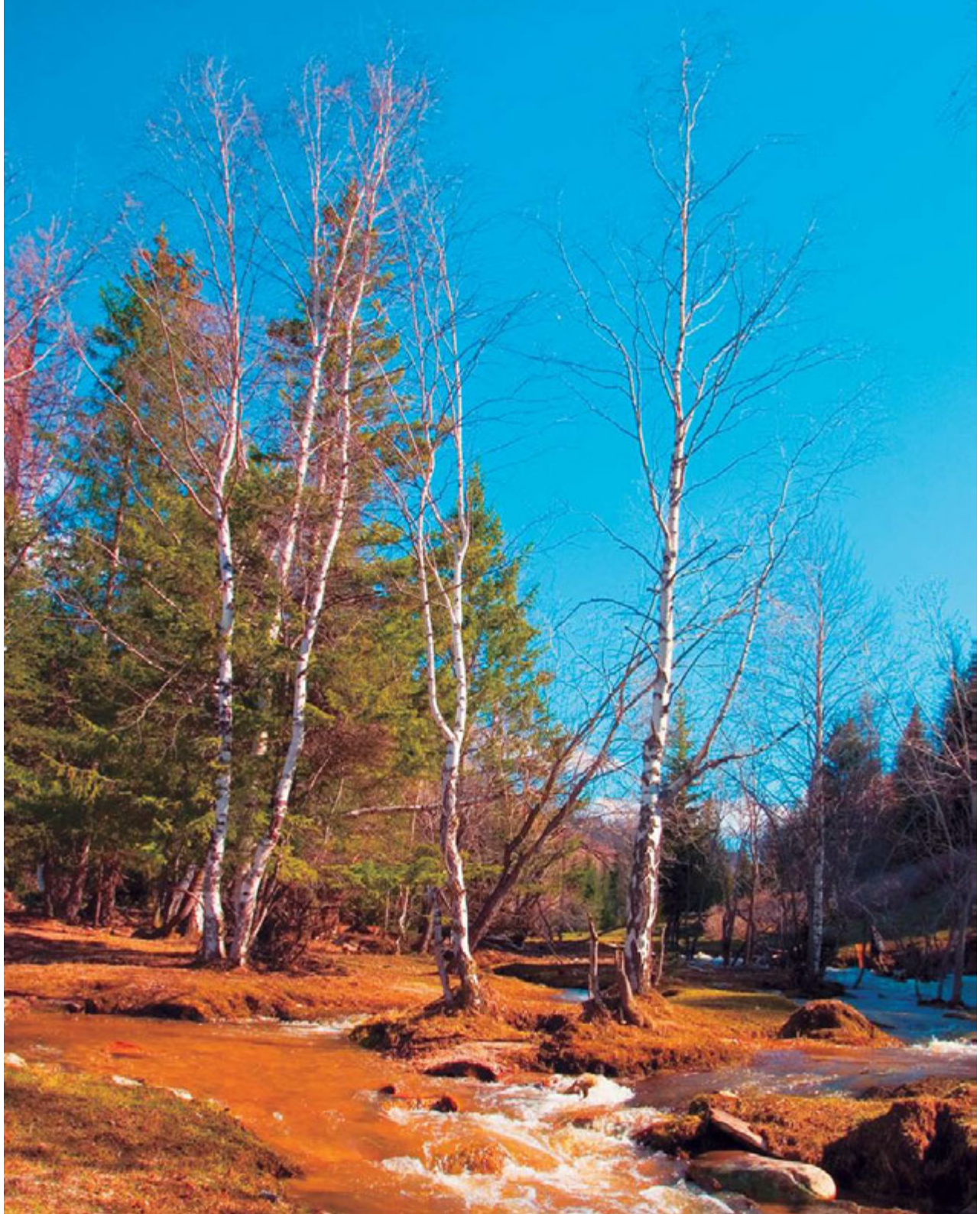
Full name and title: **Mozhanova Gaukhar**, Director NGO “Mametek”
Date: 15 August 2013
Address, phone number:35 Toraygyrov Str., Katon-Karagay Village, East Kazakhstan,
phone: +7(777) 2254917 e-mail: gauhar.1955@mail.ru

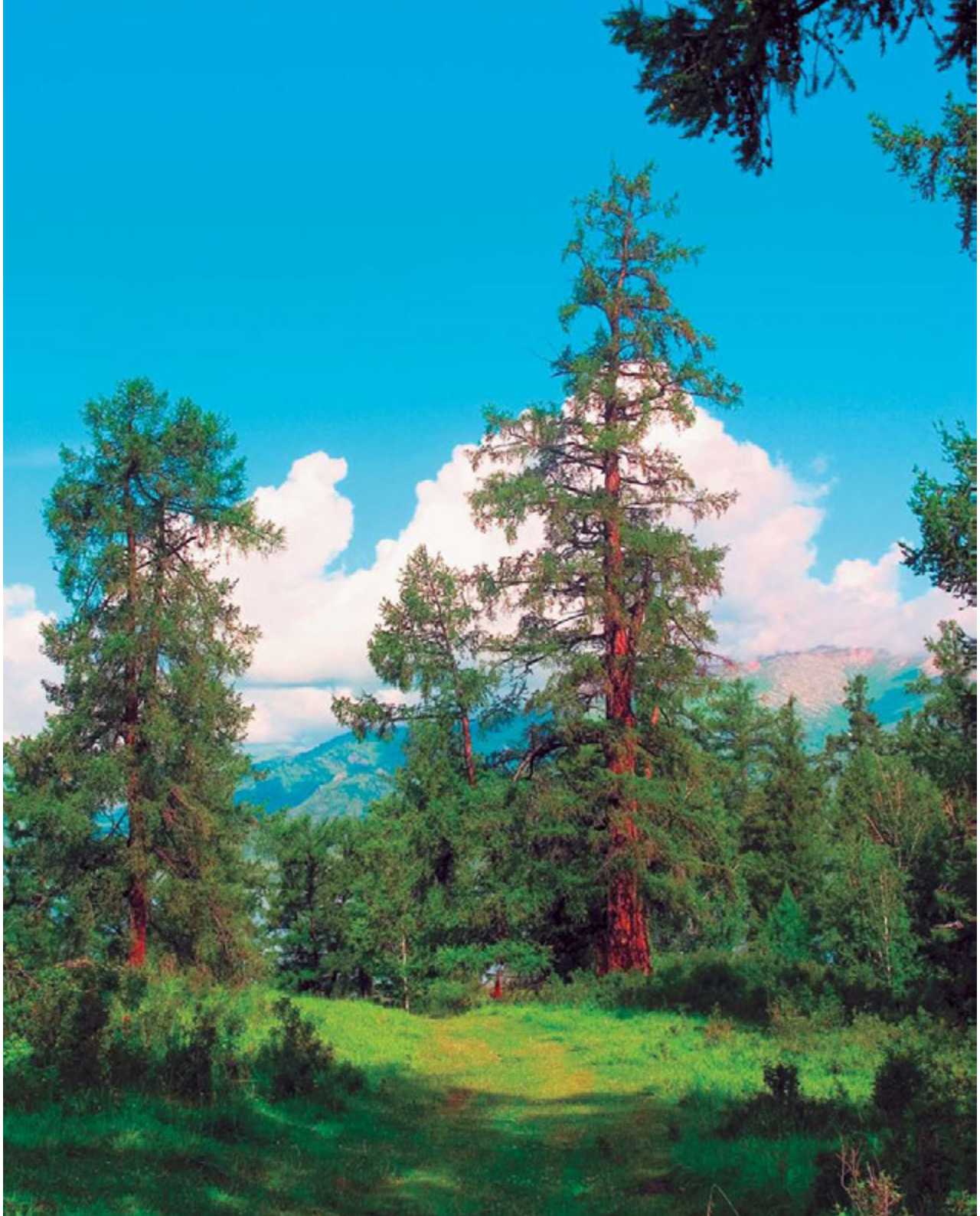
5. 5 Signed on behalf of the MAB National Committee or focal point:

Full name and title: **Roman Jashenko**, Kazakhstan National MAB Committee
Date: 09 September 2013
Address, email, phone number: 93 al-Farabi Ave., Institute of Zoology, 050060, Almaty, Kazakhstan,
e-mail: r.jashenko@inzool.kz , phone: +7(727) 2694876



Sunset in Boukhtarma





PART II: DESCRIPTION

KATON-KARAGAY

6. LOCATION (COORDINATES AND MAP(S)):

6. 1 Provide the biosphere reserve's standard geographical coordinates (all projected under WGS 84):

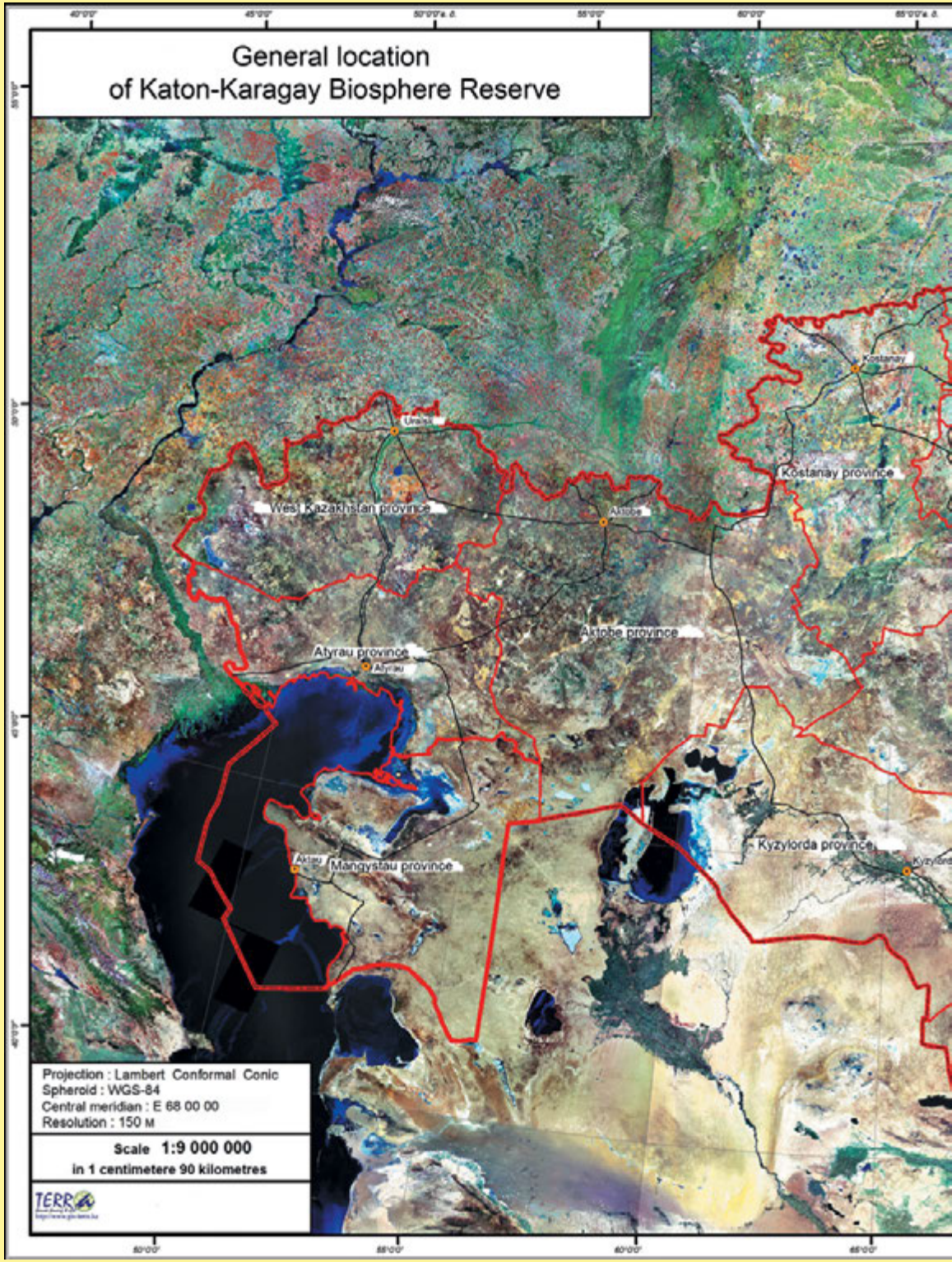
Cardinal points:	Latitude	Longitude
Most central point:	N 49°15′	E 86°10′
Northernmost point:	N 49°49′	E 86°39′
Southernmost point:	N 48°53′	E 86°10′
Westernmost point:	N 49°36′	E 84°56′
Easternmost point:	N 49°14′	E 87°19′

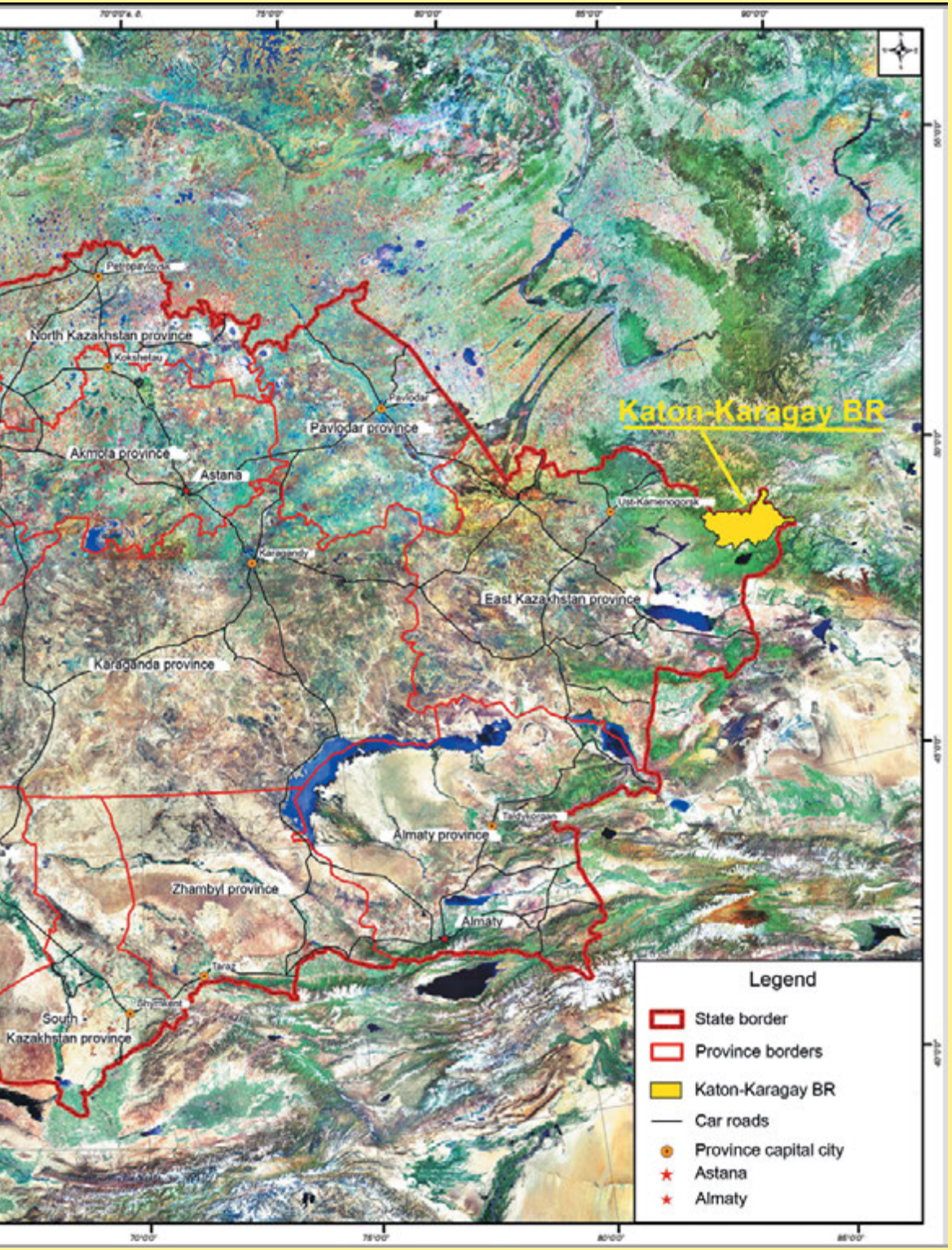
PROVIDE A MAP(S) ON A TOPOGRAPHIC LAYER OF THE PRECISE LOCATION AND DELIMITATION OF THE THREE ZONES OF THE BIOSPHERE RESERVE (MAP(S) SHALL BE PROVIDED IN BOTH PAPER AND ELECTRONIC COPIES). SHAPEFILES (ALSO IN WGS 84 PROJECTION SYSTEM) USED TO PRODUCE THE MAP MUST BE ATTACHED TO THE ELECTRONIC COPY OF THE FORM. 6. 2

If possible, also provide a link to access this map on the internet (e.g. Google map, website…).

LOCATION (COORDINATES AND MAP(S)): 7.

Total: 1 631 940 (ha)


General location
of Katon-Karagay Biosphere Reserve
Kostanay province
West Kazakhstan province
Aktobe province
Atyrau province
Kyzylorda province
Mangystau province
Projection : Lambert Conformal Conic
Spheroid : WGS-84
Central meridian : E 68 00 00
Resolution : 150 м
Scale 1:9 000 000
in 1 centimetere 90 kilometres


Katon-Karagay BR
North Kazakhstan province
Pavlodar province
Akmola province
Astana
East Kazakhstan province
Karaganda province
Almaty province
Zhambyl province
Almaty
South Kazakhstan province
Legend
State border
Province borders
Katon-Karagay BR
Car roads
Province capital city
Astana
Almaty

	Terrestrial	Marine (if applicable)	Total
7.1 Area of Core Area(s):	126 432 ha	_____ ha	126 432 ha
7.2 Area of Buffer Zone(s):	855 508 ha	_____ ha	855 508 ha
7.3 Area of Transition Area(s):	650 000 ha	_____ ha	650 000 ha
TOTAL:	1 631 940 ha	_____ ha	1 631 940 ha

7. 4 Brief rationale of this zonation in terms of the respective functions of the biosphere reserve. If a different type of zonation also exists indicate how it can coexist with the requirements of the biosphere reserve zonation.

(e.g., if national criteria exist for the definition of the area or zones, please provide brief information about these).

Kazakhstan land legislation defines zoning of territories as identification of the lands and their purpose and usage regime. According to Article 44 of the Law "About specially protected natural territories", "The state national natural park shall be a specially protected wildlife area registered as nature preservation and scientific institution and intended for conservation of biological and landscape variety and use especially valuable unique nature complexes and objects of the state natural-preserved fund for the purposes of nature conservation, ecological education, science, tourism and recreation" (paragraph 1).

Primary activities of the state national natural parks include the following: "1) preservation of natural complexes, unique and pattern wildlife areas, objects of the state natural-preserved fund, natural, historical and cultural inheritance; 2) ensuring of the protection regime of state national natural parks and its protective area; 3) ecological education; 4) development of scientific methods for preservation of the biological variety; 5) monitoring of ecological systems and separate natural objects under the Nature Chronicle program; 6) restoration of damaged natural complexes, objects of the state natural-preserved fund, natural, historical and cultural inheritance; 7) regulation of the use of the state national natural park and its protective zone for the purposes of ecological education, science, tourism, recreation and limited economic activities". (paragraph 2).

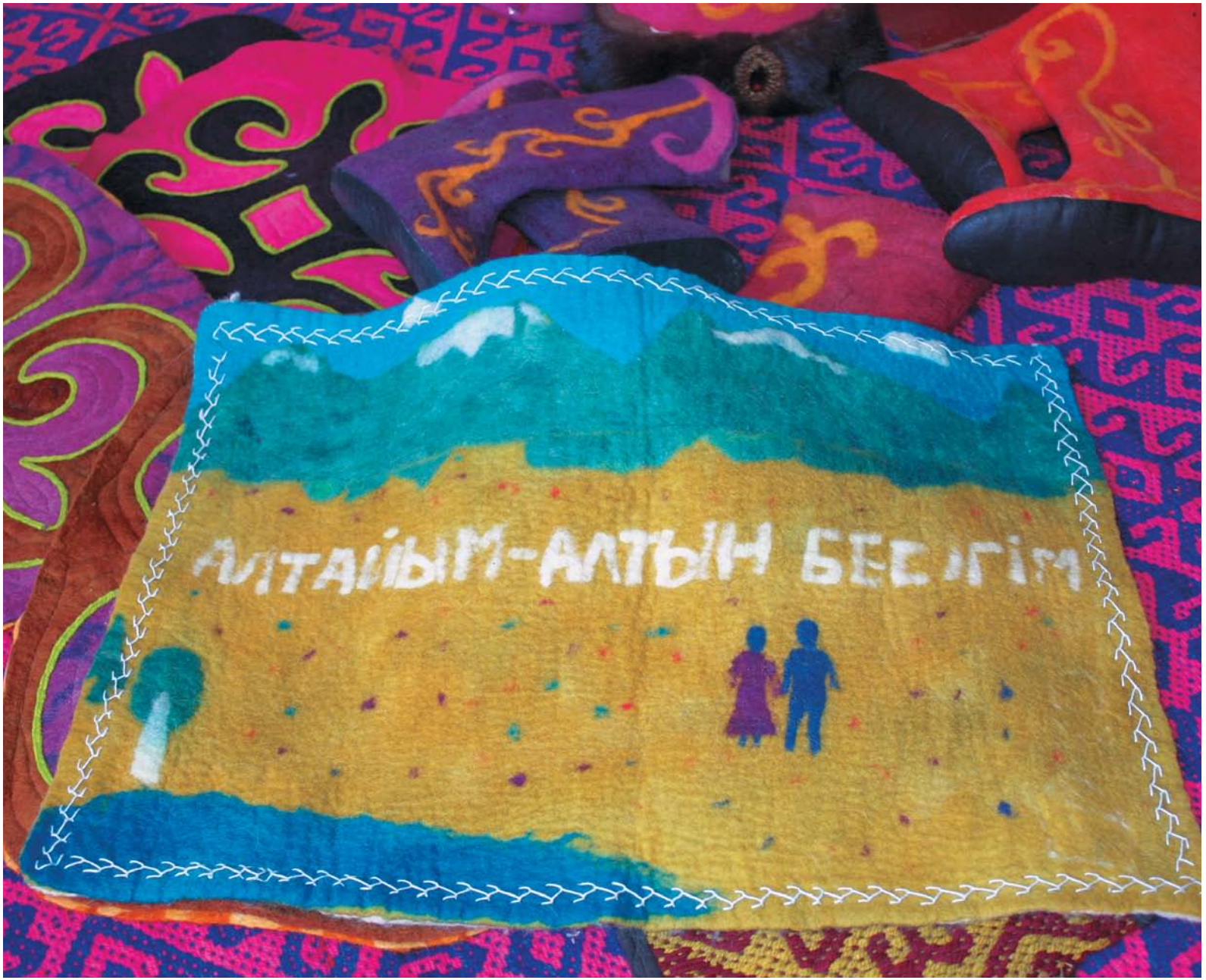
Functional zones' identification in Alakol Biosphere Reserve was conducted with goal of conservation of typical, rarea and unique natural complexes of Kazakhstan part of South-Western Altai, as well as with the goal of decrease of negative anthropogenic influence on nature condition with provision of conditions for stable social-economic development of the territory without infringement of the rights and freedoms of local people. For this purpose field biologic-geographical and social-economic research was carried out in 2005-2011 in the frame of UNDP/GEF Project on conservation of biodiversity of South-Western Altai. Factors taken into consideration during zoning included modern condition and importance of territory's natural components, as well as modern and potential use of the land for social-economic development of the territory. In the present time and according to UNESCO MAB requirements there are 3 functional zones identified for modern territory of biosphere reserve:

1. *Core zone (main zone)*. According to the legislation of Kazakhtan, this territory includes the zone of nature reserve's regime of Katon-Karagay National Nature Park, which prohibits any economic activity and provides strict protection regime.

2. *Buffer zone,* which consists of three zones – ecological stabilization, tourist activity and limited economic activity, as well as protective zone of state nature park, established according to the legislation of Kazakhstan (Article 44 paragraph 1 of the Law "About SPNA"). Any activity that would negatively influence the condition and rehabilitation of the given territory's ecosystems is prohibited here. The territory of buffer zone of biosphere reserve permits only activities of ecological education, recreation, ecotourism, and scientific research. Any limited economic activity in some areas of buffer zone (haymaking, cattle pasture) is carried out only by agreement with governmental authority (Forestry and Hunting Committee) and under the control of administration of national park.

3. *Transition area* (zone of collaboration) represents settled and developed lands used for hayfields, fallow lands, pastures, hunting and fishing farms and settlements.


Оралхан Бөкеевтің,
60 жасына орай
Алтай Республикасы
Қосағаш
ауданындағы
бауырластарынан


АЛТАЙЫМ-АЛТЫН БЕЛГІМ

8. BIOGEOGRAPHICAL REGION:

[Indicate the generally accepted name of the biogeographical region in which the proposed biosphere reserve is located.]
(The term "major biogeographic region" is not strictly defined but you may wish to refer to the Udvardy classification system (http://www.unep-wcmc.org/udvardys-biogeographical-provinces-1975_745.html)).

The territory of Katon-Karagay Biosphere Reserve, according to the modern scheme of zoogeographic regioning, is located in Altai province of Boreal subregion of Palaearctic.

9. LAND USE:

9. 1 HISTORICAL:

(If known, give a brief summary of past/historical land use(s), resource uses and landscape dynamics of each zone of the proposed biosphere reserve).

Existing farms and people, living on the territory of Katon-Karagay Biosphere Reserve's transition zone, practice breeding of cattle, sheep, Marals, horses and deers. Plant production is an additional branch and the main plantation areas are occupied by fodder perennial and annual herbs and fodder cereal cultures (oat, barley) for feeding cows, Marals, horses, sheep in winter period. Cattle breeding sector of the region is dominated by private ownership (mainly home and other private farms). But private herds are not numerous and not very productive due to lack of quality forage and cattle breeds. The majority of farms have small amount of animals – less than 40 sheep. Cattle is driven to the pastures located at a walking distance from the settlement. Since pasture is organized only at close distances from the settlements, pasture lands tend to be deteriorated and grazed. The territory of biosphere reserve's transition zone includes seven rural districts. In the land use structure the larges agricultural lands are situated on the territory of Belovskiy rural district (39.6%), a little less – in Koro-

bikhinskiy (14.5%) and Belkaragay (12.2%) rural districts, and least area of agricultural lands is in Urylskiy, Zhambylskiy, Chernovinskiy, Katon-Karagay rural districts (from 7.9 to 9%).

The area of agricultural lands is distributed unevenly, which is caused by the relief of corresponding rural district. For example, the most part of rural district territories with least agricultural lands' area is located in mountain-meadow zone, where many lands are impossible to use for agriculture (high mountains, steep slopes, coniferous forests, rocky landscape, etc.). The main territory of Belovskiy, Belkaragay, Korobikhinskiy rural district is suitable for agriculture and accessible for cattle pasture, haymaking, plant growing (lowland, flat slopes, deciduous forests).

Spacial location of agricultural lands on the territory of Katon-Karagay Biosphere Reserve depends on the peculiar conditions of land use, characterized by complex relief forms, different soil quality. The main hayfield area is located in the valley part of Belkaragay and Katon-Karagay rural districts, and other areas – at the hills' foothills, on mountain slopes. Large areas of natural hayfields are situated in Belovskiy, Korobikhinskiy, Urylskiy rural districts, which is also caused by the relief and presence of lands, suitable for haymaking. Natural hayfields also include areas which are not suitable for other uses due to conditions of soil, relief or spacial location. In the majority of cases those are large areas located along rivers and streams. Pasture lands occupy considerable part of biosphere reserve's transition zone. Pastures are used mainly during all pasture period. Considerable pasture areas are located in hard to access sites, where slopes are more than 150. These pastures are not used by population. Pasture area near settlements is 83.9% of total pasture area.

It is noteworthy that pastures, especially in mountain regions, have exclusive importance in protection of the environment. It is herbaceous and shrub ecosystems, used as pastures, that support water balance of watersheds in these regions, prevent soil erosion, control local geochemical cycles. It is also important that pasture ecosystems serve as carbon depot (creditor), the most long-term of it, because carbon is attached almost forever to soils rich in humic and fulvic acids. Pastures are also an important source of wild nature, they provide considerable part of honey yield, contain resources of medicinal, food and craft plants. Thus, the functions of natural pastures of biosphere reserve's transition zone are not limited by their use for cattle pasture. Although cattle pasture itself in some cases may lead to decrease of forest growth (prevent forest restoration) or negatively influence wild nature resources, in the other cases it may favourably influence the condition of forest massifs, preventing grass burning which leads to forest fires.

In the present time there are 881 registered and active agricultural formation on the proposed territory.

The idea of establishment of specially protected natural territory (national park) on the territory of Katon-Karagay district was conceived in late 1980s, when there were geological surveys which found Ak-Alakhinskaya group of tantalum-lithium deposits.

In late 1990s scientists and public activists of Kazakhstan often expressed their opinion in press and in appeals to the Government and in the Parliament of RK about creation of specially protected natural territory in Katon-Karagay area.

Preconditions of SPNA establishment at this specific site lied in the fact that natural complexes of the given region were very well conserved and were less anthropogenically influenced. At the same time biological diversity and genetic resources are well conserved here, there are habitats of rare and endangered plant and animal species, including the ones listed in the Red Data Book of RK and IUCN RedList, and there also is high recreational potential of the territory with presence of many objects of natural and historic-cultural importance. An important role was played by transboundary location of other specially protected natural territories of Russia, Mongolia and China. Establishment of biosphere reserve was facilitated by presence of botanic-geological reserve «Rakhmanovskiye Klyuchi».

The first step in establishment of Katon-Karagay State National Nature Park was Resolution of Akim of Eastern-Kazakhstan oblast №1-379p, as of 18 June 1998 «About organization of Katon-Karagay Nature Park».

The next step, in accordance with active legislation of RK, was preparation of documents for SPNA organization – natural – scientific and technical – economic justifications; so, in 1998 «Ecosystem Ltd.» began project works on creation of Katon-Karagay Nature Park. In 2000 the project of natural – scientific and technical – economic justifications were prepared. At first the planned area of national park was 436,700 ha. It included all the territory of Berel state institution for forest and animal protection and Shyngystay forestry of Katon-Karagay state institution for forest and animal world protection. But scientific and public organizaitons did not support initial borders and suggested status of oblast specially protected natural territory. According to the opinion of the scientists, creation of the park of local importance in indicated borders did not correspond with national and international importance of Kazakhstan Altai.

Ecosystem Ltd. finished preparation of natural – scientific and technical – economic justifications in 2001 taking into consideration avobe mentioned proposals. A positive conclusion of ecological expertise on those documents was obtained on 22 July, 2001 (№09-1087 and №09-1687). Total area of national park to this year was 643,477 ha.

Forestry, Fishery and Hunting Committee under Ministry of Natural Resources and Environmental Protection of RK prepared project of Resolution of the Government of RK, which was published on 17 July, 2001 № 970 «About creation of Katon-Karagay State National Nature Park». This day is birthday of Katon-Karagay State National Nature Park. On July 3, 2003 WWF (World Wildlife Fund) gave «Gift to Earth» Certificate to the Government of RK for establishment of Katon-Karagay State National Nature Park, proving the right direction of Kazakhstan policy concerning SPNA expansion and network creation for biodiversity conservation of the country and whole planet.

9. 2 Who are the main users of the biosphere reserve? (for each zone, and main resources used). If applicable, describe the level of involvement of indigenous people taking into account the "United Nations Declaration on the Rights of Indigenous Peoples". *(http://www.un.org/esa/socdev/unpfii/documents/DRIPS_en.pdf).*

Since the main zone of Katon-Karagay Biosphere reserve, according to the legislation of Kazakhstan, is a zone of nature reserve regime, Article 44 of Chapter 8 of the Law «About SPNA» states that here «any economic activity and recreational use of the territory are prohibited… nature reserve regime is established, correspondent with the type of state nature reserve regime». Control of nature reserve regime is carried out by the administration of Katon-Karagay Biosphere Reserve.

The buffer zone of biosphere reserve includes 3 other zones of Katon-Karagay National Park (ecological stabilization, tourist and recreational activity and limited economic activity, as well as protective zone of state nature park), so, according to Articles 45-48 of Chapter 8 of the Law of RK «About SPNA», all activity types are strictly regulated and are under the control of Katon-Karagay Biosphere Reserve's administration. Limited economic activity of local population is carried out taking into account conservation and restoration of objects of state nature reserve fund and with corresponding permissions of state bodies (Forestry and Hunting Committee under the Ministry of Environmental Protection and district Akimat).

Transition zone (zone of development, collaboration) of biosphere reserve is located on the territory of Katon-Karagay administrative district. Its separate parts, with forest plantations and hunt, are very important concentration sites for regional biodiversity, this is why these territories need considerate nature use regime. Farms and population practice breeding of cattle, horses, sheep, bees, Marals and deers. Marals and deers are bred in nine medium and large peasant farms. Agricultural production is practiced by 1518 peasant farms and 9,200 private homes. Local homes produce 94% of milk, 86% of meat and 82% of wool, as well as honey and other apiculture products. In the last years private home farms of the region produced from 16,200 to 53,500 tons of milk. In comparison with 1997 its production during 10 years increased in 3-3.5 times. The share of cattle breeding in total volume of agricultural gross product is 72%.

9. 3 What are the rules (including customary or traditional) of land use in and access to each zone of the biosphere reserve?

Since the main zone of proposed biosphere reserve is a zone of nature reserve regime, all activity types are strictly defined, according to Article 44 Chapter 8 of the Law «About SPNA»:

1. On the territory of state nature reserves it is allowed to carry out land and aviation works for prevention and extinguishing of forest and steppe fires.

2. Presence of physical bodies on the territory of state nature reserve is permitted only with permissive documents, excluding state nature reserve staff and Government officials in charge of the state natural reserves.

3. In order to grant acces to sites of worship of some religion (pilgrimage sites), located on the territory of nature reserve or outside of its territory, on the roads going through the territory of nature reserve, administration of state nature reserve by agreement with correspondent religous group may grant free group visit of those sites or access of those sites, accompanied by state nature reserve inspector.

The buffer zone of biosphere reserve actually includes zones ecological stabilization, tourist and recreational activity and limited economic activity, as well as protective zone of state nature park, this is why, according to paragraphs 3-6 of Article 44 Chapter 8 of the Law of RK «About SPNA», all activity types are strictly regulated here:

«3. Within the ecological stabilization zone the reservation regime shall be established, prohibiting economic and recreational activities except regulated ecological tourism and arrangements for the restoration of damaged natural complexes and objects of the state natural-preserved fund.

4. The tourism and recreational activity zone shall be classed as ones for regulated short- and long-term resting of visitors of the national natural park.

Within the tourism and recreational activity zone the protection regime shall be established, ensuring preservation of the natural complexes and objects of the state natural-preserved fund, where regulated use for the purposes of tourism and recreation (except hunting) shall be allowed, including arranging for tourist routes, trails, bivouacs, and viewing points, tak-

ing into account the recreational load rates.

5. Within the limited economic activity zone administrative facilities shall be located, economic activities which are necessary for ensuring protection and operation of the national natural park, visitors servicing, including arrangement of amateur (sport) hunt and fishing shall be run along with construction and operation of recreation centers, hotels, camping sites, museums and other service objects.

6. Protection and restoration arrangements shall be implemented within the national park area as per the management plan thereof». The main users of this zone are administration of Katon-Karagay Biosphere Reserve and local land users.

Transition zone (zone of development, collaboration) of biosphere reserve is located on the territory of Katon-Karagay administrative district. Its separate parts, where forestry activities and hunting occur, are very important concentration sites for regional biodiversity, this is why these territories need gentle nature use regime. Nature and resource potential of transition zone is huge. Most part of this zone is suitable for pasture cattle breeding and farming. It is necessary to organizy regulated nature use regime on the territory of transition zone and measures should be taken for restoration of previously disturbed ecosystems. It is also important to further develop strategy of tourist and recreational use of nature territories, providing maximum conservation and permissible level of pressure. In this activity sector it is possible to increase local population's involvement, giving them economic benefit. The concept of biosphere reserve is directed to improve living conditions of local people with pressure decrease on natural ecosystems by introduction of alternative economic activities types, which do not harm the biodiversity.

9. 4 Describe women's and men's different levels of access to and control over resources.

(Do men and women use the same resources differently (e.g., for subsistence, market, religious/ritual purposes), or use different resources?).

Both men and women have equal access and control over resources regardless of their religion, traditions or other factors.

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:

[Approximate number of people living within the proposed biosphere reserve]

	Permanently	Seasonally
10.1 Core Area(s):	NO	About 30-40 nature protectionists (staff of State Nature Reserve)
10.2 Buffer Zone(s):	NO	About 250 nature protectionists (staff of State Nature Reserve)
10.3 Transition Area(s):	About 40 000 people	NO
TOTAL:	About 40 000 people	About 250 nature protectionists (staff of State Nature Reserve)

10. 4 BRIEF DESCRIPTION OF LOCAL COMMUNITIES LIVING WITHIN OR NEAR THE PROPOSED BIOSPHERE RESERVE.

(Indicate ethnic origin and composition, minorities etc., main economic activities (e.g. pastoralism, tourism) and the location of their main areas of concentration, with reference to the map (section 6.2)).

Total population number is 39,500 people. District center – Ulken Naryn – with population of 7,300 people. District consists of 54 settlements, 13 rural districts. Large settlements: Katon-Karagay – 5,026, Uryl – 1,429, Chernovoye – 1,380, Aksu – 1,082 people. Average population density is 3.2 people in square km.

Social-economic research of seven rural districts of Katon-Karagay district of Eastern Kazakhstan oblast showed some progess in overall condition of agricultural production and life level of local people. According to the opinion of local people, life level improves each year, along with overall well-being of the population. Economic and social life of Katon-Karagay district is directly connected with Katon-Karagay National Nature Park. Its organization provided employment for 350 people, including 250 people involved in protection of unique flora and fauna.

Farms and people practice breeding of cattle, horeses, sheep, bees, marals and deers. Marals and deers are bred in nine medium and large peasant farms and limited liability companies. Agricultural production is practiced by 1518 peasant farms and 9,200 private homes. Local homes produce 94% of milk, 86% of meat and 82% of wool, as well as honey and other apiculture products. In the last years private home farms of the region produced from 16,200 to 53,500 tons of milk. In comparison with 1997 its production during 10 years increased in 3-3.5 times. The share of cattle breeding in total volume of agricultural gross product is 72%.

Annual growth of cattle number in the last ten years is an average of 300 to 400 heads. The main reason of this rapid growth of animal population lies in the specialization changes in private homes, peasant and individual farms, increasing cattle-breeding sector and decreasing plant production. Besides, local population practices bees breeding, but there are no legally registered companies specializing in apiculture. At the same time there are about 8,000 bee families in the region in all farm categories, and gross harvest of honey during the last season is 272 tons. Difficulties, most often mentioned by local bee-keepers, include honeycomb deficit and unregulated market. For the most part, these problems are caused by absence of quality roads.

Specialization of agricultural units is cattle breeding production with additional plant growing sector. Total area of agricultural lands is 85,011 ha (66.3%), including arable lands (13,022 ha, 3.8%); hayfields (14,803 ha, 6.4%) and pastures (53,086 ha, 58.3%). The small percentage of arable lands and their uneven distribution in rural districts relates to landscape relief and presence of suitable arable lands and possibility of their processing.

Due to this plant growing is an additional sector and main plantation areas are occupied by perennial, annual herbs and forage cultures (oat, barley) for feeding cows, marals, horses, sheep in winter.

Agricultural production growth of the region is limited by size of the lands suitable for agriculture. Now almost all available arable lands and hayfields are used for agriculture. On the other hand, in many agricultural units little attention is given to cattle breeding increase measures, innovational agrotechnologies are introduced slowly, the results of selection and breeding work’s effectivenes increase are not visible. Equipment is very slowly modernized, the use of modern agricultural equipment is insufficient, most of agricultural works are done by hand.

Forestry. In 2002 the Resolution of the Government of RK prohibited principal felling of coniferous forests for the term of 10 years. The status of Katon-Karagay State National Nature Park also prohibits principal felling. Before forestry industry of the oblast was collapsing in 1990s, Berel and Katon-Karagay firestries annually produces about 60,000 m³ of wood for the main use and 10,000 m³ for sanitary felling, thus making considerable profit from wood production for forestry keeping. But in the present time wood processing into consumer goods is stopped.

Currently the wood harvesting is performed in national park as a sanitary selective cutting and cleaning cuttings of forests, as well as the dead and windfall wood harvested at cleaning liquid clutter on other logging. The volume of intermediate felling in the reserve to increase each year. The main consumers of timber are local people, and farms. Until 1990, the planting of the forest was carried out by Berel and Katon-Karagay forestries. In 1990 the reforestations were practically stopped, forest nurseries were abandoned, reforestation infrastructure was destroyed. Artificial reforestation continues with the establishment of the reserve, and all forestry activities are funded by the national budget, in accordance with the state program "Forests of Kazakhstan."

The main types of side forest use is mowing, cattle pasture, and the collection of pine nuts, berries, mushrooms, wild herbs, preparation of forage, bee-keeping, preparation of brooms. Reserve of forest side use is huge. After organizing the reserve account of the volume of side forest use and monitoring of compliance of legislation have improved significantly.

10. 5 Name(s) of the major settlement(s) within and near the proposed biosphere reserve with reference to the map (section 6.2):

Ust-Kamenogorsk – oblast capital of East Kazakhstan oblast (400 km western the biosphere reserve), the Katon-Karagay district center is located in Ulken-Narym Town in 90 km to west.

There are 7 counties on the territory of Biosphere Reserve:

Aksuy county: villages – Aksu, Verkh-Katun, Fykalka, Chalovka;

Zhambyl county: villages – Zhambyl, Rakhmanov Springs, Karaairyk, Shubaragash, Berel, Maraldy;

Belkaragay county: villages – Belkarafay, Topkayin, Ornek, Sogornoye;

Katon-Karagay county: villages - Katon-Karagay, Moyildy, Zhanaulgo, Shyngystay, Kabyrga;

Korobikha county: villages – Korobikha, Pechi, Cheremoshka;

Uryl county: villages – Uryl, Arshaty, Enbek;

Chernovaya county: villages – Chernovaya, Akmaral, Kyzylzhuldyz, Kayindy.

Cultural significance:

(Briefly describe the proposed biosphere reserve's importance in terms of past and current cultural values (religious, historical, political, social, ethnological) and others, if possible with distinction between material and intangible heritage (c.f. UNESCO Convention concerning the Protection of the World Cultural and Natural Heritage 1972 and UNESCO Convention for the Safeguard of the Intangible Cultural Heritage 2003 (http://portal.unesco.org/en/ev.php-URL_ID=13055&URL_DO=DO_TOPIC&URL_SECTION=201.html and http://portal.unesco.org/en/ev.php-URL_ID=17716&URL_DO=DO_TOPIC&URL_SECTION=201.html)).

The beginning of the ancient civilization were established in Bukhtarma river basin, as well as in adjacent areas, based on material traces of life (stone tools, household items, skeletal remains, rock drawings, burial mounds).

The development of economic activities on the territory of Katon-Karagay National Park began during the Paleolithic, 80 - 40 thousand years BC. Neanderthals (Andronov culture) practiced hunting, fishing, collecting roots and plant fruits. There was a settling of caves, grottoes, shelters. In the Paleolithic period ancient people used stone tools made by Shell Acheulian culture. Rich deposits of metals (copper, tin, gold) have an immense impact on the development of the Andronov culture.

Mesolithic, 40 - 1 thousand years BC, is characterized by a matriarchal community-generic structure of society and construction of dwellings, domestication of wild animals, hunting, fishing, collecting plant foods. In the Neolithic period - the new stone age – there is a disintegration of matriarchy and the formation of patriarchy. Animal husbandry starts to develop, it is also the beginning of agriculture, hunting, fishing, harvesting of plants as well as construction of housing units in the settlements.

During the Bronze Age at the end of II - early I millennium BC tribes, inhabiting the area of East Kazakhstan, created distinctive Andronovo culture, with further division of culture throughout the communities, one of which is Berel community (V-IV centuries BC). It is evidenced by the excavations of Berel burial mound of high conservation condition in the Altai Mountains (the first of its kind in Kazakhstan). The mummified bodies of a man and a woman, household items, bronze and gold-plated jewelry of "Scythian-Siberian animal style" were preserved in permafrost relic lens, dated 264 BC based on radio carbon method. The role of cattle breeding increased in the late bronze period, and livestock number increased.

In the middle of I millennium BC the "Steppe Road" (one of the branches of the Silk Road) became operational. Route went from the Black Sea to Irtysh and Altai, to the country of Argipeys. Furs, skins, Iranian carpets, precious materials were distributed in this way. Rich deposits of copper, tin, gold have been developed here since the Bronze Age, and then villages of miners, metal smelters, coppersmiths and goldsmiths have grown. The rich natural resources - livestock, wool, leather, metal parts of eastern Kazakhstan – were involved in trade relations, including international, and have been included in the Silk Road.

In 766 - 840 Kimaks occupied territory of Western and Southern Altai. In the second half of the VII - IX centuries Kimak tribes settled in the Western Altai. Kimaks' main occupation was nomadic herding. Nomads make long passages on seasonal pastures. Migration routes were formed by centuries and lied on well-known fords of rivers, convenient mountain passes, pastures with abundant food and good water sources.

The beginning of the modern history of the Altai can be considered in XVII century, when the Russian settlers reached the province. At that time the "runaway" peasants and workers began to migrate to the distant corners of Altai taiga. They were hiding from the authorities "over the rocks", settling in rocky gorges on Bukhtarma and its tributaries Belaya, Tikhaya, Chernovaya, that's why they received their nickname "masons". At the end of the XVI – beginning of XVII refugees of old religion, who arrived from Voronezh City, Kerzh River Valley, by the permission of the Empress Catherine II, occupied the upper reaches of Bukhtarma river. They were imposed with a special tax - Yasak. From that point the territory was nicknamed "the Yasak" among the people.

In the second half of XIX century the Russian Geographic Society produces a description of all the land the Asian part of the Russian Empire. At that time the entire population of the valley of Bukhtarma River was 10,000 people, including in Korobiha Village: 37 households - 218 people, in Upper Bukhtarminskaya or Pechi: 26 households, 159 people, in Yazovoe: 13 households, 74 people, in Belaya: 50 households, 160 people and in Fykalka: 14 households and 73 people.

After the reform of the church, at the beginning of the XVIII century, when the tsarist government, led by Patriarch Nikon, introduced novelties in Russian canons of the church, many opponents who disagreed with that stayed with the old faith, and went to Altai. In this way, the first Old Believers appeared in Bukhtarma Valley.

At its core, the Old Believers were adherents of the pre-Nikon Orthodox Church. Standing apart from the XVII century, the dissenters moved from the old church and have developed their own rules, a particular way of life, and their own religious rituals. Believers have been brought to a lot of austerity. In the life and customs of kerzhaks (old belivers) it is important to be faithful to the precepts of the fathers, the traditions of antiquity, isolation, veneration of the sacred books, the rejection of many worldly comforts.

In 1786 and 1796 P. Shangin makes an expedition to the Altai, he maps and describes a large area of the Southern Altai, including Bukhtarma river with all its tributaries. Shangin in his travel notes gives information on the geography, geology, botany, and visited areas. August von Gebler was another famous scientist who visited the Altai. In 1833, Gebler, visiting the Rakhmanov Springs, went to the upper Bukhtarma and mapped almost all of its course and tributaries. His aim was "Altai Mont Blanc" that was the Belukha Mt.. The view of the highest peak of Altai strucked Gaebler, and he was eager to get close to it as closely as possible.

During the Great Patriotic War Kokkolsky mine works for the extraction of tungsten and molybdenum for the war effort. Kokkol field was discovered in 1936 during geological route at an altitude of 3000 meters above sea level. Geologists have been found with quartz phenocrysts wolframite. The following 1937 here was directed search party that discovered a series of parallel, closely spaced, thin, steeply dipping quartz veins containing wolframite and molybdenite. Ore mined by hand and construction of residential and of the camp began in 1938. On Kokkolsky mine tungsten was mainly mined. When it was built, enrichment plant started to get a higher concentration ore, which brought in on horseback with. Berel. At these altitudes below 3000 m, where there is practically no vegetation, people lived and hunted metal for armor.

10. 7

Specify the number of spoken and written languages (including ethnic, minority and endangered languages) in the biosphere reserve.

(Refer, for instance, to the UNESCO Atlas of Endangered languages (http://www.unesco.org/culture/languages-atlas/index.php)).

In the Republic of Kazakhstan the Kazakh language is the official accordance with Article 7 of the constitution of the country. Russian language is officially used on par with Kazakh in state institutions and local administrations.

Ethnic composition (as of January 1, 2010) in Katon-Karagay district:

- Kazakh — 30 005 people (79,29 %)
- Russians — 7 132 people (18,85 %)
- Tatars — 305 people (0,81 %)
- Germans — 234 people (0,62 %)
- Ukranians — 36 people (0,10 %)
- Belorussians — 36 people (0,10 %)
- others — 95 people (0,25 %)
- Total — 37 843 people (100,00 %)

Based on the ethnic composition the population of the district is basically speaking Kazakh and Russian languages. Also, Tatar, German, and other languages are used.

11. BIOPHYSICAL CHARACTERISTICS:

11. 1 General description of site characteristics and topography of area:

(Briefly describe the major topographic features (wetlands, marshes, mountain ranges, dunes etc.) which most typically characterize the landscape of the area).

BR territory is located in the mountains of Altai. There are two centers of modern glaciers, glaciers of Katun ridge and glaciers of the Eastern part of the South Altai mountain range. Katon-Karagay Biosphere Reserve is located in the upper reaches of Bukhtarma, Belaya and Chyornaya Berel rivers, including the Southern slopes of the mountain ranges Listvyaga and Katun (the Eastern peak of Belukha Mt.), ranges of the left bank of Buhtarma river: Sarymsakty, Tarbagatai (Southern Altai) and the Southern Altai. The Northern part, which includes part of Katun ridge, has altitudes of 2,000 to 4,506 m (Belukha). Southern part - from 850 m (Buhtarma river valley) to 3487 m (South Altai). The relative elevation of Belukha mountain is 2500-3000 m.

11. 2 Altitudinal range:

11.2.1 Highest elevation above sea level: __4506___ metres

11.2.2 Lowest elevation above sea level: __850____ metres

11.2.3 For coastal/marine areas, maximum depth below mean sea level: N/A

11. 3 Climate:

(Briefly describe the climate of the area, you may wish to use the regional climate classification by Köppen as suggested by WMO (http://www.wmo.int/pages/themes/climate/understanding_climate.php)).

The climate is continental with large amplitude of diurnal, seasonal and annual average air temperature fluctuations, due to a landlocked location of the national park. The average annual temperature is 0.4 ° C, the length of the growing season varies in different periods from 120 to 140 days. The relative humidity is 72%.

Almost all the year strong winds blow predominantly in Eastern direction, speed changes in small range from 3.3 m/s to 4.2 m/s. But on some days there are high winds of up to 15 m/s, which are usually caused during the summer by dust storms, and in the autumn-winter by snowstorms and blizzards.

The average annual rainfall is 637 mm. Most rain falls in July, the lowest in February. The affecting factors include site altitude, steepness and exposure of the slope.

In general, the area is characterized by moderately warm summers and moderately severe and snowy winter. Strong variability of meteorological elements is caused by topography, by the influence of the surrounding glaciers. A variety of landforms results in a relatively small area of a number of microclimates, which in plain conditions correspond to distances of hundreds and sometimes thousands of kilometers.

Meteorological data for the area are available at two stations: Akkem and Katon-Karagay. Both stations are working at present time. Akkem station is located 10 km North of Mount Belukha in the North-Western shore of Lake Akkem, the station's altitude is 2050 m above sea level. Katon-Karagay station is located on a former airfield of Katon-Karagay village below the forest zone at the altitude of 1087 m.

Table 1. The total number of hours of sunshine

Stations	1	2	3	4	5	6	7	8	9	10	11	12
Akkem	72	88	152	198	230	224	224	224	165	103	60	52
Katon-Karagay	144	157	197	233	248	261	256	232	200	159	107	102

The wind regime in the territory, besides general circulation conditions, depends on the terrain, proximity to glaciers, the uneven heating of the slopes. The emerging local circulation can harshly change the wind patterns. According to the data collected at Katon-Karagay station, snow cover in the area appears on average by 14 October, and the stable cover is formed by November 3. The average date for the snow melting is April 6 and it completely vanishes by April 26. In the mid-mountains thickness of snow cover varies from 70 to 250 cm, at high altitude mountains it exceeds 250 cm.

Table 2. The duration of sunshine (in hours)

Stations	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	год
Akkem	72	88	152	198	230	224	224	224	165	103	60	52	1792
Katon-Karagay	144	157	197	233	248	261	256	232	200	159	107	102	2296

The table above shows that in the valleys the annual number of sunshine hours is less than on the tops and watersheds. This decrease is evident especially during the winter months when sunshine is reduced almost in half (I, II, XI, XII). In summer, the difference in the number of sunshine hours is slight.

Table 3. The number of days with no sun

Stations	I	II	III	VI	V	VI	VII	VIII	IX	X	XI	XII	год
Akkem	6	3	3	1	1	1	0,4	0,2	2	6	10	11	45
Katon-Karagay	5	4	3	3	2	1	1	1	3	6	8	9	46

The number of days without the sun, both in the valley and on the plateau, consists of 45-48 days per year. In summer, the sun shines almost every day. The greatest number of days without the sun accounts for coldest period of the year. The diurnal variation of sunshine corresponds with the same course of cloudiness. The appearance of the sun is more likely before noon. The temperature distribution in the mountains is very peculiar, and very different from the temperature distribution in the free atmosphere. This peculiarity is due to the weakening of the circulation and exchange of air masses in the lower forms of relief, and the influence of the underlying surface. The lowest average monthly temperature is observed in January.

Table 4. Average monthly and annual temperature (in centigrade)

Stations	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	год
Akkem	-21,2	-17,2	-13,6	-6,2	-1,5	6,7	8,3	7,1	2,8	-4,7	-12	-16,9	-5,4
Katon-Karagay	-16,9	-16,4	-13,1	-7,9	1,8	4,2	6,3	5,2	0,3	-6,4	-12,8	-16,5	-6,3

Lower temperatures in the valleys over the winter ranges are explained by the predominance of anticyclonic weather, which leads to the formation of the inversion of the temperature distribution. (Inversion of temperature – its increasing with altitude instead of the commonly observed decline). Vertical power of inversion depends on the power of the anticyclone and the period of its stationing in this area. In April, with the destruction of the Mongolian anticyclone by raising daytime temperatures higher average temperature is registered in the valleys rather than on elevated landforms. That combination of average monthly temperature is held till October.

Table 5. The absolute minimum temperature (in centigrade)

Stations	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	год
Akkem	-50	-47	-42	-38	-27	-10	-6	-8	-20	-47	-49	-46	-50
Katon-Karagay	-46	-43	-39	-37	-28	-12	-7	-9	-19	-46	-46	-43	-46

At the same time, throughout the year the temperature rise (sometimes short) to positive values is possible (Table 6).

Table 6. The absolute maximum temperature (in centigrade)

Stations	I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	год
Akkem	6	8	12	17	22	25	25	24	22	16	11	8	25
Katon-Karagay	8	8	15	18	24	26	26	28	26	18	13	10	26

This does not mean that positive temperature will be necessarily recorded in any month. The table indicates only the probability of temperature, based on many years of observations.

Mountain-valley wind arises from the uneven heating of mountain ranges and valleys. This wind has its daily course. By day, it goes out of the valley to the mountains and the valley is called the valley wind. At night there is a reverse wind - the mountain wind. “Clear” mountain-valley winds can be observed only in case of anticyclonic weather when overall air transport is weakened. Most often, local circulation leaves its mark on the overall air transport and greatly diversifies the picture of the wind regime in the mountains.

According to the data of Katon-Karagay weather station, which can be considered representative of the central part of the national park, the snow cover in the area on average appears by 14 October and is stable by 3. The average date for the snow melting is April 6, and it vanishes by April 26. The number of days with snow - 194. The multi-year average height of snow in the winter is 30 cm with a maximum of 74 cm and a minimum of 9 cm. The annual precipitation is 432 mm. The average depth of soil freezing in Katon-Karagay is 67 cm (47 to 100 cm). The prevailing winds are from East, South-East directions. The average annual wind velocity is 3.8 m/s.

11.3.1 Average temperature of the warmest month: +8,3 °C

11.3.2 Average temperature of the coldest month: -21,2 °C

11.3.3 Mean annual precipitation: 637 mm, recorded at an elevation of 850 metres

11.3.4 Is there a meteorological station in or near the proposed biosphere reserve? If so, what is its name and location and how long has it been operating?

Akkem and Katon-Karagay stations. Both stations are working at present time. Akkem station is located 10 km North of Mount Belukha in the North-West coast of Akkem lake, the station altitude is 2050 m above sea level. Katon-Karagay station is located on a former airfield of Katon-Karagay village below the forest zone at the altitude of 1087 m.

11. 4 Geology, geomorphology, soils:

(Briefly describe important formations and conditions, including bedrock geology, sedimentary deposits, and important soil types).

Relief. Alpine highlands with steep rocky slopes, moraines, kars, trough-shaped valleys, ridges, and others with a smoother topography. In addition, within the park there are two centers of modern glaciation - Katun ridge glaciers and glaciers of the Eastern part of the South Altai mountain range. The relief is of erosion-tectonic type. There are the highlands, middle mountains and lowlands. Ridge and ridge-crest relief from various forms of erosion-tectonic and glacial weathering is located in the highlands. Ridge relief is developed within the mountain ranges of up to 3000 m above sea level, the orientation of ridges is latitudinal and sublatitudinal, the length does not exceed 5-10 km, the tops of the ridges are flat or slightly wavy, steep slopes have rocky mountain look.

Ridge-crest (over 3000m) - typical alpine terrain. Crest-like rocky peaks, narrow canyons, steep slopes with rock slides and talus. Middle mountains (2000 m or more) in appearance are close to the alpine, but the ridges have a lower degree of partition and slopes' steepness. Low mountains frames the areas of middle mountains and lies at an altitude of 1200-

1500m, the relative excess of the ridges is 150-200 m, length is 1-3 km. Low mountain are characterized by gently sloping, rounded, flattened top and flat watersheds.

The area of high plateaus combines the most ancient types of relief: the Mesozoic-Tertiary surface alignment, Quaternary erosion relief and accumulative relief of moraines and water-glacial terraces of upper and middle-age. The other types of relief are of minor importance, or not at all stand out. In the relief of the territory there is clear layering corresponding to the formation of the separate stages of the Altai.

By the end of the Quaternary time the orographic scheme of region's rivers, close to the modern one, is established. Mid-Quaternary moraine relief was formed in the era of maximum glaciation that followed the general elevation of the area. At this time, almost all ice covered the watershed, went down the valleys, and only a few highly elevated ridges and very partitioned Katun ridge were probably not captured by glaciation.

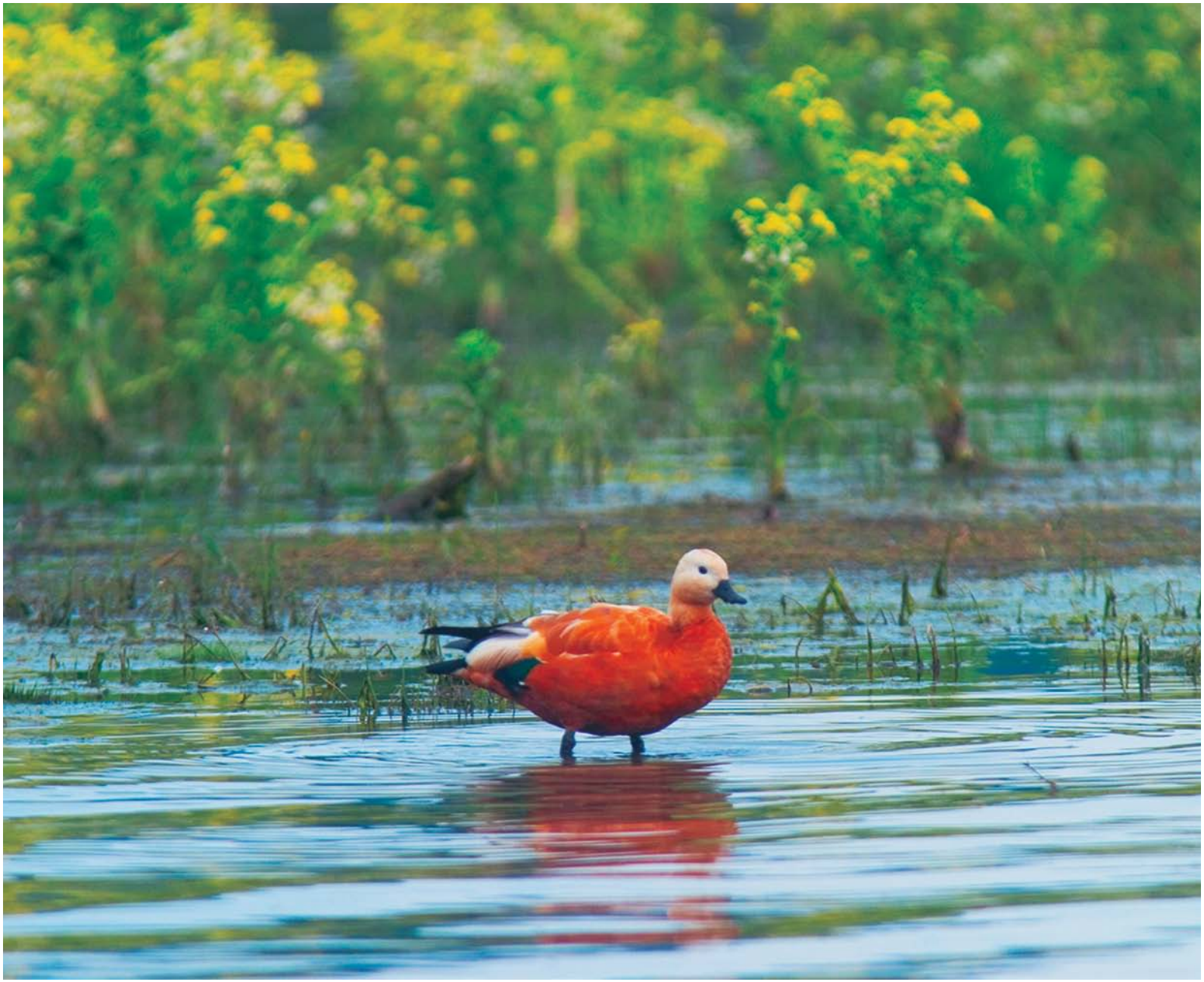
Glacial landforms are divided into ancient and modern, and are represented by glaciers, snowfields, moraines and kars. In the areas near water sheds there are moraine lakes, the size of which rarely exceeds 150 x 250 m. They can appear and disappear relatively quickly and are associated with the activity of glaciers. This is most clearly represented in the relief of the axial part of the Katun ridge.

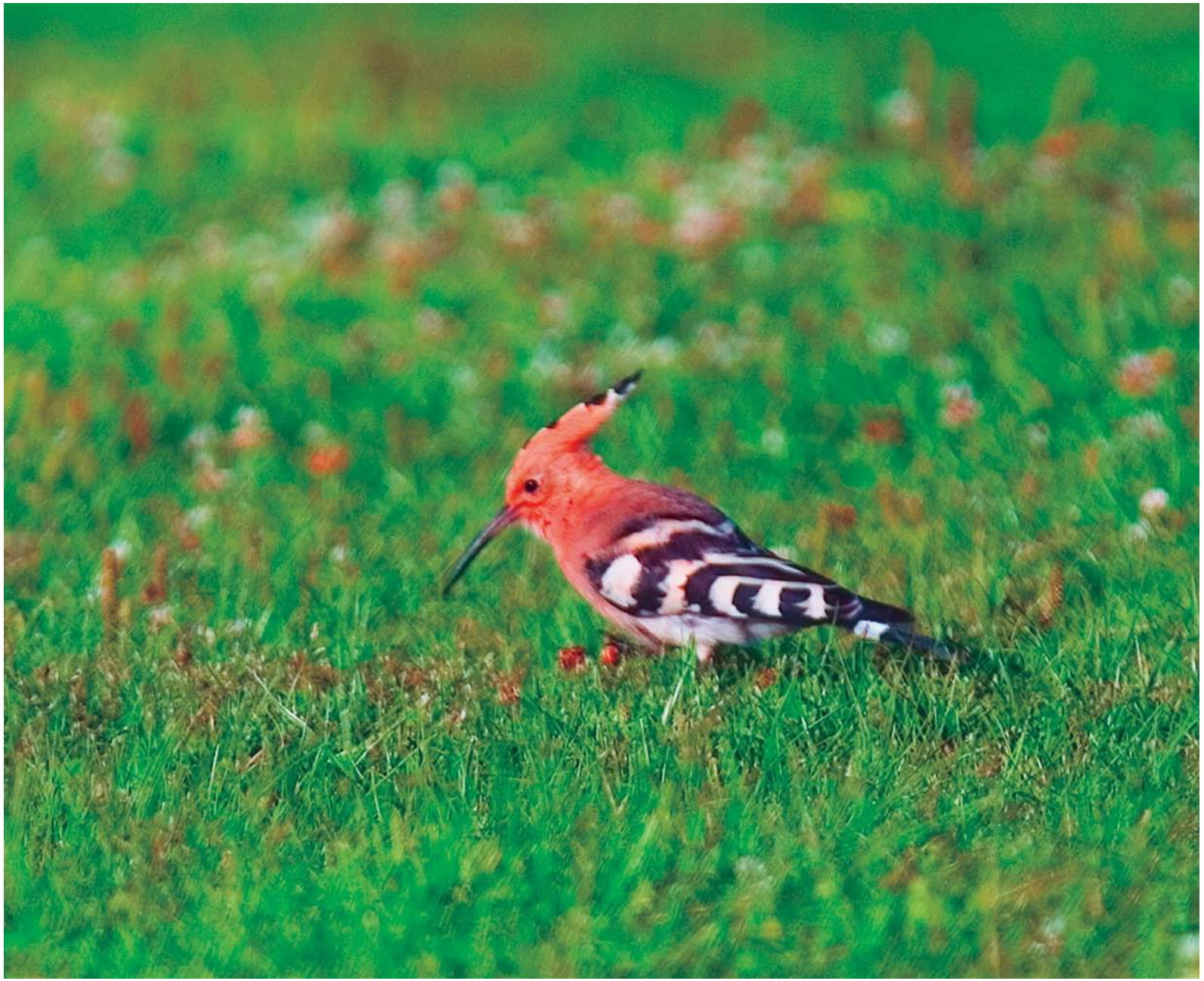
Geologic structure. The first data on the geological history of the area belong to the middle of the Cambrian period. At this time, almost all of the Altai - Sayan area, with the exception of the eastern regions of Tuva and Sayan, was a vast geosynclinal basin, founded probably still in the Proterozoic, which accumulated powerful volcanic-carbonate and clastic strata. There obviously also existed a deep enough open sea waterbasin, in the sediments of which clastic material played a major role. At the same time submarine volcanism was very active. At the end of the stage, there is a general uplift and folding area (Salair phase).

At the beginning of the Upper Cambrian area of the region was once again involved in a general lowering and sank beneath the sea level. However, the depth of depression was significantly lower than in connection with the changed composition of the formational deposits.

By the end of the Upper Cambrian - early Ordovician sea finally left the territory of the district. It was raised and has undergone folding. Folding in the Altai on the border of the Ordovician and Silurian has caused a significant reduction in the Caledonian geosyncline.

Hydrology. The territory of Katon-Karagay BR by its water resource belongs to the well-supported with a module of the annual flow of 15-30 l/s with from 1 km2 and has a dense river network. Within BR there are mountain streams with





Upupa epops

gradients of up to 130 m/km and turbulent cascades, cut by rocky ledges. Many rivers have waterfalls. Bukhtarma River is one of the largest rivers belonging to the tributaries of the Irtysh and the largest in the National Park. Its length within the area (up to. Chingistau) is about 230 km. With its origins in the mountain range of the South Altai on the border with Ukok, it carries its waters through rocky gorges.

Belaya Berel river is a right tributary of Buhtarma. River begins from the Bolshoy Berel glacier. The river's length is 57 km. Hydrological observations are conducted sincle 1958 in Berel village 3 km from the river mouth. The largest tributaries: Chyornaya Berel, Yazovaya, Itolgen, Kokkol and Arasan. Average long-term consumption of water is 25.7 m^3/s.

Karakaba river is transboundary, going to China and there falling into the Black Irtysh. The length of the river within the National Park is 65 km, the basin area is 540 km^2. River begins near the junction of ridges Tarbagatay and Southern Altai at an altitude above 3,000 meters above sea level.

The rivers of the territory are located in areas of abundant moisture and are quite full. Their nature is typical mountain, that is, rapid flow, curvy channel, destructive force of water flows. According to their regime, these rivers belong to the "Altai" type with a "low stretched, having crested look, flood, high summer and autumn runoff and low flows in the winter."

Lakes. The park has about 400 lakes with a surface area of 0.2 hectares to 141 hectares each. On average, 16.5 lakes and 0.95 km^2 of water surface are found in 100 km^2. The total area of lakes is 20.99 km^2 and lake territory of the park is 0.95. The number and area of the lake is dominated by small, with the surface of up to 1 km^2. There are five large lakes: Rakhmanovskoe, Yazevoe, Chernovoye, Maralye and Bukhtarma, but they account for over 25% of the total area of water bodies. Most of the lakes are located at altitudes over 2,000 m. Only the largest lakes (Rakhmanovskoe and Yazevoe) have a lower position. Bukhtarma lake is at an altitude of 2056 meters above sea level.

Soils. Due to the high altitude and mountainous terrain the spatial distribution of soil and vegetation of the national park is subject to the law of vertical zonation (high-altitude zone).

Within the area there are four vertical natural areas, which include eleven zones.

I. Highland nival zone

1. Alpine nival belt - glaciers, snowfields, rock, rocky placers.

II. Alpine tundra meadow zone

2. Mountain-tundra belt

a) rocky tundra and wastelands on mountain tundra primitive soils among rocks and stony placers;
b) moss-shrub (dwarf shrub) tundra on mountain tundra peat-podzolic soils;
c) grass-moss-lichen tundra on mountain tundra sod peat soils.

3. Mountain-meadow alpine zone

4. Mountain-meadow sub-alpine zone

moderately moist subalpine low-grass meadows, sometimes with sub-alpine herb larch woodlands on mountain meadow subalpine sod soils.

III. Mountain-forest zone

5. Mountain forest subalpine zone

moist subalpine coniferous-deciduous park herbal forests, partly grassy subalpine birch forests, on mountain forest acidic neo-podzolic turf soils.

6. Mountain-taiga zone

a) very moist, dark coniferous high grass, sometimes moss taiga on mountain forest non-podzolized acidic and weakly podzolized (turf and moss) soils;

b) very moist dark and mixed fir high grass – taiga on mountain forest non-podzolized acidic and weakly podzolized, as well as on light gray podzolic soils.

7. Mountain meadow-taiga belt

a) moist - dark coniferous large grass, sometimes moss taiga with forest meadows of "sun-heated" slopes on the mountain-forest acidic and weakly non-podzolized and mountain turf (forest-meadow) light soils;

b) moist dark and mixed fir large grass taiga with forest meadows and shrubs of "sun-heated" slopes on mountain-acidic and non-podzolized and weakly podzolized, as well as on light gray podzolic and mountain turf (forest-meadow) light soils ;

c) moderately moist light coniferous park grass partly covered by moss taiga with forest meadows of "sun-heated" slopes on mountain- cryptopodzolic acid (dense turf and peat), sometimes weakly podzolic mountain and mountain turf (forest meadow) dark soils;

d) moderately moist grass and light coniferous and moss taiga on the mountain- acid crypto-podzolic, sometimes slightly podzolic mountain, and the mountain of turf (forest-meadow) dark soil;

e) moderately dry moss light coniferous taiga on mountain forest acid – crypto-podzolic turf soils.

IV. Mountain-steppe zone

8) Mountain meadow-forest belt

a) moist small-leaved, sometimes mixed fir, large grass forests on mountain-forest and forest light gray and dark gray slightly podzolized, sometimes with patches of mountain meadow-steppe soils;

b) moderately moist mixed small-leaved herbaceous forests on mountain-forest dark gray podzolic, sometimes with patches of mountain turf (forest-meadow), meadow-steppe soils;

9. Mountain forest-meadow-steppe zone

a) moderately moist grass larch forests, forest meadows and meadow steppes on mountain-forest dark gray slightly podzolized, mountain-forest chernozem-like, mountain turf (forest-meadow) and dark and mountain meadow-steppe soils;

b) moderately moist forest meadows, meadow steppe, grassy and shrubby larch forests on mountain turf (forest-meadow) dark, mountain meadow-steppe, mountain-forest dark gray slightly podzolized and mountain forest chernozem-like soils;

c) moderately moist meadow steppes, secondary forest meadows, petrophilic shrub steppe and small-leaved woods on mountain meadow-steppe, mountain-steppe xeromorphic leached, mountain-forest dark gray slightly podzolized and degraded soils;

10. Mountain forest-steppe zone

a) moderately moist deciduous forest steppes on mountain forest dark gray slightly podzolized, mountain-forest and mountain-chernozem-like and mountain-steppe xeromorphic leached soils;

b) moderately moist deciduous forest steppes and shrub thickets on mountain forest dark gray slightly podzolized, mountain-forest chernozem-like, mountain-steppe xeromorphic and mountain leached black soils;

c) moderately dry deciduous forest steppes and steppified sparse forests on chernozem-like forest unsaturated and

saturated (after-forest chernozems) soils, partly on mountain-steppe xeromorphic leached soils;

11. Mountain and foothill secondary forest-meadow zone

moist motley-grass secondary forest meadows, steppe meadows and meadow steppes on podzolized, sometimes leached black soils, mountain meadow-steppe and mountain-steppe leached soils.

The peculiarity of the territory is the considerable heterogeneity of soil cover, even within the same vertical zones, caused by partition of the relief, strata forming materials' characteristics, mode of surface and subsurface moisture.

11. 5

Bioclimatic zone:

(Indicate the bioclimatic region in which the proposed biosphere reserve is located, refer to the table below and tick the appropriate box for each area of the biosphere reserve).

Areas	Average annual rainfall/mm	Aridity index		Core area(s)	Buffer zone(s)	Transition area(s)
		Penman	(UNEP index)			
Hyper-arid	P<100	<0.05	<0.05			
Arid	100-400	0.05-0.28	0.05-0.20			
Semi-arid	400-600	0.28-0.43	0.21-0.50			
Dry Sub-humid	600-800	0.43-0.60	0.51-0.65	✓	✓	✓
Moist Sub-humid	800-1200	0.60-0.90	>0.65			
Per-humid	P>1200	>0.90				

Table 1: Aridity index resulting from the use of P/ETP

Mean annual precipitation (P)/mean annual potential evapotranspiration (ETP)

11. 6 Biological characteristics:

List main habitat types (e.g. tropical evergreen forest, savanna woodland, alpine tundra, coral reef, kelp beds) and land cover types (e.g. residential areas, agricultural land, pastoral land, cultivated areas, rangeland).

List main habitat types (e.g. tropical evergreen forest, savanna woodland, alpine tundra, coral reef, kelp beds) and land cover types (e.g. residential areas, agricultural land, pastoral land, cultivated areas, rangeland).

For each type, indicate:

- REGIONAL if the habitat or land cover type is widely distributed within the biogeographical region within which the proposed biosphere reserve is located, to assess the habitat's or land cover type's representativeness;

- LOCAL if the habitat or land cover type is of limited distribution within the proposed biosphere reserve, to assess the habitat's or land cover type's uniqueness.

For each habitat or land cover type, list characteristic species and describe important natural processes (e.g. tides, sedimentation, glacial retreat, natural fire) or human impacts (e.g. grazing, selective cutting, agricultural practices) affecting the system. As appropriate, refer to the vegetation or land cover map provided as supporting documentation.

DISTRIBUTION

Regional

First type of habitat/land cover:

Meadow multigrass-grass steppes / pastures

Characteristic species:

Species confined to the loops and rocky slopes with developed chernozem (common and leached). The basis of their grasses is formed by *Stipa pennata* and *Helictotrichon altaicum* with participation of *Phleum phleoides*, *Koeleria cristata*, *Bromopsis inermis*, *Poa angustifolia*, *Festuca valesiaca*, *Carex pediformis* и *C. humilis*. In the steppe motley grasses there are: *Phlomis tuberosa*, *Valeriana dubia*, *Thymus altaicus*, *Paeonia anomala*, *Scutellaria altaica*, *Centaurea sibirica*, *Bupleurum multinerve*, *Filipendula vulgaris*, *Fragaria viridis*, as well as (*Allium strictu*, *A.nutans*), potentillas (*Potentilla bifurca*, *P. chrysantra*), *Artemisia* (*Artemisia sericea*, *A. Santolinifolia*). Found on rocky areas, listed in the Red Data Book of Kazakhstan (1981) is *Rheum altaicum*. The characteristic element of steppe vegetation is the so-called peucedanum's steppe dominated by *Peucedanum morisonii*, distributed on the Southern slopes and watershed ridges. In composition of these communities in addition to *Peucedanum morisonii* the following cereals dominate: *Stipa pennata*, *Helictotrichum desertorum*, *H. pudescens*, *H. schellianum* and *Elymus mutabilis*, etc.

Important natural processes:

Periodic spring flooding on the slopes and harsh snowy winters, causing periodic death of critical game animals and birds.

Main human impacts:

The unsustainable use of biological resources (illegal logging, poaching, over-grazing, mowing, unorganized tourism).

Cattle grazing can lead to degradation of land cover.

Fires.

Relevant management practices:

Protection regime and agitation among the local population.

DISTRIBUTION

Regional

Second type of habitat/land cover:

Larch forests with grassy ground cover / **forest lands**

Characteristic species:

The forest stand is sparse in this forest type, and the main tree species – larch – is sporadically mixed with *Populus tremula* and *Betula pendula*. The undergrowth is quite fragmented and presented by: *Salix caprea*, *Rubus sachalinensis* and *Lonicera* spp. The vegetation consists of species, such as: *Trolius altaicus*, *Lilium martagon*, *Primula macrocalyx*, *Alopecurus pratensis*, *Trifolium lupinaster* and some other plants.

Coniferous and deciduous forests with green moss, called “Taiga”, are associated, as a rule, with the Northern slopes. In contrast to the Western Altai, where the forest is dominated by *Abies sibirica*, and *Pinus sibirica* and *Picea obovata* occupy a subordinate position, in the ridges of the Southern Altai forests dominated by larch and cedar, with a slight admixture of spruce and fir, are the most widespread.

Sorbus sibirica, Padus avium and *Salix bebbiana* are observed among large shrubs and trees in the stand. Undergrowth, mostly sparse, consists of *Lonicera altaica*, *Spiraea chamaedrifolia*, *Caragana arborescens*, *Rosa acicularis*, *Rubus idaeus*, *Ribes atropurpureum*. Further, in addition to dwarf shrubs: *Vaccinium myrtillus*, *V. vitis-idaea* and representatives of the taiga small grass ecosystems such as: *Carex macroura*, *Oxalis acetosella*, *Antennaria dioica*, *Goodyera repens*, *Allium microdictyon* etc., motley grasses and cereals are present in the dark coniferous taiga: *Calamagrostis obtusata*, *Melica nutans*, *Aegopodium alpestre*, *Pulmonaria dacica,* etc. *Dryopteris filix-mas*, *D. carthusiana*, *D. dilatata* и *Athyrium filix-femina* are presented among ferns.

Such trees and shrubs as *Padus avium*, *Sorbus sibirica*, *Sambucus sibirica*, *Salix bebbiana* grow on the edges of the mountain taiga. Green moss sometimes completley cover the ground and old deadwood as a carpet. Among them are common: *Hylocomium splendens*, *Rhytidiadelphus triquetrus*, *Pleurozium schreberi*, *Ptilium crista-castrensis*, *Polytrichum commune*. From vascular plants *Vaccinium vitis-idaea*, *V. myrtillus*, *Pyrola incarnata*, *Orthilia obtusata*, *Linnaea borealis* are involved in the taiga moss communities.

Such plants as *Lycopodium annotinum, Oxalis acetosella, Gymnocarpium jessoense, G dryopteris, Moehringia umbrosa* are native to study area only in the dark coniferous woods. Moreover, *Anemone umbrosa, Cerastium pauciflorum, Galium boreale, Calamagrostis obtusata, Lathyrus gmelinii*) and horsetails (*Equisetum pratense, E sylvaticum, E. hiemale*) are constantly found in these communities.

Dwarf birch - *Betula rotundifolia* – is present in the upper zone of the forest.

Important natural processes:

Periodic spring flooding on the slopes, the harsh snowy winters and wildfires in the autumn.

Main human impacts:

The unsustainable use of biological resources, mainly excessive, inadequately controlled grazing and poaching.

Increasing recreational loads in middle mountains, especially in spring and summer.

Fires. Fire areas periodically arise in the transition zone and the buffer of BR caused by tourists, but also because of burning of the old grass by local people.

Relevant management practices:

Protection regime and agitation among the local population.

DISTRIBUTION

Regional

Third type of habitat/land cover:

The ecosystem of spruce-fir forests with cedar / forest lands

Characteristic species:

The ratio of cedar varies here in mixed stands from 1 to 6 units. As a rule, single birch (*Betula*) and aspen (*Populus*) are met there. The undergrowth is usually of medium thickness, it is composed of honeysuckle (*Lonicera*), currant (*Ribes*), rowan (*Sorbus*), willow (*Salix*), juniper (*Juniperus*), less cherry (*Padus*) and raspberry (*Rubus*). Cover is a typical subalpine on glades, its species composition dominates also in plantations, but there it is considerably rare, often replaced by a purely forest - blueberry, mosses and horsetails.

Such a mixture of trees and shrubs provides good fodder and safety conditions for many species of fauna throughout the year. A variety of conifers provides forage and protective environment for squirrels. Squirrel there has a constant year-round food supply by changing the yield on conifers and their difference in terms of ripening, dense crown of spruce and fir provide good security conditions, and winter climate with higher temperatures is generated there. Similar conditions are created for the grouse. The abundance of seeds of conifers, including cedar, provides a great opportunity for the existence of rodents, particularly voles. The abundance of rodents, as well as of cedar seeds and berries of mountain ash leads to presence of sable. In summer there are grouse broods. Spruce-fir plantations are the main winter habitat of deer .

Important natural processes:

The harsh snowy winters, causing periodic death of critical game animals and birds.

Periodic spring floods, sometimes causing runoff of fertile soil layer.

Main human impacts:

The unsustainable use of biological resources.

Over-grazing and mowing.

Fires.

Relevant management practices:

Protection regime and agitation among the local population.

12. ECOSYSTEM SERVICES:

12. 1 IF POSSIBLE, IDENTIFY THE ECOSYSTEM SERVICES PROVIDED BY EACH ECOSYSTEM OF THE BIOSPHERE RESERVE AND THE BENEFICIARIES OF THESE SERVICES.

*(Please refer to the Millennium Ecosystem Assessment Framework and The Economics of Ecosystems and Biodiversity (TEEB) Framework (*http://millenniumassessment.org/en/Framework.html *and http://www.teebweb.org/publications/teeb-study-reports/foundations/)).*

There are the following ecosystem services in Katon-Karagay BR:

- Provisioning: mix of trees and shrubs provide good fodder and safety conditions of many species of fauna throughout the year
- Regulating: climate Control
- Supporting
- Cultural

The ecosystem services of the most significant ecosystems:

Spruce-fir forest with presence of cedar:

Mixing trees and shrubs provide good fodder and safety conditions for many species of fauna throughout the year. A variety of conifers provide forage and safety conditions for squirrel. Due to harvest period differences among conifers and their ripening time, squirrel has a constant year-round food supply, dense crown of spruce and fir provide good security conditions, and in the winter they create a microclimate with a higher temperature. Similar conditions are there for grouse. The abundance of conifer seeds, including cedar, provide a great opportunity for the existence of rodents, particularly voles. The abundance of rodents, as well as cedar seeds and berries of mountain ash, supports sable. In the summer there are grouse broods. Spruce-fir plantations are the main winter habitat of Maral deer.

Deciduous forests with some cedar

Mountain taiga kislozems are characterized by the ubiquitous presence of sod peat horizon with strongly intertwined roots, rich in rough humus and colored in brownish-gray or brown tones, with fine-granular-lumpy mineral melkozem; deeper it goes into gray, brownish-gray, or brown mineral lumpy granular, sometimes lumpy or lumpy-dusty turf humus horizon. The presence of species of cedar from + up to 8 units. The undergrowth is sparse, consisting of honeysuckle *Lonicera*, meadowsweet *Spiraea*, currant *Ribes* and very rare mountain ash *Sorbus*. Cover of medium thickness with a predominance of *Carex*, *Dactylis glomerata* L., *Calamagrostis*, *Thalictrum*, *Sonchus* and *Vaccinium vitis-idaea* L., less moss cover is formed. Permanent inhabitants of this type ecosystems are rodents, squirrel, capercaillie, musk deer and rarely sable. In the summer larch-pine plantations are a favorite habitat of female deer with their young, with the snowfall deer leaves the station since the snow here is high.

Cedar-wood

Soils are mountain taiga kislozem permafrost. Soil-forming strata are slightly and moderately powerful moraine, partly illuvial-deluvial gravelly loams underlaid by coarse clastic rocks, usually completely devoid of melkozem. There is the domination of cedar from 8 to 10 in the forest composition, sometimes with separate additions of fir *Abies*, birch *Betula*, aspen *Populus* and larch *Larix*. The undergrowth is usually sparse except dwarf birch cedar woods, where in the undergrowth the dominating species are: *Betula rotundifolia*, forming dense thickets. Cover of medium thickness with a predominance of *Dactylis glomerata* L., *Calamagrostis*, *Epilobium*, *Aconitum*, *Dryopteris*, *Vaccinium myrtillus* L., separate clumps form a continuous cover. This type of ecosystem, despite the fact that the cedar seeds are willingly consumed by most species of fauna, is very poor in animals. The reasons for this are the poor safety conditions and instability of food base. The absence of other conifers deprives animals of concentrated feed in the years of crop failure of cedar seeds. Besides, there are almost no shrubs with overwintering berries. Capercaillie is a permanent resident. During the good harvest of pine seeds, the cedars are concentration area for squirrel and sable. At the time of ripening of the seed to the snow, it is a concentration site for1 deer, bear and grouse.

Spruce-fir forests

The soil is represented by montane-forest acidic cryptopodzolic varietites. The soil-forming strata are illuvial-deluvial, and on the Northern slopes and in the subalpine zone often moraine, mostly moderately gravelly loam (rarely sandy

loam and clay), usually at a depth of 50-70 cm underlaid by gravel or coarse clastic moraine deposits (rarely dense rocks), in the upper horizons rich in melkozem, and gravel in the bottom. They usually include single or up to two units of aspen *Populus*. The undergrowth is thick or of medium thickness. The composition of the undergrowth includes both wintering berries and summer berries, which includes honeysuckle *Lonicera*, hackberry *Padus*, guelder rose *Vibernum opulus* L., willow *Salix*, red currant *Ribes hispidulum*, Caragana *Caragana*, meadowsweet *Spiraea media*, Siberian mountain ash *Sorbus sibirica*, raspberry *Rubus vulgaris idaeus*. Cover of medium thickness, it consists of the many herbs eaten by ungulates: avens, fern, reed grass *Calamagrostis*, sedge *Carex*, orchard grass *Dactylis glomerata*, stone bramble, aconitum *Aconitum leucostomum*, delphinium *Delphinium elatum* L., field thistle, cow parsnip, hawksbeard, strawberry *Fragaria vesca*, geranium, bedstraw, globe flower *Trollius altaicus* and *Trollius asiaticus*, rarer *Oxalis* and mosses. Fauna of this type diverse and its size here, as a rule, is high, due to the diversity of feed stock and good safety conditions. There are squirrel, grouse. Maral is constant and only the males migrate out of here in the summer for the breeding season of blood-sucking insects. From carnivores there are constantly bear, lynx, wolverine and Siberian weasel. Due to crown density the snow cover is not high, which improves the wintering of ungulates: Maral and musk deer.

Aspen forests

The soil is mountain forest gray. Soil-forming rocks are mainly eluvial-deluvial binomial powerful and moderately powerful gravelly loams, underlaid by crushed dense rocks. In this ecosystem, which is mainly aspen stands, there are isolated trees of fir, spruce and birch. Thick undergrowth dominated by mountain ash, hackberry, currant, rarely meadowsweet and acacia. Cover is dense with domination of sedges, wood millet, orchard grass, globe flower, meadowsweet, lady's mantle, *Bupleurum aureum*. Aspen forests are the main habitat for hare. In autumn there are grouse. In the summer there is deer with young. From carnivorous the ferret, mountain weasel and ermine live there.

Birch-wood

Mountain forest chernozem soils. On top there is low-power sod peat dark gray, brown or dark brown rather loose humus-accumulative horizon, but with intertwined with roots of grasses, elastic and lightweight, with a fine powdery – lumpy – dusty mineral substrate. Single aspens, rarely fir and cedar are likely to be mixed into the birch stands. The undergrowth is sparse, and includes the following species: wild rose, mountain ash, hackberry, Altai lonicera, red hawthorn, Altai anthrax, acacia, spirea. Cover is dense with the presence of edible berries and grasses for ungulates. Dominating species are following: stone bramble, sedges, Russian iris, *Bupleurum aureum*, reed, rank grass, fireweed, meadowsweet, *Potentilla aurea*, timothy-grass. The main inhabitant is a grouse. In the brood period grouse feeds on different insects, and later on stone

bramble berries, in autumn and winter - buds of birch and rowan berries and hackberry. Along with the grouse, there constantly are hare, ferret, stoat, rarely mountain weasel. In the summer deer lives in birch-wood, mostly females with young.

Rocks and loaches

Formed soil cover is absent. The surface is covered by glaciers, firn fields, cliffs and rock streams. Plant communities settle in melkozem, which is accumulated in the cracks between the rocks and stones of stony placers, as well as in the recesses of slopes along the periphery of the glaciers and snowfields. Highland mountain-tundra zone is characterized by primitive, mountain tundra, sod peat and mountain tundra peat-podzolic soils. This type of ecosystems lies in the uppermost zone of the mountains, mainly outside the forest. Cover is poor, represented by alpine vegetation, located in small patches between rock ledges and talus. The main inhabitants of this mountain belt are ibex, snow cock, marmot, pika and very rare leopard. In winter, the snow cock and goat go down below the forest zone.

Swamps

The soils of these ecosystems are represented by several types: meadow-podzolic marsh, leached and common meadow-swampy, meadow-swampy with marsh peaty-gley (10-30%), marshy peat-gley forest, marshy peat-gley forest with meadow and marsh (30-50%), etc. This type of ecosystems is formed in the valleys between the mountains where the water from the mountains is standing still, not having free access to the main river. Often marshes are formed on the slopes of the mountains, where small but numerous creeks are blocked by the rock, resulting in the flow of water slowing down, soils are fueled by excessive moisture, there is a change of vegetation. These swamps on the slopes of the mountains in autumn usually dry out. Swamps formed in low mountains and valleys along the creek, rivers and lakeshores, are constant. The basis of the cover is formed by mosses and sedges, cotton grass and less bulrush, with a few bushes and birch (*B. rotundifolia*) and shrubby willows. The fauna is represented by the following species: the most numerous are solitary snipe, crane, in the breeding period ducks are observed The mammals live there: ermine and water vole.

Aquatic ecosystems.

Presented by rivers, lakes and numerous streams. The banks of rivers and streams are mostly rocky, steep, rarely sloping, overgrown with reeds, less with cane. Lakeshores in most cases are sloping, peaty, waterlogged. The main vegetation on the banks are sedge, cotton grass and reeds. Water submerged vegetation is very poor, it is represented by one species of

pondweed. In the small rivers and lakes almost universally there is grayling. At Bukhtarma river, connected with the Irtysh river, there is a large number of fish: trout, perch and roach. In hydrological objects mink, otter and water vole may be registered. The lakes and river Buhtarma are common for ducks, loons, grebes. Numerous water birds are found at lakes, they are extremely rare at rivers and are presented by mainly one species of merganser there.

12. 2 Specify whether indicators of ecosystem services are used to evaluate the three functions (conservation, development and logistic) of biosphere reserves. If yes, which ones and give details.

Indicators of ecosystem services for evaluation of three funcitons of biosphere reserve are:

conservation – population number and population condition of dominant plant and animal species, characteristic for each ecosystem type (list of species see above in paragraph 12.1);

development – population number (stock) and overall population condition of plants and animals' species, used by local people with economic aims. These species include, first of all, economic species of fish, birds and mammals. The list of these indicator species is given in the Appendix;

logistic – the number of nature conservation, education, scientific or other projects dedicated to sustainable development of the region, carried out on the territory of biosphere reserve, as well as total number of the tourists who visited biosphere reserve during a year. This information is given in paragraphs 3.3, 4.7, etc.

12. 3 Describe biodiversity involved in the provision of ecosystems services in the biosphere reserve (e.g. species or groups of species involved).

In the maintenance of ecosystem services the fauna and flora of the biosphere reserve play a special role; they generally represent 80% of total biodiversity of the Western Altai. For example, the flora of the Southern Altai consists of 2,052

species (83.8% of the total number of species of Kazakhstan Altai) of 608 genera (87.7%) and 116 families (88.5%). Among them about 1,000 species of plants of the Katon-Karagay Biosphere Reserve area are currently known, it is about half of the flora of the Kazakhstan Altai. With further botanical research this list will increase a lot at the expense of rare and local endemic species of Southern Altai. Reptiles are widely distributed in Asian and European parts of the Palearctic and inhabit the biosphere reserve: those are common European viper, sand and viviparous lizards, as well as Dione ratsnake and subspecies of the Halys viper. On the territory of biosphere reserve in different seasons of the year 277 species of birds can be recorded. Mammals are represented by 69 species.

12. 4 Specify whether any ecosystem services assessment has been done for the proposed biosphere reserve. If yes, is this assessment used to develop the management plan?

Assessment of the ecosystems importance for biodiversity and ecosystem services' conservation was carried out in the framework of preparing the application for the opening of the biosphere reserve. Such an assessment was also used in the design and of the management plan of core and buffer zones of biosphere reserve. In the process, a classification of ecosystems was developed, on the basis of which the ecosystem map was prepared (see the Appendix).

13. MAIN OBJECTIVES FOR THE BIOSPHERE RESERVE'S DESIGNATION:

13. 1 DESCRIBE THE MAIN OBJECTIVES OF THE PROPOSED BIOSPHERE RESERVE, INTEGRATING THE THREE FUNCTIONS (CONSERVATION, DEVELOPMENT AND LOGISTIC), PRESENTED BELOW (SECTIONS 14 TO 16), INCLUDING COMPONENTS OF BIOLOGICAL AND CULTURAL DIVERSITY. PLEASE SPECIFY THE INDIRECT PRESSURES AND/OR ORGANIZATIONAL ISSUES.

The main purpose of the biosphere reserve is to preserve the typical, rare and unique natural complexes of the Western Altai with the totality of their components, as well as to support sustainable socio-economic development of the territory on the basis of the principle of ecological and economic use of natural resources.

The purpose of biosphere reserve in the short term is to to preserve the typical, rare and unique natural complexes with the totality of their components, as well as the organization of such mechanisms of the territory that would prevent the depletion of natural resources and ensure its sustainable use by local population.

Lands of transition zone BR Katon-Karagay are most suitable for the development of forestry, crops and livestock. However, due to human impact some of these lands degraded or lost their original value. In this regard, the organization of the biosphere reserve in this area will allow conducting effective measures to restore natural ecosystems and sustainable use of natural resources. Besides, a comprehensive biodiversity conservation of the territory is closely linked to the development of socio-economic potential. It is widely known that the degradation of the natural environment leads to lower living standards of the local population and reduces sources of income.

13. 2 DESCRIBE THE SUSTAINABLE DEVELOPMENT OBJECTIVES OF THE BIOSPHERE RESERVE.

(If appropriate, please refer to Agenda 21, Rio+20 and SDG post 2015).

In the long term, the objectives of the management of biosphere reserve are the integrated sustainable management of the territory, ensuring the preservation of typical and unique ecosystems and biodiversity with simultaneous development of local social and economic potential, providing rising the living standards of the local population.

13. 3 Indicate the main stakeholders involved in the management of the biosphere reserve.

———Authorized body of coordinate the management of biosphere reserve is the Coordinating Council of the Biosphere Reserve. The Coordinating Council consists of representatives of the Katon-Karagay state national natural parks, nature users and local community organizations, local administration, as well as representatives of local NGOs, regional territorial department of forestry and hunting and district societies of hunters and fishermen.

13. 4 What consultation procedure was used for designing the biosphere reserve?

Over the past ten years the idea of organizing Biosphere Reserve is discussed a lot between the administration the Katon-Karagay State National Park, Akimats, local natural resource users and the public.

Initiators of the idea are the state nature reserve, the National Commission of RK for UNESCO and ISESCO of and scientists of research institutes in Kazakhstan. These ideas have been discussed in various workshops, seminars, environmental festivals involving the local population and on specialized scientific conferences during 2010-2012. The final decision on the preparation of the nomination was announced during a regional scientific-practical conference of UNESCO in Almaty in May 2010 at a meeting of the MAB National Committees, heads of protected areas - potential biosphere reserves.

13. 5 How will stakeholder involvement in implementing and managingthe biosphere reserve be fostered?

Biosphere Reserve's managment is conducted through Coordinational Council of Katon-Karagay Biosphere Reserve, which is a coordinational body for management and is created for promoting policies of sustainable resource use, collaboration and problem mitigation between state nature reserve and local people. This organ is a collegiate public organ and is created for introduction of the policy of effective management and resources' sustainable use, introduction of alternative activity types, resource-conserving and resource-renewing technologies. At the present time all questions regarding biosphere reserve's management are discussed at the sessions of Coordinational Council. Its sessions focus on the problems of territory's development and management, and discuss biodiversity conservation and conflicts between nature users and nature reserve's administration. Resolutions of the Council are obligatory to follow by all local organizations and private land users. Local communities and private land users are represented in the Coordinational Council through their elected representatives of local authorities, local NGO or directly as its members. All Council members have equal rights in voting and making decisions.

13. 6 What are the expected main sources of resources (financial, material and human) to implement the objectives of the biosphere reserve and projects within it?

(Please provide formal commitments and engagements.)

(The only yet) financial source of biosphere reserve is state (national) budget (through Katon-Karagay State Nature National Park). Approximate annual budget in Kazakhstan tenge is about 150,000,000 tenge.

14. CONSERVATION FUNCTION:

14. 1

At the level of landscapes and ecosystems (including soils, water and climate):

14.1. At the level of landscapes and ecosystems (including soils, water and climate):

14.1.1 Describe and give the location of ecosystems and/or land cover types of the biosphere reserve.

Altai, including Southern, where the territory of Katon-Karagay BR is located, is characterized by a large variety of forest vegetation. Here is a Southern boundary of the Siberian mountain taiga forests with cedar, fir, spruce and larch. Most common forests are of Siberian larch. Map of ecological systems of the national park is provided in Appendix 14.

In general, the structure of the vegetation belts is as follows:

- Steppe zone (400-2000m above sea level), with the participation of steppe shrubs and pine forests on granite outcrops;

- Forest-steppe zone (700-1800m), which is a combination of tall mixed, aspen and birch forest, meadow steppes and upland meadows;

- Forest zone represented by subbelts of fir taiga (400-1000m) and mountai-taiga larch-pine forests (400-1800m);

- Subalpine zone (1800-2000m) is represented by sparse forests and tall grasslands;

- The alpine zone (2000 m) of short grass meadows and mountain tundra with widespread stone placers - Corums.

14.1.2 Describe the state and trends of the ecosystems and/or land cover types described above and the natural and human drivers of the trends.

Due to the fact that the described area is located at an altitude of over 700 m, its vegetation has almost no vegetation types characteristic of the lowlands. It's about turf fescue-feather grass steppes dominated by different types of feathergrass and fescue (*Festuca valesiaca*). But somewhere along the hollows and ravines there are thickets of *Spirea - Caragana*

groups, which represent shrub steppes so characteristic of the East Kazakhstan as a whole. The Southern macro-slopes of the Southern Altai, in the range of 1000-1600 m above sea level, a combination of mountain forest are common, they including deciduous forest, meadow and true steppes, shrub thickets and serial communities of rocky slopes.

The forests of Southern Altai are composed of typical Siberian taiga representatives: *Pinus sibirica*, *Picea obovata*, *Abies sibirica* and larch *Larix sibirica*, as well as widely distributed Eurasian trees: *Pinus sylvestris*, *Populus tremula* and *Betula pendula*, *B. pubescens*. Moreover, birch and partly aspen dominate in the secondary forest stands on the site of fires and deforestation. The main forest areas are covered with larch forests. In the upper zone of forest distribution there is dwarf birch - *Betula rotundifolia*.

Alpine vegetation, represented by subalpine and alpine zones, is beginning to prevail in the range of altitudes from 1700 to 2000 m. In the sub-alpine plant communities there is a combination of pine and larch forest, dwarf birch and tall subalpine meadows. Subalpine zone, which is framed by short pine forests at an altitude of 1500 - 1800 m, is most typical in the area of Yazevoe lake. Above 2000 m above sea level, it is common to register alpine grass-shrub vegetation. Near the distribution area limits of the vascular plants (at the edge of the snowfields at altitudes over 2,500 m) large areas are covered by stone fields and talus, “covered” with lichens, which are the pioneers of overgrown rocky substrate.

In the flood plains and the valleys of numerous rivers and streams, there is meadow, shrub and forest vegetation. The main space of floodlands is occupied by forests of *Picea obovata* - species which is better than others conifers adapted to the harsh conditions of the Altai. Already mixed forests are confined to warmer soils. Besides *Picea,* there are: *Pinus sibirica*, *Larix sibirica*, *Betula pendula*. Undergrowth of forests includes: *Padus avium*, *Cotoneaster melanocarpus*, *Ribes nigrum*, *Rosa acicularis* and other shrubs. Vegetation is formed by mountain larch forests in combintation with cedar-fir forests, shrub (*Rosa*, *Spiraea*, *Salix*). In some places there are pure mountain fir coniferous forests, and aspen and fir - aspen forests, combined with the large-herb meadows.

Fauna of biosphere reserve is a combination of European animal species complex, populated the area after the departure of the glaciers from the West, with the animals of the taiga complex that came from the East. Mammals are represented by 69 species, including insectivores - shrews, bats – Ikonnikov’s bat; predators - lynx, fox, wolf, ermine, sable, mink, rodents - marmot; ungulates - maral, elk, roe deer, musk deer. The Red Data Book lists 4 species. Ornithofauna includes 277 species of birds, including 20 Red Data Book species. There are six species of reptiles, amphibians - 3 species, fish - 8 species, of which one is listed in the Red Book of the Republic of Kazakhstan.

In general, natural ecosystems remain untouched and the impact on the local population are shown only in the vicinity of the village. Due to stable demographic and socio-economic situation increasing the human impact on wild natural

ecosystems is not expected.

14.1.3 What kind of protection regimes (including customary and traditional) exist for the core area(s) and the buffer zone(s)?

The core area(s): according to the Kazakhstan Law on Protected Nature Areas the core zone is strictly protected (highest protection regime).

Since the core area of the proposed bioshpere reserve is a zone of protected regime, according to the law "About SPNA" all activities are strictly defined:

1. On the territory of the state natural reserves it is permitted to conduct ground and air operations for the prevention and suppression of forest and grassland fires.

2. Stay of individuals in the territory of the Nature Reserve is allowed only if there are authorizing documents, with the exception of employees of state nature reserves, as well as government officials, in charge of the state natural reserves.

3. To provide access to places revered by the followers of a religion (pilgrimage) in the territory of the reserve or outside their own territory, the roads passing through the territory of the reserve, the administration of the Nature Reserve in consultation with the appropriate religious association may be allowed royalty-free, accompanied by the inspectors of the Nature Reserve, group visits to these places or approach to these places.

The Buffer zone(s): according to the Kazakhstan Law on Protected Nature Areas the buffer zone is protected area with some human activity (monitoring, tourism, etc.). The buffer zone actually includes environmental stabilization zone, zone of tourist and recreational activities, and zone of limited economic activity, as well as protection zone of the state natural area of the park Katon-Karagay National Park, so according to paragraphs. 3-6, Article 44, Chap. 8 of the Law "On Protected Areas" all activities are strictly regulated. According to Art. 44-48. Chap. 8 of the Law "On protected areas" on the specially designated areas that do not include high-value ecosystems and the objects the creation of excursion paths and routes for the controlled eco-tourism are allowed in the procedure established by the authorized body.

14.1.4 Which indicators or data are used to assess the efficiency of the actions/strategy used?

Different indicators and data are used to assess the effectiveness of conducted activities. They include overall population's condition of dominant and rare plant and animal species, dynamics of economically important species population number, and total number of:

- tourists who visited biosphere reserve,
- university students undertaking practice,
- violators of the nature reserve regime in the core zone,
- scientific, educational and ecological projects.

At the level of species and ecosystem diversity:

14. 2

14.2.1 Identify main groups of species or species of particular interest for the conservation objectives, especially those that are endemic to this biosphere reserve, and provide a brief description of the communities in which they occur.

So far in the Katon-Karagay approximately 1,000 species of plants from 78 families are known, 30 of them are listed in the Red Data Book of Kazakhstan. The most species-rich families are: Poaceae, Asteraceae, Rosaceae, Ranunculaceae, Fabaceae, Cyperaceae, Caryophyllaceae. Most species-rich genera are *Carex* (32 species), *Salix* (29), *Potentilla* (16), *Poa* (16), *Allium*. Life forms of plants are: tree, semi-tree, herbaceous vegetation. In the framework of field research in the biosphere reserve 56 species of trees and shrub flora, belonging to 28 genera and 13 families, accounting for 5.4% of the species composition of the Southern Altai, were recorded. Total area of forest fund comprises 267,202 hectares. The forests are of predominantly mixed type, the composition of grass and moss layers is often kept the same as the composition of the dominant tree species changes.

Fourty forest types found are observed on the territory of the national park, which are dominated by pine stands (20.3%) and larch (21.4%) forest types. A large area is also occupied by shrub forest type – subalpine dwarf birch 37.7%. The predominant type of shrub is subalpine dwarf birch, common at altitudes of 2000-2300 m above sea level on the various forms of relief: from flat rocky ridges to flat and concave parts of the slopes. Dwarf birch tundra are spread over all mountain ridges. Semishrub form includes almost all Artemisia, many species of the family Chenopodiaceae and other plants.

Herbaceous form, or herbs, is the most numerous group. Dominated by perennial grasses, mainly xerophytes. On the territory of the biosphere reserve 30 species of rare and endangered plants are growing: *Cladonia rangiferina* (L.) Harm., *Diphasiastrum alpinum* (L.) Holub, *Huperzia selago* (L.) Bernh ex Schrank et Mart., *Adonis vernalis* L., (**златоцвет**), *Allium pumilum* Vved. in Bull. Univer. As. Centr., *Astragalus glycyphullus* L., *Cyprepedium calceolus* L., *Cyprepedium macranthon*

Sw., *Cymbaria daurica* L., *Dactylorhisa fuchsii* (Druce) Soo, *Daphne altaica* Pall., *Drosera rotundifolia* L., *Erythronium sibiricum* (Fisch. et Mey.) Kryl., *Epipogium aphyllum* (F.W. Schmidt) Sw., *Gymnospermium altaicum* (Pall.) Spach., *Lilium martagon* L., *Macropodium nivale* (Pall.) R. Br., *Orchis militaris* L., *Oxycoccus microcarpus* Turcz., *Paeonia anomala* L., *Paeonia hybrida* Pall., *Paris quadrifolia* L., *Pulsatilla patens* (L.) Mill., *Rhaponticum carthamoides* (Willd.) Iljin., *Rheum altaicum* Losinsk., *Rhodiola rosea* L., *Sanicula europaea* L., *Sibiraea altaiensis* L., *Stipa pennata* L., *Tulipa heteropetala* L.

Fishes. On the territory of the biosphere reserve there are the following species: trout, goldilocks, Arctic grayling, ide, common trout, Siberian bullhead, burbot, bream. One species – trout – is listed in the Red Data Book of Kazakhstan. Bony fish are not numerous. In the Western part of the park, in Bukhtarma river, there are sometimes species that are not typical for this area (such as bream).

Reptiles and Amphibians. Widely distributed in Asian and European parts of the Palearctic are common viper, sand and viviparous lizards, as well as typical of South Asian deserts and semi-deserts – Dione ratsnake and subspecies of the Halys viper, whose Northern limit of the distribution area lies in South-Western part of the Altai. Amphibians in the national park are represented by three species (green toad, common toad and moor frog).

Birds. On the territory of the BR in different seasons of the year there are 277 species of birds. In winter, their numbers harshly reduces, but during seasonal migrations the number of birds, on the contrary, increases. The Red Data Book includes 20 Altaian species (black stork, swan, imperial eagle, golden eagle, etc.). A characteristic feature of the region is the fact that in the cedar-larch high mountain forest (up to 1700-1800 m above sea level) not only forest species are recorded, but also species common in other habitats - subalpine meadows, marshes, shrub thickets. The typical forest birds in the park are grouse, black grouse, capercaillie is less common, nutcracker is common. In subalpine meadows there are golden eagle, hen harrier, kestrel, Asian snipe, Schur, Siberian Lentils, Yellow-browed Warbler. Connected to a scattering of stones and rock outcrops are Himalayan finch, Himalayan chanter and mottled rock thrush.

Mammals. The mammalian fauna is represented by 69 species from 6 orders: insectivores - 10 (14.5%) species, bats - 7 (10.1%), predators - 16 (23.2%), undulates - 7 (10 1%), rodents - 27 (39.1%), lagomorphs - 2 (3.0%) species. The Red Data Book of Kazakhstan consists of 4 local mammal species: Ikonnikov's bat, stone marten, snow leopard, Altai mountain sheep.

Insects. On the basis of field data collection and literature by the present moment about 640 species are identified, which is not full list of insects that can be observed here. For today, entomologists have found new sites in the distribution of red-listed species such as *Carabus imperialis* Fischer-Waldheim,1823 and *Carabus michailovi* Kabak, 1992. Besides, the studies have identified a new species for Kazakhstan - *Euheptaulacus villosus* (Gyllenhal, 1808).

14.2.2 What are the pressures on key species? In other words: what are the threats (example unsustainable management of forest), their immediate causes (drivers of change like forest change or habitat change), their underlying causes (example overgrazing, fire, pollution), and the main driving forces (example: economic, political, social, external, etc.) and the area(s) concerned?

The unsustainable use of biological resources, mainly excessive, inadequately controlled grazing and poaching.

Increasing recreational loads in middle mountains, especially in spring and summer.

Fires. From time to time in the buffer zone and the transition.

14.2.3 What kind of measures and indicators are currently used, or planned to be used to assess both species groups and the pressures on them? Who undertakes this work, or will do so in the future? Describe briefly research/activities monitoring (ongoing or planned) as well education and training activities)

On the territory of biosphere reserve monitoring and conservation of natural systems, and the monitoring of rare and endangered species to update the status of populations, explaining the features of ecology of rare species of animals and plants, is currently being conducted. This will provide an opportunity to assess the prospect of preservation and restoration of these species. The purpose of monitoring is getting regular objective data on the status of plants and animals in the biosphere reserve, as well as on the state of their environment. Based on the current assessment of the monitoring data of populations and ecosystems, the efficiency of the biosphere reserve and the development of prevention measures (removal) of critical situations and adverse events should be carried out. In the framework of monitoring the “Chronicle of Nature” is conducted, as well as counting of the number of mammals, birds and invertebrates are carried out. According to the Management Plan, the current research is dedicated to inventory and study of objects of the state natural reserve fund, and also focused on study of the natural history of natural processes and environmental monitoring. This research includes the observation of phenomena and processes under the “Chronicle of Nature,” an inventory of the flora and vegetation, the study of rare and endangered vertebrate and invertebrate animals, monitoring the state of biodiversity and the populations status of indicator species.

14.2.4 What actions are currently undertaken to reduce these pressures?

On the territory of BR the monitoring and conservation of natural systems, and the monitoring of rare and endan-

gered species to update the status of populations, explaining the features of ecology of rare species of animals and plants, is currently being conducted. It will provide an opportunity to evaluate the prospect of preservation and restoration of these species.

14.2.5 What actions do you intend to take to reduce these pressures?

Regular monitoring observation of habitats, according to the design of the elaborated Perspective research plan for the period since 2015, in the core and a buffer zone will be carried out by the staff of state natural park. Further monitoring of climatic and hydrological changes will also be continued by the East Kazakhstan branch of hydro-meteorological service.

14. 3 At the level of genetic diversity:

14.3.1 Indicate species or varieties that are of importance (e.g. for conservation, medicine, food production, agrobiodiversity, cultural practices etc).

The rich flora of the reserve is the source of many economically valuable plants, numbering about 200 of the most common types of useful plants belonging to six major raw material groups: feed, food and source of vitamins, medicines, technical (including tannins, saponin, elastica, dyeing, glue), essential-oil , decorative. A complete listing of these species by these groups is given in the appendix.

From economically important insects homopterans (Homoptera) should indicate carmine scale insect *Porphyrophora polonica*, which is a natural source of very expensive natural dye carmine.

14.3.2 What ecological, economic or social pressures or changes may threaten these species or varieties?

The unsustainable use of biological resources, mainly excessive, inadequate controlled grazing and poaching.

Increasing recreational loads in the midmountains, especially in spring and summer.

Fires. From time to time in the territory of buffer and transition zones of BR some fires (caused by tourists and also because of the arson of the old grass locals) appear.

14.3.3 What indicators, at the level of the species, are used, or will be used, to assess the evolution of population status and associated use?

Indicators at the level of species are population dynamics and status of the main populations of dominant, some rare and economic plant and animal species, population dynamics of indicator species and overall status of plant and animal populations characteristic for every ecosystem type.

14.3.4 What measures will be used to conserve genetic diversity and practices associated with their conservation?

Regular monitoring observation of habitats, according to the design of the future research plan for the period from 2015 will be held on the territory of the core and buffer zones by the staff of state nature park.

15. DEVELOPMENT FUNCTION:

15. 1 POTENTIAL FOR FOSTERING ECONOMIC AND HUMAN DEVELOPMENT WHICH IS SOCIO-CULTURALLY AND ECOLOGICALLY SUSTAINABLE:

15.1.1 Describe how and why the area has potential to serve as a site of excellence/model region for promoting sustainable development.

Lands of transition zone of Katon-Karagay Biosphere Reserve are most suitable for the development of forestry, crop production, animal husbandry and ecological tourism. The organization of the biosphere reserve will allow more effective activities to promote eco-tourism and sustainable use of natural resources. In addition, a comprehensive biodiversity conservation of the area is closely linked to the development of socio-economic potential.

Currently, there are two main types of threats to the territory of the BR: 1) unsustainable use of biological resources (unsustainable agriculture) and 2) uncontrolled visit.

The concept of the biosphere reserve is aimed at improving the living conditions of the local population while reducing the pressure on natural ecosystems through the introduction of alternative economic activities that do not harm biodiversity. In the conditions of biosphere reserve it is possible to demonstrate practices in order to eliminate or reduce specific existing and potential threats to biodiversity in the area, which can then be used in this and other regions with similar conditions.

15.1.2 How do you assess changes and successes (which objectives and by which indicator)

For the evaluation of stable development it is necessary to use the following indicators: stability of natural wild and anthropoFor the evaluation of stable development it is necessary to use the following indicators: stability of natural wild and anthropogenic ecosystems, stability of demographic indices, stability (and, in the future, increase) of local people's income, tourism development, ecologically clean productions and economic infrastructure, increase of overall educational and cultural level of local people.

If tourism is a major activity:

15.2.1 Describe the type(s) of tourism and the touristic facilities available. Summarize the main touristic attractions in the proposed biosphere reserve and their location(s).

Currently, tourism is one of the most promising activity in BR and has great potential for development, especially in the field of eco-tourism.

The proposed biosphere reserve creates good conditions for the sustainable development of eco-tourism, which includes:

a) The development of ecological routes and tourist infrastructure

- Development of nature trails and routes with definition of optimal standards of recreational load and arrangements depending on the types of ecotourism;
- Construction of a mini-hotels, holiday homes;
- Training programs for the public on the development of eco-tourism businesses and training of tour guides.

b) Local rural tourism

- Organization of guest houses;
- development of horse tourism;
- Development of national traditions to familiarize foreign tourists with, including national cuisine, etc.

The popular and most promising forms of tourism in the Katon-Karagay area now and in the future will be such kinds of ecological tourism as:

- Car tours with elements of hiking, horse-backriding, river rafting, fishing tourism, designed for people with any physical training;
- Climbing and mountain-hiking (trekking) tours. The main object of the visit - the mountain and the environs of Belukha - the highest point of Altai and Siberia (4506 m above sea level), which is a great prize for any climber.
- Floatable tours (rafting) of different complexity are designed for rafting fans traveling on mountain rivers. The most

popular river for rafting is Buhtarma river.

- Horseback riding tours are conducted on a local breed “Jabe.”
- Biking began to develop rapidly in the past two years.
- Combined tours combine different types of travel: car, horse, trekking, rafting, fishing, ethnographic, etc. Those are very popular tours offered by travel agencies.
- Scientific - educational tours are designed for people who like scientific expeditions, and are interested in the history and culture of the region, rare and endangered animals and plants.
- Ski tours are very promising due to the fact that within the reserve area it is planned (in addition to the existing Rakhmanov Klyuchi spa center) to create a network of year-round health centers, which will conduct cross-country skiing and travel within the mountain forest zone.

Currently there are 6 trails on the territory of biosphere reserve, which are equipped with resting places, fireplaces, information boards, signposts, information boards. Annually, sanitary cleaning of trails is conducted: the fallen trees are cut, twigs and debris are cleaned, wood flooring through swamps and streams is laid.

1. Recreation – educational ecologic path “Belaya Berel»

Natural complex: Yazevyi waterfall - Lake Yazevoe - Kokkol waterfall, glacier - Mount Belukha - High Camp - mountains Vera, Nadezhda, Lyubov. Tourists stay overnight in the environmental camp on the shores of Lake Yazevoe in tents on specially designated fields. There are fireplaces on the territory of the ecological camp, sanitary blocks (toilet and sanitary cabins), garbage pits for food waste, trash bags for garbage collection. Group of no more than 8 people can stay at the cordon.

2. Ecological path «Arasan» eco tour «Altai trails»

Natural complex: Arasan waterfall - Arasan lake - Rakhmanovskoe lake - «Rakhmanov Springs» radon springs - Venus Hair waterfalls - Radostnyi Pass - Black Berel waterfall. Tourists are located to sleep in the tents on the specially designated fields where there are fireplaces, garbage pits for food waste, trash bags for garbage collection. Group of no more than 8 people can stay at the cordon. Cordon is a cottage with attic and private entrance. The wooden cottage has two bedrooms with double beds and bedding, and 2 small kitchens equipped with electric stoves and cooking utensils. On the territory of the cordon there is a bath, two bathroom stalls. The cordon inspectors collect wood for heating and cooking.

3. Ecological route «Lake»

Natural complex: Schebenyuha mountain - Airtas mountain – Maral lake - Khairyuz lake - Chernovskoe lake. Tourists are located to sleep in the tents on the specially designated fields equipped with fireplaces, garbage pits for food waste, trash bags for garbage collection. Groups are of no more than 15 people. On Maral lake there is a small cordon, which is a one-room wood cabin with bunks, a stove, a table. On the shore of the lake there is a wooden canopy to rest. The cordon inspectors collect wood for heating and cooking.

15.2.2 How many visitors come to the proposed biosphere reserve each year? (Distinguish between single-day visitors and overnight guests, visitors only visiting the proposed biosphere reserve or only passing on the way to another place). Is there an upward or downward trend, or a particular target?

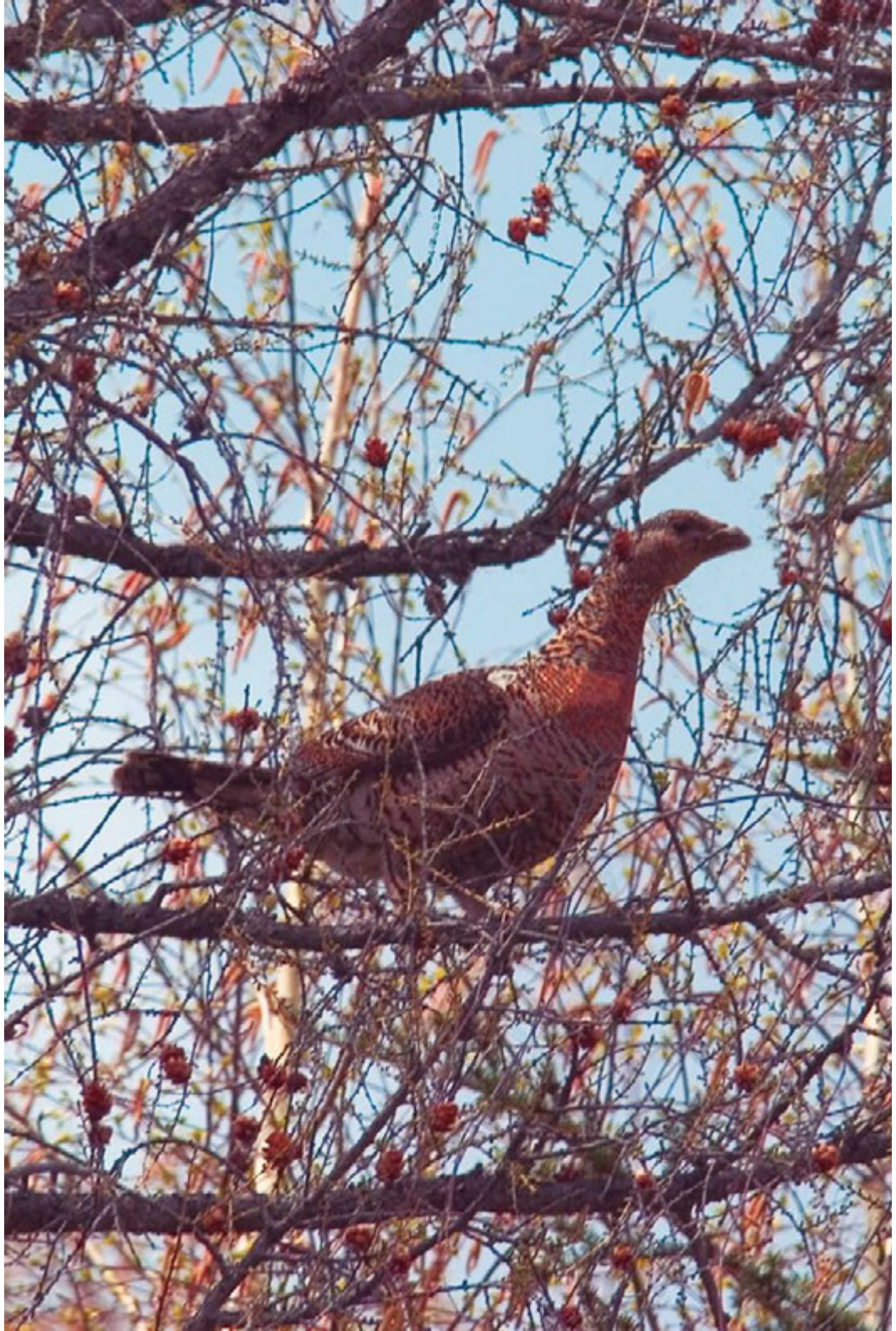
From 2004 to 2007 the amount of natural park visitors has increased noticeably, since in 2004 there were 512 people, and in 2007 the number of tourists has doubled. In 2007, the number of tourists in the Katon-Karagay was 1,069 people. In 2012, Katon-Karagay attracted more than 3,000 visitors. There has been a steady increase in the number of visitors.

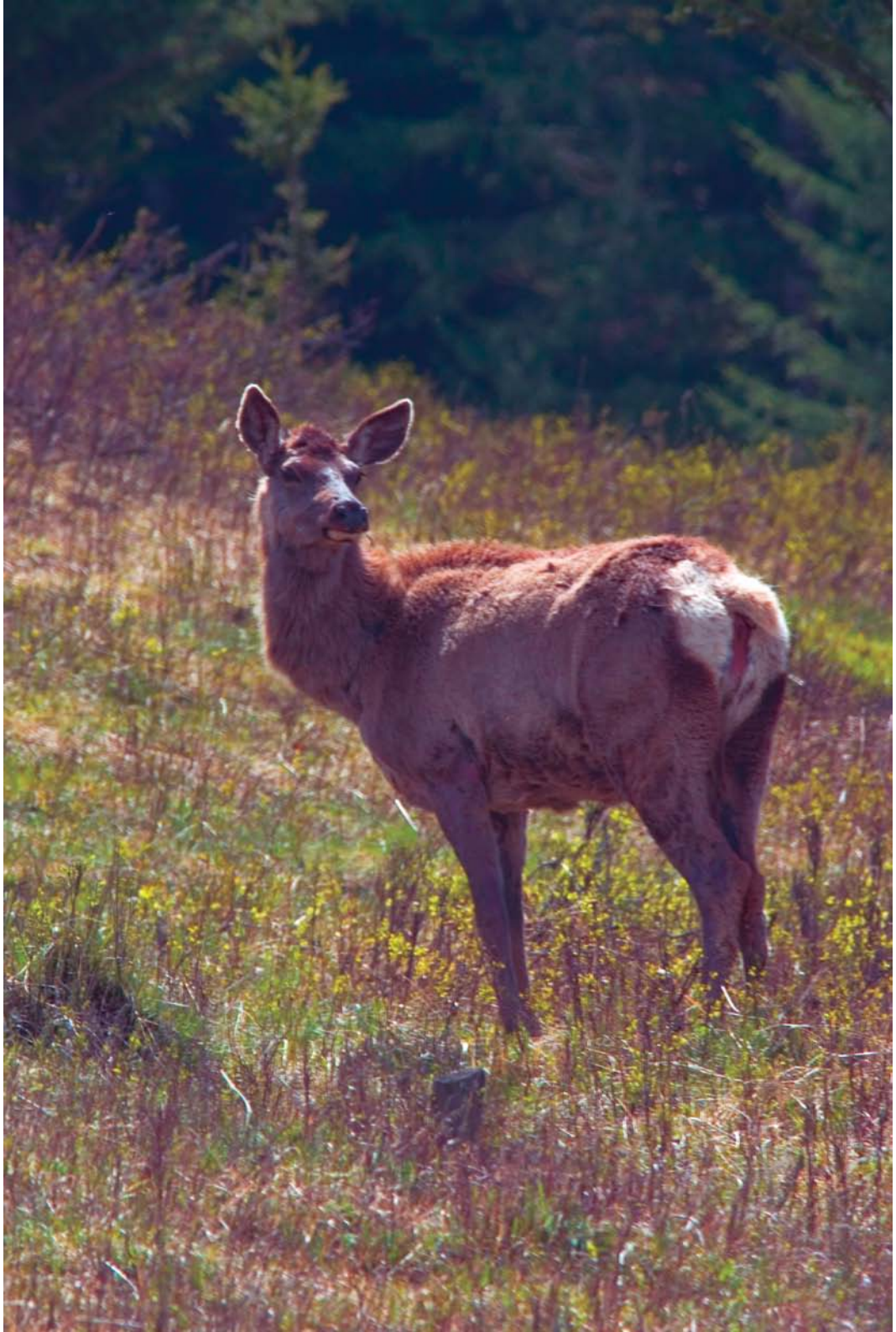
15.2.3 How are tourism activities currently managed?

Tourist development is managed by local authorities, national tourist operators in close collaboration with foreign partners and reserve administration. Local Akimats conduct annual ecological – tourist festivals, which promote local and partly foreign, tourism. Local tour operators form groups of tourists both from other regions of Kazakhstan and from abroad. Reserve administration promotes organizaiton of tourist paths, routes, support of field tourist infrastructure and attracting of scientific tourists.

15.2.4 Indicate possible positive and/or negative impacts of tourism at present or foreseen and how they will be assessed (linked to section 14)?

Positive impact will include regulation of visits to the area, benefits from tourism for the reserve and local community, reduced illegal hunting and fishing and improved environmental culture. Negative impacts of tourism on ecosystem might





be trampling down of grass and soil, disturbance of wildlife, littering and others. Such negative impacts can be mitigated through clear regulation of tourists numbers based on recreational capacity of the natural ecosystems.

Buffer zone of biosphere reserve. Tourism development increases the pressure on this zone's territory. Unfortunately, there is not enough qualified guides, insufficient information for the tourists, not enough educational and advertising materials, including the ones in English. Staff of state nature reserve does not have economic stimuli for ecological tourism development.

Transition zone (development zone). In order to decrease the pressure on the buffer zone, it is extremely important to provide conditions for ecotourism development in biosphere reserve's transition zone, especially because there are interesting objects on this territory as well. In the future it is planned to offer additional services to the tourists from local people – boat rides and rent, horse riding, fishing, locally grown ecologically clean produce realization, and local souvenir production.

15.2.5 How will these impacts be managed, and by whom?

Positive and negative sides of tourism development on the territory of biosphere reserve will be controlled by the administration of biosphere reserve and local authorities, as well as by local tour operators. Infrastructure development will be realized mostly with state support (biosphere reserve and local authorities), and creation of the employment opportunities – by initiative of private companies (tour operators, local national and foreign companies).

15. 3 Agricultural (including grazing) and other activities (including traditional and customary):

15.3.1 Describe the type of agricultural (including grazing) and other activities, area concerned and people involved (including men and women).

The peasant farms and local population are engaged in agriculture and breeding cattle, horses, sheep, bees, deer. Deers are bred in nine medium and large farms and private companies. In the district 1518 households and 9.2 thousand private farms are engaged in agriculture. Local farmsteads produce 94% of milk, 86% meat and 82% wool, as well as honey and other bee products. In recent years, private farms in the region produced from 16.2 to 53.5 thousand tons of milk. In comparison with 1997, its production for 15 years has increased 3.0 -3.5 times. Specific weight of livestock in total gross

output of agriculture is 72%.

Most of the territory of biosphere reserve's transition zone is occupied by crops, pastures and settlements. It is basically settlement and development areas inhabited a long time ago. In these areas near the settlements it is necessary to organize the restoration of renewable natural resources.

15.3.2 Indicate the possible positive and/or negative impacts of these activities on biosphere reserve objectives (section 14).

The positive sides of agricultural development on biosphere reserve's territory include increase of employment and income of local population, development of infrastructure and application of modern agricultural technologies.

Negative sides include:

- Violations of environmental legislation;
- Poaching.
- Overgrazing near the villages promotes degradation of the environment.
- Illegal logging. Among the most significant factors affecting the ecosystem of the reserve in the past and currently from the local population one may name forest logging and harvesting of dead wood. Forest cutting in mountain areas contributes to erosion, changes in the hydrological regime and the reduction of habitat for other species.

15.3.3 Which indicators are, or will be used to assess the state and its trends?

The main indicators include:

1) *Use of biological resources,* mainly excessive insufficiently controlled fishing and hunting.
2) *Water usage.* Water, flowing through biosphere reserve, is the only source of drinking and technical water for local population.

3) *Quantity of fires*, which appear from storms or accidents caused by hunters and fishermen on the territory of the transition zone, as well as from burning of old grass by local people.

4) *Alien species introduction*.

15.3.4 What actions are currently undertaken, and which measures will be applied to strengthen positive impacts or reduce negative impacts on the biosphere reserve objectives?

Department of Environmental Education organizes and carries out environmental education activities in key areas: working with the media, advertising and publishing, museum, ecological tours and educational tourism interaction with teachers and education authorities, and develops posters, flyers and other forms of visual aids, and takes part in providing practical training for students on the basis of the environmental profile of the reserve.

On the territory of the core and buffer zones the staff of Katon-Karagay state national natural park provides regular monitoring observations of biodiversity components, according to the current (till 2015) and future Perspective plan. In addition, there is a possibility of scientific research related to the work of other scientific institutions.

15. 4 Other types of activities positively or negatively contributing to local sustainable development, including impact/influence of the biosphere reserve outside its boundaries.

15.4.1 Describe the type of activities, area concerned and people involved (including men and women).

In the villages located far from there are private shops, cafe and restaurants. Many people are working for farming; some of them establish small hotel and guest-houses for tourist, there are some medicine centers for natural resources and rehabilitation of health on the base of nature treatment. In the future development of ecological tourism in the limits of nominated biosphere reserve will provide additional employment for part of local people.

15.4.2 Indicate the possible positive and/or negative impacts of these activities on biosphere reserve objectives (section 14). Have some results already been achieved?

Positive influence is connected to development of eco-tourism.

Negative impacts includes:

The unsustainable use of biological resources, mainly not controlled grazing and poaching.

Increasing recreational loads in middle mountains, especially in the summer.

Fires. From time to time in the buffer zone and the transition zone of biosphere reserve some fires appear (caused by tourists), but also because of burning of the old grass by locals.

15.4.3 What indicators are, or will be used to assess the state and its trends?

The indicators here are the status of populations and the number of the key species of plants and animals.

15.4.4 What actions are currently undertaken, and which measures will be applied to strengthen positive impacts or reducing negative ones on the biosphere reserve objectives?

- In 2011, a National Action Plan for the conservation of the snow leopard in Kazakhstan (mainly in the territory of the Altai) was established by Forestry and Hunting Committee under the ministry of Environmental Protection and «Snow Leopard Fund» Public Fund.
- The State Protection Inspection for the providing of special protection regime on the territory of biosphere reserve will be equipped with a new equipment in order to improve its activity.
- Personel of the Service for Environmental Education will be increased for cultural and educational activities and ecotourism.

15.5 Benefits of economic activities to local people:

Local people, living on the territory of biosphere reserve and in the surrounding area, will get considerable economic benefit from biosphere reserve creation. First of all, that would be new employment opportunities, connected to tourist activities (development of infrastructure, creation of private hotels and guest houses, equipment rent, guide services, etc.). The second important factor is overall rehabilitation of the environment and sustainable nature use.

15.5.1 For the activities described above, what income or benefits do local communities (including men and women) derive directly from the site proposed as a biosphere reserve and how?

Besides direct economic activity, related to nature resources use at Biosphere Reserve's territory (cattle breeding, fishing, hunting and plant growing), local people receive sufficient benefit from ecological tourism development. In the future it will lead to overall improvement of local infrastructure level (building high-quality houses, roads, electronic communication means, etc.).

15.5.2 What indicators are used to measure such income or other benefits?

The numbers that may serve as indicators are the number of tourists per year, number of opened private hotels, guest houses and restaurants, as well as agriculture productivity (number of fish, cattle and poultry, milk production, etc.). One of the indicators is per capita income of local people.

15.6 Spiritual and cultural values and customary practices:

(Provide an overview of values and practices, including cultural diversity).

15.6.1 Describe any cultural and spiritual values and customary practices including languages, rituals, and traditional livelihoods. Are any of these endangered or declining?

East Kazakhstan region is a very rich by archaeological sites. The large historical and cultural centers of ancient times are known in the region. For example, the widely known archaeological complex of ice tombs Berel, where researchers found unique archaeological findings, is located in Katon-Karagay Biosphere Reserv. The main religions of local people are Islam and Christianity. Indigenous people usually support religious traditions, besides which they keep national customs and traditions (respect for the elderly, higher status of the man, involving children in religious and national traditions).

15.6.2 Indicate activities aimed at identifying, safeguarding, promoting and/or revitalising such values and practices.

For the conservation and restoration of archaeological and architectural monuments in the Altai region the program "Cultural Heritage of Altai" was developed in order to ensure the preservation, restoration, reconstruction, research of archaeological monuments and architecture of the region of interest to the nation's history and in need of emergency assistance. For example, under this program the ethnographic festival of Turkic-speaking countries TURKSOI is held every 2 years in the archaeological complex Berel.

15.6.3 How should cultural values be integrated in the development process: elements of identity, traditional knowledge, social organizations, etc.?

Information on cultural heritage, collected by archaeologists and historians, is included in the courses of secondary and higher education institutions of the region and is used for creation of documentaries, TV shows and educational projects.

15.6.4 Specify whether any indicators are used to evaluate these activities. If yes, which ones and give details.

(Examples of indicators: presence and number of formal and non-formal education programmes that transmit these values and practices, number of revitalisation programmes in place, number of speakers of an endangered or minority language).

One of the indicators is the fact that information, collected by the archaeologists, was included in the school history programs of not only schools of the region, but throughout all Kazakhstan.

16. LOGISTIC SUPPORT FUNCTION:

16. 1 RESEARCH AND MONITORING:

16.1.1 Describe existing and planned research programmes and projects as well as monitoring activities and the area(s) in which they are (will be) undertaken in order to address specific questions related to biosphere reserve management and for the implementation of the management plan (please refer to variables in Annex I).

As part of the GEF project for biodiversity conservation of the Western Altai a complex scientific research was carried out in 2005-2011, and the natural-scientific justification for the expansion of the territory of the core and buffer zones has been developed. Within the framework of scientific research an analysis of the natural environment and socio-economic situation of the local population in the proposed biosphere reserve, as well as zonation of the reserve's territory was conducted. These studies defined the current state of the environment and the level of human impact on natural ecosystems, and helped in development of the management plan for nature reserve. Developed in the 2005-2011 programs on environmental monitoring allow regular system monitoring, both in the core zone, and on the territory of the other zones .

16.1.2 Summarize past research and monitoring activities related to biosphere reserve management (please refer to variables in Annex I).

•Abiotic research and monitoring [climatology, hydrology, geomorphology, etc.]

Since the organization of a national park the research is constantly conducted in various areas: geology, soil, hydrology, botanical and zoological. The numerous studies on the flora, vegetation and fauna have been fulfilled and the basis of its environmental monitoring were established. From the middle of the last century the qualified zoologists, botanists and geographers constantly worked there.

There is ongoing regular monitoring of the state of the vegetation, as well as of population size and condition of rare and model animals species populations, carried out on the territory of Katon-Karagay state nature park. From the mid-century records of human impact (fires, various violations of the protected regime, etc.) are documented. In addition, annually

the staff of scientific department and service department of Nature Reserve is monitoring the state of the objects. Research organizations, sometimes experts from other countries, provided support for observations.

• Biotic research and monitoring [flora, fauna]:

Monitoring and biological observations were carried out on the modern territory of biosphere reserve in the framework of state scientific and practicat programs of Kazakh scientific research institutes of the Academy of Science of KazSSR and Ministry of water and fishing of KazSSR. They included monitoring of a) status of fauna and flora of West Altai, b) number of commercial, common and rare animal species (mammals, birds, fishes), c) the condition of the main populations of plant species, d) hydrocoenoses condition, etc.

Monitoring and observations are carried out by scientific department of Katon-Karagay National Park from mid-last century, in the framework of the annual component of the “Nature Chronicles” according to the standard unified program. Key indicators for measuring state of conservation of natural sites include:

1) Inventory of fauna “Vertebrates of Katon-Karagay”;

2) Inventory monitoring research program “ Nature Chronicle”;

3) Inventory of flora;

4) The Nature Chronicles.

In addition, the surrounding forestries were studied to record the number of rare species of plants and animals: accounting of the breeding birds on the routes and permanent observation points, a counting the number of the wild boar, bears and large mammals, as well as the annual phenological observations of the animals and plants.

• Socio-economic research [demography, economics, traditional knowledge, etc.]:

Social-economic research was regularly conducted by competent governmental local authorities (Executive Com-

mittees – in Soviet time, and Akimats – in present time) and corresponding governmental scientific organizations of Kazakhstan, and also were carried out in 2005-2011 in the limits of GEF/UNDP projects on biodiversity conservation of West Altai. The most comprehensive survey of the socio-economic situation was carried out in 2007 by special research group (the report is given in Appendix 19).

16.1.3 Indicate what research infrastructure is available in the proposed biosphere reserve, and what role the biosphere reserve will play in supporting such infrastructure.

To carry out the research activities the biosphere reserve possesses the following:

1. The building of Research Station (in the main administrative building of the reserve).
2. Monitoring sites and routes.
3. Transport (Taiga snowmobiles, quadrocycles, 1 Ural truck, 3 off-road cars UAZ 3-SAZ, etc.)
4. GPS-40 pcs.
5. Radio communication equipment: stationary VHF radio KENWOOD TK-80 (16), mobile VHF station (2), car radio Kenwood (5), car radios KENWOOD (5), mobile radio Kenwood (53)
6. Optical instruments: microscopes, binoculars, telescopes, night vision, camera traps, etc.
7. Video and Photography: video and photo cameras
8. Laboratory equipment (furniture, chemicals, tools, electronic scales, etc.).
9. Field gear (scientific - traps, snares, nets for catching birds, entomology stains, etc.; household - tents, sleeping bags, etc.).
10. Computer equipment, software, solar generator, photovoltaic power
11. Research Library
12. Access to the Internet.

Education for sustainable development and public awareness:

16. 2

16.2.1 Describe existing and planned activities, indicating the target group(s) and numbers of people involved (as “teachers” and “students”) and the area concerned.

Activities to ensure environmental education and awareness, which are carried out in the BR, the following:

1) *Work with the media*. Purpose: To promote protected areas in the population. The target group - the journalists and the media, etc. Key actions:

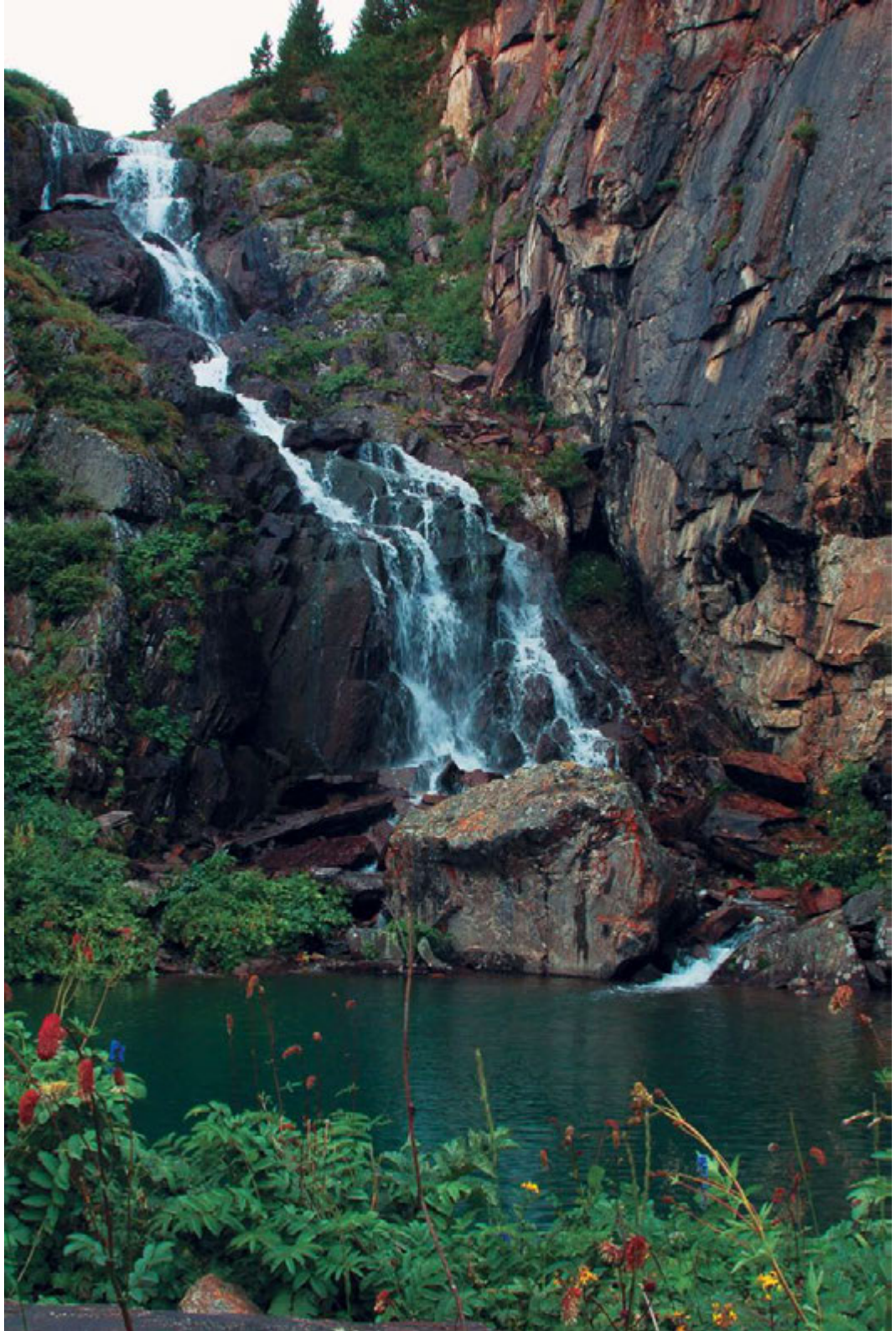
- Participation in the campaigns of mass and public information media and briefings;
- Invitation of mass media to the annual events “Day of Open Doors”, environmental activity “Parks March”, festival “Tulips”, etc.
- Organize regular presentations of reserve personnel in regional and local newspapers and on the regional and urban radio and television.
- Participate in social television and radio broadcasts (TV roundtables, etc.);

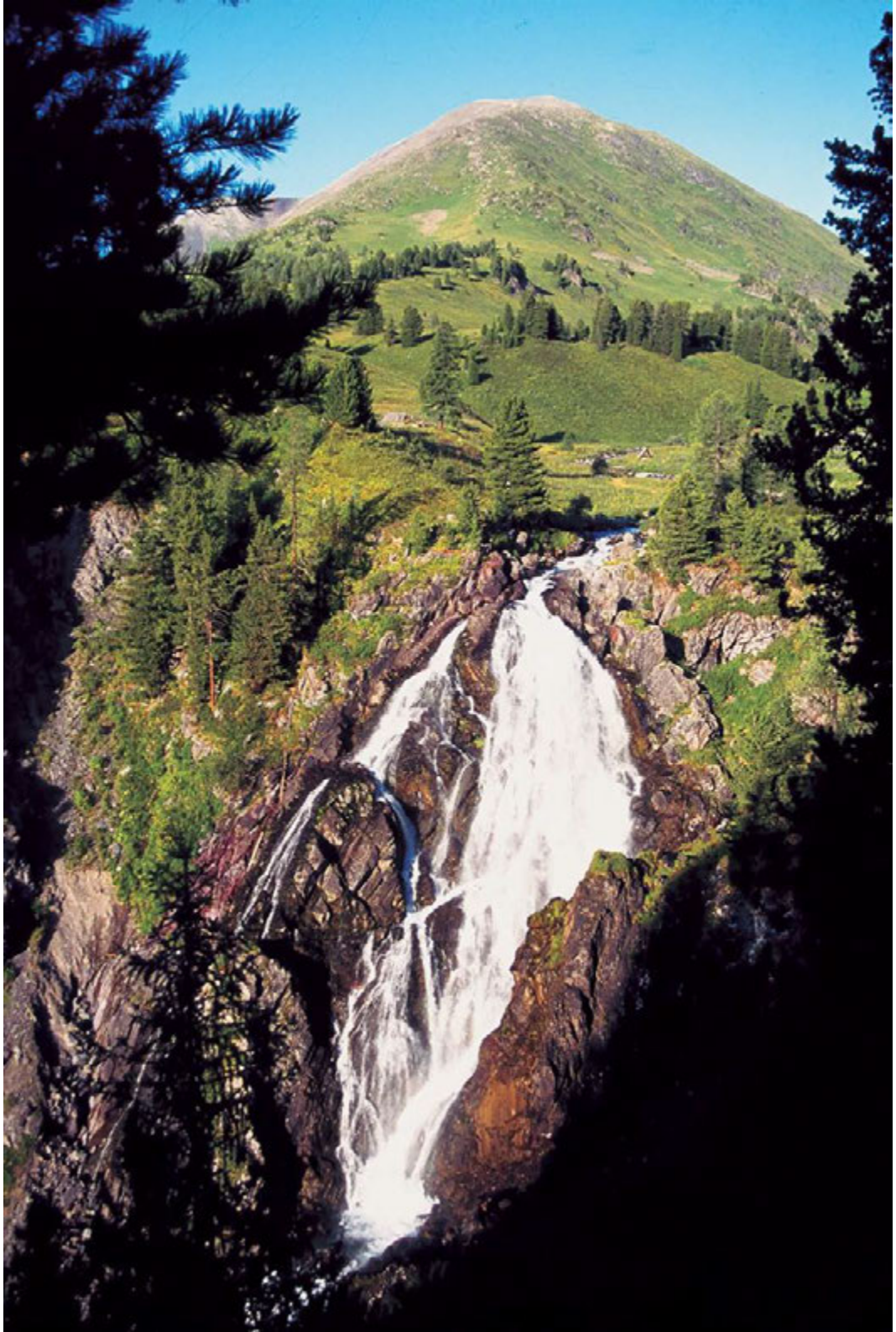
2) *Advertising and publishing*. Objective: To disseminate information on protected areas and create a positive public attitude towards them. The target group - a wide range of users. Key actions:

- Production of brochures with color illustrations.
- Creation of film and video.

3) *Involvement of NGOs and other non-profit organizations*. Objective: Involvement of NGOs to organize activities on ecotourism. The target group - national and international NGOs. Key actions:

- Create a Society of Friends of the reserve, created in order to directly support protected areas and to promote the conservation of biodiversity;
- Establish cooperation with existing regional public organizations and movements with environmental focus.





4) *Conducting ecological tours and educational tourism*. Objective: The possibility to come into contact with the world of nature. The target group - local adult population, domestic and foreign tourists, school children, students, etc. Key actions:

- Development of a regional ecotourism concept;
- Detailed inventory of existing routes and the necessary resources for their development;
- Assessment of the necessary investments for the development of infrastructure of existing routes;
- Construction of ecological trails and paths;
- A description of each route (a brochure);
- Publications about travel routes;
- Advertisement of the routes for individual visitors and tour operators;

5) *Conducting environmental festivals and activities*. Objective: To draw public attention to modern issues of environmental protection. Target group - schoolchildren, students, local adult population, domestic and foreign tourists, etc. Key actions:

- Conduct Parks March;
- Conduct Tulips Day;
- Conduct Birds Day;
- World Environment Day;
- Children's ecological festivals

6) *Work with schoolchildren*. Objective: building system views about nature reserves as national heritage sites, and a positive attitude to the diversity of wildlife, as well as increased environmental outlook and the development of relevant knowledge, developing practical environmental skills, involvement of children in environmental activities through participation in practical activities of the Reserve. Target group - schoolchildren. Key actions:

- Conduct lectures on the unique value of protected areas for students;

- Organization of competitions: photos, drawings, wall newspapers, theaters, crosswords, articles;
- Support research and other scientific work;
- Organization of round-table discussions among students;
- Creation and organization of the school teams;
- Implementation of school environmental programs;
- Conduct field trips or excursions in protected areas;
- Attracting students to participate in environmental festivals and activities.

7) *Interaction with teachers and education authorities*. Objective: To strengthen the effectiveness of environmental education in the State Natural Reserve. Target group - teachers. Key actions:

- Organization of thematic workshops for teachers, especially for teachers of biology and geography.
- Participation in the organization of courses of professional development for teachers.
- Create training programs and projects with the participation of the teachers, and their implementation.
- Provide reference and other literature to schools on environmental issues, biodiversity and landscape biodiversity and the historical and cultural heritage, as well as a variety of visual aids: photos, videos, etc.
- Conduct methodological advice sessions for teachers.
- Assist in equipment of thematic classrooms.
- Organization of round tables for school teachers on current issues in environmental education work with children.
- Development and implementation of joint environmental education projects and activities.

8) *Staff capacity building in the department of environmental education*. Objective: To improve the efficiency of the department of environmental education. Target group – Reserve's personnel. Key actions:

- Educational seminars and training;
- Exchange of experiences in other protected areas, training on the basis of the best domestic and foreign natural reserves;
- Analysis of international experience;
- Strengthening and updating methodological framework;
- Promote employee to study on graduate and doctoral level.

9) *Improvement of material and technical base of the department of environmental education*. Objective: To improve the efficiency of the department of environmental education. Target group – Reserve's personnel. Key actions:

- Purchase of equipment.

10) *Work on development of the visit - center*. Objective: Creating a base of active environmental education and community outreach. Target group - schoolchildren, students, local adult population, domestic and foreign tourists, etc. Key actions:

- Provide update exhibits of visit – center
- Engage potential donors in financing the construction of the visit center
- Provide scientific support to the center
- Organize exhibition to promote ideas of conservation among the general population: permanent (photo stands, exhibitions), temporary (children's drawings, other artwork) and mobile.

16.2.2 What facilities and financial resources are (or will be) available for these activities?

1. The visitor center plays an important role in the region in promoting and informing the public about the importance of preserving the diversity of the regional mountain ecosystems. Museum of Nature, part of the center, is now a place where visitors can get all the information about the unique nature of the Western Altai. Museum of Nature is an environmental education center not only for the local population, but also for the visiting tourists. There the educational excursions are conducted and popular science films about the nature of the region are shown. The children's room offers environmental lessons for schoolchildren.

2. Seven ecological routes are currently operating in the biosphere reserve. Tourists can stay in the field bases (houses with all necessary facilities) or tents on the environmental routes.

16. 3 Contribution to the World Network of Biosphere Reserves:

16.3.1 How will the proposed biosphere reserve contribute to the World Network of Biosphere Reserves, its Regional and Thematic Networks?

At the national level, cooperation exists with the biosphere reserves Korgalzhyn and Alakol. At the international level since the late 1990s a close working relationship had been established with Katun Biosphere Reserve (Russia). In the framework of collaboration the exchange of experiences is provided, and educational trips and trainings are organized. It is noteworthy that Katon-Karagay Biosphere Reserve has a very strong scientific and organizational relations with other state natural reserves of Kazakhstan, which in the future may also obtain the status of Biosphere Reserves. Since 2011, through the work of Kazakhstan National MAB Committee Kazakhstan became a member of the East Asia (EABRN), South Asia-Central Asia (SACAM) and European (EuroMAB, since 2012) networks of Biosphere Reserves, which allows to establish close contacts with the nearest biosphere reserves from Russia, Iran, Pakistan, India, China, Mongolia, Korea, Japan and the European Union.

16.3.2 What are the expected benefits of international cooperation for the biosphere reserve?

Biosphere Reserve Katon-Karagay plans to establish close cooperation with all the mountain biosphere reserves of Eurasia for the exchange of scientific information, experience and organization of collaborative activities.

16.4 Internal and external communication channels and media used by the biosphere reserve:

16.4.1 Is (will) there (be) a biosphere reserve website? If yes, what is its URL?

The official website of akim Katon-Karagay district of East Kazakhstan region http://katon-karagay.vko.gov.kz/ru/park.htm, the official website of the Committee for Forestry and Hunting of the Ministry of Environment provides a list of protected areas and general information on them: http://www.fhc.kz/forest/26/4835/.

16.4.2 Is (will) there (be) an electronic newsletter? If yes, how often will it be published?

Currently no electronic newsletters are published.

16.4.3 Does (will) the biosphere reserve belong to a social network (Facebook, Twitter, etc.)?

Currently Katon-Karagay Biosphere Reserve is not registered in the social networks.

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION:

[Describe the following characteristics in the prospective that the site is being designated.]

17. 1 MANAGEMENT AND COORDINATION STRUCTURE:

17.1.1 What is the legal status of the biosphere reserve?

Katon-Karagay Biosphere Reserve is being created on the basis of Katon-Karagay State National Nature Park.

17.1.2 What is the legal status of the core area(s) and the buffer zone(s)?

According to national legislation the core zone of the proposed biosphere reserve is a zone of strict protected regime. BR buffer zone actually includes environmental stabilization zone, tourist and recreational activity zone, and zone of limited economic activity, as well as reserved zone of the State National Nature Park Katon-Karagay.

17.1.3 Which administrative authorities have competence for each zone of the biosphere reserve (core area(s), buffer zone(s), transition area(s))?

Core zone is managed by Forestry and Hunting Committee of the Ministry of Environmental Protection of the Republic of Kazakhstan. Management of core zone's territory is carried out through Katon-Karagay Nature National Park.

Buffer zone is managed mainly by Forestry and Hunting Committee of the Ministry of Environmental Protection RK through Katon-Karagay Nature National Park and local state authority (district administration – Akimat of Katon-Karagay district).

Transition zone is managed by local authority (district administration) and numerous land users (owners).

17.1.4. Clarify the respective competence of each of these authorities. Make a distinction between each zone if necessary and mention any decentralized authority.

Katon-Karagay State Nature National Park is a management body for the core and buffer zones of biosphere reserve.

Akimat of Katon-Karagay district of East Kazakhstan Oblast is the management body for transition zone.

Overall management is carried out by Coordinational Council of biosphere reserve.

17.1.5 Indicate the main land tenure (ownership) for each zone.

Main zone's territory is in state possession (national property) and administered by authorized state body – Forestry and Hunting Committee of Ministry of Environment Protection of Kazakhstan. Main zone's territory is managed by Katon-Karagay State Nature National Park.

Buffer zone's lands are national (state) property and consist of agriculture and reserve lands. Agricultural lands are used by farmers. Buffer zone's land use for pasture and hayfields is controlled by nature reserve's administration. Buffer zone is administered by authorized state body – Forestry and Hunting Committee of Ministry of Environment Protection of Kazakhstan. As a whole, the territory of buffer zone is controlled by Katon-Karagay State Nature National Park.

Local authorities play considerable role in activity coordination of different state and private organizations in the limits of administrative unit, in collaborative operational plans on bioresources conservation, fire prevention and emergencies and in ecological education of population.

17.1.6 Is there a single manager/coordinator of the biosphere reserve or are several people in charge of managing it? If one manager/coordinator, who designates and employs him/her (national authorities, environmental administrative agency, local authorities)?

Director of Katon-Karagay State Nature National Park is responsible manager of the core and buffer zones of biosphere reserve. He is a staff member of environmental administrative agency (Forestry and Hunting Committee under the Ministry of Environmental Protection of RK). The Director is responsible for environmental activities and is the main state inspector. Management of the transition zone is carried out at the sessions of Coordinational Council by decision-making based on consensus.

17.1.7 Are there consultative advisory or decision-making bodies (e.g., scientific council, general assembly of inhabitants of the reserve) for each zone or for the whole biosphere reserve?

- If yes, describe their composition, role and competence, and the frequency of their meetings.

Biosphere reserve's management is carried out through the Coordination Council of the Katon-Karagay Biosphere Reserve. The Coordination Council is a collegial public body and is set up for the purpose of implementing the policy of effective management and sustainable use of the biosphere reserve, the introduction of alternative activities, resource-saving and renewable technologies. The Coordinating Council, which is composed of representatives of governmental agencies (territorial department of forestry and hunting), nature reserve, local government offices, local non-governmental organizations and land users, is necessary to ensure cooperation and overcome the contradictions between all nature users.

17.1.8 Has a coordination structure been established specifically for the biosphere reserve?

- If yes, describe in detail its functioning, composition and the relative proportion of each group in this structure, its role and competence.

The special structure - Coordination Council of Biosphere Reserve - was founded specifically for the policy of effective management and sustainable use of the biosphere reserve. The Council consists of the director of Katon-Karagay National Park and his deputies, representatives of land users in the transition zone, the representatives of the Society of Hunters and Fishermen, Regional Territorial Department of Forestry and Wildlife Service and the regional territorial management of fisheries.

- Is this coordination structure autonomous or is it under the authority of local or central government, or of the manager/coordinator of the biosphere reserve?

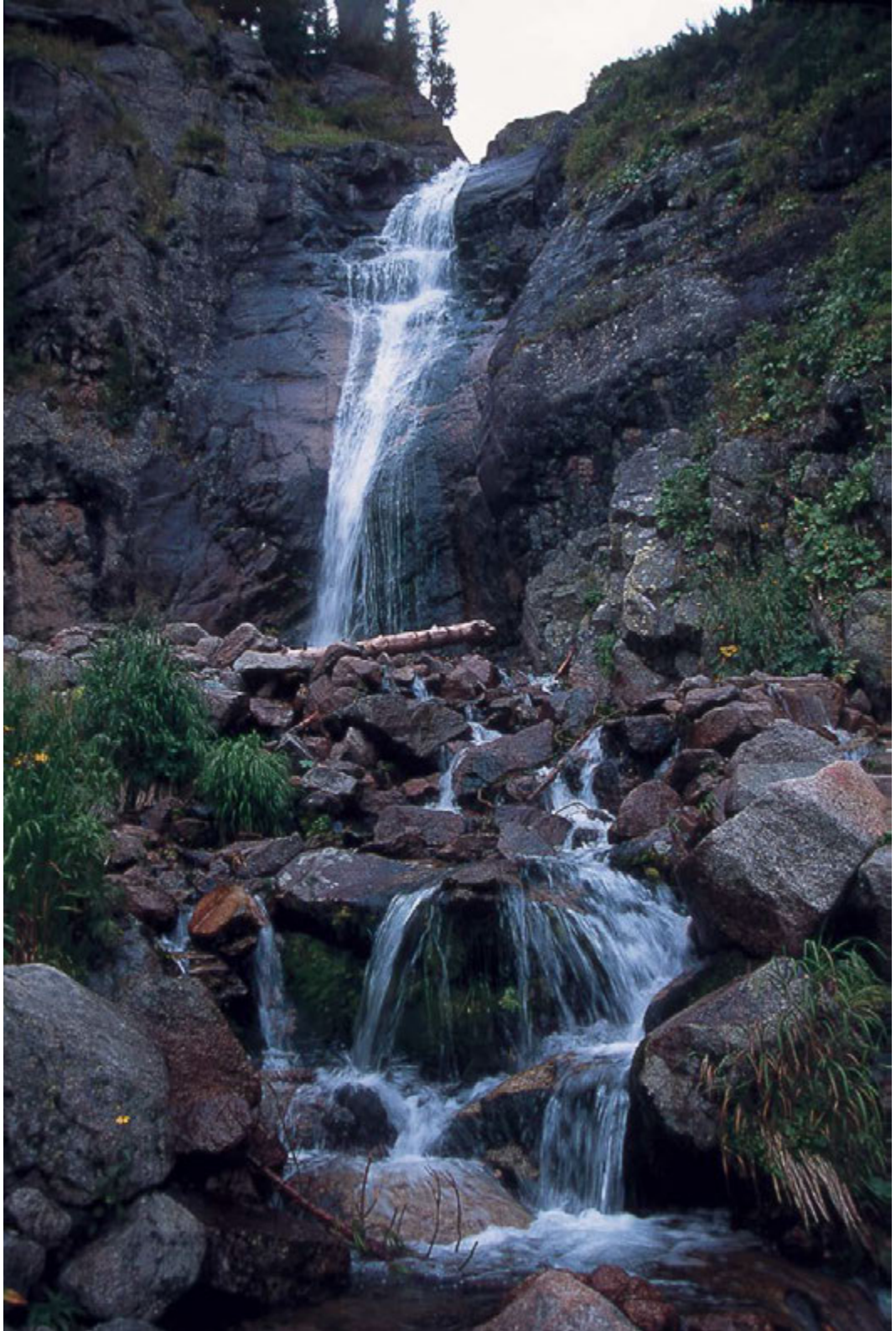
It is autonomous structure

17.1.9 How is the management/coordination adapted to the local situation?

Management of biosphere reserve is carried out using unified approach in whole Kazakhstan, and it does not need to be adapted to local conditions.

17.1.10 Is there a procedure for evaluating and monitoring the effectiveness of the management?

At the given stage a special procedure for evaluation and monitoring of biosphere reserve's management effectiveness is not elaborated. In Kazakhstan for SPNA of Republican importance a method of management effectiveness evaluation, developed in IUCN, is used.



17. 2 Conflicts within the biosphere reserve:

17.2.1 Describe any important conflicts regarding the access or the use of natural resources in the area considered (and precise period if accurate). If the biosphere reserve has contributed to preventing or resolving some of these conflicts, explain what has been resolved or prevented, and how this was achieved for each zone.

The main conflict between the national park and the community in past years is the process of release the forest wood to the local population, carried out by the park. It should be noted that previously the forest wood release (according to the words of the locals) was carried out with violations of established rules and regulations: writing out a wood ticket for 1-2 cubes, almost every resident harvested up to 10 cubes. Now the process of wood release, along with permits for hunting and the collateral use, is strictly controlled. Strengthening the regime of security in the region, the termination of unlicensed hunting laid the foundation for the emergence of controversies between the national park and local residents. In this regard, the public commission was created that addresses issues of conflict with the local population. The commission includes representatives of the public. During the work of this public commission four scheduled and one emergency meeting were held; every member of the commission was introduced to activities of the National Park, heard the reports of department chiefs of National Park, got familiar with the results of an anonymous survey in Katon-Karagay, Uryl and Aksu (White) villages. The main result of the work of the commission was to inform the local population about the activities of the park as many people living side by side with the park did not know about the basic environmental and scientific activities of the park.

At present time sometimes conflicts appear between the local population and the national park that relate to the absence of permanent marked border between the buffer zone and adjacent territories of the transit area. For the same reason, there are problems with the plowing of land by farmers, illegal mowing, picking berries, mushrooms and livestock grazing. Creating a Biosphere Reserve provides a clear zoning with marked borders and an area for farming and the preservation of natural resources.

17.2.2 If there are any conflicts in competence among the different administrative authorities in the management of the biosphere reserve, describe these.

To the present time there are no conflicts between different management bodies of biosphere reserve (reserve's administration, local authorities).

17.2.3 Explain the means used to resolve these conflicts, and their effectiveness.

The main means of conflict solving were direct talk of conflicting sides or discussion in the frame of Coordinational Council sessions. As the result of discussions, all conflicts were solved.

Representation, participation and consultation of local communities:

17. 3

17.3.1 At what stages in the existence of a biosphere reserve have local people been involved: design of the biosphere reserve, drawing up of the management/cooperation plan, implementation of the plan, day to day management of the biosphere reserve? Give some specific examples.

Currently, the Management Plan of Katon-Karagay State National Nature Park is available, it relates to the management of the core and buffer zones of biosphere reserve. Nature users have their own management plans that relate to the management plan for the reserve. As a result, simple aggregation of all these plans is in fact overall integrated management plan of whole biosphere reserve's territory.

17.3.2 Describe how the local people (including women and indigenous communities) have been, and/or are represented in the planning and management of the biosphere reserve (e.g., assembly of representatives, consultative groups).

Local communities and private land users are represented in Coordinational Council through their elected representatives of local authorities, local NGOs or directly as its members. All members of the Council have equal rights in voting and decision-making.

17.3.3 Describe the specific situation of young people in the proposed biosphere reserve (e.g., potential impacts of the biosphere reserve on youth, consideration of their interests and needs, incentives to encourage them to participate actively in the governance system of the biosphere reserve).

Young people actively participate in creation and life of biosphere reserve through the Youth Public Association "Neosphera". The mission of "Neosphera" is to establish a scientific, educational, cultural and ecological basis for sustainable development of society. "Neosphera" operates in the following areas:

- promoting cultural, educational and scientific information, aesthetic and environmental awareness;
- Conducts activities in the field of biological and landscape diversity;
- Promote the creation and development of protected areas;
- Conducts research and environmental monitoring surveys for NGOs, government agencies and business structures;
- Helps ensure environmental safety, protection of nature and cultural values;
- Promote the activities of state bodies directed against violations of environmental laws;
- Establishes the media and other organizations;
- Provides publishing, film, radio and multimedia tutorials and presentations, relevant aspects of the Association;
- Provides data collection, analysis, synthesis and dissemination of information about the activities of the association and other organizations;

- Contributes to the development, implementation and dissemination of information on energy- and resource-efficient environmentally friendly technologies in all economic activities and promotes their introdution among local population;

- Contributes to the development of eco-tourism in the region;

- Cooperates with other associations, organizations, institutions and the media, within the territory of the Republic of Kazakhstan, CIS and foreign countries;

- Participates in the unions and associations of public organizations, including international;

17.3.4 What form does this representation take (e.g., companies, associations, environmental associations, trade unions)?

Representation of youth in activity and management is carried out through local NGOs, school committees and youth clubs.

17.3.5 Are there procedures for integrating the representative body of local communities (e.g., financial, election of representatives, traditional authorities)?

Local communities are represented in management organ of biosphere reserve (Coordinational Council) through their elected representatives of local authorities and through local NGOs.

17.3.6 How long-lived are consultation mechanisms (permanent assembly, consultation on specific projects)? Make a complete description of this consultation. What are the roles of involved stakeholders compared to the role of the biosphere reserve?

In the framework of the international UNDP / GEF project “Conservation of Altai” from 2005 to 2011 the material-technical base was strengthened and numerous training seminars were held.

17.3.7 What consultation mechanisms have been used, and who has been involved? Are they for specific purposes or long-term? What impacts have they had on decision-making processes (decisional, consultative or merely to inform the population)?

As part the GEF project on biodiversity conservation of the Western Altai a complex scientific research in 2005-2011 was carried out, the nature-scientific justification for expanding the territory of the core and buffer zones were also elaborated. In the framework of scientific research the proposed zoning of the biosphere reserve from the analysis of the natural environment and the socio-economic situation of the local population has been conducted.

These studies allowed definition of the current state of the natural environment and the level of human impact on natural systems, as well as development of a management plan for the natural reserve. Developed in the 2005-2011, the program on monitoring the status of the environment allow regular system monitoring, both in the main zone, and on the territory of the other zones.

17.3.8 Do women participate in community organizations and decision-making processes? Are their interests and needs given equal consideration? What incentives or programmes are in place to encourage their representation and participation (e.g.: was(were) a “gender impact assessment(s)” carried out)?

Both women and men are equal in their rights to participate in the activities of state and non-governmental organizations, involved in the work with Biosphere Reserve. There were no special efforts for increased representation of women in management bodies, in order not to humiliate women’s dignity by creating gender preferences. Due to high educational level of local people and cultural traditions, formed by centuries, women in Kazakhstan have equal economic and political rights.

17. 4 The management/cooperation plan/policy:

17.4.1 Is there a management/cooperation plan/policy for the biosphere reserve as a whole?

In the present the Management Plan of Katon-Karagay BR is dedicated mainly for the core and buffer zones of Biosphere Reserve, nature users have their own management plans, that corresponds with Management Plan of biosphere

reserve. As a result, simple aggregation of all these plans is essentially an overall integrated management plan for the whole biosphere reserve's territory. Special Management Plan for Biosphere Reserve territory is not developed, there is not need for it at the present stage of Biosphere Reserve's development. All controversial issues are solved at the sessions of Coordinational Council of Biosphere Reserve.

17.4.2 Which actors are involved in preparing the management/cooperation plan? How are they involved?

Local and national / international experts, as well as representatives of state authorities and NGOs were involved in preparing the Management Plan. A draft, developed by experts, was discussed at the sessions of expert group, it was corrected with the recommendations of local consultants.

17.4.3 Do local authorities formally adopt the management/cooperation plan? Are local authorities making reference to it in other policies and/or plans? If so, please provide details.

Management Plan was agreed with local authorities and, according to legislation of Kazakhstan, was approved by the authorized body – Forestry and Hunting Committee under the Ministry of Environmental Protection of RK. Authorities and representatives of public organizations had an opportunity to give their recommendations during the process of Plan development.

17.4.4 What is the duration of the management/cooperation plan? How often is it revised or renegotiated?

The existing Management Plan of Katon-Karagay National Park was developed for 2009-2013. Then on the basis of the existing plan and taking into account the achieved results, the next Management Plan for the next five-year period (2014-2018) will be developed in 2014.

17.4.5 Describe the contents of the management/cooperation plan. Does it consist of detailed measures or detailed guidelines? Give some examples of measures or guidelines advocated by the plan? (Enclose a copy).

Management Plan for Katon-Karagay State National Park was created within the UNDP / GEF Project "Conservation and Sustainable Use of Biodiversity of Kazakhstan part of Altai-Sayan ecoregion". Management Plan consists of four chapters:

- Description (location, size, land use, climate, etc.)

- Evaluation of the current status and overall conclusions (current management objectives, evaluation of protected areas over the past period, labor, etc.)

- Mechanisms for the implementation of management plan (program management, wildlife management,

research and monitoring, etc.)

- Financial needs

Management Plan of Katon-Karagay Biosphere Reserve gives the current assessment of the National Park and on the basis of general conclusions the realization ways for, for example, wildlife management, human resource management, program improvement of living conditions of the local population. Management plan includes the activities on management of natural resources:

- Habitat management provides forest thinning, planting, strengthening of fire prevention activities, prevention of occurrence of forest pest centers, monitoring of forest resources, forest pathology and forest fires monitornig. For the period of the fire season it is expected to create fire service staff (20 people)

- Human Resource Management provides for the development of eco-tourism and the involvement of local people in tourism service.

- The introduction of the combined method of protection, including the inspector patrol and well-equipped patrol groups is proposed for the implementation of reliable protection within the park.

- the formation of the research themes, works on the inventory of flora and invertebrate species is offered in the area of scientific research and monitoring.

- conducting special training courses of inspectors, training of scientific staff in Russia and other foreign countries, increasing computer literacy of staff and language training is proposed to staff development.

Management Plan of Katon-Karagay is presented in the appendix.

17.4.6 Indicate how this management/cooperation addresses the objectives of the proposed biosphere reserve (as described in section 13.1).

Management of biosphere reserve corresponds with the three main goals of biosphere reserve: conservation, development and access (logistics). The first and second parts of the Management Plan give assessment of the conditions of natural diversity (physical and biological peculiarities), social-economic potential for stable development, access to natural resources, management programs, scientific research and environmental monitoring, threats, etc. The third part gives detailed action plan for the nearest five years.

17.4.7 Is the plan binding? Is it based on a consensus?

Management Plan for Katon-Karagay National Park is developed in accordance with the "Rules of the development of management plan for nature protective organization," approved by Order of the Chairman of the Forestry and Hunting Committee № 233 as of 13.07.2007, and other normative legal acts regulating the activities of Katon-Karagay National Park employees. During development of the management plan the consultants were engaged and a seminar was held in the framework of the UNDP / GEF Project "Conservation and sustainable use of biodiversity of the Kazakhstan part of the Altai-Sayan Ecoregion". The developed Management Plan is obligatory for execution; it is created based on consensus of all parties interested in the management of biosphere reserve.

17.4.8 Which authorities are in charge of the implementation of the plan, especially in the buffer zone(s) and the transition area(s)? Please provide evidence of the role of these authorities.

The responsible body for the implementation of management plan for Katon-Karagay Biosphere Reserve in the buffer and core zone is the Katon-Karagay national park run by the authorized state body - the Forestry and Hunting Committee of the Ministry of Environmental Protection. In the transition zone, the nature users have their own management plans.

17.4.9 Which factors impede or help its implementation (e.g.: reluctance of local people, conflicts between different levels of decision-making).

Factors impeding the implementation of the management plan Katon-Karagay BR:

- Some problems of funding:

budget funding is not sufficient for the purchase of equipment for research, security services and infrastructure development of the national park. Funds for construction, major repairs are not enough.

- Personnel turnover: lack of knowledge and experience of the inspectors, security guards, the absence of Fire Service in the State Department;

- Insufficient efficiency of environmental education.

Environmental education receives a lot of attention, but the effectiveness of the work could be enhanced by own video and movies production, presentations, improving the quality and quantity of produced booklets, posters, calendars, souvenirs.

Positive factors for the implementation of the management plan are favorable attitude of the local population towards the biosphere reserve, high level of education of the local population and environmental activities of the people.

17.4.10 Is the biosphere reserve integrated in regional/national strategies? Vice versa, how are the local/municipal plans integrated in the planning of the biosphere reserve?

Biosphere reserve is integrated in national and regional strategies for biodiversity conservation and stable economic growth. This integration is carried out on the level of authorized body - Forestry and Hunting Committee under the Ministry of Environmental Protection of RK – and Government of Kazakhstan.

17.4.11 Indicate the main source of the funding and the estimated yearly budget.

(The only yet) financial source of Biosphere Reserve is state (national) budget (through Katon-Karagay State National Nature Park State). Approximate annual budget in Kazakhstan tenge is about 150,000,000 tenge.

Conclusions:

17. 5

17.5.1 In your opinion, what will ensure that both the functioning of the biosphere reserve and the structures in place will be satisfactory? Explain why and how, especially regarding the fulfillment of the three functions of biosphere reserves (conservation, development, logistic) and the participation of local communities.

Successful functioning and interaction of biosphere reserve and other organizations of the region is guaranteed by the legislation of Kazakhstan, favourable attitude of local people and large industrial and agricultural companies towards the biosphere reserve, clear understanding of goals and tasks of biosphere reserve by local authorities. This is why all possible conflicts of interests may be quite easily solved at the level of Coordinational Council's sessions, where representatives of local communities take part.

18. SPECIAL DESIGNATIONS:

[Special designations recognize the importance of particular sites in carrying out the functions important in a biosphere reserve, such as conservation, monitoring, experimental research, and environmental education. These designations can help strengthen these functions where they exist or provide opportunities for developing them. Special designations may apply to an entire proposed biosphere reserve or to a site included within. They are therefore complementary and reinforcing of the designation as a biosphere reserve. Check each designation that applies to the proposed biosphere reserve and indicate its name]

Name:

(√) UNESCO World Heritage Site

Transborder Belukha Mountain - a World Heritage site in the "Golden Mountains of Altai" (Russia). Height - 4506 meters. It is the origin of the main river of the Altai Mountains - Katun.

( ) RAMSAR Wetland Convention Site

( ) Other international/regional conservation conventions/directives (specify)

(√) Long term monitoring site (specify)

Meteorological and hydrological monitoring is carried out on the territory of the biosphere reserve since 1933. Monitoring of the status of natural systems and biodiversity continues in the scientific themes of the reserve, including the monitoring of vegetation at the monitoring sites, number and status of populations of rare and model species of birds and mammals, as well as accounting of human impact (fires, various violations of the protected mode, etc.).

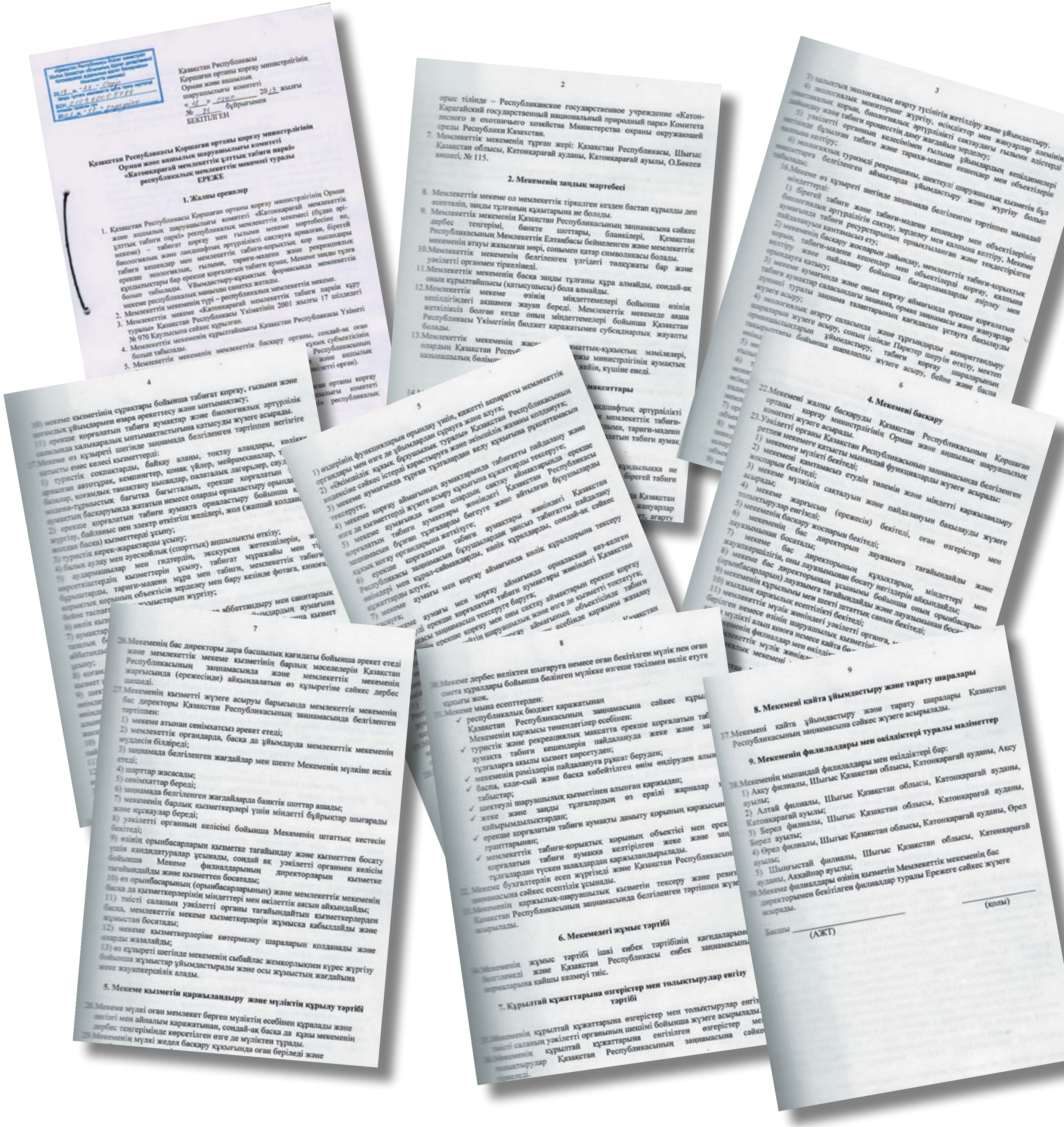
( ) Long Term Ecological Research (LTER site)

( ) Other (specify)

19. SUPPORTING DOCUMENTS (TO BE SUBMITTED WITH NOMINATION FORM):

List of legal documents
authorizing the establishment and governing use and management of the proposed
Katon-Karagay Biosphere Reserve

1. The Law of the Republic of Kazakhstan “On specially protected natural territories” # 175-III ЗРК at 07 July 2006 (with amendments of 09.01.2007);
2. The Certificate of the state registration of State National Nature Park Katon-Karagay #163-1917-02-ГУ, issued by the Ministry of Justice of Kazakhstan at 30 June 2009 (in Kazakh and Russian)
3. Regulations of state institution “State National Nature Park Katon-Karagay of the Forestry and Hunting Committee under the Ministry of Agriculture of the Republic of Kazakhstan at 16 April 2013, # 81


Қазақстан Республикасы Қоршаған ортаны қорғау министрлігінің Орман және аңшылық шаруашылығы комитеті «Катонқарағай мемлекеттік ұлттық табиғи паркі» республикалық мемлекеттік мекемесі туралы
ЕРЕЖЕ

1. Жалпы ережелер

2. Мекеменің заңдық мәртебесі

4. Мекемені басқару

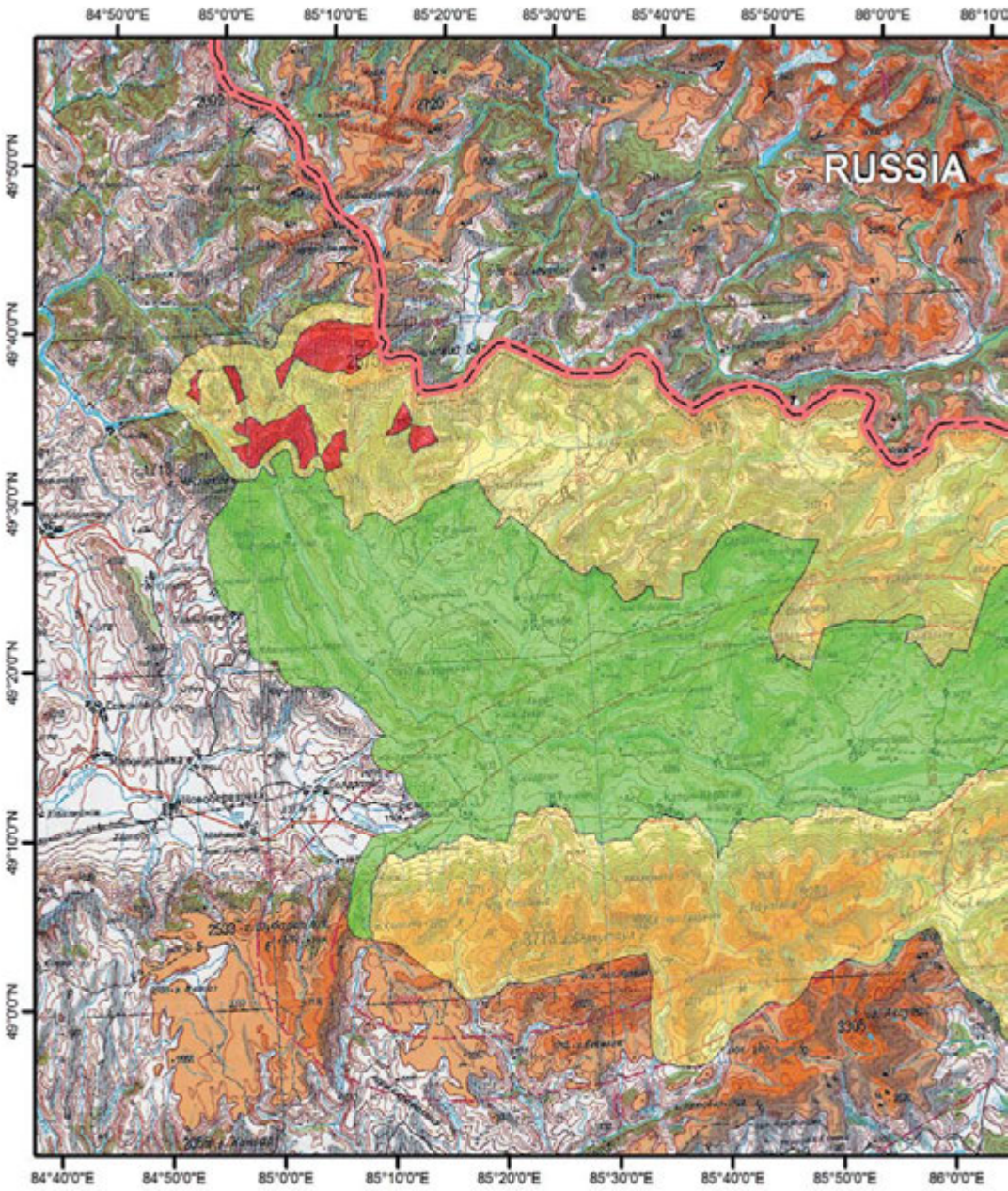
5. Мекеме қызметін қаржыландыру және мүліктің құрылу тәртібі

6. Мекемедегі жұмыс тәртібі

7. Құрылтай құжаттарына өзгерістер мен толықтырулар енгізу тәртібі

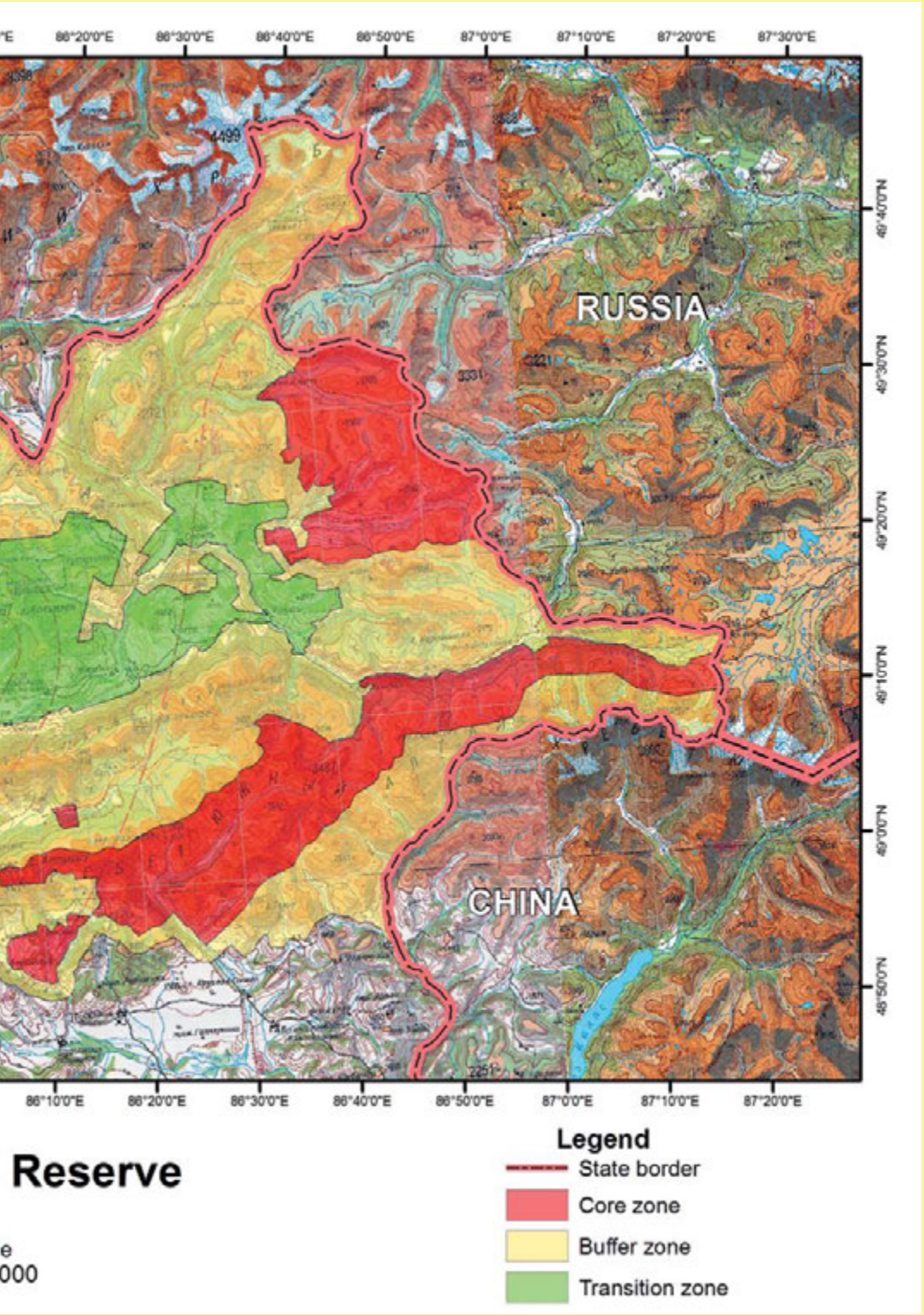
8. Мекемені қайта ұйымдастыру және тарату шаралары

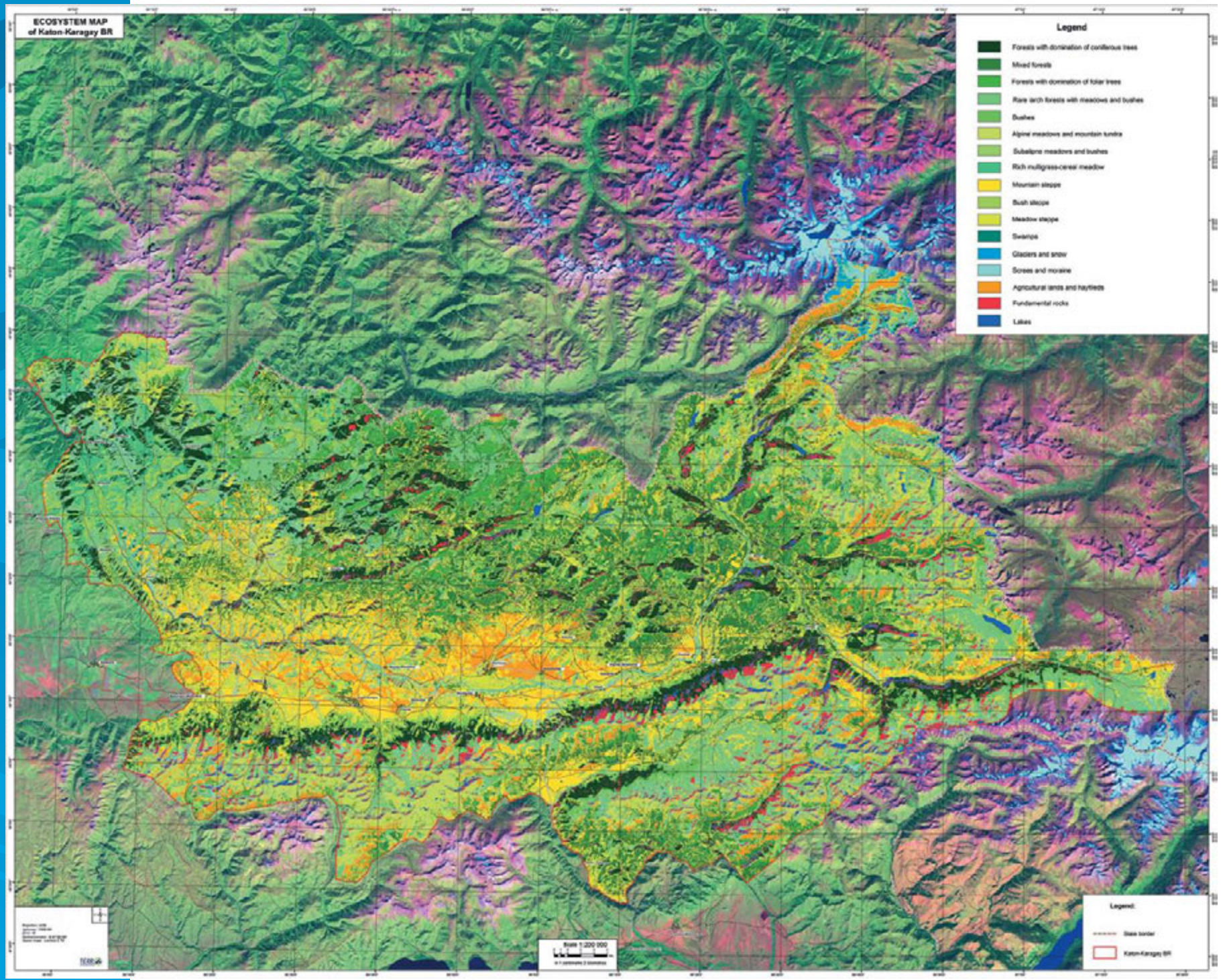
9. Мекеменің филиалдары мен өкілдіктері туралы мәліметтер

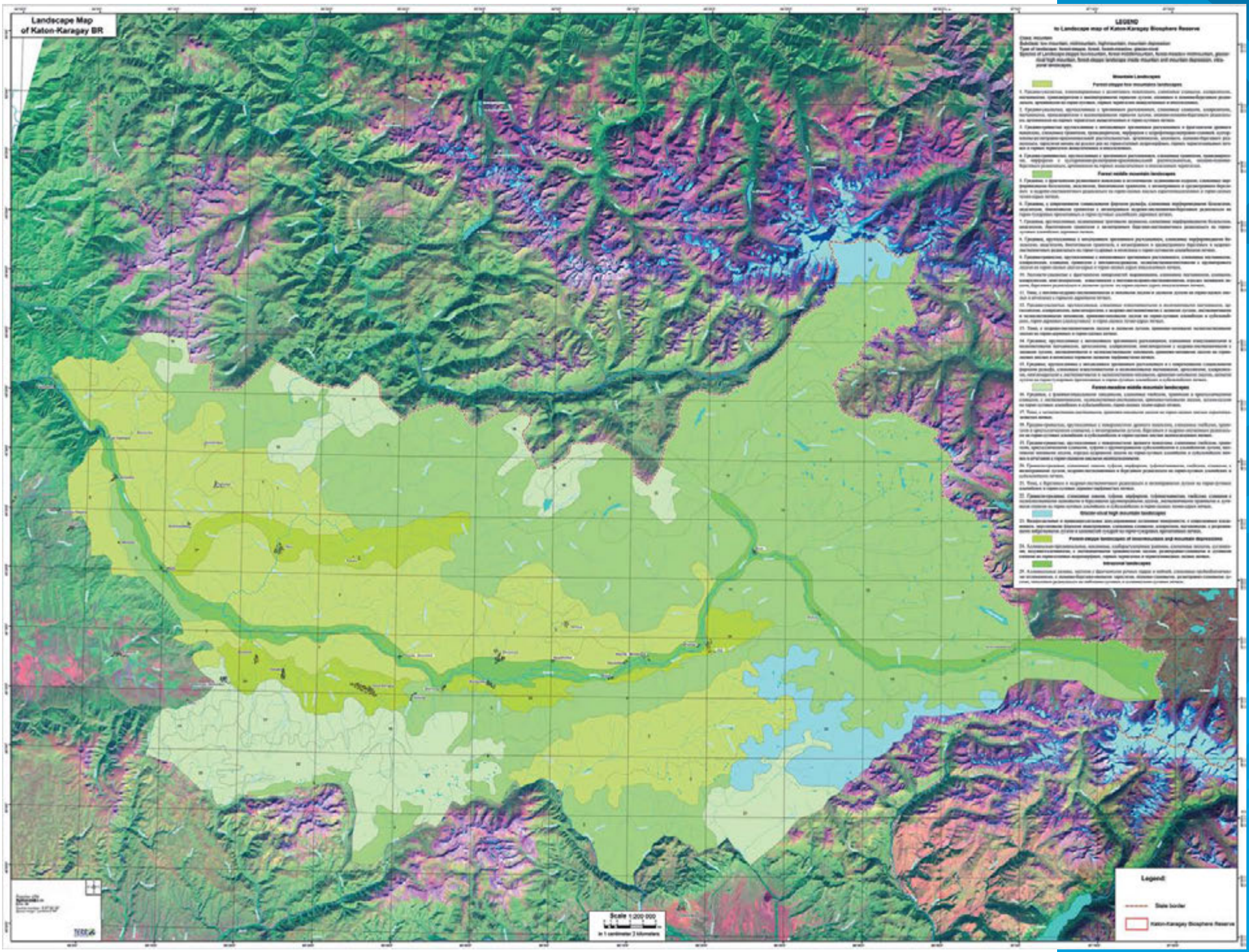


Zonation map of Katon-Karagay Biosphere

Scal
1:750


86°20'0"E
86°30'0"E
86°40'0"E
86°50'0"E
87°0'0"E
87°10'0"E
87°20'0"E
87°30'0"E
49°40'0"N
49°30'0"N
49°20'0"N
49°10'0"N
49°0'0"N
48°50'0"N
RUSSIA
CHINA
Reserve
Legend
State border
Core zone
Buffer zone
Transition zone


ECOSYSTEM MAP
of Katon-Karagay BR
Legend
Forests with domination of coniferous trees
Mixed forests
Forests with domination of foliar trees
Rare larch forests with meadows and bushes
Bushes
Alpine meadows and mountain tundra
Subalpine meadows and bushes
Rich multigrass-cereal meadow
Mountain steppe
Bush steppe
Meadow steppe
Swamps
Glaciers and snow
Screes and moraine
Agricultural lands and haylfields
Fundamental rocks
Lakes
Legend:
State border
Katon-Karagay BR


Landscape Map
of Katon-Karagay BR
LEGEND
to Landscape map of Katon-Karagay Biosphere Reserve
Mountain Landscapes
Forest-steppe low mountains landscapes
Forest-middle mountain landscapes
Forest-meadow-middle mountain landscapes
Forest-steppe landscapes of intermontane and mountain depressions
Intrazonal landscapes
Legend:
State border
Katon-Karagay Biosphere Reserve
Scale 1:200 000
in 1 centimeter 2 kilometers

List of land use and management plans

1. Act on the right of permanent land use (cadastral number of land # 05-071-028-007), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3823 on the right of permanent use of land area 90 566,9 ha within the boundaries of land according to land-use plan.
2. Act on the right of permanent land use (cadastral number of land # 05-071-028-018), issued by the Head of the Land department of Katon-Karagay District at 29 January 2010 №03-03/502 on the right of permanent use of land area 182 521,9 ha within the boundaries of land according to land-use plan.
3. Act on the right of permanent land use (cadastral number of land # 05-071-028-011), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3819 on the right of permanent use of land area 181011,3 ha within the boundaries of land according to land-use plan.
4. Act on the right of permanent land use (cadastral number of land # 05-071-028-009), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3821 on the right of permanent use of land area 4683,7 ha within the boundaries of land according to land-use plan.
5. Act on the right of permanent land use (cadastral number of land # 05-071-028-013), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3816 on the right of permanent use of land area 58,0 ha within the boundaries of land according to land-use plan.
6. Act on the right of permanent land use (cadastral number of land # 05-071-028-012), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3818 on the right of permanent use of land area 7,0 ha within the boundaries of land according to land-use plan.
7. Act on the right of permanent land use (cadastral number of land # 05-071-028-008), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3832 on the right of permanent use of land area 134 117,4 ha within the boundaries of land according to land-use plan.
8. Act on the right of permanent land use (cadastral number of land # 05-071-028-010), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3820 on the right of permanent use of land area 151 295,6 ha within the boundaries of land according to land-use plan.
9. Act on the right of permanent land use (cadastral number of land # 05-071-028-014), issued by the Head of the Land department of Katon-Karagay District at 04 December 2006 №3817 on the right of permanent use of land area 305,0 ha within the boundaries of land according to land-use plan.
10. Resolution of Government of Kazakhstan # 970 at 17 July 2001 on the creation of State National Nature Park “Katon-Karagay”.
11. Order №304 Committee of Forestry and Hunting “On realization of Resolution of Government of epublic of Kazahstan at 17 July 2001 # 970” at 10 September 2001.
12. Resolution №1228 Akim (Governor) of Katon-Karagay district “On establishing the Katon-Karagay nature national park” at 02 May 2000.
13. Resolution of the meeting of Katon-Karagay district land commission at 28 May 2002.
14. Management Plan for the Katon-Karagay. Approved by Order № 385 of Forestry and Hunting Committee of the Ministry of Agriculture of Kazakhstan at 25 December 2009.

English Translations of the documents

Act 1

on the right of permanent

land use

Next page

№ 0077485

Cadastral number of land plot (code): **05-071-028-007**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **90 566,9 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations**: to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infrastructure.**

Divisibility of land plot: **divisible.**

Base for act presenting – **The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: south-east part of Katon-Karagay district, East Kazakhstan Oblast

Scale 1:750 000

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Extraneous users of land plots in the limits of the plan

State Border Service team - 6.7062 ha

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 25 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3823.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 2

on the right of permanent

land use

Next page

№ 0111411

Cadastral number of land plot (code): **05-071-028-018**

The right of permanent land use of the land plot

Area of land plot: **182 521,9 ha**

Land category: **lands of specially protected nature territories of rehabilitation, recreation and historic-cultural purposes**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai.**

Land plot use and encumbrance limitations: **to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infrastructure.**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

Divisibility of land plot: **divisible.**

Document as a base for governmental presenting the right to use the land – **The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: north-east part of Katon-Karagay district, East Kazakhstan Oblast

Scale 1:500 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

El-Tur Vostok - 10.0 ha

Rakhmanov spring Village – 36.0 ha

Land of special land reserve – 958.0 ha

Land plot of «East Kazkahstan department of Com. For transport development» - 102.9 ha

Electric Lines – 0.3 ha

Lands of Karaairyk Village – 258.4 ha

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin, 27 January 2009

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 03-03/502.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Asangaliev E.A.

29 January 2010

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 3

on the right of permanent

land use

Next page

№ 0077488

Cadastral number of land plot (code): **05-071-028-011**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **181 011,3 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infrastructure**.

Divisibility of land plot: **divisible.**

Base for act presenting **– The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: north-east part of Katon-Karagay district, East Kazakhstan Oblast

Scale 1:500 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

El-Tur Vostok - 10.0 ha

Rakhmanov spring Village – 36.0 ha

Land of special land reserve – 1341.3 ha

Car road Ust-kamenogorsk-Rakhman Springs - 101.7 ha

Lands of Karaairyk Village – 258.4 ha

Farmong institution Zhilkishbaev B. – 687.8 ha

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 25 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3819.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 4

on the right of permanent land use

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№ 0077480

Cadastral number of land plot (code): **05-071-028-009**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **4683,3 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infrastructure**.

Divisibility of land plot: **divisible.**

Base for act presenting **– The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: Chernovaya Village, Bukhtarma river-bed, Katon-Karagay district, East Kazakhstan Oblast

Scale 1:250 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 29 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3821.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 5

on the right of permanent land use

Next page

№ 0077480

Cadastral number of land plot (code): **05-071-028-013**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **58,0 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **no**

Divisibility of land plot: **divisible.**

Base for act presenting – **The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: in 2 km eastern Belkaragay Village, Katon-Karagay district, East Kazakhstan Oblast

Scale 1:25 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 17 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3816.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 6

on the right of permanent land use

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№ 0077455

Cadastral number of land plot (code): **05-071-028-012**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **7,0 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **no**

Divisibility of land plot: **divisible.**

Base for act presenting **– The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: in 1.7 km southwestern Yryl Village, Katon-Karagay district, East Kazakhstan Oblast

Scale 1:10 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 24 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3818.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 7

on the right of permanent land use

Next page

№ 0077486

Cadastral number of land plot (code): **05-071-028-008**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **134 117,4 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infra-structure**.

Divisibility of land plot: **divisible.**

Base for act presenting **– The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: Central part of Katon-Karagay region, Sarymsakty Ridge, Tarbagatay Ridge, East Kazakhstan Oblast

Scale 1:750 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 25 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3832.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 8

on the right of permanent land use

Next page

№ 0077487

Cadastral number of land plot (code): **05-071-028-010**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **151 2957,6 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infrastructure**.

Divisibility of land plot: **divisible.**

Base for act presenting **– The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: northwestern part of Katon-Karagay region, East Kazakhstan Oblast

Scale 1:500 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

Land of JSC «Aksu» - 1944.0 ha

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 25 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3820.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

Act 9

on the right of permanent land use

Next page

№ 0077457

Cadastral number of land plot (code): **05-071-028-014**

Intended use of land plot: **State Institution "Katon-Karagay State National Nature Park", East Kazakhstan oblast, Katon-Karagay district, Katon-Karagay Village, 115 O. Bokeev Str.**

The right of permanent land use of the land plot

Area of land plot: **305,0 ha**

The goal of land plot: **conservation and rehabilitation of unique nature complexes of South Altai**.

Land plot use and encumbrance limitations: **to establish public servitut for providing the interests of local community for transportation, cattle moving and service of electric and other lines and nets as well as objects of transport infrastructure**.

Divisibility of land plot: **divisible.**

Base for act presenting **– The resolution of the Government of Kazakhstan # 970 as of July 17, 2001**

Next page

Land plot plan

Location: in 1 km north-western Katon-Karagay Village, Katon-Karagay district, East Kazakhstan Oblast

Scale 1:25 000

Next page

Extraneous users (owners) of land plots in the limits of the plan

Land of JSC «Aksu» - 1944.0 ha

The present act is issued by East Kazakhstan GosNPCZem subsidiary state enterprise

Stamp (Signature) G.Zhadrin S., 17 August 2006

Record on issue of this Act was made in the Register of land titles and perpetual use under the number 3817.

Appendix: none

Chief of the Department of Land Relations of Katon-Karagay District

(Signature) Zhakitov M.

4 December 2006

Description of adjoining lands is valid for the moment of issuing of land plot identification document.

10

RESOLUTION

OF THE GOVERNMENT OF THE REPUBLIC OF KAZAKHSTAN

On the creation of State National Nature Park “Katon-Karagay”.

In order to preserve and restore the unique natural complexes of the southern Altai, having special ecological, scientific, cultural and recreational value, the government of the Republic of Kazakhstan **decrees**:

1. Reorganize Berel and Katon-Karagay state institutions for the protection of forests and wildlife by merging them in a public institution «Katonkaragay State National Nature Park» (hereinafter - the institution).

2. Give to institution the right of permanent land use in selected areas with total area of 515,538 hectares, owning Berel and Katon-Karagay public institutions for the protection of forests and wildlife in the way of universal legal continuity.

3. Provide additional institutions in the permanent use of land plots with total area of 127939 hectares of land reserve Katon-Karagay district of East Kazakhstan region.

4. The institution include the land to the land categories of protected areas, and available in the area of the forest to the protection category «government of national forest parks.»

5. To ensure the special protection of the land of institution Akim of East Kazakhstan oblast set along the external borders of the protected zone to the prohibition within the zone of any activity negatively infuencing to the preservation and reproduction of the state natural reserve fund.

6. Agency of the Republic of Kazakhstan on land management the established procedure to determine the boundaries of land area of institution.

Ministry of Natural Resources and Environmental Protection of the Republic of Kazakhstan in the established order:

1) within two months to approve the Regulations on the Institution;

2) take other measures resulting from this resolution.

7. To establish that the funding of institution carried out at the expense of the republican budget and within the amounts provided by the Ministry of Natural Resources and Environmental Protection of the Republic of Kazakhstan for the maintenance of protected areas.

8. Contribute to the resolution of the Government of the Republic of Kazakhstan on February 10, 2000 number 198 «Matters of the Forestry, Fishing and Hunting of the Ministry of Natural Resources and Environmental Protection of the Republic of Kazakhstan and certain organizations under its jurisdiction» (SAPP Republic of Kazakhstan, 2000, № 5-6, p. 74) the following amendments and additions:

1) in the list of organizations under the jurisdiction of the Committee on Forestry, Fishing and Hunting of the Ministry natural resources and Environmental Protection of the Republic of Kazakhstan approved by this decree:

after the «State Institution» Ile-Alatau State National Park «to add the following line:

«State agency» Katonkaragay State National Nature Park «;

2) in Annex 5 of the said resolution: in column 1 of the line:

«50. Republican State Enterprise» Berel forestry «

61. Republican State Enterprise «Katon-Karagay forestry» shall be deleted; 2 lines in the graph:

«44. Berel state institution for the protection of forests and wildlife

54. Katon-Karagay state institution for the protection of forests and wildlife «shall be deleted.

9. This Resolution enters into force upon signature.

Prime Minister

of the Republic of Kazakhstan **Tokaev K.**

Astana, 17 July 2001

970

11

ORDER №304

Committee of Forestry and Hunting Ministry of Natural Resources and Environmental Protection

of the Republic of Kazakhstan

10 September 2001.

“On realization of Resolution of Government

of Republic of Kazahstan at 17 July 2001

 # 970”

In order to realize the decision of the Government of the Republic of Kazakhstan of July 17, 2001 № 970 “On creation of Katon Karagay State National Park” and in addition to the orders of the Committee of Forestry, Fishing and Hunting on August 4, 2001 number 26 ORDER:

1. Reorganize Berel and reorganize Katon-Karagay state institutions for the protection of forests and wildlife by merging them in a state institution “Katon-Karagay State National Nature Park (hereinafter Institution).

2. Chief of the East Kazakhstan regional territorial management through the Forest and Bioresources Kalmykov A.G.:

1) redeem the amount due to Berel and Katon-Karagay government institutions at the date of the reorganization in accordance with the legislation of the Republic of Kazakhstan;

2) pursuant to the above-mentioned decision to transfer the balance of the newly established Institution capital stock of the reorganized Berel and Katon Karagay state institution for the protection of forests and wildlife.

3. that paragraph 2 of the Order of the Committee on August 4, 2001 number 26 as follows: Fixed assets Berel and Katon Karagay production sites of the Republican State Enterprise «Shygys ormany» donated to the Institution in accordance with the application.

Chairman signed A. Amanbaev

12

AKIM

Katon-Karagay district

RESOLUTION

No. 1228 3 May 2000

On creation of Katon-Karagay Nature (National) Park

In order to make full use of the rich natural potential of an area, creating a modern recreation infrastructure, and given the fact that the region is set up for tourism, as evidenced by the release of the Altai-Sayan region as a global reference object at the same time the new direction of development of the economy of Kazakhstan, based on the concept of sustainable development and to which the Government of the Republic attaches great significance.

To direct economic effect can be attributed income derived tourism and investment as a guarantor of international environmental organization. When creating tourism infrastructure and the involvement of local people in this kind of business can be expected to create 200 - 300 jobs with permanent jobs and several hundred workers employed in seasonal downloads that will stop the outflow of people from the area. On the other hand, the status of natural (National) Park makes a great advertising to the region, which in turn will attract business people as investors in the economy of the area.

To date, the creation of natural (National) Park is a realistic option for reviving the economy and social sphere of the district. Taking into account the unique nature of the region, its high recreational criteria popularity in the tourism aspect.

DECIDE:

1. Organizovat natural state (national) park in Katon-Karagay district.

2. Make an allotment of land under natural (national) park in the Berel, Uryl, Archatin forestry, Berel forestry area of 225,735 hectares, Chingistay, Chernovin forestry, Katon-Karagay forestry area of 36,200 hectares.

3. District Committee on Land Affairs to make land acquisition, according to the requirements of the Law

4. Recommend LLP "Ecosystem" (Yurchenkov E) to continue work on the scheme and the feasibility study (FS) of the park, elaborate on the economic activity of the park as an independent self-supporting unit with allocations of funds from the budget of the District.

5. Apply to the regional akim of giving Katon-Karagay natural park status "Natural Park" of regional significance and submission.

6. Pursuant to the order of Akim number 1-379r from 18 June 1998 for the newly created joint-stock company founded to offer: Administration of the District, Katonkaragay, Berel, BolshenarymskiY forest enterprises, LLC "Rakhmanov Springs", "Arna" farms "Maraldy" "Deer Park "," Karla ", JSC" Aksu ".

7. Control over the implementation of this resolution assigned to the Deputy Akim District and Uranbaeva O.U.

Akim of Katon-Karagay district **A. Seitov**

Assistant: Berkarimova K.A.

20. ADDRESSES

20. 1 *Contact address of the proposed biosphere reserve:*

[Government agency, organization, or other entity (entities) to serve as the main contact on the MABnet to whom all correspondence within the World Network of Biosphere Reserves should be addressed.]

Name: **Katon-Karagay Biosphere Reserve**

Street or P.O. Box: 115 Bokey Str.

City with postal code: **Katon-Karagay, Katon-Karagay district, East-Kazakhstan Oblast,**

Country: **Kazakhstan**

Telephone: 2-18-49, 2-21-91

E-mail: katon_gnpp@mail.ru

Web site: **http://katon-karagay.vko.gov.kz/ru/park.htm,http://www.fhc.kz/forest/26/4835/**

20. 2 *Administering entity of the core area:*

Name: **Katon-Karagay Biosphere Reserve**

Street or P.O. Box: 115 Bokey Str.

City with postal code: **Katon-Karagay, Katon-Karagay district, East-Kazakhstan Oblast,**

Country: **Kazakhstan**

Telephone: 2-18-49, 2-21-91

E-mail: katon_gnpp@mail.ru

Web site: **http://katon-karagay.vko.gov.kz/ru/park.htm,http://www.fhc.kz/forest/26/4835/**

20. 3

Administering entity of the buffer zone:

Name: **Katon-Karagay Biosphere Reserve**

Street or P.O. Box: 115 Bokey Str.

City with postal code: **Katon-Karagay, Katon-Karagay district, East-Kazakhstan Oblast,**

Country: **Kazakhstan**

Telephone: 2-18-49,2-21-91

E-mail: katon_gnpp@mail.ru

Web site: **http://katon-karagay.vko.gov.kz/ru/park.htm,http://www.fhc.kz/forest/26/4835/**

20. 4

Administering entity of the transition area(s):

Name: **Katon-Karagay Biosphere Reserve**

Street or P.O. Box: 115 Bokey Str.

City with postal code: **Katon-Karagay, Katon-Karagay district, East-Kazakhstan Oblast,**

Country: **Kazakhstan**

Telephone: 2-18-49,2-21-91

E-mail: katon_gnpp@mail.ru

Web site: **http://katon-karagay.vko.gov.kz/ru/park.htm,http://www.fhc.kz/forest/26/4835/**

ANNEX I TO BIOSPHERE RESERVE NOMINATION FORM, JANUARY 2013
MABNET DIRECTORY OF BIOSPHERE RESERVES
BIOSPHERE RESERVE DESCRIPTION [1]

Administrative details

Country: Kazakhstan

Name of BR: Katon-Karagay

Year designated: (*to be completed by MAB Secretariat)*

Administrative authorities: (17.1.3) Katon-Karagay State National Park

Name Contact: (20.1)

Contact address: (Including phone number, postal and email adresses) (20.1)**Related links** *(web sites)*: http://www.oopt.kz/forest/27/4829/

Related links: (web sites) http://katon-karagay.vko.gov.kz/ru/park.htm,http://www.fhc.kz/forest/26/4835/

Social networks: (16.4.3)

Description
General description: *(Site characteristics in 11.1; human population in 10)*

[1]To be posted on the MABnet once the nomination has been approved. The numbers refer to the relevant sections of the nomination form.

Approximately 25 lines

Katon-Karagay Biosphere Reserve is located in the upper reaches of the rivers Bukhtarma, White and Black Berel, including the southern slopes of the ridges Listvyaga and Katun (the eastern peak Belukha), ridges of the left bank of the Buhtarma River: Sarymsakty, Tarbagatai (Southern Altain) and the Southern Altai. The northern part, which includes part of Katun ridge, has altitudes of 2,000 to 4,506 m (Belukha). South - 850 m (Valley Buhtarma River) to 3487 m (Southern Altai mountain range). Total area of BR Katon-Karagay is 1,631,940 hectares. The core zone consists of 126,432 ha, the buffer zone - 855,508 ha, the transition zone - about 650,000 ha. Lands of core and buffer zones belong to the Katon-Karagay State National Nature Park. Part of the land buffer zone used by agricultural producers for grazing and haying in consultation with the government and authorized body under the control of the administration of State National Nature Park. The transition zone consists of agricultural land, state reserves and settlements, there are about 40,000 thousand people. All issues of governance BR be decided at meetings of the Coordinating Council. The development and management of the BR are decided at meetings of the Coordinating Councilas well as the issues of biodiversity conservation and the conflicts between nature users and the administration of the national park are discussed. Decisions of the Board are obligatory for execution to all local organizations and private land users. The population engaged in farming and breeding cattle, horses, sheep, bees and deer. Deer are bred in nine medium and large farms. 1,518 farms and 9.2 thousands of personal farmsteads of the population engaged in agricultural production

Major ecosystem type: Alpine nival, alpine and sub-alpine zone; middle mountain meadow-steppe zone of juniper woodlands, shrubs and bushes savannoids; lowland belt of shrubs and large grass (sometimes steppe) savannoids.

Major habitats & land cover types: Meadow multigrass- feather grass steppes / pastures, Larch forests with grassy ground cover / forest land, The ecosystem of spruce-fir forests with some cedar / forest land

Bioclimatic zone (11.5)

Location (latitude & longitude): (6.1) N 48º53› - N 49º49′ and E 86º10′ - 87º19′

Total Area (ha): (7) 1 631 940 ha

Core area*(s):* (7) 126 432 ha

Buffer zone*(s):* (7) 855 508 ha

Transition area*(s) :* (7) 650 000 ha

Different existing zonation: (7.4)

Altitudinal range *(*metres above sea level): (11.2) from 850 to 4506 m

Zonation map(s): (6.2)

Main objectives of the biosphere reserve

Brief description (13.1)

Approximately 5 lines

The main purpose of the biosphere reserve is to preserve the natural state of a typical rare and unique natural complexes of the Western Altai with the totality of their components, as well as support sustainable socio-economic development of the territory on the basis of the principle of ecological and economic use of natural resources.

Research

Brief description (16.1.1)

Approximately 5 lines
The main goal of research is monitoring conservation status of natural systems, including also undertake further inventory of fauna and flora. All studies were carried out taking into account the ecological and geographical, flora and fauna features. A separate area of research is the monitoring of rare and endangered species to update the status of populations.

Monitoring

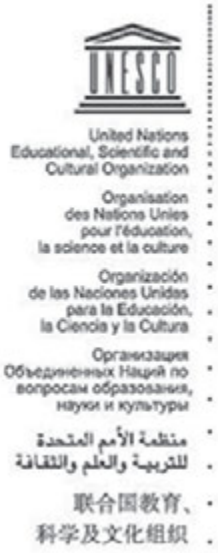
Brief description (16.1.1)

Approximately 5 lines
At present, the monitoring of climate change is conducted by the East Kazakhstan Hydrometeorological Service Department, as well as members of the reserve. Meteorological and hydrological monitoring is carried out on the territory of the of BR since 1933. Monitoring the status of of natural systems and biodiversity is conducted from 1995 and continued in the scientific themes of the reserve.

Annex II to the Biosphere Reserve Nomination Form, January 2013
Promotion and Communication Materials For the Proposed Biosphere Reserve

Provide some promotional material regarding the proposed site, notably high quality photos, and/or short videos on the site so as to allow the Secretariat to prepare appropriate files for press events. To this end, a selection of photographs in high resolution (300 dpi), with photo credits and captions and video footage (rushes), without any comments or sub-titles, of professional quality – DV CAM or BETA only, will be needed.

In addition, return a signed copy of the following Agreement on Non-Exclusive Rights. A maximum of ten (10) minutes on each biosphere reserve will then be assembled in the audiovisual section of UNESCO and the final product, called a B-roll, will be sent to the press.



UNESCO Photo Library
Bureau of Public Information

Photothèque de l'UNESCO
Bureau de l'Information du Public

AGREEMENT GRANTING NON-EXCLUSIVE RIGHTS

Reference:

1. a) I the undersigned, copyright-holder of the above mentioned photo(s) hereby grant to UNESCO free of charge the non-exclusive right to exploit, publish, reproduce, diffuse, communicate to the public in any form and on any support, including digital, all or part of the photograph(s) and to licence these rights to third parties on the basis of the rights herein vested in UNESCO

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c) The name of the photographer will be cited alongside UNESCO's whenever his/her work is used in any form.

2. I certify that:
a) I am the sole copyright holder of the photo(s) and am the owner of the rights granted by virtue of this agreement and other rights conferred to me by national legislation and pertinent international conventions on copyright and that I have full rights to enter into this agreement.

b) The photo(s) is/are in no way whatever a violation or an infringement of any existing copyright or licence, and contain(s) nothing obscene, libellous or defamatory.

Name and Address : Date :

Signature :

(sign, return to UNESCO two copies of the Agreement and retain the original for yourself)

Mailing address: 7 Place Fontenoy, 75352 Paris 07 SP, Direct Telephone: 00331 – 45681687
Direct Fax: 00331 – 45685655; e-mail: photobank@unesco.org; m.ravassard@unesco.org

Specific variables (please fill in the table below and tick the relevant parameters)

Abiotic		Biodiversity	
Abiotic factors	X	Afforestation/Reforestation	X
Acidic deposition/Atmospheric factors		Algae	X
Air quality		Alien and/or invasive species	X
Air temperature	X	Amphibians	X
Climate, climatology	X	Arid and semi-arid systems	X
Contaminants	X	Autoecology	
Drought	X	Beach/soft bottom systems	
Erosion		Benthos	X
Geology	X	Biodiversity aspects	X
Geomorphology	X	Biogeography	X
Geophysics		Biology	X
Glaciology	X	Biotechnology	
Global change		Birds	X
Groundwater	X	Boreal forest systems	
Habitat issues	X	Breeding	
Heavy metals	X	Coastal/marine systems	X
Hydrology	X	Community studies	X
Indicators	X	Conservation	X
Meteorology	X	Coral reefs	
Modeling		Degraded areas	X
Monitoring/methodologies	X	Desertification	
Nutrients		Dune systems	
Physical oceanography		Ecology	X
Pollution, pollutants	X	Ecosystem assessment	X
Siltation/sedimentation	X	Ecosystem functioning/structure	X
Soil	X	Ecotones	X
Speleology		Endemic species	X

Topography	X	Ethology	X
Toxicology	X	Evapotranspiration	
UV radiation		Evolutionary studies/Palaeoecology	X
		Fauna	X
		Fires/fire ecology	X
		Fishes	X
		Flora	X
		Forest systems	X
		Freshwater systems	X
		Fungi	X
		Genetic resources	X
		Genetically modified organisms	
		Home gardens	
		Indicators	X
		Invertebrates	X
		Island systems/studies	
		Lagoon systems	
		Lichens	X
		Mammals	X
		Mangrove systems	
		Mediterranean type systems	
		Microorganisms	
		Migrating populations	X
		Modeling	
		Monitoring/methodologies	X
		Mountain and highland systems	X
		Natural and other resources	X
		Natural medicinal products	X

		Perturbations and resilience	
		Pests/Diseases	
		Phenology	X
		Phytosociology/Succession	X
		Plankton	
		Plants	X
		Polar systems	
		Pollination	
		Population genetics/dynamics	X
		Productivity	X
		Rare/Endangered species	X
		Reptiles	X
		Restoration/Rehabilitation	
		Species (re) introduction	
		Species inventorying	
		Sub-tropical and temperate rain-forest systems	
		Taxonomy	X
		Temperate forest systems	
		Temperate grassland systems	
		Tropical dry forest systems	
		Tropical grassland and savannah systems	
		Tropical humid forest systems	
		Tundra systems	
		Vegetation studies	X
		Volcanic/Geothermal systems	
		Wetland systems	X
		Wildlife	X

Socio-economic		Integrated monitoring	
Agriculture/Other production systems	X	Biogeochemical studies	X
Agroforestry		Carrying capacity	
Anthropological studies	X	Conflict analysis/resolution	
Aquaculture		Ecosystem approach	X
Archaeology	X	Education and public awareness	X
Bioprospecting		Environmental changes	X
Capacity building	X	Geographic Information System (GIS)	X
Cottage (home-based) industry		Impact and risk studies	X
Cultural aspects	X	Indicators	X
Demography	X	Indicators of environmental quality	X
Economic studies	X	Infrastructure development	X
Economically important species	X	Institutional and legal aspects	
Energy production systems		Integrated studies	X
Ethnology/traditional practices/knowledge	X	Interdisciplinary studies	X
Firewood cutting		Land tenure	X
Fishery		Land use/Land cover	X
Forestry	X	Landscape inventorying/monitoring	X
Human health		Management issues	X
Human migration	X	Mapping	X
Hunting	X	Modeling	
Indicators	X	Monitoring/methodologies	X
Indicators of sustainability	X	Planning and zoning measures	X
Indigenous people's issues		Policy issues	
Industry		Remote sensing	X

Livelihood measures	X	Rural systems	X
Livestock and related impacts	X	Sustainable development/use	X
Local participation	X	Transboundary issues/measures	X
Micro-credits		Urban systems	
Mining		Watershed studies/monitoring	
Modeling			
Monitoring/methodologies	X		
Natural hazards			
Non-timber forest products			
Pastoralism	X		
People-Nature relations	X		
Poverty			
Quality economies/marketing			
Recreation	X		
Resource use	X		
Role of women			
Sacred sites			
Small business initiatives			
Social/Socio-economic aspects	X		
Stakeholders' interests	X		
Tourism	X		
Transports			

The list of some publication
Katon-Karagay Biosphere Reserve

Kotukhov Yu., Danilova A.N., Anufrieva O.A., 2003. The status of Allium (*Allium pumilum* Vved.) in West Altai. *Botanical research in Kazakhstan, Almaty: 76-79.*

Panov A.V., Karpov F.F., 2004. About the first finding of Asian Thrush in West Altai. *Kazakhstan ornithological Bulletin 2003: 192.*

Scherbakov B.V., 2004. The Corn Crake in West Altai. *Kazakhstan ornithological Bulletin 2003: 169.*

Danilova A.N., 2005. The characteristics of biotops of *Allium altaicum* in Kazakhstan Altai. *New zapovedniks of Kazakhstan, Almaty: 48-59.*

Kotukhov Yu., 2005. The list of vascular plants of Kazakhstan Alati. *Botanical research of Siberia and Kazakhstan, Barnaul, Altai State University, 11: 11-83*.

Kotukhov Yu., Danilova A., Anufrieva A., 2005. The first results if reintroduction of rare and threatened plants of Kazakhstan Altai. *Botanical research of Kazakh Altai, Almaty: 140-144.*

Shmakov A.I., , 2005. The Flora of Altai. *Barnaul*, *1:1-340.*

Botanical research of Siberia and Kazakhstan, 2005. (editor-in-chief A.N. Kupriyanov). *Issue 11., Barnaul: 1-159.*

Starikov S.V., 2005. Some results of the work on the inventory of the avifauna Katon-Karagay State Natural Park. *The regional component of the system of environmental education, Ust-Kamenogorsk: 14-29.*

Starikov S.V., 2005. Observations of birds in the vicinity of Katon-Karagay Village in spring 2004. *Kazakhstan ornithological Bulletin 2004: 93-95.*

Starikov S.V., 2005. Notes on the birds of the origins of the Kara-Kaba (Southern Altai). *Kazakhstan ornithological Bulletin 2004: 104-107*.

Chelyshev A.N., 2006. To avifauna Katon-Karagay National Park. *Kazakhstan ornithological Bulletin 2005: 233.*

Prokopov K.P., Zinchenko Yu.K., Starikov S.V., 2005. Distribution of irbis or the snow leopard *Uncia uncia* Schreber, 1776 in East Kazakhstan. International scientific and practical conference «Amanzholov reading - 2005», Ust-kamenogorsk*: 330-333.*

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LIST OF SPECIES OF KATON-KARAGAY BIOSPHERE RESERVE

The species list of fungi

MYXOMYCOTA

Order *PHYSARALES*

Family *PHYSARACEAE*

1. Fuligo septica (L.) Wigg.

2. Phisarum compressum Alb. et Schw.

3. Phisarum nutans Pers.

4 .Phisarum viride (Bull.) Pers.

5. Diderma radiatum Morg.

Order *STEMONITALES*

Family *STEMONITACEAE*

6. Stemonitis confluens Cke et Ell.

7. Stemonitis smithii Macbr.

8. Stemonitis fusca Roth.

9. Comatricha pulchella (Bab.) Rost.

10. Comatricha tiphoides (Bull.) Rost.

Family *LAMPRODERMATACEAE*

11. Lamproderma arcyrionema Rost.

Order *LICEALES*

Family *CRIBRARIACEAE*

12. Lindbladia effuse (Her.) Rost.

13. Dictydium cancellatum (Batsch) Macbr.

Family *TUBIFERACEAE*

14. Tubifera ferruginosa (Batsch) J.F.Gmel.

Family *RETICULARIACEAE*

15. Enteridium olivaceum Ehr.

16. Enteridium roseanum Wingate

17. Reticularia lycoperdon Bull.

Family *LYCOGALACEAE*

*18. *Lycogala epidendrum* (L.) Fr.

19. Lycogala flavofuscum (Her.) Rost.

Order *TRICHALES*

Family *PERICHAENACEAE*

20. Perichaena corticalis (Batsch) Rost.

Family *ARCYRIACEAE*

21. Arcyria nutans (Bull.) Grev.

22. Arcyria oerstedtii Rost.

23. Arcyria punicea Pers.

Family *TRICHIACEAE*

24. Trichia botrytis (J.F.Gmel.) Pers.

25. Trichia favoginea (Batch) Pers.

26. Trichia varia (Pers.) Pers.

EUMYCOTA

Class *ASCOMYCETES*

Order *XYLARIALES*

Family *XYLARIACEAE*

27. Hypoxylon serpens (Fr.) Fr.

Order *SPHAERIALES*

Family *SPHAERIACEAE*

28. Clypeosphaeria notarisii Fckl.

Order *HYPOCREALES*

Family *HYPOCREACEAE*

29. Nectria viridescens Booth

Order *PLEOSPORALES*

Family *PLEOSPORACEAE*

30. Leptosphaeria doliolum (Fr.) de Not.

Order *ERYSIPHALES*

Family *ERYSIPHACEAE*

31. Erysiphe communis Grev. *f.rumicis* Fckl.

32. Erysiphe communis Grev. *f.ononidis* Jacz.

Order *PEZIZALES*

Family *PEZIZACEAE*

33. Aleuria aurantia (Pers.) Fckl.

34. Otidea abietina (Pers.) Fckl.

Order *HELVELLALES*

Family *GEOGLOSSACEAE*

35. Spatularia clavata (Schaeff) Sacc.

Family *HELVELLACEAE*

36. Morshella conica Pers.

37. Morshella esculenta Pers. ex St.Amans.

38. Gyromitra esculenta (Pers.) Fr.

Order *APHYLLOPHORALES*

Family *CANTHARELLACEAE*

39. *Cantharellus cibarius* Fr.

Family *RAMARIACEAE*

40. Ramaria apiculata (Fr.) Donk.

41. *Ramaria formosa* (Fr.) Quel.

42. *Ramaria flava* (Fr.) Quel.

Family *HYMENOCHAETACEAE*

43. Phellinus tremulae (Bond.) Bond. et Boriss.

44. Phellinus hartigii (Allesch. et Schnabl.) Bond.

Family *GANODERMTACEAE*

45. *Ganoderma lucidum* (Fr.) Karst.

Family *POLYPORACEAE*

46. Polyporus squamosus Micheli ex Fr.

47. Polyporus varius Pers. ex Fr.

48. *Piptoporus betulinus* (Bull.:Fr.) Karst.

49. *Trametes betulina* (Fr.) Pilat

50. *Trametes versicolor* (Fr.) Pilat

51. Trichaptum abietinum (Pers.:Fr.) Ryv.

52. *Fomes fomentarius* Fr.

53. Fomitopsis annosa (Fr.) Karst.

54.*Fomitopsis pinicola* (Sw.:Fr.) Karst.

55. *Pleurotus ostreatus* (Fr.) Kummer

Order *BOLETALES*

Family *BOLETACEAE*

56. *Boletus pinicola* Vitt.

57. Boletus betulicolus (Vasilk.) Pilat et Dermek

58. *Leccinum aurantiacum* (Fr.) S.F.Gray

59. *Leccinum scabrum* (Fr.) S.F.Gray

60. *Leccinum testaceoscabrum* (Secr.) Sing.

61. *Xerocomus badius* (Fr.) Kummer

62. *Suillus luteus* (Fr.) S.F.Gray

Family *PAXILLACEAE*

63. Paxillus involutus (Fr.) Fr.

64. *Paxillus panuoides* (Fr.) Fr.

Family *GOMPHIDIACEAE*

65. Gomphidius glutinosus (Fr.) Fr.

Order *AGARICALES*

Family *TRICHOLOMATACEAE*

66. *Laccaria laccata* (Fr.) Berk.

67. *Armillariella mellea* (Fr.) Karst.

68. *Clitocybe gibba* (Fr.)Kummer

69. *Marasmius oreades* (Fr.) Fr.

70. *Mycena polygramma* (Fr.) S.F.Gray

71. *Xerampelina campanella* (Fr.)R.Mre

Family *ENTOLOMATACEAE*

72. Rhodophyllus majaiodes (Orton) Mos.

Family *AMANITACEAE*

73. *Amanita muscaria* (Fr.) Hook

74. *Amanita vaginata* (Fr.) Quel.

Family *AGARICACEAE*

75. *Agaricus arvensis* Schaeff ex Secr.

76. *Agaricus campestris* Fr.

77. *Agaricus silvaticus* Schaeff. ex Secr.

Family *COPRINACEAE*

78. *Panaeolus sphinctrinus* (Fr.) Quel.

79. *Panaeolus semiovatus* (Fr.) Lund.

Family *BOLBITIACEAE*

80. Agrocybe praecox (Fr.) Fayod.

Family *STROPHARIACEAE*

81. *Hypholoma capnoides* (Fr.:Fr.) Kummer

82. *Hypholoma fasciculare* (Huds.:Fr.) Kummer

83. *Pholiota squarrosa* (Fr.) Kummer

84. *Kuehneromyces mutabilis* (Fr.) Sing.

Family *CORTINARIACEAE*

85. Cortinarius argentatus (Fr.) Fr.

86. *Cortinarius collinitus* (Fr.) Fr.

87. *Cortinarius subfulgens* P.D.Orton.

88. *Gymnopilus hibridus* (Fr.) Sing.

Order *RUSSULALES*

Family *RUSSULACEAE*

89.*Lactarius aurantiacus* (Fr.) Fr.

90. Lactarius deliciosus (Fr.) S.F.Gray

91. Lactarius picinus Fr.

92. *Lactarius torminosus* (Fr.) S.F.Gray

93. Russula adusta (Pers.) Fr.

94. *Russula aeruginea* Lindbl.

95. Russula delica Fr.

96. *Russula emetica* (Fr.) Fr.

97. *Russula foetens*(Fr.) Fr.

98. *Russula vesca* Fr.

99. *Russula violacea* Quel.

100. *Russula xerampelina* (Secr.)Fr. var. *erythropus* Pelt.

Group Orders *GASTEROMYCETALES*

Order *PHALLALES*

Family *PHALLACEAE*

101. *Mutinus ravenelii* (Berk. et Curt.) E.Fischer

Order *LYCOPERDALES*

Family *LYCOPERDACEAE*

102. *Calvatia utriformis* (Bull.) Japp.

103. Lycoperdon molle Pers.

104. Lycoperdon perlatum Pers.

105. Lycoperdon pyriforme Schaeff. ex Pers.

106. Bovista plumbea Pers.

107. *Bovista nigrescens* Pers.

Order *NIDULARIALES*

Family *NIDULARIACEAE*

108. *Cricibulum laeve* (Bull.) Kambly

Order *USTILAGINALES*

Family *USTILAGINACEAE*

109. Cintractia caricis (Pers.) Magnus.

110. Cintractia arenaria Syd.

Family *TILLETIACEAE*

111. Urocystis irregularis (Winter) Savul.

DEUTEROMYCOTA

Class *COELOMYCES*

Order *SPHAEROPSIDALES*

Family *SPHAEROPSIDACEAE*

112. Rhizosphaera radicata Naumov

113. Dothiorella sibiraeae Muraschk.

Family *LEPTOSTROMATACEAE*

114. Leptostroma laricinum Fuck.

Order *MELANCONIALES*

Family *MELANCONIACEAE*

115. Vermicularia herbarum Westend.

Class *HYPHOMYCETES*

Order *MONILIALES*

Family *MONILIACEAE*

116. Oedocephalum globuliferum Brefeld.

117. Ramularia bergeniae Vassjag.

118. Ramularia gei (Eliasson)Lindr.

Family *DEMATIACEAE*

119. Cladosporium epiphyllum (Pers.) Mart.

Family *TUBERCULARIACEAE*

120. Sphacelia typhina (Pers.) Sacc.

Class *AGONOMYCETES*

121. Ectostroma bistortae (DC.) Fr.

122. Sclerotium durum Pers.

The list of vascular plants of Katon-Karagay Biosphere Reserve

Order EQUISETOPHYTA

Class EQUISETOPSIDA

Family EQUISETACEAE Rich. ex DC.

Equisetum arvense L.

E. fluviatile L. (= *E. heleocharis* Ehrh.)

E. hyemale L.

E. palustre L.

E. pratense L.

E. ramosissimum Desf.

E. sylvaticum L.

Order POLYPODIOPHYTA

Class POLYOPSIDA

Family OPHIOGLOSSACEAE (R.Br.) Agardh

Botrychium lunaria (L.) Sw.

Family WOODSIACEAE (Diels) Herter

Woodsia acuminata (Fomin) Sipl. (= *W. ilvensis* (L.) R. Br. *var. acuminata* Fomin)

W. alpina (Bolt.) S.F.Gray

W. asiatica Schmakov et Kiselev

W. calcarea (Fomin) Schmakov (= W. ilvensis (L.) R. Br. *var. calcarea* Fomin*)*

*W. heterophylla (*Turcz. ex Fomin*)* Schmakov.

W. ilvensis (L.) R. Br.

W. ilvensis (L.) R. Br. *var. rufidula* (Koch.) Aschers.

Family ATHYRIACEAE Alst.

Athyrium distentifolium Tausch ex Opiz (= *A. alpestre* (Hoppe) Ngl.).

A. filix-femina (L.) Roth

Cystopteris altajensis Gureeva

C. dickieana R. Sim (= *C. fragilis* (L.) Bernh. *subsp. dickieana* (R. Sim) Hyl.)

C. fragilis (L.) Bernh.

Rhizomatopteris montana (Lam.) A.Khokhr.

Rh.sudetica (A. Br. et Milde) A. Khokhr.

Gymnocarpium dryopteris (L.) Newm.

G. jessoense (Koidz.) Koidz.

Family ONOCLEACEAE Pichi Sermolli

Matteuccia struthiopteris (L.) Tod.

Family DRYOPTERIDACEAE Ching

Dryopteris carthusiana (Vill.) H.P.Fuchs (= *D. spinulosa* (O.R.Muell) Watt.)

D. dilatata (Hoffm.) A.Gray *(= D.austriaca* (Jacq.) Woynar)

D. filix-mas (L.) Schott

Polystichum lonchitis (L.) Roth

Family THELYPTERIDACEAE Pichi Sermolli

Phegopteris connectilis (Michx.) Watt. (=*Thelypteris phegopteris* (L.) Sloss.)

Family ASPLENIACEAE Mett. ex Frank

Asplenium septentrionale (L.) Hoffm.

Family POLYPODIACEAE Bercht. et J.Presl.

Polypodium vulgare L.

LYCOPODIOPHYTA

Class LYCOPODIOPSIDA

Family LYCOPODIACEAE Beauv. ex Mirb.

Lycopodium clavatum L.

Diphasiastrum alpinum (L.) Holub (= *Lycopodium alpinum* L.)

Family HUPERZIACEAE Rothm.

Huperzia selago (L.) Bernh. ex Schrank et C.Mart. (= *Lycopodium selago* L.)

PINOPHYTA

Class PINOPSIDA

Family PINACEAE Lindl.

Abies sibirica Ledeb.

A. sibirica Ledeb. *f. alpina* Poljak.

Picea obovata Ledeb.

P. obovata Ledeb. *var. coerulea* L. Malyschev

P. obovata Ledeb. *var. altaica* Tepl.

P. obovata Ledeb. *var. nana* Litw.

Larix sibirica Ledeb.

Pinus sibirica Du Tour

P. sylvestris L.

Family CUPRESSACEAE Rich. et Bartl.

Juniperus pseudosabina Fisch. et C.A.Mey.

J. sabina L.

J. sibirica Burgsd.

Class GNETOPSIDA

Family EPHEDRACEAE Dumort.

Ephedra dahurica Turcz.

MAGNOLIOPHYTA

Class Liliopsida

Family TYPHACEAE Juss.

Typha angustifolia L.

T. latifolia L.

Family SPARGANIACEAE Rudolphi

Sparganium stoloniferum (Graebn.) Buch.

Family POTAMOGETONACEAE Dumort.

Potamogeton gramineus L.

P. natans L.

P. perfoliatus L.

P. pusillus L.

Сем. ALISMATACEAE Vent.

Alisma plantago-aquatica L.

Family POACEAE Barnhart (= GRAMINEAE Juss.)

Echinochloa crusgalli (L.) Beauv.

Setaria viridis (L.) Beauv.

Phalaroides arundinacea (L.) Rauschert (= *Digraphis arundinacea* (L.) Trin.)

Anthoxanthum alpinum A. et D. Love

A. odoratum L.

Hierochloë alpina (Sw.) Roem. et Schult.

H. glabra Trin.

H. repens (Host.) Beauv.

Achnatherum confusum (Litv.) Tzvel. (= *Stipa confusa* Litv.)

A. sibiricum (L.) Keng ex Tzvel. (= *Stipa sibirica* (L.) Lam.)

Stipa capillata L.

S. pennata L.

Milium effusum L.

Phleum alpinum L.

P. phleoides (L.) Karst.

P. pratense L.

Alopecurus aequalis Sobol.

A. alpinus Smith

A. arundinaceus Poir.

A. pratensis L.

Agrostis albida Trin.

A. clavata Trin.

A. divaricatissima Mez (= *A.mongholica* Roshev.)

A. gigantea Roth

A. stolonifera L.

A. tenuis Sibth.

Calamagrostis arundinacea (L.) Roth

C. epigeios (L.) Roth

C. langsdorffii (Link) Trin.

C. neglecta (Ehrh.) Gaertn., Mey. et Scherb.

C. obtusata Trin.

C. phragmitoides C. Hartm.

C. pseudophragmites (Hall. fil.) Koel.

Deschampsia cespitosa (L.) Beauv.

D. koelerioides Regel

Trisetum altaicum Roshev.

T. mongolicum (Hult.) Peschkova

T. sibiricum Rupr.

T. spicatum (L.) K. Richt.

Helictotrichon hookeri (Scribn.) Henrard (= *Avenastrum asiaticum* Roshev.)

H. mongolicum (Roshev.) Henrard

H. pubescens (Huds.) Pilg.

Beckmannia syzigachne (Steud.) Fern.

Koeleria altaica (Domin) Kryl.

K. atroviolacea Domin

K. ledebourii Domin

Melica altissima L.

M. nutans L.

M. transsilvanica Schur

Dactylis altaica Bess.

D. glomerata L.

Poa. alpina L.

P. altaica Trin.

P. angustifolia L.

P. annua L.

P. attenuata Trin.

P. krylovii Reverd.

P. nemoralis L.

P. palustris L.

P. pratensis L.

P. remota Forsell.

P. sibirica Roshev.

P. supina Schrad.

P. transbaicalica Roshev. (= P. stepposa (Kry1.) Roshev.)

P. trivialis L.

Arctopoa subfastigiata (Trin.) Probat. *(= Poa subfastigiata* Trin.)

Paracolpodium altaicum (Trin.) Tzvel.

Puccinellia hauptiana V. Krecz.

Eremopoa altaica (Trin.) Roshev.

Festuca altaica Trin.

F. altissima All.

F. borissii Reverd.

F. gigantea (L.) Vill.

F. kryloviana Reverd.

F. pratensis Huds.

F. rubra L.

F. valesiaca Gaudin

Bromopsis inermis (Leyss.) Holub

Brachypodium pinnatum (L.) Beauv.

Agropyron pectinatum (Bieb.) Beauv.

A. tarbagataicum N.Plotnikov

Elymotrigia leninogorica Kotuch. (= *Elymus sibiricus* L. x *Elytrigia geniculata* (Trin.) x Nevski)

Elytrigia elongatiformis (Drob.) Nevski

E. gmelinii (Trin.) Nevski

E. jacutorum (Nevski) Nevski

E. pseudocaesia (Pacz.) Prokud.

E. repens (L.) Nevski *(= Agropyron repens* (L.) Beauv.)

Elymus caninus (L.) L. (= *Agropyron caninum* (L.) Beauv.).

E. gmelinii (Ledeb.) Tzvel. (= *Agropyron gmelinii* (Ledeb.) Scribn. et J.G. Smith)

E. kronokensis (Kom.) Tzvel.

E. lineicus Kotuch.

E. longespicatus Kotuch.

E. marmoreus Kotuch.

E. caninus (L.) L. и E. mutabilis (Drob.) Tzvel.

*E. mutabilis (*Drob.*)* Tzvel. *(= Agropyron mutabilis* Drob.*).*

E. nevskii Tzvel.

E. novae-angliae (Scribn.) Tzvel.

E. praecaespitosus (Nevski) Tzvel.

E. sibiricus L. (= *Clinelymus sibiricus* (L.) Nevski)

E. transbaicalensis (Nevski) Tzvel.

E. ubinica Kotuch.

Phragmites australis (Cav.) Trin. ex Steud.

Family CYPERACEAE Juss.

Scirpus lacustris L.

S. sylvaticus L.

Eriophorum humile Turcz. ex Steud.

E. polystachyon L. (= *E. angustifolium* Honck.)

Eleocharis acicularis (L.) Roem. et Schult.

E. palustris (L.) Roem. et Schult.

Kobresia capilliformis Ivanova

K. myosuroides (Vill.) Fiori (= *K. bellardii* (All.) Degl.)

K. smirnovii Ivanova.

Carex acuta L. (= C. gracilis Curt.)

C. aquatilis Wahlenb.

C. atherodes Spreng. (= *C. aristata subsp. orthostachys* (C.A.Mey.) Kuk.)

C. atrata L.

C. cinerea Poll. (= *C. canescens* L.)

C. capillaris L.

C. cespitosa L.

C. curaica Kunth

C. duriuscula C.A. Mey.

C. humilis Leyss.

C. lachenalii Schkuhr (= *C. tripartita* All.)

C. leporina L.

C. macroura Meinsh.

C. melanantha C.A.Mey.

C. melanocephala Turcz.

C. omskiana Meinsh. (= *C. hudsonii* auct. non A. Bonnet)

C. orbicularis Boott

C. pallescens L.

C. pauciflora Lightf.

C. rhynchophysa C.A. Mey.(= *C. laevirostris* (Fries) Blytt. et Fries)

C. riparia Curt.

C. rostrata Stokes (= *C. urticulata* Boott)

C. rupestris All.

C. sempervirens Vill. *(= C.stenocarpa* Turcz. ex V.Krecz., = *C. tristis* Bieb.)

C. vesicaria L.

Family LEMNACEAE S.F.Gray

Lemna minor L.

L. trisulca L.

Family JUNCACEAE Juss.

Juncus bufonius L. (= *J. erythropodus* V.Krecz.)

J. compressus Jacq.

J. filiformis L.

J. gerardii Loisel.

J. triglumis L.

Luzula multiflora (Ehrh.) Lej. (= *L. pallescens* Sw.)

L. parviflora (Ehrh.) Desv.

L. pilosa (L.) Willd.

L. spicata (L.) DC.

Family ALLIACEAE J. Agardh

Alium altaicum Pall.

A. amphibolum Ledeb.

A. bogdoicolum Regel *(= A. schrenkii auct. non* Regel)

A. flavidum Ledeb.

A. hymenorhizum Ledeb.

A. ledebourianum Schult. et Schult. fil.

A. lineare L.

A. microdictyon Prokh.

A. nutans L.

A. obliquum L.

A. pumilum Vved.

A. rubens Schrad. ex Willd.

A. schoenoprasum L.

A. strictum Schrad.

Family MELANTHIACEAE Batsch

Veratrum lobelianum Bernh.

V. nigrum L.

Family LILIACEAE Juss.

Gagea emarginata Kar. et Kir.

G. fedtschenkoana Pasch.

G. granulosa Turcz.

Lilium pilosiusculum (Freyn) Miscz. *(= L.martagon* L. *var. pilosiusculum* Freyn)

Erythronium sibiricum (Fisch. et Mey.) Kryl.

Lloydia serotina (L.) Reichenb.

Tulipa patens Agardh ex Schult. et Schult. fil.

T. uniflora (L.) Bess. ex Baker

Family TRILLIACEAE Lindl.

Paris quadrifolia L.

Family IRIDACEAE Juss.

Iris bloudowii Ledeb.

I. ruthenica Ker-Gawl.

Family ORCHIDACEAE Juss.

Corallorrhiza trifida Chatel.

Cypripedium guttatum Sw.

Epipogium aphyllum (F.W. Schmidt) Sw.

Goodyera repens (L.) R.Br.

Coeloglossum viride (L.) C. Hartm.

Dactylorhiza baltica (Klinge) Orlova *(= D. longifolia (*L.

Neum.) Aver.*)*

D. fuchsii (Druce) Soo.

D. incarnata (L.) Soo -

D. umbrosa (Kar. et Kir.) Nevski.

Class MAGNOLIOPSIDA

Family SALICACEAE Mirb.

Salix alatavica Kar. et Kir. ex Stschegl.

S. arbuscula L.

S. arctica Pall.

S. bebbiana Sarg.

S. berberifolia Pall.

S. caprea L.

S. cinerea L.

S. dasyclados Wimm.

S. glauca L.

S. hastata L.

S. kochiana Trautv.

S. lanata L.

S. myrsinites L.

S. pentandra L.

S. pyrolifolia Ledeb.

S. rectijulis Ledeb. ex Trautv.

S. reticulata L.

S. rhamnifolia Pall.

S. rorida Laksch.

S. sajanensis Nas.

S. saposhnikovii A. Skvorts.

S. taraikensis Kimura

S. triandra L.

S. vestita Pursh.

S. viminalis L.

Populus laurifolia Ledeb.

P. tremula L.

Family BETULACEAE S. F. Gray

B. humilis Schrank

B. microphylla Bunge

B. pendula Roth (= *B. verrucosa* Ehrh.)

B. pubescens Ehrh.

B. rotundifolia Spach

Family CANNABACEAE Endl.

Humulus lupulus L.

Cannabis ruderalis Janisch.

Family URTICACEAE Juss.

Urtica dioica L.

U. urens L.

Parietaria micrantha Ledeb.

Family SANTALACEAE R.Br.

Thesium refractum C.A.Mey.

T. repens Ledeb.

T. rupestre Ledeb.

Family POLYGONACEAE Juss.

Oxyria digyna (L.) Hill. (= O. *elatior* R.Br. ex Meissn.)

Rumex acetosa L.

R. acetosella L.

R. aquaticus L.

R. confertus Willd.

R. crispus L.

R. longifolius DC.

R. pseudonatronatus (Borb.) Borb. ex Murb.

Rheum altaicum Losinsk.

Rh. compactum L.

Fallopia convolvulus (L.) A. Love

Polygonum aviculare L.

Persicaria hydropiper (L.) Spach (= *Polygonum hydropiper* L.)

Aconogonon aplinum (All.) Schur. *(= Polygonum. alpinum* All.)

*Bistorta elliptica (*Willd. ex Spreng.) Kom. (= *Polygonum nitens* (Fisch. et Mey.) V.Petrov ex Kom.)

B. major S.F. Gray (= *Polygonum bistorta* L.)

B. vivipara (L.) S.F.Gray

Family CHENOPODIACEAE Vent.

Kraschenninnikovia ceratoides (L.). Gueldenst. *(= Ceratoides papposa* Botsch. et Ikon.)

Axyris amaranthoides L.

Chenopodium album L.

Family AMARANTHACEAE Juss.

Amaranthus retroflexus L.

Family PORTULACACEAE Juss.

Portulaca oleracea L.

Claytonia joanneana Schult.

Family CARYOPHYLLACEAE Juss.

Stellaria bungeana Fenzl

S. graminea L.

S. media (L.) Vill.

S. palustris Retz.

Dichodon cerastoides (L.) Reichenb. (= *Cerastium cerastoides* (L.) Britt.)

Cerastium arvense L.

C. caespitosum Gilib.

C. davuricum Fisch. ex Spreng.

C. lithospermifolium Fisch.

C. pauciflorum Stev. ex Ser.

C. pusillum Ser.

Minuartia biflora (L.) Schinz et Thell.

M. verna (L.) Hiern

Eremogone formosa (Fisch. ex Ser.) Fenzl (= *Arenaria formosa* Fisch. ex Ser.)

Arenaria serpyllifolia L.

Oberna behen (L.) Ikonn. (= *Silene latifolia* (Mill.) Britt. et Rendl.)

Silene graminifolia Otth

S. repens Patrin

Gastrolychnis apetala (L.) Tolm. et Kozhanczikov (= *Melandrium apetalum* (L.) Fenzl)

G. tristis (Bunge) Czer. (= *Melandrium triste* (Bunge) Fenzl)

Melandrium album (Mill.) Garcke

Gypsophila altissima L.

Psammophiliella muralis (L.) Ikonn. (= *Gypsophila muralis* L.)

Dianthus superbus L.

D. versicolor Fisch. ex Link

Moehringia lateriflora (L.) Fenzl

M. umbrosa (Bunge) Fenzl

Family PAEONIACEAE Rudolphi

Paeonia anomala L.

P. hybrida Pall.

Сем. RANUNCULACEAE Juss.- ЛЮТИКОВЫЕ

Caltha palustris L.

Trollius altaicus C.A.Mey.

Callianthemum angustifolium Witas.

Actaea erythrocarpa Fisch.

Aquilegia glandulosa Fisch. ex Link

A. sibirica Lam.

Delphinium elatum L.

Aconitum anthoroideum DC.

A. apetalum (Huth) B.Fedtsch. (= *A. monticola* Steinb.)

A. leucostomum Worosch.

A. volubile Pall. ex Koelle

Anemonoides altaica (C.A.Mey.) Holub (= *Anemone altaica* Fisch. ex C.A. Mey.)

A. caerulea (DC.) Holub (= *Anemone caerulea* DC.)

Anemonastrum crinitum (Juz.) Holub (= *Anemone crinita* Juz.)

Pulsatilla patens (G. Pritzel) Juz.

Atragene sibirica L.

Clematis integrifolia L.

Ranunculus acris L. *(= R. acer* L.)

R. altaicus Laxm.

R. cassubicus L.

R. grandifolius C.A.Mey.

R. krylovii Ovcz.

R. monophyllus Ovcz.

R. polyrhizos Steph.

R. repens L.

Thalictrum alpinum L.

T. contortum L.

T. flavum L.

T. foetidum L.

T. minus L. (= *T. collinum* Wallr.)

T. petaloideum L.

T. simplex L.

Adonis sibirica Patrin ex Ledeb.

A. vernalis L.

Family BERBERIDACEAE Juss.

Gymnospermium altaicum (Pall.) Spach

Berberis sibirica Pall.

Family PAPAVERACEAE Juss.

Chelidonium majus L.

Papaver croceum Ledeb.

P. nudicaule L.

P. pseudocanescens M. Pop.

Family FUMARIACEAE DC.

Corydalis bracteata (Steph.) Pers.

C. capnoides (L.) Pers.

C. nobilis (L.) Pers.

C. pauciflora (Steph.) Pers.

Fumaria officinalis L.

Family BRASSICACEAE Burnett

Macropodium nivale (Pall.) R.Br.

Eutrema integrifolium (DC.) Bunge

Sisimbryum altissimum L.

S. heteromallum C.A.Mey.

S. polymorphum (Murr.) Roth

Erysimum cheiranthoides L.

E. flavum subsp. altaicum (C.A.Mey.) Polozhij (= E.altaicum C.A.Mey.)

Barbarea stricta Andrz.

Rorippa palustris (L.) Bess.

Cardamine impatiens L.

C. macrophylla Willd.

Turritis glabra L.

Bunias orientalis L.

Hesperis sibirica L.

Berteroa incana (L.) DC.

Alyssum obovatum (C.A.Mey.) Turcz. *(= Alyssum biovulatum* N.Busch)

Sphaerotorrhiza trifida (Poir. ex Lam.) Khokhr. *(= Cardamine trifida* (Poir.) B.M.G.Jones)

Draba alpina L. (= *D. algida* Kryl.)

D. altaica (C.A.Mey.) Bunge

D. cana Rydb. (= *D. lanceolata* Royle)

D. hirta L.

D. nemorosa L.

D. ochroleuca Bunge

D. oreades Schrenk

D. sibirica (Pall.) Thell.

D. subamplexicaulis C.A. Mey.

Brassica juncea (L.) Czern.

Sinapis arvensis L.

Lepidium ruderale L.

Thlaspi arvense L.

T. cochleariformis DC. (= *Noccaea cochleariformis* (DC.) A.et D.Love)

T. perfoliatum L. (= *Microthlaspi perfoliatum* (L.) F.K.Mey.)

Camelina microcarpa Andrz.

Capsella bursa-pastoris (L.) Medik.

Family CRASSULACEAE DC.

Rhodiola algida (Ledeb.) Fisch. et C.A.Mey.

R. quadrifida (Pall.) Fisch. et C.A.Mey.

R. rosea L. (= *Sedum roseum* Scop.)

Sedum ewersii Ledeb. (= *Hylotelephium ewersii* (Ledeb.) H.Ohba)

S. hybridum L.

S. telephium L. (= *S. purpureum* (L.) Schult., = *Hylotelephium triphyllum* (Haw.) Holub)

Orostachys spinosa (L.) C.A.Mey.

Family SAXIFRAGACEAE Juss.

Bergenia crassifolia (L.) Fritsch

Saxifraga hirculus L.

S. punctata L.

S. sibirica L.

Chrysosplenium nudicaule Bunge

Family PARNASSIACEAE S.F. Gray

Parnassia palustris L.

Family GROSSULARIACEAE DC.

Ribes atropurpureum C.A. Mey.

R. graveolens Bunge

R. nigrum L.

Grossularia acicularis (Smith) Spach

Family ROSACEAE Juss.

Spiraea chamaedryfolia L.

S. media Franz Schmidt

S. trilobata L.

Cotoneaster melanocarpus Fisch. ex Blytt

C. uniflorus Bunge

Crataegus chlorocarpa Lenne et C.Koch *(= C. altaica* (Loud.) Lange)

Sorbus sibirica Hedl.

Rubus idaeus L. (= *R. sericeus* Gilib.)

R. sachalinensis Levl. (= *R. matsumuranus* Levl. et Vaniot.)

R. saxatilis L. (= *R. ruber* Gilib.)

Fragaria vesca L. (= *F. sylvestris* Duch.)

F. viridis (Duch.) Weston (= *F. collina* Ehrh.)

Pentaphylloides fruticosa (L.) O.Schwarz

Potentilla anserina L.

P. argentea L.

P. biflora Willd. ex Schlecht.

P. bifurca L.

P. chrysantha Trev.

P. erecta (L.) Raeusch.

P. nivea L.

P. norvegica L.

P. sericea L.

Sibbaldia procumbens L.

Geum rivale L.

G. urbanum L.

Dryas oxyodonta Juz.

Filipendula ulmaria (L.) Maxim.

F. vulgaris Moench (= *F. hexapetala* Gilib.)

Alchemilla altaica Juz.

A. bungei Juz.

A. cyrtopleura Juz.

A. curvidens Juz.

A. krylovii Juz.

A. ledebourii Juz.

A. orbicans Juz.

A. rubens Juz.

A. sibirica Zam.

Agrimonia asiatica Juz.

A. pilosa Ledeb.

Sanguisorba alpina Bunge

S. officinalis L.

Rosa acicularis Lindl.

R. spinosissima L. (= *R.pimpinellifolia* L.)

Padus avium Mill. (= *P. racemosa* (Lam.) Gilib.)

Sibiraea altaiensis (Laxm.) Schneid. (= *S.laevigata* (L.) Maxim.)

Family FABACEAE Lindl.

Thermopsis alpina (Pall.) Ledeb.

Melilotoides platycarpos (L.) Sojak (= *Melissitus platycarpos* (L.) Golosk.)

Trifolium hybridum L. (= *Amoria hybrida* (L.) C.Presl.)

T. lupinaster L. (= *Lupinaster pentaphyllus* Moench)

T. pratense L.

T. repens L. (= *Amoria repens* (L.) C.Presl.)

Medicago falcata L.

M. lupulina L.

M. sativa L.

Melilotus officinalis (L.) Pall.

Caragana arborescens Lam.

C. frutex (L.) C. Koch

Astragalus abbreviatus Kar. et Kir.

A. alpinus L.

A. danicus Retz.

A. megalanthus DC.

A. schanginianus Pall.

A. tschuensis Bunge

A. vaginatus Pall.

Oxytropis alpina Bunge

O. altaica (Pall.) Pers.

O. ambigua (Pall.) DC.

O. sulphurea (Fisch. ex DC.) Ledeb.

Hedysarum alpinum L.

H. neglectum Ledeb.

H. theinum Krasnob.

Vicia cracca L.

V. megalotropis Ledeb.

V. sepium L.

V. tenuifolia Roth

Lathyrus gmelinii Fritsch

L. frolovii Rupr.

L. krylovii Serg

L. pannonicus (Jacq.) Garcke

L. pisiformis L.

L. pratensis L.

L. vernus (L.) Bernh.

Family GERANIACEAE Juss.

Geranium albiflorum Ledeb.

G. pratense L.

G. pseudosibiricum J. Mayer

G. sibiricum L.

Erodium cicutarium (L.) L.

Family OXALIDACEAE R.Br.

Oxalis acetosella L.

Family LINACEAE DC. ex S.F.Gray

Linum altaicum Ledeb. ex Juz.

Family POLYGALACEAE R.Br.

Polygala sibirica L.

Family EUPHORBIACEAE Juss.

Euphorbia alpina C.A.Mey.

E. discolor Ledeb.

E. latifolia C.A.Mey.

E. lutescens C.A.Mey.

E. macrorhiza C.A.Mey.

E. subcordata C.A. Mey.

Family EMPETRACEAE S.F.Gray

Empetrum androgynum V.Vassil.

Family BALSAMINACEAE A.Rich.

Impatiens noli-tangere L.

I. parviflora DC.

Family MALVACEAE Juss.

Malva pusilla Smith

Lavatera thuringiaca L.

Family HYPERICACEAE Juss.

***Hypericum hirsutum* L.**

***H. perforatum* L.**

Family VIOLACEAE Batsch

Viola altaica Ker-Gawl.

V. biflora L.

V. canina L.

V. disjuncta W. Beck.

V.dissecta Ledeb.

V. elatior Fries

V. hirta L.

V. macroceras Bunge

V. rupestris F.W.Schmidt

V. tricolor L.

V. uniflora L.

Family ONAGRACEAE Juss.

Epilobium alpinum L.

E. hirsutum L.

E. palustre L.

Chamaenerion angustifolium (L.) Scop.

Ch. latifolium (L.) Th. Fries et Lange

Family APIACEAE Lindl.

Anthriscus sylvestris (L.) Hoffm.

Angelica decurrens (Ledeb.) B. Fedtsch. (= *Archangelica decurrens* Ledeb.)

A. palustris (Boiss.) Hoffm.

Bupleurum krylovianum Schischk.

B. longifolium L. (= *B. aureum* Fisch.)

B. longiinvolucratum Kryl.

B. multinerve DC.

Conium maculatum L.

Pachypleurum alpinum Ledeb.

Carum carvi L.

Schulzia crinita (Pall.) Spreng.

Aegopodium alpestre Ledeb.

Seseli buchtormense (Fisch. ex Hornem.) Koch (= *Libanotis buchtormensis* (Fisch. ex Hornem.) DC.)

S. condensatum (L.) Reichenb. fil.

Pleurospermum uralense Hoffm.

Heracleum dissectum Ledeb.

H. sibiricum L.

Peucedanum morisonii Bess. ex Spreng.

Sium sisaroideum DC.

Sanicula europaea L.

Sajanella monstrosa (Willd. ex Spreng.) Sojak

Conioselinum tataricum Hoffm.

Family PYROLACEAE Dumort.

Pyrola chlorantha Sw.

P. incarnata (DC.) Freyn (= *P.asarifolia* Michaux)

P. minor L.

P. rotundifolia L.

Moneses uniflora (L.) A. Gray (=*Pyrola uniflora* L.)

Family ERICACEAE Juss. (VACCINIACEAE S. F.Gray)

Vaccinium myrtillus L.

V. vitis-idaea L.

Family PRIMULACEAE Vent.

Primula macrocalyx Bunge

P. nivalis Pall.

P. pallasii Lehm.

Androsace fedtschenkoi Ovcz.

A. filiformis Retz.

A. lactiflora Fisch. ex Duby (= *A.amurensis* Probat.)

A. maxima L. (= *A. turczaninowii* Freyn)

A. septentrionalis L.

Lysimachia vulgaris L.

Cortusa altaica Losinsk.

Family LIMONIACEAE Lincz.

Goniolimon speciosum (L.) Boiss.

Family GENTIANACEAE Juss.

Gentiana algida Pall. (= *Dasystephana algida* (Pall.) Borkh.)

G. decumbens L. fil. (= *Dastystephana decumbens* (L.fil.) Zuev)

G. fischeri P.Smirn. (= *G. gebleri* Fisch.)

G. grandiflora Laxm. (= *G. altaica* Pall., = *Ciminalis grandiflora* (Laxm.) Zuev)

G. macrophylla Pall. (= *Dasystephana macrophylla* (Pall.) Zuev)

G. pneumonanthe L. (= Dasystephana pnemonanthe (L.) Zuev)

G. septemfida Pall. (= Dasystephana septemfida (Pall.) Zuev)

G. uniflora Georgi (= *G. krylovii* Grossh., = *Calathiana uniflora* (Georgi) Holub)

Gentianopsis barbata (Froel.) Ma (= *Gentiana barbata* Froel.)

Gentianella amarella (L.) Boern. (= *Gentiana amarella* L.)

G. atrata (Bunge) Holub (= *Gentiana atrata* Bunge)

G. azurea (Bunge) Holub *(= Comastoma azureum* (Bunge) Zuev)

G. lingulata (Agardh) Pritchard *(= Gentiana lingulata* Agardh*)*

Comastoma tenellum (Rottb.) Toyokuni (= *Gentiana tenella* Rottb.)

Swertia obtusa Ledeb.

Family CONVOLVULACEAE Juss.

Calystegia sepium (L.) R. Br.

Convolvulus arvensis L.

Family CUSCUTACEAE Dumort.

Cuscuta europaea L.

C. lupuliformis Krock.

Family POLEMONIACEAE Juss.

Polemonium caeruleum L.

Family BORAGINACEAE Juss.

Lithospermum officinale L.

Echium vulgare L.

Nonea caspica (Willd.) G.Don fil.

Pulmonaria mollis Wulf. ex Hornem. (= *P. dacica* Simonk.)

Myosotis arvensis (L.) Hill

M. caespitosa K.F. Schultz

M. krylovii Serg.

M. palustris (L.) L.

M. sylvatica Ehrh. ex Hoffm.

Lappula microcarpa (Ledeb.) Guerke

L. rupestris (Schrenk) Guerke

L. squarrosa (Retz.) Dumort.

Eritrichium altaicum M.Pop. (= *E. rupestre* (Pall. ex Georgi) Bunge)

E. villosum (Ledeb.) Bunge

Hackelia deflexa (Wahlenb.) Opiz

Cynoglossum officinale L.

Family LAMIACEAE Lindl. (= LABIATAE Juss.)

Amethystea caerulea L.

Scutellaria altaica Fisch.

S. galericulata L.

S. supina L.

Glechoma hederacea L.

Dracocephalum imberbe Bunge

D. grandiflorum L. (= *D. altaiense* Laxm.)

D. nutans L.

D. peregrinum L.

D. ruyschiana L.

Prunella vulgaris L.

Phlomoides alpina (Pall.) Adyl., R.Kam. et Machmedov *(= Phlomis alpina* Pall.)

Ph. tuberosa (L.) Moench.

Galeopsis ladanum L.

G. speciosa Mill.

Lamium album L.

Leonurus glaucescens Bunge

L. quinquelobatus Gilib.

Stachys palustris L.

S. sylvatica L.

Ziziphora clinopodioides Lam.

Origanum vulgare L.

Thymus serpyllum L.

Mentha arvensis L.

M. longifolia (L.) L. Huds.

Family SOLANACEAE Juss.

Physochlaina physaloides (L.) G.Don fil.

Solanum dulcamara L.

Hyoscyamus niger L.

Family SCROPHULARIACEAE Juss.

Verbascum thapsus L.

Linaria vulgaris L.

Veronica anagallis-aquatica L.

V. beccabunga L.

V. densiflora Ledeb.

V. krylovii Schischk.

V. longifolia L.

V. pinnata L.

V. serpyllifolia L.

V. spicata L.

Lagotis integrifolia (Willd.) Schischk. (= *Gymnandra integrifolia* Willd.)

Euphrasia altaica Serg.

Odontites vulgaris Moench. (= *Odontites serotina* (Lam.) Dumort.)

Rhinanthus songaricus (Sterneck) B.Fedtsch.

Scrophularia altaica Murr.

S. nodosa L.

Limosella aquatica L.

Pedicularis achilleifolia Steph.

P. amoena Adams ex Stev.

P. compacta Steph.

P. elata Willd.

P. oederi Vahl

P. physocalyx Bunge

P. proboscidea Stev.

P. verticillata L.

Family OROBANCHACEAE Vent.

Orobanche alsatica Kirschl.

O. krylowii G. Beck

Family PLANTAGINACEAE Juss.

Plantago depressa Schlecht.

P. major L.

P. media L.

Family RUBIACEAE Juss.

Galium boreale L.

G. odoratum (L.) Scop.

G. palustre L.

G. pseudorivale Tzvel. (= *Asperula aparine* Bieb.)

G. uliginosum L.

G. verum L.

Cruciata krylovii (Iljin) Pobed. (= *C. glabra subsp. krylovii* (Iljin) Naumova, = *Galium krylovii* Iljin)

Family SAMBUCACEAE Batcsh ex Borkh.

Sambucus sibirica Nakai

Family CAPRIFOLIACEAE Juss.

Linnaea borealis L.

Lonicera altaica Pall. ex DC.

L. hispida Pall. ex Schult.

L. tatarica L.

Family ADOXACEAE Trautv.

Adoxa moschatellina L.

Family VALERIANACEAE Batsch

Patrinia intermedia (Hornem.) Roem. et Schult.

P. sibirica (L.) Juss.

Valeriana capitata Pall. ex Link

V. dubia Bunge

V. martjanovii Kryl.

V. rossica P. Smirn.

Family DIPSACACEAE Juss.

Scabiosa ochroleuca L.

Family CAMPANULACEAE Juss.

Campanula altaica Ledeb.

C. cervicaria L.

C. glomerata L.

C. sibirica L.

Adenophora lilifolia (L.) A. DC.

Family ASTERACEAE Dumort. (= COMPOSITAE Giseke)

Solidago gebleri Juz.

S. dahurica Kitag.

Aster alpinus L.

Galatella hauptii (Ledeb.) Lindl.

G. punctata (Waldst. et Kit.) Nees

Erigeron acris L.

E. altaicus M.Pop.

E. canadensis L. (= *Conyza canadensis* (L.) Cronq.)

E. eriocalyx (Ledeb.) Vierh. (= *E. uniflorus* L. *subsp. eriocalyx* (Ledeb.) A. et D. Love)

E. flaccidus (Bunge) Botsch.

E krylovii Serg.

Antennaria dioica (L.) Gaertn.

Leontopodium ochroleucum Beauverd

Omalotheca norvegica (Gunn.) Sch. Bip. et F.Schultz (= *Gnaphalium norvegicum* Gunn.)

O. sylvatica (L) Sch. Bip. et F. Schultz (= *Gnaphalium sylvaticum* L.)

Leucanthemum vulgare Lam.

Pyrethrum krylovianum Krasch. (= *P. alatavicum* (Herd.) O. et B. Fedtsch. *subsp. krylovianum* (Krasch.) Boldyreva)

Inula britannica L.

I. salicina L.

Bidens tripartita L.

Achillea millefolium L.

Ptarmica ledebourii (Heimerl) Klok. et Krytzka (= *Achillea ledebourii* Heimerl)

Chamomilla recutita (L.) Rauschert (= *Matricaria recutita* L.)

Ch. suaveolens (Pursch) Rydb. (= *Matricaria discoidea* DC.)

Matricaria ambigua (Ledeb.) Kry1. (= *Tripleurospermum ambiguum* (Ledeb.) Fr. et Sav.)

Tanacetum millefolium (L.) Tzvel.

T. tanacetoides (DC.) Tzvel.

T. vulgare L.

Artemisia absinthium L.

A. armeniaca Lam.

A. austriaca Jacq.

A. commutata Bess.

A. dracunculus L.

A. gmelinii Web.

A. sericea Web.

A. sieversiana Willd.

A. vulgaris L.

Tussilago farfara L.

Petasites frigidus (L.) Fries

P. radiatus (J.F. Gmel.) Toman

Arnica iljinii (Maguire) Iljin (= *A.alpina* (L.) Olin et Ladau *subsp. iljinii* Maguire)

Doronicum altaicum Pall.

Cacalia hastata L.

Senecio jacobaea L.

S. nemorensis L.

Ligularia altaica DC.

L. glauca (L.) O.Hoffm.

L. sibirica (L.) Cass.

Carlina biebersteinii Bern. ex Hornem. (= *C. vulgaris* auct.).

Arctium leiospermum Juz. et C. Serg.

A. tomentosum Mill.

Tephroseris integrifolia (L.) Holub (= *Senecio integrifolius* (L.) Clairv.)

T. veresczaginii (Schischk. et Serg.) Holub (= *Senecio veresczaginii* Schischk. et Serg.)

Saussurea alpina (L.) DC.

S. foliosa Ledeb.

S. frolowii Ledeb. –

S. krylovii Schischk. et Serg.

S. latifolia Ledeb.

S. schanginiana (Wydl.) Fisch. ex Herd.

Carduus crispus L.

Alfredia cernua (L.) Cass.

Cirsium incanum (S. G.Gmel.) Fisch.

C. helenioides (L.) Hill

C. serratuloides (L.) Hill

C. setosum (Willd.) Bess.

C. vulgare (Savi) Ten.

Serratula cardunculus (Pall.) Schischk.

S. coronata L. (= *S. wolffii* Andrae)

S. kirghisorum Iljin

Rhaponticum carthamoides (Willd.) Iljin

Centaurea cyanus L.

C. jacea L.

C. sergii Klok.

C. sibirica L.

Cichorium intybus L.

Trommsdorffia maculata (L.) Bernh. *(= Achyrophorus maculatus* (L.) Scop., = *Hypochoeris maculata* L.)

Leontodon autumnalis L.

Picris hieracioides L.

P. rigida Ledeb. ex Spreng.

Tragopogon orientalis L. *(= T. pratensis subsp. orientalis* (L.) Celak.)

Scorzonera radiata Fisch. ex Ledeb.

Taraxacum altaicum Schischk.

T. erythrospermum Andrz.

T. officinale Wigg.

Sonchus arvensis L.

S. asper (L.) Hill

S. oleraceus L.

Lactuca sibirica (L.) Maxim.

Crepis chrysantha (Ledeb.) Turcz.

C. lyrata (L.) Froel.

C. sibirica L.

C. tectorum L.

Hieracium dublitzkii B.Fedtsch. et Nevski (= *Pilosella dublitzkii* (B.Fedtsch. et Nevski) Tupitzina)

H. echioides Lumn. (= *Pilosella echioides* (Lumn.) F.Schultz et Sch. Bip.)

H. korshinskyi Zahn

H. narymense Schischk. et Serg.

H. robustum Fries

H. umbellatum L.

H. veresczaginii Schischk. et Serg.

H. virosum Pall.

The list of fish species of Katon-Karagay Biosphere Reserve

Class Osteichthyes

Order Salmoniformes

Family Salmonidae

1.Таймень (Russian) – *Hucho taimen* Pallas, 1773.

2. Ленок – *Brachyinystax lenok* Pallas, 1776.

Family Thymallidae

3. Сибирский хариус – *Thymallus arcticus* Pallas, 1776.

Order Esociformes

Family Esocidae

4. Щука – *Esox lucius* Linnaeus, 1758.

Order Cypriniformes

Family Cyprinidae

5. Плотва – *Rutilus rutilus* Linnaeus, 1758.

6. Обыкновенный елец – *Leuciscus leuciscus* Linnaeus, 1758.

7. Язь – *Leuciscus idus* Linnaeus, 1758.

8. Обыкновенный гольян - *Phoxinus phoxinus* Linnaeus, 1758.

9. Пескарь – *Gobio gobio* Linnaeus, 1758.

10. Лещ – *Abramis brama* Linnaeus, 1758.

11. Сазан – *Cyprinus carpio* Linnaeus, 1758.

Family Cobitidae

12. Обыкновенный голец – *Noemacheilus barbatulus* Linnaeus, 1758.

Order Gadioformes

Family Gadidae

13. Налим – *Lota lota* Linnaeus, 1758.

Order Perciformes

Family Percidae

14. Обыкновенный окунь – *Perca fluviatilis* Linnaeus, 1758.

15. Обыкновенный судак – *Stizostedion lucioperca* Linnaeus, 1758.

Order Scorpeniformes

Family Cottidae

16. Сибирский подкаменщик – *Cottus sibiricus* Kessler, 1899.

17. Пестроногий подкаменщик – *Cottus poecilopus* Heckel, 1836

The list of amphibias of Katon-Karagay Biosphere Reserve

Class AMPHIBIA

Order Anura

Family Bufonidae

1. Зеленая жаба (Russian) – *Bufo viridis* (Laurenti) – Жасыл құрбақа (Kazakh).

2. Обыкновенная жаба – *Bufo bufo* (L.) – Кәдімгі құрбақа

Family Ranidae

3. Остромордая лягушка – *Rana arvalis* Nils. – Сүйіртұмсық қөлбақа

The list of reptilias of Katon-Karagay Biosphere Reserve

Class Reptilia

Order Squamata

Family Lacertidae

1. Прыткая ящерица (Russian) – *Lacerta agilis* L. – Секіргіш кесіртке (Kazakh)

2. Живородящая ящерица – *Lacerta vivipara* Jacq. – Тірі туатын кесіртке (Kazakh)

Family Colubridae

3. Обыкновенный уж – *Natrix natrix* (L.) – Кәдімгі сарыбас жылан (Kazakh)

4. Узорчатый полоз – *Elaphe dione* (Pall.) – Өрнекті қарашұбар жылан (Kazakh)

Family Viperidae

5. Обыкновенная гадюка – *Vipera berus* (L.) – Кәдімгі сұржылан (Kazakh)

Family Crotalidae

6. Обыкновенный щитомордник – *Agkistrodon halys* (Pall.) – Бужча-жылан (Kazakh)

The list of birds species of Katon-Karagay Biosphere Reserve

I. Order Gaviiformes

1. Family Gaviidae

1. Чернозобая гагара (Russian) – *Gavia arctica* (L.) – Қаражемсаулы гагара (Kazakh)

II. Order Podicepediformes

2. Family Podicepedidae

2. Красношейная поганка – *Podiceps auritus* (L.) – Қызылмойын сүқсыр.

3. Большая поганка – *Podiceps cristatus* (L.) – Үлкен сүқсыр.

III. Order Pelecaniformes

3. Family Pelecanidae

4. Кудрявый пеликан – *Pelecanus crispus Bruch.* – Бүйра бірқазан.

4. Family Phalacrocoracidae

5. Большой баклан – *Phalacrocorax carbo (L.)* – Үлкен суқұзғыны.

IV. Order Ciconiiformes

5. Family Ardeidae

6. Большая выпь – *Botaurus stellaris* (L.) – Үлкен көлбүқа.

7. Большая белая цапля – *Egretta alba* (L.) – Үлкен аққұтан.

8. Серая цапля – *Ardea cinerea* L. – Көккұтан.

6. Family Ciconiidae

9. Черный аист – *Ciconia nigra* (L.) – Қара дегелек.

V. Order *Anseriformes*

7. Family Anatidae

10. Серый гусь – *Anser anser* (L.) – Сұр қаз

11. Сухонос – *Cygnopsis cygnoides* (L.) – Қытай қазы.

12. Лебедь-кликун – *Cygnus cygnus* (L.) – Сұңқылдақ аққу.

13. Огарь – *Tadorna ferruginea* (Pall.) – Сарыалақаз.

14. Кряква – *Anas platyrhynchos* L. – Барылдауық ұйрек.

15. Чирок-свистунок – *Anas crecca* L. – Ысылдақ шүрегей.

16. Серая утка – *Anas strepera* L. – Қоңыр ұйрек.

17. Свиязь – *Anas penelope* L. – Сарыайдар үйрек.

18. Шилохвость – *Anas acuta* L. – Бізқұйрық үйрек.

19. Чирок-трескунок – *Anas querquedula* L. – Даурықла шүрегей.

20. Широконоска – *Anas clypeata* L. – Жалпақтұмсықты үйрек.

21. Хохлатая чернеть – *Aythya fuligula* (L.). – Айдарлы сүңгуіpі.

22. Морская чернеть – *Aythya marila* (L.) – Теңіз сүңгуіpі.

23. Обыкновенный гоголь – *Bucephala clangula* (L.) - Сусылдақ.

24. Горбоносый турпан – *Melanitta deglandi* (Bonap.) – Дөңтұмсық тұрпан.

25. Луток – *Mergus albellus* L. – Кіші бейнарық.

26. Длинноносый крохаль – *Mergus serrator* L. – Секпілтөс бейнарық.

27. Большой крохаль – *Mergus merganser* L. – Үлкен бейнарық.

VI. Order Falconiformes

8. Family Pandionidae

28. Скопа – *Pandion haliaetus* (L.). – Балықшы тұйғын.

9. Family Accipitridae

29. Обыкновенный осоед – *Pernis apivorus* (L.) – Аражегіш.

30. Хохлатый осоед – *Pernis ptilorhyncus* (Temm.) – Айдарлы аражегіш.

31. Черный коршун – *Milvus migrans* Bodd. – Қара кезқұйрық.

32. Полевой лунь – *Circus cyaneus* (L.) – Түз құладыны

33. Степной лунь – *Circus macrourus* (Gm.) - Дала құладыны

34. Луговой лунь – *Circus pygargus* (L.) – Шалғын құладыны.

35. Болотный лунь – *Circus aeruginosus* (L.) – Саз құладыны.

36. Тетеревятник – Accipiter gentilis (L.) – Қаршыға.

37. Перепелятник – *Accipiter nisus* (L.) – Қырғи.

38. Зимняк – *Buteo lagopus* (Pontopp.) – Айнақанат тілеміш.

39. Мохноногий курганник – *Buteo hemilasius* Temm. et Schleg. – Жұнбалақ тілеміш.

40. Обыкновенный курганник – *Buteo rufinus* (Cretzscm.) – Кәдімгі тілеміш.

41. Обыкновенный канюк – *Buteo buteo* (L.) – Жамансары.

42. Орел-карлик – *Aquila pennatus* (Gm.) – Бақалтақ бүркіт.

43. Степной орел – *Aquila rapax* (Temm.) – Дала қыраны.

44. Большой подорлик – *Aquila clanga* Pall. – Шаңқылдақ қыран.

45. Могильник – *Aquila heliaca* Sav. - Қарақұс.

46. Беркут – *Aquila chrysaetos* (L.) – Бүркіт.

47. Орлан-долгохвост – *Haliaeetus leucoryphus* (Pall.) – Кезқұйрықты субүркіті.

48. Орлан-белохвост – *Haliaeetus albicilla* (L.) – Аққұйрықты субүркіті.

49. Бородач – *Gypaetus barbatus* (L.) – Сақалтай.

50. Стервятник – *Neophron percnopterus* (L.) – Жұртшы.

51. Черный гриф – *Aegypius monachus* (L.) – Тазқара.

52. Белоголовый сип – *Gyps fulvus* (Habl.) – Ақбас құмай.

53. Кумай – *Gyps himalayensis* Hume – Құмай.

10. Family Falconidae

54. Кречет – *Falco rusticolus* L. – Ақ сұңқар.

55. Балобан – *Falco cherrug* Gray – Ителгі.

56. Сапсан – *Falco peregrinus* Tunst. – Лашын.

57. Чеглок – *Falco subbuteo* L. – Жағалтай.

58. Дербник – *Falco columbarius* L. – Тұрымтай.

59. Кобчик – *Falco vespertinus* L. – Бөктергі.

60. Степная пустельга – *Falco naumanni* Fleisch. – Дала күйкентайы.

61. Обыкновенная пустельга – *Falco tinnunculus* L. – Кәдімгі күйкентай.

VII. Order Galliiformes

11. Family Tetraonidae

62. Белая куропатка – *Lagopus lagopus* (L.) - Аққұр.

63. Тундряная куропатка – *Lagopus mutus* (Montin) - Тундра аққұры.

64. Тетерев – *Lyrurus tetrix* (L.) - Құр.

65. Глухарь – *Tetrao urogallus* L. - Меңіреу құр.

66. Рябчик – *Tetrastes bonasia* (L.) - Сұр құр.

12. Family Phasianidae

67. Алтайский улар – *Tetraogallus altaicus (Gebler)* - Алтай ұлары.

68. Кеклик – *Alectoris chukar* (Gray) - Кекілік.

69. Серая куропатка – *Perdix perdix* (L.) - Сұр шіл.

70. Бородатая куропатка – *Perdix dauurica* (Pall.) - Сақалды шіл.

71. Перепел – *Coturnix coturnix* (L.) - Бөдене.

VIII. Order Gruiformes

13. Family Gruidae

72. Стерх – *Grus leucogeranus* Pall. - Ақ тырна.

73. Серый журавль – *Grus grus* L. - Сұр тырна.

74. Черный журавль – *Grus Monacha* Temm. - Қара тырна.

75. Красавка – *Anthropoides virgo* (L.) - Ақбас тырна.

14. Family Rallidae

76. Погоныш – *Porzana porzana* (L.) - Тартар.

77. Коростель – *Crex crex* (L.) - Шәукілдек.

78. Камышница – *Gallinula chloropus* (L.) - Қызылқасқа сутартар.

79. Лысуха – *Fulica atra* L. - Қасқалдақ.

15. Family Otididae

80. Дрофа – *Otis tarda* L. – Дуадақ.

81. Джек – *Chlamidotis undulata* (Jacq.) – Жек дуадақ.

IX. Order Charadriiformes

16. Family Charadriidae

82. Малый зуёк – *Charadrius dubius* Scop. – Шаушүрілдек торғай.

83. Морской зуёк – *Charadrius alexandrinus* L. – Теңіз шүрілдек торғайы.

84. Хрустан – *Eudromias morinellus* (L.) – Алқалы татрең.

85. Чибис – *Vanellus vanellus* (L.) – Қызғыш.

17. Family Haemantopidae

86. Кулик-сорока – *Haemantopus ostralegus* L. – Сауысқан балшықшы.

18. Family Charadriiformes

87. Черныш – *Tringa ochropus* L. – Бұлыңғыр балшықшы.

88. Фифи – *Tringa glareola* L. – Бөрте балшықшы.

89. Травник – *Tringa totanus* L. – Шөпілдек.

90. Поручейник – *Tringa stagnatilis* (Bechst.) – Бұлақшы.

91. Перевозчик – *Actitis hypoleucos* L. – Мамыркүс.

92. Круглоносый плавунчик – *Phalaropus lobatus* (L.) – Ақтамақ қалытқы.

93. Турухтан – *Phylomachus pugnax* (L.) – Күжіркей.

94. Кулик-воробей – *Calidris minuta* (Leisl.) – Құмғақша.

95. Белохвостый песочник – *Calidris temminckii* (Leisl.) – Аққұйрық құмдауық.

96 Гаршнеп – *Limnocryptes minimus* (Brunn.) – Шаушалшық.

97. Бекас – *Gallinago gallinago* L. – Тауқұдірет.

98. Лесной дупель – *Gallinago megala* Swinhoe – Орман маңқысы.

99. Азиатский бекас – *Gallinago stenura* (Bonap.) – Азиялық тауқұдірет.

100. Горный дупель – *Gallinago solitaria* Hodgs. – Тау маңқысы.

101. Дупель – *Gallinago media* (Lath.) – Маңқы.

102. Вальдшнеп – *Scolopax rusticola* L. – Жылқышы.

103. Большой кроншнеп– *Numenius arquata* (L.) – Үлкен шалшықшы.

104. Большой веретенник – *Limosa limosa* (L.) – Үлкен шырғалақ.

19. Family Laridae

105. Черноголовый хохотун – *Larus ichtyaetus* Pall. – Қарабас өгізшағала.

106. Озёрная чайка – *Larus ridibundus* L. – Көл шағаласы.

107. Хохотунья – *Larus cachinnans* Pall. – Өгізшағала.

108. Черная крачка – *Chlidonias niger* (L.) – Қара қарқылдақ.

109. Речная крачка – *Sterna hirundo* L. – Өзен қарқылдақ.

110. Малая крачка – *Sterna albifrons* Pall. – Кіші қарқылдақ.

X. Order Pteroclidiformes

20. Family Pteroclididae

111. Саджа – *Syrrhaptes paradoxus* (Pall.). – Қылқұйрық бұлдырық.

XI. Order Columbiformes

21. Family Columbidae

112. Вяхирь – *Columba palumbus* L. – Дыркептер.

113. Клинтух – *Columba oenas* L. – Түз кептері.

114. Сизый голубь – *Columba livia* (Gm.). – Көк кептер.

115. Скалистый голубь – *Columba rupestris* Pall. – Құз кептері.

116. Кольчатая горлица – *Streptopelia decaocto* (Friv.) – Сақиналы түркептер.

117. Большая горлица – *Streptopelia orientalis* (Lath.) – Үлкен түркептер.

118. Малая горлица – *Streptopelia senegalensis* (L.) – Кіші түркептер.

XII. Order Cuculiformes

22. Family Cuculidae

119. Обыкновенная кукушка – *Cuculus canorus* L. – Кәдімгі көкек.

120. Глухая кукушка – *Cuculus saturatus* Blyth. – Меңіреу көкек.

XIII. Order Strigiformes

23. Family Strigidae

121. Белая сова – *Nyctea scandiaca* (L.) – Ақ жапалақ.

122. Филин – *Bubo bubo* (L.) – Үкі.

123. Ушастая сова – *Asio otus* (L.) – Құлақты жапалақ.

124. Болотная сова – *Asio flammeus* (Pontopp.) – Саз жапалағы.

125. Сплюшка *Otus scops* (L.) – Маубас жапалақ.

126. Лесной сыч – *Aegolius funereus* (L.) – Орман байғызы.

127. Воробьиный сыч – *Glaucidium passerinum* (L.) – Байғызша.

128. Ястребиная сова – *Surnia ulula* (L.) – Қаршыға жапалақ.

129. Длиннохвостая неясыть – *Strix uralensis* Pall. – Кезқұйрық жапалақ.

130. Бородатая неясыть – *Strix nebulosa* J.R. Forst. – Сақалды жапалақ.

XIV. Order Caprimulgiformes

24. Family Caprimulgidae

131. Обыкновенный козодой – *Caprimulgus europaeus* L. – Кәдімгі тентеккұс.

XV. Order Apodiformes

25. Family Apodidae

132. Черный стриж – *Apus apus (L.)* – Қара сұрқарлығаш.

133. Белопоясный стриж – *Apus pacificus* (Lath.) – Ақбел сұрқарлығаш.

XVI. Order Coraciiformes

26. Family Coraciidae

134. Сизоворонка – *Coracias garrulu* L. – Көккарға.

27. Family Alcedinidae

135. Обыкновенный зимородок – *Alcedo atthis* (L.) - Зымыран.

28. Family Meropidae

136. Золотистая щурка – *Merops apiaster* L. – Сарыалқым аражегіш.

XVII. Order *Upupiformes*

29. Family *Upupidae*

137. Удод – *Upupa epops* L. - Бәбісек.

XVIII. Order *Piciformes*

30. Family *Picidae*

138. Вертишейка – *Jynx torquilla* L. – Дүпілдек.

139. Седой дятел – *Picus canus* Gm. – Боз тоқылдақ.

140. Желна – *Dryocopus martius* (L.) – Қара тоқылдақ.

141. Большой дятел – *Dendrocopus major* (L.) – Үлкен тоқылдақ.

142. Белоспинный дятел – *Dendrocopus leucotos* (Bechst.) – Ақжон тоқылдақ.

143. Малый дятел – *Dendrocopus minor* (L.) – Кіші тоқылдақ.

144. Трехпалый дятел – *Picoides tridactylus* (L.) – Үшсаусақты тоқылдақ.

XIX. Order Passeriformes

31. Family Hirundinidae

145. Береговая ласточка – *Riparia riparia* (L.) – Жар қарлығашы.

146. Бледная ласточка – *Riparia diluta* (Sharpe et Wyatt) – Сұр қарлығаш.

147. Скальная ласточка – *Ptyonoprogne rupestris* (Scop.) – Құз қарлығашы.

148. Деревенская ласточка – *Hirundo rustica L.* – Қыстау қарлығашы.

149. Воронок – *Delichon urbica* (L.) – Қала қарлығашы.

32. Family Alaudidae

150. Малый жаворонок – *Calandrella cinerea* (Gm.) – Кіші бозторғай.

151. Рогатый жаворонок – *Eremophila alpestris (L.)* – Құлақты бозторғай.

152. Полевой жаворонок – *Alauda arvensis* L. – Шабындық бозторғайы.

33. Family Motacillidae

153. Степной конёк – *Anthus richardi* Vieill. – Дала жадырағы.

154. Полевой конек – *Anthus campestris* (L.) – Түз жадырағы.

155. Лесной конек – *Anthus trivialis* (L.) – Орман жадырағы.

156. Зеленый конек – *Anthus hodgsoni* Richm. – Жасыл жадырақ.

157. Луговой конек – *Anthus pratensis* (L.) – Шиаяқ жадырақ.

158. Горный конек – *Anthus spinoletta* (L.) – Тау жадырағы.

159. Желтоголовая трясогузка – *Motacilla citreola* Pall. – Сарыбас шақшақай.

160. Горная трясогузка – *Motacilla cinerea* Tunst. – Тау шақшақайы.

161. Белая трясогузка – *Motacilla alba* L. - Ақ шақшақай.

162. Маскированная трясогузка – *Motacilla personata* Gould. – Қарамойын шақшақай.

34. Family Laniidae

163. Сибирский жулан – *Lanius cristatus* L. – Сібір тағанағы.

164. Обыкновенный жулан – *Lanius collurio* L. – Жасылбас тағанақ.

165. Чернолобый сорокопут – *Lanius minor* Gm. – Кіші тағанақ.

166. Серый сорокопут – *Lanius exubitor* L. – Үлкен тағанақ.

35. Family Oriolidae

167. Обыкновенная иволга – *Oriolus oriolus* (L.) – Мысықторғай.

36. Family Sturnidae

168. Обыкновенный скворец – *Sturnus vulgaris* L. – Қараторғай.

169. Розовый скворец – *Sturnus roseus* (L.) – Алаторғай.

37. Family Corvidae

170. Кукша – *Perisoreus infaustus* (L.) – Орманқарға.

171. Сойка – *Garrulus glandarius* (L.) – Жорғаторғай.

172. Сорока – *Pica pica* (L.) – Сауысқан.

173. Кедровка – *Nucifraga caryocatactes* (L.) – Самыркеш.

174. Клушица – *Pyrrhocorax pyrrhocorax* Tunst. – Қызылтұмсық шауқарға.

175. Альпийская галка – *Pyrrhocorax graculus* (L.) – Сарытұмсық шауқарға.

176. Галка – *Corvus monedula* L. – Шауқарға.

177. Даурская галка – *Corvus dauuricus* Pall. –Даур шауқарға.

178. Грач – *Corvus frugilegus* L. - Таған.

179. Черная ворона – *Corvus corone* L. – Қара қарға.

180. Серая ворона – *Corvus cornix* L. – Ала қарға.

181. Обыкновенный ворон – *Corvus corax* L. – Құзғын.

38. Family Bombicyllidae

182. Свиристель – *Bombicylla garrulus* (L.) – Самыр.

39. Family Cinclidae

183. Оляпка – *Cinclus cinclus* (L.) – Кәдімгі сушылқарға.

40. Family Prunellidae

184. Гималайская завирушка – *Prunella himalayana* (Blyth) – Қаратұмсық содырғы.

185. Сибирская завирушка – *Prunella montanella* (Pall.) – Сібір содырғысы.

186. Черногорлая завирушка – *Prunella atrogularis* (Brandt) – Қаратамақ содырғы.

41. Family Sylviidae

187. Широкохвостка – *Cettia cetti* (Temm.) – Жалпаққұйрық бұлбұлша.

188. Певчий сверчок – *Locustella certhiola* (Pall.) – Сайрауық шырылдақ.

189. Обыкновенный сверчок – *Locustella naevia* (Bodd.) – Кәдімгі шырылдақ.

190. Индийская камышевка – *Acrocephalus agricola* (Jerd.) – Қызғылтсары айқабақ.

191. Садовая камышевка – *Acrocephalus dumetorum* Blyth. – Бақ айқабағы.

192. Северная бормотушка – *Hippolais caligata* (Licht.) –Үлкен міңгірлек.

193. Ястребиная славка – *Sulvia nisoria* (Bechst.) – Қаршығарең сандуғаш.

194. Серая славка – *Sylvia communis* Lath. – Сұр сандуғаш.

195. Славка-завирушка – *Sylvia curruca* (L.) – Боз сандуғаш.

196. Пеночка-весничка – *Phylloscopus trochilus* (L.) – Көктем сарықасы.

197. Пеночка-трещотка – *Phylloscopus sibilatrix* (Bechst.) – Сайрауық сарықас.

198. Пеночка-теньковка – *Phylloscopus collybita* (Vieill.) – Саяшыл сарықас.

199. Зелёная пеночка – *Phylloscopus trochiloides* (Sund.) – Жасыл сарықас.

200. Тусклая зарничка – *Phylloscopus humei* Brooks. – Арай сарықасы.

201. Бурая пеночка – *Phylloscopus fuscatus* (Blyth) – Қоңыр сарықас.

202. Индийская пеночка – *Phylloscopus griseolus* Blyth. – Үнді сарықасы.

42. Family Regulidae

203. Желтоголовый королёк – *Regulus regulus* (L.) – Сарыбас шөже.

43. Family Muscicapidae

204. Малая мухоловка – *Ficedula parva* (Bechst.) – Қіші шыбыншы.

205. Серая мухоловка – *Muscicapa striata* (Pall.) – Сұр шыбыншы.

206. Сибирская мухоловка – *Muscicapa sibirica* Gm. – Сібір шыбыншысы.

44. Family Turdidae

207. Луговой чекан – *Saxicola rubetra* (L.) – Жағал шақшақ.

208. Черноголовый чекан – *Saxicola torquata* (L.) – Қарабас шақшақ.

209. Обыкновенная каменка – *Oenanthe oenanthe* (L.) –Кәдімгі тасшымшық.

210. Каменка-плешанка – *Oenanthe pleshanka* (Lepech.) – Қасқа тасшымшық.

211. Пустынная каменка – *Oenanthe deserti* (Temm.) – Шөл тасшымшық.

212. Каменка-плясунья – *Oenanthe isabellina* (Temm.) – Шыбжын тасшымшық.

213. Пёстрый каменный дрозд – *Monticola saxatilis* (L.) – Алабажақ сайрақ.

214. Обыкновенная горихвостка – *Phoenicurus phoenicurus* (L.) – Кәдімгі қызылқұйрық.

215. Горихвостка-чернушка – *Phoenicurus ochruros* (Gm.) – Қошқыл қызылқұйрық.

216. Красноспинная горихвостка – *Ph. erythronotus* (Ev.) – Қызылжон қызылқұйрық.

217. Краснобрюхая горихвостка – *Ph. erythrogaster* (Guld.) – Қызылбауыр қызылқұйрық.

218. Зарянка – *Erithacus rubecilla* (L.) – Таңшымшық.

219. Обыкновенный соловей – *Luscinia luscinia* (L.) – Кәдімгі бұлбұл.

220. Соловей-красношейка – *Luscinia calliope* (Pall.) – Қызылтамақ бұлбұл.

221. Варакушка – *Luscinia cvecica* (L.) – Алабұлбұл.

222. Синехвостка – *Tarsiger cyanurus* (Pall.) – Көк бұлбұл.

223. Чернозобый дрозд – *Turdus atrogularis* Jarock. – Қаражемсаулы сайрақ.

224. Рябинник – *Turdus pilaris* L. – Шетен сайрағы.

225. Чёрный дрозд – *Turdus merula* L. – Қара сайрақ.

226. Белобровик – *Turdus iliacus* L. – Аққабақ сайрақ.

227. Певчий дрозд – *Turdus phylomelos* C.L. Brehm. – Әуезшіл сайрақ.

228. Деряба – *Turdus viscivorus* L. – Қылғытпа сайрақ.

45. Family Aegithalidae

229. Длиннохвостая синица – *Aegithalos caudatus (L.)* – Кезқұйрық шымшық.

46. Family Remezidae

230. Черноголовый ремез – *Remiz coronatus* (Sev.) – Қарабас құрқылтай.

47. Family Paridae

231. Черноголовая гаичка – *Parus palustris* L. – Қарабас шөже.

232. Буроголовая гаичка – *Parus montanus* Bold. – Күреңбас шөже.

233. Сероголовая гаичка – *Parus cinctus* Bold. – Қыраубас шөже.

234. Московка – *Parus ater* L. – Шөре шымшық.

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235. Белая лазоревка – *Parus cyanus* Pall. – Ақ шымшық.

236. Большая синица – *Parus major* L. – Сарыбауыр шымшық.

48. Family Sittidae

237. Обыкновенный поползень – *Sitta europaea* L. – Орман көктекесі.

49. Family Certhiidae

238. Обыкновенная пищуха – *Certhia familiaris* L. – Кәдімгі шиқылдақ.

50. Family Ploceidae

239. Домовый воробей – *Passer domesticus* (L.) – Үй торғайы.

240. Полевой воробей – *Passer montanus* (L.) – Жауторғай.

51. Family Fringillidae

241. Зяблик – *Fringilla coelebs* L. – Жаурауық.

242. Вьюрок – *Fringilla montifringilla* L. – Құнақ.

243. Красношапочный вьюрок – *Serinus pusillus* Pall. - Қызылтелпекті құнақ

244. Обыкновенная зеленушка – *Chloris chloris* (L.) – Жасылтуылжық.

245. Чиж – *Spinus spinus* (L.) – Шымшық.

246. Черноголовый щегол – *Carduelis carduelis* (L.) – Кәдімгі пайыз.

247. Седоголовый щегол – *Carduelis caniceps* Vig. – Бозбас пайыз.

248. Коноплянка – *Acanthis cannabina* (L.) – Шоңайнақ.

249. Горная чечётка – *Acanthis flavirostris* (L.) – Тау шоңайнағы.

250. Обыкновенная чечётка – *Acanthis flammea* (L.) – Шекілдек.

251. Пепельная чечётка – *Acanthis hornemanni* (Holb.) – Күл шекілдек.

252. Гималайский вьюрок – *Leucosticte nemoricola* (Hodg) – Аршашыл құнақ.

253. Жемчужный вьюрок – *Leucosticte brandti* Bonap. – Інжурең құнақ.

254. Сибирский вьюрок – *Leucosticte arctoa* (Pall.) – Бұлдыр құнақ.

255. Обыкновенная чечевица – *Carpodacus erythrinus* (Pall.) – Кәдімгі құралай.

256. Сибирская чечевица – *Carpodacus roseus* (Pall.) – Жолаққанат құралай.

257. Урагус – *Uragus sibiricus* (Pall.) – Кезкұйрық самыр.

258. Щур – *Pinicola enucleator* (L.) – Орман қызылқұнағы.

259. Клест-еловик – *Loxia curvirostra* L. – Шыршашыл қайшауыз.

260. Белокрылый клест – *Loxia leucoptera* Gm. – Аққанатты қайшауыз.

261. Обыкновенный снегирь – *Pyrrhula pyrrhula* (L.) – Кәдімгі суықторғай.

262. Серый снегирь – *Pyrrhula cineracea* Cab. – Боз суықторғай.

263. Обыкновенный дубонос – *Coccothraustes coccothraustes* (L.) – Кәдімгі ементұмсық.

264. Арчовый дубонос – *Mycerobas carnipes* (Hodg.) – Арша ементұмсығы.

52. Family Emberizidae

265. Обыкновенная овсянка – *Emberiza citrinella* L. – Кәдімгі сұлыкеш.

266. Белошапочная –*Emberiza leucocephala* Gm. – Ақбас сұлыкеш.

267. Горная овсянка – *Emberiza cia* L. – Тау сұлыкеші.

268. Овсянка Годлевского – *Emberiza godlewskii* Tacz. – Годлевский сұлыкеші.

269. Красноухая овсянка – *Emberiza cioides* Brandt. – Қызылқұлақ сұлыкеш.

270. Тростниковая овсянка – *Emberiza schoeniclus* (L.) – Қамыс сұлыкеші.

271. Полярная овсянка – *Emberiza pallasi* (Cab.) – Поляр сұлыкеші.

272. Овсянка-крошка – *Emberiza pusilla* Pall. – Шөже сұлыкеш.

273. Дубровник – *Emberiza aureola* Pall. – Еменшіл сұлыкеш.

274. Садовая овсянка – *Emberiza hortulana* L. – Бақ сұлыкеші.

275. Желчная овсянка – *Emberiza bruniceps* Brandt. – Сарғалдақ сұлыкеш.

276. Подорожник – *Calcarius lapponicus* (L.) – Жолторғай.

277. Пуночка – *Plectrophenax nivalis* (L.) – Ақторғай.

I. Order Insectivora Bowdich, 1821

I. Family Erinaceidae Fischer, 1814

1. Белогрудый еж – *Erinaceus concolor* Martin, 1838

II. Family Soricidae Fischer, 1814

2. Малая бурозубка – *Sorex minutus* Linnaeus, 1766
3. Средняя бурозубка – *Sorex caecutiens* Laxmann, 1788
4. Равнозубая бурозубка – *Sorex isodon* Turov, 1924
5. Обыкновенная бурозубка – *Sorex araneus* Linnaeus, 1758
6. Тундряная бурозубка – *Sorex tundrensis* Merriam, 1900
7. Сибирская белозубка – *Crocidura sibirica* Dukelsky, 1930
8. Обыкновенная кутора *Neomys fodiens* Pennant, 1771

III. Семейство Talipidae Ficher, 1814

9. Сибирский крот – *Talpa altaica* Nikolsky, 1883

II. Order Chiroptera Blumenbach, 1779

IV. Family Vespertilionidae Gray, 1821

10. Ночница Брандта – *Myotis brandti* Eversmann, 1845
11. **Ночница Иконникова** – ***Myotis ikonnikovi*** **Ognev, 1912**
12. Водяная ночница – *Myotis daubentoni* Kuhl, 1819
13. Бурый ушан – *Plecotus auritus* Linnaeus, 1758
14. Рыжая вечерница – *Nyctalus noctula* Schreber, 1774
15. Северный кожанок – *Eptesicus nilssoni* Keyserling et Blasius, 1839
16. Двухцветный кожан – *Vespertilio murinus* Linnaeus, 1758

III. Order Carnivora Bowdich, 1821

V. Family Canidae Fischer, 1817

17. Волк – *Canis lupus* Linnaeus, 1758
18. Обыкновенная лисица – *Vulpes vulpes* Linnaeus, 1758

VI. Family Медвежьи Ursidae Fischer, 1817

19. Бурый медведь – *Ursus arctos Linnaeus*, 1758

VII. Family Mustelidae Fischer , 1817

20. **Каменная куница** – ***Martes foina*** **Erxleben, 1777**
21. Соболь – *Martes zibellina* Linnaeus, 1758
22. Росомаха *Gulo gulo* Linnaeus, 1758
23. Солонгой – *Mustela altaica* Pallas, 1811
24. Ласка – *Mustela nivalis* Linnaeus, 1766
25. Горностай – *Mustela erminea* Linnaeus, 1758
26. Колонок – *Mustela sibirica* Pallas, 1773
27. Степной хорек – *Mustela eversmanni* Lesson, 1827
28. Американская норка – *Mustela vison* Schreber, 1777
39. Барсук – *Meles meles* Linnaeus, 1758
30. Речная выдра – *Lutra lutra* Linnaeus, 1758

VIII. Family Felidae Fischer, 1817

31. Обыкновенная рысь – *Lynx lynx* Linnaeus, 1758
32. **Снежный барс, или ирбис** – ***Uncia uncia Schreber*****, 1776**

IV. Order Artiodactyla Owen, 1848

IX. Family Свиные Suidae Gray, 1821

33. Кабан – *Sus scrofa* Linnaeus, 1758

X. Family Moschidae Gray, 1821

34. Кабарга – *Moschus moschiferus* Linnaeus, 1758

XI. Family Cervidae Goldfuss, 1820

35. Благородный олень, марал – *Cervus elaphus* Linnaeus, 1758

36. Сибирская косуля – *Capreolus pygargus* Pallas, 1773

37. Лось – *Alces alces* Linnaeus, 1758

XII. Family Bovidae Gray, 1821

38. Сибирский горный козел – *Capra ibex* Linnaeus, 1758

39. **Архар – *Ovis ammon Linnaeus*, 1758**

V. Order Rodentia Bowdich, 1821

XIII. Family Pteromyidae Brandt, 1855

40. Летяга – *Pteromys volans* Linnaeus, 1758

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XIV. Family Sciuridae Fischer, 1817

41. Обыкновенная белка – *Sciurus vulgaris* Linnaeus, 1758

42. Азиатский бурундук – *Tamias sibiricus* Laxmann, 1769

43. Длиннохвостый суслик – *Spermophilus undulatus* Pallas, 1779

44. Серый сурок –*Marmota baibacina* Kastschenko, 1889

45. Алтайская мышовка – *Sicista napaea* Hollister, 1912

46. Серая мышовка, или мышовка – Страутмана *Sicista pseudonapaea* Strautman, 1949

XV. Family Cricetidae *Fischer*, 1817

47. Серый хомячок – *Cricetulus migratorius* Pallas, 1773

48. Обыкновенный хомяк – *Cricetus cricetus* Linnaeus, 1758

49. Плоскочерепная полевка – *Alticola strelzowi* Kastschenko, 1899

50. Большеухая полевка – *Alticola macrotis* Radde, 1861

51. Красно-серая полевка – *Clethrionomys rufocanus* Sundevall, 1846

52. Красная полевка – *Clethrionomys rutilus* Pallas, 1779
53. Ондатра – *Ondatra zibethicus* Linnaeus, 1766
54. Водяная полевка – *Arvicola terrestris* Linnaeus, 1758
55. Полевка-экономка – *Microtus oeconomus* Pallas, 1776
56. Обыкновенная полевка – *Microtus arvalis* Pallas, 1779
57. Пашенная полевка – *Microtus agrestis* Linnaeus, 1761
58. Узкочерепная полевка – *Microtus gregalis* Pallas, 1779
59. Обыкновенная слепушонка – *Ellobius talpinus* Pallas, 1770

XVI. Family Myospalacidae Lilljeborg, 1866

60. Алтайский цокор – *Myospalax myospalax* Laxmann, 1773

VII. Family Muridae Jlliger, 1811

61. Лесная мышь – *Apodemus sylvaticus* Linnaeus, 1758
62. Восточно-азиатская мышь – *Apodemus peninsulae* Thomas, 1907
63. Полевая мышь – *Apodemus agrarius* Pallas, 1771
64. Домовая мышь – *Mus musculus* Linnaeus, 1758
65. Мышь-малютка – *Micromys minutus* Pallas, 1771
66. Серая крыса – *Rattus norvegicus* Berkenhout, 1769

VI. Order Lagomorpha Brandt, 1855

XVIII. Family Leporidae Fischer, 1817

67. Заяц-беляк – *Lepus timidus* Linnaeus, 1758

XIX. Family Ochotonidae Thomas, 1897

68. Алтайская пищуха – *Ochotona alpina* Pallas, 1773

The vertebrate animals from the Red Data Book of Kazakhstan

Таймень (*Hucho taimen*).

Черный аист (*Ciconia nigra*).

Беркут (*Aguila chrysaetos*).

Балобан (*Falco cherrug*).

Сапсан (*Falco peregrinus*).

Филин (*Bubo bubo*).

Сухонос (*Gygnopsis gygnoides*).

Лебедь кликун (*Cignus cignus*).

Горбоносый турпан (*Melanitta deglandi*).

Алтайский улар (*Tetraogallus altaicus*).

Серый журавль (*Grus grus*).

Журавль – красавка (*Anthropoides virgo*).

Черноголовый хохотун (*Larus ichyaetus*).

Саджа (*Syrrhaptes paradoxus*).

Скопа (*Pandion hallaetus*).

Могильник (*Aquilla haliaca*).

Орлан – белохвост (*Haliaetus albicilla*).

Кудрявый пеликан (*Pelicanus crispus*).

Орел-карлик (*Hieraaetus pennatus*).

Степной орел (*Aquila rapax*).

Бородач (*Gypaetos barbatus*).

Ночница Иконникова (*Myotis ikonnikovi*).

Каменная куница (*Maries forina*).

Снежный барс (*Uncia uncia*).

Алтайский горный баран (аргали) - архар (*Ovis amon ammon*).

Красотка девушка (*Calopteryx virgo* Linnaeus, 1758).

Червец карминоносный польский (*Porphyrophora polonica* Linnaeus, 1758).

Дыбка степная (*Saga pedo* Pallas, 1771).

Кузнечик темнокрылый (*Ceraeocercus fuscipermis* Uvarov, 1910).

Даламаканта Вакка (*Damalacantha vacca* F.d.W., 1846).

Деракантина гранулята (*Deracanthina granulata* F.d.W., 1839).

Жужелица Геблера (*Carabus gebleri* Fischer-Waldheim, 1827).

Жужелица восхитительная (*Carabus imperialis* Fischer-Waldheim, 1823).

Хилокорус двуточечный *(Chilocorus bipustulatus* Linnaeus, 1758).

Точечная коровка (*Stethorus punctillum* Weise, 1891).

Сколия степная (*Scolia hirta* Schrenk, 1781).

Голубянка Аргали (*Glaucopsyche argali* Elwes, 1899).

Class Gastropoda

Order Geophila

Family Pupillidae

Гастрокопта Теля – *Gastrocopta theeli* Westerlund, 1877

Family Higromiidae

Монахоидес акулеата – *Monachoides aculeata* Uvalieva, 1964

Class Insecta

Order Coleoptera

Family Carabidae

Жужелица Михайлова – *Carabus michailovi* Kabak, 1992

Жужелица восхитительная – *Carabus imperialis* Fischer de Waldheim, 1823

Class Osteichthyes

Order Salmoniformes

Family Salmonidae

Таймень – *Hucho taimen* Pallas, 1773

Class Aves

Order Pelecaniformes

Family Pelecanidae

Розовый пеликан – *Pelecanus onocrotalus* L.

Order Ciconiiformes

Family Аистовые Ciconiidae

Черный аист – *Ciconia nigra* L.

Order Anseriformes

Family Утиные Anatidae

Лебедь-кликун – *Cygnus cygnus* L.

Гробоносый турпан – *Melanitta deglandi* Bonap.

Order Falconiformes

Family Pandionidae

Скопа – *Pandion haliaetus* L.

Family Accipitridae

Степной лунь – *Circus macrourus* Gmel.

Орель-карлик – *Hieraaetus pennatus* Gm.

Степной орел – *Aquila nipalensis* Hodg.

Большой подорлик – *Aquila clanga* Pall.

Могильник – *Aquila heliaca* Sav.

Беркут – *Aquila chrysaetos* L.

Орлан-долгохвост – *Haliaeetus leucoryphus* Pall.

Орлан-белохвост – *Haliaetus albicilla* L.

Бородач – *Gypaetus barbatus* L.

Стервятник – *Neophron percnopterus* L.

Family Falconidae

Черный гриф – *Aegypius monachus* L.

Кумай – *Gyps himalayensis* Hume, 1869

Кречет – *Falco rusticolus* L.

Балобан – *Falco cherrug* Gray

Сапсан – *Falco peregrinus* Tunst.

Степная пустельга *Falco naumanni* Fleischer

Order Galliformes

Family Phasianidae

Алтайский улар – *Tetraogallus altaicus* Geb.

Order Gruiformes

Family Gruidae

Стерх – *Grus leucogeranus* Pall.

Серый журавль – *Grus grus* L.

Журавль- красавка – *Anthropoides virgo* L.

Family Rallidae

Коростель – *Crex crex* L.

Family Otididae

Дрофа – *Otis tarda* L.

Стрепет – *Otis tetrax* L.

Джек – *Chlamydotis undulata* Jacq.

Order Charadriiformes

Family Laridae

Черноголовый хохотун – *Larus ichtyaetus* Pall.

Order Pteroclidiformes

Family Pteroclididae

Саджа – *Syrrhaptes paradoxus* Pall.

Order Strigiformes

Family Strigidae

Филин – *Bubo bubo* L.

Order Passeriformes

Family Emberizidae

Дубровник – *Emberiza aureola* Pall.

Class Mammalia

Order Cyiroptera

Family Vespertilionidae

Ночница Иконникова – *Myotis ikonnikovi* Ognev, *1911*

Order Carnivora

Family Canidae

Красный волк – *Cuon alpinus* Pallas, 1811

Family Mustelidae

Каменная куница – *Martes foina* Erxleben, 1777

Family Felidae

Снежный барс – *Uncia uncia* Schreber, 1775

Order Artiodactyla

Family Bovidae

Алтайский горный баран – *Ovis ammon* Linnaeus, 1758

The list of rare plant species of Katon-Karagay Biosphere Reserve

Сем. Lycopodiaceae

1. *Diphasiastrum alpinum*

Сем. Huperziaceae

2. *Hupersia selago*

Сем. Ophioglossaceae

3. *Botrychium lunaria*

Сем. Athyriaceae

4. *Athyrium distentifolium*

5. *Rhizomatopteris montana*

Сем. Dryopteridaceae

6. *Polystichum lonchitis*

Сем. Aspleniaceae

7. *Aspienium septentrionale*

Сем. Pinaceae

8. *Pinus sibirica*

9. *Abies sibirica*

Сем. Ephedraceae

10. *Ephedra monosperma*

Сем. Poaceae

11. *Elytrigia jacutorum*

12. *Festuca altissima*

13. *Paracolpodium altaicum*

Сем. Alliaceae

14. *Allium microdictyon*

15. *A. altaicum*

16. *A. ledebourianum*

17. *A. pumilum*

Сем. Liliaceae

18. *Lilium pilosiusculum*

19. *Tulipa uniflora*

20. *T. patens*

21. *Erythronium sibiricum*

Сем. Trilliaceae

22. *Paris quadrifolia*

Сем. Orchidaceae

23. *Cypripedium guttatum*

24. *Dactylorhiza baltica*

25. *D. fuchsii*

26. *Coeloglossum viride*

27. *Epipogium aphyllum*

Сем. Polygonaceae

28. *Rheum altaicum*

Сем. Ranunculaceae

29. *Adonis vernalis*

30. *Pulsatilla patens*

Сем. Paeoniaceae

31. *Paeonia anomala*

32. *P. hybrid*

Сем. Berberidaceae

33. *Gymnospermium altaicum*

Сем. Brassicaceae

34. *Macropodium nivale*

Сем. Crassulaceae

35. *Rhodiola rosea*

36. *Rh. quadrifida*

37. *Rh. algida*

Сем. Rosaceae

38. *Padus avium*

Сем. Apiaceae

39. *Bupleurum krylovianum*

40. *Sanicula europaea*

Сем. Asteraceae

41. *Arnica iljinii*

42. *Rhaponticum carthamoides*

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ANNEXES

Special thanks to staff of Katon-Karagay State Nature Reserve, UNDP/ GEF Project on Altai-Sayan area, Cluster office of UNESCO in Almaty, and National Comission of epublic of Kazakhstan for UNESCO and ISESCO

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