Aksu-Zhabagly

BIOSPHERE RESERVE

United Nations
Educational, Scientific and
Cultural Organization

National
Commission
Republic
of Kazakhstan

Kazakhstan
National
Committee

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

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AKSU-ZHABAGLY

BIOSPHERE RESERVE NOMINATION

BIOSPHERE RESERVE

PART I: SUMMARY

1. PROPOSED NAME OF THE BIOSPHERE RESERVE:

Aksu-Zhabagly Biosphere Reserve

2. COUNTRY:

Kazakhstan

3. FULFILLMENT OF THE THREE FUNCTIONS OF BIOSPHERE RESERVES

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

Aksu-Zhabagly biosphere reserve is located in the Western end of Talasskiy Alatau and Southern part of Karatau in the West Tien Shan. The whole region of the West Tien Shan is an Eastern outpost of Mediterranean atmospheric circulation, therefore it has a winter-spring rainfall. The mountain range of the West Tien Shan is a barrier that catches the moisture in the Western transport of air masses; in addition, this region is situated within the zone of the Southern deserts, where the annual temperature sum is high and about 4000-5000o C. As a result, this area is the most favorable for vegetation and preservation of many ancient relict species and plant communities. Moreover, the reserve's ecosystems have a very close relationship with the natural systems of the Near East and the Mediterranean than to the rest of the ecosystems of the Tien Shan.

The territory of Aksu Zhabagly has a high degree of representativeness at regional level. For example, it has almost all landscape types and sub-types of the West Tien Shan, except for deserts and gypsophilous subshrub communities, which are well below the reserve in altitude. Aksu Zhabagly Biosphere Reserve has about 75% of biodiversity of West Tien Shan. It has 48% of the total diversity of birds in the region, 72.5% of vertebrates, 221 of 254 fungi species, 63 of 80 moss species of and 15 of 17 vegetation types of West Tien Shan and 114 of 180 plant formations.

Flora of higher plants consists of 483 genera and 91 family, which is very representative of both West Tien Shan and Mountain Middle Asian Province. This fact is proved by its representativeness – 51.3% of West Tien Shan flora (2538 species) and approximately 25% of Middle Asian Province flora, which is estimated as 6,000 species by florists. Flora of biosphere reserve is quite representative at the families level, the majority of them are represented in 50% and more of their species diversity for the whole region. The same pattern is observed at the genera level, with leading genera: Astragalus (60 species), Gagea (24), Carex, Allium (22 each), Oxytropis (20), Veronica (19), Cousinia, Polygonum, Potentilla, Silene и Artemisia (15-17 species each). Flora of Aksu-Zhabagly Reserve is typical for Middle Asian province, which is also proved by the presence of Middle Asian endemic species in its composition (Korolkowia, Rhaphidophyton, Pseudoclausia, Hyalolena, Mediasia, Oedibasis, Pilopleura, Schrenkia, Schtschurowskia, Sphaenolobium, Pseuderemostachys, Stephanocaryum, Lepechiniella, Cylindrocarpa, Sergia, Trichanthemis, Ugamia, Lepidolpha, Kosopoljanskia). As a whole, reserve's flora is characterized by high level of genera and species endemism – there are 20 endemic genera (out of 64 genera endemic for Mountain Middle Asian Province) and about 10% of endemic species, including 28 species endemic to Karatau district, 25 species of Ugam-Chatkal district, 35 species of Kirgiz district. Reserve's flora composition also includes 100 massive species which play considerable role in vegetation cover and are edificators of separate vegetation associations (Juniperus semiglobosa, J. seravschanica, J. turkestanica, Alopecurus pratensis, Bromopsis inermis, Ferula tenuisecta, Prangos pabularia, Festuca valesiaca, Potentilla hololeuca, Allium fedtschenkoanum, etc.). There are more than 70 species of wild relatives of cultural plants on the territory of Aksu-Zhabagly, and more than 200 species are medicinal. There are 57 rare species listed in the Red Data Books of Kazakhstan, Uzbekistan and Kyrgyzstan.

All vertebrates, except fishes, are well represented in biosphere reserve. So, 338 vertebrate species out of 428 are registered in the reserve (79%), and more than 70% of rare species are concentrated in this area.

Fauna of vertebrates in Aksu- Zhabagly Biosphere Reserve

Vertebrate class	*Total*			*Rare species*		
	WTS	A-D	%	WTS	A-D	%
Mammals	61	52	85.2	12	9	75.0
Birds	316	267	84.5	33	25	75.7
Nesting birds	158	130	82.3	13	9	69.2
Migrating and wintering birds	158	137	86.7	20	16	80.0
Reptiles	17	11	64.7	2	2	100
Amphibians	3	3	100	1	1	100
Fishes	31	5	16.1	3	0	0
Total:	428	338	79.0	51	37	72.5

Note: «WTS» -West Tien Shan; « A-D » - Aksu-Zhabagly Biosphere Reserve

Invertebrate fauna of West Tien Shan is represented by 60% in the reserve. Most representative groups are insects - ground beetles (62%), scarabs (66%) and horse flies (91%), the share of beetles – Middle Asian endemics and subendemics – is about a half (47%) of total composition of reserve's beetles.

There are 24 species and subspecies of vertebrate animals, 24 insect species and 1 species of annelids listed in the Red Data Book of Kazakhstan. IUCN Redlist lists 2 bird species – Corncrake (*Crex crex*) and White-winged Woodpecker (*Dendrocopos leucopterus*), and 3 mammal species - Snow Leopard (*Uncia uncia*), endemic to the West Tien Shan Marmot (*Marmota menzbieri*) and threatened to extinction endemic subspecies of Argali (*Ovis ammon karelini*).

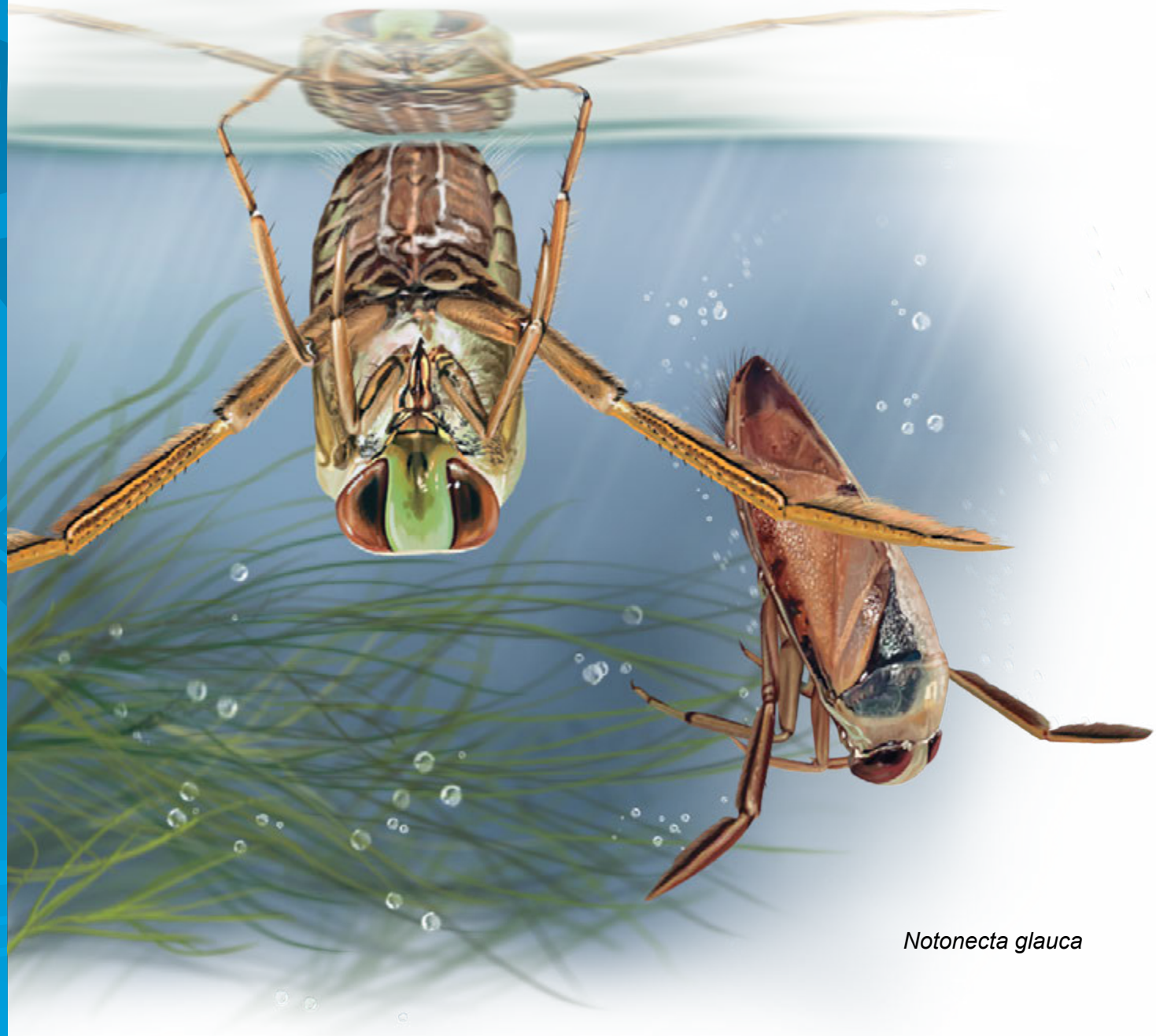
From economically valuable animal species of Aksu-Zhabagly there are 14 ungulate species (Argali, Wild Boar, Roe Deer, Maral) and predators (Wolf *Canis lupus*, Fox *Vulpes vulpes*, Corsac Fox *Vulpes corsac*, African Wildcat *Felis libyca*), to lesser extent – from rodents and lagomorphs (Badger *Meles meles*, Stoat *Mustela erminea*, Least Weasel *Mustela nivalis*, Long-tailed Marmot *Marmota caudata*, Muskrat *Ondatra zibethica* and Tolai Hare *Lepus tolai*), and 6 game bird species (Common Quail *Coturnix coturnix,* Chukar *Alectoris chukar,* Grey Partridge *Perdix perdix,* Himalayan Snowcock *Tetraogallus himalayensis,* Common Wood Pigeon *Columba palumbus* and Oriental Turtle Dove *Streptopelia orientalis*). Economically important homopterans include carmine-scale insects *Porphyrophora polonica* and *P. monticola*, which serve as a natural source of very expensive natural dye carmin.

There are a lot of Jurassic fossils found on the territory of Aksu-Zhabagly Biosphere Reserve, which are typical for this territory and represent the best samples of West Tien Shan.

Accipiter nisus

Apis melifera

Rhynocoris iracundus



Notonecta glauca

Ilyocoris cimicoides

Canis lupus

Marmota caudata

3. 2

«Development — foster economic and human development which is socio-culturally and ecologically sustainable»

Aksu-Zhabagly biosphere reserve is located on the lands of Tulkibas, Tole Bi, Baydibek districts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast. Near the biosphere reserve there are 26 settlements, with 11 of them in Tulkibas district, 9 in Tole Bi district and 6 in Zhualy district.

Most of the popoulation are Kazakhs, rather less are Russians, Uzbeks, Karakalpaks, Turks and Azerbaijanis. Kazakhs, who lived in that region, belong to older juz (ancestor branches occupying specific territories).

Major economical orientation of the region is agriculture. There are several crops growing on agricultural land: on the rainfed area – cereal cultures (wheat and barley); on irrigated arable lands – forage cultures (corn, clover, alfalfa) and technical (sunflower, safflower, tobacco).

Local people usually breed cattle (mainly Aulieatinskaya dairy- meat breed), sheep (South-Kazakh Merino), goats, horses (trotters and Donskaya breed) and poultry (chicken and turkey).

Orthopteran

Hunting

Most of the villages have plumbing, others take water from wells and rivers. Roads are mostly paved or gravel. Houses are heated by wood, charcoal and dung (dry horse or cow manure).

In the late 1990s - early 2000s, due to problems of natural gas supply, local people cut down a lot of tree plantations, which are currently being restored. In all the major towns there are hospitals or aid stations and shops are available in every village. Among the most significant factors affecting the local environment by local population are logging, harvesting of dead wood and poaching.

Eco-tourism, which is a constant flow of visitors, using specially equipped routes and with specially established for this purpose infrastructure, was virtually non-existent in Aksu Zhabagly until 1992, but in the late 1990s and into the 2000s it began to develop. At present, the territory of the buffer zone is visited by scientists and amateurs interested in flora and fauna, as well as ordinary sightseers. In accordance with 10 routes for scientific and educational tourism, visitors move through the reserve on trails and roads, and for the rest stops use previously constructed field bases and traditional camping sites. Currently, the potential of eco-tourism for educational purposes is still insufficiently developed, although Aksu Zhabagly is one of the famous tourist spots for birdwatchers from all over the world.

Malus sieversii

Tulipa greigii

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»

Currently the main scientific – technical support of the biosphere reserve's territory is carried out by the staff of Aksu Zhabagly state nature reserve. In the framework of the international GEF/UNDP project "Biodiversity conservation of West Tien Shan" (1998-2004) the material-technical base was strengthened and numerous training seminars were conducted. Administrartion of biosphere reserve is conducting different festivals and competitions, such as «Parks March», Birds' Day, festivals of children's art, etc. Since the 1970s, Museum of Nature is open, which has several exhibition halls with numerous dioramas and museum exhibits (more than 200 stuffed animals, entomological and botanical collections.)

In 2003-2004 part of UNDP Project's equipment was donated (cars, computers and other office appliences, equipment for water quality control, photo cameras, video camera, binoculars, telescopes, GPS, etc.). In 2004-2011 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 for staff members of Aksu Zhabagly state nature reserve to attend Korgalzhyn Biosphere Reserve, Karatau Nature Reserve (Kazakhstan), Berezinskiy Nature Reseve (Belarus), and to scientific-practical conferences inside Kazakhstan (Almaty, Astana) and abroad (Moscow, Russia and Minsk, Belarus).

Tulipa greigii large flower

CRITERIA FOR DESIGNATION AS A BIOSPHERE RESERVE 4.

4. 1

«Encompass a mosaic of ecological systems representative of major biogeographic regions, including a gradation of human intervention»

Biosphere reserve is located in the Western part of the Tien Shan mountain system at the junction of sub-boreal (temperate) and dry sub-tropical (warm-temperate) climatic zones. This caused complex structure of landscape and soil zoning, mixing and interpenetration of these two zones. Consequently, there is a high vegetation diversity, complex structure of vertical zoning, which differs in the Western and Eastern parts of the reserve. Aksu Zhabagly is a territory of high, medium and low mountains of Western end of the Talas Alatau and the North-Eastern edge of the Ugam Ridge. Its territory covers the upper part of the left tributaries' basins of Arys river - Zhabaglysu, Aksu and Sayramsu. The territory of the reserve is characterized by very strong compartmentalization, prevalence of steep and very steep slopes, especially in Aksu river basin. The altitudes of the territory range from 1300 m (Alatau Mountains Southern of Zhabagly - previously Nov- Nikolayevka) to 4229 m (Sairam peak in Ugam Ridge, in the South of the reserve).
There are 5 natural altitudinal zones in Aksu-Zhabagly Biosphere Reserve:

1. Highland nival level**,** 3600 (3800) m is characterized by almost absence of higher vegetation, domination of ice, firn, naked rocks and rocky alluvial deposits. This level is very important in regulating river flow. There are no soil formations on nival level.

2. Highland alpine level, 2800 (3000) — 3600 (3800) m, with appearance of sparse short vegetation, mostly consisting of steppe and meadow-steppe herbs, including characteristic highland species.

3. Highland sub-nival level, 2200—2800 (3000) m is characterized by a little more dense vegetation cover formed of not high meadow-steppe herbs with islands of creeping junipers, which occupy up to 20-30% of the slope surface.

4. Medium montane level (1500—2200 m) of meadow-steppe juniper sparse forests, shrubs and shrub semi-savannas. It is characterized by vegetation cover of double type: slopes of Northern exposition are dominated by dry juniper light park forests with meadow-steppe vegetation in the forest and in the meadows, which dominate in area (50-90% of total surface); slopes of Southern exposition are dominated by shrub large herbs semi-savannas, partly with juniper sparse forests. There are apple forests in the canyons.

5. Lowland level (below 1500—1600 m) of shrub large herbs, partly steppe semi-savannas

Vegetation of the reserve is subdivided into 4 large type groups: I. trees and shrubs, II. grass, III. prickly-shrub and IV. vegetation of rocks and screes.

I. **Vegetation of trees and shrubs:**

1. *Evergreen junipers* – associations with dominance of evergreen trees and shrubs of the genus *Juniperus* (standing *Juniperus semiglobosa, Juniperus seravshanica*, creeping *Juniperus turkestanica*)

2. *Deciduous forests and woodlands* – associations dominated by deciduous trees (mainly broadleaf): apple (*Malus sieversii*), hawthorn (*Crataegus turkestanica*), Caucasian Hackberry (*Celtis caucasica*) and woodland hawthorn (*Crataegus pontica*).

Malus sieversii

3. *Deciduous shrub type* combines deciduous shrub thickets (mostly broad-leaved) with participation of species of the genera *Rosa, Lonicera, CotonEaster, Berberis*. Shrub thickets are usually multispecies, but usually the main role is played by species of *Rosa* genus with abundance of honesuckle. Deciduous shrubs include *Spiraea hypericifolia*, *Cerasus erythrocarpa, C. tianschanica*, *Athraphaxis pyrifolia*.

4. *Small-leaved forests* are mostly deciduous forest of river valleys: birch (*Betula pendula* (synonym of *B. talassica*), *B. tianschanica, B. turkestanica*); willow (*Salix niedzwieckii, S. pycnostachya, S.alba*)

5. *Mountain riparian forests* – floodplain forests of Asian arid zone, including poplar (*Populus talassica, P. cataracti*) forest.

II. **Grass vegetation**

6. *Cryophyte low-grass meadows* – associations of microterm mesophile and xeromesophile herbaceous perennial plants, distributed in highland. This type includes: cryophyte meadiws with participation of *Waldheimia tridactylites, Cerastium lithospermifolium, Cystiocorydalis fedtschenkoana, Allium polyphillum, Oxytropis albovillosa, Oxytropis*

chionobia, etc.; meadows of *Carex stenocarpa*, *Cobresia cappiliformis, Puccinella subspicata, Festuca kryloviana, Helictotrichon hookeri, Hordeum turkestanicum, Poa alpine, Trisetum spicatum*.

7. *Mid-grass meadows* - grass and motley-grass associations of xeromesophile and mesophile perennial grasses, sub-alpine, upland. The main meadow types include: *Alopecurus pratensis, Dactylis glomerata, Poa pratensis, P. angustifolia, Agropyron repens, Phleum phleoides, Zerna inermis, Salamagrostis epigeios; Roegneria canina, Carex melanantha, Geranium collinum, G.saxatile, Allium hymenorhizum, Medicago tianschanica; Polygonum coriarium* and many others.

8. *Steppes* – type of vegetation, including associations dominated by perennial microterm turf cereals with codomination of mesoxerophile and xeromesophile motley-grasses (*Stipa, Festuca, Koeleria, Helictotrichon*). The main formations are *Festuca valesiaca; Stipa kirghisorum, Helictotrichon desertorum, Stipa capillata*.

9. *Savannoid type of vegetation* – associations dominated by ephemeroids (*Agropyron trichophorum, Hordeum bulbosum, Poa bulbosa, Carex pachystilis*), as well as mesophile and xeromesophile geophytes (species of the genera *Prangos, Ferula*).

III. Prickly-shrub vegetation (phryganoids)

10. *Phryganoids* **–** associations of sclerophyllus dwarf-shrubs (*Onobrychis echidna, Acantholimon*), semi-dwarf shrubs (*Artemisia*) and perennial prickly grass (*Cousinia*). *Onobrychis echidna* associations also belong to this type.

IV. Vegetation of rocks and screes

11. *Petrophyton-* vegetation of rocks and scree, which is subdivided into vegetation of rocks and scree of mid-mountain level (*Allium polyphillum, A. pskemense, Paraquilegia grandiflora, Delphinium oreophilum, Saxifraga albertii, Campanula capusi* and etc) and vegetation of rocks and scree of low and mid-mountain level (*Dasiphora fruticulosa, Artemisia rutifolia, Silene braghuica, Parrya albida, Eremurus lactiflorus, Spiraea pilosa, Rosa cocanica, Ephedra equisetina*). Rocks of this lower altitude are characterized by shrubs (*Cerasus erythrocarpa, Spiraea pilosa, Athraphaxis pyrifolia, Lonicera tianschanica*, etc).

12. Group of petrophytes with domination of labiates, main dominant species are of genera *Ziziphora* and *Thymus.*

Most of above listed types of vegetation is unique and distributed only in Mountain Middle Asian region, part is characteristic only for West Tien Shan. Some of the unique types are savannoid and phryganoid vegetation types. Other original type for that region is juniper sparse forests (*Juniperus semiglobosa* and *J. seravschanica*).

Tulipa greigii

«Be of significance for biological diversity conservation»

Aksu Zhabagly is extremely important to preserve biodiversity of West Tien-Shan.

There are 52 species of mammals, accounting for 85.2% of West Tien Shan theriofauna, among them - rodents (44%) predators (24%), bats (18 %), ungulates (9%), lagomorphs and insectivores (3% each). Ungulates include Argali, Ibex, Roe Deer, Maral and Wild Boar, carnivores - Bear, Badger, Stone Marten, Least Weasel and Stoat, and rodents and lagomorphs – Long-tailed Marmot, Indian Porcupine, Tolai Hare and Muskrat. The Red Data Book of Kazakhstan lists 10 species of rare and endangered species of mammals. Special attention should be drawn to the protection of 3 mammal species – Snow Leopard, listed in the IUCN Redlist, endemic to the West Tien Shan Menzbier's Marmot and currently endangered endemic subspecies of Argali.

There are 267 bird species in total, including 130 nesting species and 137 migrating, wintering or occasional birds. Red Data Book of Kazakhstan lists 11 species. Besides, 2 more bird species are recognized by IUCN as globally threatened, which are Corncrake (*Crex crex*) and White-winged Woodpecker (*Dendrocopos leucopterus*). Herpetofauna is represented by 11 species of reptiles, and 3 species of amphibians, which is more than 70% of the regional fauna. Three species are listed in the Red Data Book of Kazakhstan. Fish fauna includes five species, the most common of them - an Common Marinka (*Schizothorax intermedius*) and Scaleless Osman (*Diptychus dybowskii*).

Fauna of mollusca includes 53 species of 24 genera of 14 families, or about 60 % of the regional fauna. Five species are endemic to the Talasskiy Alatau: *Pupilla striopolita, Pseudonapaeus entoptyx, Turanera leptogyra, Turanera stshukini, Leucozonella reitteri*.

The most studied insect flora includes such small orders as cockroaches, stick insects, earwigs, and partly beetles, heteropterans, true butterflies and dragonflies. About 2,500 insect species are registered at the present time on the territory of biosphere reserve. In Aksu-Zhabagly there are 77 species of orthopterans, including 5 species of cockroaches, 4 species of praying mantis, one species of stick insect, 9 species of stoneflies, 3 species of earwigs and 53 orthopteran species. To the present time 388 species of hemipterans were found on the reserve's territory, including 113 homopteran and 275 heteropteran species. Beetle fauna of the reserve comprises not less than 906 species of 358 genera of 41 families. Under-studied fauna of hymenopterans consists of 175 species. According to estimations, fauna of this group must count not less than 1000 species. To the present time there are 463 butterfly species on the territory of the reserve, species composition of Rhopalocera includes 118 species of 7 families.

Flora of Aksu Zhabagly Biosphere Reserve includes 1,737 species, including 235 species of fungi, 64 species of lichens, 63 species of algae and mosses and 1,312 species of higher plants. Reserve plays a prominent role in the preservation of endemic genera. So, from 64 endemic for Central Asia genera in Aksu- Zhabagly 19 genera are found: *Korolkowia* Regel (Liliaceae), *Rhaphidophiton* Iljin (Chenopodiaceae), *Botschantzevia* Nabiev (Brassicaceae), *Pseu-*

doclausia M.Pop., *Galagania* Lipsky, *Hyalolaena* Bunge, *Mediasia* Pimen., *Oedibasis* Koso-Pol., *Pilopleura* Schischk., *Schrenkia* Fisch.et Mey., *Sclerotiaria* Korov., *Schtschurovskia* Regel et Schmalh., *Sphaenolobium* Pimen., *Pseuderemostachys* M.Pop. (Lamiaceae), *Stephanocaryum* M.Pop. (Boraginaceae), *Cylindrocarpa* Regel, *Sergia* Fed., *Lepidolopha* C.Winkl., *Ugamia* Pavl. There are 57 species listed in the Red Data Books of Uzbekistan, Kazakhstan and Kyrgyzstan. In Aksu-Zhabagly Biosphere Reserve there are 72 wild relatives of cultural plants. Here are all of the useful plants: fodder, medicinal, food, technical, ether- oil crops, decorative, nectariferous. About 30-40 species were traditionally used by local people and authorities system (fruit, medicinal, tannic, saponin-bearing). In 1940s roots of tannic plants, such as *Rheum maximoviczii*, *Polygonum coriarium*, *P.nitens*, as well as bulbs of food plants *Koralkowia sewerzowii* and *Allium pskemense* were produced. In the present time populations of these species are restoring.

4. 3

«Provide an opportunity to explore and demonstrate approaches to sustainable development on a regional scale»

It is very perspective to develop livestock and crop production, as well as ecological tourism on the basis of biosphere reserve. On a regional scale the experience of development ecological tourism could be successfully used in Kazakhstan, Kyrgyzstan and Uzbekistan. Proximity of the reserve to main cities Taraz and Shymkent, as well as financial and cultural center – Almaty – with its well developed tourist infrastructure (international airport, railroad and bus stations, hotels, tourist companies, restaurants, etc.) gives tourists a potential possibility to stay in comfortable conditions of the city with short-term (without night stays) visits of the sightseeing areas. In the future these tourist services will be developed on the territory of biosphere reserve (villages in collaboration zone) in the form of private guest tourism with additional services from local people (hiring and using the boats, horse-riding, fishing, etc.) with realization of local fresh produce and local souvenirs.

Tulipa greigii on hand

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

Total area of the territory of Aksu-Zhabagly Biosphere Reserve is 357,734 ha. The main core zone (territory of Aksu-Zhabagly State Nature Reserve) is 131,934 ha, buffer zone is 25,800 ha (2-3 km border along the perimeter of nature reserve), development zone – about 200,000 ha.

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»? 4. 5

The main zone of biosphere reserve is strictly protected zone of nature reserve regime of Aksu-Zhabagly State Nature Reserve, which represents natural mountain complex of West Tien Shan.

In accordance with Article 39 Chapter 7 of the Law of RK “About specially protected natural territories”: State Nature Reserve shall be a Protected area registered as nature conservation and scientific institution created in order to ensure conservation and research on its territory of natural processes and events, flora and fauna, and separate species of plants and animals, typical and unique ecological systems and restoration thereof. On specially assigned areas, which do not include especially valuable ecological systems and object, it is permitted, in the order stipulated by the authority, to create excursion paths and routes for conducting regulated ecological tourism (Article 42). Aksu-Zhabagly State Nature Reserve corresponds with the highest category (A1) of IUCN natural territories. Total area of core zone is 131,934 ha.

The core zone represents one area of Northen-West part of Talasskiy Alatau with its long Western and partly Northern ranges and adjacent to the main ridge North-Eastern slopes of Ugam ridge. There are two paleontological sites “Aulie” and “Karabastau” near the biosphere reserve (120 km) on the territory of Algabas District South-Kazakhstan oblast with total area of 225 ha.

Altitudinal limits of biosphere reserve in the main part vary from 1300 to 4200 m above sea level. Ranges of the main ridge represent separate water-dividing ridges of considerable altitude. From the East nature reserve is limited by side ridge, dividing Arabiik and Koksay river basins. A little Western from that, the tops of the main Sarytau ridge (3,657.2 m) and Aksuat (4,027.4 m) are origin for the ridges which are water-divides of Koksay, Aksay and Zhabagly rivers. The highest altitudes along side water-divide ridges change form 3,401.1 m to 3,977.1 m. Canyons of Koksay and Aksay rivers have meridianal stretch (South-North) and are steeply slopes V-shaped valleys. Koksay and Aksay rivers are the only in nature reserve which belong to Talas river basin. Mountain center in the area of Aksuat top gives origin

to a whole range of ridges: Alatau (Kaskabulak top, 3,831.9 m), Bugulutor (3,926.3 m) and Aksu (3,795.8 m). All of them have mostly latitudinal direction and serve as water-divide ridges of Arys river basin, large right-side inflow of Syrdarya river. Zhabaglytau ridge, limiting nature reserve from the North, is considerably not high (highest point 2,913.1 m), it is adjacent to plateau-like Topshak area of Aksay-Zhabagly water-divide. From the Southern slope of Talasskiy Alatau in South-Western direction goes a large ridge – Ugam – limiting Maidantal river valley (Pskem river inflow) from the North. Highest point of Ugam ridge is Sairamskiy top (4,238.6 m), which is South-Westernmost point of the reserve.

«(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...»

Buffer zone of Aksu-Zhabagly biosphere reserve comprises the lands of the buffer and protected territories of state reserve. According to Article 43 of the Law of RK «About SPNA»: «buffer zone — the area used for ecologically oriented economic activity and stable reproduction of biological resources». This zone is created to protect specially protected natural territories from unfavourable influences from the outside, with prohibition of any activity that may negatively influence the condition and restoration of the given territory's ecosystems. Lands of the buffer zone are not withdrawn from the main land users, they consist of the lands of agricultural purpose and are administered by agricultural organizations and private bodies. Within the buffer zone of biosphere reserve economic activity in some parts of the protection zone (haymaking, cattle pasture) is carried out by agreement with state authority (Forestry and Hunting Committee of the Ministry of Agriculture of RK) and under the control of the administration of state nature reserve. Eco-educational, tourist, and recreational activities are conducted on the territory of biosphere reserve's buffer zone, as well as scientific research. The area of the buffer zone is 25,800 ha. In the present time one more km along the border of Kazakhstan and Uzbekistan completely matches with state border of RK, according to the Law RK "On the state border" this territory is under the management of the border control service of RK. According to the Chapter 3, Article 12 (State border regime) paragraphs 4-5 "the regime includes: … 4) the entry, temporary stay, residence, movement in the border strip and implementation fly over the border strip;5) conducting business, fishing and other activities of the socio-political, cultural or other events".

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

Transition zone (collaboration zone) of Aksu-Zhabagly biosphere reserve is located on the territory of Tulkibas, Tole Bi, Baydibek districts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast. Total approximate area is 200,000 ha.

The most favorable conditions for local people are in the foothill areas with altitudes of 1,500 m above sea level due to climatic conditions. As a result, most of settlements are concentrated in the foothill areas near the main

rivers and streams. Thus, the entire Northern and Western parts of buffer zone are full of villages and small settlements. The territory near the buffer and transition zones of reserve is the most densely populated region of South Kazakhstan (from 20 to 40 people per sq.km). In the nearest proximity (up to 75 km) there are settlements near oblast centers: Shymkent and Taraz cities, with population density of 50-60 and more people in 1 square km. Most of the lands, adjacent to nature reserve, are in state possession and are given on the right of constant or temporary land use. They may be divided into the following categories: -lands of specially protected natural territories (reserves); - lands of forest funds; - lands of agricultural use; - reserve lands; - lands for industry, transport, communication, defense and other non-agricultural use. Lands of forest fund are administered by Shymkent, Tyulkibas and Zhualy state institutions for forest and animal world protection, and hunt for large mammals is permitted there. The lands are registered and used by numerous local farm-ers and production agricultural cooperatives and units, with intensive use of the lands for growing plant cultures, cattle pasture and haymaking. Reserve lands are not used due to their distance from the settlements, very rugged terrain and hard access in the conditions of highlands.

«(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 here (such as tourism, scientific research, educational programs, partial use of natural renewable resources, etc.). Both zones serve for conservation of natural complexes and partially for sustainable development. The transition zone is used for living of local people, development of economy, culture and education. Here there is no strict protection regime of natural complexes, but there are some restrictions on the nature use (ecologically dirty production is prohibited). 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.

«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»

4. 6

For organization of partner relations a special Coordinational Council of Aksu-Zhabagly 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)).

Local communities are involved in the development of biosphere reserve's Management Plan and by participating in the Coordinational Council in the integrated reserve's management. Complete management of the core and buffer zone is conducted by the administration of Aksu-Zhabagly state nature reserve, but local NGOs, local communities receive full information on natural complexes of the zones that will be used for education, as well as for tourist routes in the buffer and transition zones, development of scientifically based sustainable nature use, etc.

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 GEF project "Conservation of biodiversity in the West Tien Shan" in 2000 – 2004 complex research of the region was carried out. In the limits of this work the influence of the environment and economical situation on cultural and social life of local people was assessed, nature reserve's management plan was developed, etc. Social-economic conditions and historic-cultural peculiarities of the region are given in the first part of Management Plan of 2008.

Allium karataviense

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»?

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. During the zonation of buffer zone a consultation with all land users were held.

«(b) a management plan or policy 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 for core and buffer zones of Aksu-Zhabagly Biosphere Reserve, which describes management of the main protected areas of Biosphere Reserve. In the transition zone the land users have their own management plans, which are in accordance with Management Plan of core and buffer zones. 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. A Management Plan for Aksu-Zhabagly that is inclusive of the core, buffer and some part of transition area, was worked out and developed for five year period according to the national legislation. After that the results of its implementation are analyzed and new Management Plan is created taking into consideration positive and negative experiences of previous plan’s realization. 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 and Water Resources of Kazakhstan.

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

The biosphere reserve is managed through Aksu-Zhabagly Biosphere Reserve Coordinational Council created in 2012. Before that the territory of the core and buffer zone was managed by Scientific-Technical Council of the Nature Reserve (until July 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»?

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. According to the Management Plan of Aksu-Zhabagly, scientific research on its territory focuses on inventarization and study of the objects of state nature reserve fund, as well as study of natural processes for Nature Chronicles program. This scientific work includes observations of natural phenomena and processes and their study for the «Nature Chronicles» program, flora and vegetation inventarization, research of rare and threatened vertebrate and invertebrate animals, monitoring of biodiversity condition and indicator species' population condition.

For cultural – educational activities in the Reserve there is a department of ecological education. The staff of the Department consists of 5 people - museum chief and 4 instuctors – excursionists. Cultural – educational work is also carried out by staff from Department of Science, Information and Monitoring, and Reserve's Security Service (30 people) in the area of nature protection legislation. The main work on ecological education is carried out in the form of excursions on ecologicla paths in the protective zone, in Nature Museum, lectures, articles publication in mass media. There are environmental protection activities such as Parks' March, ecological scouts, etc. In the past such effective methods as slide shows and scientific-popular documentary films were often used, but now the projection equipment is worn out and this kind of activities are not conducted. The goal of Department's work is in raising ecological awareness of local people, their understanding of the key role of the protected territory, importance of unique nature conservation, public support, and raising patriotism and responsibility for the environment, and, as the result, pressure decrease on region's biodiversity from local population. The main activity directions are: work with mass media, publishing activity, museum, ecological excursions, environmental tourism, interactions with teachers and educational bodies. Besides, Department's staff develops posters, leaflets and other agitational materials, and takes part in providing practice for students on the base of nature reserve.

Supported by two UNDP/GEF Projects (Conservation of biodiversity of West Tien Shan and Wetlands Project) state nature reserve's staff had an opportunity of exchange experience and raise their qualifications in Korgalzhyn Biosphere Reserve, Karatau Nature Reserve (Kazakhstan), Berezinskiy Nature Reserve (Belarus), Zapovedniki Ecological Center (Moscow, Russia), and at scientific-practical conferences inside Kazakhstan and abroad (Minsk, Belarus). In 2009-2011 training seminars were conducted dedicated to preparation of management plan, biodiversity monitoring, state inspectors were trained in drawing up reports, complying with safety operating procedures and fire prevention.

5. ENDORSEMENTS

5. 1 Signed by the authority/authorities in charge of the management of the core area(s):

Full name and title: Menlibekov A.N., Director of Aksu-Zhabagly State Nature

Date: 02 September 2013

Address, email, phone number: 28 Abai Str., Zhabagly Village, Tyulkubas Dstr., 161310, Kazakhstan, e-mail: menlibekov@mail.kz, phone: +7(725 38) 55-633

5. 2 Signed by the authority/authorities in charge of the management of the buffer zone(s):

Full name and title: Menlibekov A.N., Director of Aksu-Zhabagly State Nature

Date: 02 September 2013

Address, email, phone number: 28 Abai Str., Zhabagly Village, Tyulkubas Dstr., 161310, Kazakhstan, e-mail: menlibekov@mail.kz, phone: +7(725 38) 55-633

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(s):

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

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

Full name and title: Turgumbekov A.E., Akim of Tolebi Dstr., South Kazakhstan Oblast,

Date: 02 September 2013

Address, email, phone number: 28 Aitekebi Str., Lenger Town, South Kazakhstan, phone: +7(72547) 621-35 e-mnail: tolebi.akimat@mail.ru

Full name and title: Abdualiev K.A., Akim of Tyulkubas Dstr., South Kazakhstan Oblast

Date: 03 September 2013

Address, email, phone number: 201 Ryskulov Str., Turar Ryskulov Town, phone: +7 (725 38)53-480, e-mail: Tulkubas79@mail.ru

Full name and title: Kobeev A.K., Akim of Baidibek Dstr., South Kazakhstan Oblast

Date: 03 September 2013

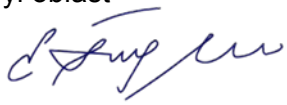
Address, email, phone number: 69 Baidibek Str., Shayan Village, South Kazakhstan, e-mail: Erbol7676@mail.ru,phoine: +7(725 48)21-167

Full name and title: Kulekeev B.A., Akim of Zhualy Dstr., Zhambyl Oblast

Date: 04 September 2013

Address, email, phone number: B. Momysh-Uly Village, Zhualy dstr., Zhambyl oblast

phone: +7(725 48)21167, e-mail: akim_gualin@mail.ru



Full name and title:Baskakova S., Chairman NGO “Wild Nature”

Date: 03 September 2013

Address, email, phone number: Zhabagly Village, Tyulkubas Dstr., South Kazakhstan, 161310

phone: +7 (726 35) 21365, e-mail: baskakova2008@mail.ru

Full name and title: Berlousov E.M., Director “Jenja and Lyuda Boarding House” Company

Date: 04 September 2013

Address, email, phone number: : Zhabagly Village, Tyulkubas Dstr., South Kazakhstan, 161310

phone: +7 (726 35) 2-11-75, e-mail: info@aksuinn.com

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

Anthropoides virgo

PART II : DESCRIPTION

AKSU-ZHABAGLY

6. LOCATION (LATITUDE AND LONGITUDE):

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

Cardinal points:	Latitude	Longitude
Most central point:	N 42°20′	E 70°40′
Northernmost point:	N 42°43′	E 70°39′
Southernmost point:	N 40°56′	E 70°34′
Westernmost point:	N 42°28′	E 70°04′
Easternmost point:	N 42°43′	E 71°03′

6. 2 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.

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

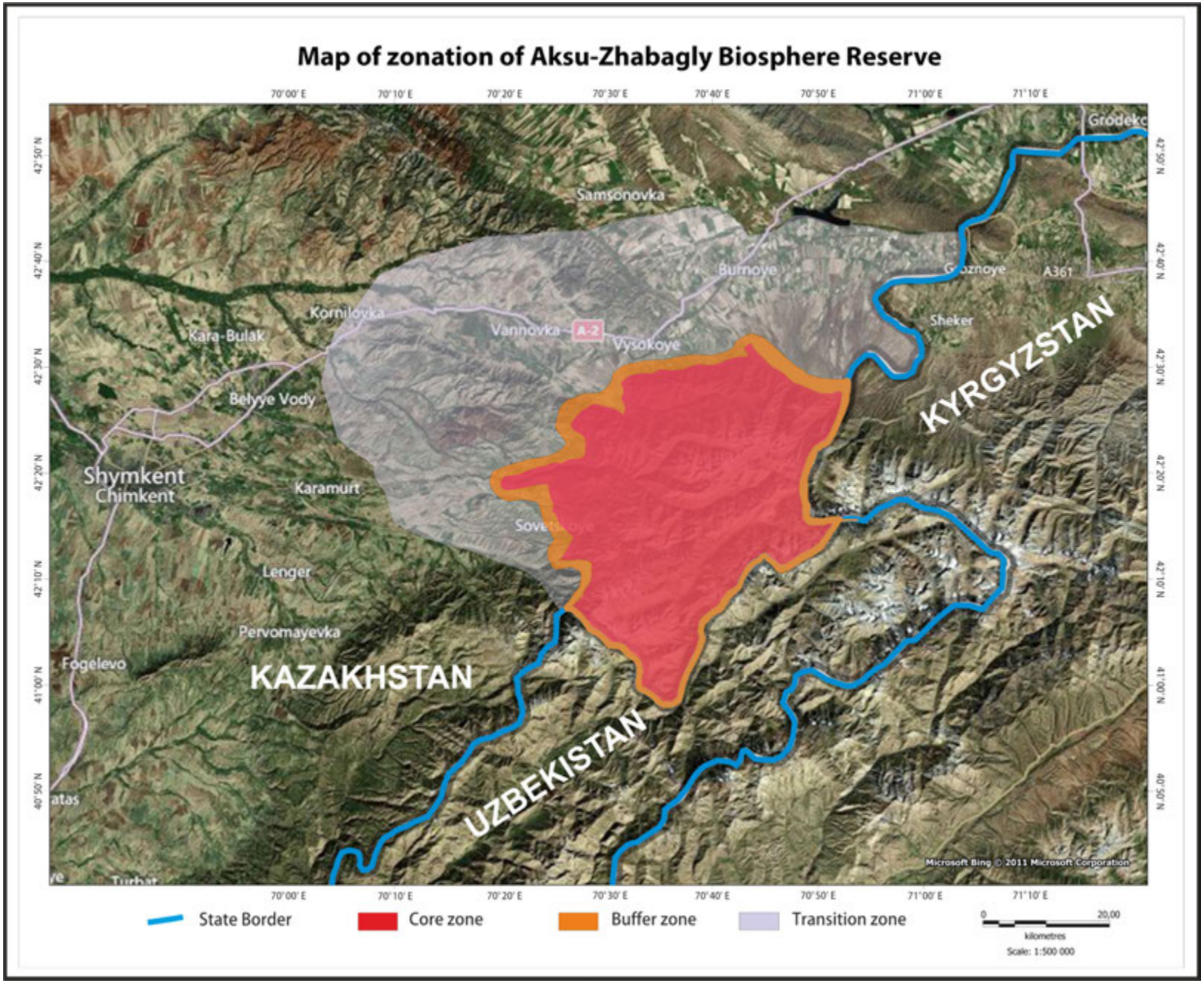
7. AREA (see map):

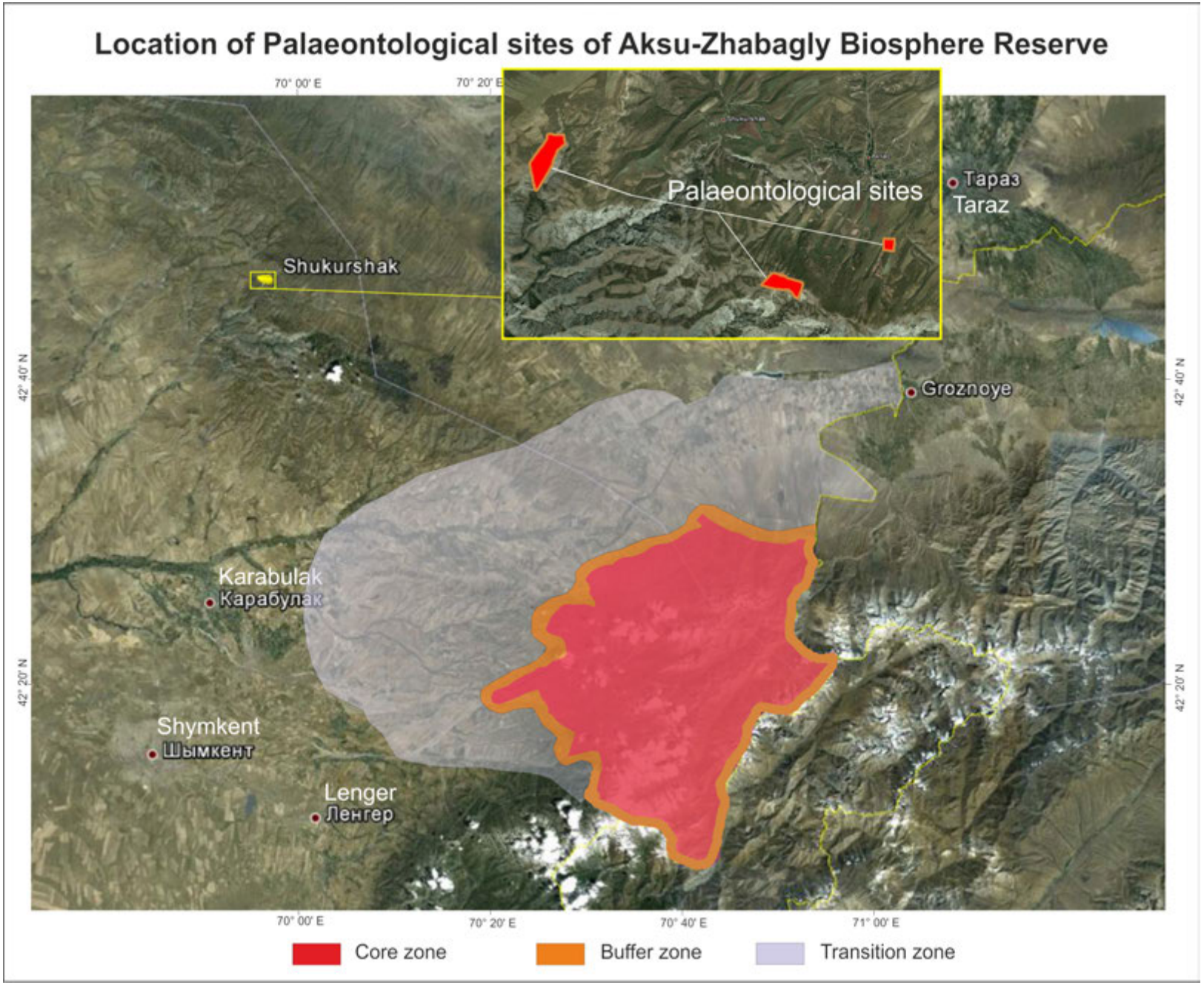
	Terrestrial	Marine (if applicable)	Total
7.1 Area of Core Area(s):	131 934 ha	_____ ha	131 934 ha
7.2 Area of Buffer Zone(s):	25 800 ha	_____ ha	25 800 ha
7.3 Area of Transition Area(s):	200 000 ha	_____ ha	200 000 ha
TOTAL:	357 734 ha	_____ ha	357 734 ha

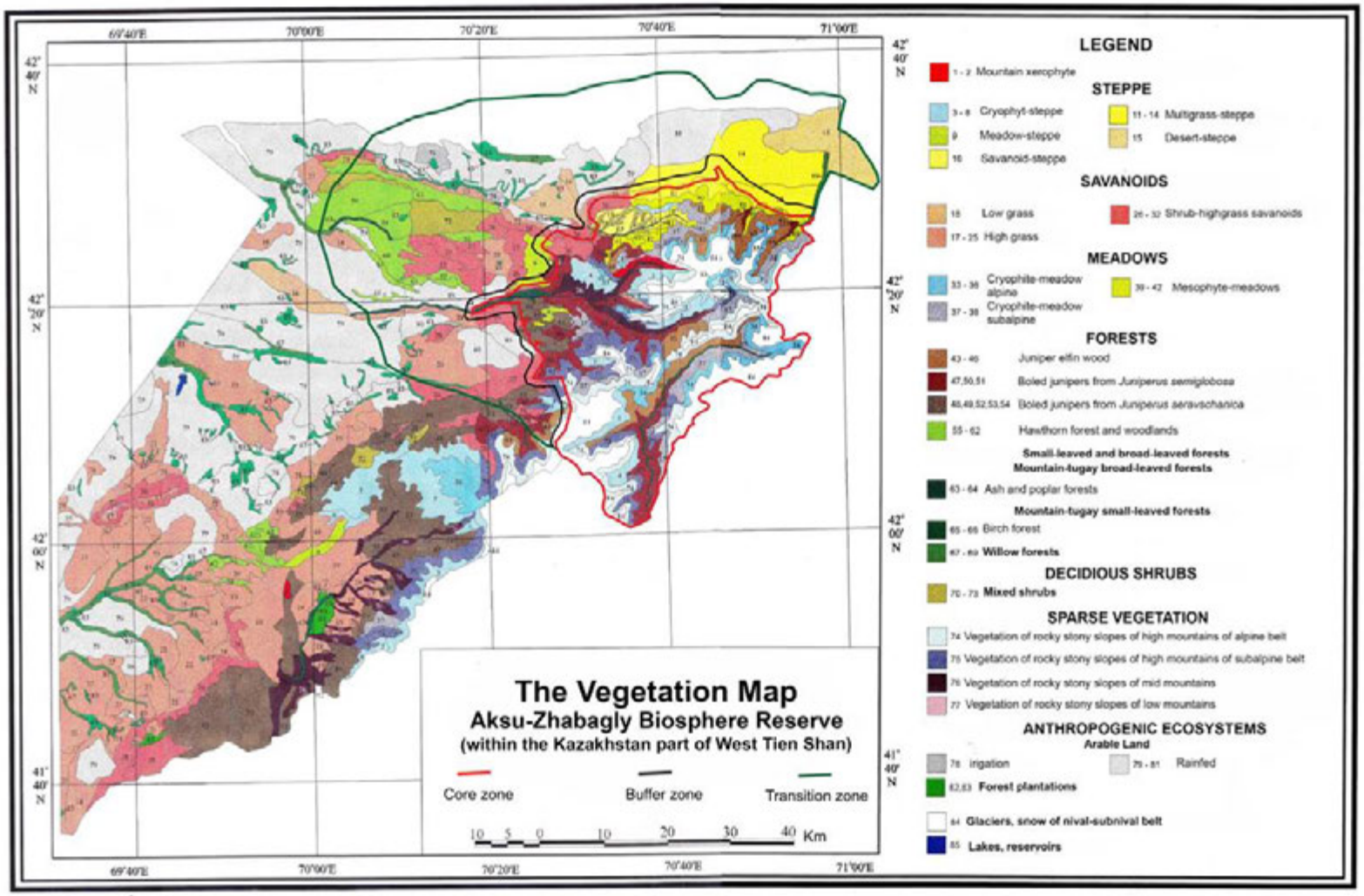

LATVIA
Moscow
Minsk
BELARUS
Kyiv
UKRAINE
KAZAK
Chișinău
Sea of Azov
Aral Sea
Bucharest
Black Sea
UZBEKISTAN
BULGARIA
GEORGIA
Sea of Marmara
Ankara
Baku
TURKEY
Caspian Sea
TURKMENISTAN
Ashgabat
Athens
Tehran
Nicosia
SYRIA
Beirut
Baghdad
Damascus
IRAQ
IRAN
Amman
KUWAIT
EGYPT
Persian Gulf
Riyadh
QATAR
Abu Dhabi

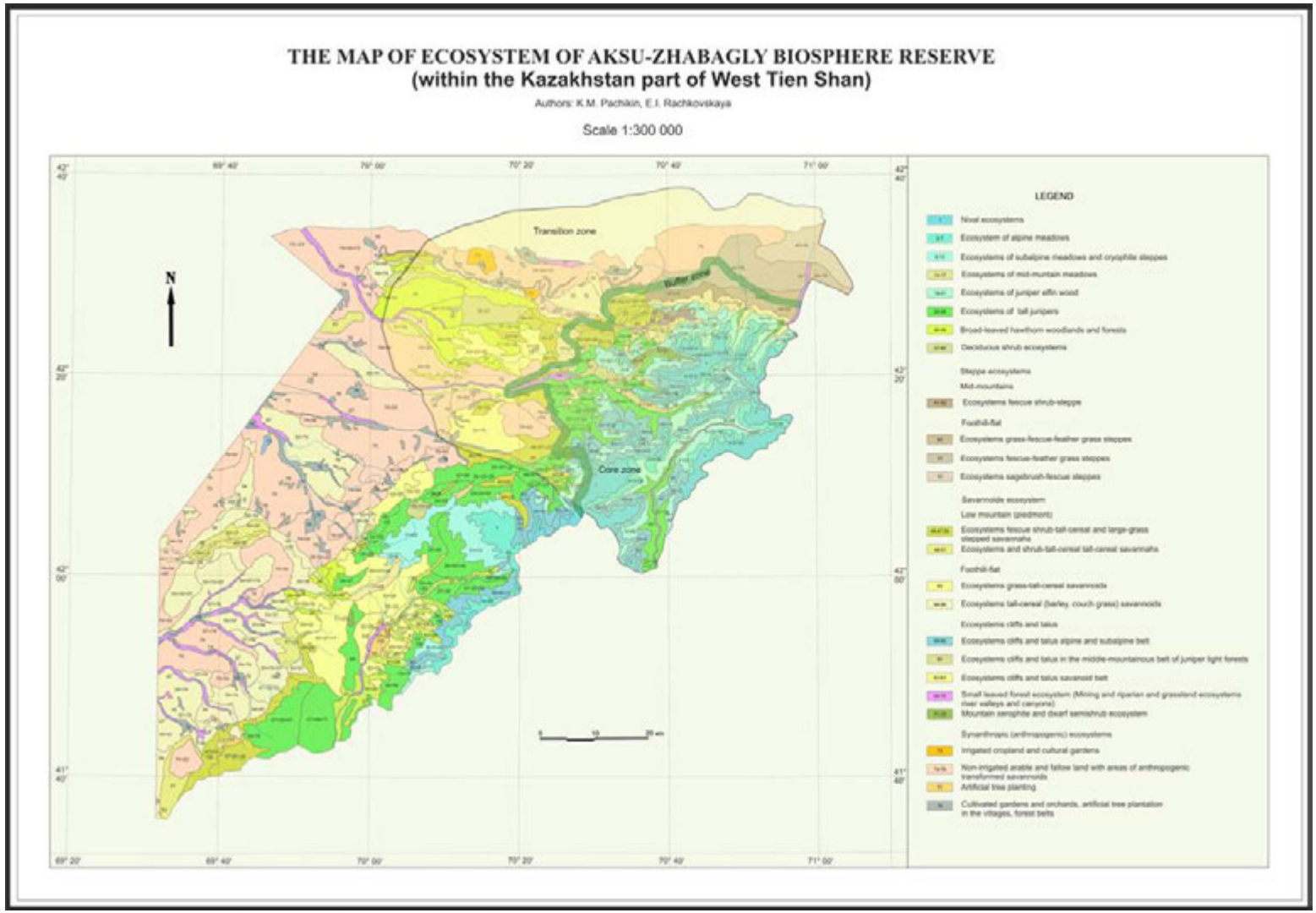
location

Aksu-Dzhabagly Biosphere Reserve


Map of zonation of Aksu-Zhabagly Biosphere Reserve
70°00' E
70°10' E
70°20' E
70°30' E
70°40' E
70°50' E
71°00' E
71°10' E
42°50' N
42°40' N
42°30' N
42°20' N
42°10' N
41°00' N
40°50' N
Samsonovka
Burnoye
A361
Sheker
Kornilovka
Kara-Bulak
Vannovka
A-2
Vysokoye
Belyye Vody
KYRGYZSTAN
Shymkent
Chimkent
Karamurt
Lenger
Pervomayevka
Fogelevo
KAZAKHSTAN
UZBEKISTAN
Microsoft Bing © 2011 Microsoft Corporation
State Border
Core zone
Buffer zone
Transition zone
0
20,00
kilometres
Scale: 1:500 000


Location of Palaeontological sites of Aksu-Zhabagly Biosphere Reserve
70° 00' E
70° 20' E
70° 40' E
71° 00' E
42° 40' N
42° 20' N
Palaeontological sites
Shukurshak
Тараз
Taraz
Groznoye
Karabulak
Карабулак
Shymkent
Шымкент
Lenger
Ленгер
Core zone
Buffer zone
Transition zone


The Vegetation Map
Aksu-Zhabagly Biosphere Reserve
(within the Kazakhstan part of West Tien Shan)
Core zone
Buffer zone
Transition zone
10 5 0 10 20 30 40 Km
69°40'E
70°00'E
70°20'E
70°40'E
71°00'E
42° 40' N
42° 20' N
42° 00' N
41° 40' N
LEGEND
1 - 2 Mountain xerophyte
STEPPE
3 - 8 Cryophyt-steppe
9 Meadow-steppe
10 Savanoid-steppe
11 - 14 Multigrass-steppe
15 Desert-steppe
SAVANOIDS
16 Low grass
17 - 25 High grass
26 - 32 Shrub-highgrass savanoids
MEADOWS
33 - 36 Cryophite-meadow alpine
37 - 38 Cryophite-meadow subalpine
39 - 42 Mesophyte-meadows
FORESTS
43 - 46 Juniper elfin wood
47,50,51 Boled junipers from Juniperus semiglobosa
48,49,52,53,54 Boled junipers from Juniperus seravschanica
55 - 62 Hawthorn forest and woodlands
Small-leaved and broad-leaved forests
Mountain-tugay broad-leaved forests
63 - 64 Ash and poplar forests
Mountain-tugay small-leaved forests
65 - 66 Birch forest
67 - 69 Willow forests
DECIDIOUS SHRUBS
70 - 73 Mixed shrubs
SPARSE VEGETATION
74 Vegetation of rocky stony slopes of high mountains of alpine belt
75 Vegetation of rocky stony slopes of high mountains of subalpine belt
76 Vegetation of rocky stony slopes of mid mountains
77 Vegetation of rocky stony slopes of low mountains
ANTHROPOGENIC ECOSYSTEMS
Arable Land
78 irrigation
79 - 81 Rainfed
82,83 Forest plantations
84 Glaciers, snow of nival-subnival belt
85 Lakes, reservoirs


THE MAP OF ECOSYSTEM OF AKSU-ZHABAGLY BIOSPHERE RESERVE
(within the Kazakhstan part of West Tien Shan)
Authors: K.M. Pachikin, E.I. Rachkovskaya
Scale 1:300 000
Transition zone
Buffer zone
Core zone
N
LEGEND

7. 4 Brief rationale of this zonation (in terms of the various roles of biosphere reserves) as it appears on the zonation map. In the cases where a different type of zonation is also in force at the national level, please indicate how it can coexists with the requirements of the biosphere reserve zonation system:

Kazakhstan land legislation defines zoning of territories as identification of the lands and their purpose and usage regime. According to Article 39 of the Law “About specially protected natural territories”, “State Nature Reserve is a specially protected natural territory with the status of nature protective and scientific institution, its activities’ goal is in conservation and research of natural processes on its territory, objects of plant and animal world, separate species and communities of plants and animals, typical and unique ecological systems and their rehabilitation” (paragraph 1). The main activities of state nature reserves include: “1) provision of protection regime and restoration of biological diversity of state nature reserve and its protective zone; 2) organization and conduction of scientific research and monitoring of ecological systems, objects of state nature reserve fund, including Nature Chronicles; 3) expertise of the projects and distribution schemes of economic and other objects which may negatively influence ecological systems of state nature reserve;, 5) regulation of the use of state nature reserve’s territory and its protective zone in ecologic-educational, scientific and limited tourist purposes” (paragraph 2)

Functional zones’ identification in Aksu-Zhabagly Biosphere Reserve was conducted with goal of conservation of typical, rare and unique natural complexes of Kazakhstan part of West Tien Shan, 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 2000-2004 in the frame of UNDP/GEF West Tien Shan Transboundary Project. 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 result of this work 3 functional zones were identified for Aksu-Zhabagly Biosphere Reserve:

1. C*ore zone (main zone).* According to the legislation of Kazakhtan, this territory includes the zone of nature reserve’s regime of Aksu-Zhabagly State Nature Reserve, which prohibits any economic activity and provides strict protection regime.

2. *Buffer zone*, which consists of the protective zone of Aksu-Zhabagly State Nature Reserve, established according to the legislation of Kazakhstan. This territory is designed for the protection of Nature Reserve’s core from unfavourable external influence. Any activity that would negatively influence the condition and rehabilitation of the given territory’s ecosystems is prohibited haere. 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 Aksu-Zhabagly State Nature Reserve.

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

Canyon of Aksu River

8. BIOGEOGRAPHICAL REGION:

The territory of Aksu-Zhabagly biosphere reserve, according to the modern scheme of zoogeographic regioning, is located at the junction of Turkestan Mountain and Turan provinces, which belong to Iran-Turan infra-province of Sahara-Gobi subregion of Ancient Mediterranean region of Holarctic kingdom. According to its botanic-geographical regioning it belongs to Holarctic kingdom, Iran-Turan subdistrict, Turkestan and Turan province (or Montane Middle Asian province: Karatau and West Tien Shan districts).

9. LAND USE HISTORY:

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).

There are no ancient's permanent settlements due to historical nomadic lifestyle of Kazakhs. Mountain pastures were used only in summer. In core zone of the reserve scientists discovered stone cattle pens of annular shape, and rock paintings on the porphyritic rocks covered with desert tan (ferro - manganese crust) - petroglyphs depicting hunting scenes and life and the figures of wild and domestic animals. These petroglyphs are approximately dated to the Bronze Age. In Taldybulak gorge stones were also found to play togyz kumalak (a national game). The modern territory of the core and buffer zones of the reserve was not used by local people for the construction of permanent settlements in the last 300 years. Until 1926 the montane part of the two zones of Aksu Zhabagly was used for summer pastures (Zhailau). Prior to the organization of the reserve in 1926, the territory was used by local people. Here people pastured cattle, mowed hay, fell juniper for firewood and construction. Because of small population the degree of natural resources' depletion in the future reserve was low. Until 1935 the anthropogenic impact on the reserve was minimal, and since 1946 it has intensified. Since that time such types of nature use as cutting of trees and dead-wood (up to 1954), were allowed, as well as planting of alien flora forest species (from 1951 to 1960), cattle driving and mowing (up to 1984), geological exploration, apiaries' installation, mass tourism (up to 1973) near the border of the core and buffer zones.
In 1922 Prof. Brodsky raised a question of organizing Aksu-Zhabagly Reserve. In 1922-1923 scientists of Central Asian State University (Professor Kultiasov, Korovin, Popov and Kashkarov) visited nature reserve's area and supported the organization of the reserve here. On October 12, 1925 meeting of the Central Executive Committee of Land Management of Turkestan Republic took place, approving scientists's proposals and adopting the Resolution on the allocation of land for establishment of the reserve in the defined borders.

Aksu-Zhabagly state nature reserve was organized by the Resolutions of the Council of People's Commissars of the Kazakh Autonomous Soviet Socialist Republic (KazASSR) as of 14 July, 1926 and the Council of People's Commissars of the Russian Soviet Federative Socialist Republic (RSFSR) as of 27 May, 1927; area of reserve was 30,545 ha. With this definition of the borders even at the moment of nature reserve's establishment it was obvious that borders of some valuable animal species distribution areas were not taken into consideration due to lack of research, and also valuable juniper massifs were left outside of its limits. This is why several new Resolutions were issued, allocating more lands to the nature reserve. In 1929 Aksu river canyon with total area of 825 ha was added, and the Resolution of Central Executive Committee of RSFSR as of 16 February 1935 approved new borders of nature reserve with its total area of 48,570 ha by adding juniper forests in Bala-Baldybrek and Baldybrek river valleys. On 10 April 1937 the Resolution #161 of Tyulkibas Regional Executive Committee and Presidium of Lengeskiy Regional Executive Committee added Southern slopes of Zhabagly river's right bank, upper part of Aksu river and Kshi-Aksu river, and park of Maidantal valley. Thus, nature reserve's area was increased to 69,826 ha. Considerable change of configuration and area of nature reserve happened in 1969, when, based on the results of forest planning, the area of Maidantal river valley was changed by Aksu river origins with area of 6,300 ha. Despite of the inequality in area changes, the South and South-Eastern border of nature reserve were established at its natural limits – along the top of Ugam ridge. The Resolution of Ministers' Cabinet of the Republic of Kazakhstan as of 22 June 1995 #855 the nature reserve was granted with a right of permanent land use of forest fund land plots (land plots, covered and not covered by forests, for forestry necessities) of total area of 10,660 ha and agricultural use on the area of 6 ha. The last extension of nature reserve's territory was carried out in accordance with Resolution of the Government of the Republic of Kazakhstan #1133 as of 17 November 2005. Besides, there are two palaeontological sites managed by nature reserve: Karabastau with area of 100 ha and Auliye with area of 125 ha. In the present time the only enclave of nature reserve's territory is Chuuldak meteorological station, which exists here more than 50 years. Due to climatic conditions, the most favourable conditions for living are in the foothill zones at the altitudes from 1500 m above sea level. This is why the majority of settlements is located in the foothill areas where the main rivers and streams come from mountain canyons to the plains. Thus, all Northern and Western parts of nature reserve are filled with villages and small settlements.

Mountain clouds

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).

According to legislation of Kazakhstan, the main zone of proposed Biosphere Reserve is protection regime zone, so all activities are strictly defined according to Article 40 Chapter 7 of the Law «On specially protected natural territories».

Biosphere Reserve’s buffer zone is actually protected zone of Aksu-Zhabagly State Nature Reserve, so according to Article 42 Chapter 7 of the Law «On specially protected natural territories» all activities are strictly regulated. Around 10-30 people (staff of reserve) live in buffer zone.

Around 150 thousand people live in transition zone of biosphere reserve. The major economical orientation of the region is agriculture. The main vegetation cultures are wheat, potato, sunflower, beetroot, beans, safflower, corn, apples and grapes. In cattle breeding the main direction include breeding sheep, horses and cattle. The largest land users of the transition zone are agricultural enterproses, which use most of the lands. Other large land users include enterprises which work in industry, transport, communications and defense, among them the largest companies are Kazakhstan Temir Zholy railroad company, Ministry of Defense of RK and Border Control Service of the Committee of Natinoal Secutiry of RK, as well as administrations of local rural districts and settlements with their lands for local population needs (public pastures, cattle drives, etc.). Besides, some territories belong to the State Management of Forests and Animal World Protection.

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

According to legislation of Kazakhstan, the main zone of proposed Biosphere Reserve is nature reserve zone, so all activities are strictly defined according to Article 40 Chapter 7 of the Law «About specially protected natural territories»:

1. Land and aviational works for forest and steppe fires prevention and extinguishing is permitted on the territory of state nature reserves.
2. Physical bodies’ presence on the territory of state nature reserve is permitted only in the presence of permitting documents, excluding state nature reserve’s staff and governmental officials in charge of state nature reserves.
3. For access to areas, worshiped by religion followers (pilgrimage sites) and situated on nature reserve’s territory or out of its limits, state nature reserve’s administration in agreement with corresponding religous association may permit free of charge group visit to these areas accompanied by state nature reserve’s inspectors using the roads which go through nature reserve’s territory.

According to Article 42 Chapter 7 of the Law «About specially protected natural territories», excursion paths and routes for regulated ecological tourism creation is permitted at specially designated areas which do not include especially valuable ecological systems and object in the order established by the authorized body.
Biosphere Reserve's buffer zone is actually protected zone of Aksu-Zhabagly State Nature Reserve, so according to Article 42 Chapter 7 of the Law «About specially protected natural territories» all activities are strictly regulated:
«Different forms of economic activity may be carried out on the territory of state nature reserves' protected zones if they don't negatively influence the condition of nature reserve's ecological systems:
1) forestry activity;
2) traditional landuse, including cattle pasture and haymaking, as well as other activity in the limits of long-term biodiversity conservation and invulnarability;
3) tourism and recreational activity;
4) mineral waters, balneologic and climatic resources use;
5) commercial and sport fishing;
6) land and aviational works on forest and steppe fires extinguishing;
7) disturbed lands recultivation;
8) forest and other vegetation associations restoration;
9) wild animals' habitat and population restoration;
10) use of land areas for tourist sites development, nurseries for artificial reproduction, plantation of endemic, rare and disappearing plant and animal species, and service buildings (cordones) construction for state natural reserve's staff, providing them with service land plots».

Transition zone (development, collaboration zone) of Aksu-Zhabagly Biosphere Reserve is situated on the territory of three administrative districts of two oblasts: Tyulkibas and Tolebi dsitricts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast. The total area of development zone is about 200,000 ha. This zone is mainly used for haymaking, pasture and agriculture, used by local people for life support and social-economic protection.

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?).

Regardless of religion, tradition and market, both men and women have access to and control over resources.

10. HUMAN POPULATION OF PROPOSED BIOSPHERE RESERVE:

	Permanently	Seasonally
10.1 Core Area(s)	NO	About 10-30 nature protectionists (staff of State Nature Reserve)
10.2 Buffer Zone(s)	NO	About 10-30 nature protectionists (staff of State Nature Reserve)
10.3 Transition Area(s)	About 150 000 people	NO
Total:	About 150 000 people	About 20-60 nature protectionists (staff of State Nature Reserve)

10. 4 Brief description of local communities living within or near the proposed Biosphere Reserve

Aksu- Zhabagly Biosphere Reserve is located on the territory of 4 districts and 2 oblasts. It is the most densely populated region of Kazakhstan with total population of about three million people. In Tyulkibas district of South Kazakhstan oblast there are more than 101,000 people, including Kazakhs - 80.8 %, Russian - 6.55 %, Uzbek - 4.4 %, Azerbaijanians - 4.1 %, Turkish - 1.9 %, and other - 2.3 %. There are 118 thousand people in Tolebi district, most of them are Kazakhs (69.7 %), Uzbeks (13.8%), Russian (6.4%) and Turkish (3%), other ethnic groups take 7.1% of the population. In Baydibek district of South Kazakhstan oblast there are 55,700 people, the vast majority are Kazakhs (98.3%). In

Zhualy district of Zhambyl oblast population in recent years has reached 52,000 people. The majority are Kazakhs (90 %) and Russian (about 4%), other ethnic groups account for 6% of the local population. In general, the transition zone of the reserve is inhabited by about 150 thousand people. The main direction of economic development is agriculture - crop and livestock production. The main grown crops are wheat, potatoes, sunflowers, beets, beans, safflower, corn, apples and grapes. In cattle breeding the main direction include breeding sheep, horses and cattle.

The territory of the core and buffer zones is not crossed by railways and highways. There are only about 30 km of ground roads and about 150 km of paths for pack animals, which are of seasonal character and are not accessible in the winter. The only ground road to Chuuldak tract with length of 3 km and 5-km path along Bala-Baldabrek river canyon are used by Chuuldak meteorological station staff, administered by Shymkent city meteorological service. The hardest to reach parts of the core zone are Eastern and South-Eastern parts, where there are almost no roads and paths.

In the transition zone 17 km away from the buffer zone there is Tulkibas railway station, a part of the railroad goes through the transition zone. There is a paved road from Zhabagly village, where nature reserve's administrative office is located, to the district centers; its length is: to Ryskulov village – 16 km, to Momyshuly village – 35 km, to Lenger town – 110 km, to oblast centers: to Shymkent city – 90 km and to Taraz city – 100 km. Highway of international importance Almaty – Tashkent – Termez goes at the distance of 10 km from the Northern limit of reserve's buffer zone. A ground road with length of 25 km goes along the border at the distance of several tens of meters to the core zone in Aksu canyon area and on the territory of the buffer zone. It iss intensively used during agricultural works and has seasonal importance.

In the last 10 years eco-tourism is developing very actively in the transition zone of biosphere reserve. It is mainly ornithological and botanical foreign tourism, and local recreational tourism. Tourist business is practiced mostly by local people of Tyulkibas district, especially Zhabagly village, and Ryskulov and Tyulkibas villages; they provide tourist services. In the last years hotel complexes and private guest houses were opened in the areas adjacent to the buffer zone. For example, in Zhabagly village near the central office of nature reserve there is a private hotel for 40 people, which offers all services with good level of comfort. In the nearest vicinity of the buffer zone's border a former pioneer camp was reconstructed for visitors; now it's a private tourist base. In reserve's area along Tashkent-Almaty road a whole network of hotels, spas and guest houses is constructed for tourists.

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

10. 5

Shymkent is the administrative center of South-Kazakhstan oblast (80 km Western of biosphere reserve's border) and Taraz is the administrative center of Zhambyl oblast (70 km Eastern of biosphere reserve's border). There are 26 settlements within and near the biosphere reserve (2-24 km from the core and buffer zones). The major settlements are T. Ryskulov, Zhabagly, Tyulkibas and others.

10. 6

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)).

There are various sites of ancient cattlemen, Bronze Age and early Iron Age monuments in close proximity of the biosphere reserve. A lot of monuments of Islamic architecture of past centuries, such as ancient necropolis, underground mosques and etc. are found in this region.

Kazakhs were nomads, as a result there are no permanent settlements in the biosphere reserve. Pastures were used only in summer. Circle shaped stone cattle pens were discovered in the reserve, as well as rock paintings on the porphyritic rocks covered with desert tan (ferro - manganese crust) – petroglyphs depicting hunting and life scenes and figures of wild and domestic animals on them. Petroglyphs are approximately dated to be from the Bronze Age. In Taldybulak gorge stones to play togyz Kumalak (Kazakh national game) were found.

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)).

There are two main languages: Kazakh and Russian in the biosphere reserve.

11. BIOPHYSICAL CHARACTERISTICS:

11. 1

General description of site characteristics and topography of area:

Aksu-Zhabagly Biosphere Reserve occupies North-Western extremity of the Talasskiy Alatau with its latitudinally stretched Western, partly Northern ridges and North-Eastern slopes of Ugam Ridge adjacent to the main range. Altitudinal limits of the reserve area range from 1,000 to 4,236 meters above sea level.

Altitudinal range:

Highest elevation above sea level: 4200 metres

Lowest elevation above sea level: 1000 metres

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

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 very continental. In the mountain part the cyclons are most developed and climate's continentality and aridness is not so strong.

Air temperature. Average annual air temperatures on the territory of nature reserve are about 5.8-10.8°C. The coldest month is January, when average monthly air temperature in the foothill zone varies from -2.3°C in the Western part to -6.5°C in the Northern part. In January absolute minium in the foothills of the territory is -34°, -38°C. In winter, the influence of the relief on the air temperature is most expressed. In the mountain part of the reserve, there are radiative cooling, the flow of cold air from the mountains and its stagnation in the depressions. At the same time higher sites have free air exchange with the atmosphere and therefore have higher air temperature. Such conditions lead to the formation of inversions. From February to March air temperature is increasing intensively, reaching its maximum average value in July: +22.6°C to +25.4°C in the foothills, up to +17°C in the middle mountains. At the same time, the absolute maximum was +38-41°C in the foothill zone, +30°C in the middle mountain zone. In summer air temperature increase is most visible with elevation above sea level. For example, at the Western slopes of Talasskiy Alatau average monthly temperature in July increases 0.7°C every 100 m. Starting from August, the temperature is gradually reducing. In September and October the average temperature is 11.3-18.9°C and 4.9-11.5°C respectively. In November in the mountain areas the average monthly temperature is 0°C, in the foothill zone – 0.3-5.0°C and in December – from -4.0°C to +4.0 °C.

The period absolutely without frosts is 182-193 days in the foothills and 155 days in the middle mountains. The change of average daily temperatures to above-zero indices in spring defines the dates of snow cover melting, and in autumn – the dates of stable snow cover development. For the foothill part (at the altitude of up to 1200 m) this air temperature change occurs in late February – early March, at the altitudes of up to 2000 m – in late March, at the altitudes of 2000-3000 and more – in second decade of April. In autumn, air temperature goes through "0" point in middle and late December at the altitudes of 1200-2000 m, and in the second half of September for the altitudes of more than 3000 m.

Relative air humidity in the cold period (November-March) varies in the limits of 61-79%. From April relative humidity in the foothill zone decreases, reaching its minimum in August – 31-37%. In autumn the most intensive humidity increase is observed in September – November.

Wind. According to the direction of the prevailing winds the reserve can be divided into two parts: 1) the foothills, influenced by the nearby mountain ranges, 2) montane areas, where orientation of the mountain valleys is critical for establishment of wind regime. The foothills of the Western part of the reserve are dominated mainly by Eastern and South- Eastern winds with repeatability of 31-33 and 23-28%. Southern and Northern winds are most rarely observed (3 and 1-2%). The Northern part is dominated by North-Eastern and South-Western winds of 41 and 28%, respectively. In the mountain valleys the wind direction coincides with their main axis. Relatively frequently observed are warm winds blowing from the mountains (dryers), which in cold weather cause thawing, and in summer are felt in the form of hot, dry winds. Along with the mountain-valley winds and dryers, there is a local wind in the area of the reserve, which the locals call Chokpak. In the cold season this wind of North-Eastern direction dominates in Chokpak depression area between the Boralday and Zhabaglytau ridges, causing a strong cooling in the upper reaches of Arys river valley, without affecting the valleys of Aksu and Baldybrek rivers. Average annual values of wind speed vary in the reserve from 2.5 to 3.9 m/s. The maximum average monthly wind speeds are mainly observed in late winter and in spring (February, March, April). Average number of days with strong wind (15 m/s) is from 17 to 22 days.

Precipitation. Annual precipitation ranges from 526 mm (Northern part) to 627-765 mm (Western part), in middle mountain part of the reserve the rainfall is 891 mm. In some years the rainfall reaches 1260 mm in Zhabagly river basin and 1347 mm in Baldybrek river basin (Nature Chronicles 1995-97, 1998-1999). Most rainfall occurs in springtime, when the Asian anticyclone breaks and the warm air masses are taken away from the South at increased rate. The second largest maximum rainfall occurs in autumn and winter. Summer period is characterized by aridity. The lowest rainfall is in August and September – 6-10 mm and 10-13 mm respectively. Precipitation of the warm period (April-October) in the midlands are 49%, and the cold period - 51% of the annual precipitation.

Snow cover. The average maximum snow depth in Zhabagly river basin at altitudes of 1360-2120 m varies from 27 cm to 82 cm, and on snow measuring course in Baldybrek and Silbili river basins from 75 cm to 99 cm respectively (according to data of 1995-1999). The density of snow during winter is 100-356 g/cm3. The maximum density of snow is observed mainly in February and minimum density – in December.

11. 3. 1

Average temperature of the warmest month:

+22,6 °C

11. 3. 2

Average temperature of the coldest month:

-6,5 °C

11. 3. 3

Mean annual precipitation:

526-1347 mm

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?

Chuuldak weather station – since 1962. It is located in Bala-Baldirek River basin at the altitude of 1947 m above sea level in the zone of juniper forests and characterizes meteorological conditions of middle mountains of forest-meadow zone of South-Western part of the reserve. It's automatic since 2005.

- Blinkovo weather station – since 1960. It's located at the altitude of 1122 m above sea level in the foothill valley of Sayramsu river near the buffer zone (12 km from the biosphere reserve's border). It's automatic since 2004.
- Tyulkibas weather station, located at the altitude of 789 m above sea level in Arys river valley, works since 1933.
- Chokpak weather station- since 1933. It's located at the altitude of 1135 m above sea level at the junction of Boraldday ridge and Dzhabaglytau ridge (Chokpak pass) on the territory of the buffer zone and represents meteorological conditions of foothill zone of Northern part of the reserve.

Geology, geomorphology, soils:

11. 4

Orography. The Biopshere Reserve occupies the North -Western extremity of the Talasskiy Alatau with its altitudinally stretched Western, partly Northern ridges and North- Eastern slopes adjacent to Ugam ridge. Altitudinal limits of the reserve here vary from 1300 to 4200 m above sea level. The ridges represent separate watershed ridges of considerable altitude. From the East side nature reserve limits side ridge that separate rivers basins of Arabiik and Koksai. A little Western, from the tops of the main ridge of Sarytau (3,657.2 m) and Aksuat (4027.4 m), there are spurs that give origin to water divides of Koksay, Aksay and Zhabagly rivers. The highest absolute altitudes vary from 3,401.1 m to 3,977.1 m along the side watershed ridges. Koksay and Aksay river canyons are steep-sloped V-shaped valleys stretching meridionally from South to North. Aksay and Koksay are the only rivers of Talas river basin. Mountain center in Aksuat top area gives origin to several ridges: Alatau (Kaskabulak top, 3,831.9 m), Bugulutor (3,926.3 m) and Aksu (3,795.8 m). They all have latitudinal direction and serve as water dividing ridges of Arys river basin (large right-bank inflow of Syrdarya river). Zhabaglytau ridge limits the nature reserve from the North; it is relatively low (highest point 2,913.1 m) and adjacent to plateau-like Topshak area of Aksay-Zhabagly water divide. A large ridge – Ugam – starts from the Southern slope of Talasskiy Alatau in South-Western direction and limits Maidantal river valley (Pskem river inflow) from the North. The highest point of Ugam ridge is Sayram (4,238.6 m) which is South-Westernmost point of the reserve.

In the altitude range of 3500-4000 m the ridges are characterized by alpine forms with developed glacial-nival relief forms: circuses, troughs and moraines. In the present time there are hanging and kar glaciers. Glaciation mainly covers slopes and valleys oriented to the North. The mountain slopes are steep (up to 60º) and rocky. There are many screes and gullies. Ridges are narrow, in some areas changed by mountain top depressions: Ashutor (3,760 m), Gimeyny (3,520 m), Aksay (3,475 m), Korumtor (3,528 m), Shunkulduk, etc.

In the altitude range of 2800-3500 m dominating relief includes erosion and accumulative types. Slopes are crossed by numerous ridges and gullies of temporary streams. River valleys are of trough form in the upper part, going into narrow, steep-sloped canyons in the lower part. There are “snow bridges” in the narrowest valley areas as the result of avalanche activity. In the axial zone of the ridge one may often observe circuses and dry cars without modern glaciation. Modern glacial moraines descend from glacial cirques and represent block-grained material with almost no melkozem. The older moraines are mostly turf-covered. This zone contains the majority of the reserve’s lakes.

At the altitudes of 2000-2800 m relief pattern is mostly flat. The slopes and contours of water dividing ridges are not steep. The relative excess of 1000 m, mountain terraces are common. These are the Northern slopes of Alatau and Baldybrektau mountain, which is sharply contrasting with the general alpine character of the mountains. At the altitude above 2800 m due to frost weathering and snow erosion nival niches are common. The areas of intrusive rock outcrops are characterized by the development of vast stone placers. Screes are common on slopes of the streams, canyons and often end in alluvial fans at the foot of the slopes. Landslides and mud-streams occupy inconsiderable space. In the area

of ancient moraine deposits small lakes can be found, such as Aynakol (2,360 m), Kyzolgenkol (2,149.8 m). Subterranean waters' outcrops are frequent in this area.

At the altitudes of 1500-2000 m relative excess is up to 500 m. Depth of erosion varies from 100 to 350 m. The surface is strongly dissected by a net of permanent and temporary streams. Slopes are steep and rocky, tops are plateau-like. Landslide processes are very common (in Kzylzhar, Ulken Kaindy, Dzhetytez tracts). There are denudation, erosion-tectonic and erosional-accumulative types of relief. Absence of rocky landforms is characteristic. Erosion-accumulation type of relief in the flood plain deposits is developed in fragments, in Bala-Baldybrek river, in Kolzhailyau tract area, Zhabagly and Aksu rivers middle and lower streams. Some rivers form canyons when they exit the mountains. Aksu and Koksay river canyons cut through the quaternary conglomerates and for 10-12 km have depth of 300-500 m and 60-100 m respectively.

Sixty km North-Western from the main territory, in the spurs of Karatau range, there are two paleontological sites: Auliye and Karabastau (total area of 226 ha). Palaeontological site "Karabastau" is located on the South-Western slope of Karatau ridge, on plateau-like watershed of Koshkarata and Bala-Bugun rivers five kilometers Southern of Baydybek-Ata village (Kitaevka village) at the altitude of 800 meters above sea level. Second paleontological site "Auliye" is located on the Northern slope of Alakushuk ridge - watershed of Koshkarata and Boraldai rivers.

The geological structure of the region is very complex, since it is located at the junction of two structural- formational zones: North-Tien-Shan and Karatau-Naryn, divided by Talasskiy – Karatau deep fault. In structural-tectonic terms the reserve is located within the wing of Borolday-Zhabagly anticlinorium with a total monoclinal fall to South. Anticlinorium axis is in the North, outside of the reserve, and to the South there is the Ugamskiy synclinorium. In the North- East there is a small part of the Kishisuy (Chiger - Mughal) horst uplift. The reserve is located in the South- West of the sublateral Talas-Fergana deep fault of the first order, with a direct continuation – the Main Karatau fault. It is characterized as the most important structural line of the Tien Shan, separating the Northern and Southern Tien Shan (Nikolaev V.P., 1924). The direction of these faults identified North-West stretching of the ridges and socket type joints of the Talasskiy Alatau mountain ranges with Chatkal and Ugam peaks, etc., that act as a long ridges of its Southern slope. Another major fault zone is Zhabagly fault zone of a lower order of the same stretch dividing horst - anticlinal morphostructure into a number of separate units.

Geological history lists two periods: geosynclinal (marginal part of the Hercynian geosyncline) and platform. Geosynclinal stage lasted from the upper Proterozoic to the late Paleozoic. The structure of the reserve's territory is formed of uneven formations, formed from the Proterozoic to our age. The North of the territory is composed of sandstones, siltstones and mudstones of Ordovician. Crystalline limestones and shales of the Cambrian are also observed here. Silurian sediments are recorded in the South of the reserve. Limestone of the Lower Carboniferous are very common in the reserve. Small patches of the Neogene sediments of the lake and the lake- proluvial origin lie throughout the territory in the form of clay, loam, and in Aksu river area and its canyon – in the form of conglomerates. Less common is sandstone, gravelites, conglomerates of the Devonian.

Minerals. Zhabagly site contains a phosphorite deposit of carbon-clay-cream fluorine-apatite formation. Productivity of the horizons is low, but in sediment of the given formation vanadium, molybdenum, etc. were found. In Aksu river basin (representing the Northern part of Aksu-Karzhantau fluorite zone) fluorite deposits and occurrences was registered that are found here together with mercury, polymetallic, gray ores and rare elements. In the area of the plateau Irsu deposits of nepheline ores of albazite formation were also found, accompanied by vermiculite, alkaline kaolin and copper-magnetite ores. There are fluorite-barite ores in the limestones of lower Carbon in the area of Baldybrek fault; they are often observed with mercury-polymetallic, lead-zinc and dolomite ores.

Paleontology there are two unique paleontological sites of reserve, located in Karatau mountains. The first location of the Upper Jurassic fauna and flora in Karatau mountains was discovered in 1921. In 1923 – 1925, new graves near Auliye village, in Karabastau and Chugurchak tracts were found. This is one of the few places on Earth where in very thin-layered carbonate rocks, known as “paper” or “fish” shale, the remains of animals and plants, that existed 145 -150 million years ago, are perfectly preserved. According to the data of R.F. Hecker (1948), burial of the remains of plants and animals occurred in the sediments of the Late Jurassic Karatau Lake. Upper Jurassic flora of Karatau was rich and diverse: Caytoniales and ferns, cycads and bennettitaleans with thick leathery leaves, numerous coniferous with hard scaly or needle-like leaves. 90% of this flora are typical xerophytes. There is no other place in the world with such rich and interesting deposits of Mesozoic insects as in Karatau, and in many cases they are very well conserved, giving an opportunity to see the structure of ancient insects as well as we can see modern insects.

Scientists of the Paleontological Institute of Russian Academy of Sciences and the Institute of Zoology of Kazakhstan compiled a unique collection from Karatau (more than 18,000 samples of insect remains of 1,200 species belonging to 500 genera). There are 6 species of fish described in Karatau, with dominance of cartilaginous ganoid fishes over more progressive groups (94% of all specimens). The remains of flying reptiles of the order *Rhamphorhynchus* are found. First flying reptile of Karatau was described in 1948. Also the remains of aquatic turtle of new genus and species (*Yaxartemys longicauda*) with a long tail - the inhabitant of freshwater bodies were described. The remains of small long-necked reptile and crocodile are yet to be described and are stored in the collections of the above mentioned Paleontological Institute. Other important remains: 1) a large land dinosaur bone; 2) concentrations of lower crustaceans; 3) clams.

Most researchers tend to believe that the precipitations of Karabastau Lakes were formed in the Upper Jurassic time. The waters of the lake were fresh or slightly brackish, with lots of calcium and magnesium salts, which hindered the development of aquatic vegetation and fauna of mollusks. In the reserve area numerous fossils of the Paleozoic period were found: screes in the Northern part of the reserve are rich in ancient invertebrates’ remains – mollusks, corals and bryozoans; in Kazanchukur tract remains of perfectly conserved trilobites were discovered.

Hydrology. Rivers. According to the classification of V.L. Schultz (1963), most of the reserve’s rivers (Koksay, Aksay, Zhabaglysu, Aksu, Baldybrek and Bala Baldybrek) are fed by snow and glaciers from the mountains, rather than from the glaciers. In July and August due to runoff from the most mountainous area water consumption is maintained at high level. High water in rivers of this type begins in March or early April and ends in September, and rarely at the

beginning of October. Duration of flooding varies from 140-150 to 200 days or more. 75-85% of the annual runoff passes during the high water. The highest annual rate observed in June, more rarely – in May. Formation of water runoff period strongly depends on the altitude. With average watershed altitude of about 2000 m, flood starts on March 10-20 and with average altitude of watershed about 3000 m – in April 10 – 20.

Lakes. There are 23 lakes registered on the reserve's territory. The total area of the lakes in the reserve is more than 0.27 km^2 (Nature Chronicles 1998). Distribution of lakes in the reserve is in the range of altitudes from 2500 to 3500 m, i.e. the largest number of lakes is concentrated in areas adjacent to areas of the modern glaciation of the mountains. Above and below this altitude range the number of lakes sharply decreases. Lakes of the reserve at elevations of 3000 to 3500 are represented mainly by glaciogenous lakes, the largest of which is Shunkulduk lake (3,422 m), Bugulutorkol lake (3,400 m) and adjacent to nature reserve lake Korumtor (3,189 m). Outside of the area the last glaciation traces' distribution lakes of other genetic types are observed. In most cases those are dammed, seismic and tectonic lakes. Typically, dammed lakes are found on the lower hypsometric level than glaciogenous lakes. Those are mainly large lakes: Kokuyrum (2,506 m), the lower Koksay "Heart" (2542 m), Zhasyl (2,420 m) and the chain of Koksay lakes (2620-2700 m). The lower lake level is represented by small lakes of landslide origin - Kyzulgenkol (2,150 m) and Aynakol (2360 m).

Glaciers. As the result of the inventory of glaciers in Talasskiy Alatau, located in the basins of Koksay, Aksay, Zhabagly, Aksu, Baldybrek and Sayramsu rivers, geographically included in the Aksu-Zhabagly biosphere reserve, 114 glaciers were identified with total area of 29.4 km^2. The glaciers of the reserve at altitudes of 3,000 to 4,000 m are mainly kar glaciers. The largest glaciers are located in the area of river basins: Zhabagly - Zhabagly glacier (2.63 km^2), Baldybrek - Shunkulduk glacier (2.56 km^2), Aksu – Amansaysk glacier (1.02 km^2). Area of most glaciers (83.3%) does not exceed 1.0 km^2, and glaciers larger than 2.0 km^2 account for only 2.6% of all glaciers. The altitude of the lower glacier limit is 3230 m above sea level.

Soils. There are following types and subtypes of mountain soils in the biosphere reserve: 1. common alpine; 2. primitive alpine; 3. hydromorphic alpine; 4. subalpine sod; 5. subalpine steppe; 6. subalpine dark-colored; 7. subalpine hydromorphic (waterlogged); 8. brown with subtypes: dark brown, light brown and brown 9. meadow-dark-brown; 10. meadow-marsh; 11. floodplain: forest-meadow and meadow.

Alpine soils. Common at altitudes above 3000 m and on the moraines and kars. They form combinations with each other depending on the power profile, as well as complexes with hydromorphic alpine, alpine primitive soils and bedrock outcrops. Formed under short and cool summers, long and cold winters with stable snow cover. In warm period the soil is well moistened, enough warmed up. Power of alpine soils in general does not exceed 40-50 cm, although in the depressions among the moraine hills it can reach 1 m. Color is various - on Southern, Eastern slopes and elevations – light-brown, pale yellow. On the Northern, Western slopes and depressions - more dark, brightening with depth. Among alpine soils there are calcareous, conventional, leached, with domination of the latter.

Subalpine sod soil. Common at altitudes from 2100-2400 m to 2900-3000 m mainly on the Northern slopes under motley-grass. In the valleys of streams, where snow can lay for a long time, can descend to 1800 m. Uniform contours are rare, often in combination with sub-alpine steppe, dark-colored sub-alpine, subalpine hydromorphic and bedrock outcrops. Sometimes in one contour there may be sub-alpine sod soil different in power and in carbonates saturation. Overall capacity of these soils is more than alpine, and often reaches 50-70 cm. Color – dark-gray, dark-brown, slightly paler with depth.

Subalpine steppe soil. Developed at altitudes of 2100 (2400) - 2900 (3000 m), mainly in the Southern macro-slopes. They are observed in homogeneous contours and in complexes with other types of soils and bedrock outcrops. More likely to develop in same contours as sub-alpine sod and dark-colored soils, rarely - with subalpine hydromorphic. Characterized by a strong gravelly profile, increasing downwards and low power of these soils which does not exceed 40-50 cm. Color of sub-alpine steppe soil is light brown, pale yellow. The profile is lighter than of subalpine sod soils. The soil structure is not very expressed, it is often dusty-powdery. On the plateau, in the watershed sloping ridges, the surface of the soil is often covered with a continuous layer of crushed stone. Obviously, this is a result of the periodic freezing and thawing. Sub-alpine steppe soils may be of different texture - from slightly clay to sandy loam, but more often they are hard loamy. Among sub-alpine steppe one may distinguish genera of “carbonate, common, deeply effervescent leached” soils. Soils formed in the Southern half of the reserve, are of lighter shades of brown and look like light brown. The high content of humus is observed in sub-alpine steppe soils formed in combination with the sub-alpine dark-colored soils. There is a favourable influence of junipers on vegetation development and nutrients accumulations.

Subalpine dark-colored soils. Found on the slopes of different expositions, but mostly Northern. Uniform contours are not common, they form complexes with other soils: on the Northern slopes mainly with sub-alpine turf, on the Southern - with sub-alpine steppe. The third component often is bedrock outcrops. They develop under cover of Turkestan Juniper. This is a slow-growing perennial shrub, which can live to the age of 100 years or more. During this time, the soil beneath it is undergoing some changes. The cover of juniper creates a unique microclimate. Here the sunlight is weak, evaporation is reduced. So, here grow moisture-loving types of plants. The soil surface is always covered with a layer of fallen needles. Besides, juniper usually grows in rocky areas, so the soil underneath is very rocky and has little profile power, usually not exceeding 40 cm. Subalpine dark colored soil, as other types, are generally leached from carbonate, but among them common and carbonate are also observed. These soils’ peculiarity is their upper horizon consisting of decomposed needles of juniper. The structure of these soils is poorly developed. It is powdery, with weak lumps.

Subalpine hydromorphic soil. Formed in depressions, gullies, nival niches on the plateau and the slopes of different expositions. Uniform contours are rarely observed, most often they form complexes with other types of sub-alpine soils, most often being the second and the third component of the complex. At the reserve they are spread inconsiderably, by separate areas. Mechanical structure is diverse, often slightly loamy, usually it does not change with depth, but sometimes becomes lighter in weight. In granule size composition the main role is played by dusty and silty fractions.

Brown soil. Formed in the low and middle mountains in the warm-temperate conditions in different strata. Characterized by deep penetration of the soil-forming process and the large power of the soil profile (if it is not prevented by dense rock). The humus content is various: from 3.6 to 15%. There is increased clay content of the entire profile, especially of its middle part, dominance of brown color, separation of very expressed illuvial horizon. Among the brown soil subtypes there are dark-brown, light-brown and brown soils. Each subtype is characterized by the degree of carbonatenesss: carbonate, common and deeply effervescent genera.

Dark-brown soil. Develop mainly on the Northern, Western, in the lower parts of the Southern slopes, and in the depressions among light-brown soils at altitudes of 1600-2200 (2500) m under juniper, birch, and in Aksu river canyon – apple forests, and under cover of grass and bush thickets. Homogeneous contours are not common, more often they are in combination with other subspecies of dark brown soils, varying in power and carbonates content. Sometimes they form complexes with light brown soils. In Southern part of the reserve, along the river valleys on the lower parts of the slopes and alluvial fans of temporary streams, there are birch forests, with the same dark brown soils formed under them, but with some peculiarities. They differ by dark gray, almost black color and lots of gravel. The surface is covered by fallen leaves and herbs.

Light brown soil. Developed on a plateau of Southern and Eastern exposition and in the low mountains - on the Northern slopes under shrub, grass- shrub thickets, in juniper forests, as well as under the large grass, rarely large cereals shrub semi savanna, in some areas steppe. These soils are found mainly with dark - brown soils or form a combination of light - brown soils, differing in power melkozem layer and carbonate content. In low hills on the Northern slopes light brown, powerful, common, not stony, lightly clay soils are formed. Vegetation is motley-grass with *Alopecurus*, *Dactylis*, *Lathyrus*, *Galium*. Light brown soil under juniper have some peculiarities. *Juniperus semiglobosa* and *Juniperus seravschanica,* which grow in these soils distribution area, are long-living trees that can reach age of 100 years or more. The surface accumulates considerable amount of litter needles under these trees. It is cool, the vegetation is more mesophilic. Appearance of the soil depends on the habitat in which the juniper is growing, and it prefers rocky areas, so the soil is not powerful. In the subalpine zone, soils formed under Turkestan juniper, are included in a separate type - subalpine dark-colored soils. Peculiarities of light-brown soils, formed under its canopy, are in increased humus content, total nitrogen and phosphorus, increased absorption capacity. However, the color and the structure of the horizons do not change. Mechanical structure of the upper horizon becomes lighter, and the lower horizon - heavier.

Subtype of brown soils. In the reserve they come in small areas from foothill plains. Formed at altitudes of 1250-1600 m in the alluvial fan deposits in the Northern part of the reserve. Natural vegetation cover consists of large cereal,

somewhat steppe-like vegetation with separate trees and shrubs. Vegetation composition consists of: *Hordeum bulbosum*, *Elytrigia trichophora*, *Dactylis glomerata*, *Phleum*, *Prangos*, *Ferula, Eremurus,* etc., as well as individual trees of *Prunus dulcis*, *Crataegus*, *Spiraea hypericifolia*, rarely *Juniperus*. The subtype of brown soils is divided into carbonate, common, and leached genera. Color - dark brown, the structure in horizon A - lumpy granular, in horizon B - lumpy, sometimes - nuciform.

Floodplain soils. They are intrazonal. Distributed in floodplains and river terraces in boulder-pebble deposits under the birch forests and high grasses. They are mostly leached of carbonates, only in Aksu river valley and its tributaries they are sometimes slightly effervescent from the surface. In Baldabrek river valley, upper part of Aksu river there are flood-land common soils. Mechanical structure is mostly heavy loamy. Floodplain soils may be of several subtypes depending on which particular area they are developing on.

Bioclimatic zone:

11. 5

(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).

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

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

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				

Juniper forest

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).

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: Midmountain ecosystems of standing juniper sparse forests/ pastures

Characteristic species:

Juniper sparse forests (*Juniperus semiglobosa)* of mostly Northern slopes with shrubs (*Lonicera tianschanica, L. karelinii, Rosa fedtschenkoana, R. albertii, Berberis oblonga, Hedysarum flavescens)* with meadow and steppe-meadow cover *(Poa angustifolia, P. relaxa, Phleum phleoides, Bromus inermis, Festuca valesiaca, Achillea millefolium, Origanum tittariantum, Thalictrum minus, Veronica spuria*), sometimes with *Prangos pubularia* on montane-forest dark-brown

leached soils.

Steep pebbly-stone slopes of mostly Southern expositions with juniper sparse forests with steppe *(Helictotrichon desertorum Stipa kirghisorum, Poa stepposa, Calamagrostis epigeios)* and petrophyte – motley-grass (*Thymus sp., Ziziphora clinopodioides, Stipa caucasica)* cover on limestone ridges on mountain light-brown soils.

Sparse forest of juniper (*Juniperus semiglobosa*) with shrubs *(Rosa fedtchenkoana, Berberis oblonga, Lonicera tianshanica, L. nummularifolia)* with cover of savannoid steppe meadows *(Poa angustifolia, Dactylis glometata, Phleum phleoides, Poa bulbosa, Stipa kirghisorum, Prangos pobularia, Ferula tenuisecta, Hypericum perforatum, Origanum tittarianum, Galatella coriacea, Galium pamiroalaicum)* on mountain dark-brown normal soils.

Background species of standing juniper and meadow areas include: Red-headed Bunting, Common Nightingale (*Luscinia megarhynchos*), Oriental Turtle Dove, Common Wood Pigeon, Rufous-naped Tit, Yellow-breasted Tit, warblers – Hume's Whitethroat (*Sylvia althaea*), Common Whitethroat, Blue-capped Redstart (*Phoenicurus caeruleocephalus*), Mistle Thrush, Common Blackbird.

There are 15 mammal species: wolf, fox, Tien Shan Bear, Stone Marten, Badger, Lynx, Snow Leopard, Wild Boar, Roe Deer, Maral, Argali, Ibex, Forest Dormouse (*Dryomys nitedula*), Northern Mole Vole (*Ellobius talpinus*), Tolai Hare. This list is maximal, since the composition of mammals varies according to the season and only a part of them will be observed at once. Permanent residents include only Stone Marten, Forest Dormouse, Northern Mole Vole and Tolai Hare.

Important natural processes:

Cold and snowy winters and periodic spring floods on the slopes, causing periodic death of important game animals and birds.

Main human impacts:

- unsustainable use of natural resources (illegal felling, poaching, overpasture, non-organized tourism)
- over-grazing may lead to soil-vegetation cover's degradation
- fires

Relevant management practices:

Environmental conservation and agitation among the local population.

DISTRIBUTION

Regional

Second type of habitat/land cover: Middle mountain ecosystems of medium grass meadows/ pastures

Characteristic species:

Steep rubbly-rocky slopes, sometimes watershed areas with motley-grass - cereal steppe grasslands (*Poa angustifolia, Phleum phleoides, Bromus inermis, Koeleria gracilis, Trifolium pratensis, Geranium collinum, Potentilla haloleuca, Pedicularis dubia, Linum olgae*) on mountain dark-brown leached not powerful rubbly soils.

Northern slopes are melkozem, rubbly-melkozem, and river terraces and depressions with motley-grass – cereal and cereal – motley-grass, sometimes steppe meadows (*Phleum phleoides, Alopecurus pratensis, Poa angustifolia, Festuca valesiaca, Hordeum crinitum, Allium hymenorhizum, Hieracium echioides, Polygonum andulatum, Seseli schrenkiana, Galium verum, Veronica spuria, Betonica foliosa, Rosa fedtschenkoana, R. K*лее длительные полевые выезды*. 01* г*.01* г*. 2001* г.расной книге Уз распространения важен в региональном плане - для ько в долинах*okanica*) on brown leached and meadow-brown soils. In combination with very rubbly ridge slopes with *Onobrychis echidna* phryganoids, with meadow-steppe *Festuca* cover (*Artemisia santalinifolia, Festuca valesiaca, Phleum phleoides, Poa angustifolia, Polygala hybrida, Potentilla fedtchenkoana*) or steppe-meadow (*Phleum phleoides, Festuca valesiaca*, *Potentilla transcaspia*) cover on mountain gray-brown underdeveloped soils.

Northern slopes with shrub – motley-grass – cereal steppe meadows (*Rosa fedchenkiana, Poa angustifolia, Phleum phleoides, Festuca valesiaca, Polygonum andulatum, Seseli shrenkiana, Galium verum*) on mountain dark-brown leached soils.

Middle grass meadows are characterized by such numerous species as Red-headed Bunting, Grey Partridge, Quail, European Stonechat and Hume’s Whitethroat.

Important natural processes:

Cold and snowy winters, periodic spring floods and natural fires in autumn.

Main human impacts:

- unsustainable use of natural resources – mostly excessive and uncontrolled cattle pasture and poaching.
- increasing recreational pressure in middle mountains, especially in spring and autumn
- fires – sometimes happen on the territory of transition and buffer zone of biosphere reserve caused by tourists and from local people burning old grass.

Relevant management practices:

Environmental conservation and agitation among the local population.

DISTRIBUTION

Regional

Third type of habitat/land cover: Middle mountain savannoid ecosystems / agricultural land

Characteristic species:

Melkozem slopes with rich motley-grass – barley with shrubs (*Hordeum bulbosum, Ferula tenuisecta, Dipsacus azureus, Alcea nudiflora, Rosa maracandica, Spiraea hypericifolia*) savannoids on dark-brown normal soils.

Flat slopes (foothill plains) with *Agropyron* (*Agropyron trichophorum, Hordeum bulbosum, Poa bulbosa, Bromus inermis, Ferula tenuisecta, Dipsacus azureus, Centaurea squarrosa*) areas and shrub abundance (*Rosa cocanica, Lonicera tianschanica, Spiraea hypericifolia*) savannoids on dark-brown normal soils.

Foothill plains with long producing low-grass *Poa* (*Poa bulbosa, Taenatherum crinitum, Centaurea squarrosa*) in place of large-grass savannoids on brown underdeveloped normal soils.

Flat slopes and watersheds with *Prangos-Ferula, Rheum-Ferula* (*Ferula tenuisecta, Rheum maximowiczii, Rosa kokanica, R. Fedtschenkoana*) vegetation on montane gray-brown not powerful soils.

Common bird species for savanoid ecosystems: Magpie, Red-headed Bunting, Common Wood Pigeon, Corn Bunting *Emberiza calandra;* Common Myna *Acridotheres tristis;* Calandra Lark *Melanocorypha calandra;* Crested Lark *Galerida cristata.*

Important natural processes:

Cold and snowy winters causing periodic death of important game animals and birds.

Periodic spring floods, sometimes causing fertile soil runoff.

Main human impacts:

- unsustainable use of natural resources
- over-grazing and mowing
- fires

Relevant management practices:

Environmental conservation and agitation among the local population.

Kshi Kaindy mountain pass

ECOSYSTEM SERVICES:

12.

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/)).

The territory of Aksu-Zhabagly biosphere reserve is located in the Western part of Tien Shan mountain system at the junction of sub-boreal (temperate) and dry sub-tropical (temperately warm) climatic zones. The result is complex structure of landscape and soil zoning, mixing and interpenetration of elements of these two zones. This causes high plant diversity, complex structure of vertical zoning, which differs in the Western and Eastern parts of the reserve.

There are 5 altitudinal zones in the Biosphere Reserve:

1. Highland nival level**,** 3600 (3800) m is characterized by almost absence of higher vegetation, domination of ice, firn, naked rocks and rocky alluvial deposits. This level is very important in regulating river flow. There are no soil formations on nival level.

2. Highland alpine level, 2800 (3000) — 3600 (3800) m, with appearance of sparse short vegetation, mostly consisting of steppe and meadow-steppe herbs, including characteristic highland species.

3. Highland sub-nival level, 2200—2800 (3000) m is characterized by a little more dense vegetation cover formed of not high meadow-steppe herbs with islands of creeping junipers, which occupy up to 20-30% of the slope surface.

4. Medium montane level (1500—2200 m) of meadow-steppe juniper sparse forests, shrubs and shrub semi-savannas. It is characterized by vegetation cover of double type: slopes of Northern exposition are dominated by dry juniper light park forests with meadow-steppe vegetation in the forest and in the meadows, which dominate in area (50-90% of total surface); slopes of Southern exposition are dominated by shrub large herbs semi-savannas, partly with juniper sparse forests. There are apple forests in the canyons.

5. Lowland level (below 1500—1600 m) of shrub large herbs, partly steppe semi-savannas

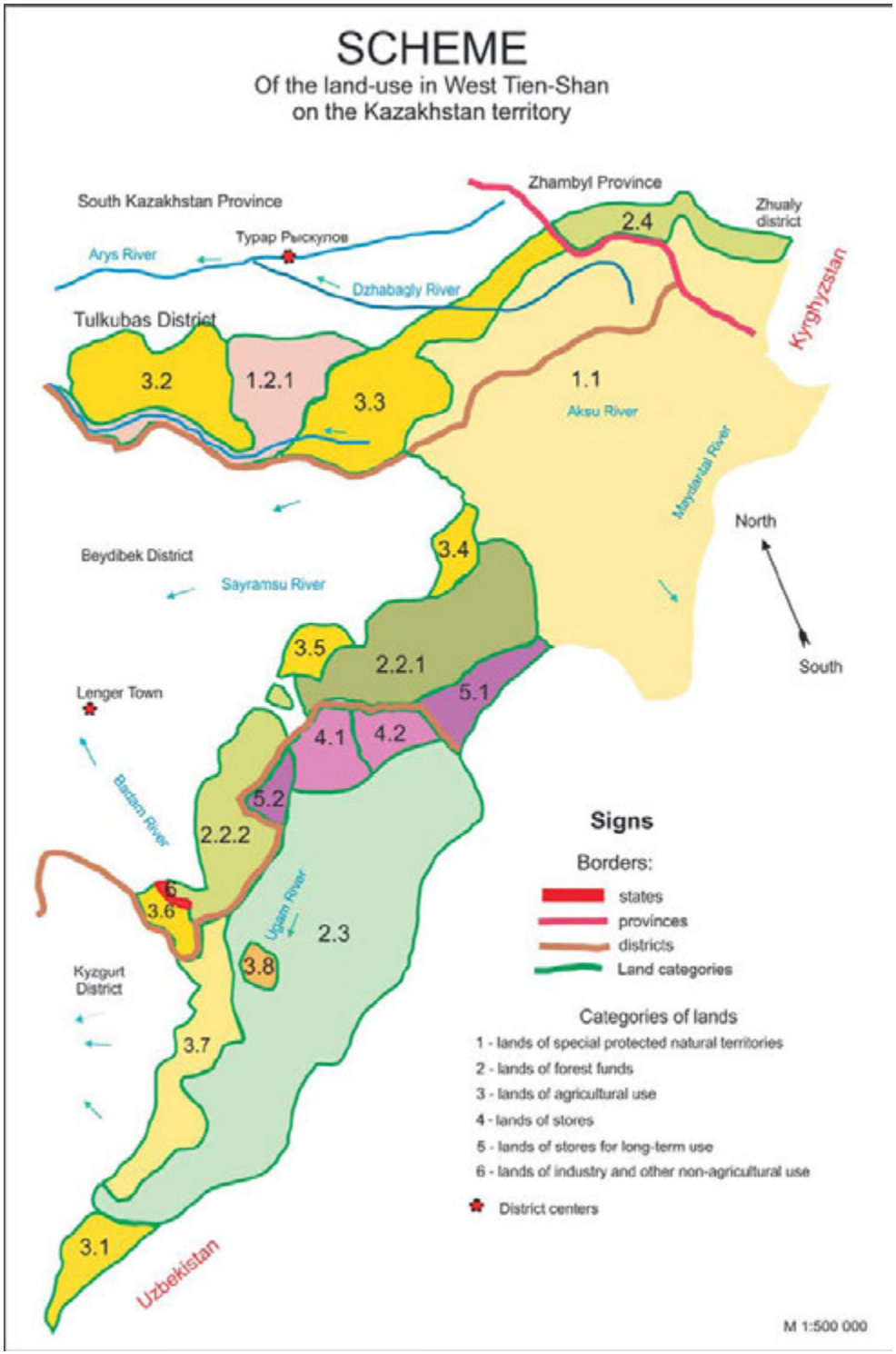
12. 2 Specify whether indicators of ecosystem services are used to evaluate the three functions (conservation, development and logistic) of biosphere reserves. If yes, which ones and give details.

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

conservation – population number and population condition of dominant plant and animal species, characteristic for each ecosystem type (list of species is given 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.


SCHEME
Of the land-use in West Tien-Shan
on the Kazakhstan territory
Zhambyl Province
South Kazakhstan Province
Zhualy district
Турар Рыскулов
Arys River
Dzhabagly River
Tulkubas District
Kyrghyzstan
3.2
1.2.1
3.3
2.4
1.1
Aksu River
Maylantal River
North
South
Beydibek District
Sayramsu River
3.4
3.5
2.2.1
5.1
Lenger Town
4.1
4.2
Badam River
5.2
2.2.2
6
3.6
Ugam River
2.3
3.8
Kyzgurt District
3.7
3.1
Uzbekistan
Signs
Borders:
states
provinces
districts
Land categories
Categories of lands
1 - lands of special protected natural territories
2 - lands of forest funds
3 - lands of agricultural use
4 - lands of stores
5 - lands of stores for long-term use
6 - lands of industry and other non-agricultural use
District centers
M 1:500 000

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

Fauna of biosphere reserve plays a major role in the provision of ecosystem services. Aksu-Zhabagly Biosphere Reserve has around 75% of West Tien Shan biodiversity. Around half (48%) of Kazakhstan birds are concentrated in this region. 130 of them are nesting in biosphere reserve. All groups of vertebrates, except fishes, are well represented in biosphere reserve. For instance, out of 428 species of region's vertebrate fauna 338 are registered in the reserve (which is 79%). The most represented of them are Long-tailed Marmot, Tolai Hare, Muskrat, Argali, Roe Deer, Maral. In invertebrate animals, beetles (Coleoptera) account for 906 species. The leading role belongs to Curculionidae (including Apionidae), Staphylinidae, Carabidae, Chrysomelidae and Scarabaeidae, which constitute 57.5% of genera.

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?

Evaluation of ecosystem's importance for biodiversity conservation and ecosystem services was carried out during application's preparation for biosphere reserve nomination. This assessment was also used during the development of Management Plan of the main and buffer zones of biosphere reserve. In course of this work Aksu-Zhabagly Biosphere Reserve ecosystems' classification was elaborated; it served as a base for development of ecosystem map with detailed legend (given in 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 Aksu-Zhabagly biosphere reserve is to preserve typical, rare and unique natural complexes of West Tien Shan with their components, as well as to support sustainable socio-economic development of the territory on the basis of ecological and economic principle of natural resources use.

The short-term purpose of Biosphere Reserve is to preserve typical, rare and unique natural complexes and their components, as well as the organization of such mechanisms of the territory management that would prevent the depletion of natural resources and ensure sustainable use by population.

Local people want to preserve nature of the region for future generations. In this regard, one of the objectives of the reserve is environmental education, leading to responsibility for environmental conservation. Nature reserve regime, established more than 85 years ago, formed a special relationship and a certain respect for the reserve in people's mind, although the consumerism attitude to natural resources of the reserve is not excluded.

In general, development of the concept of biosphere reserve will help local people to increase the level of environmental awareness, foster a sense of responsibility to our descendants in the conservation of biodiversity, establish environmentally friendly ways to use local natural resources, and to find more effective mechanisms for biodiversity conservation in the region.

13. 2

Describe the sustainable development objectives of the biosphere reserve. (If appropriate, please refer to Agenda 21, Rio+20 and SDG post 2015).

The main task of sustainable development on biosphere reserve's territory is harmonization of relations between people and nature, i.e. economic and socio-cultural development that would take place without harm for the environment and promote conservation of biodiversity and region's unique/typical ecosystems. Wild nature complexes' conservation is carried out in the core and partially in buffer zones, and human potential's development takes place in the transition zone. This is why the most suitable activities for stable economic and socio-cultural development are cattle breeding, hunting farms, fishery and ecological tourism, as well as educational, ecological and cultural programs.

13. 3

Indicate the main stakeholders involved in the management of the biosphere reserve.-

The main stakeholders in biosphere reserve's management are the following:

1) Aksu-Zhabagly State Nature Reserve's administration,

2) local authorities / administration – Akimats of Tulkibas, Tole Bi, Baydibek districts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast.

3) local land users and NGOs – district Hunters and Fishermen Society

4) representatives of inspecting authorities – oblast territorial management of forestry and hunting, oblast territorial management of fishery.

13. 4

What consultation procedure was used for designing the biosphere reserve?

In the limits of GEF project on biodiversity conservation of the West Tien Shan complex research (2001-2004) was performed to assess current state and values of the natural ecosystems, scientific-technical justification was devel-

oped for extension of the core and buffer zones. In the frames of scientific research the zoning of proposed biosphere reserve was made as the result of analyses of environment condition and social economic situation of local population.

This research allow defining modern condition of the environment and level of anthropogenic influence on natural complexes of biosphere reserve, as well as preparing Management Plan of nature reserve. Monitoring programs, developed in 2001-2004, allow regular and systemic monitoring on the territory of the core and other biosphere reserve's zones

How will stakeholder involvement in implementing and managing the biosphere reserve be fostered?

13. 5

Biosphere Reserve's management is conducted through Coordinational Council of Aksu-Zhabagly 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 body is a collegiate public body 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.

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

13. 6

(Please provide formal commitments and engagements.)

(The only yet) financial source of biosphere reserve is state (national) budget (through Aksu-Zhabagly State Nature Reserve). Approximate annual budget in Kazakhstan tenge is about 80,000,000 tenge.

14. CONSERVATION FUNCTION:

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.

The reserve is located at the junction of sub-boreal (temperate) and dry sub-tropical (warm-temperate) climatic zones. Related to this is the complex structure of landscape and soil zoning, mixing and interpenetration of the elements of these two zones. As a result there is a great diversity of vegetation, the complex structure of vertical zoning, and divers in the Western and Eastern parts of the reserve.

The main peculiarity of the landscape of Aksu- Zhabagly biosphere reserve and all of the West Tien Shan is in the dominance of Western Asian – Mediterranean features over Central Asian, which are more characteristic for Eastern regions of Tien Shan. So, the soils of West Tien Shan belong to Turan facies, only its Northern portion and some highland parts are similar to more Northern areas of Tien Shan. Flora and fauna of this area is characterized by many of the features of the Ancient Mediterranean; in particular, distribution areas of many plant and animal species have their Eastern border exactly in West Tien Shan. The characteristic look of West Tien Shan mountains is given by standing juniper forests of the three species of Central Asian junipers (*Juniperus turcestanica, J. zeravschanica, J. semiglobosa*), almost indistinguishable in appearance from the same forests in Pamir-Alai. Even more characteristic of the West Tien Shan are treeless grassy slopes. The main peculiarity of its vegetation cover is wide distribution of semi-savannas. In the foothills they are based mainly on *Hordeum bulbosum* and *Elytrigia trichophora*, which in the middle belt, in addition to shrubs (wild rose, honeysuckle , almond) are mixed with *Dactylus glomerata, Ferula tenuisecta* and *Prangos pabularia*. The peculiar and unique *Prangos* meadows of Himalayan type are characteristic only for West Tien Shan and Pamir- Alai Mountains.

Sloping foothill plains and foothills, an integral part of the zonation structure, are occupied by savannoid vegetation type. On the Northern slopes usually there is a combination of savannoid vegetation with shrub and tree-shrub thickets. This layer is represented in the region at the altitudes of 1000-1600 m. On the Northern edge of the reserve in Zhabagly mountain massif shrub-savannoid vegetation combines with steppe on the Southern slopes. Zone of savannoid vegetation with shrub and tree-shrub thickets is changed by zone of standing juniper in combination with steppe and true meadows (1500-1600-2400 m). Above is the subalpine zone, which is characterized by a combination of meadows, often with cryopetrophyte elements with creeping juniper *Juniperus turkestanica* (2400-2450-3200 m). The alpine zone is dominated by low-grass meadows and cryopetrophyte settlements (3200-3600 m).

Botanical and geographical surveys have found two types of zoning within the reserve: 1. Foothill steppes – medium grass meadows combined with creeping juniper - cryophyte low-grass meadows (North-Eastern part of the reserve). This is a special region that decreases the influence of the Western wet sediment transport. Mountain piedmonts (foothill plains) are covered by steppe, not savannoid type of vegetation. In the steppe associations an active role is played by annual ephemers and perennial ephemeroids (species of the genera *Eremurus, Tulipa*). In the zoning spectrum steppe type is changed directly by meadow, which is combined with creeping juniper. Sparse standing juniper do not form a zone, and are found only on the slopes of humid gorges.

2. The second zoning type is represented by a change of foothill and low mountain savannoids combined with deciduous sparse forests and shrubs – standing juniper combined with medium grass meadows – medium grass meadows combined with creeping juniper - cryophytic short grass meadows (North- Western and Southern parts of the reserve). This type of zoning can be divided into two geographical zoning variations: North with the belt of juniper sparse forest of *Juniperus semiglobosa*, which is presented in the North -West (Zhabagly - Kishi Kaindy) section of the reserve. Foothill plains and low hills are dominated by savannoids. The latter are changed by standing juniper *Juniperus semiglobosa* and medium grass meadows, and then - by sub-alpine meadows and creeping juniper. The peculiarity of the region's vegetation is the existence of transitional associations – steppe European-Kazakh type with participation of savannoid elements and savannoid association with participation of steppe species. Another geographical variation of this zoning type (Aksu - Baldybreksky) features a predominance of *Juniperus seravshanica* sparse forests. A big role in the structure of vegetation cover is played by savannoid associations which are changed by standing juniper *Juniperus seravshanica* and then – by vegetation of subalpine and alpine zones.

Distribution of peculiar geographic West Tien Shan variations of associations is established for mountain-steppe and savannoid vegetation types. The area is interesting because it is at the junction of the steppe zone (represented in the Kyrgyz Range and partly in the Karatau) and savannoid (foothill plains, low mountains of West Tien Shan). Peculiarity of the vegetation cover of this region is the existence of transitional associations - steppe dominated by European- Kazakhstan species of turf cereals and motley grass and co-dominance of savannoid elements and savannoid associations with participation of steppe species. A special geographic variation of steppes with savannoid elements: fescue (*Festuca valesiaca*) steppes with active participation of *Ferula tenuisecta, Poa bulbosa, Hordeum bulbosum, Alcea nudiflora), Stipa kirghisorum (Stipa kirghisorum, Sousinia minkwitzae, Eremurus regelii), Stipa (Stipa capillata , Agropyron trichophorum, Hordeum bulbosumis* widely distributed. In barley, *Prangos* and *Ferula* associations there are *Festuca valesiaca, Stipa capillata, Koeleria gracilis* and other steppe species. Long-term coexistence (paragenetic development) of so different vegetation types promoted and promotes mutual penetration of species from one type of vegetation into other and phenomena of succession between these types of vegetation.

Of the 12 selected for the Aksu Zhabagly vegetation types, in 7 rare and unique plant communities are registered (14 variations).

1. Type of evergreen coniferous forests - 2 formation: a) *Juniperus seravschanica* (sites in Aksu river canyon and Chuuldak tract), b) *Juniperus semiglobosa* (Kishi Kaindy river basin). Particularly original is the juniper with shrubs and motley-grass with significant participation of *Morina kokanica* on the Eastern slope of the left bank of the Kishi Kaindy river.

2 . Type of broad-leaved forests - two formations: a) mesophyte apple forests (*Malus sievrsii*), are best represented on the Northern slope of Aksu river canyon; b) xerophyte Mediterranean Hackberry (*Celtis caucasica*) - small in size island groves in Aksu river canyon, in the lower reaches of Taldybulak and Zhabagly rivers.

3 . Type of tugay forests - formation *Hippophae rhamnoides* (lower reaches of Aksai and Topshak rivers; mixed sea buckthorn in Zhabagly and Koksai river valleys) - particularly mobile association, one of the long phases of tree succession, changed by willow and birch formations.

4 . Type of tall grass savannoid - 3 formations: a) *Elytrigia trichophora*; b) barley (*Hordeum bulbosum*), found in fragments on the Southern slopes of Aksu river canyon, in the lowlands and on fans of Zhabaglytau c) many variant with significant participation of a Red Data Book *Centaurea turkestanica*, fragments of which are found in the upper part of Aksu river canyon. (Surovkina Paseka tract).

5. Type of steppes - formation *Festuca valesiaca* with savannoid elements, it is best represented at Zhabaglytau ridge (Koylybayzhaylyau tract).

6. Type of phryganoids (tragakant) – formations of *Onobrychis echidna* with steppe motley grass presented in fragments in the upper mountain zones (Kyzolgen , Topshaksaz tracts, Kishi Kaindy pass).

7. Type of rocks and scree vegetation - 3 variations: a) Mid-mountain scree with domination of formations of *Allium pskemense* and *Mediasia macrophylla* (Red Data Book species), b) low- and middle mountain fragments of rubbly- rocky plateau with significant participation of *Rhaphidophyton regelii, Pseuderemostachys sewerzowii*, occurring in small fragments in Western part of Zhabaglytau ridge and in a narrow strip on the right bank of Aksu river canyon. Vast areas of these associations are concentrated outside of the reserve (Irsu - Daubabinsky, Kokbulaksky, Berkarinsky sites), and c) highland variations of rocks' vegetation with participation of *Paraquilegia grandiflora, Pyrethrum tianschanicum, Stephanocaruum olgae, Primula minkwitziae, Saxifraga alberti* , etc. (top of Kishi Kaindy pass).

The first category of rare (critically endangered) associations includes three more broad-leaf forests formations – maple (*Acer semenovii*), pistachio *(Pistacia vera*) and ash tree forests of relict *Fraxinus sogdiana*. Formations of *Acer semenovii* are not observed in Aksu-Dzhabagly by themselves, there are only separate trees or in the composition of multi-variation broad-leaf tree-shrub thickets in the lower part of Zhabagly, Taldybulsk and Aksu river canyon. Pistachio and tugay ash-tree forests, as well as formations of *Pyrus regelii, Crataegus pontica*, and unique shrub associations of West Tien Shan and adjacent part of Karatau (formations of *Spiraenthus schrenkianus, Lepidolopha karatavica, L. talassica, Calophaca tianschanica*) are conserved in the transit zone of the reserve (Irsu-Daubaba mountains, Kokbulak, Berkara, Borolday and Koshkarata river canyons).

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.

As the core area of the proposed biosphere reserve is strictly protected according to Article 40 Chapter 7 of the PA Law:

1. It is allowed to perform surface and aviation activities for the prevention and extinguishing of forest and steppe fires within the core zone.

2. Any presence of individuals without permission documents in the core zone is not allowed, except for reserve employees as well as officials from government authorities supervising protected areas.

3. To ensure access to sites hold sacred by followers of any religion (pilgrimage sites), located within core zone of biosphere reserve, visits to such sites can be allowed in groups only as accompanied by inspectors of a state nature reserve.

4. It is allowed to set up, in accordance with procedures set forth by regulator, trails and routes within a core zone of a nature reserve at specially designated plots which do not include valuable ecological systems and objects.

1. Different types of restricted, regulated and environmentally benign for the core zone activities can be performed in the buffer zone:

1) scientific research and establishment of training and development centers;

2) environmental monitoring and monitoring of changes in ecological systems;

3) forestry, fire safety activities and protection of woodlands;

4) traditional land uses provided that such uses secure long-term conservation and do not affect biological diversity of the core zone and sustainability of ecological systems of the overall state nature reserve;

5) advanced measures for the rehabilitation of biological and landscape diversity, natural ecological systems;

6) tourism, recreational uses, controlled and regulated in accordance with the recreational intensity set forth by rules for visiting protected areas by individuals;

7) usage of mineral waters and curative resources;

8) ecological education, delivery of training programmes, arrangement of demonstration sites and environmentally benign nature use management

Any activities which can have a negative impact on the core zone ecological system are prohibited in the buffer zone, particularly:

1) to establish new settlements;

2) to deploy and operate industrial facilities;

3) to construct and operate production facilities;

4) to perform geological exploration works and to produce mineral resources;

5) to fell forests for principal use;

6) to introduce new plant and animal species;

7) to take actions which change the hydrological regime of the core zone area and buffer zone; and

8) to perform any other activities which can impact the ecological system of the core zone.

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).

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.).

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 used 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:

14.2.1 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.

Flora of biosphere reserve is rich and diverse. Currently higher vascular plants are well studied while lower plants are significantly less studied.

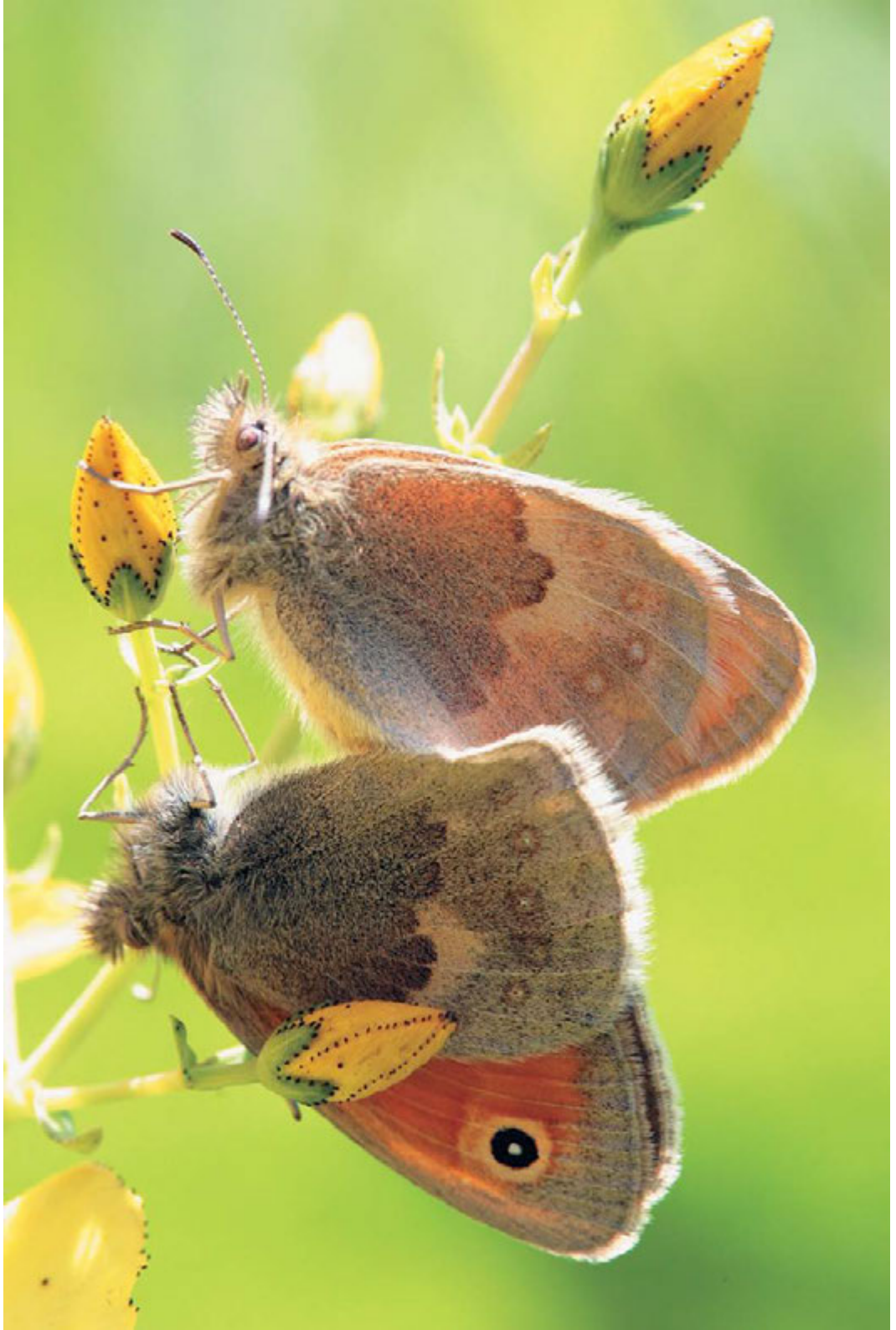
Higher plants. Flora of biosphere reserve includes 1,737 species, including 235 species of fungi, 64 species of lichens, 63 species of algae and 63 species of bryophytes. Complete list of higher plants is given in the Appendix (list of species). Reserve plays an important role in the preservation of endemic genera. So, there are 19 endemic genera out of 64 species endemic for Middle Asia: *Korolkowia* Regel (Liliaceae), *Rhaphidophiton* Iljin (Chenopodiaceae), *Botschantzevia* Nabiev (Brassicaceae), *Pseudoclausia* M.Pop., *Galagania* Lipsky, *Hyalolaena* Bunge, *Mediasia* Pimen., *Oedibasis* Koso-Pol., *Pilopleura* Schischk., *Schrenkia* Fisch.et Mey., *Sclerotiaria* Korov., *Schtschurovskia* Regel et Schmalh., *Sphaenolobium* Pimen., *Pseuderemostachys* M.Pop. (Lamiaceae), *Stephanocaryum* M.Pop. (Boraginaceae), *Cylindrocarpa* Regel , *Sergia* Fed., *Lepidolopha* C.Winkl., *Ugamia* Pavl. There are 57 rare species, listed in the Red Book of Uzbekistan, Kazakhstan and the Kyrgyz Republic, in the reserve. The rarest species in the biosphere reserve are as follows: *Rhaphidophyton regelii, Pseuderemostachys sewerzowii, Allochrusa gypsophiloides, Prenanthes mira, Tulipa dubia, Thesium minkwitzianum, Malus niedzwetzkiana, Seseli setiferum, scutellaria flabellulata, Ugamia angrenica, Dryopteris mindshelkensis*.

Bryophyta. According to incomplete data, 63 species are registered in biosphere reserve. Five most diverse genera are: *Grimmia* (10 species), *Ortotrichum* (4), *Tortula* (6), *Brachythecium* (4), *Bryum* (5). Various ecological groups – soil, lithophyte, epiphyte, marsh and aquatic – are represented in the reserve. Only one rare species is recorded – *Hymenostomum krassavinii*.

Lichens. Detail research of lichens hasn't been done yet. According to some data, there are 80 species in Kazakhstan part of West Tien Shan, including 64 lichen species of 30 genera on the territory of Aksu-Zhabagly.

Algae. There are 63 species in the reserve. The most diverse and numerous is Diatomea (37 species). Preliminary data shows that algae flora of the reserve is quite typical – 9 background North Alpine taxons are recorded in the reserve out of 50 registered for Middle Asia.

Fungi. There are 221 species of 80 genera in the reserve. Most diverse genera are: *Septoria* (23), *Puccinia* (27), *Ramularia* (23), *Pleospora* (14). Approximately 80% of the species are parasites, 20% - saprophytes. Representatives of



Coenonympha pamphilus

Ursus arctos

the first group often cause mass epiphytoties of cereals (*Puccinia graminis*, *Claviceps purpurea*, *Erysiphe graminis*), as well as trees and shrubs. Rare species include *Agaricus tabularis* (listed in the Red Data Book of Kazakhstan), *Uncinula celtidis, Puccinia alatavica, Pycnorostrum ferulae, Septoria ungerniae, Ramularia hedysari.* Several species are edible, most popular among local people are *Pleurotus eryngii* and *Lepista nuda*, collected in mass in reserve's transition zone, and sometimes in the buffer zone. The level of mycoflora research in West Tien Shan and Aksu-Zhabagly reserve is insufficient – about 25-30%. It is proved by the fact that short-term expeditions identified and described 21 new species, 18 of them on the territory of the core and buffer zones.

Vegetation of the reserve is subdivided into 4 large type groups: I. trees and shrubs, II. grass, III. prickly-shrub and IV. vegetation of rocks and screes, represented mostly by obligate petrophytes of different life forms.

I. **Vegetation of trees and shrubs:**

1. *Evergreen junipers* – associations with dominance of evergreen trees and shrubs of the genus *Juniperus* (standing *Juniperus semiglobosa, Juniperus seravshanica*, creeping *Juniperus turkestanica*)

2. *Deciduous forests and woodlands* – associations dominated by deciduous trees (mainly broadleaf): apple (*Malus sieversii*), hawthorn (*Crataegus turkestanica*), Caucasian Hackberry (Celtis caucasica) and woodland hawthorn (*Crataegus pontica*).

3. *Deciduous shrub type* combines deciduous shrub thickets (mostly broad-leaved) with participation of species of the genera *Rosa, Lonicera, CotonEaster, Berberis*. Shrub thickets are usually multi-species, but usually the main role is played by species of *Rosa* genus with abundance of honesuckle. Deciduous shrubs include *Spiraea hypericifolia*, *Cerasus erythrocarpa, C. tianschanica*, *Athraphaxis pyrifolia*.

4. *Small-leaved forests* are mostly deciduous forest of river valleys: birch (*Betula pendula* (synonym of *B. talassica*), *B. tianschanica, B. turkestanica*); willow (*Salix niedzwieckii, S. pycnostachya, S.alba*)

5. *Mountain tugay* – floodplain forests of Asian arid zone, including poplar (*Populus talassica, P. cataracti*) forest.

II. **Grass vegetation**

6. *Cryophyte low-grass meadows* – associations of microterm mesophile and xeromesophile herbaceous perennial plants, distributed in highland. This type includes: cryophyte meadiws with participation of *Waldheimia tridactylites, Cerastium lithospermifolium, Cystiocorydalis fedtschenkoana, Allium polyphillum, Oxytropis albovillosa, Oxytropis chionobia*, etc.; meadows of *Carex stenocarpa*, *Cobresia cappiliformis, Puccinella subspicata, Festuca kryloviana, Helictotrichon hookeri, Hordeum turkestanicum, Poa alpine, Trisetum spicatum*.

7. *Mid-grass meadows* - grass and motley-grass associations of xeromesophile and mesophile perennial grasses,

sub-alpine, upland. The main meadow types include: *Alopecurus pratensis, Dactylis glomerata, Poa pratensis, P. angustifolia, Agropyron repens, Phleum phleoides, Zerna inermis, Salamagrostis epigeios; Roegneria canina, Carex melanantha, Geranium collinum, G.saxatile, Allium hymenorhizum, Medicago tianschanica; Polygonum coriarium* and many others.

8. *Steppes* – type of vegetation, including associations dominated by perennial microterm turf cereals with codomination of mesoxerophile and xeromesophile motley-grasses (*Stipa, Festuca, Koeleria, Helictotrichon*). The main formations are *Festuca valesiaca; Stipa kirghisorum, Helictotrichon desertorum, Stipa capillata*.

9. *Savannoid type of vegetation* – associations dominated by ephemeroids (*Agropyron trichophorum, Hordeum bulbosum, Poa bulbosa, Carex pachystilis*), as well as mesophile and xeromesophile geophytes (species of the genera *Prangos, Ferula*). Originality of vegetation associations' composition of this type led to different names in the works of different researchers: ephemeral meadows, ephemeroid, herbaceous vegetation, and ephemeretum. Most often this vegetation type is called semi-savanna, subtropic steppes, montane semi-savanna, Western Asian (Turan) dry steppes, and also savannoid type. Associations of this type are subdivided into 3 ecologic-physionomic subtypes: 1) low-grass savannoids, represented only by anthropogenic modifications – ephemeral – meadow grass (*Poa bulbosa*) low-grass savannoids in place of high-grass savannoids; 2) large cereal savannoids, usually with participation of large grass, main formations include *Agropyron trichophorum* and *Hordeum bulbosum*, large cereal savannoids are close to associations of *Botriochloa ishaemum*, also ephemers, ephemeroids and large grass is observed; 3) so-called umbrella species, including *Prangos pabularia* (endemic of West Tien Shan, Pamir-Alay and Western Himalayas) and *Ferula tenuisecta* (endemic of West Tien Shan).

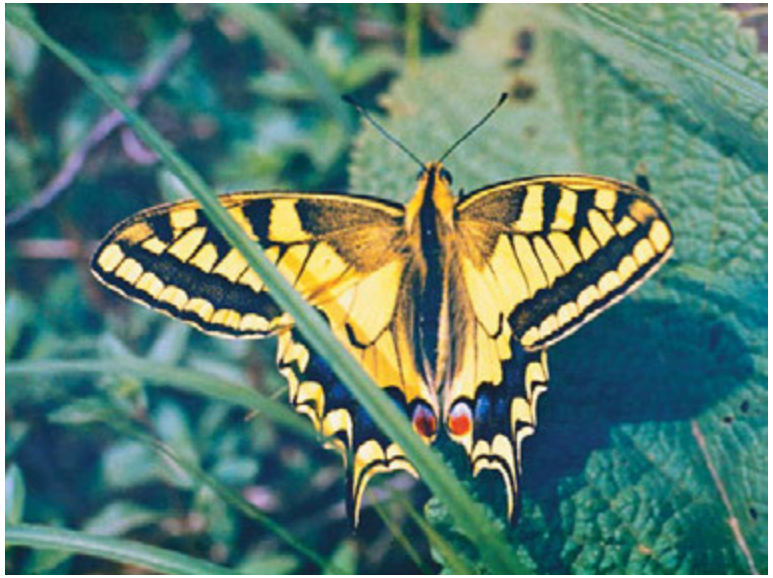
III. Prickly-shrub vegetation (phryganoids)

10. *Phryganoids* **–** associations of sclerophyllus dwarf-shrubs (*Onobrychis echidna, Acantholimon*), semi-dwarf shrubs (*Artemisia*) and perennial prickly grass (*Cousinia*). *Onobrychis echidna* associations also belong to this type. In many works phryganoid is a synonym of foothill xerophyte (Korovin, 1962) – formation of xerophile, low, mostly very prickly shrubs of hemispherical shape.

VI. **Vegetation of rocks and screes**

11. *Petrophyton*- vegetation of rocks and scree, which is subdivided into vegetation of rocks and scree of mid-mountain level (*Allium polyphillum, A. pskemense, Paraquilegia grandiflora, Delphinium oreophilum, Saxifraga albertii, Campanula capusi* and etc) and vegetation of rocks and scree of low and mid-mountain level (*Dasiphora fruticulosa, Artemisia rutifolia, Silene braghuica, Parrya albida, Eremurus lactiflorus, Spiraea pilosa, Rosa cocanica, Ephedra equisetina*). Rocks of this lower altitude are characterized by shrubs (*Cerasus erythrocarpa, Spiraea pilosa, Athraphaxis pyrifolia, Lonicera tianschanica*, etc).

Colias erate



Papilio machaon

12. Group of petrophytes with domination of labiates, main dominant species are of genera *Ziziphora* and *Thymus.* These associations are observed throughout whole territory of the core and buffer zone, because most part of the territory is made of limestone.

Overall, vegetation diversity is rich and represented by 12 vegetation types, which include 60 formations. Many of the named above vegetation types are **unique** and distributed exclusively in Mountain Middle Asian region, part of the formations is characteristic only for West Tien Shan. Some of the unique types are savannoid and phryganoid vegetation types. Other original type for that region is juniper sparse forests (*Juniperus semiglobosa* and *J. seravschanica*).

Fauna. Insects and other important invertebrate animals. All data on the fauna of various invertebrates groups of Aksu Zhabagly Biosphere Reserve, with the exception of some insect orders, are fragmentary. The reserve has 53 species of 24 genera of 14 families, or about 60% of the regional fauna of mollusks. Five species of mollusks are endemic of Talasskiy Alatau: *Pupilla striopolita, Pseudonapaeus entoptyx, Turanera leptogyra, Turanera stshukini, Leucozonella reitteri*.

The most studied insect flora includes such small orders as cockroaches, stick insects, earwigs, and partly beetles, heteropterans, true butterflies and dragonflies. About 2,500 insect species are registered at the present time on the territory of biosphere reserve. Besides, 14 species of insects and one species of worms are listed in the third edition of the Red Data Book of Kazakhstan.

Ursus arctos

Table 5. Entomofauna composition of Aksu-Zhabagly biosphere reserve

Latin name of order	Number of species		Latin name of order	Number of species	
	known	prediction		known	prediction
Collembola	-	150	Homoptera	113	900
Diplura	-	5	Heteroptera	275	350
Thysanura	-	5	Thysanoptera	-	?
Ephemeroptera	1	15	Coleoptera	784	1000
Odonata	23	25	Strepsiptera	-	5
Blattoptera	5	5	Hymenoptera	175	1000
Mantoptera	4	5	Trichoptera	-	?
Plecoptera	9	15	Lepidoptera	463	1000
Phasmatoptera	1	1	Raphidioptera	-	?
Orthoptera	53	60	Neuroptera	6	25
Dermaptera	3	3	Mecoptera	1	1
Siphunculata	1	20	Diptera	202	1000
Mallophaga	1	100	Siphonaptera	4	50
Psocoptera	-	10	TOTAL	2124	>5750

Orthoptera insects – there are 77 species of orthopterans in Aksu-Zhabagly, including 5 species of cockroaches, 4 species of praying mantis, one stick insect, 9 species of stoneflies, 3 species of earwigs and 53 orthopteran species. *Homoptera and bugs* – there are 388 species of hemipteran insects, 113 of them are homopterans and 275 are bugs, but this data is incomplete, supposedly homopteran fauna must account for 900 species, and there must be about 400 bug species. *Coleoptera* – beetle fauna includes not less than 906 species of 358 genera of 41 families; leading role belongs to Curculionidae (including Apionidae), Staphylinidae, Carabidae, Chrysomelidae and Scarabaeidae, which occupy 57.5% of genera and 68.8% of species composition. Thus, there are 20 species in beetle fauna composition, which are endemic of the reserve, 136 – endemic of West Tien Shan, about 425 Middle Asian endemics and subendemics, 401 species with wide area (7 of them are cosmopolitans), distribution area of 80 species is still unclear. *Hymenoptera* – insufficiently studied fauna of hymenopteran insects consists of 175 species, with predicted not less than 1000 species. *Lepidoptera* – to the present time 463 butterfly species are found in the reserve, among which species composition of Rhopalocera accounts for 118 species of 7 families, including Papilionidae - 7 species, Pieride - 16, Nymphalidae - 26, Satyridae - 24, Libytheidae - 1, Lycaenidae - 37, Hesperiidae - 8.

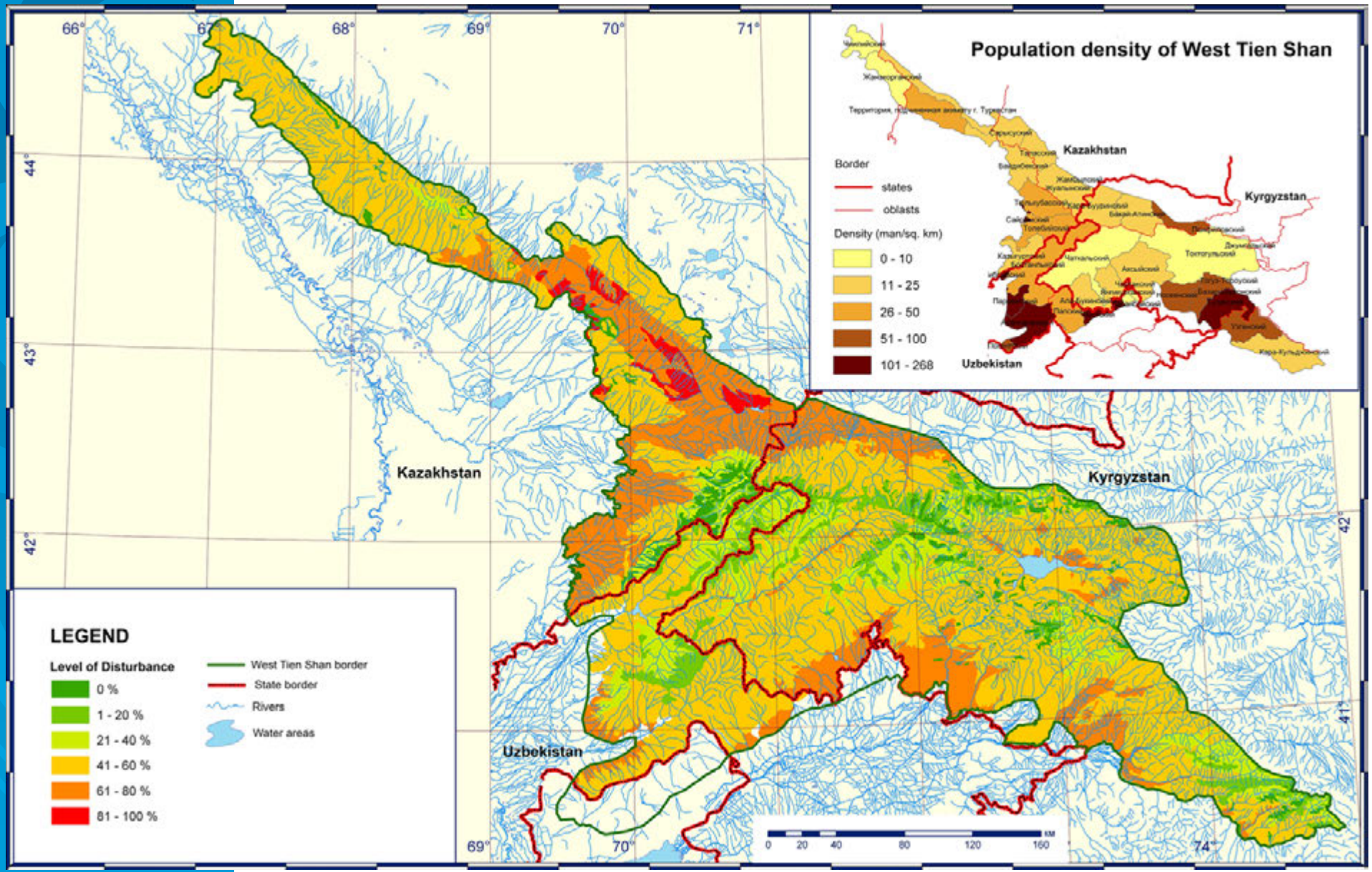
Numbers of some insect orders in West Tien Shan and Aksu-Zhabagly Biosphere Reserve
(number of species, in the last line – number of families)

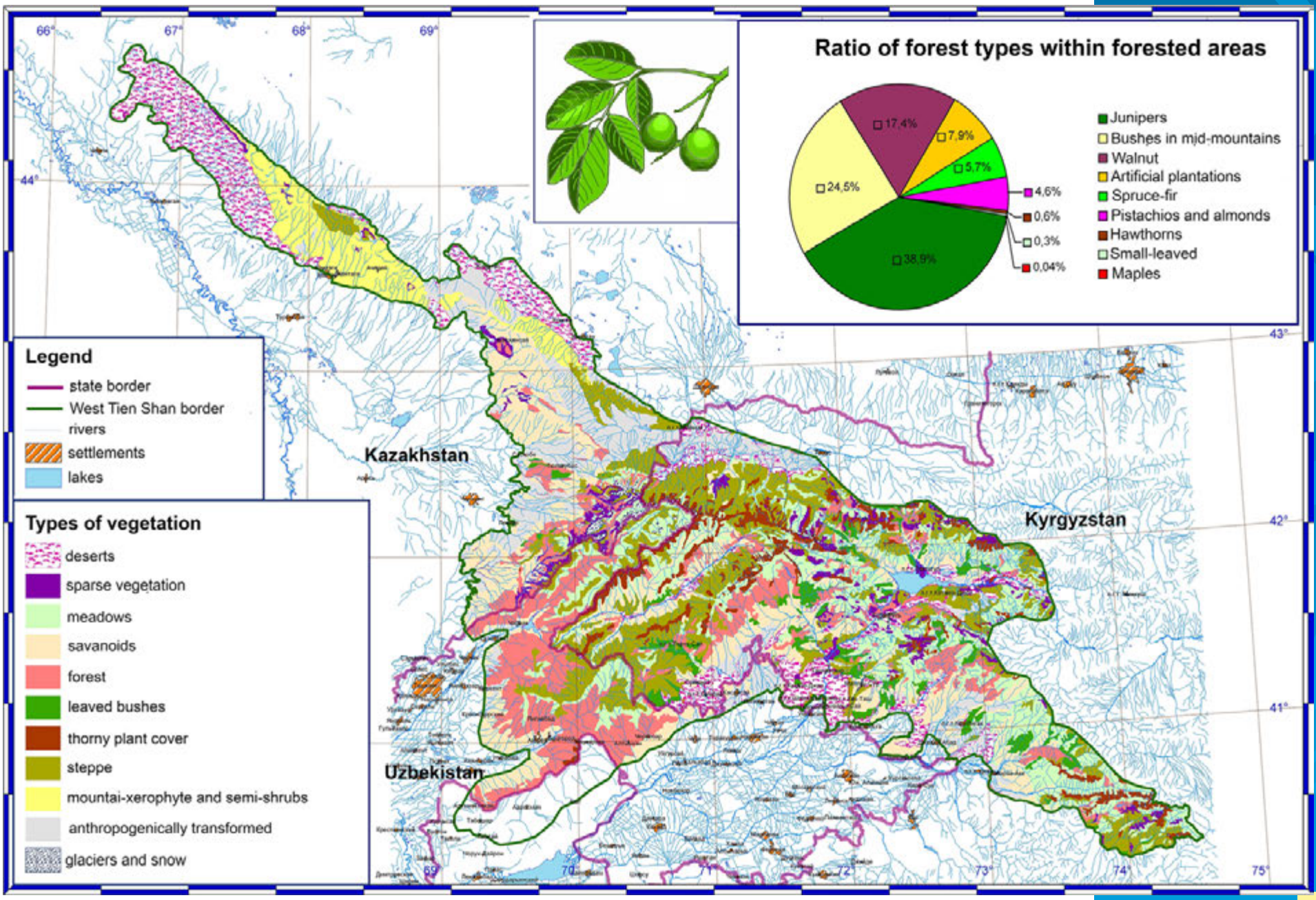
Insect order	West Tien Shan	Aksu-Zhabagly	%
Odonata	29	25	86.2
Orthoptera	105	54	51.4
Homoptera	442	115	26.0
Heteroptera	600	277	46.1
Coleoptera	1500	784	52.2
Lepidoptera	834	452	54.2
Diptera	979	197	20.1
Hymenoptera	1174	170	14.5
TOTAL	6095	2123	34.8
FAMILIES	366	199	54.4

There are 5 **fish** species of 3 families (carp, loaches and cottids), and two species are still in question: *Noemacheilus stoliczkai elegans* Kessler and *Noemacheilus kuschakewitschi* Herzenstein. The Red Data Book of Kazakhstan (1996) listed only one species - Marinka (*Schizotorax intermedius* McCleland).

Reptiles are represented by 11 species in the reserve, which is 64.7% of the herpetofauna of West Tien Shan. Reptiles include 7 species of snakes (Steppe Ribbon Racer - *Psammophis lineolatum*, Dice Snake - *Natrix tesselata*, Steppe Ratsnake - *Elaphe dione*, Spotted Whip Snake - *Coluber ravergieri*, Braid Snake - *Coluber rhodorhachis*, Steppe Viper - *Vipera ursinii*, Siberian Pit Viper - *Agkistrodon halys* and 4 species of lizards (*Asymblepharus alaicus*, *Ablepharus deserti, Eremias arguta, Ophisaurus apodus*). There are 2 poisonous snakes (Steppe Viper and Siberian Pit Viper). It is important to provide protection for *Coluber rhodorachis* and *Pseudopus apodus*, listed in the Red Book of Kazakhstan (1978, 1991, 1996).

Amphibians. There are three species in the reserve: Green Toad - *Bufo viridis*, Asiatic Toad - *Bufo danatensis* and Marsh Frog - *Rana ridibunda*. One of them - Asiatic Toad - is listed in the third edition of the Red Data Book of Kazakhstan (1996).


Population density of West Tien Shan
Border
states
oblasts
Density (man/sq. km)
0 - 10
11 - 25
26 - 50
51 - 100
101 - 268
Kazakhstan
Kyrgyzstan
Uzbekistan
LEGEND
Level of Disturbance
0 %
1 - 20 %
21 - 40 %
41 - 60 %
61 - 80 %
81 - 100 %
West Tien Shan border
State border
Rivers
Water areas
66°
67°
68°
69°
70°
71°
74°
44°
43°
42°
41°
0 20 40 80 120 160 KM


Ratio of forest types within forested areas
17,4%
7,9%
5,7%
24,5%
4,6%
0,6%
0,3%
38,9%
0,04%
Junipers
Bushes in mid-mountains
Walnut
Artificial plantations
Spruce-fir
Pistachios and almonds
Hawthorns
Small-leaved
Maples
Legend
state border
West Tien Shan border
rivers
settlements
lakes
Types of vegetation
deserts
sparse vegetation
meadows
savanoids
forest
leaved bushes
thorny plant cover
steppe
mountai-xerophyte and semi-shrubs
anthropogenically transformed
glaciers and snow
Kazakhstan
Kyrgyzstan
Uzbekistan
66°
67°
68°
69°
44°
43°
42°
41°
69
70
71
72
73
74
75

Birds. 267 bird species are registered in biosphere reserve. Of these, 130 species are nesting, which is 82.3% of all nesting fauna of West Tien Shan. These 130 species belong to 12 orders (Ciconiiformes, Anseriformes, Falconiformes, Galliformes, Charadriiformes, Columbiformes, Cuculiformes, Strigiformes, Caprimulgiformes, Apodiformes, Coraciiformes, Passeriformes).

The basis of nesting avifauna is formed of passerine birds (83 species). It includes such typical for West Tien Shan species as Red-billed Chough (*Pyrrhocorax pyrrhocorax*), Alpine Chough (*Pyrrhocorax graculus*), White-winged Grosbeak (*Mycerobas carnipes*), Paradise Flycatcher (*Terpsiphone paradisi*), Crimson-winged Finch (*Rhodopechys sanguinea*), Brandt's Mountain Finch (*Leucosticte brandti*), White-winged Snowfinch (*Montofringilla nivalis*), Rufous-naped Tit (*Parus rufonuchalis*), Yellow-breasted Tit (*Parus flavipectus*), Blue Rock Thrush (*Monticola solitaria*), Common Rock Thrush (*Monticola saxatilis*), Orphean Warbler (*Sylvia hortensis*), Hume's Whitethroat (*Sylvia althaea*), White-throated Robin (*Irania gutturalis*), White-tailed Rubythroat (*Calliope pectoralis*), etc. Predatory birds are well represented by 15 species: Golden Eagle (*Aquila chrysaetos*), Booted Eagle (*Hieraetus pennatus*), Short-toed Snake Eagle (*Circaetus gallicus*), Cinereous Vulture (*Aegypius monachus*), Griffon Vulture (*Gyps fulvus*), Bearded Vulture (*Gypaetus barbatus*), Egyptian Vulture (*Neophron percnopterus*), Eurasian Hobby (*Falco subbuteo*), Merlin (*Falco columbarius*), Barbary Falcon (*Falco pelegrinoides*), Common Kestrel (*Falco tinnunculus*), Lesser Kestrel (*Falco naumanni*), Black Kite (*Milvus migrans*), Long-legged Buzzard (*Buteo rufinus*), Eurasian Sparrowhawk (*Accipiter nisus*).

Besides nesting birds, the nature reserve's territory is habitat for at least 110 species in not-nesting period – in winter and during seasonal migrations in spring and autumn. Many of them spend considerable part of their annual cycle (up to 4-5 months) in the reserve. This list also includes species in need of special protection, for example, Saker Falcon (*Falco cherrug*), Peregrine Falcon (*Falco peregrinus*), Common Crane (*Grus grus*), Demoiselle Crane (*Anthropoides virgo*), Great Bustard (*Otis tarda*), Little Bustard (*Otis tetrax*), etc.

Mammals (Mammalia) are represented in Aksu-Zhabagly Biosphere Reserve by 52 species, belonging to 6 orders (insectivores, bats, carnivores, artiodactyls, rodents, lagomorphs) and 21 families. Species diversity is distributed as follows: rodents (44%), predators (24%), bats (18%), ungulates (9%), lagomorphs and insectivores (3% each). Special attention in terms of conservation of biodiversity and gene pool is needed for two mammal species - Snow Leopard, listed as a threatened species in IUCN Redlist, and endemic of West Tien Shan – Menzbier's Marmot (*Marmota menzbieri* Kaschkarov, 1925). There are large-scale activities conducted by international conservation organizations dedicated to Snow Leopard; one of them is a project of Snow Leopards' conservation in Central Asia, and Aksu-Zhabagly Biosphere Reserve with adjacent territories play an important role in this project.

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 main threats are caused by anthropogenic activity, they include:

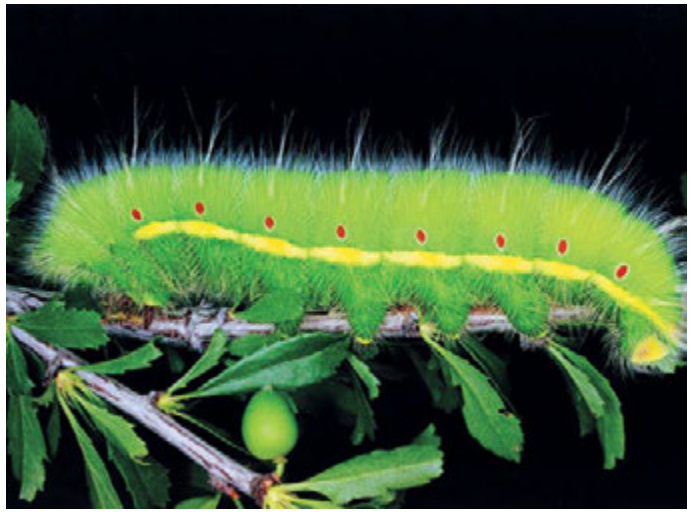
1. *Fires*, the most dangerous threat for biosphere reserve, causing a reduction of invertebrates' populations, environment degradation, soil changes, erosion, changes in the composition of plant associations and the reduction of juniper and other forests.

2. *Cold and snowy winters* happen 2-3 times in a decade, causing population decrease of many animal species.

3. *Atmosphere pollution by industrial enterprises.* Air pollution happens quite rarely in regional scale, caused by large chemical and energy factories of Chimkent and Taraz cities. For example, the last one was in 1989 in Chuuldak tract in South-West of the reserve due to accidental emissions of Chimkent phosphorous plant, with mass destruction of junipers, when their leaves dried out and fruits fell down.

4. *Accidental introduction of alien plant and animal species*. Ecologically illiterate resolutions of local authorities in 1950-60s let to accidental introduction of alien plant species (apricot, locust tree, yellow acacia, cherry-plum, smoke tree).

5. *Poaching.* Most vulnerable sites are lands adjacent to Topshaksaz tract (Argali – females and young) and lower part of Aksu river canyon (wintering Ibex, Wild Boar, Maral, Bear, Chukar). Increase of gun possession is a serious threat for animal populations migrating from the core and buffer zones into transition zone of the reserve.



Saturnia schenki

6. *Cattle overpasture* promotes environmental degradation, as well as spread of disease from cattle to wild animals, and introduction of weeds into natural ecosystems. It was especially obvious when authorites forced overpasture of large cattle number in drought period of 1974-1975, leading to epizooty of scabies among Ibex and Argali, decreasing their population almost in 2.5 times.

7. *Illegal logging*. Among the most significant factors affecting reserve's ecosystems in the past and in the present time, the leading role belongs to forest felling and dry grass burning. Forest logging on mountian territories leads to erosion, changes in hydrological regime and habitat decrease for other animal species.

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?

Management Plan of Aksu-Zhabagly nature reserve defines monitoring programs of environment and biodiversity components, stating that monitoring observations are carried out on specially identified monitoring sites and routes (see Management Plan in the Appendix). In the present time monitoring is conducted annually according to the dates, stated in the Management Plan. For example, monitoring of vegetation world is conducted on the basis of 14 indicator species, including 3 tree-shrub and 11 herbaceous perennial species, and entomofauna monitoring – on the basis of 20 indicator species, their evaluation being the basis of habitat condition's assessment. Two main profiles were chosen for long-term monitoring, which provide basis for annual observations of populations' condition, vitality and renewal of key and indicator plant species, and overall condition of vegetation cover.

14.2.4 What actions are currently undertaken to reduce these pressures?

Scientific research on the territory of biosphere reserve is carried out according to Perspective Thematic Plan for 2011-2015. The main goal of scientific research in Aksu-Zhabagly Biosphere Reserve is monitoring of condition and conservation of natural complexes, including further flora and fauna inventarization. All research is conducted taking into consideration ecologic-geographical, floristic and faunistic peculiarities, and also accounting for the objectives of the protected territories.

Another direction of the research is monitoring of rare and endangered species to clarify their population's condition, ecological peculiarities of rare animal and plant species, giving an opportunity of assess this species' conservation and restoration perspective. This direction includes research of rare and endangered bird species with evaluation of their populations' condition and ecological peculiarities, condition of Red Data Book and key species with passportization of habitat and reproduction. Current research includes Nature Chronicles, because this program is connected to all scientific theems. Besides scientific departments, the data for Nature Chronicles is also collected by all inspector staff.

According to the Perspective Thematic Plan of scientific research for the period of up to 2015, the following scientific themes are studied on the territory of biosphere reserve:

1. Ornithological monitoring. Includes evaluation of population dynamics of indicator bird species, registration of rare birds observations and analysis of their distribution on the territory, ornithophenological phenomena: migration of common and rare bird species, nesting phenology, wintering birds population number dynamics, ethological monitoring.

2. Monitoring of vegetation condition of Aksu-Zhabagly reserve. Research of peculiarities of vertical and horizontal structure of vegetation associations on stationary key sites of monitoring profiles; elucidation of floristic composition of the key sites; research of peculiarities in composition and distribution of meadow vegetation on the territory of Zhabagly river; studying plant phenology.

3. Research of hydrometeorologic conditions of Aksu-Zhabagly reserve. Includes activities of data collection and analysis of long-term hydrometeorologic data of nearest weather stations and hydro stations.

4. Fauna and monitoring of invertebrates populations condition of nature reserve and adjacent territories. Includes monitoring of indicator species populations' condition, continuation of faunistic research of invertebrates, study of ecology and biology of stinging hymenopterans of nature reserve and adjacent territories.

5. Modern condition of ungulate mammal populations of nature reserve. Study of modern distribution of ungulate mammals on the territory of nature reserve and adjacent territories, definition of the numbers and condition of mammal populations, study of mammal biology and ethology.

6. Modern condition of predatory mammals populationas in nature reserve. Study of modern distribution of predatory mammals on the territory of nature reserve and adjacent territories, definition of the numbers and condition of mammal populations, study of mammal biology and ethology.

7. Nature Chronicles' data collection.

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

Regular monitoring observations of the habitat will be conducted by state nature reserve staff according to the developed Perspective Research Plan for the period until 2015.

In the future monitoring of climatic, hydrological changes will also be continued by South Kazakhstan department 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 reserve is the source of many economically valuable plants. There are 160 most distributed species of six major groups: feed, food and source of vitamins, medicinal, technical, essential-oil, decorative. A complete list of these species is given in Appendix.

Among the **forage** plants leading place is occupied by cereals and legumes, especially valuable hay-producing species (*Alopecurus pratensis, Bromopsis inermis, Dactylis glomerata, Elytrigia trichophora, Hordeum bulbosum, Medicago tianschanica*), pasture (*Festuca valesiaca, F.kryloviana, Oxytropis aulieatensis, O.talassica*) and silo (*Ferula tenuisecta, Cousinia umbrosa*, etc.). Of the group of **food and vitamin** best known examples include onions (*Allium longicuspis, A.pskemense, A.fedtschenkoanum*), and fruit-berry species (*Malus sieversii, Rubus caesius, Rosa alberti, R.fedtschenkoana, Hippophae rhamnoides, Ribes meyeri*, etc.). In previous years, local people widely used plants with large starchy roots and tubers for food (*Megacarpaea orbiculata, Korolkowia sewerzowii*). The thickets of the latter were almost destroyed in 1930s and now they are intensively restoring.

The most popular and in demand are **medicinal** plants, which in Aksu-Zhabagly are represented by 186 species, including plants of conventional medicine, and the species used in folk medicine of different countries. Among the widespread conventional species one may name *Ephedra equisetina, Rhamnus cathartica, Hypericum perforatum, H.scabrum, Origanum tyttanthum, Tussilago farfara*, etc.

The group of **technical** plants is multidirectional, and consists of, first of all, tanning (*Rheum maximoviczii, Polygonum coriarium*) species and saponine-bearing *Allochrusa gypsophiloides*, which was intensively collected on the territory of nature reserve and its vicinity in 1940s. Soapweed is still collected in Karatau mountains, although its stock harshly decreased and this species is listed in the Red Data Book of Kazakhstan. Local population uses *Delphinium semibarbatum, D. longipeduculatum, Macrotomia ugamensis, Roemeria refracta* and other species for dye. The latter 2 species are especially valuable since they serve as a source of food dye.

Many species contain **essential oils**. The most valuable of them are junipers (*Juniperus* - all 4 species), many *Apiaceae - Ferula tenuisecta, Prangos pabularia* (Demidovskaya et al, 1978), *Lamiaceae* (*Mentha asiatica, Ziziphora* species*, Thymus, Dracocephalum*) and *Asteraceae* (*Tanacetum pseudachillea, Achillea filipendulina, Artemisia* species, etc.).

Among the **ornamental** plants most interesting species include many trees and shrubs, as well as ephemeroid bulbous plants (*Crocus alatavicus, Tulipa greigii, T.kaufmanniana, Juno coerulea, J.orchioides*), *Trollius altaicus, Anemone protracta, species Myosotis, Viola, Primula*, blooming in late summer *Dipsacus azureus, Scabiosa songorica*, *Galatella* species, etc.

Almost all plants are important for **soil protection and water regulation**. In this aspect, the most important tree and shrub species, rhizomatous grasses and plants pioneers, colonizing disturbed habitats mobile (landslides, debris, etc.) - Tussilago farfara, Allium pskemense, A.karataviense, Mediasia macrophylla, Ferula talassica and etc.

The most valuable commercial mammal species in the past were representatives of two groups - ungulates (Argali, Ibex, Roe Deer, Wild Boar, Maral) and predators (bear, badger, Stone Marten, Least Weasel, Stoat), as well as some rodents and lagomorphs (Long-tailed Marmot , Indian Crested Porcupine, Tolai Hare). Now a lot of mammals are threatened and listed in the Red Data Book of Kazakhstan as requiring special protection. Those are Argali (*Ovis ammon karelini*), Tien Shan Brown Bear (*Ursus arctos isabellinus*), Turkestan Lynx (*Lynx lynx isabellinus*), Snow Leopard (*Uncia uncia*), Dhole (*Cuon alpinus*), Stone Marten (*Martes foina intermedia*), Indian Crested Porcupine (*Hystrix indica*), European Free-tailed Bat (*Tadarida teniotis*).

Some bird species are of economic interest as well, including Himalayan Snowcock (*Tetraogallus himalayensis*), Chukar (*Alectoris chukar*), Gray Partridge (*Perdix perdix*), Common Quail (*Coturnix coturnix*), Common Wood Pigeon (*Columba palumbus*), Rock Dove (*Columba livia*), Stock Dove (*Columba oenas*), Oriental Turtle Dove (*Streptopelia orientalis*), European Turtle Dove (*Streptopelia turtur*), etc. The category of birds in need of special protection includes 10 species, listed in the Red Data Book of Kazakshtan (Black Stork, White Stork, Yellow-eyed Pigeon, Barbary Falcon, Egyptian Vulture, Bearded Vulture, Golden Eagle, Booted Eagle, Short-toed Snake Eagle, Eurasian Eagle Owl), as well as following globally endangered species included in IUCN Redlist: Corn Crake (*Crex crex*) and White-winged Woodpecker (*Dendrocopos leucopterus*).

The list of economically valuable **homopterans** includes carmine scale insects *Porphyrophora polonica и P. monticola*, which are sources of very expensive natural dye – carmine. A unique population of *Porphyrophora polonica* inhabits Aksay canyon.

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

The main threats to genetic biodiversity include:

1. *Poaching.* Most vulnerable sites are lands adjacent to Topshaksaz tract (Argali – females and young) and lower part of Aksu river canyon (wintering Ibex, Wild Boar, Maral, Bear, Chukar). Increase of gun possession is a serious threat for animal populations migrating from the core and buffer zones into transition zone of the reserve.

2. *Cattle overpasture* promotes environmental degradation, as well as spread of disease from cattle to wild animals, and introduction of weeds into natural ecosystems. It was especially obvious when authorites forced overpasture of large cattle number in drought period of 1974-1975, leading to epizooty of scabies among Ibex and Argali, decreasing their population almost in 2.5 times.

3. *Illegal logging*. Among the most significant factors affecting reserve's ecosystems in the past and in the present time, the leading role belongs to forest felling and dry grass burning. Forest logging on mountian territories leads to erosion, changes in hydrological regime and habitat decrease for other animal species.

4. *Fires*, the most dangerous threat for biosphere reserve, causing a reduction of invertebrates' populations, environment degradation, soil changes, erosion, changes in the composition of plant associations and the reduction of juniper and other forests.

5. *Cold and snowy winters* happen 2-3 times in a decade, causing population decrease of many animal species.

6. *Atmosphere pollution by industrial enterprises.* Air pollution happens quite rarely in regional scale, caused by large chemical and energy factories of Chimkent and Taraz cities. For example, the last one was in 1989 in Chuuldak tract in South-West of the reserve due to accidental emissions of Chimkent phosphorous plant, with mass destruction of junipers, when their leaves dried out and fruits fell down.

7. *Accidental introduction of alien plant and animal species*. Ecologically illiterate resolutions of local authorities in 1950-60s let to accidental introduction of alien plant species (apricot, locust tree, yellow acacia, cherry-plum, smoke tree).

8. *Unsustainable use of biological resources*, mainly excessivle, uncontrolled cattle pasture and haymaking.

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?

Scientific research on the territory of biosphere reserve is carried out according to Perspective Thematic Plan for 2011-2015. The main goal of scientific research in Aksu-Zhabagly Biosphere Reserve is monitoring of condition and conservation of natural complexes, including further flora and fauna inventarization. All research is conducted taking into consideration ecologic-geographical, floristic and faunistic peculiarities, and also accounting for the objectives of the protected territories.

Another direction of the research is monitoring of rare and endangered species to clarify their population's condition, ecological peculiarities of rare animal and plant species, giving an opportunity of assess this species' conservation and restoration perspective. This direction includes research of rare and endangered bird species with evaluation of their populations' condition and ecological peculiarities, condition of Red Data Book and key species with passportization of habitat and reproduction. Current research includes Nature Chronicles, because this program is connected to all scientific theems. Besides scientific departments, the data for Nature Chronicles is also collected by all inspector staff.

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

Regular monitoring observations of the habitat will be conducted by state nature reserve's staff according to developed Perspective Research Plant for the period of up to 2015.

In the future monitoring of climatic, hydrological changes will also be continued by South Kazakhstan department of hydrometeorologic service.

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 Aksu-Zhabagly Biosphere Reserve's transition zone are most suitable for cattle breeding and for crop plantation. But due to anthropogenic impact some part of these lands is degraded or lost its original value to the present date. This is why Biosphere Reserve's organization at that territory will allow conducting effective activities for fallow land restoration and nature resources' use control. Besides, complex biodiversity conservation of the territory is tightly connected to the development of social-economic potential.

There are two main types of threats for biosphere reserve's territory:

1. Unsustainable use of natural resources (unsustainable fishing, hunting and agriculture)
2. Uncontrolled visiting of biosphere reserve

In this case the conception of Biosphere Reserve is aimed to improve life conditions of local people with simultaneous decrease of pressure on natural ecosystems by introducing alternative economic activity types, which are not harmful for biodiversity. Biosphere reserve's conditions give an opportunity to demonstrate practices of existing and potential biodiversity threats termination or decrease. These approaches may then be used in other regions with similar conditions.

To the present date with the support of GEF project on conservation of biodiversity of West Tien Shan several projects were realized on the territory of Aksu-Zhabagly Biosphere Reserve, aimed to introduce best practices in agriculture and development of ecotourism in this area.

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

Regular monitoring observations of the habitat will be conducted by state nature reserve's staff according to developed Perspective Research Plant for the period of up to 2015.

In the future monitoring of climatic, hydrological changes will also be continued by South Kazakhstan department of hydrometeorologic service.

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).

Tourism types practiced on the territory:

- *Study tourism*. Proximity to major cities: Shymkent, Taraz, and Almaty, as well as the capitals of the neighboring countries: Tashkent (Uzbekistan) and Bishkek (Kyrgyzstan), which are home to many tourist companies, defines a large number of tourists who would be interested with both natural and cultural heritage of West Tien-Shan.
- *Educational tourism*. Organized excursions for familiarization with Aksu-Zhabagly Biosphere Reserve's nature and historical monuments in its vicinity. Is often organized in universities, schools, and companies.
- Recreational tourism – family tourism or local weekend tourism – becomes more popular. People come and stay in local hotels and tourist bases in order to connect with nature. There are car, horse and walking routes for this goal.
- *Birdwatching*. Groups of tourists from abroad coming to see only birds of the given territory. This type has its peculiarities and specific demands for tour conduction.
- *Botanical tourism*, especially to see individual rare species of plants during their flowering or fruiting. This type of tourism is close to birdwatching. The most popular tours are dedicated to wild populations of flowering tulips.
- *Photo tourism.* In the last year there is an increasing number of tourists coming to take photos of wild nature, as well as national holidays and ethnic festivals.
- *Scientific tourism***,** especially on the territory of core and buffer zones, because only here natural ecosystems, flora and fauna, typical for the given natural zone as well as rare, are conserved in their original condition. The visitors are mostly researchers from local and foreign research institutions, as well as representatives of international conservation organizations.

There are 10 tourist routes and 2 ecological paths developed in the buffer zone of biosphere reserve. There also is a visit-center with museum of West Tien Shan nature, which is located in administrative building of Aksu-Zhabagly Nature Reserve. This is the base for educational, scientific tourism, birdwatching and familiarization tourism. There are two field scientific bases, which are also used for tourism. There are historically formed bivy sites, used by nature reserve's staff when visiting the territory, as well as by security service and scientific expeditions. These sites are located in proximity of field scientific bases of Kshi-Kaindy and Ulken-Kaindy and serve as resting sites for participants of ecological excursions and scientific expeditions. All tourist infrastructure objects are located in the transition zone of biosphere reserve.

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?

Currently, tourism is one of the most promising types of activities in Aksu- Zhabagly Biosphere Reserve. It has great potential for development, especially eco-tourism. In Zhabagly village near reserve's central office there is a private hotel for 40 people, offering foreign guests complete service with good level of comfort. In the immediate vicinity of the buffer zone's border there also are several guest houses and private hotels. On the territory of the transition zone of the reserve there is Sayramsu camping area in the valley of the same name, which offers a variety of outdoor activities in the mountains of West Tien Shan: rock climbing, horseback riding, etc. In the region of the reserve along the route Tashkent - Almaty a network of hotels , resorts and guest houses for tourists is being constructed. In the last 10-15 years the number of tourists visiting the reserve increases. In general, the visit-center of Aksu-Zhabagly biosphere reserve, equipped with a museum, is visited by more than 5,000 people a year, and more than 2,000 people a year stay in the reserve for educational and recreational purposes. Those are mainly naturalists (ornithologists and botanists), photographers, hikers and extreme tourism admirers.

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

a) The development of ecological routes and tourist infrastructure

• Development of ecological trails and routes with definition of optimal standards of recreational load and equipment depending on the type of ecotourism ;

• Construction of a mini-hotels, rest houses;

• 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-riding tourism;

• Development of national customs to show foreign tourists, including national cuisine, etc.

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 Aksu-Zhabagly Reserve administration. Local Akimats conduct annual ecological – tourist festivals, which attract local and, partly, foreign tourists. Local tour operators form groups of tourists both from other regions of Kazakhstan and from abroad. Aksu-Zhabagly Reserve's administration promotes organizaiton of tourist paths, routes, support field tourist infrastructure and attract 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)?

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 Aksu-Zhabagly reserve and local authorities, as well as by local tour operators. Infrastructure development will be realized mostly with state support (Aksu-Zhabagly Reserve and local authorities), and creation of the employment opportunities – by initiative of private companies (tour operators, local national and foreign companies).

Chuuldak juniper forest

Kshi Kaindy valley

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).

Major economical orientation of the region is agriculture. Agricultural activity is permitted in transition zone. Local population, both men and women, grow wheat and barley on the rainfed area; and forage (corn, clover, alfalfa) and technical (sunflower, safflower, tobacco) cultures on irrigated arable lands. Local people usually breed cattle (mainly Aulieatinskaya dairy-meat breed), sheep (South-Kazakh Merino), goats, horses (trotters and Don variety) and poultry (chicken and turkey).

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 include increase of employment and income of local population, development of infrastructure and application of modern agricultural technologies.

Negative factors and consequences of include:

1) Fires (deforestation, destruction of flora and fauna)
2) Uncontrolled trees and shrubs felling: disturbance of rivers hydrological regime, changes in local climatic conditions, animal habitat decrease
3) Cattle overpasture: soil and vegetation cover degradation. Negative influence on natural restoration of juniper forests
4) Land privatization and changes in their use (changes in traditional land use, loss of springs, difficulty with activities coordination, lack of state authority in the matter of land use)
5) Collection of fruits, berries, flowers, herbs and mushrooms (population decline, loss of genetic diversity)
6) Plowing (without keeping the rules of agrotechnics), resulting in soil degradation, erosion, changes in the population of plant communities

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. Irrigation systesm, built in early 1960s, have no facing, are overgrown with hard vegetation, more than 30% of consumed water is aimlessly used for transpiration and evaporation.

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?

Actions in biosphere reserve:

The following actions are carried out:

1. A voluntary group of 15 people (from the staff of the Reserve) was set up to fight fires in biosphere reserve and around it.

2. Environmental education. The main forms of environmental education in the reserve are tours on environmental trails in the protected zone, in the nature museum, lectures, publishing articles in the popular media. Environmental actions such as Parks March, ecological troops, etc. are conducted.

3. Research and monitoring of biosphere reserve. Research is carried out for five themes in accordance with the profile number of scientific staff. Scientific department collects data for Nature Chronicles (observations started in 1947) and for scientific research works.

4. Development of eco-tourism. Ten tourist routes and two walking routes are developed in the reserve.

Current goals of management in Aksu-Zhabagly Nature Reserve include:

1. Conservation and natural restoration of ecosystems in nature reserve and adjacent territories (protective zone);

2. Support of ecological balance in the region, study of natural development of natural complexes and their components;

3. Development of scientific bases for nature protection and sustainable nature use;

4. Ecological education.

Argynnis pandora

Parnassius mnemosinae

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 Shymkent city there are small private shops, cafe and restaurants. People living closer to the city prefer buying produce on city markets. Unfortunately, there is not enough work for local people and part of the population, especially youth, is forced to work in Shymkent and Taraz cities. 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?
Negative impacts include:

- Air pollution by industrial enterprises causing the negative influence on reserve's ecosystems
- Unorganized tourism sometimes makes fires in biosphere reserve
- Poaching, which reduces wildlife populations that go beyond the reserve (argali, wild boar, bear).
- River runoff regulation (in Koksai, Aksai, Zhabagly) resulting in hydrological regime disturbance in lower river parts and changes in plant and fish populations

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

Indicators are the following: level of air pollution by industrial enterprises of Shymkent and populations' condition and population numbers of key and indicator 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 in collaboration with state authority (Forestry and Hunting Committee under the Ministry of Agriculture of Kazakhstan) and «Snow Leopard Fund» a national plan for conservation of Snow Leopard in Kazakhstan was developed.
- Staff of biosphere reserve, including inspectors and security officers, is providing special protection of the territory. There are 19 employees, 16 of them are inspectors of the territory, one security chief and two specialists. One more person will be employed in order to improve protection activities.

In order to improve the protection of Zhabagly area will be one more security officer.

- For cultural and educational activities, and ecotourism a department of ecological education will be created consisting of two experts: for public relations and eco-tourism.

Benefits of economic activities to local people:

15. 5

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. As it was stated before, there will be new employment opportunities providing services to the visitors. 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.

Spiritual and cultural values and customary practices:

15. 6

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?

South Kazakhstan Region is famous for its historical memorials - burial mounds, ancient settlements, fortresses, mausoleums and ancient towns. Large historic-cultural centers appeared in this region. Unique archaeological sites were found near the biosphere reserve. In Karabastau area the remains of plants and animals which lived here about 140 million years ago (during the Jurassic period) were found. In 20-30 km away from Kazygurt mound there are historical monuments located in Ispidzhab (known today as Sairam): Sharaphana settlement (VI-XVI centuries), Turbat (XI-XIX centuries), Ismail-ata, Isakhan-ata, Ibragim-ata, Karashash-ana and Mariam-ana.

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.

In 2004-2006 program “Cultural heritage of South-Kazakhstan oblast” was established to safeguard and revitalize archeological and architectural monuments in this region. In the strategic plan of 2010-2014 the priority for South-Kazakhstan oblast is safeguarding, promoting and development of cultural- historic heritage.

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, in 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.

Canyon of Aksu River

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).

Scientific research of Biosphere Reserve's territory is carried out according to perspective thematic plan for 2011-2015. The main task of scientific research in Aksu-Zhabagly Biosphere Reserve is monitoring of condition and conservation of natural complexes, including further fauna and flora inventarization. All research is carried out taking into consideration ecologic-geographical, floristic and faunistic peculiarities, and also in accordance with the tasks of protected territories.

Rare and endangered species' monitoring is a separate direction of the research. It is necessary to clarify populations' condition, identify the peculiarities of rare animal and plant species' ecology, leading to an opportunity of evaluation of these species' conservation and restoration perspective. The ongoing research also includes Nature Chronicles, because this program is in close contacts with all scientific themes. Data collection for Nature Chronicles is carried out not only by scientific department staff, but also by all inspectors' staff.

According to the Perspective Thematic Plan of scientific research for the period of up to 2015, the following scientific themes are studied on the territory of biosphere reserve:

1. Ornithological monitoring. Includes evaluation of population dynamics of indicator bird species, registration of rare birds observations and analysis of their distribution on the territory, ornithophenological phenomena: migration of common and rare bird species, nesting phenology, wintering birds population number dynamics, ethological monitoring.

2. Monitoring of vegetation condition of Aksu-Zhabagly reserve. Research of peculiarities of vertical and horizontal structure of vegetation associations on stationary key sites of monitoring profiles; elucidation of floristic composition of the key sites; research of peculiarities in composition and distribution of meadow vegetation on the territory of Zhabagly river; studying plant phenology.

3. Research of hydrometeorologic conditions of Aksu-Zhabagly reserve. Includes activities of data collection and analysis of long-term hydrometeorologic data of nearest weather stations and hydro stations.

4. Fauna and monitoring of invertebrates populations condition of nature reserve and adjacent territories. Includes monitoring of indicator species populations' condition, continuation of faunistic research of invertebrates, study of ecology and biology of stinging hymenopterans of nature reserve and adjacent territories.

5. Modern condition of ungulate mammal populations of nature reserve. Study of modern distribution of ungulate mammals on the territory of nature reserve and adjacent territories, definition of the numbers and condition of mammal populations, study of mammal biology and ethology.

6. Modern condition of predatory mammals populationas in nature reserve. Study of modern distribution of predatory mammals on the territory of nature reserve and adjacent territories, definition of the numbers and condition of mammal populations, study of mammal biology and ethology.

7. Nature Chronicles' data collection.

In the present time monitoring of climatic, hydrological changes is carried out by South Kazakhstan branch of Kazakhstan Hydro-meteorological Service, and, in less extent, by nature reserve's staff on the cordones of the main and buffer zones of biosphere reserve.

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.]

From the moment of nature reserve's establishment in 1926 there was ongoing research of different directions: geological, soil, hydrological, botanical and zoological. Numerous research of flora, vegetation and fauna were conducted here, making a basis for environmental monitoring. From the middle of last century qualified zoologists, botanists and geographists constantly worked on the territory of biosphere reserve.

Regular observations of vegetation condition are ongoing on the territory of modern Aksu-Zhabagly State Nature Reserve, as well as studying population number and population condition of rare and model animal species (since the middle of 1930s). Since the middle of last century anthropogenic influence is registered (fires, violations of nature reserve regime, etc.), as well as monitoring the condition of the objects, conducted by scientific department's staff and security service of the reserve throughout the year. Some help in observations was given by corresponding scientific organizations and sometimes specialists from abroad.

• Biotic research and monitoring [flora, fauna]:

Monitoring and biological observations are carried out on the modern territory of Aksu-Zhabagly Biosphere Reserve in the limits of state scientific and practical programs of Kazakhstan scientific research institutes of the Academy of Science of KazakhSSR and USSR, and Ministry of Agriculture of KazakhSSR and USSR. They included monitoring of a) condition of fauna and flora of West Tien Shan, b) population of commercial, background and rare animal species (mammals, birds, fishes), c) the populations condition of rare and background plant species, d) hydrocoenoses condition, etc.

From 1950s monitoring was carried out here, continued now in the frames of “Nature Chronicles” and scientific themes of nature reserve. Main nature conservation indicators for monitoring include:

1. Birds fauna condition
2. Populations number of background and rare animal species (mammals, birds, fishes)
3. Populations condition of background and rare plant species
4. Major ecosystems’ condition
5. Phenological dates of seasonal events in life of animals and plants
6. Biodiversity and structure of plant communities

Besides, near biosphere reserve scientists conducted monitoring research of rare animal and plant species’ population number: countings of nesting birds on the routes and permanent observation sites, countings of populations of Wild Boar, Brown Bear, and large mammals, as well as annual phenological observations of animals and plants. Also, Epidemiological Station and regional anti-plague station conducted counting and monitoring of small mammals.

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

Social-economic research was regularly conducted by competent governmental local authorities (Executive Committees – in Soviet time, and Akimats – in the present) and corresponding governmental scientific organizations of

Kazakhstan, and also were carried out in 2000-2004 in the limits of GEF Project on biodiversity conservation of West Tien Shan.

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.

In order to realize scientific activity, biosphere reserve possesses:

1. Scientific station (in the main building of Nature Reserve)
2. Monitoring sites and routes
3. Vehicle (snowmobile – 4, quad bike – 3, 1 car «GAZ-SAZ 3507», 1 car «Chevrolet Niva»)
4. GPS – 10 devices
5. Radio communication equipment: stationary radio stations (16), mobile stations (2), car radio stations Kenwood (5), mobile radio stations Kenwood (53)
6. Optical devices: 4 microscopes, 30 binoculars, 4 optical tubes, 10 night vision devices
7. Photo and video equipment: video cameras (4), photo cameras (21)
8. Laboratory equipment (furniture, chemical reagents, instruments, electronic scales, etc.)
9. Field equipment (scientific – traps, bird nets, entomological killing jars, etc.; household – tents, sleeping bags, etc.)
10. Computers, programs, developed automated data base system, solar generator, photo-electrostation
11. Scientific library
12. Internet connection

Ursus arctos

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.

The measures of ecological education, conducted in Aksu-Zhabagly Biosphere Reserve, are the following:

1) *Work with mass media*. Goal: Propaganda of SPNA problems among the people. Target group – mass media journalists, etc. Key actions:

- Participation in mass media campaigns and briefings organization;
- Invitation of mass media to annual activities «Open doors day», ecological activity «Park March», festivals «Tulips», etc.
- Organize regular presentations of reserve’s staff in regional and local press and in other mass media types;
- Participate in social TV and radio shows (round table discussions, etc.).

2) Development of advertising - publishing activity. Goal: distribution of the information on SPNA and establishment of positive image of SPNA. Target group – broad audience. Key actions:

- Publishing advertisements with color images
- Creation of videoproduction

3) *Attraction and initiation of public unions and other NGO*. Goal: Attraction of NGO to ecotourism works’ organization. Target group – national and international NGO. Key actions:

- Create a community of Reserve’s friends for SPNA support and help in biodiversity conservation efforts;
- Establish collaboration with public organizations of environmental protection and ecological directions, working in the region.

4) *Ecological excursions and ecological education*. Goal: Opportunity to explore and touch the world of living nature. Target group - local adult population, local and foreign tourists, schoolchildren, students, etc. Key actions:

- Ecotourism concept development;
- Detailed inventory of existing routes and resources necessary for their development;
- Inventarization of necessary resources for existing routes' development;
- Evaluation of necessary investments in infrastructure's development of the existing routes;
- Ecological routes and trails' equipment;
- Description of every route (brochures' publication);
- Publications about tourist routes;
- Routes' advertisement for individual visitors and tour operators;

5) *Ecological festivals and activities*. Goal: Attracting people's attention to modern problems of nature protection. Target group - schoolchildren, students, local adult population, local and foreign tourists etc. Key actions:

- World Environmental Day;
- International Birds Day;
- Parks March;
- Tulips Day
- Childrens' ecological festivals.

6) *Work with schoolchildren*. Goal: establishment of system views of nature reserves as objects of national heritage; positive attitude to all nature's diversity, and widening ecological knowledge scope; establishment of practical ecological skills; raising interest of schoolchildren in nature protective activities by their participation in Reserve's practical activities. Target group – schoolchildren. Key actions:

- Lectures about unique value of SPNA for schoolchildren;
- Organization and conduction of the contests: photography, pictures, posters, theatre, crosswords, articles;
- Support of scintific research and works;
- Organizaiton of round tables and discussions among schoolchildren;
- Creation and organization of school teams' work;
- Introduction of school ecological programs;
- Field practice or excursions on SPNA territory;
- Children and youth ecological festivals, contests, conferences;
- Schoolchildren participation in ecological festivals and activities.

7) *Interaction with teachers and educational institutions.* Goal: Enforcement of ecological education effectiveness. Target group – teachers. Key actions:

- Organization of thematic seminars for teachers, first of all, for teachers of biology and geography;
- Participation in organization and conduction of professional development courses for teachers;
- Development of educational programs and projects with participation of teachers, and their realization;
- Provision of schools with reference and other special literature dedicated to the problems of nature protection, conservation of biological and landscape biodiversity and historic-cultural heritage, as well as demonstrational materials: photos, viedo, etc.
- Methodic consultations for teachers;
- Help in equipment of thematic classrooms;
- Round table organization dedicated to modern problems of ecological education of children;
- Development and realization of collaborative projects and activities.

8) *Qualification increase of eco-education department's staff*. Goal: Increase effectivenes of eco-education department's work. Target group – reserve's staff. Key actions:

- Educational seminars, trainings;
- Experience exchange with other SPNA, internships in the best domestic and foreign nature reserves;
- Analysis of foreign experience;
- Improvement and constant renewal of methodic base;
- Promotion of further graduate education of staff.

9) *Improvement of material-technical base of eco-education department*. Goal: Effectiveness increase of eco-education department's work. Target group – reserve's staff. Key actions:

- Purchase of equipment.

10) *Work on the development of Visit-center of the Reserve*. Goal: Creation of the base for active ecologic educational work with local population and SPNA visitors. Target group - schoolchildren, students, local adult population, local and foreign tourists, etc. Key actions:

- Provide renewal of expositions;
- Attract potential sponsors for Visit-center construction;
- Provide scientific support of the cetner;
- For nature protection ideas' propaganda among broad audience to organize exhibitions: stationary (photos), temporary (children's paintings, etc.) and mobile.

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

In the main core zone, on 15 cordones and 2 field stations there are conditions for overnight staying or temporary living of SPNA scientific staff, as well as for visiting scientists.

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?

On the national level collaboration is established with Korgalzhyn and Alakol Biosphere Reserves. At the same time Aksu-Zhabagly Biosphere Reserve has very close scientific and organizational connections with other state nature reserves of Kazakhstan, which in the future may also obtain the status of biosphere reserves. On the regional level (Central Asia) it is possible to collaborate with 4 biosphere reserves, such as Sary-Chelek and Issyk-Kul in Kyrgyzstan, Repetek in Turkmenistan and Chatkal in Uzbekistan. In 2010 administrations of these reserves participated in a workshop in Almaty and duscussed the ways to collaborate at the regional level. In 2011 Kazakhstan became a member of Eastern Asian (EABRN) and South-Asian – Centreal-Asian (SACAM) networks of biosphere reserves, which allows close contacts' establishment with the nearest biosphere reserves of Russia, Iran, Pakistan, India, China, Mongolia, Korea and Japan.

The Aksu-Zhabagly Biosphere Reserve is contributing to the World Network of Biosphere Reserves, its Regional and Thematic Networks by:

- Contribution to the sustainable management of Biosphere Reserve ecosystems
- Provide a regional and international framework for dialogue and cooperation for developing biosphere reserves management policies;
- Promote the conservation of biological diversity through the sustainable management, restoration and rehabilitation of various ecosystems;
- Strengthened relations and partnerships between MAB National Committees, administrative authorities and technical structures of the countries concerned
- The promotion of relations with other regional network ;
- The promotion and support of efforts aimed at creating, managing and monitoring biosphere reserves.

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

International collaboration is aimed for exchange of experience and current information, introduction of best practices of nature protection and sustainable development.

Expected benefits of international cooperation for the biosphere reserve:

- Promote the implementation of the MAB Programme for sustainable development in Kazakhstan;
- Promote the implementation of national and regional policies for the sustainable use of Biosphere Reserves eco-systems in Central Asia;
- Create greater awareness on ecological, cultural, recreational, scientific and social values of Biosphere Reserves in Kazakhstan, especially with regard to policy makers, local communities and other stakeholders ;
- Participate in building institutional capacities in Kazakhstan and Central Asia in order to face the challenges of conservation and long-term use of Biosphere Reserves ecosystems

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

Aksu-Zhabagly Biosphere Reserve collaborates with several national and local TV companies (Khabar, Bilim, KTK) and some periodical press (magazines and newspapers), where articles about the national park regularly appear.

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

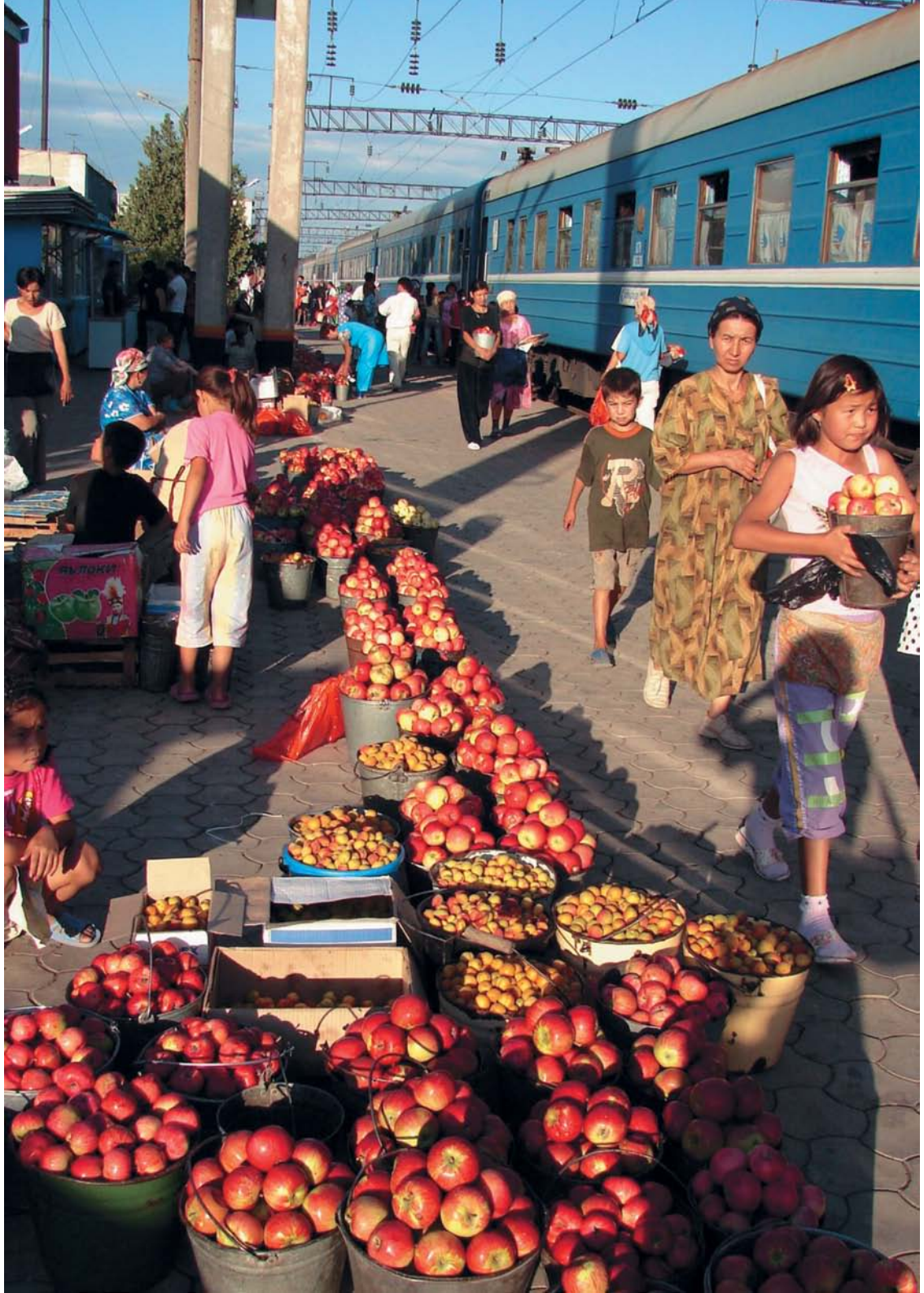
http://www.aksu-jabagly.kz/, http://www.aksu-zhabagly.com/

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

At the present time there is no electronic newsletter of Aksu-Zhabagly Biosphere Reserve, but it is planned to create biosphere reserve's newsletter.

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

No



Malus sieversii

Tulipa greigii

17. 1

17. GOVERNANCE, BIOSPHERE RESERVE MANAGEMENT AND COORDINATION:

Management and coordination structure:

The Committee for Forestry and Hunting of the Ministry of Environment Protection ensures for the State Nature Reserve Aksu-Zhabagly.

1. Core area – lands of the Aksu-Zhabagly State Nature Reserve
2. Buffer area – lands of the Aksu-Zhabagly State Nature Reserve
3. Transition area – agricultural and stock lands

17.1.1 What is the legal status of the biosphere reserve?

Aksu-Zhabagly Biosphere Reserve is being created on the basis of Aksu-Zhabagly State Nature Reserve, all neccessary powers for strict nature reserve regime provision in the core zone and protection regime in the buffer zone are in accordance with Article 50 of the Law of RK «About SPNA».

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

1. Core zone – territory of Aksu-Zhabagly State Nature Reserve

2. Buffer zone – a two-kilometer stripe of the land embracing the perimeter of the core zone of biosphere reserve. Buffer zone includes the lands of nature reserve's protection zone and consists of the lands of agricultural use and reserved lands. Part of agricultural lands is used for pastures and haymaking in accorodance with governmental authorized body and under the control of administration of Aksu-Zhabagly State Nature Reserve.

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

Main zone's territory is in state possession (national property) and administered by authorized state body –

Forestry and Hunting Committee under the Ministry of Agriculture of Kazakhstan. Main zone's territory is managed by Aksu-Zhabagly State Nature Reserve.

Buffer zone lands are national (state) property and consist of agriculture and reserve lands. Agricultural lands are used by farmers. Inconsiderable part of buffer zone is in private possession of peasant farms, but 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 Agriculture of Kazakhstan. As a whole, the territory of buffer zone is controlled by Aksu-Zhabagly State Nature Reserve.

The territory of transition zone is divided between different owners. Most part of the lands is state property and is administered by district/regional Akimats, including lands of state reserve, agricultural lands, settlements and governmental institutions. The rest of the territory is owned by private organizations – joint-stock companies and limited liability companies, and peasant farms.

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.

Aksu-Zhabagly State Nature Reserve is management body for the core and buffer zones of biosphere reserve.

Akimats of Tulkibas, Tole Bi, Baydibek districts of South Kazakhstan oblast and Zhualy district of Zhambyl oblast are management bodies 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.

Core area(s):

Main zone's territory is in state possession (national property) and administered by authorized state body – Forestry and Hunting Committee of Ministry of Agriculture of Kazakhstan. Main zone territory is managed by Aksu-Zhabagly State Nature Reserve.

Buffer zone(s):

Buffer zone lands are national (state) property and consist of agriculture and reserve lands. Agricultural lands are used by farmers. Inconsiderable part of buffer zone is in private possession of peasant farms, but land use for pasture and hayfields is controlled by nature reserve's administration. Buffer zone is administered by authorized state body – For-

estry and Hunting Committee of Ministry of Agriculture of Kazakhstan. As a whole, the territory of buffer zone is controlled by Aksu-Zhabagly State Nature Reserve.

Transition area(s):

The territory of transition zone is divided between different owners. Most part of the lands is state property and is administered by district/regional Akimats, including lands of state reserve, agricultural lands, settlements and governmental institutions. The rest of the territory is owned by private organizations – joint-stock companies and limited liability companies, and peasant farms.

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 Aksu-ZhabaglyState Nature Reserve 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). 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 managment is conducted through *Coordinational Council of Aksu-Zhabagly Biosphere Reserve.* This organ is a coordinational 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. Coordinational Council consists of representatives of Aksu-Zhabagly State Nature Reserve, local NGO and land users, administration of Tulkibas, Tole Bi, Baydibek districts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast, state agencies (territorial office of forestry and hunting and territorial office of fishery). Coordinational Council was formed in 2012 on the basis of Scientificw-technical Council of Aksu-Zhabagly nature reserve.

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 goal of Coordinational Council of biosphere reserve is introduction of the policy of effective management and resources' sustainable use, introduction of alternative activity types, resource-conserving and resource-renewing technologies. The members of the Council include director of Aksu-Zhabagly State Nature Reserve and his deputies, representatives of Akimats (Tulkibas, Tole Bi, Baydibek districts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast), representatives of Association of Hunters and Fishermen of Zhambyl and South-Kazakhstan oblasts, territorial office of forestry and hunting and territorial office of fishery.

- 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.

At present, conflicts between local people and biosphere reserve sometimes happen due to no permanent border between buffer and transition zones. These conflicts regarding the access and use of natural resources, such as plowing land by farmers (in Aksu Canyon), the illegal mowing, picking berries, mushrooms and cattle pasture. The biosphere reserve is taking into account that conflicts and zonation of territory will prevent such conflicts.

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.

17. 3 Representation, participation and consultation of local communities:

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.

Local communities 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. Management plan of biosphere reserve includes the involvement of local people by using natural resources in a sustainable way, development of ecotourism and environmental education.

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 authorities, local NGO or directly as its members. All Councils members have equal rights in decision-making voting.

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. Development of ten tourists and two walking routes was done with participation of local youth from surrounding villages. In the last several years undergraduate and graduate students of Kazakhstan universities carried out their scientific work on the territory of biosphere reserve.

Biosphere reserve gives an opportunity to realize youth potential in this direction. In the present time the question of representativenes of youth organization in Coordinational Council of biosphere reserve is solved, giving young people an opportunity to take part in managing the reserve.

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 Palace of Schoolchildren and Students of Zhambyl and Shymkent cities.

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?

Consultational mechanisms work on the basis of expert groups, created for solving the problems during the work of special projects. In the last 10 years several consultation works on reserve's management, nature reserve staff's training, recommendations on region's biodiversity improvement were given in the frames of GEF project on conservation of biodiversity of West Tien Shan and GEF/UNDP Wetlands Project, with participation of "Zapovedniki" ecocenter (Russia). Stakeholders' attraction plays key role in reserve's work support.

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)?

All materials from GEF project "Conservation of biodiversity of West Tien Shan" (2000-2006) were used for compilation of national nomination to UNESCO.

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 Aksu-Zhabagly 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.

Tulipa greigii

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 time Integrated Management Plan of Biosphere reserve represents simple composition of Management Plan of Aksu-Zhabagly State Nature Reserve, which is directed for the main and buffer zones of Biosphere Reserve development, and management plans of other nature users. Special Management Plan for Biosphere Reserve territory is not developed, there is not need for it at the present stage of Biosphere Reserve development. Nature users of protected and transition zones have their own management plans and all controversial issues are solved at the Coordinational Council of Biosphere Reserve sessions.

Generally, management of Biosphere Reserve is conducted through Coordinational Council of Aksu-Zhabagly Biosphere Reserve, which is a coordinational management organ created to promote sustainable resources use policy, provide collaboration and overcome contradiciton between state nature reserve and local people.

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 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. For example, recommendations of public organizations about ecologic educational programs

and nature conservation ideas' agitation campaigns among local people were taken into consideration and put in the Management Plan.

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

According to the legislation, a Management Plan is developed for five year period. After that the results of its implementation are analyzed and new Management Plan is created taking into consideration positive and negative experiences of previous plan's realization. Further changes in the Management Plan are possible, but these changes must be approved by the authorized body – Forestry and Hunting Committee under the Ministry of Environmental Protection of RK.

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 along with list of contents and illustrations is given in the Appendix. It consists of introduction and 24 chapters, gathered in three main parts: 1) status and peculiarities of nature reserve, 2) evaluation of current condition and overall conclusions, 3) management plan's realization mechanism. Tables, maps and other materials are given in the Appendices to the Management Plan. This is why the Management Plan contains as detailed analysis of the condition and importance of the reserve, as detailed action plan for five years. For example, the second part (evaluation of current condition) in Chapter 13 gives assessment of labor resources, and Chapter 14 presents analysis of the main threats and management problems.

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?

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.

Authorized management coordination organ of biosphere reserve is *Coordinational Council of Aksu-Zhabagly Biosphere Reserve.* This organ is coordinational collegial public body and is created for introduction of effective management and sustainable resource use policies, introduction of alternative acitivity types, resource-conserving and resource-renewable technologies. Coordinational Council consists of representatives from Aksu-Zhabagly State Nature Reserve, local nature users and public organizations, administration of Tulkibas, Tole Bi, Baydibek districts of South-Kazakhstan oblast and Zhualy district of Zhambyl oblast, regional territorial Department of Fishing and regional Association of Hunters and Fishermen. Coordinational Council was organized in 2012 on the basis of extended *Scientific – Technical Council of Aksu-Zhabagly Nature Reserve*.

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

The main risk factors for Plan's implementation are:

1) low financial budget of reserve and low salary of staff,

2) security inspectors staff turnover,

3) the absence of effective methods to control the Southern part of biosphere reserve (there is no cordone in Maidantal area to protect it, especially in winter –spring time),

4) Absence of professional development courses, training, participation in seminars and scientific conferences, experience exchange. Scientific potential is decreased by absence of professional development, especially in the area of modern research methods, data collection and analysis in GIS systems, experience exchange with other nature reserves.

Positive factors for Management Plan's implementation include favorable attitude of local people towards biosphere reserve, quite high educational level of local population and nature conservation activity of local 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?

Aquila nipalensis

Biosphere reserve in 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 Aksu-Zhabagly State Nature Reserve). Approximate annual budget in Kazakhstan tenge is about 80,000,000 tenge.

17. 5 Conclusions:

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 are guaranteed by the legislation of Kazakhstan, favourable attitude of local and large industrial and agricultural companies in 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.

Juno orchoides

Agapanthia soror

SPECIAL DESIGNATIONS: 18.

[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
( ) RAMSAR Wetland Convention Site
( ) Other international/regional conservation conventions/directives (specify)
(√) Long term monitoring site (specify)

Since 1933, with the establishment of the first weather station in Tyulkibas village, the meteorological and hydrological monitoring is actively operating. Monitoring of natural systems and biodiversity started in 1926 and continues in the scientific topics of the reserve, including monitoring of vegetation on monitoring sites, population number and condition of rare and model species of birds and mammals, as well as records of human impact (fires, various violations of the protected regime, etc.).

(√) Long Term Ecological Research (LTER site)
( ) Other (specify)

SUPPORTING DOCUMENTS 19.


ТУРАКТЫ ЖЕР ПАЙДАЛАНУ
ҚҰҚЫҒЫН БЕРЕТІН
АКТ
НА ПРАВО ПОСТОЯННОГО
ЗЕМЛЕПОЛЬЗОВАНИЯ
ПОСТАНОВЛЕНИЕ
ҚАУЛЫСЫ
ПОСТАНОВЛЕНИЕ
ҚАУЛЫ
ПОСТАНОВЛЕНИЕ
ҚАУЛЫСЫ
ПОСТАНОВЛЕНИЕ

МИНИСТЕРСТВО ЮСТИЦИИ РЕСПУБЛИКИ КАЗАХСТАН

Департамент юстиции Южно-Казахстанской области
Управление юстиции Тюлькубасского района

СВИДЕТЕЛЬСТВО
О государственной перерегистрации юридического лица

-1958-15-ГУ
регистрационный номер
050240007308
бизнес – индентификационный номер

село Т.Рыскулова «20» февраля 2009 г.

Наименование юридического лица:
Государственное учреждение
«Аксу-Жабаглинский государственный природный заповедник» Комитета лесного и охотничьего хозяйства Министерства сельского хозяйства Республики Казахстан

Местонахождение юридического лица: 161340, ЮКО, Тюлькубасский район, с.Жабаглы, ул. Абая, 34
Дата первичной государственной регистрации: 19.09.2005 г.

СВИДЕТЕЛЬСТВО ДАЕТ ПРАВО ОСУЩЕСТВЛЯТЬ ДЕЯТЕЛЬНОСТЬ В СООТВЕТСТВИИ С УЧРЕДИТЕЛЬНЫМИ ДОКУМЕНТАМИ В РАМКАХ ЗАКОНОДАТЕЛЬСТВА РЕСПУБЛИКИ КАЗАХСТАН

Начальник управления юстиции З. Тюмебаев

Серия В № 0373944

Жер учаскелерінің бетен меншік иелері және жер пайдаланушылары
Посторонние собственники земельных участков и землепользователи

Жер учаскелерінің бетен меншік иелері және жер пайдаланушылардың атауы Наименование собственников земельных участков и землепользователей	Көлемі, гектар Площадь га

Осы акт жер учаскесіне меншік құқығын (уақытша жер пайдалану құқығын беретін актіні жазылған Кітапта № 2475 болып жазылды.

қосымша: жоқ

Данного акта произведена в Книге записей актов на земельный участок, право постоянного

Приложение: нет

Тюлькубасского районного отдела по управлению территориального управления по управлению земельными ресурсами Южно-Казахстанского областного земельными ресурсами:

(қолы, подпись) К.Мұратбеков

26 11 2005 ж.

Жер учаскесінің құқығын тіркеу туралы белгісі
Отметка о регистрации права на

ОБЛЖЕРКОМ № 0001668

ТҰРАҚТЫ ЖЕР ПАЙДАЛАНУ ҚҰҚЫҒЫН БЕРЕТІН

АКТ

НА ПРАВО ПОСТОЯННОГО ЗЕМЛЕПОЛЬЗОВАНИЯ

Приложение к постановлению Правительства Республики Казахстан от « 17 » ноября 2005 года № 1130

Экспликация земель, предоставляемых в постоянное землепользование государственному учреждению «Аксу-Жабаглинский государственный природный заповедник» Комитета лесного и охотничьего хозяйства Министерства сельского хозяйства Республики Казахстан

№ п/п	Категория земель и сельскохозяйственные угодья	Площадь, га
1.	Тюлькубасский район Южно-Казахстанской области Земли запаса, пастбища	1000,0
2.	Толебийский район Южно-Казахстанской области Земли запаса (участок Майдантал), пастбища	45882,3
	Всего	46882,3

ОҢТҮСТІК ҚАЗАҚСТАН ОБЛЫСЫНЫҢ ӘДІЛЕТ ДЕПАРТАМЕНТІ
БӘЙДІБЕК АУДАНЫНЫҢ ӘДІЛЕТ БАСҚАРМАСЫ

Өтініш № 0310 1827 Төркіу ісі № 286:001:139

Кадастр № 19:286:001:139 Тіркелген күні 11.05.2007

Тіркеуші (маман) Пірназаров Ж.С. Қолы

Басшы Жалдыбаев Қ.Ә. Қолы

ҚАЗАҚСТАН РЕСПУБЛИКАСЫ ҮКІМЕТІНІҢ ҚАУЛЫСЫ

ПОСТАНОВЛЕНИЕ ПРАВИТЕЛЬСТВА РЕСПУБЛИКИ КАЗАХСТАН

2005 жылғы 17 қарашада Астана, Үкімет үйі от «__» ____ 200 года

№ 1130 № ____

Қазақстан Республикасының Ауыл шаруашылығы министрлігі

Қазақстан Республикасы Ауыл шаруашылығы министрлігі Орман және аңшылық шаруашылығы комитетінің «Аксу-Жабағылы мемлекеттік табиғи қорығы» мемлекеттік мекемесіне тұрақты жер пайдалануға жер учаскелерін беру туралы

Ұяттық және халықаралық маңызы бар Батыс Тянь-Шаньнің біреуі табиғи объектілері ретінде Оңтүстік Қазақстан облысының флорасы мен фаунасының бағалы түрлерін сақтау мақсатында және «Шекте қорғалатын табиғи аумақтар туралы» Қазақстан Республикасының 1997 жылғы 15 шілдедегі Заңына сәйкес Қазақстан Республикасының Үкіметі ҚАУЛЫ ЕТЕДІ:

1. Қосымшаға сәйкес Оңтүстік Қазақстан облысы Тұлкібас және Толе би аудандарының жер қоры санатынан жалпы алаңы 46882,3 гектар жер учаскесі алып қойылсын және олар тұрақты жер пайдалануға Қазақстан Республикасы Ауыл шаруашылығы министрлігі Орман және аңшылық шаруашылығы комитетінің «Аксу-Жабағылы мемлекеттік табиғи қорығы» мемлекеттік мекемесіне (бұдан әрі – мекеме) берілсін.

2. Осы қаулының 1-тармағында көрсетілген жер учаскелері жер қорының ерекше қорғалатын табиғи аумақтардың жерлері санатына ауыстырылсын.

3. Қазақстан Республикасы Жер ресурстарын басқару агенттігі Қазақстан Республикасы Ауыл шаруашылығы министрлігінің Орман және аңшылық шаруашылығы комитетімен бірлесіп, заңнамада белгіленген тәртіппен жерлерінің жерде мекеме жерінің шекарасын белгілесін.

4. Оңтүстік Қазақстан облысының әкімі қүзет аймағының шегінде бұл аумақтардың экологиялық [illegible] жай-күйіне және оларды қалпына келтіруге теріс әсер ететін [illegible] қызметке тыйым сала отырып, мекеме жерінің төңірегінде [illegible]

5. Осы қаулы [illegible] қолданысқа енгізіледі.

Қазақстан Республикасының Премьер-Министрі Д. Ахметов

Charadrius dubius

20. ADDRESSES

20. 1 Contact address of the proposed biosphere reserve:

Name: Aksu-Zhabagly Biosphere Reserve
Street or P.O. Box: 34 Abai Str.
City with postal code: Zhabagly Village, Tyulkubas district, South-Kazakhstan Oblast, 131610
Country: Kazakhstan
Telephone: +7 (725) 385 5633 / +7 (725) 385 5565
Telefax (or telex): +7 (725) 385 5565
E-mail: menlibekov@mail.ru
Web site: http://www.aksu-jabagly.kz/

20. 2 Administering entity of the core area(s):

Name: Aksu-Zhabagly Biosphere Reserve
Street or P.O. Box: 34 Abai Str.
City with postal code: Zhabagly Village, Tyulkubas district, South-Kazakhstan Oblast, 131610
Country: Kazakhstan
Telephone: +7 (725) 385 5633 / +7 (725) 385 5565
Telefax (or telex): +7 (725) 385 5565
E-mail: menlibekov@mail.ru
Web site: http://www.aksu-jabagly.kz/

Administering entity of the buffer zone:

20. 3

Name: Aksu-Zhabagly Biosphere Reserve
Street or P.O. Box: 34 Abai Str.
City with postal code: Zhabagly Village, Tyulkubas district, South-Kazakhstan Oblast, 131610
Country: Kazakhstan
Telephone: +7 (725) 385 5633 / +7 (725) 385 5565
Telefax (or telex): +7 (725) 385 5565
E-mail: menlibekov@mail.ru
Web site: http://www.aksu-jabagly.kz/

Administering entity of the transition area(s):

20. 4

Name: Aksu-Zhabagly Biosphere Reserve
Street or P.O. Box: 34 Abai Str.
City with postal code: Zhabagly Village, Tyulkubas district, South-Kazakhstan Oblast, 131610
Country: Kazakhstan
Telephone: +7 (725) 385 5633 / +7 (725) 385 5565
Telefax (or telex): +7 (725) 385 5565
E-mail: menlibekov@mail.ru
Web site: http://www.aksu-jabagly.kz/

Annex I to the Biosphere Reserve Nomination Form, January 2013
MABnet Directory of Biosphere Reserves
Biosphere Reserve Description

Administrative details

Country: Kazakhstan
Name of BR: Aksu-Zhabagly
Year designated: (to be completed by MAB Secretariat)
Administrative authorities: Aksu-Zhabagly State Nature Reserve
Name Contact: Coordination Council
Contact address: 34 Abai Str., Zhabagly Village, Tyulkubas district, South-Kazakhstan Oblast, 131610 Kazakhstan
Related links (web sites): http://www.aksu-jabagly.kz/, http://iucnca.net/reserve108 or http://www.fhc.kz/forest/25/3924/

Description

Aksu-Zhabagly biosphere reserve occupies North-Western edge of Talasskiy Alatau with its latitudinally stretched Western, partly Northern ridges and adjacent North-Eastern slopes of the main Ugam ridge. Total area of Aksu-Zhabagly Biosphere Reserve is 357,734 ha, including 225 ha of two paleontologic sites (Auliye and Karabastau) located 120 km North-Western of the main territory in Karatau ridges. Aksu-Zhabagly is located on the territory of 4 districts of 2 oblasts in the most densely populated region of Kazakhstan with total population number of about three million people. About 150,000 people inhabit transition zone. The main economic direction of local population's development is agriculture – plant growing and cattle breeding. In the last 10 years ecological tourism became very popular in the transition zone of biosphere reserve, caused mainly by ornithological and botanical foreign tourism, as well as local recreational tourism. There are various sites of ancient cattlemen, as well as monuments of Bronze and Early Iron Age in the nearest proximity of biosphere reserve. Nearest large cities are Chimkent and Taraz – oblast capitals of South Kazakhstan and Zhambyl oblasts.

Aksu-Zhabagly is not a cluster reserve and is represented by one whole territory and two paleontological sites. The main core zone (131,934 ha) is strictly protected zone of Aksu-Zhabagly State Nature Reserve. The buffer zone (25,800 ha) is a 2-km land stripe along the perimeter of the core zone consisting of agricultural and reserved lands; part of it is used for pastures and hayfields by agreement and under control of Aksu-Zhabagly administration. Transition zone (200,000 ha) consists of agricultural and state reserved lands, and settlements.

The main title documents are Certificate of state re-registration of legal body # 77-1958-15-ГУ as of 20 February 2009, Regulations of the government institution approved by Order #33 of the Forestry and Hunting Committee under the

Ministry of Agriculture of the Republic of Kazakhstan as of 21 February 2010, as well as 17 state acts on the ownership of land.

Major ecosystem type: Highland nival level, alpine level, sub-alpine level, middle mountain level of meadow-steppe juniper sparse forests, shrubs and shrub semi-savannas; lowland level of shrub large grass, partly steppe semi-savannas.

Major habitats & land cover types: Mid-mountain ecosystems of standing juniper sparse forests / pastures (regional); Mid-mountain ecosystems of medium grass meadows / pastures (regional); middle-low mountain ecosystems of savannoids / agricultural lands (regional)

Location (latitude & longitude)**: N** 42º20′ / E 70º40′, North border - N 42º43′/ E 70º39′, South - N 40º56’/ E 70º34′, West – N 42º28′/E 70º04′ and East - N 42º43′/71º03′.

Area (ha):
Total Area (ha): (7) 357 734 ha
Core area(s): 131 934 ha
Buffer zone(s): 25 800 ha
Transition area(s) (when given): 200 000 ha
Different existing zonation: (7.4)
Altitudinal range (metres above sea level): (11.2) from 1000 m to 4236 m.
Zonation map(s): (6.2)

Main objectives of the biosphere reserve

Brief description (13.1)

The main purpose of Aksu-Zhabagly biosphere reserve is to preserve typical, rare and unique of nature of West Tien Shan and their components, as well as to support sustainable socio-economic development of the territory on the basis of principle of ecological and economic use of natural resources.

The long-term goal of Biosphere Reserve is integrated sustainable management of the territory with simultaneous development of local social-economic potential, providing lifestyle level increase for local population.

Research

Brief description (16.1.1)

Scientific work on biosphere reserve's territory is conducted according to the Perspective Thematic Plan for 2011-2015. The main goal of scientific research in Aksu-Zhabagly State Nature Reserve is monitoring of condition and conservation of natural complexes, including further inventarization of fauna and flora. All research is conducted taking into consideration ecologic-geographical, floristic and faunistic peculiarities, and accounting for the objectives of the protected territories.

Monitoring

Brief description (16.1.1)

In the present time the monitoring of climatic, hydrological changes is carried out by South Kazakhstan department of Kazakhstan Hydro-meteorological Service, and also, to a less extent, by nature reserve's staff on the cordones of the main and buffer zones of biosphere reserve.

Capra sibirica

Circaetus gallicus with snake

Specific variables (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/Paleoecology	X
		Fauna	
		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 rainforest 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	
		Wildlife	

Socio-economic		Integrated monitoring	
Agriculture/Other production systems	X	Biogeochemical studies	X
Agroforestry		Carrying capacity	
Anthropological studies	X	Climate change	
Aquaculture		Conflict analysis/resolution	X
Archaeology	X	Ecosystem approach	X
Bioprospecting		Education and public awareness	X
Capacity building	X	Environmental changes	X
Cottage (home-based) industry		Geographic Information System (GIS)	X
Cultural aspects	X	Impact and risk studies	X
Demography	X	Indicators	X
Economic studies	X	Indicators of environmental quality	X
Economically important species	X	Infrastructure development	
Energy production systems		Institutional and legal aspects	X
Ethnology/traditional practices/knowledge	X	Integrated studies	X
Firewood cutting		Interdisciplinary studies	X
Fishery		Land tenure	X
Forestry	X	Land use/Land cover	X
Human health		Landscape inventorying/monitoring	X
Human migration	X	Management issues	X
Hunting	X	Mapping	
Indicators	X	Modelling	X
Indicators of sustainability	X	Monitoring/methodologies	X
Indigenous people’s issues		Planning and zoning measures	
Industry		Policy issues	X
Livelihood measures	X	Remote sensing	X
Livestock and related impacts	X	Rural systems	X

Local participation	X	Sustainable development/use	X
Micro-credits		Transboundary issues/measures	
Mining		Urban systems	X
Modelling		Watershed studies/monitoring	
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	X		

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Coracias garrulus

THE LIST OF SPECIES OF AKSU-ZHABAGLY BIOSPHERE RESERVE

THE LIST OF THE MAIN ECONOMIC SPECIES OF PLANTS

Aksu-Zhabagly Biosphere Reserve

I. Fodder

Alopecurus pratensis

Bromopsis inermis

Dactylis glomerata

Elytrigia trichophora

Hordeum bulbosum

Festuca valesiaca

F.kryloviana

Phleum phleoides

Poa bulbosa

P. pratensis

P. nemoralis

P. relaxa

Stipa kirghisorum

S. capillata

Medicago tianschanica

Oxytropis aulieatensis

O. talassica

Onobrychis grandis

Vicia tenuifolia

Trifolium preatense

Hedysarum talassicum

Ferula tenuisecta

Geranium collinum

G. saxatile

Cousinia umbrosa

Scorzonera franchetii

S. turkestanica

Hieracium procerum

Carex turcestanica

C. melanostachya

II. Food and vitamin

Allium pskemense

A.longicuspis

A.fedtschenkoanum

Korolkowia sewerzowii

Oxyria digyna

Megacarpaea orbiculata

Berberis oblonga

Ribes meyerii

Rubus caesius

Malus sieversii

Crataegus turkestanica

C.songorica

C.korolkowii

Rosa alberti

R.fedschenkoana

R.beggerana

Carum carvi

Hippophae rhamnoides

III. Medicine

Ephedra equisetina

Equisetum arvense

Betula pendula

Elytrigia repens

Urtica dioica

Ungernia sewerzowii

Delphinium confusum

Thalictrum simplex

Th.minus

Sanguisorba officinalis

Rhamnus catharica

Melilotus officinalis

Hypericum perforatum

H.scabrum

Plantago major

P.lanceolata

Chamerion angustifolium

Leonurus turkestanicus

Lamium album

Ziziphora bungeana

Betonica foliosa

Origanum tyttanthum

Codonopsis clematidea

Achillea millefolium

Cichorium intybus

Helychrisum maracandicum

Inula macrophylla

Artemisia absinthium

Tussilago farfara

V. Technical (tannins, saponin, of rubber, dyeing and glue)

Allochrusa gypsophiloides

Eremurus regelii

E.lactiflorus

Polygonum coriarium

P.bucharicum

P.nitens

P.hissaricum

Rheum maximoviczii

Rumex tianschanicus

Sanguisorba alpina

S.officinalis

Orthurus kokanicus

Geranium collinum

Macrotomia ugamensis

M.euchroma

Delphinium semibarbatum

D.longipedunculatum

Roemeria refracta

Chondrilla canescens

Ch.leiosperma

V. Aromatic

Juniperus seravschanica

J.semiglobosa

J.turkestanica

Ferula penninervis

F. tenuisecta

Prangos pabularia

Mediasia macrophylla

Dracocephalum integrifolium

D.komarovii

Mentha asiatica

Salvia sclarea

Ziziphora bungeana

Z.clinopodioides

Z.pamiroalaica

Thymus dmitrievae

Th.karatavicus

Th.seravschanicus

Lophanthus tschimganicus

Nepeta mariae

N.pannonica

Achillea filipendulina

A.biebersteinii

Tanacetum pseudachillea

Artemisia persica

A.rutifolia

A.santolinifolia

A.juncea

A.dracunculus

VI. Decorative

Juniperus seravschanica

J.semiglobosa

J.turkestanica

Amygdalus petunnikovii

Betula talassica

Sorbus persica

Lonicera nummularifolia

L.microphylla

Spiraea hypericifolia

S.pilosa

Allium sewerzowii

A.coeruleum

A.karataviense

A.oreophilum

A.barczewskii

Tulipa greigii

T.kaufmanniana

T.turkestanica

Eremurus lactiflorus

Korolkowia sewerzowii

Juno coerulea

J.orchioides

Iris korolkowii

Iridodyctium kolpakowskianum

Crocus alatavicus

Trollius asiaticus

Anemone protracta

Dianthus hoeltzerii

D.karataviensis

Delphinium confusum

D.oreophilum

Paraquilegia grandiflora

Primula minwitziae

P.algida

Cortusa turkectanica

Campanula alberti

Scabiosa songorica

Veronica spuria

V.laeta

Viola suavis

V.ambigua

V.rupestris

THE LIST OF SPECIES INSERTED IN RED DATA BOOK OF KAZAKHSTAN
AKSU-ZHABAGLY BIOSPHERE RESERVE

Type CHORDATA - ХОРДОВЫЕ

subtype VERTEBRATA – ПОЗВОНОЧНЫЕ

Class**AMPHIBIA - ЗЕМНОВОДНЫЕ**

Order ANURA - БЕСХВОСТЫЕ

Family **Bufonidae** - Жабы

1. Bufo danatensis Pisanetz - данатинская жаба

Class **REPTILIA – ПРЕСМЫКАЮЩИЕСЯ**

Order SQUAMATA - ЧЕШУЙЧАТЫЕ

Family **Anguidae** - Веретеницевые

2. Ophisaurus apodus (Pallas) - желтопузик

Family **Colubridae** - Ужи

3. Coluber rhodorhachis (Jan) - краснополосый полоз

Class **AVES – ПТИЦЫ**

Отряд PELECANIFORMES - ВЕСЛОНОГИЕ

Family **Pelecanidae** - Пеликановые

4. Pelecanus crispus (Bruch) - кудрявый пеликан – *во время миграций*

Отряд CICONIIFORMES - АИСТООБРАЗНЫЕ

Family **Ardeidae -** Цаплевые

5. Ciconia nigra L. - черный аист

6. Ciconia ciconia L. – белый аист – *во время миграции*

Family **Threskiornithidae** - Ибисовые

7. Platalea leucorodia L. – колпица – *во время миграции*

Order ANSERIFORMES - ГУСЕОБРАЗНЫЕ

Family **Anatidae** - Утиные

8. Aythya nyroca (Guldenstedt) - белоглазая чернеть – *во время миграции*

Order FALCONIFORMES - СОКОЛООБРАЗНЫЕ

Family **Pandionidae** - Скопиные

9. Pandion haliaetus (L.) – скопа – *во время миграции*

Family **Accipitridae** - Ястребиные

10. Circaetus gallicus Gmelin - змееяд

11. Hieraaetus pennatus (Gmelin) - орел-карлик

12. Aquila chrysaetus (L.) - беркут

13. Gypaetus barbatus (L.) - бородач

14. Neophron percnopterus (L.) – стервятник

15. Aquila rapax (Temminck) - степной орел – *во время миграции*

16. Aquila heliaca heliaca Savigny – могильник – *во время миграции*

Family **Falconidae** - Соколиные

17. Falco cherrug Gray – сокол-балобан

18. Falco peregrinus Tunstall – сапсан – *во время миграции*

Order GRUIFORMES - ЖУРАВЛЕОБРАЗНЫЕ

Family **Gruidae** - Журавлиные

19. Grus grus lilfordi Sharpe - серый журавль – *во время миграции*

20. Anthropoides virgo (L.) - журавль-красавка – *во время миграции*

Family **Otididae** - Дрофиные

21. Otis tarda tarda L. - дрофа (дудак) – *во время миграции*

22. Otis tetrax L. – стрепет – *во время миграции*

23. Chlamydotis undulata (Jacquin) - джек, или дрофа-красотка – *во время миграции*

Order CHARADRIIFORMES - РЖАНКООБРАЗНЫЕ

Family **Laridae** - Чайковые

24. Larus ichthyaetus Pallas - черноголовый хохотун – *во время миграции*

Order COLUMBIFORMES - ГОЛУБЕОБРАЗНЫЕ

Family **Pteroclidae** - Рябковые

25. Pterocles orientalis L. - чернобрюхий рябок – *во время миграции*

26. Pterocles alchata L. - белобрюхий рябок – *во время миграции*

27. Syrrhaptes paradoxus (Pallas) – саджа – *во время миграции*

Order STRIGIFORMES - СОВООБРАЗНЫЕ

Family **Strigidae** - Совиные

28. Bubo bubo L. – филин

Order PASSERIFORMES - ВОРОБЬИНООБРАЗНЫЕ

Family **Turdidae** - Дроздовые

29. Myophonus caeruleus turcestanicus Zarudny - синяя птица

30. Carpodacus rubicilla Guldenstadt - большая чечевица - *на зимовке*

Class MAMMALIA – МЛЕКОПИТАЮЩИЕ

Order CHIROPTERA - РУКОКРЫЛЫЕ

Family **Vespertilionidae** - Гладконосые летучие мыши

31. Otonycteris hemprichi Peters - белобрюхий стрелоух

Family **Molossidae** - Бульдоговые рукокрылые

32. Tadarida teniotis Rafinesque - широкоухий складчатогуб

Order CARNIVORA - ХИЩНЫЕ

Family **Canidae** - Псовые

33. Cuon alpinus Pallas - красный волк – *во время миграции*

Family **Ursidae** - Медвежьи

34. Ursus arctos isabellinus Horsfield - тянь-шаньский бурый медведь

Family **Mustelidae** - Куньи

35. Martes foina Erxleben -каменная куница

36. Vormela peregusna Guldenstaedt - перевязка

Family **Felidae** - Кошачьи

37. Lynx lynx isabellinus Blyth - туркестанская рысь

38. Uncia uncia Schreber - снежный барс, ирбис

Family **Bovidae** - Полорогие

39. Ovis ammon karelini Severtzov - тянь-шаньский архар

Order RODENTIA - ГРЫЗУНЫ

Family **Sciuridae** - Беличьи

40. Marmota menzbieri Kaschkarov - сурок Мензбира

Family **Hystricidae** - Дикобразы

41. Hystrix indica Kerr - индийский дикобраз.

Type ANNELIDA - КОЛЬЧАТЫЕ ЧЕРВИ

Class **OLIGOCHAETA - МАЛОЩЕТИНКОВЫЕ**

42. *Allolobophora (Perelia) ophiomorpha* Perel - аллолобофора змеевидная

Type ARTHROPODA - ЧЛЕНИСТОНОГИЕ

Class **INSECTA - НАСЕКОМЫЕ**

Order ODONATA - СТРЕКОЗЫ

43. *Cordulegaster insignis* Schneider - булавобрюх заметный

44. *Calopteryx virgo* L. - красотка девушка

45. *Anax imperator* Leach - Дозорщик-император

46. Anormogomphus kiritschenkoi Bartenev – Летодедка Кириченко.

Order MANTOPTERA - БОГОМОЛОВЫЕ

47. *Bolivaria brachiptera* Pallas - боливария короткокрылая

Order ORTHOPTERA - ПРЯМОКРЫЛЫЕ

48. *Damalacantha vacca* F.d.W. - дамалаканта вакка

49. *Saga pedo* Pallas - дыбка степная

50. *Ceratocercus fuscipennis* Uvarov - кузнечик темнокрылый

Order HOMOPTERA – РАВНОКРЫЛЫЕ

51. *Porphyrophora polonica* – польский кармононосный червец

Order COLEOPTERA - ЖЕСТКОКРЫЛЫЕ

52. *Chilocorus bipustulatus* L. - хилокорус двуточечный

53. *Stethorus punctillum* Weise - точечная коровка

Order HYMENOPTERA - ПЕРЕПОНЧАТОКРЫЛЫЕ

54. *Scolia hirta* Schrenk - сколия степная

55. *Sceliphron shestakovi* Gussakovskij - сцелифрон Шестакова

56. *Sphex flavipennis* Fabricius - сфекс желтокрылый

Order LEPIDOPTERA - ЧЕШУЕКРЫЛЫЕ

57. *Colias wiscotti* draconis Grum-Grzhimailo - желтушка Вискотта

INDICATOR SPECIES OF PLANTS

Juniperus semiglobosa – арча полушаровидная.

J. seravschanica – арча зеравшанская.

J. turkestanica – арча туркестанская.

Hordeum bulbosum - ячмень луковичный.

Tulipa greigii – тюльпан Грейга.

Crocus alatavicus – шафран алатауский.

Medicago tianschanica – люцерна тяньшанская.

Alcea nudiflora - шток-роза голоцветковая.

Ferula tenuisecta – ферула тонкорассеченная.

Prangos pabularia – прангос кормовой.

Hypericum scabrum – зверобой шероховатый.

H. perforatum – зверобой обыкновенный.

Verbascum songoricum – коровяк джунгарский.

Achillea millifolium – тысячелистник обыкновенный

INDICATOR SPECIES OF INSECTS

Order Aranea

1. *Agelena orientalis*

Order Lepidoptera

2. *Argynnis pandora*

3. *Parnassius mnemosyne*

4. *Papilio machaon*

5. *Colias erate*

Order Orthoptera

6. *Calliptamus barbarous*

Order Homoptera

7. *Cicadetta inserta*

Order Hymenoptera

8. *Xylocopa valga*

Order Neuroptera

9. *Libelloides macaronius*

Order Coleoptera

Family Scarabaeidae

10. *Lethrus turkestanicus*

11. *Cetonia aurata*

12. *Oxytherea cinctella*

Order Carabidae

13. *Calisthenes kuschakewitschi*

Order Meloidea

14. *Mylabris quadripunctata*

15. *Lytta tagata*

Family Cerambicidae

16. *Stenocorus vittatus*

Order Hemiptera

Family Pentatomidae

17. *Graphosoma lineate*

Family Reduviidae

18. *Rhynocoris iracundus*

CONTENT

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