

NOMINATION DOSSIER

# WESTERN TIEN-SHAN

(REPUBLIC OF KAZAKHSTAN, KYRGYZ REPUBLIC AND REPUBLIC OF UZBEKISTAN)

PROPOSAL FOR INSCRIPTION ON  
THE UNESCO WORLD CULTURAL AND  
NATURAL HERITAGE LIST



NOMINATION DOSSIER

# WESTERN TIEN-SHAN

(REPUBLIC OF KAZAKHSTAN, KYRGYZ REPUBLIC AND REPUBLIC OF UZBEKISTAN)

PROPOSAL FOR INSCRIPTION ON  
THE UNESCO WORLD CULTURAL AND  
NATURAL HERITAGE LIST

***Prepared by:***

Association for the Conservation of Biodiversity of Kazakhstan, NGO  
Committee of Forestry and Wildlife of the Ministry of Agriculture of Kazakhstan

Environmental Movement of Kyrgyzstan "Aleine"  
State Agency on Environmental Protection and Forestry of Kyrgyzstan  
"BIOM" Environmental Movement, Kyrgyzstan

State Inspection on Protection and Rational Usage of Flora and Fauna,  
State Committee of Uzbekistan on Environmental Protection  
Chatkal State Biosphere Natural Reserve, Uzbekistan

***With the support of:***

UNESCO Almaty Cluster Office  
World Wildlife Fund  
Royal Society for the Protection of Birds  
UNESCO Country Office in Uzbekistan



# CONTENTS



EXECUTIVE SUMMARY	4
1. IDENTIFICATION OF THE PROPERTY	12
2. DESCRIPTION	14
3. JUSTIFICATION FOR INSCRIPTION	60
4. STATE OF CONSERVATION AND FACTORS AFFECTING THE PROPERTY	74
5. PROTECTION AND MANAGEMENT	82
6. MONITORING	97
7. DOCUMENTATION	110
8. CONTACT INFORMATION OF RESPONSIBLE AUTHORITIES	124
9. SIGNATURE ON BEHALF OF THE STATE PARTY	130
ANNEXES	131

# EXECUTIVE SUMMARY



Sparse juniper forest, Yesipov A.V.

## State – Party to Convention

Republic of Kazakhstan, Kyrgyz Republic and Republic of Uzbekistan

## State, Province or Region

Tolebi, Tulkubas and Kazygurt districts of South Kazakhstan region, and Zhualyn district of Zhambyl region of the Republic of Kazakhstan;  
Aksiy and Chatkal district of Jalal-Abad region of the Kyrgyz Republic;  
Bostalyk and Parkent districts of Tashkent region of the Republic of Uzbekistan.

## Name of Property

Western Tien-Shan

## Geographical coordinates to the nearest second

Nominated serial transnational property consists of thirteen component parts, that are the parts of seven specially protected natural areas (SPA):

Nº	Name of component part	Geographic coordinated of central point
1.	Karatau State Nature Reserve	E 68°40'44'' N 43°44'00''
2.	Aksu-Jabagly State Nature Reserve – main part	E 70°40'27'' N 42°16'34''
3.	Aksu-Jabagly State Nature Reserve – Karabastau paleontological area	E 69°54'54'' N 42°56'24''
4.	Aksu-Jabagly State Nature Reserve – Aulie paleontological area	E 70°00'00'' N 42°54'18''
5.	Sairam-Ugam State National Nature Park – Boraldaitau area	E 70°15'23'' N 42°41'31''
6.	Sairam-Ugam State National Nature Park – Irsu-Daubabin area	E 70°11'18'' N 42°24'48''
7.	Sairam-Ugam State National Nature Park – Sairam-Ugam area	E 70°04'57'' N 41°56'24''
8.	Sary-Chelek State Biosphere Nature Reserve	E 71°56'14'' N 41°52'25''
9.	Besh-Aral State Nature Reserve – main part	E 70°27'28'' N 41°35'31''
10.	Besh-Aral State Nature Reserve – Shandalash area	E 71°16'26'' N 42°2'29''
11.	Padysha-Ata State Nature Reserve	E 71°34'42'' N 41°43'28''
12.	The Chatkal State Biosphere Nature Reserve – Maidantal area	E 70°15'18'' N 41°18'05''
13.	The Chatkal State Biosphere Nature Reserve – Bashkizilsay area	E 69°56'03'' N 41°12'36''

### Textual description of the boundary (ies) of the nominated property

**Karatau SNR** is located in the central part of the Karatau ridge which is an offshoot of the north-western edges of the Tien Shan.

The northern boundary begins in Suzak region. The KSNR boundaries run from Kokkezen tract towards the east through an altitude of 1,911.1 m and Bessaz tract to a mark of 2,176 m, Bessaz peak, then to the southeast through the northern slopes of Qyzyl Shuneyt Mountain, Toyshman Bulak spring well and then Kelinshektau up to the Kazanbulak tract, to the trigonometric point with a mark of 1,791 m.

The northeastern boundary runs through the Karasai, Akbulak, Kyzylsai, Tarsai gorge to a southerly direction. The southern boundary runs across the Taldybulak river up to Karagashtau Mountain, further down the Biresik River. Starting with a mark of 625.9 m the boundary direction changes from south to north, it passes between the Zhingylshik and Biresik rivulets through the Almaly gorge, Terisbulak to the Asha tract, crossing the Baltaban and Baiyldyr rivulets.

The western boundary begins with a mark of 1,125.1 m, passes on the left bank of the Kenuzen river through the mark of 1,940.1 m of Zheltimes mountain, then through Sualma, Samauryntas mountains through the Murat pass to the Kokkezen gorge.

**Aksu-Jabagly SNR** is located in the westernmost tip of Talas Alatau ridge.

The northern boundary of the reserve begins in the territory of Tulkubas district of the South Kazakhstan region from trigonometric point with a mark of 1,949.3 m on the Alatau ridge and runs to the north-east through the gorge watersheds of the Taldybulak, Irgayly, Kursay rivers, along the Zhetymsai gorge to the north up to the Zhabagly river, further to the north-east along the Baybarak stream up to the level of 2,473 m on the Zhabaglytau ridge, then along the boundary of South Kazakhstan and Zhambyl areas to the east till the watershed of the Zhabaglytau ridge, along the latter up to an altitude of 2,911 m, and further to the Topshak river, from the latter southwestward through the valley of the Aksai river upward the cordon of the same name for 2 km, then on the northern slope of the side spur which separates the basin of the Aksai and Koksai rivers, going to the bed of the Koksai river upward the hydroelectric complex.

The eastern boundary runs from the Koksai river up to its right tributary of the Talysay river, along it up to the watershed of the ridge separating the basins of the Koksai and Arabiik rivers (Kyrgyzstan). Then it goes along the state border of the Republics of Kazakhstan and Kyrgyzstan till the altitude of 3,651.1 m, located at the junction of the Talas Alatau and Ugam ridge before reaching the Maidantal pass (3,520.6 m) of about 300 m.

The southern boundary begins at a mark of 3,651.1 m and runs to a south-westerly direction along the main watershed of the Ugam ridge to the Sairam peak (4,239 m), separating along the whole length the basins of the Aksu and Baldabrek rivers from the Maidantal river.

There are two separately located paleontological sites - Auliye and Karabastau - within 120 km (along the highway) to the north-west of the mainland, in the spurs of the Karatau ridge in the territory of Baidibek district of South Kazakhstan region; their total area is 225 hectares.

**Sairam-Ugam SNNR** is adjacent in the west to the AJSNR and includes areas of the Talas Alatau (the westernmost tip at the junction with Ugam ridge), Ugam and Karzhantau ridges. It consists of three parts:

1. Boraldytau area: the northern boundary runs along the border of the Zhambyl region, eastern, western and southern borders - along the border of Kayrchakty, Kanai and Kokbulak forest cottages;
2. Irsu Daubaba area: the northern border runs through the watershed ridges between the valleys of the Daubaba and Mashat rivers, western - on the road from Seslavino village to Aksai winter road, the east - on the Tulkubas-Rayevka road. The southern boundary - along the canyon of the Mashat river, including the canyon itself;

3. Sairam Ugam area: the northern boundary coincides with the boundary of the Aksu Jabagly SNR, eastern and south-eastern borders run along the state border of the Kazakhstan, the western boundary - on the Karzhantau slopes and foothills and north-western part of Ugam ridge.

**Sary-Chelek SBR** occupies the upper part of the basin of the Hodzha-Ata river, located on the south megaslope of the central part of the Chatkal ridge.

The northern boundary runs along the watershed of the Chatkal ridge in the territory of Aksyi region at an altitude of 4,000-4,247 m above sea level.

The southern boundary is adjacent to the Fergana valley at an altitude of 1,000 m above sea level.

The western boundary runs along the watershed of the Bozbu-too range and the Aflatun river in the middle course.

The eastern boundary runs along the spurs of the Aflatun ridge which is watershed between the basins of the Kozho-Ata and Karasu rivers.

**Besh-Aral SR** is located in the western part of the Chatkal valley.

The northern boundary runs along the watershed of the Pskem ridge, coinciding with the state border of Kyrgyzstan and Uzbekistan at an altitude of 3,000-3,500 m above sea level.

The southern boundary runs along the watershed of the Chatkal ridge at an altitude of 3,000-4,000 m above sea level bounding from the south the drainage basin left tributary of Chatkal – Ters rivers.

The western boundary coincides with the state border of Kyrgyzstan and Uzbekistan, and runs along the watershed of northern spur of the Chatkal ridge which is the watershed between the tributaries of the Chatkal - Ters and Akbulak inflows at an altitude of 3,000 m above sea level.

The eastern boundary runs from the headwaters of the Aktashsay river near Chapchyma pass (2,810 m above sea level) across the Kumbel ridge along interstream area of the Ispara Sai and Katta Kumbel rivers at an altitude of 3,500 to 1,000 m above sea level.

**Padysha-Ata SR** is the upper part of the catchment basin of the Padysha-Ata river on the southern megaslope of the Chatkal ridge.

The northern boundary runs along the watershed of the southern spur of the Chatkal ridge in the territory of Aksyi region at an altitude of 3,500-2,900 m above sea level between the Padysha-Ata and Itagar rivers.

The southern boundary runs at an altitude of 800-2,000 m above sea level along the Padysha-Ata - Tostu and Chetta-Sai tributaries.

The western border separates from the lands of the state forest fund and state provisions of the Ala-Buka area and crosses in the middle course the right tributary of the Padsha-Ata - Mindzhilki to the confluence of the Chetta-Sai tributary and it goes along it to the east and then to the north.

The eastern boundary separates the SNR from the land of the Avletim forestry and runs from the mountains Chetta (3,564 m above sea level) along the Chetta-Sai river.

**The Chatkal SBNR** is situated at the West extremity of Chatkal ridge and includes two isolated areas.

Bashkizilsay area:

Westward from Kizil-Nura mountain along the watershed between Parkent-say and Bashkizilsay river basins to Khavlyya mountain.

Then south-westward to an altitude of 2,506.8, straight southward to an altitude of 2,354.3 m a.s.l. and southward to Bezimyanni pass being crossed by a trail leading from Bashkizilsay gorge to Sukok village.

From the pass the border line runs southwestward to an altitude of 1,759.1 and on to an altitude of 1,773.8 m a.s.l. Then it turns south-eastward, crosses altitudes of 2,154.3; 2,054.2; 1,891.5; 1,857.8 m a.s.l. and runs westward to an altitude of 1,677.7 m, where it turns southward crossing altitudes of 1,479.3 and 1,477.8 m. From 1,477.8 the border line turns east towards Djartash village, crosses altitudes of 1,068.4 and 1,870.8 m a.s.l.

Eastern border: Running north-eastward from an altitude of 1,870.8 m along the watershed between Shavas-say and Akchasay it crosses altitudes of 1,906.8; 1,981.4; 1,941.7; 2,019.8; 2,078.2; 2,524.8 (Karakush-khana mountain); 2,575.2; 2,272.7 m a.s.l. The border line then crosses an altitude of 2,470.6 m running northward along the watershed between Karabau and Shavas-say upper river basins as far as Kizil-Nura mountain.

Maidantal area:

Occupies the Tashkesken-say, Kungur-say, Terekli-say, Zymnan-say river basins and an area situated on the right bank of Tavak-say river.

Its border runs north-westward from Adam-Tash pass (2,892.7 m) and along Tavak-say river to its confluence with Terekli-say. From there it goes along the Serkali-say creak to a place where Tashkesken-say flows into the creak. Here the border turns north-eastward and goes along the Tashkesken mountain range (2,726.3; 3,159.2 m) reaching the Aksham range and further running to Maliy Piyazli pass and on along the Chatkal range through Bolshoy Piyazli pass to Adam-Tash pass at an altitude of 2,892.7 m

**Maps and plans, showing the boundaries of the proposed property and buffer zone**

- A1. Administrative map of Central Asia and Kazakhstan with indication of the proposed territory
- A2. Topographic map of Western Tien-Shan with property boundaries. Scale: 1:1,000,000
- A3. Topographic map of Karatau State Nature Reserve. Scale: 1: 300,000
- A4. Topographic map of Aksu-Jabagly State Nature Reserve. Scale: 1: 300,000
- A5. Topographic map of Sairam-Ugam State National Nature Park. Scale: 1: 300,000
- A6. Topographic map of Sary-Chelek State Biosphere Nature Reserve. Scale: 1: 300,000
- A7a, b. Topographic maps of Besh-Aral State Nature Reserve. Scale: 1: 300,000
- A8. Topographic map of Padysha-Ata State Nature Reserve. Scale: 1: 300,000
- A9. Topographic map of Chatkal State Biosphere Nature Reserve. Scale: 1: 300,000

**Area of the nominated property (ha) and proposed buffer zone (ha)**

№	Name of component part	Square, Ha	
		Area	Buffer zone
1.	Karatau State Nature Reserve	34,300	17,490
	Aksu-Jabagly State Nature Reserve, including	131,934	25,800
2.	a) Aksu-Jabagly State Nature Reserve – main part	131,704	25,800
3.	b) Aksu-Jabagly State Nature Reserve – Karabastau paleontological area	100	-
4.	c) Aksu-Jabagly State Nature Reserve – Aulie paleontological area	130	-
	Sairam-Ugam State National Nature Park, including	149,053	27,000
5.	a) Sairam-Ugam State National Nature Park – Boraldaitau area	26,971	4,900
6.	b) Sairam-Ugam State National Nature Park – Irsu-Daubabin area	45,509	8,200

7.	c) Sairam-Ugam State National Nature Park – Sairam-Ugam area	76,573	13,900
8.	Sary-Chelek State Biosphere Nature Reserve	23,868	18,080
	Besh-Aral State Nature Reserve, including	137,288	-
9.	a) Besh-Aral State Nature Reserve – main part	112,018	-
10	b) Besh-Aral State Nature Reserve – Shandalash area	25,270	-
11	Padysha-Ata State Nature Reserve	16,010.6	14,545.8
	The Chatkal State Biosphere Nature Reserve	35,724	-
12	a) The Chatkal State Biosphere Nature Reserve – Maidantal area	24,706	-
13	b) The Chatkal State Biosphere Nature Reserve – Bashkizilsay area	11,018	-
	Total	528,177.6	102,915.8

---

**Criteria under which property is nominated**

viii, x

---

**Statement of Outstanding Universal Value**

a) Brief synthesis

The Western Tien-Shan trans-boundary serial nomination, lying within the Republics of Kazakhstan, Kyrgyzstan and Uzbekistan, consists of 13 component parts covering a combined area of 528,177 ha. Each of the component parts has its own specifics and at the same time they complement each other in terms of biodiversity, remarkable landscapes and monuments of paleontology. They represent the most valuable and preserved territory of a single natural complex that forms part of the extensive Tien-Shan mountain chain, one of the most impressive mountain ranges in Central Asia.

Western Tien-Shan is characterized by an exceptional diversity, mosaicism and beauty of landscapes, outstanding evidence of large-scale geological and evolutionary processes; a unique combination of different types of supporting ecosystems; rich flora and fauna, which represent a considerable proportion of endemic species and communities, as well as a significant number of rare and endangered species, including 24 species listed in the IUCN Red List (version 2013) with varying degrees of threat. The region is one of the world centers of origin of nut, fruit and many other cultivated plants.

b) Justification for Criteria

**Criteria viii:**

A relatively small area combines a variety of geological structures that reflect successive stages of evolution of the earth's crust. Here can be found sediments dated from the lower Proterozoic till modern era: the Cambrian, Ordovician, Devonian and Carboniferous systems, in which traces of life of ancient times are found. In Karatau paleontological field, solidified sludge perfectly preserved footprints of plants and animals that lived in the pool and on the shores of the Jurassic seas around 150 million years ago. Prints of more than 60 species of plants, 100 species of insects and mollusks, crustaceans, turtles, ganoid fish were found there. There is no other place in the world with such a rich and interesting burial of Mesozoic insects.

**Criteria x:**

Western Tien-Shan is one of the world's centers of origin of nut, fruit, and many cultivated plants. This huge gene pool is of exceptional importance for the agro-biodiversity in many countries. Characteristic of Western Tien-Shan combination of different types of coniferous and deciduous forests is preserved at the nominated territory: juniper, fir, maple, hickory, fruit trees, riparian, and more than 10 endemic plant communities.

Menzbier's marmot (*Marmota menzbieri*) is an endemic species that is found in Western Tien-Shan, distributed only in the territory of Kazakhstan, Uzbekistan and Kyrgyzstan. The snow leopard (*Panthera uncia*) and Karatau argali subspecies (*Ovis ammon nigrimontana*) deserve special attention in terms of biodiversity and gene pool.

The nominated area is home to many rare and endangered plant and animal representatives of the world, among which 24 species are included in the Red List of IUCN (version 2013) with varying degrees of threat.

**c) Statement of Integrity**

13 clusters of the nominated serial property, are key parts of the natural complex Western Tien-Shan, the main components of which are inextricably linked by common origin, historical fate, and dynamics of natural development and include the elements necessary to show its outstanding universal value.

Dimensions (from 15,846 to 149,053 ha) of component parts of the nominated property are sufficiently accurate in order to jointly maintain functioning of natural systems of Western Tien-Shan and fully represent the properties and processes that reflect their significance. The presence of buffer zone gives the additional guarantees of integrity.

Different forms of human activity (grazing, logging, haying, etc.), that existed in Western Tien-Shan prior to the establishment of the nominated SPA, had limited impact on the ecosystem, without causing major disturbances. Biophysical processes and components of natural landscapes of the nominated property were not violated.

**e) Requirements for protection and management**

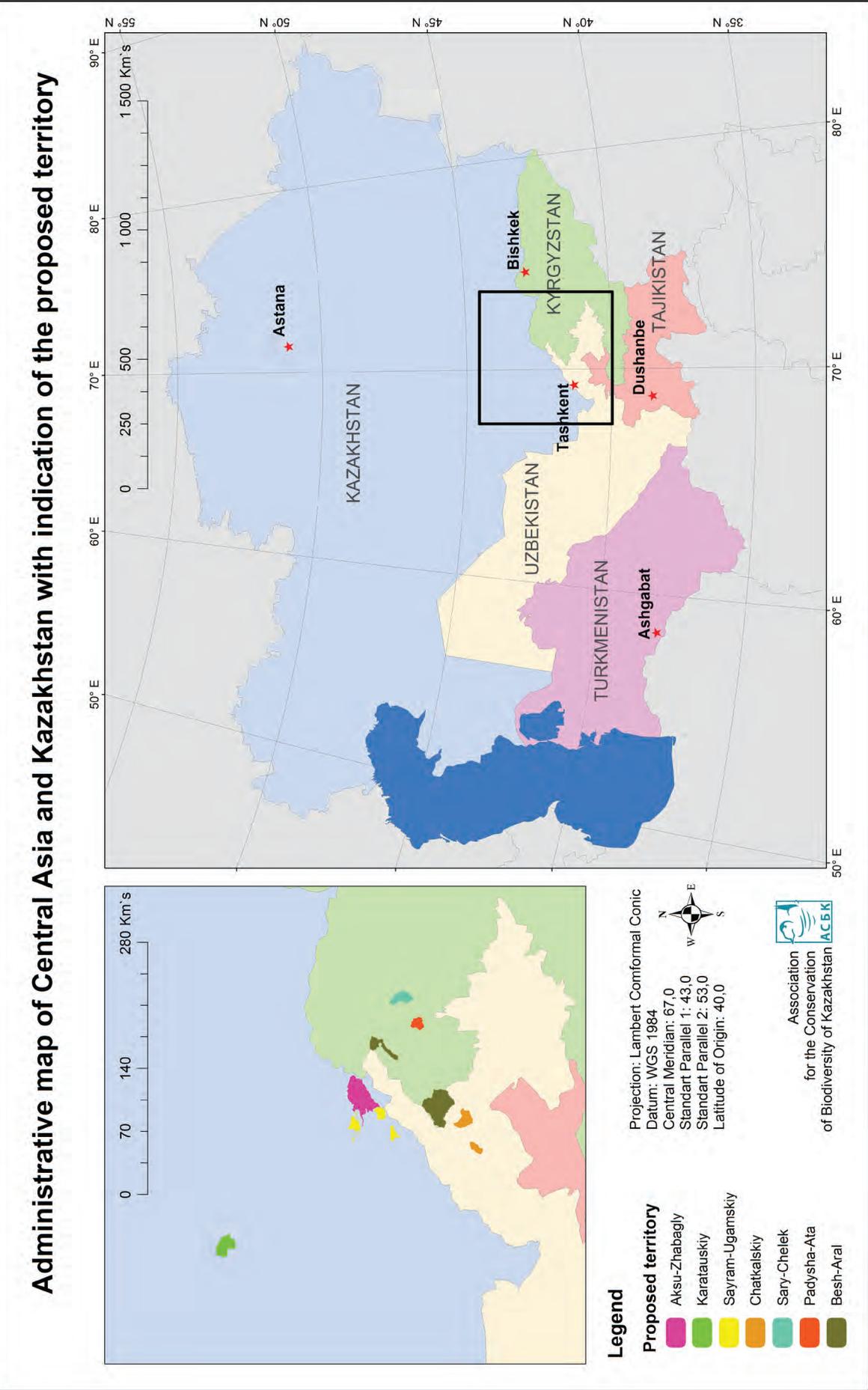
Currently, status of National Reserves (corresponds to category Ia IUCN) and National Park (II IUCN), that have all the component parts of serial nomination, guarantees preservation and further natural development of a unique complex of ecosystems of Western Tien-Shan. All SPA have sufficient financial and administrative resources for long-term preservation of the declared Outstanding Universal Value. Now, every of designated protected areas have its own administration and management plan. The process of creating a single coherent management system of a serial transnational property is going on.

**Name and contact  
information of  
official local  
institution/agency**

Committee of Forestry and Wildlife  
at the Ministry of Agriculture of Kazakhstan  
010000 Astana, Left Bank, Orynbor Street,  
House of Ministries, 5th porch  
Tel: +7 (7172) 743288  
Fax: +7 (7172) 743290  
e-mail: reserve@eco.gov.kz  
Head: Bagdat Azbayev  
Deputy Head: Kayrat Ustemirov

State Agency on Environmental Protection and Forestry under the Kyrgyzstan government  
Toktogul st., 228  
720001 Bishkek  
Tel. +(996-312) 35-27-27  
Fax +(996-312) 35-31-02  
Director: Kadyrov Bayanbek Esenovich

The Chatkal State Biosphere Nature Reserve  
Address: 2, Mirsaidov Street  
Parkent,  
102222, Tashkent region  
Uzbekistan  
Tel: (370) 7222496  
Fax: (370) 7221581  
e-mail: esipov@sarkor.uz  
Director: J.T. Dustov  
Deputy Director: A.V. Yesipov



# 1

## IDENTIFICATION OF THE PROPERTY

### IA. COUNTRY (AND STATE PARTY, IF DIFFERENT)

Republic of Kazakhstan, Kyrgyz Republic and Republic of Uzbekistan

### IB. STATE, PROVINCE OR REGION

Baidibek, Tolebi, Turkestan, Tulkubas and Kazygurt districts of South Kazakhstan region, and Zhualyn district of Zhambyl region of the Republic of Kazakhstan;

Akshiy and Chatkal districts of Jalal-Abad region of the Kyrgyz Republic;

Bostalyk and Parkent districts of Tashkent region of the Republic of Uzbekistan.

### IC. NAME OF PROPERTY

Western Tien-Shan

### ID. GEOGRAPHICAL COORDINATES TO THE NEAREST SECOND

N°	Name of component part	Geographic coordinated of central point
1.	Karatau State Nature Reserve	E 68°40'44" N 43°44'00"
2.	Aksu-Jabagly State Nature Reserve – main part	E 70°40'27" N 42°16'34"
3.	Aksu-Jabagly State Nature Reserve – Karabastau paleontological area	E 69°54'54" N 42°56'24"
4.	Aksu-Jabagly State Nature Reserve – Aulie paleontological area	E 70°00'00" N 42°54'18"
5.	Sairam-Ugam State National Nature Park – Boraldaitau area	E 70°15'23" N 42°41'31"
6.	Sairam-Ugam State National Nature Park – Irsu-Daubabin area	E 70°11'18" N 42°24'48"
7.	Sairam-Ugam State National Nature Park – Sairam-Ugam area	E 70°04'57" N 41°56'24"
8.	Sary-Chelek State Biosphere Nature Reserve	E 71° 56'14" N 41° 52'25"
9.	Besh-Aral State Nature Reserve – main part	E 70° 27'28" N 41° 35'31"
10.	Shandalash area	E 71°16'26" N 42°2'29"
11.	Padysha-Ata State Nature Reserve	E 71° 34'42" N 41°43'28"
12.	The Chatkal State Biosphere Nature Reserve – Maidantal area	E 70°15'18" N 41°18'05"
13.	The Chatkal State Biosphere Nature Reserve – Bashkizilsay area	E 69°56'03" N 41°12'36"

## IE. MAPS AND LAYOUTS OF THE NOMINATED PROPERTY, SHOWING BOUNDARIES AND BUFFER ZONE

- A1. Administrative map of Central Asia and Kazakhstan with indication of the proposed territory
- A2. Topographic map of Western Tien-Shan with property boundaries. Scale: 1:1,000,000
- A3. Topographic map of Karatau State Nature Reserve. Scale: 1: 300,000
- A4. Topographic map of Aksu-Jabagly State Nature Reserve. Scale: 1: 300,000
- A5. Topographic map of Sairam-Ugam State National Nature Park. Scale: 1: 300,000
- A6. Topographic map of Sary-Chelek State Biosphere Nature Reserve. Scale: 1: 300,000
- A7a, b. Topographic maps of Besh-Aral State Nature Reserve. Scale: 1: 300,000
- A8. Topographic map of Padysha-Ata State Nature Reserve. Scale: 1: 300,000
- A9. Topographic map of Chatkal State Biosphere Nature Reserve. Scale: 1: 300,000

## IF. AREA OF NOMINATED PROPERTY (HA) AND PROPOSED BUFFER ZONE (HA)

N°	Name of component part	Square, ha	
		Area	Buffer zone
1.	Karatau State Nature Reserve	34,300	17,490
	Aksu-Jabagly State Nature Reserve, including	131,934	25,800
2.	a) Aksu-Jabagly State Nature Reserve – main part	131,704	25,800
3.	b) Aksu-Jabagly State Nature Reserve – Karabastau paleontological area	100	-
4.	c) Aksu-Jabagly State Nature Reserve – Aulie paleontological area	130	-
	Sairam-Ugam State National Nature Park, including	149,053	27,000
5.	a) Sairam-Ugam State National Nature Park – Boraldaitau area	26,971	4,900
6.	b) Sairam-Ugam State National Nature Park – Irsu-Daubabin area	45,509	8,200
7.	c) Sairam-Ugam State National Nature Park – Sairam-Ugam area	76,573	13,900
8.	Sary-Chelek State Biosphere Nature Reserve	23,868	18,080
	Besh-Aral State Nature Reserve, including	137,288	-
9.	a) Besh-Aral State Nature Reserve – main part	112,018	-
10.	b) Shandalash area	25,270	-
11.	Padysha-Ata State Nature Reserve	16,010.6	14,545.8
	The Chatkal State Biosphere Nature Reserve	35,724	-
12.	a) The Chatkal State Biosphere Nature Reserve – Maidantal area	24,706	-
13.	b) The Chatkal State Biosphere Nature Reserve – Bashkizilsay area	11,018	-
	Total	528,177.6	102,915.8



# 2

## DESCRIPTION



### 2A. DESCRIPTION OF PROPERTY

*The Western Tien-Shan trans-boundary serial nomination, lying within the Republics of Kazakhstan, Kyrgyzstan and Uzbekistan, consists of 13 component parts covering a combined area of 528,178 ha plus 102,916 ha of buffer zones. As the name indicates, the nominated property forms part of the extensive Tien-Shan mountain chain, one of the most impressive mountain ranges in Central Asia. The nominated property ranges in altitude from 700 to 4,503 m above sea level and as a result supports an outstanding variety of landscapes of great intrinsic natural beauty which, in turn, support an exceptionally rich biodiversity including numerous endemic species and species which are the wild ancestors of many of today's commercial fruit and nut trees. The Tien-Shan as a whole is considered to be one of the best examples in the world of intra-continental mountain building.*

All the selected parts of the Property are situated in Western Tien-Shan and are the most representative for this geographical unit in every country. These areas are the most well protected and managed. They complement each other, specifically the relatively remote Karatau State Nature Reserve is very special and valuable extension of Western Tien-Shan to the North, and it complements the Property characteristics by a number of endemic and rare species typical for low-altitude parts of this mountain country.

In total, the Property consists of thirteen component parts that are the parts of seven specially protected natural areas (SPA):

**1. Karatau State Nature Reserve (KSNR)** is situated in the central part of Karatau ridge, which is the branch of Tien Shan northwest arcs.

**2. Aksu-Jabagly State Nature Reserve (AJSNR)** is situated primarily at the West extremity of Talas Alatau ridge and includes three areas.

**3. Sairam-Ugam State National Nature Park (SUSNNP)** is adjacent to AJSNR on the west and includes the areas of Talas Alatau (utmost western extremity adjoining Ugam ridge), Ugam, Karazhantau, Boroldai and Kazygurt ridges.

AJSNR and SUSNNP join together intrinsically forming a single territory, at the same time they are separate SPNTs with their own administrations. SUSNNP includes three areas.

**4. Sary-Chelek State Biosphere Nature Reserve (SCSBNR)** is situated in the central part of Chatkal ridge.

**5. Besh-Aral State Nature Reserve (BASNR)** is situated in the lower part of Chatkal valley and includes two areas.

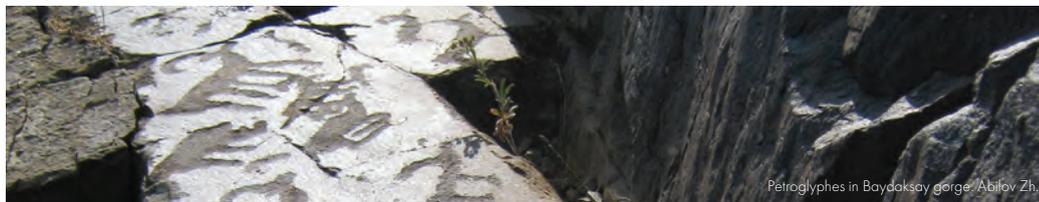
**6. Padysha-Ata State Nature Reserve (PASNR)** is situated in the central part of Chatkal ridge.

SCSBNR and PASNR are situated at the distance of 20 km from each other and have similar environmental conditions and biodiversity. BASNR is situated 50 km away from PASNR.

**7. The Chatkal State Biosphere Nature Reserve (CSBNR)** is situated at the West extremity of Chatkal ridge

and includes two areas. The Bashkizilsay area represents a mountainous part of Bashkizilsay River's catchment basin. Maidantal area is 20 km distant from Bashkizilsay area, and covers side sectors of cirque depressions of the northern macro-slope.

## GEOLOGY



Petroglyphs in Baydaksay gorge. Abilov Zh.

Geological structure of the area is very complex as it is situated at the junction of two structural and formational zones: North Tien Shan and Karatau-Naryn, separated by Talas-Karatau geosuture (Nikolayev, 1924). Series of fault and shear fractures of the period between Neogene and Quaternary determined modern relief. E.g., they led to appearance of almost all big river valleys. Tectonic fractures led to relief forms connected to high tectonic activity such as caving lakes, precipices etc. Middle mountain regions are situated in the area of high tectonism. Seismic activity can manifest itself in earthquakes with a magnitude of 8-9 points on the Richter scale.

From geological point of view, the territory is diversified and extremely complicated complex of sedimentary, effusive and intrusive rocks. The main part of the territory is formed by ancient granitic rocks, Proterozoic crystalline gneisses, deposits of Silurian, Devonian and Carboniferous period: sandstones, aleurolites, limestones and sedimentation rocks. Low-hill terrains are formed by the Neogene and Anthropogene deposits. In many places, the sedimentary and sedimentary-effusive layers are broken by intrusions and dissected as a result of faults and displacements. Recent sediments are formed in the valleys of rivers, springs and temporary streams (alluvium, proluvium), on the slopes in the form of cliff debris (colluvial deposits) and in the recent glaciation zone (ungrassed moraines).

Landslips is not rare occurrence in the lower belt of middle altitude mountain zone of Bashkizilsay, it's that is connected with a wide spreading of sedimentary rocks, particularly - of loess. In some river basins the torrents are detected, and from time to time incidental high water rising wash away floodplain, wash off soils and vegetation. Mineral deposits: plumb, silver, zinc, antimony, construction materials.

**KSNR.** Karatau ridge, the utmost northwest branch of West Tien Shan, is a prominent tectonically arched elevation. The rocks are represented mostly by carbonaceous rocks of the Paleozoic submerging under Mesozoic-Cainozoic sandshale deposits at the foot of hills. Formations of the Quaternary, represented by alluvial deposits of river valleys and proluvial-deluvial deposits of gullies and hillsides, are outspread in mountain and piedmont areas. The older Upper Protozoic deposits are uncovered on northeast slopes and represented by greatly metamorphized shale rocks, quartz sandstones, strias and conglomerates. Granitic rocks and greenstones are found among intrusive formations. The Lower Paleozoic is represented by the deposit of Cambrian (conglomerates, sandstones, carbonaceous-argillaceous and siliceous schist) and Ordovician (aleurolitic slates, aleurolites, conglomerates and sandstones) periods. The Devonian deposits, represented by lea stones, argillites, conglomerated, limestones, dolomitic limestones, dolomitic rocks, chalky clays and aleurolites, occur in abundance. The rocks are mainly colored in red, red-brown and brown colors. Ballstones form solid ledge rocks. Lower Carboniferous deposits are represented by crumbling, compact-grained pale-gray limestones. Sometimes heavy layers of dark-grey limestones occur, in places separate layers are brecciated. Argillous greenish shale rocks and marly limestones occur on the downslopes of foothills. Settlements of the Paleogene system are spread within intermontane and submontane troughs. Eocene deposits build up limy sandstones and dolomitic. Neogene deposits outcrop in small areas, among them alluvial-deluvial deposits prevail. They are represented by conglomerates, bench gravels, inequigranular sands of pale and brownish-yellow color interlaying with sandy clays. Sometimes chalky clays, limestones and limy sandstones occur. Quaternary formations build up piedmonts, intermontane valleys and cover rock masses of smooth hillslopes. These rock masses are formed by gravelly-sand-loam deposits. Sedentary, deluvial and alluvial-deluvial formations consisting of block masses of solid rocks, breakstones, gravel and gravel-

stones are spread here.

**AJSNR, SUSNNP.** The North of the territory is formed by sandstones, aleurolites and argillites of the Ordovician. Crystalline limestones and shale rocks of the Cambrian period occur here as well. Silurian deposits are observed in the South. Limestones of the Lower Carbonian are outspread in the area. Neogene deposits of limnic and limnic-proluvial origin represented by clays, clay-bearing soils and conglomerates (in canyons) underlay in small areas all over the territory. Sandstones, gravelstones and conglomerates of the Devonian occur more rarely. Marine deposits of Middle Quaternary and Upper Quaternary age consisting of field stones, coarse gravel, clay loams and fine sandy loams are overspread along the valleys of some rivers, such as Jabagly and Zhusaly.

**SCSBNR.** The deposits of the Middle and Upper Paleozoic and Mesozoic period occur here. They are represented by granitic rocks, limestones, sandstones, conglomerates, gypsums, friable fragmental rocks, fieldstones, break stones, clays and clay-bearing soils. The upper part of the nature reserve including the location of Sary-Chelek lake is formed by the Paleozoic red sandstones with limestones. The territory adjacent to the lake from the southwest is formed by Ordovician sandstones and conglomerates represented by alteration products of Precambrian and Cambrian-Ordovician periods. Central part of the reserve's territory is formed by the Jurassic conglomerates and quartz sandstones intermittent with red terrigenous sediments, carbon-bearing alluviums and gypsums.

**BASNR.** Low-mountain smooth hillsides are formed by sandstones, clays, chalky clays and conglomerates. The middle-mountain type of the relief is represented by metamorphosed limestones and Paleozoic shale rocks. Rock massifs surrounding the basin are mainly formed by the rocks of Pre-Paleozoic and Paleozoic period. Their lithological composition is represented by shales, quartz porphyries, quartz sandstones, limestones, granitic rocks and greenstones.

**PASNR.** Geologically all described territory is characterized by deep incised, short and narrow canyons. Generally, interfluvial spaces are distinguished by cleves covered by break stones. Smooth surfaces in places covered by a great number of break stones, quarry spalls, field stones and blocks. These smooth surfaces intersperse with narrow, heavily intended dividing ridges. The dividing ridges are narrow, with typical sharp peaks, cirque glaciers and kars. The slopes of marginal longitudinal canyons are rather steep and rocky. Lateral valleys often have asymmetrical and canyon-shaped character.

CSBNR. Glacial formations are well developed at Tashkesken, Terekli, Zymnasay and Karabuzuk river heads. Glaciers with the moraine are situated upwards and represent four well formed terraces. Time-wise, fourfold recession of glaciers corresponds to four cycles of the quaternary sediment formation. The main geological profile was formed as a result of tectogenesis in the Neogene and Quaternary time. Faults and overthrusts shaped benched slopes around Kizil-Nura alp. Inside the nature reserve area, sediments of the Mingbulak suite are limited to the valleys of Tavaksay, Karabuzuk, Revashta, Davansay and Tashkesken rivers and the lower reaches of Terekli and Zimnansay. The cross-sections indicate a presence of tuff-gravelites in strata of the Mingbulak suite. Later Triassic sediments of the same suite, mainly represented by tuffs, are common for Bashkizilsay. Represented by clays, marls, conglomerates and sandstones, the Cainozoic sedimentary rocks of later formation, having a thickness of up to 150 m, are of subordinate distribution. Of intrusive rocks prevailing are diorites, fine granites, granite-porphyrines, gabbros, quartz porphyries, syenites, and diabases.

Wide spreading of modified rocks: limestone, breccias, conglomerates – indicates reiterated "immersion" of sediments in depths. Occurrence of sandstones, slates, shell rock confirms the assumption of long existence in sea territory in middle and upper Quaternary.

## LANDSCAPES



The relief of the Property is characterized by heterogeneity and high contrast, and generally all its areas corresponds the systems of deeply split mountain ridges with various altitudes, river valleys, and with well fringed vertical zonality.

**KSNR.** Syrdariya Karatau, the area of this nature reserve, is a complex system of farewell rock ridges, which joins to the vest virgation ridges of Talas Alatau in an extremely complicated way. It is impossible to distinguish a single ridge almost anywhere along the whole length of Syrdariya Karatau. The territory of Karatau nature reserve includes high massif Mynzhylki (starting from altitudes of 700 m above sea level), where Bessaz peak reaches 2,176 m above sea level and where the mountain relief is the most pronounced as compared to other parts of Syrdariya Karatau. Northern and southern macroslopes with Berkuty diagonal fold and Karaadyr group of farewell rocks are well pronounced. Mountains with flat tops – jorns and cleves cut by deep ravines of temporary and perennial streams are the unique feature of the area. Plain or smooth hillside water-parting lines are cut with deep and often steep canyons oriented not only across the radical axis of entire mountain system but at a various angles to it. The northeastern slope of the ridge is steep and narrow and southwestern slope is flat-lying and wide cut by the network of parallel river valleys situated at a distance of 5-6 km from each other, they have common direction north-east to south-west. Steepness of south-west and north-east slopes is up to 80 and up to 300 respectively. River valleys are filled with alluvial deposits.

**AJSNR and SUSNNP.** AJSNR occupies the north-western extremity of Talas Alatau with its latitudinal-extended western and partially northern branches and north-eastern slopes of Ugam ridge adjacent to the main ridge. SUSNNP includes the utmost western extremity of Talas Alatau, a part of Ugam ridge, Karzhantau, low-mountain ridges of Boroldai and Kazygurt. The altitude limits range from 800 to 4,200 m above sea level, the highest point is Sairam Peak (4,238.6 m) of Ugam ridge. Branches of high ridges are represented by separate dividing ranges of considerable altitude – 3,400 to 3,977 m above sea level. Canyons of numerous rivers are mainly represented by steep V-shaped valleys and have both north-south and east-west direction. Within the range of 3,500 to 4,000 m the branches are distinguished by Alpine forms with generally developed glacial-nival land forms: circuses, kars, troughs and glacial clays. At present hanging and cirque glaciers can occur here. Glaciation embraces predominantly slopes and valleys of north orientation. Mountains slopes are steep (up to 600) and rocky. Cliff debris and couloirs are well developed. Crests are narrow, here and there interrupted by ridge lows. At the altitudes of 2,800 to 3,500 m erosive and accumulative complexes of relief types prevail. Here, the branch slopes are dissected by numerous grooves and ravines of temporary streams. River valleys in heads have trough form, downstream they pass into narrow cliff canyons. For example, in AJSNR such forms are typical for the rivers Zhusalay and Baldybrek and left feeders of the river Aksu. 'Snow bridges' resulting from avalanche activity can be observed in the narrowest places of valleys. Dry circuses and kars without contemporary glaciation can be quite often observed in axial zones of the ridge. Contemporary glacial clays fall down from glacial cirques and represent blocky-fragmentary material almost without fine earth. The more ancient glacial clays are mainly grass-covered. Most of the reserve's lakes are concentrated in this area. At the height of 2,000 to 2,800 m the relief is mainly subdued. Slopes and outlines of dividing crests are gentler. Relative heights do not exceed 1,000 m, mountain terraces are abundant. Vast stone field's development is typical in the areas of intrusive rocks exposure. Slide rocks are spread on the slopes of streams and valleys and often terminate with alluvial cones at the bottoms of slopes. Small lakes can be observed among knobs in the provenience of moraine deposits. In this area ground water discharge is predominant. In the lower stage at the altitudes of 1,500 to 2,000 m relative heights do not exceed 500 m; the surface is greatly dissected by the network of permanent and temporary streams. The slopes are steep and rocky; the summits are plateau-like. Soil slips prevail here to a greater degree. Denudation,

erosion-tectonic and erosion accumulative relief types may be distinguished here. Lack of rocky forms of relief is characteristic for the area. Some rivers form canyons on exit from mountains. The canyons of rivers Aksu, Koksai and Mashat cut the rock mass of quaternary conglomerates and over the length of 10-12 km have the depth of 300-500, 60-100 and 50-120 m respectively.

At the distance of 60 km north-westward the main territory of AJSNR, in the branches of Karatau ridge there are two paleontological areas of the reserve – Auliye and Karabastau (with the total area of 226 ha). Karabastau paleontological area is situated on the south-west slope of the ridge, in the plateau-like interstream area of the rivers Koshkarata and Bala-Bugun at the height of 800 m above sea level. The second paleontological area – Auliye is situated on the northern slope of the Alakushuk ridge – in the interstream area of the rivers Koshkarata and Boraldai.

**SCSNR, BASNR, PASNR.** Chatkal ridge, where these three nominated areas are situated, is the most typical mountain massif of West Tien Shan central part. It has extended for 225 km from the north-east to the south-west from the junction of Talas and Atoinok ridges, coming down to the south. North-western slopes are short and south-eastern slopes are extended; the width of the ridge in the main part reaches 50-60 km. The average height is 3,500 m above sea level; the highest point is 4,503 m (Aflatun Peak). Outbreaks of rock material prevail in the interstream area.

SCSNR is situated in the Alpine basin protected by the ridges: Chatkal – from the north-west, Atoinok – from the north-east and Bozbu-Too – from the south-west at the heights of 1,000 to 4,000 m. Chatkal ridge extended here for 120 km is the most powerful formation adjoining the territory of the reserve. The highest peak of the ridge in the reserve is the Mount Mustor (4247 m above sea level); the least height – 1,200 m is situated on the south line of the reserve. The largest south branches of the ridge next to its junction with Talas Ala-Too are Uzun-Akhmat ridge (about 45 km long) and Atoinok ridge (60-70 km long). From the south the corner formed by Chatkal and Atoinok ridges is covered by the quite high mountains Bozbu-Too, the highest level of which reaches 2,875 m above sea level.

By degree of its roughness, relief and height the territory of SCSNR is divided into three parts: northern, southern and central. The northern part is presented by rocky mountains with peak-shaped tops interstratified with loosened rocks and rocky steeps. The central part of the reserve is medium mountains. The relief is the hilled plateau penetrated by comparatively rare network of ravines with flat terrace-like slopes. Valleys with depths of 500 to 2,000 m are typical for this area. Deep V-shaped canyons together with large rocky hills and slides are widely distributed at the bottom of slopes. The lake plateau itself (1,800-1,900 m) has a gently rolling topography with relative heights not exceeding 100-150 m and a series of ranges with a number of small lakes between them. Rocky outcrops with a slope angle exceeding 300 and maximum elevation difference of 1,000 m are developed here. The southern part of the reserve is represented by variegated low-hill terrains with dissected ridgy relief with sais and ravines, with deep incised valleys having scarp slopes, steeply in places, with outcrop of parent rock material and ledge rocks.

**BASNR.** Besh-Aral reserve is enclosed by the ridges: Pskem – from the north and north-west and Chatkal – from the south. They abound with rocky peak-shaped tops, deep steep-sloped valleys, scree debris and canyons. In places there are small glaciers; considerable areas of high mountains are occupied by snow fields. Average elevation of Chatkal ridge in the reserve is 3,800 m above sea level and Chatkal Peak reaches the level of 4,350 m. Average elevation of Pskem ridge is 3,200 m above sea level; its highest point is Mont Beshtor (4,299 m). The main passes connecting Chatkal valley with Fergana and Talas valleys are Aflatun – 3,408, Chanach – 3,408 and Chapchyma – 2,840 m above sea level.

The territory of the reserve is represented by intermontane troughs: low-mountain, mid-mountain and high-mountain troughs. River terrace, alluvial cones and submontane sloping planes, often wide, can be distinguished in the flood plain of the river Chatkal, its feeders and adjacent foothills of Chatkal ridge. River valleys, canyons, dry sais, small ravines and shallows obtained wide-spread occurrence there as a result of erosion processes. A picturesque canyon of the river Chatkal with a length of about 30 km is situated within the reserve. Piedmonts and hills (1,400

## Description

to 2,000 m) are represented by smooth slopes. In places erosion-denudation ledges can be observed. The relief is characterized by gentleness, roundness and smoothness of peaks and dividing parts of mountains. Narrow valleys, concentrations of slide rocks in places, large alluvial cones in junctions of lateral inflows of rivers are typical for mid-mountain relief (1,800 to 2,800 m). High-mountain relief of subalpine and Alpine belts (3,200 to 3,600 m) is represented by latitudinal-elongated short branches of main ridges. The relief of glacial-nival belt (3,600 m) is represented by troughs, kars, glacial clays, ice-flows and snow fields.

PASNR. The relief of PASNR's territory is characterized by lack of homogeneity and it is distinguished by high contrasts. The unique feature of the reserve's relief is presence of plenty of alluvial cones consisting of alluvial deposits; they superpose terraces at the exit from each ravine. The largest zones of alluvial cones with the area of 30-40 ha are situated at ravines of the rivers Chon and Kichi Karatal. The surfaces of all alluvial cones are covered by vegetative ground cover.

The lower zone of the mountains is occupied by hilled-undulated low 'adyrs' with smooth hillsides and blunted domed peaks. While moving up along the valley of the river Padysha-Ata the height of adyrs increases successively, in places they are exposed in the form of steep cliffs. Numerous dry sais, ravines and shallows split off from adyrs radially.

Low adyrs are entirely composed of loess loams consisting of clays, sands and partly of pebble stones. Sometimes thickness may reach 20 meters. Medium-altitude adyrs are composed of neogene sediments mainly consisting of clays, sands and small pebble stones. High adyrs are composed of cemented conglomerates consisting of clays, pebble stones and breccias. They are weatherworn and remind silhouettes of different animals and other subjects. High adyrs are immediately adjacent to the ravine Kapchygai, here the landscape facies changes drastically and relief is high-mountain. This ravine is a narrow-canyon having length of 1 to 1.5 km. Both its edges consist of huge monolithic steep cliffs hanging to the bed of the river Padysha-Ata. Cliffs consist of lime stones and sandstones; they are also weatherworn and sometimes take bizarre forms. Their structure is similar to the structures of mountains Kok-Sarai, Azapkyr and Tegerek. As a whole, alluvial plains and terraces are poor expressed along the river Padysha-Ata, narrow, low terraces often covered by alluvial cones can be observed in some places only. Terraces above the flood-plain are present only in the valleys of rivers Ak-Sai, Ergesh-Sai, Kaiyndy-Bulak, Komur-Sai, Koko-Dobo, Taldybashat, Ak-Tash. The most expanded and flat areas (natural boundaries Zhaiyk and Aral) are situated here too.

The view of the Mont Azapkyr greets at the exit from Kapchygai natural boundary. Numerous branches represented by monolithic steep often sheer cliffs split off radially from this giant rocky mountain. Horizontal bedding of earth material is clearly marked on exposures.

Slide rocks and macrofragmental stone fields are widely developed on the slopes of Padysha-Ata valley.

The valley is considerably expanded and has trough-shaped character apically before Muztor pass. The bottom of the valley is flat and composed of extra fine bench gravel and stony-rubble material. The peaks are covered by permanent snow.

Kentor depression is a wide natural boundary with clearly marked troughs is situated over the pass. Glacial relief forms: kars, circuses, couloirs etc. are well marked here. Cliff debris, alluvial deposits and outbreaks of blunted disintegrated rocks are widely developed lower. The territory of Kentor depression is composed of red beds of the Paleogene consisting of clays, sands, rock debris and bench gravel. Mynzhylky valley is the antecedent ravine with steep monolithic cliffs starts from Kaman-Arka pass. Dissection depth is 1 to 1.5 km. The right edge consists of only bare monolithic cliffs and on the left edge the cliffs are low and have horizontal bedding.

There are caves in the territory too. The largest of them are situated in the valley of rivers Mynzhylky and Chymangazy.

**CSNR.**

Deep cut watercourse Bashkyzylsaya divides the territory into two mesoslopes – southeastern and northwestern, which are divided by lateral large and small feeders into the plenty of slopes enclosing the whole range of exposition, however the above mentioned slopes prevail. Maidantal area covers only lateral sector of circus-shaped depression of ridge's north mecoslope. From the south and south-east the basin is limited by the mountain

## Description

ridge Chatkal. From the west it is covered by the high virg joining peaks Kyzylnury and Chimgan. Koxsu ridge rises steeply up from the river Chatkal. This area surrounded by high ridges reminds a funnel, on the south-west slopes of which there is Maidantal area of Chatkal reserve. Both areas are dissected by deep cut river valleys. Steepness of slopes ranges primarily from 20 to 40°, about 15% of slopes have steepness exceeding 40° and only 10% mainly represented by narrow trail ridges, terraces of valleys and several plateaus are more flat-lying – from 5 to 20°.

The territories are difficult to access; it is possible to move only along numerous horse ways, many steep areas are impassable. In spring in Bashkyzylsaya and in the beginning of summer in Maidantal stream crossings are dangerous. Along the whole length the course of rivers is fast flowing and full of rapids, there are a lot of small and large waterfalls.

There are no glaciers in the territory. Only small ice tongues of snow-drift sites in pre-apical cirques and downwind side of some peaks remain until the second half of summer and in single years – until new snow.

There are several small lakes in Maidantal remaining in glacier cirques after their liberation from snow.

## HYDROGRAPHY



Hydrological network of the Property is quite well developed. It consists of relatively large and small rivers, there are a lot of springs, a number of lakes of various size and origin. The sources for supply of river are diverse: these are melting snow, glaciers, underground water and precipitation. An unique feature is the presence of seasonal peak runoff, with its the timing and duration dependent on location and altitude.

**KGSNR.** The main water arteries of the reserve are the rivers Baiyldyr, Khantagi, Biresik, which refer to the basin of the river Syrdariya. Besides, there are a lot of small rivers in the territory, they are Baltabai, Zhingylshik, Balauzen, Karauzen, Tyuetas, Kursai, Taldybulaki etc., however most of them are periodically active stream flows, which act permanently only in their mountain part due to well springs discharge. Upstream all rivers have canyon-shaped or V-shaped sections of valleys with steep and sheer cliffs, with sharp inclines of bottoms and repeated steep drops in streams. Before exits from mountains the river valleys widen up to 200-300 meter, the inclines of bottoms lessen and the slopes become gentler. The length of these rivers ranges from 25 to 110 km. Baiyldyr is the largest and the deepest river of the region, it is 54 km long. Along its way the river take a number of feeders the largest of which are the water springs Tyuetas and Balauzen. Groups of springs, where water discharge is observed throughout the year, interpose along the chain of south-western slope of the ridge, in the lower course of rivers, at southern and south-western boundaries. During summer period flows of rivers at their exit from the mountains are taken for irrigation and are partially lost in alluvial deposits of river valleys, whereupon in June-July the flows of rivers in the lower course run dry. Flow distribution during a year is highly uneven. Surface discharge can be usually observed in February – March and is determined by the start of intensive snow melting in the mountains. Sometimes, after short-time thaw periods, flows pass in December and January. Surface stream flows in rivers stop in June-July and as an exception – in August. Maximum water discharge for rivers occurs during spring flood, mainly in March-April after snow cover melting and rain peaks. Minimum water discharge occurs from July-August to February-March. Solid flow of rivers of the region is formed during snow melting, fallout of liquid precipitation and as a result of stream-channel erosion. Period of drastically increased concentration of suspended load are usually short and last from several hours to 1-3 days. There are no lakes in the territory of the reserve.

**AJSNR, SUSNNP.** According to classification of Schults V.L. (1963) most of rivers of the territory (Koksai, Aksai, Zhabaglysu, Aksu, Baldybrek, Bala-Baldybrek, Sairamsu, Kaskasu, Badam, Keles, Ugam) refer to the rivers of snowy-glacial feeding, which are partially fed from high-mountain area, however glacial feeding is negligible or

may be even absent. In July-August the discharge rate is maintained at a rather high level due to the stream flow from the highest mountain area. Overflow stage starts in March or in the beginning of April and ends in September or on rare occasions in the beginning of October. The overflow period ranges between 140-150 and 200 days and more. 75-85% of annual flow passes during overflow stage. The highest discharge rate can be observed in June, less frequently in May. In winter rivers in the mountains do not freeze but have flood ices, which are sometimes good sized.

Stream flow formation during overflow stage essentially depends on the high-altitude position. At weighted average watershed altitudes of about 2,000 m high the overflow stage starts on March 10 to 20 and at watershed altitudes of about 3,000 m high it starts on April 10 to 20. For most of rivers maximum discharges are formed by means of laying of rain peaks on the platform formed by snowmelt runoff. Rain peaks are critically important in formation of annual maximums. Minimum water discharge rates: for rivers with average altitude of river basins exceeding 2,000 m dry weather period starts in July-October and ends in February-May. Dry weather period lasts for 164 to 200 day on different rivers and in different years. Concentration of suspended load and flood of solid matter considerably vary during a year: in winter period (from December to February inclusively) suspended load and flood of solid matter are minimal. Maximal flood of solid matter falls within April to June.

Lakes. More than 30 lakes have been registered in the territory, their total area exceeds 0.5 km<sup>2</sup>. The lakes are situated mainly at heights within 2,500 to 3,500 m, i.e. most of lakes are concentrated in areas adjoining to contemporary glaciation zones of mountains. The quantity of lakes drastically decreases above and below these altitude intervals. The lakes of AJSNR within altitude intervals from 3,000 to 3,500 are mainly represented by glaciogenous lakes the largest of which are Shunkulduk (3,422 m), Bugulutorkol (3,400 m) and Korumtor (3,189 m). Lakes of other genetic types can be observed outside the limits of last glaciation traces distribution. Most commonly they are rock-dammed, seismotectonic lakes. As a rule, rock-dammed lakes can be found on the lower hypsographical level than glaciogenous lakes. Basically they are large lakes such Kokuirum (2,506 m), Koksai lower 'Serdise' (2,542 m), Zhasyl (2,420 m) as well as the chain of Koksai lakes (2,620-2,700 m). The lower lake layer is represented by small lakes of landslide origin - Kyzulgenkol (2,150 m) and Ainakol (2,360 m). Glaciers. The height of the area glaciation lower boundary of is 3,230 m above sea level. Almost all glaciers are situated in the territory of AJSNR in the basins of rivers Koksai, Aksai, Zhabaglysu, Aksu, Baldybrek and Sairamsu, where there were discovered 114 glaciers with a total area of 29,4 km<sup>2</sup>. There are few glaciers in SUSNNP, they are concentrated in the area of Sairam Peak and in the head of the river Ugam. Glaciers are mainly presented by kar gletschers. The largest glaciers are situated in the basins of rivers: Zhabaglysu – Jabagly glacier (2.63 km<sup>2</sup>), Baldybrek – Shunkulduk glacier (2.56 km<sup>2</sup>), Aksu-Amansai glacier (1.02 km<sup>2</sup>). The area of most glaciers does not exceed 1 km<sup>2</sup>.

**SCSNR, BASNR, PASNR.** In the territory of Kyrgyzstan the drainage boundary of Chatkal ridge divides basins of rivers Kara-Suu and Ala-Buki, right feeders of rivers Naryn and Chatkal, belonging to the basin of the river Chirchik, the right feeder of Syr-Daiya river. The main rivers, which flow from Chatkal ridge are Ters, Kara-Terek and Kara-Toko flowing along north-western slope; Kara-Suu, Kasan-Sai, Padysha-Ata and Gava-Sai flowing along south-eastern megaslope. The largest rock-dammed and moraine lakes are Sary-Chelek and Kara-Too.

SCSNR. The main river Khodzha-Ata originates at the height of approximately 3,000 m and flows into the feeder of Naryna – Kara-Suu. The main sources of nourishment of rivers are melting snows, glaciers, blowing out underground waters and atmospheric precipitations. The river Sary-Chelek stands out among the feeders. Besides, in the territory of the reserve there are several lakes most famous for their beauty: Sary-Chelek, Kyla-Kol, Iri-Kol, Aram-Kol, Cherek-Kol, Bakaly-Kol and others. Sary-Chelek is the largest of them. It is 7.5 km long and 0.5 to 1.8 km wide; it is situated at the height of 1,876 m. Average depth of the lake is about 100 m and maximal depth is 244 m. Water is hydrocarbonate-calcic-magnesium with mineralization level of 300–500 mg/l (soft).

**Table 1. Hydrographical characteristic of lakes of Sary-Chelek reserve**

	Sary-Chelek	Kyla-Kol	Iri-Kol	Choichok-Kol	Aram-Kol
Area (sq.km)	4.92	0.357	0.22	0.49	0.04
Depth (m)	244	16.3	21.5	10.6	15.0

**BASNR.** Hydrological network of the reserve is formed by the river Chatkal and its feeders. The main sources of nourishment of rivers are permanent snows, glaciers and underground sources. Chatkal river is the main water artery of the reserve. It originates from the south-western slopes of Talas Ala-Too. Its source is deemed to be the river Kara-Kuldzha. Average flow rate of the river Chatkal is 2.8 m/sec., in places up to 4 m/sec. Annual average discharge rate is 65.6 cub.m/sec., average maximal – 262 cub.m/sec., average minimal – 18.2 cub.m/sec. Water is hydrocarbonate-calcic-magnesium, moderately hard with mineralization level of 150–300 mg/l. Average sediment load is 50 to 100 g/m. The largest feeders of the river Chatkal within the reserve are: Ters, Besh-Aral, Barkyrak, Naiza, Kok-Kem and others. Overflow stage lasts from April to September. Minimal water level can be observed from October to March.

**PASNR.** Padysha-Ata river serves as the main water artery of the reserve, it originates from Muztor ridge. The river bed is encumbered with large boulders. The flow is rapid especially in the canyon-shaped ravine Kapchygai. Starting from Eki-Chat mountain area the quantity of water in the river reduces and the flow becomes more tranquil. The river Padysha-Ata accepts about 60 feeders. The largest of them are the rivers Zhoon-Bakan, Alapai, Chon-Umet, Chymangazy, Kashkasuu, Irisuu, Turasu, Oyulma, Mynzhylky, Zhylandy and others. There is Padysha-Ata waterfalls in the valley Mynzhylky.

Debris flow traces can be observed almost in all valleys. They are particularly clearly expressed in the valley of Mynzhylky river. A whole dam was formed by fell Semyonov's firs in the result of debris flows and snow avalanches.

The table 2 below shows water discharge rates (m /sec).

**Table 2. Average monthly and annual water discharge rates for the river Padysha-Ata. Station 'Padysha-Ata'.**

I	II	III	IV	V	VI	VII	VIII	IX	X	XI	XII	Annual
1.84	1.83	1.77	4.92	11.9	23.2	19.7	9.52	5.32	3.06	2.37	2.4	7.3

**CSBNR.** The main rivers of the nature reserve are Bashkizilsay running across an area of the same name and Serkalisay separating Maidantal area. A total area of the Bashkizilsay catchment basin is about 110 square km. A difference in altitudes between the river source and the place where it outflows from the nature reserve is 2,000 m; the river bed being 21 km long. An average incline of the waterway bed is 9.5 m per each 100 m of length. In Bashkizilsay river, water level is ranging from its September's minimum of 175 (flow-measuring structure at the rangers' field base) to April's maximum of 235. Flow rate begins to increase intensively in February. Spring flooding lasts three months.

The rivers of Maidantal area are typical to the mountains and characterized by irregularity of riverbed incline, rapid and turbulent flow, vigorous deep erosion, underdeveloped longitudinal profile, riffles, rapids and waterfalls. The density of hydrographic network is approximately the same and amounts to 100 m per one square km in both areas. There are no ice-flows on the territory of the nature reserve. Separate snow beds over 3,000 m make it through the winter, but do not last more than two years.

## CLIMATE



Climate in the territory of the object is extremely continental. Cold and snowy winters are changed by hot and dry summers. In the mountain part, where cyclones are better developed, the continentality and dryness of climate are considerably weakened as compared to flat terrain. Vertical zonality is well-expressed.

**KSNR.** Hot weather with a great number of cloudless days prevails. Absolute minimum in a number of open areas of central Karatau reaches  $-24^{\circ}\text{C}$  in the northern part (Syzgan) and  $-19^{\circ}\text{C}$  in the southern part (Khantagi, Biresik) according to data of 2005-2008. Absolute maximums of summer temperatures in piedmont plains reach  $+43^{\circ}\text{C}$   $+47^{\circ}\text{C}$  in July-August. Annual average air temperature was  $+14.3^{\circ}\text{C}$  in 2005 and  $+13.4^{\circ}\text{C}$  in 2006. Meteorological observations over the last years show the change of climatic conditions – climate becomes more extremely continental. From 2004 to 2008 years July and August were especially hot, there were no precipitations till the middle of October of 2007-2008. Till the end of winter beds of rivers flowing along the reserve's territory remained waterless in the lower reaches. In 2007 temperatures in June reached  $+47^{\circ}\text{C}$ . Winters of 2004 to 2007 were very snowy and cold. Number of days with precipitations in piedmont plains varies between 119 and 124 with expressed spring (in the south-west) and spring-autumn (in the east and north-east) maximums. In piedmont plains and low-hill terrains a mantle of snow regularly exceeds 61 cm. In medium-altitude mountains a mantle of snow is considerably higher and exceeds 100 cm as for instance in 2005. Summer season, at least on Karatau northern microslopes never remains absolutely without precipitations, sometimes thunder-heads pass here in July and in August too. The belt of comparatively high humidification is at the elevation of 1,500 to 2,000 m in central and eastern parts of the ridge, where precipitation amount exceeds 500 mm per year and as absolute altitudes go down to the feet of slopes the amount of precipitations drops to 150 – 200 mm. Climate of the north microslopes (Suzak area) is more severe, and winters are colder.

Air temperature fall at the dividing ridge, that is earlier onset of subzero temperatures in autumn and later onset of above-zero temperatures in spring, create conditions for the prolongation of the cold period. Snow blanket in the high-mountain part of the ridge and on northern slopes of the reserve melts considerably later than in the lower-mountain part and on southern smooth hillsides. The most intensive wind activity can be observed on August and December and January are the calmest months, northern and north-eastern wind directions prevail, south-westerly direction winds blow less frequently.

**AJSNR, SUSNNP.** Annual average air temperatures are  $5.8^{\circ}\text{C}$  to  $10.8^{\circ}\text{C}$ . January is the coldest month, monthly average temperature in piedmont area ranges from  $-2.3^{\circ}\text{C}$  in western part to  $-6.5^{\circ}\text{C}$  in northern part. Absolute minimum of temperatures in January is  $-38^{\circ}\text{C}$  in the territory's piedmont part and  $-32^{\circ}\text{C}$  in medium-altitude mountains. Maximal average temperatures in July range from  $+22.6$  to  $+25.4^{\circ}\text{C}$  in piedmont areas to  $+17^{\circ}\text{C}$  – in medium-altitude mountains. Thereat absolute maximum was  $+41^{\circ}\text{C}$  in piedmont belt,  $+30^{\circ}\text{C}$  – in mid-mountain belt. During summer season as altitude above sea level goes up, the decrease in air temperature becomes more noticeable. On western slopes of Talas Alatau monthly average temperature in July decreases at average by  $0.7^{\circ}\text{C}$  with the increase of altitude by 100 m. Annual amplitudes decrease with the increase of altitude above sea level. Thus, in piedmont belt the amplitude is  $28.4^{\circ}\text{C}$ , in the area of meteorological observing station Blinkovo (1,122 m above sea level) the absolute annual amplitude is  $25.7^{\circ}\text{C}$ , in the area of meteorological observing station Chuuldak (at the height of 1,947 m above sea level) –  $21.2^{\circ}\text{C}$ . Freeze-free period lasts from 182 to 193 days in piedmont areas, 155 days in medium-altitude mountains. Air temperature crosses  $0^{\circ}\text{C}$  at the end of February and in the beginning of March for piedmont part (at the altitude not exceeding 1,200 m), at the end of March for altitudes up to 2,000 m, in the second decade of April for altitudes of 2,000 to 3,000 m and over. In autumn air temperature crosses  $0^{\circ}\text{C}$  predominantly in the middle and towards the end of December for altitudes up to 1,200 m, from the third decade of November and to the second decade of December for altitudes from

1,200 to 2,000 m and in the second half of September for altitudes exceeding 3,000 m.

By the direction of prevailing winds the territory may be divided into two areas: 1) piedmont areas affected by neighboring ridges; 2) mountain areas, where orientation of mountain valleys is critical for wind conditions development. Generally, southern, eastern and south-eastern winds prevail in piedmont area of the western part, north-eastern and south-western winds prevail in the northern part. In mountain valleys wind direction coincides with their main axis. Fans can be observed comparatively often (warm winds blowing from the mountains), in cold season they cause thaw periods and in summer they felt as hot and dry winds. During cold season in the area of Chokpak depression between Boraldai and Zhabaglytau ridges local north-eastern wind 'Chokpak' prevails, it causes cold snap in the upper valley of the river Arys thereat skipping valleys of rivers Aksu and Baldybrek. Average number of days with strong wind 15 m/sec ranges from 17 to 22, the overwhelming majority of winds blows at a speed of 1.9 – 3.9 m/sec.

Annual precipitation in low-hill terrain ranges from 526 mm to 627-765 mm. In medium-altitude mountains amount of precipitations comes to 891 mm (met. Chuuldak). In occasional years amount of precipitations reaches 1,260 mm in the basin of Zhabaglysu river and 1,347 mm in the basin of Baldybrek river. Most of precipitations fall in spring period, second maximum of precipitations occurs towards the end of autumn and in the beginning of winter, mainly in December. The least of precipitations falls in August (6-10 mm) and in September (10-13 mm).

The height of a snow blanket at altitudes 1,360 to 2,120 m ranges from 27 to 82 in the basin of Zhabaglysu river and from 75 cm to 99 cm in the basins of rivers Baldybrek and Silbili.

**SCSNR, BASNR, PASNR.** Climate of Chatkal ridge is extremely continental. Average January temperature is  $-3^{\circ}\text{C}$   $-5^{\circ}\text{C}$  in piedmonts,  $-10^{\circ}\text{C}$   $-15^{\circ}\text{C}$  on the dividing ridge. Average July temperature ranges from  $+22$  to  $+25^{\circ}\text{C}$  to  $0$   $-5^{\circ}\text{C}$  respectively. Annual rainfall is 200 mm in low-hill terrains, up to 600-700 mm in medium-altitude mountains, up to 1,000 mm in Sary-Chelek area. Snow-cover depth reaches 6 cm in low-hill terrains and 1 m in medium-altitude mountains. There are 18 small glaciers on the ridge with a total area of 5.7 km<sup>2</sup>.

SCSNR. Owing to mountain ridges protecting the reserve's territory from cold-air outbreak from the north-west and east in winter, a climate with relatively mild and snowy winter and warm damp summer was formed in the reserve. Winter is characterized by formation of temperature inversions due to filling of Fergana valley with cold air masses. Over the last 5 years heavy frosts were occasional and short-term. The lowest temperatures occur in winter and range from  $-10^{\circ}\text{C}$  to  $-21^{\circ}\text{C}$ . Thaw periods are frequent; they are accompanied by sensible rise in the temperature. Maximal winter temperatures sometimes reached  $11^{\circ}\text{C}$ . In recent years thaw periods often occur in winter, rains occur sometimes. Monthly average amount of precipitations is 66 mm.

In spring temperature rises at a rapid rate and amount of precipitations increases. In 2002 number of days with precipitations reached 55 and monthly average amount of precipitations was 226 mm. Snow melting runs fast and ends towards the end of March, sometimes in the beginning of April. Frosts occur in April and May (air temperature drops to  $-6^{\circ}\text{C}$ ).

Temperature in the beginning of summer is not very high. Average air temperature in summer ranges from  $17^{\circ}\text{C}$  to  $20^{\circ}\text{C}$ . End of summer is dry; it is characterized by low cloudiness, atmosphere transparency and predominantly calm weather. Autumn comes towards the end of August.

In recent years autumn is dry. For example, precipitation depth in 2002 was 73.2 mm. The earliest formation of snow cover was registered on October 20, 1999, the latest – on December 1, 2001. Average date of stable snow cover formation occurs in November. Snow-cover depths range widely. On average it is 43 cm, winter minimum of 24 cm was registered in 2002, absolute maximum was registered in 1998 and was equal to 103 cm.

PASNR. Climate of Padysha-Ata reserve is characterized by moderately cold winter and hot summer. According to data of hydrometeorostation 'Padysha-Ata', monthly average air temperature in July is  $+18.6^{\circ}\text{C}$ , in January  $-3.4^{\circ}\text{C}$ . Mean daily air temperature crosses  $0^{\circ}$  and  $10^{\circ}$  on February 16-23 and December 13-30 and on March 28-30 and October 20-29 respectively. So, vegetation period lasts for 204 to 218 days.

Air temperature is below zero during three months in a year, during remaining 9 months it is above zero. Maximum and minimum air temperatures are in August and February respectively.

The last spring frosts occur in the second decade of April and autumn frosts sometimes start in the second decade of October.

Average yearly precipitation is 355 mm. Bulk of precipitations falls from February to June (325 mm). Most of precipitations occur in February, April and June and least of precipitations fall in September and October. Snow blanket is stable, it forms in the second decade of November and remains till the middle of April.

BASNR. Besh-Aral nature reserve is situated at the altitude of 1,200–3,900 m above sea level and as a part of Chatkal valley represents a separate area of South-Western climatic region of Kyrgyzstan. Its unique orographical conditions play a leading role in the basin's climate formation. High mountain ranges surrounding the valley prevent from penetration of cold air masses from the north and north-east and weaken the influence of Siberian anticyclone and enough high 'barrier' in the south-west impedes heat exchange with more heated air of subjacent deserts. Thus, in cold season the valley becomes a peculiar kind of trap for powerful air masses coming from the west. The relief of the basin and low air temperatures facilitates condensation of brought moisture and formation of unusually deep blanket of snow.

Climate of Chatkal is continental with wide fluctuations in air temperature during seasons and days, with cold winter and warm summer. Monthly average temperature of the warmest month July ranges between 6.4°C (weather station 'Chatkal') and 14.1°C (weather station 'Ters river mouth'). Absolute maximum is 32.2°C and 38.5°C correspondingly. Monthly average temperature of the coldest month January is -8.9°C and -21°C respectively. Absolute minimum is -26.2°C and -39.8°C. Annual mean amount of precipitations ranges between 467 and 440 mm. Frost-free period lasts for 140 days on average ('Ters river mouth'), and in highlands frosts occur practically in any time of vegetation period. South-west and north-east directions winds prevail in Chatkal basin. Their average speed is 2–3 m/sec., their maximum speed does not exceed 15 m/sec. Regional mountain-and-valley breezes regularly blow from the bottom upwards the valley during a day and backward at night.

Spring comes in March (medium-altitude mountains) and towards the end of April (highlands); long duration and unstable weather is typical for it. Average temperature in March is -0.9°C in medium-altitude mountains and -4.2°C in highlands. Maximum mean yearly rainfall in the form of rain and snow – 67 mm falls during spring period (in March). Summer is rather warm, dry and mainly clear. Only 10-15% of annual rainfall falls during three summer months, minimum precipitations – 10 mm fall in August. First half of autumn in the basin is usually dry and warm but quite intensive rains and even snow start falling from the middle of October. Winter is snowy and cold. First snow occurs towards the end of October – in the beginning of November. Stable snow cover remains during 4-5 months. Average date of stable snow cover formation is November 15. Towards the end of March average maximum height reaches 83 cm ('Chatkal'). Average date of destruction is April 20. Maximal and minimal heights of snow cover reach 195 cm and 44 cm respectively.

**CSBNR.** On the basis of N.N.Ivanov continentality coefficient, the climate of middle altitude mountain zone of Bashkizilsay area is the middle continental type.

Specific circulation of mountain atmosphere and orographical conditions have an appreciable influence upon winds. Bashkizilsay valley with a significant incline of its bottom takes a south-westerly prevailing direction in the region. North-eastern winds are prevailing here. In the valleys of Maidantal area, where elevation mostly drops northward, southern winds are prevailing. The coldest month is January (or February in certain years.) The sum of average daily temperatures below zero throughout winter is only 252 on the height of 1,115 m (for reference, this value is much higher in mountain depths and highlands.)

Air temperature begins to grow in February and evenly goes up till July. The long-term average temperature is relatively low (23°C) during the hottest month (July) and is 21-22°C in June and August. Air temperature evenly declines August through December.

In separate years, both occurrence and descent of snow cover fluctuate in a wide range - about two and more months. On average, days with constant snow cover number from 180 (on the slopes of northern exposition, 1600 m above sea level) to 40 days (in floodplain 1200 m above sea level). The height of a snow cover in February in the meteorological station area does not exceed 30 cm, with height thickness of a snow cover increases to 100-120 cm.

Temperature gradient, for warm period equal to 0,45-0,55° for 100 m, provides insight into temperature rate in zones located above the weather station. The climate on sites is middle continental, hot in middle altitude mountain zone, warm in subalpine belt, cool and cold in the alpine belt. The precipitation total has no tendency to increase

## Description

with height (judging by grid of total precipitation gages), but evaporation decreases, and humidifying conditions, thus, are softened.

On conditions of humidifying the climate is transformed from subarid in middle altitude mountain zone of Bashkizilsay to damp in alpine belt of Maidantal, though the summer drought is expressed in all belts. Graphs and tables below show meteorological data from Bashkizilsay station located at a lower part of middle altitude zone (1,154 m a.s.l.).

## SOILS



Soil cover of the territory is much diversified, with well developed altitute zonation. The following types and subtypes of soils are distinguished: 1. Alpine common; 2. Alpine primitive; 3. Alpine hydromorphous; 4. Subalpine limonite; 5. Subalpine steppificated; 6. Subalpine dark; 7. Subalpine hydromorphous (hydromorphic); 8. Brown with subtypes: dark-brown, light-brown and brown; 9. Meadow-dark-brown; 10. Meadow-swamp; 11. Mountain and common sierozems and grey-brown soils; 12. Alluvial: forest-meadow and meadow (Basic diagnostic indicators of soils from alpine and subalpine territories of Kazakh SSR, Alma-Ata, 1989). Various non-soil formations, e.g. outcrops and talus are rather widely present in the area at both watershed ridges and slopes.

*Alpine soils.* They are developed in altitudes above 3,000 m as well as on moraines and kars. During warm period soils are irrigous and enough warmed-up. Generally, thickness of alpine soils does not exceed 40-50 cm, however it can reach 1 m in depressions among moraine hills. They are weakly differentiated to genetic horizons. The color is different in southern and eastern slopes and light-brown, pale on elevations. On northern and west slopes and on degradations it is darker, growing light with depth. Carbon-bearing, common, leached soils can be found among alpine soils. Leached soils prevail. The humus content is 12-13%.

*Subalpine meadow soils.* They are distributed mainly on altitudes more than 2,000 m. They rarely occur in homogeneous contours, more often they occur in complex with subalpine steppificated, subalpine dark, subalpine hydromorphous and rock ledges. As a whole, thickness of these soils is higher than alpine ones, frequently reaches 50-70 cm. Color is dark-grey, dark-brown, slightly lighter with depth.

*Subalpine steppificated soils.* They are developed at altitudes more than 2,000 m. They occur both in homogenous contour and in complex with other types of soils and rock ledges. For these soils not exceeding 40-50 cm high rubliness of profile and low thickness are typical. Subalpine steppificated soils are light-brown and pale. Their profile is lighter than the one of meadow soils. The soil structure is poorly expressed. More frequently it is powder-silty. On the plateau, on sloping dividing ridges the surface of these soils are often covered by continuous layer of break stone. Subalpine steppificated soils may have different mechanical composition – from slightly loamy to clay sand, however they are more often heavy loamy. ‘Carbonate, common, deeply bubbling up, leached’ types of soils can be identified among subalpine steppificated soils. Humus content is up to 12.6%.

*Subalpine dark-colored soils.* They are negligibly distributed in compact profiles, they form complexes with other soils: mainly with subalpine meadow on northern slopes, with subalpine steppificated - on the southern ones. Third component is often represented by rock ledges. They develop under the cover of *Juniperus turkestanica*. It is a perennial slow-growing shrub, the age of which may reach 100 and more years. During this period soils under it undergo some changes. A peculiar kind of microclimate is created under the cover of juniperus. Sun rays weakly penetrate juniperus’ cover, evaporation is reduced. The surface of soils is always covered by the layer of fallen needles. Besides, as a rule, juniperus grows on stony areas, therefore soils under it are very stony, they have a

## Description

small profile thickness usually not exceeding 40 cm. The structure in these soils is poor-developed. It is incompetent lumpy and power-like.

*Subalpine hydrogenic soils.* Compact profiles occur in rare cases, more often, they form complexes with other types of subalpine soils representing the second and the third component of the complex. Mechanical composition is diversified, more often, slightly loamy, usually it does not change with the depth, but becomes lighter to some extent. Pulverescent and uliginous fractures have a dominant role in particle size distribution.

*Brown soils.* They develop in low-hill terrain and medium-altitude mountains on different rocks. They are characterized by deep penetration of soils-forming process and considerable thickness of soils profile. Humus content is different: from 3.6 to 15% in the horizon A. There can be noted increased clayiness of whole profile especially its middle part, predominance of brown color and segregation of expressed illuvial horizon. Subtypes of dark-brown, light-brown and peculiarly brown soils can be identified among brown soils. Carbonate, common and deeply bubbling up types can be separated by degree of carbonate content in each subtype.

a) Dark-brown soils. They develop under the cover of forests as well as under the cover of grass and brushwood.

b) Light-brown soils. Basically these soils occur with dark-brown soils or form compositions with light-brown soils, which differ by thickness of silt rock layer and carbonate content. Light-brown, thick, common, non-stony, slightly loamy soils develop in low-hill terrain on northern slopes. Light-brown soils under the cover of juniperus have some peculiarities. *Juniperus hemispherica* and *Juniperus seravschanica* grow in the area of these soils distribution. They are long-term trees reaching the age of 100 and more years. Considerable amount of fallen needles accumulates on the surface under the cover of such trees. It is cool here, vegetation is more mesophilic. The appearance of the soils depends on wildlife habitat area, where juniperus grows, as far as it prefers stony areas the soils are thin here. Their peculiarities are in the increase of humus content, total nitrogen and phosphorus, increase in base exchange capacity. However, color and structure of horizons do not change. Mechanical composition of the upper horizon becomes easier and the one of the lower horizon – heavier.

c) Brown soils subtype. They develop on alluvial cones piedmont plains. The types of carbonate, common and leached soils are defined among brown soils. Their color is dark-brown, the structure is lumpy-grainy in the horizon A and lumpy, sometimes nutty – in the horizon B.

*Gray-brown soils.* Eluvial-deluvial rubble loam and loess loam serve as soil-forming rocks. Gray-brown soils are characterized by thick humus horizons (from 35 to 95 cm).

*Common mountain sierozems.* Soil-forming rocks are represented by eluvial-deluvial rubble silty loam developed in the result of deflation of different dense rocks. Thickness of humus horizons ranges from 30 to 60 cm. Content of humus in the upper horizon of dark sierozem may reach 4-5%. The structure of humus horizons is lumpy-granular. Soils are carbonate from the surface. Deeply bubbled up, nonsaline and gypsum-bearing rocks are separated among mountain sierozems.

*Southern light sierozems.* Soil-forming rocks are represented by loess loam. Humus horizons have thickness of 50-60 cm and crumble structure.

*Northern light sierozems.* Thickness of humus horizons is 40-50 cm. Their structure is lumpy-luminal. Carbonate horizon have fine-nutty structure. Main rocks are normal, xeromorphic, deeply-gypsum-bearing, poor-developed.

*Alluvial soils.* They are intrazonal and distributed along flood beds and terraces of rivers among bouldery-pebble deposits. Mechanical composition is predominantly heavy-loamy. Alluvial soils may be presented by several subtypes depending on the specific area of their development.

Below, there are general soil characteristics for each area.

## Description

**KSNR.** In piedmont plains surrounding Central Karatau north light grey soils (sierozems) are developed in loess south-westerly, which are substituted by southern sierozems southwardly. In Karatau upland common sierozems obtained a wide-spread occurrence and light-chestnut and dark-chestnut alpine soils are presented in the highest orographical altitudes (Zhikhareva, Kurmangaliyev, Sokolov, 1969).

*Gray-brown soils* are spread in piedmont plains and in the lower parts of slopes.

*Southern light sierozems* occupy the lower belt of sleepy-sloping undulating piedmont plains.

*Nothern light sierozems* occur along piedmont plains on loamy deposits of different genesis and in hummocky topography of northern depressed part of Karatau.

*Alpine chestnut and dark-chestnut soils* are connected with low-mountain and medium-altitude mountain relief.

**AJSNR and SUSNNP.**

*Alpine soils.* They are developed in altitudes above 3,000 m as well as on moraines and kars.

*Subalpine meadow soils.* They are distributed on altitudes of 2,100-2,400 m to 2,900-3,000 m predominantly along north slopes. Along valleys of springs they may come down to 1,800 m.

*Subalpine steppificated soils.* They are developed at altitudes of 2,100 (2,400) – 2,900 (3,000 m) predominantly along south microslopes.

*Subalpine dark-colored soils.* They occur on the slopes of different expositions, but more often, northern.

*Subalpine hydrogenic soils.* They are formed in depressions, coombes, nival niches, on the plateau and slopes of different expositions.

*Brown soils.* They develop in low-hill terrain and medium-altitude mountains.

a) *Dark-brown soils.* They develop predominantly on the northern, western and in lower parts – on southern slopes as well as in depressions among light-brown soils at heights of 1,600-2,200 (2,500) m under the cover of juniperus, birch and in the canyon of Aksu river – apple forests as well as under the cover of grass and brushwood.

b) *Light-brown soils.* They develop on the plateau, in the southern and eastern expositions, and in low-hill terrain - on northern slopes under brushwood, grass and brushwood, in juniperus woods as well as under tall-grass, less frequently, grass of tall grasses shrubby semi-savanna forests, slightly steppificated in some places.

*Brown soils subtype.* They enter mountains in small areas from the piedmont plain. They develop at heights of 1,250-1,600 m on alluvial cones piedmont plains.

*Alluvial soils.* They are distributed along flood beds and terraces of rivers among bouldery-pebble deposits.

**SCSNR, BASNR, PASNR.**

In the Chatkal ridge in highlands relatively small areas are occupied by highland-meadow alpine soils (above 3,000 m). Generally this belt is occupied by rocks, rock ledges, cliff debris and alluvial deposits. Mountain meadow steppe subalpine (2,000-2,600 m) and mountain brownish-chestnut (1,600-2,200 m) soils prevail in medium-altitude mountains. The lower part is occupied by sierozems (600-1,800 m).

SCSNR.

*Black-brown, dark-brown forest soils* of nut and fruit forests of Tien Shan have absolutely specific conditions for development and a great inconsistency of their genetic interpretation by different authors, this has made it possible to define these soils as independent genetic type.

*Black-brown soils* of nut and fruit forests by their mechanical composition predominantly belong to pulverescent heavy loam soils, less frequently – to medium-textured loams and light loams. They have a water-stable structure, high water-retaining capacity and good water permeability thus preconditioning the lack of surface flow. Humus content is a unique feature of black-brown soils.

*Mountain steppe brown soils* are usual on steep slopes of northern and western expositions under shrubs. Brown forest soils are distributed under spruce and spruce-fir woods on the slopes of mountains surrounding Sary-Chelek lake. *Meadow steppe brown soils* are distributed on the northern and western expositions under shrubs, broken forest and subalpine meadows. *Mountain meadow sod soils* are developed under alpine meadows.

BASNR.

*Mountain valley typical brown soils* are distributed in the lower part of mountains and in the bottom of Chatkal

## Description

basin at the height of 1,300–1,500 m.

*Mountain valley dark-brown soils* are formed in the mid-mountain belt under shrubs, tallgrass meadows and grasslands. They occur at heights of 1,600–1,900 m.

*Mountain brown typical soils* occupy more humidified northern and north-western slopes of mountains. They are distributed at heights of 1,600 to 2,600 m.

*Mountain Subalpine meadow steppe soils* are widely distributed within the heights of 2,600 to 3,300 m.

*Mountain alpine meadow steppe soils* are widely distributed in near-ridge parts of mountains, at heights exceeding 3,200 m. They are thin. Humus content does not exceed 12–13%.

Intrazonal types of soils: *meadow, meadow-swamp alluvial*. They are limited to cavities and territories with close groundwater occurrence.

PASNR. Adyrs consist of *sierozemic pulverescent soils*. While low-mountain zone is occupied by varieties of sierozem soils, the varieties of *mountain steppe* and *mountain meadow brown soils* are distributed in the mid-mountain belt. *Mountain-forest dark-brown soils* are distributed in the forest belt. The slopes of northern expositions are occupied by the thicker layer of soil covering, and *thin, stony-rubby, arenose soils* are usually developed on the slopes of southern expositions.

*Alluvial soils* distributed on terraces of rivers and on loess loams have the thickest layer of soil covering. Loess loams are distributed on adyrs.

**CSBNR.** Rocks, taluses, clay breakages occupy 7-15% of the reserve territory. On slopes of the southern exposition small *breakstone unformed soils* are spread with the small content of pit-run fines. In the lower belt of middle altitude zone *aeolian soils* are widespread. Thickness of loess "cloak" in some areas reaches 30 m. Slopes of the northern exposition, as a rule, are covered by thickness mantle of pit-run fines, and soils have deep, lengthy profile with the expressed genetic horizons.

On the foothills there are developed grey soils (sierozems) that can be found up to 1200 – 1300 m. There is not much of sierozem represented in Chatkal reserve. There were found 300 ha of *dark sierozem* on loamy soil only in the Bashkizilsay area. Another type of sierozem is a *dry dark sierozem*, prevalent near, though outside of the low boundary of Bashkizilsay area.

The brown soil is spread over the middle-altitude zone of mountains. *Meadow brown soils* are the most similar to steppified type of the subalpine zone spread on the slopes of the southern exposition.

*Light-brown meadow-steppe alpine soils* are common for watersheds of ridges and adjacent parts of slopes. Usually low development of the *light-brown soils* is located at 2600 – 2800 m, but on the ridges with lower watersheds the light-brown soils may be lower at the level of 2000 – 2200 m. Content of humus in upper horizons of light-brown soils is 5 – 7%. Soils of the northern slopes contain more moisture and have higher content of humus. Soils of southern slopes are more subject to erosion and contain less humus. There is no vast accumulation of small fraction soils in this zone.

Near springs and snowfields, at highly moistened sites, *light-brown meadows and peat-marshy soils* are developed with humus content reaching 10 – 12%. However distribution of these types of soil is limited. Mountain-forest soils also have scanty occurrence under the deciduary forest: hazel, apple and mountain ash.

## BIODIVERSITY



## WESTERN TIEN-SHAN AS A CENTER OF ORIGIN OF CULTIVATED PLANTS

A well-known theory developed by Nikolai Vavilov, an outstanding Russian scientist, identifies 12 world centers of origin of cultivated plants. One of them, Central Asiatic Center, includes Northwest India (Punjab), northern

## Description

Pakistan, Afghanistan, Tajikistan, Uzbekistan, and Western Tien-Shan.

It is important that along with specific tree species, Western Tien-Shan represents the whole wild fruit forest areas which may be rather extensive. They are formed by autochthon relict tree species which fruits are used for food and as genetic resources for selection and breeding of domesticated plants.

There are 10 species of wild relatives of domesticated fruit plants. Such species as Siverse's apple tree (*Malus siversii*), Nedzvetsky's apple-tree (*Malus niedzwetzkyana*), apricot (*Armeniaca vulgaris*), pistachio (*Pistacia vera*), and wild vine (*Vitis vinifera*), are threatened and included on the Red List of Kazakhstan. Other species, such as plum (*Prunus sogdiana*), Regel's Eminium (*Purus regelii*), walnut (*Juglans regia*) and hawthorn (*Crataegus pontica*) are qualified as rare.

Apple forests formed by a relict endemic Siverse's apple tree (*Malus siversii*) are of great value today. In Western Tien-Shan, they are found in an extensive altitude range, primarily in low and middle altitudes (Ugam ridge, Boroldai, Kokbulak clove in Karatau, Mashat and Talas Alatau.)

A 2002 sensational discovery made by Barrie E. Juniper, professor at the University of Oxford, and his peers (Harris, Robinson, Juniper, 2002), showed that Siverse's apple tree was the progenitor of today's apple diversity which originates from Kazakhstan's Tien-Shan. Barrie Juniper visited Kazakhstan (apple trees of Trans-Ili and Dzungarian Alatau) in 1998. His genetic analysis and Apple genus pedigree tree show that of all 30 wild apple species found worldwide only Siverse's apple tree has a gene pattern similar to domesticated apple.

Today, Siverse's apple tree, an indigenous species and an autochthon of Kazakh Tien-Shan, is regarded as progenitor of the existing apple range (totally, about 10,000 species.) Other species, such as oriental apple tree, the main species of the Caucasus, and crab apple found in Europe, had no serious impact on domesticated apple tree genetics, although earlier researchers, including Nikolai Vavilov, supposed crossbreeding with Siverse's apple tree, but up-to-date data have proved this concept to be unlikely (Morgan, Richards, 2002.). Research conducted in natural and artificial stands showed that a set of valuable polymorphic signs and features of Siverse's apple tree are hereditary and may be fixed in progeny in case of their artificial propagation (Djangaliyev, 2007). According to Bertil Lindquist, a Swedish geneticist, "discovery of a single natural elite tree may have the same importance as a persistent selection work." (Lindquist, 1958)

Siverse's apple tree is found in Western China, Uzbekistan, Kirgizia, and Tajikistan, but it forms the stands with a characteristic forest structure only in Kazakhstan and grows in fragments in all other places. This means that the prospects of world's apple industry currently exposed to serious challenges related to a steep decline of stress resistance of cultivars in many ways depend on authentic (original) genetic resources of Kazakhstan's apple forests (Djangaliyev, 1977; Salova, 2012).

The area of wild fruit forests has been drastically decreasing during the last 20 years. Their most important threat factors include direct man-made destruction of natural ecosystems; transformation of forest apple phytocenosis into agrobiocenosis; genetic erosion of natural populations of Siverse's apple trees; aggressive impacts of foreign species and excessive recreational loads on apple forest ecosystems. The above factors cause pollination of wild trees with pollen of pedigree or "semi-domesticated" material and give rise to a "wild" posterity with modified genetic criteria. Such posterity is characterized with a low competitive ability in phytocenosis, inadequate adaptive ability and a drastic fall of viability. (Djangaliyev, 1977)

Interest in Siverse's apple tree is increasingly growing because practicing breeders are primarily concerned with starting material to cultivate species resistant to pests and diseases. Nikolai Vavilov believed that resistant species and forms of seed plants may be found in their original geographic native country (Vavilov, 1960). Petr Zhukovsky (Zhukovsky, 1971) integrated multiple data and made a conclusion that the most reliable original material for resistance breeding may be found in the common native country of the "host" where it shows excessive variation and the "pest". There they pursue their joint evolution resulting in survival and preservation of resistant host forms in the natural environment even though the parasite forms new and even more virulent races and biotypes.

After leaving Tien-Shan far back in the past, Siverse's apple tree reached North America, among other locations. Four species of wild apple trees are found in the USA: *M.angustifolia*, *M.coronaria*, *M.ioensis*, and *M.fusca*. They are of no interest for breeding commercial species. Today's apple range in the USA is based on apple cultivars imported from the Old World, i.e. descendants of Siverse's apple tree which underlies such renowned cultivars as Golden Delicious and Red Delicious which are progenitors of over 90% apple hybrids used by people. According

## Description

to James Luby, expert at the University of Minnesota, Red Delicious produced such hybrids as Fuji and Empire and Gold Delicious such hybrids as Gala, Jonagold, Mutsu and Pink Lady (LeVine, 2003.)

Of nut-bearing trees, pistachio open woods are most expanded and found in the Karatau mountains (Kokbulak clove), mountains Mashat and Daubaba and Galiatogay clove of Ugam ridge.

Nut-bearing bushes are most expanded across Western Tien-Shan and represented by the following species of wild almond: *Amygdalus petunnikowi* included on the Red List and *Amygdalus spinosissima* which may be of interest for selection purposes (Ogar, 2013.)

The most extensive wild forest areas of Western Tien-Shan are under conservation in Aksu-Jabagly reserve, Sairam-Ugam national park and Boraldaitau area of Syrdarya-Turkestan Regional Nature Park (the latter is not included in the discussed nomination.)

## FLORA AND VEGETATION

Western Tien Shan is the extremest outpost of the mountain range deeply pressing between the Mujunkum and Kyzyl Kum deserts. Owing to their marginal position and due to the fact that the majority of main ridges deviate from latitudinal disposition, they intercept the damp air masses bearing moisture from the Atlantic Ocean and besiege them on their slopes. Western Tien Shan is the most humidified part of Tien Shan and the most provided with heat. Mode of temperature and humidifying are favorable for organic life to flourish. A variety of mountain and inundated coniferous and deciduous woods is unprecedented for the TienShan and other ranges on its latitudes. Some part of them has existed since the preglacial period, since the tertiary time, protected by ridges from the cold northern winds. A specific originality of the region's wildlife is due to both the woods and other relicts of former epoch (plants, vegetative communities and animals). Gradual rising of the former flat territories to the greater height during the mountain formation was accompanied on the one hand, with transformation of communities living on them, and on the other hand with certain preservation of the separate groups that stopped in their progress in comparison with relatives which remained on the plains.

### KSNR.

#### Phytogeographical zoning

In the landscape division of Central Asia (Agakhanianz, 1981; Kamelin, 1990) Karatau is related to the type of arid and subarid ranges of the western extremity of TienShan. The vegetation of the given type is characterised by the predominance of foothill deserts, enriched with mountain elements (Khramtsov, 2003). The Syr-Darya Karatau separates the North Turan moderately cold (subboreal) deserts from the South-Turan (sub-boreal - tropical) deserts with moderately warm climate. This geographical position facilitates interosculation of representatives of one type of vegetation into the other vegetative communities and complex structure of plant communities formation. The vegetative cover is presented by the communities which are in the extreme northern limit of their geographical distribution including the savannoids adapted to winter-spring atmospheric precipitation. Besides, unique communities of the friganoids (Kamelin, 1990) - endemic subshrubs are widespread here. In the "Flora of Kazakhstan" (1956) Karatau is singled out as a separate floristic area. The latest system of botany-geographical division into districts (Volkova, 2003) distinguishes the Karatau mountain sub-province of the Mountain-Central Asian province in the structure of Sahara-Gobi desert area (Rachkovskaya, Safronov, Volkova, 2003). The Karatau Ridge is characterized by a total absence of large forests and bush thickets and small forests are widespread only in the mountain part of river valleys and in northern slopes of mountains.

#### Zonation and main formations

Desert groupings of wormwoods (*Artemisia terrae-albae*, *A. diffusa*, *A. turanica*) and *Salsola arbusculiformis* are presented in the foothills and in submontane plains. These communities in the bottom part of mountains are replaced by ephemeral-wormwood ecosystems with Sublessing wormwood *Artemisia sublessingiana*, bulbous meadow grass *Poa bulbosa*, Regel's eremurus *Eremurus regelii*.

The belt over which vegetation is dominated with Karatav wormwood *Artemisia karataviensis* (Rachkovskaya,

## Description

Sadvokasov, 2003) begins at a height of 500-700 m above the sea level. Prevailing type of communities is ephemeral-cereal-Karatav wormwood. Among the cereals there is bulbous meadow grass, fescue grass *Festuca valesiaca*, fox needlegrass *Achnatherum caragana* and crested wheatgrass *Agropyron pectinatum*. The motley grass abounds with ferula *Ferula tenuisecta*, as well as Greig's tulip, Regel's eremurus and lampwick plant *Phlomis salicifolia*. The semishrubs endemics can be found, such as *Lepidolopha karatavica*, *L. talasia*, *Jurinea suffruticosa*, etc., the majority of which are registered in the Red Book of Kazakhstan (1981). Regel's pear *Pyrus regelii* occurs rather rarely.

The belt of the real mountain steppes begins at the height of 1,000-1,100 m. The most widespread are turf-cereal fescue grass steppes, with feather grass *Stipa lessingiana*, Caucasian *Stipa caucasica* and Karatav matgrass *Stipa karatavica*. In the steppe communities the shrubs layer is developed usually including spirea meadowsweet, honeysuckle *Lonicera nummularifolia* and Karatau dogwood *Cotoneaster karatavica*. In the stony areas there are bushes of *Atraphaxis pyrifolia*, Petunnikov's almonds *Amygdalus petunnikovii*, red cherries *Cerasus erythrocarpa* and petrophyte wormwoods (*Artemisia juncea*, *A. rutifolia*). In the northern slope of Mynzhilky range at the height of 800 m above sea level along the northern expositions the strip of shrub thickets of spirea meadowsweet is developed together with honeysuckle. In the mountain steppes the Karatau endemic often occurs, and in the central part of Betpak Dala a relic bush – Shrenk's tavolgotsvet *Spiraeanthus schrenkianus* can be found.

In watershed alignment surfaces, jons, upland xerophytic fescue grass steppes are widespread. Here the friganoids tier is typical, such as prickly pillow-like acanthuslemon plants (*Acantholimon linczevskii*, *A. mikeschinskii*), cylindercarp *Cylindrocarpa sewerzowii*, Mynzhilky cousinia *Cousinia minshelkensis*, lepidolopha spp. *Lepidolopha karatavica*, *Jurinea suffruticosa* and others, many of which are Karatau endemics.

In the mountain river valleys Sogdian ash-trees *Fraxinus sogdiana* reside, which is a tree of up to 25 m height; this is the northern limit area for occurrence of this type. The plantings were badly damaged as a result of unsystematic cuttings during the crisis of the 90s of the last century. Now they are protected and being gradually restored.

### Rare and unique vegetation communities

A number of vegetation types is unique to and widespread only in the mountainous regions of Central Asia, and a part of formations is characteristic only for Western Tien-Shan, with a very high level of endemism.

**Deciduous woods** composed of *Crataegus turkestanica*, light forests of *Crataegus pontica*, *Pyrus regelii*, and fragments of woods with *Malus sieversii*.

**Shrubs** with domination of a relic type of *Spiraeanthus schrenkianus*, Western Tien-Shan endemic *Amygdalus petunnikovii*, typical *Spirea hypericifolia*, *Cerasus erythrocapra* and types of *Atraphaxis* genus.

**Steppe** upland xerophyte fescue grass (including the endemic types of *Acantholimon*), shrub fescue grasses including *Cotoneaster karatavica* of *Allochrysa* genera, Karatau feather grasses *Stipa karataviensis*.

**Savannoid (semisavannah):** varied shrub high cereals including bushes (almonds *Amygdalus petunnikovii*, *Spiraeanthus schrenkianus*, *Cerasus erythrocapra*), and prangos communities with their original floristic composition (*Prangos pubularia*).

**Prickly grasses and prickly bushes (friganoids).** It is necessary to name the communities with dominant and co-dominant endemic roles: *Raphidophyton regelii*, *Lepidolopha karatavica*, *Cousinia mindschelkensis* and types of *Acantholimon*.

**Mountain semishrubs.** Karatau wormwoods *Artemisia karatavica* are original in their structure and endemic for the mountains of Karatau with presence of friganoid and savannoid elements.

**Apple woods** of Sievers' apple-tree *Malus sieversii* once occupied vast areas in the gorges of Almalysa and Almalay, to which the gorges' names testify. Ruthless cutting down of inundated woods along the small rivers of

Hantagi, Biresik and Asha during the last decade resulted in dramatic reduction of quantity and range of this type, which is represented now by literally single species.

## Flora

The total number of plants found in the Karatau reserve by 2008 is 540:

- 2 types of algae of 2 genera and 2 families;
  - 4 types of mushrooms of 3 families and 4 genera;
  - 3 types of hepatic mosses of 2 genera;
  - 72 types of real leaf-caulescent mosses with 18 families and 30 genera;
- 5 types referring to 4 genera of the Ferns (Polypodiophyta) and 4 types of the Horsetail were discovered.

The gymnospermous section – Gymnospermatophyta – is represented by 2 kinds of the conifers.

The angiosperms section- Angiospermatophyta – is represented by 457 kinds, falling into 240 genera and 60 families, and 61 genera out of them are endemic. The study of the reserve flora has been in progress, and the number of species will undoubtedly increase. The Karatau flora as a whole is notable for the raised content of specific and subspecies level of endemics, numbering 153 taxons or 9% from the total (1,666 types) (Kameliny, 1990). This phenomenon is explained by a relative isolation from the other Tien-Shan ranges, deep introduction in flat spaces of the desert in the watershed of the Chu, Syr-Darya and Talas riverpools. The phytogeographical value of the Syr-Darya Karatau is reinforced by the fact that many types of the ancient-Mediterranean genesis, and the vegetative communities formed by them, including those of friganoids, shibliak and semisavannas, are in an extreme northern limit of their geographical distribution.

The Karatau area is the northern border of areas for many Central Asia and Kazakhstan flora representatives. During the last decades intensive economic activities, the major part of inundated wood was cut down and now there is a process of its slow renewal. Willows, hawthorns and ash-trees were heavily exposed to cutting down. Near to the settlements (outside the SNR) erosive processes of the soils and strongly pitted vegetative communities with predominance of weeds and poisonous plants over the impoverished species composition are observed.

The vegetative cover of Karatau is rich with the types of plants with medicinal value in economic respect (Samarkand karaway, high elecampane, Karatav rapontikum, horsetail ethedra, etc.), valuable as food (red cherry, Turkestani hawthorn, Siverse's apple-tree, ordinary apricot, etc.), with decorative value (Greig's tulip, Albert's tulip, eremurus, Shrenk's spirea meadowsweet, etc.) and fodder (feather grasses, locoweeds, wheat grasses, sedge, etc.) value.

## Rare and endemic species

Out of 76 narrow endemic types of the plants typical for the central part of the Karatau ridge, 65 types referred to as seldom occurring have been found on the territory of KSNR. During the last decades some of them have not been found in the places where they were collected earlier. These types include Mynzhylky shield-fern *Dryopteris minshelkensis*, *Thesium minkwitzianum*, thickset sroganovia, *Stroganovia robusta*, horsetail prangos *Prangos equisetoides*, Karatav dorema *Dorema karataviense*, Mynzhylky accantholemon *Acantholimon minshelkense*, Karatav mattiastrum *Mattiastrum karataviense*, *Eremostachys pectiana*, Karatav broomrape *Orobanche karatavica* and Kultiassov's cornflower *Centaurea kultiassovii*.

There are the following representatives of Central Asia endemic genera: *Stroganovia*, *Pseudosedum*, *Schtschurowskia*, *Schrenkia*, *Oedibasis*, *Lepidolopha*, *Lepidolopsis*, *Kirilovia*, *Triclophiton*, *Drepanocaryum*, *Hanodelia*, and *Microcephala*.

Endemic and rare types in the ridge are mostly of relic character, they are non-uniform in age and origin. Among them there are representatives of Eocene subtropical flora (Shrenk's spirea meadowsweet, threadleaf lepidolopha, *Thesium minkwitzianum*, *Karatav zigophyllum*, scorconera mountain-gum, etc.), of Oligocene mezophilic-wood flora (Persian mountain ash, moisture-loving ash, Nedzvetsky's apple-tree, etc.) and ancient Mediterranean Miocene flora (Ponty hawthorn, Kokand moraine, etc.). They basically occur in stony abrupt slopes, crevices of rocks, in stony platforms, grassy slopes, looses at the top part of mountain crests where they form special landscape areas of endemic xerophyte Karatav vegetation.

**AJSNR, SUSNNP.****Phytogeographical zoning**

By the types of flora and vegetation, the territory is a typical area of Central Asia's «southern» mountains. It is located within the borders of three (Karatau, Ugam-Chatkal and Kyrgyz) botany-geographical districts of the mountain-Central Asian province. In AJSNR the woods occupy 34.6% from a total area of the reserve (29,604 hectares), including covered with wood - 27.2% (23,251 hectares), 4.4% out of them made by wood plantings (3,767 hectares). In SUSNNP woods occupy 34.2% from a total area (50,980 hectares). Among the forest lands, the area covered by forest makes up 27,407 hectares, which is 18.4% of the park forest territories and this determines the savannah like character of wood vegetation.

**Zonation and main formations**

Bushes prevail in the structure of the grounds covered by woods, they are primarily low shrubs of the Turkestani archa and thickets of honeysuckle, then the plantings of treelike Zeravshani archa (juniper) and *Juniperus semiglobosa*. Fruit bushes are represented basically by communities of dogrose and cherry. Wood plantings with predominance of rare and valuable species (Sievers' apple-tree, Ponty hawthorn, Talas birch, Caucasian hackberry, Persian mountain ash, etc.) occupy small territories. The woods in total contain 58 arboreal-shrub types (with 20 types of trees and 62 types of natural flora bushes). The average age of juniper forest stands makes 150-160 years, the age of individual juniper stands (on the area of 30 hectares) makes up to 300 years. Anthropogenous impact in the past caused rarity of the forest stands and predominance of thickets of bushes over the grounds, suitable for the growth of tall-trunked woods. The greatest harm before reserving caused a centuries-old unsettled cattle pasturage. The vegetative cover is influenced by this mountain region relief originality, and its various types are linked with the certain high-altitude belts.

As follows from V.N.Pavlov's classification (1980), 4 high-altitude belts are singled out here:

- 1) low mountain ephemeral belt semideserts, wormwood and cereal-wormwood deserts - up to 800 (1300) m b.s.l.;
- 2) mid-montane belt of the Turan cereal-motley grass mountain steppes (semi-savannahs) - 800 (1,300) – 2,000 (2,00) m b.s.l.;
- 3) subalpine - (2,000 2,200-2,800 (3,200) m b.s.l.;
- 4) Alpine - above 2,800 (3,200) m b.s.l.;

*The basic formations:*

A. The arid group includes 2 types of deserts of low mountain belts (ephemeral, cereal-wormwood):

1. Ephemeral deserts are presented by 2 basic formations: *Poa bulbosa*, *Carex paghystilis*; *Taeniatherum crinitum*. In Aksu-Jabagly these formations are along the bottom border, on loops of foothills;
2. Cereal-wormwood deserts are marked by only small spots of feather grass *Stipa hohenackeriana* formations.

B. The subarid group includes 3 types of vegetation with 5 subtypes and over 30 formations:

1. Steppes with 2 subtypes:

- a) ceppitose-cereal boreal with formations of fescue grass *Festuca valesiaca*, feather grass (*Stipa capillata*, *S. caucasica*), barley *Hordeum turkestanicum*, Altai wild rye *Leymus angustus*;
- b) Turan cereal-wormwood with formations of coach-grass *Elytrigia trichophora* and barley (*Hordeum bulbosum*);

2. Xerophyte sparse growth of trees and shrubs thickets ("shibliak"), main formations: *Celtis caucasica*, *Rosa maracandica*, *Atraphaxis pyrifolia*. Hackberries are in the form of small groves in the reserve territory;

3. Upland-xerophyte vegetation (frigans) include 2 subtypes:

- a) prickly grasses with 2 main formations of Cousinia (*C. chrysantha*, *C. bonvalotii*);

## Description

- b) Acantholemons with 2 formations (*Acantholimon alberti*, *Onobrychis echidna*);  
 c) mother-of-thyme with 3 formations (*Artemisia persica*; *A. lehmanniana*; *Pseudolynosyris grimmii*);

B. Damp group of types is the widest and most diverse including 7 types, three out of which fall into 2-3 subtypes:

1. Juniper forest "archa" stands include 3 formations (*Juniperus semiglobosa*, *J. seravschanica*, *J. turkestanica*).

Tall-trunked archa forest stands are presented by two types of the archa: Himalayan pencil juniper *J. semiglobosa* and Zeravshan juniper *Juniperus seravschanica* or the mixed plantings. In the top mountains belts, subalpine and Alpine, Turkestani archa plantings *Juniperus turkestanica* are strongly represented.

2. Deciduous woods are divided into 2 subtypes: broad-leaved (black woods) and narrow-leaved (white woods). Significantly larger areas in the region are occupied by the first subtype, represented by 5 formations (*Malus sieversii*, *Crataegus koralkovii*, *Crataegus turkestanicus*, *Prunus sogdiana*, *Acer turkestanicum*), two of which are rare and in need of special protection and control. The narrow-leaved woods represented by 7-9 formations (*Populus*, *Salix*, *Betula* spp.) occupy very small areas in the form of narrow strips along the riverbeds, rising up to the height of 2,200-2,400 m above the sea level.

3. Mezophyte and xeromezophyte shrub vegetation is represented by 2 subtypes:

A) large shrub communities – include a barberry formation (*B. heteropoda*);

B) shrub communities are more varied and are presented by roses (*Rosa kokanica*, *R. fedtschenkoana*), almonds *Amygdalus petunnikovii*, meadowsweets *Spiraea hypericifolia*, currants (*Ribes meyerii*, *R. janczevskii*) and raspberry canes *Ribes caesius*;

4. There are 2 subtypes of meadow steppes:

A) mountain savannoids (large grass umbellate) with 2 formations (*Prangos pabularia*, *Ferula tenuisecta*);

B) cereal-motley grass meadow steppes with 3 formations (*Bromopsis inermis*, *Vicia tenuifolia*, *Paraligusticum discolor*).

5. Meadows are the most diverse type with 3 subtypes:

a) flood plain meadows, compiled by 3 formations (*Phragmites australis*, *Elytrigia repens*, *Calamogrostis pseudophragmites*);

b) midmountain meadows with cereals domineering (formations of *Dactylis glomerata*, *Alopecurus pratensis*, *Calamogrostis epigeios*); waterless valley meadows differ by a considerable amount of motley grass (*Stachys betonicaeflora*, *Vedicago tianschanica*, *Veronica spuria*, *Galium septentrionale*, *Delphinium confusum* etc.);

c) highland meadows; the group of subalpine belt is represented by 6 formations (*P. nitens*, *Geranium collinum*, *Ligularia heterophylla*; *Trollius altaicus*; *Angelica decurrens*; *Alchimilla retropilosa*). Alpine meadows have 4 formations (*A. fedtschenkoanum*, *Anemonoides prattracta*, *Geranium saxatile*, *Myosotis suaveolens*). They are normally spread throughout the highlands in the form of spots and inclusions.

6. Marshes – sazes.

There are almost no swamps in the lower belts of the mountains. Natural marshes (sazes) occur only at heights over 2,000 m. The vegetation here is rather uniform sedge formations (*Carex melanantha*, *C. orbicularis*, *C. pseudofoetiga*) and tussock (*Deschampsia koeleroides*). Considerable share of meadowgrass is typical for them (*Primula algida*, *Oxytropis lapponica*, *Astragalus alpinus* and others) (Karmysheva, 1973).

7. Subnival group is of 2 types – Alpine carpets and waste ground and cryophyte locoweeds:

1. Alpine carpets and waste ground are original groups placed in fragmentary mosaic way in the specific environmental conditions of the highlands. Carpet communities include 9 formations - mouse-ear chickweeds *Dichodon cerastoides*, buttercups (*Ranunculus rubrocalyx*, *R. rufosepalus*), silverweeds (*Potentilla hololeuca*, *P. gelida*), mustards (*Ch. macropoda*, *Ch. elegans*), forget-me-nots *Eritrichium villosum* and lagotises *Lagotis korolkovii*. Waste ground communities have a uniform type structure and are represented by 4 formations - sedges

## Description

(*Cobresia humilis*, *C. stenocarpa*), bluegrasses *Poa litvinovii* alkali grass salt *Puccinella subspicata*.

2. Cryophyte locoweeds are typical for all the Central Asian highlands and include 7 formations - locoweeds (*Oxytropis immersa*, *O. leucocyanea*, *O. microsphaera*, *O. savellanica*, *O. trajectorum*), cushion plants *Sibbaldia tetrandra* and hedysarums *Hedysarum talassicum*.

8. Petrophyte (rock-scrub) vegetation contains only one type which is in fact intrazone and quite widespread in this region.

1) Rock vegetation in the lower and middle belts is mostly presented by *Allium pskemense*, *Scutellaria immaculata*, *Sergia sewerzowii*, *Ephedra equisetina*; in the highlands by *Carex litwinowii*, *Macrotomia (Arnebia) ugamensis*, *Paraquilegia grandiflora*, *Neuroloma asperrima*, *Stephanocaryum olgae*, etc.

2) Scree vegetation is of unstable type, changing due to the community substratum flexibility and nature. In the lower belt the most typical are onions *Allium karataviense*, alcorns *Mediasia macrophylla* and polydominant communities including *Rheum maximoviczii*, various species of *Ferula*, *Cicer flexuosum*, *Vicia kokanica*. In the highlands there are usually groups with domineering *Polygonum hissaricum*, *Veronica lutkeana*, *Cysticorydalis fedtschenkoana*, *Allium carolinianum*, *Ferula talassica*, *Scutellaria flabellulata*.

## Flora

The flora totals about 1,700 types of the highest and lowest plants.

Fungi. There are registered 221 types relating to 4 classes, 22 families and 80 genera that makes about 6% of Kazakhstan microflora. The following 4 genera differ in maximal variety: *Septoria* - (23 types), *Puccinia* - (27), *Ramularia* - (23), *Pleospora* - (14). About 80% of types are parasite, and the others are saprophytes.

Algae dwell in the reservoirs of 63 types and the forms referring to 41 genera, 26 families, 12 classes from 5 sections: Cyanophyta, Chrysophyta, Bacillariophyta (= Diatomea), Euglenophyta, Charophyta. Diatomea (37 species) are the most numerous and varied.

Lichens. There are known 64 types of 30 genera and 17 families that comprise 14% of Kazakhstan lichenflora. By the linking to substratum types they are distributed as follows: lithophytes (60 types), epiphytes (23), soil (15), living on the vegetative rests, mosses and litter (15 types). The maximal variety is shown by 5 genera: *Aspicilia* (6 types), *Caloplaca* (6), *Parmelia* (6), *Physcia* (4), *Lecanora* (3).

The registered 63 moss-like types include 32 genera, 20 families and 2 classes (*Hepaticae*, *Musci*). The maximal variety is provided by 5 genera: *Grimmia* (10 types), *Ortotrichum* (4), *Tortula* (6), *Brachythecium* (4), *Bryum* (5). Various ecological groups are singled out: soil, lithophytes, epiphytes, marsh and water.

Higher plants. Registered are about 1,300 types including 470 genera and 70 families. Quantitatively, the flora makes 50% out of the flora of all Western TienShan and 25% - of mountain Central Asian province flora. The flora uniqueness is proven by a high degree of endemism.

Groups of useful plants – fodder, medicinal, food, tannic, decorative and melliferous (*Aconitum talassicum*, *Allochrysa gypsophiloides*, *Polygonum coriarium*, *Rheum maximoviczii*, *Korolkowia sewerzowii*), as well as more than 70 types of wild relatives of cultural plants (*Ribes meyerii*, *Medicago tianschanica*, *Amygdalus petunnikovii*, *Rubus caesius*, etc.) are present here as well.

Paleontologic sites of Aulie and Karabastau are located in the Syr-Darya Karatau mountain ridge, differing by a greater originality of flora and vegetation. As a whole the reserve flora totals, according to preliminary estimates, nearby 400 – 500 types of the highest plants. In the paleontologic sites area rich groupings of *Prangos pabularia*, *Ferula tenuisecta*, *F. diversivittata*, *F. penninervis*, *Inula grandis*, *Hordeum bulbosum* and *Elytrigia trichophlora* are present. Steppes occupy very small areas. The bottoms of gorges are resided by the mixed groupings with the elements of black woods, shibliak and inundated woods - *Malus sieversii*, *Acer semenovii*, *Celtis caucasica*, *Fraxinus sogdiana*, as well as the types of *Cotoneaster*, *Crataegus*, *Lonicera*, *Rosa*, *Salix*, *Prunus sogdiana* and *Vitis vinifera*. From other plant communities, those dominated by wild garlic *Allium longicuspus*, characteristic for Aulie area are of special interest.

### Rare and endemic species

There are 19 of 64 genera endemic for montane Central Asian, including two (*Pseuderemostachys*, *Rhaphidophyton*) from 10 monotype endemic genera of Kazakhstan. The number of endemics of various ranks makes about 10%, including the 34 endemics of the Kyrgyz district (*Oxytropis talassica*, *Medicago ochroleuca*, *Primula minkwitziae*, *Senecio nuraniae*, *Prenanthes* (= *Lactuca*) *mira*, etc.); 23 of Ugam-Chatkal (*Gagea ugamica*, *Silene adenopetala*, *Astragalus aksaricus*, *Scutellaria cordifrans*, *Pyrethrum tianschanicum*, *Draba arsenievii*, etc.) and 26 endemics of the Karatav area (*Leymus aemulans*, *Eyphorebia severzovii*, *Scutellaria subcaespitosa*, *Rindera tianschanica*, *Trichanthemis radiata*, *Lepidolopha komarovii* ssp. *filifolia*, etc.). Here grow 30 species registered in the Red Book of Kazakhstan (1981).

The following species are the rarest and in need of additional protection measures: *Prenanthes mira*, *Tulipa dubia*, *Thesium minkwitzianum*, *Malus niedzwetzkyana*, *Seseli setiferum*, *Scutellaria flabellaria*, *Ugamia angrenica*, *Dryopteris mindshelkensis*.

In Aulie and Karabastau paleontologic sites there are five monotype endemic Kazakhstan genera – *Rhaphidophyton*, *Botschantzevia*, *Pseuderemostachys*, *Pseudo-marrubium* and *Spiraeanthus*. Here are available such endemic Karatau taxons as *Phleum pratense* ssp. *roshevitzii*, *Pseudosedum karatavicum*, *Rosa karataviensis*, *Cerasus tianschanica* ssp. *karabastaviensis*, *Lepidolopha karatavica* ssp. *karatavica*, etc. From the types registered in the Red Lists of rare and threatened plants of Kazakhstan (2006), those living in the basic territory (*Tulipa greigii*, *T. kaufmanniana*, *Celtis caucasica*) are plentiful enough, and the types protected only within these sites are *Fraxinus sogdiana*, *Vitis vinifera*, *Botschantzevia karatavica*.

Out of the plants included in the IUCN Red List (the version of 2009\_1) under this or that threat, in the nomination territory (KSNR, AJSNR, SUSNNP) 9 types grow: wild apricot *Armeniaca vulgaris* (EN), *Talsa birch* *Betula talassica* (EN), Karatau Cornelian cherries *Cotoneaster karatavicus* (DD), Russian hawthorn *Crataegus ambigua* (DD), Sogdian ash *Fraxinus sogdiana* (NT), rare Karatau honeysuckle *Lonicera karataviensis* (CR), Nedzvetzky's apple *Malus niedzwetzkyana* (EN), Sievers' apple-tree *Malus sieversii* (VU) and Shrenk's spirea meadowsweet *Spiraeanthus schrenkianus* (EN).

### SCSBNR, BASNR, PASNR.

### Phytogeographical zoning

All the three reserves are located in the Chirchik-Chatkal subdistrict of the West Tianshan botany-geographical district. (Takhtajan A.L., 1988; Korovin E.P., 1961, 1962; Pavlov V.N., 1980):

The Sary-Chelek and the Padysha-Ata reserves belong to the Aflatun-Karasu region, and the Besh-Aral reserve to the Chirchik-Chatkal phytogeographical area. The first district is characterized by a broad development of umbellar communities with dominant species of *Prangos*, *Ferula*, deciduous forests of *Juglans regia*, *Malus sieversii*, *Prunus* and *Pyrus* species; Taiga forests of *Picea schrenkiana* and *Abies semenovii*. The second area lacks the forest of *Juglans regia*, *Picea schrenkiana* and *Abies semenovii*.

SCSBNR, PASNR.

### Zonation and main formations

The Chatkal Ridge is characterized by well expressed vertical belts. The south-east of the low mountains is occupied by wormwood semideserts (700-1,200 m) above which there are couch-borodach steppes (1,200-1,500 m). Wormwood-cereal steppes locate at an altitude of 1,400-2,000 m, then up to the height of 2,800 m they are replaced by motley grass steppes with feltwort and ephemers. From 1,500m to 2,600 m there is a growth zone of walnut and fruit forests, the western border of which goes through the Padysha-Ata reserve. At an altitude of 2,600-3,100 m there are fir groves with silver firs and uniqueness of sediments. At these altitudes, the forestless slopes are occupied by unique endemic grass communities – umbellars, which above 3,000m get replaced by sub-alpine and alpine meadows, and to some extent with crush stone mountain deserts. At an altitude of 3,500 m

## Description

nival-glacial belt begins with cliffs, screes and small glaciers.

The Sary-Chelek nature reserve was created for the preservation and restoration of natural complexes in the walnut and fruit forests (*Juglans regia*, *Malus sieversii*, *Prunus*, *Pyrus communis sogdiana*, etc.); dark coniferous forest of *Picea schrenkiana*, *Abies semenovii*; herbaceous savanna-type steppes with dominant *Bothriochloa*, *Hordeum bulbosum ischaemum*; Umbellar *pabularia* and species of *Ferula* and *Prangos*. There are the following vegetation types, subtypes and formations in the reserve (K.U.Borlakov, A.G. Golovkova, 1971):

1. Type - Steppes

Subtype – large grass cereal savannoids (Turan cereal – motley grass steppes). It is represented by three formations: *Bothriochloa schaeumum*, *Hordeum bulbosum*, *Eremurus fuscus*.

2. Type – Soil xerophytes

Subtype - thymes. The formation of *Perovskia angustifolia*.

3. Type – Archa forests. Formations: *Juniperus semiglobosa*, *J. turkestanica*, *J. seravschanica*.

4. Type - Dark coniferous forest. Formation *Picea schrenkiana*, *Abies semenovii*.

5. Type – Deciduous forests

Subtype – Broad-leaved forests (Black woods). Formations: *Juglans regia*, *Malus sieversii*, *Crataegus turkestanica*, *Prunus sogdiana*, *Acer turkestanicum*, *Pyrus communis*.

Subtype – flood plain forests (tugais). White forests. Formations: *Populus*, *Betula procurva*, *Salix*.

6. Type – Mezophyte and xeromezophyte shrub vegetation represented by the formations of *Exochorda tianschanica*, rosary and polydominant shrubs.

7. Type – meadow steppes.

Subtype - umbellars. Formation: *Prangos pabularia*.

8. Type - Meadows.

Subtype - midmountain meadows. Formations: *Dactylis glomerata*, *Calamagrostis epigeios*, *Poa pratensis*, *Brachypodium sylvaticum*.

Subtype - highland subAlpine meadows. Formations: *Aconogonon coriarium*; *Geranium ferganense*; *Trollius altaicus*; *Iris ruthenica*; *Allium atosanguineum*.

Subtype - highland Alpine meadows. Formations: *Allium oreophiloides*; *Alchemilla retropilosa*.

9. Type - petrophyte vegetation

10. Type - hygrophyte vegetation.

The PASNR vegetation in general has much in common with the vegetation of SCSBNR. The upland xerophytes and hygrophyte vegetation are expressed weaker here due to the limitedness of the highlands and water habitats.

## Flora

The flora of the Sary-Chelek nature reserve is representative for the flora of Western Tien-Shan, where 1,788 species of the highest plants (44% of plant species of the Kyrgyzstan) grow, which include 90 families and 570 genera. Of these, 30 species are listed in the Red Book of the Kyrgyzstan and more than 30 species of plants are used for medicinal purposes. Over 345 species of mushrooms grow, they incorporate elements of ancient Mediterranean flora and tree flora of North America and Eurasia. There are 67 registered species of lichens (13 families, 28 genera). In the reserve there are many valuable plants: 180 species of fodder plants; 56 decorative; 57 honey; 52 food; 26 aromatic and 19 medicinal species (H. W. Borlakov, 1966). Most plants - 417 species

## Description

- grow in meadow plant communities and 376 in steppe communities.  
The flora of Padysha-Ata nature reserve is a somewhat poor replication of SCSNR flora.

BASNR.

### Zonation and main formations

The following vegetation types, subtypes and formations are currently present in the reserve:

1. Type - steppes.

Subtype – Turan cereal-motley grass. Formation *Hordeum bulbosum*.

Subtype - cespitose-cereal boreal (Southpaleartic). Formation *Festuca valesiaca*.

2. Type – xerophyte sparse grow of tress and shrub thickets ("shibliak"). Formations *Amygdalus spinosissima*, *Cerasus erythrocarpa*.

3. Type – deciduos forests.

Subtype – broad-leaved woods. Formations *Malus sieversii*, *Acer turkestanicum*.

Subtype – flood plain woods. Formation *Betula tianschanica*.

4. Type – mezophyte and xeromezophyte shrub vegetation. The group of shrub formations: *Rosa kokanica*.

5. Type – meadow steppes, umbellars. Formation *Prangos pabularia*.

6. Type – meadows.

Subtype – midmountain meadows. Formation *Dactylis glomerata*.

Subtype - highland sub-alpine meadows. Formation *Aconogonon coriarium*.

### Flora

388 species of the highest plants are currently known, while only 1/4 – 1/5 of the species composition has been researched. Given the natural-climatic conditions of the region, the flora of the Besh-Aral reserve higher plants should consist of not less than 1,500 species. 65 species from the list are endemic to Western Tien-Shan as a whole. About 80% of species are endemic to Central Asia. 17 species of medicinal plants are marked in the Besh-Aral reserve. However, only the following are found in significant numbers: *Juniperus semiglobosa*, *Hypericum perforatum*, *Hippophae rhamnoides*, *Hypericum perforatum*, *Achillea millefolim*, *Carum carvi*, *Helichrysum maracandicum*, *Betula tianschanica*.

### Rare and endemic species

*Pyrus korshinskyi*, Middle Asian Pear, *Niedzvetzki's* Apple-tree, *Sievers' Apple-tree*, *Sorbus persica*, *Knorring's* Haw-tree, *Vitis uzunachmatica*, *Tulipa greigii*, *Tulipa kaufmanniana*, Chatkal Yellow Tulip, *Amygdalus petunnikovii*, *Thesium minkvitzianum*, *Salvia korolkovii*, *Allochrusa gypsophiloides*, *Regel's Eminium*, Twelve-dentate Onion, Pskem Onion.

CSBNR.

### Phytogeographical zoning

By phytogeographical zoning, both areas of the reserve are a part of South Turkestan mountain province, West Tien Shan district, Chirchik-Chatkal subdistrict, Parkent region.

### Zonation and main formations

The vegetation cover is extremely variegated. More than 57% of Chatkal reserve is covered with arboreal and shrubby plants. Forests are scarce, undersized, and with many bare places. Thick plantations of juniper *Juniperus*

Description

spp., apple *Malus* spp., cherry plum *Prunus* spp., birch *Betula* spp., willow *Salix* spp., poplar *Populus* spp., and walnut *Juglans regia* can be seen in the limited and more favorable places on the slopes, and, more often, valleys. Prevailing wood species – juniper *Juniperus seravschanica* – occupies 24% of the area. About one third of the area has 100% cover, and more than a half of the rest area has 80% cover. And only 9% of the area has no vegetation. Forest and steppe vegetation occupies 63.6% of the total nature reserve's area. By nature of growth the forest vegetation can be classified as follows: mountain-riverside forest; mountain foliage forest; and juniper forest. Only mountain-riverside forests, associated with rivers/creeks and pebble valleys, have clear boundary of distribution, whereas distribution of mountain foliage and juniper forest is not marked clearly. Smooth transition in the 'contact' zone formed mixed arboreal vegetation: juniper-foliage forest. Among the main types of plant community are alpine steppes, riverside peddles, rocks, talus with a projective coverage of 20%. Wide ecological range of herbaceous vegetation determines diversity of botanical groups. Along with typical mesophilous plant groups, represented by meadow grasses, there are xerophilous plant communities.

The following are the most widespread on the territory of the reserve, presented by area and altitudinal belt (Table 3):

	Bashkizilsay	Maidantal
Alpine zone	<i>Aconogonon hissiricum</i> , <i>Oxytropis savellanica</i> , <i>Dimorphosciadium gayoides</i> , <i>Cousinia bonvalotti</i> , <i>Eremogone griffithii</i> , <i>Poa alpine</i> , <i>Puccinella subspicata</i> , <i>Acantholimon alata</i>	<i>Ranunculus rufosepalus</i> , <i>Potentilla gelida</i> , <i>Potentilla hololeuca</i> , <i>Cerastium lithospermifolium</i> , <i>Aconogonon hissiricum</i> , <i>Bistortia elliptica</i> , <i>Oxytropis immerse</i> , <i>Festuca valesiaca</i>
Subalpine zone	<i>Aconogonon coriarum</i> , <i>Ferula tschimganica</i> , <i>Hypericum scabrum</i> , <i>Geranium ferganense</i> , <i>Aulacospermum simplex</i> , <i>Hieracium robustum</i> , <i>Lagotis korolkowii</i> , <i>Elytrigia trichophora</i>	<i>Aconogonon coriarum</i> , <i>Prangos pabularia</i> , <i>Dactylis glomerata</i> , <i>Geranium ferganense</i> , <i>Dipsacus dipsacoides</i> , <i>Ligularia alpigena</i> , <i>Asperugo procumbens</i> , <i>Elytrigia trichophora</i>
Mid-mountain zone	<i>Elytrigia trichophora</i> , <i>Amygdalus spinosissima</i> , <i>Rosa kokanica</i> , <i>Juniperus seravschnica</i> , <i>Ferula tenuisecta</i> , <i>Populus afghanica</i> , <i>Malus sieversii</i> , <i>Spiraea hypericifolia</i> , <i>Lonicera nummulariifolia</i> , <i>Rheum maximowicsii</i> , <i>Sorbus persica</i> , <i>Atraphaxis seravschanica</i> , <i>Crataegus turkestanica</i> , <i>Acer semenovii</i> , <i>Hordeum bulbosum</i>	<i>Elytrigia trichophora</i> , <i>Spiraea hypericifolia</i> , <i>Amygdalus petunnikovii</i> , <i>Cerasus erythrocarpa</i> , <i>Juniperus seravschnica</i> , <i>Ferula tenuisecta</i> , <i>Populus afghanica</i> , <i>Malus sieversii</i> , <i>Betula tianschanica</i> , <i>Prangos pabularia</i> , <i>Dipsacus dipsacoides</i> , <i>Ligularia heterophylla</i> , <i>Lonicera nummulariifolia</i> , <i>Sorbus tianschanica</i>

Some forest species have a prominent defining role in plant communities: *Malus sieversii*, *Sorbus persica*, bushes: *Spiraea hypericifolia*, *Atraphaxis seravschanica*, *Rosa kokanica*, and on small areas – *Juniperus seravschanica*, *Crataegus turkestanica*. In mid-montane and subalpine zones, projective vegetation coverage is close to 100% on the north exposition off cliffs and slides, and 60-85% on the slopes of the south exposition. Peaks in the alpine zone, cliffs and slides in the lower zones have thinned vegetation (periphyton) made up of individual specimen, and the projective cover does not exceed 5-10%.

Juniper formation - *Juniperus seravschnica* – takes up about a quarter of the territory of both areas, and rotating *J. turkestanica* occupies the upper extents. Due to climatic conditions, biological specifics, as well as the influence of the past economic activity, juniper stands are in form of light forests, with 0.3-0.7 density. As a rule, subdominants are bushes and short trees: *Crataegus turkestanica*, *Cotoneaster multiflorus*, *Amygdalus petunnikovii*, *Cerasus erythrocarpa*, *Padellus mahaleb*, *Prunus divaricata*, *Rosa kokanica*, *R. maracandica*, *Sorbus persica*, *Spiraea*

## Description

*hypericifolia*, *Atraphaxis seravschanica*, *Ephedra equisetina*, *Lonicera nummulariifolia*, *Acer semenovii*, as well as grass plants, many of which are named above.

## Flora

1,136 taxons (species and subspecies) of plants have been registered on both of the reserve's territories combined: 745 in Maidantal, 1,004 in Bashkizilsay, and 613 common species for both areas.

Besides the above-mentioned dominants (table of main formations), the following occurrences are frequently noted in the alpine zone: *Ephedra regeliana*, *Paraquilegia caespitosa*, *Ranunculus rubrocalyx*, *Papaver croceum*, *Corydalis gortschakovii*, *Silene guntensis*, *Stellaria graminea*, *Chorisporea bungeana*, *Ch. elegans*, *Draba alberti*, *Rosularia alpestris*, *Rhodiola heterodonta*, *Oxytropis ornate*, *O. pseudosavellanica*, *Geranium regelii*, *Schtschurowskia meifolia*, *Inula rhizocephala*, *Omalotheca supina*, *Waldheirma tomentosa*, *Yongia serawschanica* and others.

In subalpine zone: *Allium barszczewskii*, *Eremurus robustus*, *Artemisia persica*, *Hieracium virosum*, *Ligularia heterophylla*, *Oberna behen*, *Astragalus lasiosemius*, *Lathyrus pratensis*, *Vicia tenuifolia*, *Elymus drobovii*, *Schtschurowskia meifolia*, *Lindelofia tschimganica*, *Campanula glomerata*, *Dianthus ugamicus*, *Juniperus turkestanica*, *Scutellaria cordifrons*, *Ziziphora pedicellata*, *Rosa nanothamnus*, *Sorbus persica*, *Pedicularis dolichorhiza*, *Festuca rubra* and others.

In mid-montane zone:

*Origanum tyttanthum*, *Allium caesium*, *Achillea millefolium*, *A. filipendulina*, *Elaeosticta hirtula*, *Ferula pennmervis*, *Schrenkia golickeana*, *Turgenia latifolia*, *Eremurus regelii*, *Centaurea squarrosa*, *Cousinia vicaria*, *Galatella coriacea*, *Hieracium virosum*, *Inula macrophylla*, *Lindelofia macrostyla*, *Asyneuma argutum*, *Lonicera altmannii*, *Convolvulus lineatus*, *C. subhirsutus*, *Carex turkestanica*, *Scabiosa songarica*, *Medicago sativa*, *Vicia tenuifolia*, *Hypericum scabrum*, *H. perforatum*, *Betonica foliosa*, *Scutellaria haematochlora*, *Ziziphora pedicellata*, *Alcea nudiflora*, *Plantago lanceolata*, *Bromus oxyodon*, *Phleum phleoides*, *P. paniculatum*, *Taeniatherum crinitum*, *Delphinium semibarbatum*, *Cerasus tianschanica*, *Potentilla orientalis*, *Poterium polygamum*, *Rosa maracandica*, *Galium pamiro-alaicum*, *Veronica campylopoda*, *Arenaria serpyllifolia* and others.

## Rare and endemic species

Approximately 25 species of plants are classified as endemics of the western part of Chatkal ridge. Some of the are: *Cerastium taschkenticum*, *Geranium baschkyzylsaicum*, *Trichanthemis butkovii*, *Tulipa butkovii*, *Juno capnoides*, *Oxytropis fedtschenkoana*, *Bunium angreni*, *Acantholimon korolkowii*, *Astragalus rubrivenosus*, *Androsace angrenica*, *Jurinea eduardi-regelii*, *Swertia gonczaroviana*, *Lonicera anisotricha*, *Ferula juniperina*, *Cousinia egreia*, *Cousinia strobilocephala*, *Tanacetopsis submarginata*.

In vast floral areas of Ancient Mediterranean and Central Asia, over half of plant species on the territory of the nature reserve is endemic.

37 plant species from the Red Book of Rare and Endangered Species of Uzbekistan have been found on both areas of the nature reserve. Those with the "rare" status are: *Astragalus abolinii*, *Oxytropis fedtschenkoana*, *Tulipa butkovii*, *Allium pskemense*, *Salsola titovii*, *Thesium minkwitzianum*, *Salvia tianschanica*, *Trichanthemis butkovii*, *Ferula juniperina*.

## THE ANIMAL WORLD

According to zoogeography the object is situated in the Western Tien-Shan zoogeographic district. The following pattern describes the place of the Western Tien-Shan in zoogeographic classification (Shukurov et al., 2005):

Realm (ecozone): Palearctic

Sub-realm: South Palearctic

Province: Mountain Asian

Subprovince: Tien-Shan

District: Western Tien-Shan (divided in 2 sub-districts - Western Tien-Shan and Karatau)

The features of the described area are influenced by its zoogeographic position. The species from southern parts of the Asian continent are noticeably spread alongside with the species widespread in the moderate zone of Eurasia. The Tien-Shan subprovince represents the north part of Central Asian center of mountain fauna formation. Here the Central Asia species presence is reduced, and the presence of Mediterranean species is reinforced. The animal world of Western Tien-Shan has been studied absolutely not evenly. Terrestrial vertebrates are known rather well, and in the same time some groups of invertebrates are not studied at all. The number of known species is shown in the table XXX which demonstrates clear not only biodiversity but the level of knowledge on various groups as well.

In general the vertebrates in Western Tien-Shan region are represented by 61 species of mammals, 316 species of birds, 17 reptiles, 3 amphibians and more than 20 fish (Shukurov et al., 2005), and almost all of these occur in the area of the nominated property. Fauna of invertebrates of different groups is known for 15-80%, includes more than 10000 species and in some taxons has high level of endemism.

**Fish (Pisces).** The native ichthyofauna of the western Tien Shan is limited but quite original and endemic. The marinka (Sattar snowtrout) *Schizothorax intermedius* is the most widespread in rivers and at the bottom of streams. The naked osman *Gymnodiptychus dybowskii* is an inhabitant of upland rivers and lakes. The total number of fish species registered in different protected areas of the property is 2-6.

**Amphibians (Amphibia).** All 3 species of observed amphibians belong to one order - Anura; these are the green toad *Bufo viridis*, Pevzov's toad *Bufo pewzowi* and marsh frog *Rana ridibunda*. The toads widespread almost everywhere up to the heights of 3000 m, the marsh frog is widespread in all water-bodies in the low altitudes and to some extent in the mid-mountain.

**Reptiles (Reptilia).** These group includes 19 species from 2 orders (*Squamata* and *Testudines*) and 6 families. The tortoises are represented by one species: the Central Asian tortoise *Testudo (Agrionemys) horsfieldii* observed at foothills of Karatau only. The European glass lizard *Pseudopus apodus* is rather common in some areas. Of other lizards, Alai lidless skink *Asymblepharus alaicus*, desert lidless skink *Ablepharus deserti*, steppe racerunner *Eremias arguta*, rapid racerunner *Eremias velox* are most common. Of snakes, the spotted whip snake *Hemorrhois ravergieri*, the steppe ratsnake *Elaphe dione*, the dice snake *Natrix tessellata*, the Siberian pit viper *Gloydius (Agkistrodon) halys* and Orsini's viper *Vipera ursinii* are observed regularly.

**Birds (Aves), mammals (Mammalia).** These are the most known groups with high diversity: 316 and 61 species respectively. Their distribution depending of type of ecosystems demonstrates more or less defined species compositions.

For example, for spruce forests belt the following species are typical: mammals - stoat *Mustela erminea*, red fox *Vulpes vulpes*, brown bear *Ursus arctos isabellinus*, Turkestan lynx *Lynx lynx isabellinus*, Siberian roe deer *Capreolus pygargus*, wood mouse *Apodemus sylvaticus*; birds - black kite *Milvus migrans*, Eurasian sparrowhawk *Accipiter nisus*, common kestrel *Falco tinnunculus*, common wood-pigeon *Columba palumbus*, Oriental turtle-dove *Streptopelia orientalis*, common cuckoo *Cuculus canorus*, tree pipit *Anthus trivialis*, wren *Troglodytes troglodytes*, back-throated accentor *Prunella atrogularis*, Eversmann's and blue-headed redstarts (*Phoenicurus erythronotus* and *Ph. caeruleocephalus*), blue whistling thrush *Myophonus caeruleus*, black bird *Turdus merula*, mistle thrush *T. viscivorus*, whitethroat *Sylvia communis*, Hume's warbler *Phylloscopus humei*, dark-grey and azure tits (*Parus rufonuchalis*, *Parus cyanus*), fire-fronted serin *Serinus pusillus*, grey-headed goldfinch *Carduelis caniceps*, carrion crow *Corvus corone*.

For walnut-fruit forests, the following species are typical: mammals - grey long-eared bat *Plecotus austriacus*, lesser white-toothed shrew *Crocidura suaveolens*, wolf *Canis lupus*, red fox *Vulpes vulpes*, brown bear *Ursus arctos isabellinus*, badger *Meles meles*, Turkestan lynx *Lynx lynx isabellinus*, wild boar *Sus scrofa*, Indian porcupine *Hystrix indica*, forest dormouse *Dryomys nitedula* and Turkestan rat *Rattus turkestanicus*; birds - shikra *Accipiter badius*, short-toed snake-eagle *Circaetus gallicus*, Eurasian hobby *Falco subbuteo*, common kestrel *Falco tinnunculus*, tawny owl *Strix aluco*, stock dove *Columba oenas*, Oriental turtle-dove *Streptopelia orientalis*, white-

## Description

winged woodpecker *Dendrocopus leucopterus*, common cuckoo *Cuculus canorus*, lesser grey shrike *Lanius minor*, magpie *Pica pica bactriana*, golden oriole *Oriolus oriolus*, common mynah *Acridotheres tristis*, lesser whitethroat *Sylvia curruca*, Orphean warbler *Sylvia hortensis* and Hume's whitethroat *Sylvia althaea*, Hume's warbler *Phylloscopus humei*, greenish warbler *Phylloscopus trochiloides*, spotted flycatcher *Muscicapa striata*, Asian paradise-flycatcher *Terpsiphone paradisi*, Turkestan nightingale *Luscinia megarhynchos hafizi*, dark-grey, azure and turkestan tits (*Parus rufonuchalis*, *P. cyanus*, *P. bokharensis*), Hawfinch *Coccothraustes coccothraustes*, red-headed bunting *Emberiza bruniceps* and chestnut-breasted bunting *Emberiza stewarti*.

Such compositions can be described for every type of landscapes. Some details on animal world of the property clusters are given below. Due to different level of knowledge in specific areas the information has different completeness.

**KSNR.****Invertebrates**

By 2009 the researches revealed 182 species of the following classes:

- Oligochaeta – Oligochaetes: 1 species of 1 genus, 1 family;
- Gastropoda - Gasteropods: 1 species of 1 genus, 1 family;
- Cladocera - Crustacea: 10 species of 9 genera, 4 families;
- Arachnida - Spiders: 10 species of 10 genera, 8 families;
- Chilopoda : 1 species of 1 genus, 1 family;
- Insecta Ectognatha – true insects: 159 species of 135 genera, 79 families.

The first taxonomic list of the arthropods was compiled, including 27 orders, 92 families and 180 species.

So far, in the reserve the Lumbricomorpha and Isopoda orders and Basommatophora and Decapoda orders have revealed 1 species each. The Cladocera order includes 3 species, while the copepods - 5 species and the class of Chilopoda has 1 species. The class of Insects totals 159 species, with 1 species of the mayflies order. The order Lepidoptera accounts for 45 species, and in 2008 the list of butterflies was replenished with 19 types. The new species registered in the Red Book of Kazakhstan (2006) is *Catocala optima*. From the 3 species of praying mantis (Mantoptera) order the most widespread is the ordinary mantis, while the Central Asian wood mantis can be encountered very seldom. The most numerous order (Coleoptera) accounts for 37 species. The representatives of the jewel beetles family (Buprestidae), including the rare species *Capnodis miliaris metallica* can be found in the reserve most often. The most common species from the family of woodcutters or borers (Cerambycidae) is *Prionus angustatus*. *Dorcadion ganglbaueri* and *Haplosoma ordinatum* from the Lamellate family are rare species with small number and reducing area. The true bugs (Hemiptera) are represented by 14 species. Widespread are the 7 species of the Dragonflies (order Odonata), of which *Ischnura aralenais* is a rare and locally spread species.

The Hymenoptera account for 16 species, and the Orthoptera 13 species. The order Diptera is represented by eight species. Three species were found of the stoneflies and Homoptera orders. Cockroaches, Dermaptera and fleas account for 2 species each. The orders of leaf insects, Dermaptera, mayflies and neuroptera include 1 species each. The class of Arachnida totals 10 species including the rare *Gylippus rickmersi*. In fact, the registered species are just a small part of the Karatau invertebrates fauna.

15 insects out of the total amount of rare and threatened species were registered in the Red Book of Kazakhstan (2011).

**Vertebrates**

**Fish.** There is one order, 2 families and 2 species. Ordinary marinka (Sattar snowtrout) *Schizothorax intermedius* and grey loach *Nemacheilus dorsalis* are widespread in all the large rivers. **Amphibians** are represented by 2 species: Pevzov's toad *Bufo pewzowi* and the marsh frog *Rana ridibunda*.

**Reptiles.** Reptiles includes 2 orders, 6 families and 9 species, of which 1 species, the European glass lizard *Pseudopus apodus* is included in the Red Book of Kazakhstan (2011). The lizards are represented by the Caucasian

Description

gecko *Cyrtopodion russowii*, the desert lidless skink *Ablepharus deserti*, and the rapid racerunner *Eremias velox*. The snakes are represented by the spotted whip snake *Hemorrhois ravergieri*, the steppe ratsnake *Elaphe dione*, the dice snake *Natrix tessellata*, the Siberian pit viper *Gloydius (Agkistrodon) halys* and the steppe viper *Vipera renardi*. Central Asian tortoise *Testudo (Agrionemys) horsfieldi* occurs at foothills.

**Birds.** The researches revealed 118 species of birds from 14 orders, 37 families and 79 genera in the Karatau Reserve. 12 species are included in the national Red Data Book (2011): white stork *Ciconia ciconia*, black stork *Ciconia nigra*, short-toed snake-eagle *Circaetus gallicus*, booted eagle *Hieraetus pennatus*, steppe eagle *Aquila nipalensis*, golden eagle *Aquila chrysaetos*, lammergeier *Gypaetus barbatus*, Egyptian vulture *Neophron percnopterus*, saker falcon *Falco cherrug*, demoiselle crane *Anthropoides virgo*, houbara bustard *Chlamydotis undulata* and the Eurasian eagle-owl *Bubo bubo*.

**Mammals.** The fauna consist of 6 orders, 11 families and 20 species. They are: greater horseshoe bat *Rhinolophus ferrumequinum proximus*, lesser mouse-eared bat *Myotis blythi*, common pipistrelle *Pipistrellus pipistrellus*, lesser horseshoe bat *Rhinolophus hipposideros*, long-eared hedgehog *Hemiechinus auritus*, the grey wolf *Canis lupus*, golden jackal *Canis aureus*, red fox *Vulpes vulpes ochroxantha*, corsac fox *Vulpes corsac turkmenicus*, steppe cat *Felis libyca*, stone marten *Martes foina*, steppe polecat *Mustela eversmannii*, stoat *Mustela erminea*, badger *Meles meles*, Kara Tau argali *Ovis ammon nigrimontana*, wild boar *Sus scrofa*, yellow ground squirrel *Spermophilus fulvus oxianus*, Indian crested porcupine *Hystrix indica*, forest dormouse *Dryomys nitedula* and tolai hare *Lepus tolai lehmanni*.

Three species are included in the Red Book of Kazakhstan (2011): the Karatau argali, the stone marten and the Indian porcupine.

**Rare and endemic species**

Out of the species of vertebrates, included in IUCN Red list (version 2013) under various degrees of threat, in KSNR there are noted 8 nesting and flying birds species, including the flying species – the pallid harrier *Circus macrourus* (NT), the Eastern imperial eagle *Aquila heliaca* (VU), the pale-backed pigeon *Columba eversmanni* (VU), and the nesting ones - the cinereous vulture *Aegypius monachus* (NT), the European roller *Coracias garrulus* (NT), the saker falcon *Falco cherrug* (EN), the lesser kestrel *Falco naumanni* (VU), the Egyptian vulture *Neophron percnopterus* (EN); and one species of mammal, the argali *Ovis ammon* (NT). The latter deserves special attention, as it is represented by an extremely restricted-range endemic Kara Tau subspecies - *Ovis ammon nigrimontana*, the 80% of the population of which is under the reserve protection.

**AJSNR, SUSNNP.**

The fauna is typical for the west Tien Shan with specific prevalence of the Mediterranean forms.

**Table 4. Taxonomic diversity of the AJSNR, SUSNNP fauna**

Animal classes	Lower Taxon			
	Order	Family	Genus	Species
Mammals	6	19	40	54
Birds	15	42	130	240
Reptiles	1	5	10	11
Amphibia	1	2	2	2
Fish	1	1	2	2
Insects	27	229	>2,000	>5,000

## Invertebrates

All the information on fauna of various groups of the vertebrate animals, except for some groups of insects, is of a fragmentary and associated character and is obtained basically in AJSNR. The most in-depth study has been done for the fauna of the small groups of insects, such as cockroaches, stick insects and earwigs (Beskokotov, 1996), as well as partly for the bugs, bedbugs, butterflies and dragonflies. Currently there are about 2,500 types of insects in AJSNR. Moreover, 24 species of insects and of 1 species of the annular worms included the list of rare and threatened species (2006) and accordingly in the forth edition of the Red Book of Kazakhstan (2011) dwell here. The research work on the invertebrates fauna of the SUSNNP has been very fragmentary. It is obvious that in general it is similar to that of the AJSNR, but, undoubtedly, it includes an additional number of species, especially in the western and northern parts of this national park.

**Lepidoptera:** 463 species of butterflies and moths have been discovered in the reserve by now (Beskokotov, 1996). The species composition of the Rhopalocera butterflies covers 118 species, referring to 7 families including: Papilionidae - 7 species, Pieride - 16, Nymphalidae - 26, Satyridae - 24, Libytheidae - 1, Lycaenidae - 37, Hesperidae - 8.

**Polyneoptera:** In the reserve 77 species of polyneopterus insects were found, with 5 cockroach species, 4 mantis species, one species of stick insect, 9 species of stoneflies, 3 species of earwigs and 53 species of Orthoptera.

**Homoptera and bugs:** In the reserve at the present time there are 388 species of hemipteroid insects, with 113 homoptera species and 275 species of bugs. The information on these groups of insects is incomplete, and presumably the homoptera insects fauna makes about 900 types, and true bugs – nearby 400.

**Coleoptera:** Beetles include no less than 906 types relating to 358 genera and 41 families. The leading role here belongs to Curculionidae (including Apionidae), Staphylinidae, Carabidae, Chrysomelidae and Scarabaeidae, which make 57.5% of the genera and 68.8% of the species composition. Thus, there are 20 species of beetle, which arbitrarily can be considered as the reserve endemics, 136 of western Tien Shan, about 425 of Central Asian endemics and sub-endemics and 401 species in a wide area (7 of them are cosmopolitans). The area of habitat remains obscure for 80 species.

**Hymenoptera:** The underresearched fauna of the hymenoptera insects numbers 175 species, although regarding the forecast for this group fauna, it should account for not less than 1,000 types.

The reserve is a refuge for individual extremely vulnerable invertebrate species, especially for the Talas Alatau endemics: the weevils (*Apion subinsidiosum*, *Otiorhynchus aksudshabaglinus*, *O. karataviensis*, *O. subseudulus*, *Platyrhamphus talassicus*, *Sirocalodes talassicus*), the carabid beetles (*Carabus vernus*, *Nebria talassica*), the Orthoptera (*Conophyma boldyrevi*, *C. susinganicus*), the semicoleoptera (*Dicramomerus marginatus*, *Litoxenus tenellus*, *Metacanthus meridionalis*, *Orsililus depressus*, *Oxycarenum lacteus*, *Coriomerus echinatus*, *Cypostetustristriatus* – only in Aksu-Jabagly), segmented worms (*Allolobophora ophiomorpha* is known only from Aksu-Jabagly) and many other endemics and near-endemics. In the reserve there are in total the representatives of 22 species of invertebrate animals listed in the Red Book of Kazakhstan (2011) that makes 21% of the invertebrates included there.

## Vertebrates

**Fish.** The fish fauna includes 7 species, the most typical of them being the ordinary marinka (Sattar snowtrout) *Schizothorax intermedius* and naked osman *Gymnodiptychus dybowskii*.

**Amphibians.** There are two species - the green toad and the marsh frog.

**Reptiles.** Among the reptiles there are 7 species of snake: steppe ribbon racer *Psammophis lineolatum*, dice snake *Natrix tessellata*, steppe ratsnake *Elaphe dione*, spotted whip snake *Hemorrhoids ravigieri*, Jan's cliff racer *Coluber rhodorachis*, Orsini's viper *Vipera ursinii*, Siberian pit viper *Gloydius (Agkistrodon) halys*; and 4 lizard species:

Alai lidless skink *Astylepharus alaicus*, desert lidless skink *Ablepharus deserti*, steppe racerunner *Eremias arguta* and European glass lizard – *Pseudopus apodus*.

**Birds** The birds are the most numerous of the vertebrates. They include 267 species (Kovshar, 1963, 1966, 1991, Chalikova, 1992). Of these, 130 species nest in the reserve, and the others 137 are flying, stray or wintering. Basically, the nesting avifauna is made by 83 species of Passeriformes, with the typical for the West Tien Shan red-billed chough *Pyrrhocorax pyrrhocorax*, yellow-billed chough *Pyrrhocorax graculus*, white-winged grosbeak *Mycerobas carnipes*, Asian paradise-flycatcher *Terpsiphone paradisi*, crimson-winged finch *Rhodopechys sanguineus*, black-headed mountain-finch *Leucosticte brandti* and white-winged snowfinch *Montofringilla nivalis*, dark-grey and azure tits (*Parus rufonuchalis*, *Parus cyanus*), blue and rufous-tailed rock-thrushes (*Monticola solitaria*, *Monticola saxatilis*), the Orphean warbler *Sylvia hortensis* and Hume's whitethroat *Sylvia althaea*, white-throated robin *Irania gutturalis* and white-tailed rubythroat *Luscinia pectoralis* and others.

In the national park there is a great presence of the falconiformes (15 species): golden eagle *Aquila chrysaetus* and booted eagle *Hieraetus pennatus*, short-toed snake-eagle *Circaetus gallicus*, cinereous vulture *Aegypius monachus*, griffon vulture *Gyps fulvus*, lammergeier *Gypaetus barbatus*, Egyptian vulture *Neophron percnopterus*; the falcons – the Eurasian hobby *Falco subbuteo*, the merlin *Falco columbarius*, the barbury falcon *Falco pelegrinoides*, common and lesser kestrels (*Falco tinnunculus*, *F. naumanni*), the black kite *Milvus migrans*, the long-legged buzzard *Buteo rufinus* and the Eurasian sparrowhawk *Accipiter nisus*. A number of species are referred to as game birds: Himalayan snowcock *Tetraogallus himalayensis*, chukar *Alectoris chukar*, grey partridge (*Perdix perdix*), quail (*Coturnix coturnix*), the doves – common wood-pigeon *Columba palumbus*, rock pigeon *Columba livia* and stock dove *Columba oenas*; the Oriental and European turtle-doves (*Streptopelia orientalis*, *S. turtur*), etc. 11 species are included in the Red Data Book of Kazakhstan.

**Mammals.** The theriofauna includes 53 species that makes 79.6% from all the Western Tien Shan theriofauna, of them - rodents (44%), carnivores (24%), chiroptera (18%), ungulates (9%), hares and insectivores (on 3%). The ungulates are represented by the argali *Ovis ammon*, ibex *Capra sibirica*, Siberian roe deer *Capreolus pygargus*, red deer *Cervus elaphus*, wild boar *Sus scrofa*, the carnivores are the brown bear *Ursus arctos isabellinus*, badger *Meles meles*, stone marten *Martes foina*, weasel *Mustela nivalis* and stoat *Mustela erminea*, and the rodents and hares – the long-tailed marmot *Marmota caudata*, Menzbier's marmot *Marmota menzbieri*, porcupine *Hystrix indicus*, tolai hare *Lepus tolai* and the muskrat *Ondatra zibetica*. A number of types of mammal are entered in the Red Book of Kazakhstan: the argali *Ovis ammon karelini*, the Tien Shan brown bear *Ursus arctos isabellinus*, the Turkestan lynx *Lynx lynx isabellinus*, the snow leopard *Panthera uncia*, the dhole *Cuon alpinus*, the stone marten *Martes foina intermedia*, the Indian crested porcupine *Hystrix indica*, the free-tailed bat *Tadarida teniotis*, and Menzbier's marmot *Marmota menzbieri*.

### Rare and endemic species

There are 16 species of the animals included in Red List of IUCN (the version of 2013) under this or that threat. It is one species of butterflies – the Apollo *Parnassius apollo* (VU); 11 nesting and flying birds species, including the migrant species pallid harrier *Circus macrourus* (NT), Eastern imperial eagle *Aquila heliaca* (VU), great bustard *Otis tarda* (VU), little bustard *Tetrax tetrax* (NT), corncrake *Crex crex* (NT), pale-backed pigeon *Columba eversmanni* (VU); and the breeding cinereous vulture *Aegypius monachus* (NT), European roller *Coracias garrulus* (NT), saker falcon *Falco cherrug* (EN), lesser kestrel *Falco naumanni* (VU), Egyptian vulture *Neophron percnopterus* (EN); four species of mammals: dhole *Cuon alpinus* (EN), Menzbier's marmot *Marmota menzbieri* (VU), argali *Ovis ammon* (NT) and snow leopard *Panthera uncia* (EN). Here the argali subspecies - *Ovis ammon karelini* – differs from the KSNR argali.

### SCSBNR.

In the nature reserve, 43 species of mammal, 157 birds, 7 reptiles, 2 amphibians, 4 fish, about 2,000 species of insects, 123 spiders, 33 ticks, 52 worms and 18 species of molluscs are registered.

## Invertebrates

The research on the invertebrates is incomplete. Of the Insecta, the Coleoptera order is the most representative among the insects. Description is given to 47 species of lamellar bugs – Scarabaeidae and 44 species of leaf-cutting beetles. Palearctic species and Central Asia endemics are prevailing. The fauna of earthen flea beetles is represented by 106 species, of these there are 40% of the Central Asian species, 25% of transpalearctic, 23% of Mediterranean and 11% of boreal. 14 out of 36 sawfly species are Central Asian endemics, and 20 species belong to a wide palearctic area. 37 ant species are described, including 8 Central Asian endemics. There are many Lepidoptera species. The apple moth has been studied best of all the butterflies.

The rare species of the reserve insects are as follows: European odorous ground beetle - *Colocoloma sicophanta*, Ordinary wax myrtle - *Trichius mochata*, Ordinary swallowtail - *Papilio machaon*, Mnemosyne - *Papilio mnemosina*, Tien Shan Apollo - *Parnassius tianschanica*, Carpenter bee - *Xilocopa valda*, Motley ascaph - *Asalaphus macoronus*.

## Vertebrates

**Fish.** The water bodies are inhabited by marinka (sattar snowtrout) *Schizothorax intermedius* (the lakes of Sary-Chelek and Kyla Kol, the Hodzha-Ata and Sary-Chelek rivers), Turkestan catfish *Glyptosternum reticulatum* and Tibetan stone loach *Nemacheilus stoliczkai* (the Hodzha-Ata river).

**The amphibians** are represented by the green toad *Bufo viridis* and the marsh frog *Rana ridibunda*.

**Reptiles.** The 7 reptile species of the reserve are the Alai lidless skink *Asymblepharus alaicus*, rapid racerunner *Eremias velox*, multi-ocellated racerunner *Eremias multiocellata* and steppe racerunner *Eremias arguta*, dice snake *Natrix tessellata*, steppe ratsnake *Elaphe dione* and the Siberian pit viper - *Gloydius (Agkistrodon) halys*. The Siberian pit viper is seldom found.

**Birds.** In the reserve there are 157 species of 18 orders that makes almost 50% of Kyrgyzstan ornithofauna. The greatest variety is characteristic for the following orders: the perching birds – Passeriformes (84 species), the birds of prey - Falconiformes (18 species) and the pigeons - Columbiformes (7 species). There are 54 species of migrants, and 57 of residents and vagrants. The reserve is located near to traditional migratory ways of birds. In the reserve 118 species of birds are nesting. Of these, almost 100 species are characteristic for a wood belt, from above 90 - for sub-alpine and nearby 25 – for Alpine belts.

The plain species order is usually represented by the stock dove *Columba oenas*, common wood-pigeon *Columba palumbus*, European turtle-dove *Streptopelia turtur*, common kestrel *Falco tinnunculus*, Eurasian eagle-owl *Bubo bubo*, Eurasian hoopoe *Upupa epops*, Eurasian golden-oriole *Oriolus oriolus*, spotted flycatcher *Muscicapa striata neumanni*, greenish warbler *Phylloscopus trochiloides viridanus*, mistle thrush *Turdus viscivorus bonopartei* and others.

The following species are typical for the rocks, sub-alpine and Alpine meadows: chukar *Alectoris chukar*, Himalayan snowcock *Tetraogallus himalayensis*, rock pigeon *Columba livia neglecta*, cinereous vulture *Aegypius monachus*, common swift *Apus apus pekinensis* and Alpine swift *Tachymartia melba tuneti*, red-billed chough *Pyrrhocorax pyrrhocorax*, yellow-billed chough *Pyrrhocorax graculus forsythi*, chestnut-breasted bunting *Emberiza stewarti*, grey-necked bunting *E. buchanani buchanani* and rock bunting *E. cia par*, plain mountain-finch *Leucosticte nemoricola altaica*, white-winged grosbeak *Mycerobas carnipes merzbacheri*, blue whistling-thrush *Myophonus caeruleus turcestanicus*, wallcreeper *Tichodroma muraria* and others.

**Mammals.** The mammal fauna includes more than 40 species. Among insectivores the lesser white-toothed shrew *Crocidura suaveolens* occasionally occurs - and the long-eared hedgehog *Hemiechinus auritus*, and from the Chiroptera: the grey long-eared bat *Plecotus austriacus*, lesser mouse-eared bat *Myotis blythii* and the common pipistrelle *Pipistrellus pipistrellus*. The lagomorphs are represented by the Turkestan red pika *Ochotona rutila* (a high-mountain species) and the tolai hare *Lepus capensis tolai*, an inhabitant of the open sites of wood and sub-al-

## Description

pine belts. The fauna of rodents is presented by 11 species. The long-tailed marmot *Marmota caudata* population numbers 4,000 – 4,500 individuals. The Tien-Shan ground squirrel *Spermophilus relictus* is a background species of the alpine belt. A common species of fruit and inundated woods is the forest dormouse *Dryomys nitedula*. The wood mouse *Apodemus sylvaticus* is numerous in all belts; the house mouse *Mus musculus* is a typical species of a cultural landscape. The Turkestan rat *Rattus turkestanicus* is a typical inhabitant of a wood belt. The voles are presented by three species: common vole *Microtus arvalis*, juniper vole *M. juldaschi* and silver mountain vole *Altiticola argentatus*. The voles are the most numerous rodents in grassy and wood ecosystems. In favourable years the density of vole holes can reach up to tens of thousands per hectare.

The northern mole vole *Ellobius talpinus* is a common species for all the ecosystems. There are lots of Indian crested porcupines *Hystrix indica*. Among carnivores there are 10 native and 4 acclimatized species. The red fox *Vulpes vulpes* and the golden jackal *Canis aureus* are common native species. From time to time, the grey wolf *Canis lupus* drops in to the reserve. The mustelid family is represented by the badger *Meles meles*, the weasel *Mustela nivalis*, the stoat *Mustela erminea* and the stone marten *Martes foina*. The badger lives in the wooded belt, while the stoat and stone marten inhabit the sub-alpine zone; their number is insignificantly small. The ungulates are represented by 3 species: the wild boar *Sus scrofa*, the Siberian roe deer *Capreolus pygargus* and the Siberian ibex *Capra (Ibex) sibirica*.

### Rare and endemic species

Several species of insects are included in the national Red; these are the blue-eyed goldenring, the bolivaria brachyptera, the wood mantis, the bumblebees moss, the lamellar and Armenian rophitoides, the carpenter bee, the red-dot she-bear, the swallowtail, the alexanor swallowtail, the Mnemosyne - *Parnassius mnemosyna*, the delphius - *P. delphius* and others.

Of birds, several species are included in the national Red Book: golden eagle *Aquila chrysaetus*, lammergeier *Gypaetus barbatus*, peregrine falcon *Falco peregrinus*, saker falcon *Falco cherrug*, Eurasian sparrowhawk *Accipiter nisus*, black stork *Ciconia nigra*, short-toed snake-eagle *Circaetus gallicus*, Eastern imperial eagle *Aquila heliaca*, the gyrfalcon *Falco rusticolus* and white-winged woodpecker *Dendrocopos leucopterus*. And 7 species are included in Red List of IUCN (the version of 2013) with various degree of threat. These are Eastern imperial eagle *Aquila heliaca* (VU), corncrake *Crex crex* (NT), cinereous vulture *Aegypius monachus* (NT), European roller *Coracias garrulus* (NT), saker falcon *Falco cherrug* (EN), lesser kestrel *Falco naumanni* (VU), Egyptian vulture *Neophron percnopterus* (EN).

Among the mammals, there are 2 globally threatened - snow leopard *Panthera uncia* (EN) and Pallas's cat *Otocolobus manul* (NT), and 2 are in the national Red Book - Turkestan lynx *Lynx lynx isabellinus* and the Himalayan brown bear *Urcus arctos isabellinus*. The number of brown bear in recent years has been reduced.

### PASNR.

#### Invertebrates

Invertebrates fauna is not well studied and in general similar to SCSBNR.

#### Vertebrates

##### Fish

In the reservoirs of PASNR the following can be found: marinka (Sattar snowtrout) *Schizothorax intermedius* (Kaska-Suu river) and the naked osman *Gymnodiptychus dybowskii* (Kaska-Suu river).

##### Amphibians and reptiles.

The species composition of the reptiles and amphibians is similar with that of SCSBNR.

**Birds.** There are 51 species of the birds related to 6 orders. The most numerous order is Passeriformes, which amounts to 29 species. The order of diurnal birds of prey (8 species) is numerous as well. The owl order is represented by two species, while gallinaceous birds by 4 species. There are 28 species of resident birds and 14

## Description

migrants. The saker falcon, the lammergeier and the griffon vulture are very rare species as well as the Eurasian hobby, Eurasian sparrowhawk and Egyptian vulture.

**Mammals.** In the Padysha-Ata nature reserve there are about 31 mammals species of 6 orders, the list is given below.

The insectivores includes lesser white-toothed shrew *Crocidura suaveolens*, pale grey shrew *Crocidura pergrisea*. The bats: brown long-eared bat *Plecotus auritus* and common pipistrelle *Pipistrellus pipistrellus*.

The rodents: *Muridae* - wood mouse *Apodemus sylvaticus*, house mouse – *Mus musculus*, and Turkestani rat *Rattus turcestanicus*; family *Cricetidae* - juniper vole *Microtus juldaschi*, common vole *Microtus arvalis*, Zaisan mole vole *Ellobius tancrei*, and silver mountain vole *Alticola argentatus*; *Gliridae*- forest dormouse *Dyromys nitedula*; *Sciuridae*- long-tailed marmot *Marmota caudata* and the Tien Shan ground squirrel *Spermophilus relictus*; *Hystricidae* - Indian crested porcupine *Hystrix indica*.

The hares. tolai hare *Lepus capensis* and Turkestan red pika *Ochotona rutila*.

The carnivores. The *Canidae*: grey wolf *Canis lupus*, red fox *Vulpes vulpes*, golden jackal *Canis aureus*. The *Ursidae*: brown bear – *Ursus arctos*. The *Mustelidae*: stone marten *Martes foina*, weasel *Mustela nivalis*, steppe polecat *Mustela eversmannii*, and badger *Meles meles*. The *Felidae*: snow leopard *Panthera uncia* and the Eurasian lynx *Lynx lynx*

The even-toed ungulates. The *Suidae*: wild boar *Sus scrofa*. The *Cervidae*: Siberian roe deer *Capreolus pygargus*. The *Capridae*: Siberian ibex *Capra sibirica*.

### Rare and endemic species

The animal species included in the Red Book of Kyrgyzstan (and partly in IUCN list of threatened species) are: **the mammals** – Tien Shan brown bear *Ursus arctos isabellinus*, stone marten *Martes foina*, Turkestan lynx *Lynx lynx isabellinus*, snow leopard *Panthera uncia* (EN); **the birds** – short-toed snake-eagle *Circaetus gallicus*, golden eagle *Aquila chrysaetus*, lammergeier *Gypaetus barbatus*, cinereous vulture *Aegypius monachus* (NT), Himalayan vulture *Gyps himalayensis*, and saker falcon *Falco cherrug* (EN). Breeding European roller *Coracias garrulus* (NT) and con Drake *Crex crex* (NT) are included in IUCN Red list only.

### BASNR.

#### Invertebrates

In the reserve fauna there are several dozens of spiders (*Araneae*) of the invertebrates, in addition to the insects. This group in the area under consideration virtually has not been investigated earlier, however, some part of the species has been identified so far.

The *Oxyopes marakandensis*, *Xysticus pseudocristatus* and *Enoplognatha sp.* are domineering in the savanna grass. In the soil cover of these vegetative communities the most abundant are *Pardosa turkestanica* and *P. thaleri*. The orb-weaver spiders fall into two types – *Argiope lobata* and *Araneus tartaricus*; the former inhabits the grass, while the latter is spread in the chains of poplar-birch woods in the banks of the rivers. There is still no research on the reserve's mollusc fauna.

#### Vertebrates

In BASNR 36 species of mammals, 150 birds, 6 reptiles, 2 species of amphibians and 4 fish species were registered for now.

**Fish.** The fish fauna is scanty. In the Chatkal river and its tributaries there are: marinka (Sattar snowtrout) *Schizothorax intermedius*, Turkestan catfish *Glyptosternum reticulatum*, naked osman *Gymnodiptychus dybowskii* and gudgeon *Gobio gobio*.

**The amphibian** species are the green toad *Bufo viridis* and the marsh frog *Rana ridibunda*.

## Description

Reptiles. The reptiles inhabiting the reserve are the desert lidless skink *Ablepharus deserti*, spotted racerunner *Eremias multiocellata*, dice snake *Natrix tessellata*, steppe ratsnake *Elaphe dione*, Siberian pit viper *Gloydius (Agkistrodon) halys* and the European glass lizard *Pseudopus apodus*.

Birds. The birds in the reserve account for 150 species, with more than half nesting. The expedition teams research materials (2001) recorded over 100 species. The gallinaceous birds are represented by the chukar *Alectoris chukar* and Daurian partridge *Perdix daurica*. The diurnal predators are the common kestrel *Falco tinnunculus*, black kite *Milvus migrans*, short-toed snake-eagle *Circaetus gallicus*, golden eagle *Aquila chrysaetos*, lammergeier *Gypaetus barbatus*, Himalayan vulture *Gyps himalayensis*, saker falcon *Falco cherrug* and the Eurasian hobby *Falco subbuteo*.

The plain species usually are the Asian paradise-flycatcher *Terpsiphone paradisi*, blue rock-thrush *Monticola solitarius pandoo*, brown dipper – *Cinclus pallasii tenuirostris*, Turkestan nightingale *Luscinia megarhynchos hafizi*, common whitethroat *Sylvia communis rubicola*, red-headed bunting *Emberiza bruniceps*, lesser grey shrike *Lanius minor*, Turkestan rufous-tailed shrike *Lanius (isabellinus) phoenicuroides*, Eurasian golden oriole *Oriolus oriolus*, common cuckoo *Cuculus canorus subtelephonus*, rock pigeon *Columba livia*, common wood-pigeon *Columba palumbus casiotis* and the rosy starling *Sturnus roseus*.

In the wood meadow belt the following are usually found: the rock sparrow *Petronia petronia intermedia*, masked wagtail *Motacilla (alba) personata*, rock bunting *Emberiza cia par*, common whitethroat *Sylvia communis rubicola*, white-winged grosbeak *Mycerobas carnipes merzbacheri*, northern wheatear *Oenanthe oenanthe* and Isabelline wheatear *Oenanthe isabellina*, crag martin *Hirundo rupestris*, common swift *Apus apus pekinensis*, European bee-eater *Merops apiaster*, carrion crow *Corvus corone orientalis*, black-billed magpie *Pica pica bactriana*, Turkestan starling *Sturnus vulgaris porphyronotus*, common myna *Acridotheres tristis tristis* and the rosy starling *Sturnus roseus*.

Typical for the rocks, subalpine and alpine meadows are the chukar *Alectoris chukar*, Himalayan snowcock *Tetraogallus himalayensis*, rock pigeon *Columba livia*, red-billed chough *Pyrrhocorax pyrrhocorax*, yellow-billed chough *Pyrrhocorax graculus forsythi*, white-winged snowfinch *Montifringilla nivalis*, Alpine accentor *Prunella collaris rufilata*, blue rock-thrush *Monticola solitarius pandoo*, wallcreeper *Tichodroma muraria* and others. The golden eagle *Aquila chrysaetos* and the short-toed snake-eagle *Circaetus gallicus* are included in the Red Data Book.

Mammals are represented by 6 orders.

The insectivores. The lesser white-toothed shrew *Crocidura suaveolens* lives everywhere, except the mountain areas of the Ters river valley. The long-eared hedgehog *Hemiechinus auritus* can be found in the Chatkal river valley. There is virtually no research made on the Chiroptera order.

The lagomorphs are represented by the Turkestan red pika *Ochotona rutila* and tolai hare *Lepus capensis*.

The most numerous order, the rodents, is represented by 16 species. The background species typical for all the belts are the northern mole vole *Ellobius talpinus*, wood mouse *Apodemus sylvaticus*, house mouse *Mus musculus*, and common vole *Microtus arvalis*. There are three other vole species: the juniper vole *M. juldaschi*, the silver mountain vole *Alticola argentatus* and the narrow-headed vole *M. gregalis*. The forest dormouse *Dryomys nitedula* is typical for the fruit and inundated woods. The population of Menzbier's marmot *Marmota menzbieri*, a western Tien Shan endemic, does not exceed 1,000 individuals. The Menzbier's marmot's range is the sub-alpine and alpine meadows of the Ters river valley and the northern slopes of the Kumbel ridge. The population of the Menzbier's marmot is decreasing from year to year due to the ongoing economic activities. The long-tailed marmot is rare. The Tien Shan ground squirrel *Spermophilus relictus*, a western Tien Shan endemic, can often be found in the mid mountains. The Indian crested porcupine *Hystrix indica* inhabits mainly the lowlands and tugai forests.

The carnivores are represented by 12 species. The common species are the red fox *Vulpes vulpes*, grey wolf *Canis lupus*, badger *Meles meles*, weasel *Mustela nivalis*, stoat *Mustela erminea*, stone marten *Martes foina*, steppe polecat *Mustela eversmannii* and steppe cat *Felis libyca*. The rare Red Book species are the snow leopard *Panthera uncia*, Turkestan lynx *Lynx lynx isabellinus*, brown bear *Ursus arctos*, European marbled polecat *Vormela peregusna* and Pallas' cat *Felis manul*. The dhole *Cuon alpinus* could possibly be resident, but there has been no reliable recorded proof.

The Artiodactyla are represented by the wild boar *Sus scrofa*, Siberian roe deer *Capreolus pygargus*, Siberian ibex *Capra sibirica* and the argali *Ovis ammon*.

### Rare and endemic species

The animal species included in the Red Book of Kyrgyzstan (and partly in IUCN list of threatened species) are: **the mammals** – Tien Shan brown bear *Ursus arctos isabellinus*, stone marten *Martes foina*, steppe polecat *Mustela eversmanii*, otter *Lutra lutra seistanica*, Turkestan lynx *Lynx lynx isabellinus*, snow leopard *Panthera uncia* (EN), Tien Shan argali *Ovis ammon* (NT), Menzbier's marmot *Marmota menzbieri* (VU), and Indian crested porcupine *Hystrix indica*; **the birds** – short-toed snake-eagle *Circaetus gallicus*, golden eagle *Aquila chrysaetus*, lammergeier *Gypaetus barbatus*, cinereous vulture *Aegypius monachus* (NT), Himalayan vulture *Gyps himalayensis*, saker falcon *Falco cherrug* (EN) and Asian paradise-flycatcher *Terpsiphone paradisi*. Breeding European roller *Coracias garrulus* (NT) and con Drake *Crex crex* (NT) are included in IUCN Red list only.

### CSNR.

The reserve fauna has been studied to quite a full extent. However, due to the relatively small size of the reserve, there are no special summary reports and inventories on it. The available faunistic publications characterize mainly the vertebrates fauna. The total registered number of the fish species is 6. There are 2 amphibians, 14 reptiles, 184 birds and 36 mammal species.

### Invertebrates

1,360 species were identified in the territory of reserve; most of them belong to arthropods, mostly to insects. Specimens of butterflies and moths (Lepidoptera), beetles (Coleoptera), bugs (Hemiptera), crickets and grasshoppers (Orthoptera), flies (Diptera) are widely spread. In certain years harmful activity of lepidopterans appears, specifically it's the activity of *Limantria dishar* and *Clytra quadripunctata*.

### Vertebrates

**Fish.** The marinka (Sattar snowtrout) *Schizothorax intermedius* is the most widespread in rivers and at the bottom of streams. The naked osman *Gymnodiptychus dybowskii* is numerous in the middle parts of rivers and inhabits the lakes, too. It resides in the Tereklsai and Kainsai rivers and in their tributaries. The Kushakevich loach *Nemacheilus kuschakewitschi* usually inhabits the half mountain types of rivers and can be sometimes found in separate parts of the lower flow of the Terekli sai and Bashkyzyl sai rivers.

The Tibetan stone loach *Nemacheilus stoliczkai* is an inhabitant of the upland rivers and lakes. It is spread in the Tereklsai and Kainsai rivers and in their tributaries. The Turkestan catfish *Glyptosternum reticulatum* inhabits of the clear mountain and pre-mountain parts of rivers, small rivers and springs. In the reserve rivers it is found in the lower (Terekli sai, Kainsai) and middle (Bashkyzyl) parts, not rising up to the higher mountain.

In the reserve the Chatkal miller's-thumb, a subspecies of the common miller's-thumb *Cottus gobio* ssp. *jaxartensis* Berg resides. It is a cold-resistant bottom fish, which is represented in small numbers in the Tereksai and is very rare in the Kainsai.

The Chatkal miller's-thumb and the Turkestan catfish are included in the national Red Book.

**Amphibians** (3 species): the green toad (*Bufo viridis* complex of 2 species) is often found in the valleys; it is widespread almost everywhere up to the heights of 3000 m. The marsh frog *Rana ridibunda* is widespread in all the low-mountain and to some extent in the mid-mountain water-bodies.

**Reptiles.** There were 14 species of reptiles registered in the territory of reserve. In the reserve low- and midlands the European glass lizard *Pseudopus apodus* is often found, as well as the Caucasian gecko *Cyrtopodion russo-wi*, Schneider's skink *Eumeces schneideri*, spotted desert racer *Coluber karelini*, spotted whip snake *Hemorrhois ravergieri*, steppe ratsnake *Elaphe dione* and the steppe ribbon racer *Psammophis lineolatum*. The dice snake *Natrix tessellata* is common in the rivers. In all the reserve territory up to the height of 3,000 m the Siberian pit viper *Gloydius (Agkistrodon) halys* can be found, as well as the Alai lidless skink *Asyblepharus alaicus* and the rapid racerunner *Eremias velox*. The steppe viper *Vipera renardi* which is registered in the national Red Book is very rare.

**Birds.** The avifauna numbers 183 species. The nesting birds of the mountain woods are the most diverse. There

## Description

are no endemics here, but the combination of the species in the archa forests and light forests is unique for this territory. Especially remarkable here is the joint living of a number of close genera of a different zoogeographic origin - *Gyps*, *Accipiter*, *Columba*, *Streptopelia*, *Otus*, *Prunella*, *Carpodacus*. As in many other groups, significant spatial differentiation of species composition and localness of the areas of habitat of many relatively rare types is typical for the representatives of wood ornithofauna.

Populations of some species are numerous: *Alectoris chukar*, *Streptopelia orientalis*, *Eremophila alpestris*, *Delichon urbica*, *Anthus spinoletta*, *Motacilla cinerea*, *Pyrrhocorax graculus*, *Sylvia althaea*, *Muscicapa striata*, *Oenanthe isabellina*, *Fringilla coelebs*, *Fringilla montifringilla*, *Emberiza cia*, *Emberiza bruniceps*. They lay the basis of the nesting avifauna (except for wintering). The majority of birds are inclined to migrations, therefore there are no endemics noted in the Western Tien Shan.

The alpine avifauna is interesting and hardly changed by anthropogenous influence, with typical *Gypaetus barbatus*, *Gyps himalayensis*, *Aquila chrysaetos*, *Tetrao gallus himalayensis*, *Eremophila alpestris*, *Anthus spinoletta*, *Motacilla citreola calcarata*, *Calandrella acutirostris*, *Pyrrhocorax pyrrhocorax*, *Pyrrhocorax graculus*, *Prunella collaris*, *Montifringilla nivalis*, and *Rhodopechys sanguineus*.

In both sites of the reserve the midmountain belt is well expressed. It is characterized by abundance and variety of nested avifauna, the core of which is made up by *Alectoris chukar*, *Accipiter nisus*, *Columba palumbus*, *Apus apus*, *Lanius minor*, *Corvus corone*, *Sylvia althaea*, *Muscicapa striata*, *Luscinia megarhynchos*, *Turdus merula*, *Remiz pendulinus*, *Parus bokharensis*, *Chloris chloris*, *Emberiza stewarti*, *Emberiza cia*, *Emberiza bruniceps*.

The following species find their way into the territory of the reserve from oasis dwellings, at times increasing the numbers: *Columba livia*, *Streptopelia senegalensis*, *Upupa epops*, *Hirundo daurica*, *Motacilla personata*, *Lanius schach*, *Oriolus oriolus*, *Pica pica*, *Passer indicus*, *Emberiza calandra*.

Winter fauna of the birds of the Chatkal reserve is quite manifold, but underexplored.

**Mammals.** The fauna of mammals of the reserve includes 36 species (69% from Western Tien Shan theriofauna). Some species from the order of rodents are spread widely in the reserve: *Alticola argentatus*, *Cricetulus migratorius*, *Ellobius tancrei*, *Mus musculus*, *Sylvaemus uralensis* (the last two species in the mid-montane belt). In the mid-montane zone the following are widespread: *Capreolus pygargus*, *Hystrix indica*, *Dryomys nitedula*, *Rattus turkestanicus*.

The high mountainous zone is occupied by: *Mustela erminea*, *M. nivalis*, *Panthera uncia*, *Capra sibirica*, *Marmota menzbieri*, *Spermophilus relictus*, *Alticola argentatus*, *Microtus carruthersi*.

In the mountain-wood zone the following are common: *Vulpes vulpes*, *Ursus arctos*, *Martes foina*, *Meles meles*, *Capreolus pygargus*, *Sus scrofa*, *Hystrix indica*, *Dryomys nitedula*, *Apodemus sylvaticus*, *Rattus turkestanicus*. The grey wolf *Canis lupus* is linked mainly with this belt as well.

The tamarisk jird *Meriones tamariscinus* and the Kyrgyz vole *Microtus kirgisorum* are linked with the valleys of the rivers.

*Cricetulus migratorius* and *Ellobius tancrei* are widespread on all the territory of the reserve.

The fauna of insectivorous and bats has been studied very little and is represented by *Crocidura suaveolens*, *Rhinolopus ferrumequinum*, *Pipistrellus pipistrellus*.

*Spermophilus relictus*, *Martes foina*, *Mustela nivalis*, *Mustela erminea* are spread widely and have a high number in local conditions:

The large mammals occur everywhere, though in low numbers: *Capra sibirica* (in the Bashkizylsai not below the heights of 1,400 meters), *Ursus arctos*, *Vulpes vulpes*, *Canis lupus*, *Sus scrofa*, *Meles meles*.

*Panthera uncia* and *Marmota menzbieri* perpetually stay in the high mountain belt. Extremely rare are *Lynx lynx isabellina*, *Vormela peregusna*. The ongoing invasion of *Mustela vison* is extremely undesirable, as while adapting to the CSNR wetlands, it is eating out the fish, amphibia, birds and small rodents.

### Rare and endemic species.

In the national Red Data Book and partly in the list of globally threatened species are included three species of insect (*Papilio alexanor*, *Chrysotoxum kozhevnikovi*, *Heringia senilis*), 9 species of birds (*Ciconia nigra*, *Circaetus gallicus*, *Aquila nipalensis*, *Aquila chrysaetos*, *Gypaetus barbatus*, *Aegyptius monachus* - NT, *Gyps himalayensis*,

*Falco cherrug* - EN, *Falco pelegrinoides*). As almost everywhere in Western Tian-Shan, globally “near threatened” European roller and corncrake are breeding here. Of mammals, the national Red Book includes the brown bear, the snow leopard (EN) and the Menzbier’s marmot (VU).

## PALEONTOLOGICAL ARTIFACTS



During past geological time the territory of nominated object underwent a long and complex series of transformations and changes. Traces of plants and animals on so-called ‘fishy slates’ of Karatau, which are present in large quantities on two paleontological areas of AJSNR – Auliye and Karabastau situated on Karatau ridge at the distance of 100 km to the north of the main territory are the evidence of these processes.

The first location of the Upper Jurassic fauna and flora in Karatau mountains was discovered in 1921. New repositories were discovered in 1923 – 1925 near the village Auliye in natural boundaries Karabastau and Chugurchak.

Shale found here may laminate into thinnest plates resembling sheets of paper that is why it is also called ‘paper shale’; by origin it is carbon-bearing silt. Subsequently consolidated silt perfectly preserved traces of plants and animals that inhabited the ancient water reservoir and on its shore lines about 150 million years ago. According to the data of Gekker R.F. (1948), animal and plant carcasses were buried in sediments of Late Jurassic Karatau lake. Such rich and interesting ground disposal of Mesozoic insects as in Karatau cannot be found anywhere in the world, thereat, in many cases, they are wonderfully preserved. The employees of paleontological Institute of the RAS and RK Institute of Zoology amassed unique collections in Karatau (over 18 thousand samples of 1,200 types of insects belonging to 500 genres). 6 species of fishes with predominance of chondrosteans (94% of all samples) were described in Karatau. The remains of flying pterosaurs from the order of rhamphorhynchus were discovered (the first one was described in 1948). Traces of over 60 types of plants were found there. The remains of water tortoise of new genus and type (*Yaxartemys longicauda*) with long tail – the inhabitant of freshwater bodies were described, bones of dinosaur, remains of shellfish and others were found. Karatau paleontological deposit is rightfully considered to be one of the most interesting in the world (Gekker, 1948; Orsovskaya, 1996). Numerous fossils of Paleozoic period – remains of shellfishes, corals, moss animals, trilobites – continue being discovered on the main territory of AJSNR.

## 2B. HISTORY AND DEVELOPMENT

### Geological history

Contemporary geological structure as well as geomorphological image was obtained as a result of several steps of geological transformation. Intensive volcanic activity interchanged by repeated quiescent stages in the Permian occurred in the territory of contemporary West Tien Shan as far back as in Paleozoic period. The process of sedimentation with subsequent erosion of sedimentary covers was going during quiescent stages. Sedimentary rocks (limestone) were developed at the bottom of the sea in the process of repeated transgression (and subsequent regression). During the Cenozoic the sedimentation processes dominated over volcanic processes. By getting to considerable depths sedimentary rocks underwent metamorphosis, obtaining considerable hardness and stable strength against destruction. In the process of repeated falls of temperature in the Cenozoic, glaciers were formed on the tops of ridges. Four-stage moraines point to the 4-fold formation (and subsequent melting) of glaciers.

### The Paleozoic

Geological history of the Western Tien Shan is closely associated with the ancient sea Tethys, which occupied practically all its contemporary territory in the Paleozoic Cambrian period (570 million years ago) and Ordovician

period (500 million years ago). Those periods left dolomites, gay colours, limestones, sandy and shaly rock masses as well as fossil remains: archaeocyatha, trilobites, graptolites, cystoids, brachiopods, dreadnautilus and sea ores. Starting from the Silurian (430 million years ago) there was interchange of transgression and regression periods of Tethys. The last transgression occurred already in the Cenozoic in Eocene 65 million years ago. In the Silurian the region was noted for increased volcanic activity. A part of Western Tien Shan went far into the shallow sea forming peninsulas and islands. That period left thin shale, fossil tabulates, brachiopods and graptolites. In the Devonian (395 million years) considerable areas of the land were washed by the sea, which entered by bays into the depth of the continent, especially in the southern part of the Western Tien Shan. Volcanic activity developed in a less degree. Carbonate deposits with brachiopods, corals, moss animals and crinoids are typical for Chatkal. Shallow sea was inhabited by armored fishes, ostracods, giant shellfishes, phylloporids, lamellibranchs and crinoids. On the land psilophyte are substituted by archeopterias (equisetites, ferns, lepidophytes, pteridosperms). In the Carbonic (345 million years ago) during transgression period the sea occupied the largest part of the Western Tien Shan, relatively small islands remain only in the north. Red cross-layered sandstones carbonate deposits, conglomerates, gritstones and redbeds are the evidence of these processes. Fossil brachiopods, corals, crinoids, fusulinids, goniatites in the sea and lepidodendrons, sigillarias, nevroptecs and astrotecs on shore point to the plenitude of organic life.

Thick humid forests form lepidophytes up to 30 m, calamites (type of giant horsetails), ferns and cordaites. Vegetable organics of the Carbonic gave large carboniferous deposits. During that period the area was inhabited by crocodile-like labyrinthodonts, cotylosaurs and pelycosaurs. In the Permian (280 million years ago) the land occupied the largest part of the Western Tien Shan and only its southern part was occupied by the sea. During that time large conglomerates, sandstones and shale were formed. Ridges acquired contemporary forms; they rose to several thousand meters but were below contemporary level. The Permian fossils include: brachiopods, foraminifers, pelecypodas, gastropods, rugoses, ammonites. Pteridosperms and conifers dominated on the shore.

### The Mesozoic

During Mesozoic period shore area prevailed. Only in the South there remained a narrow bay of the Tethys sea. In the Triassic (225 million years), Jurassic (195 million years), Cretaceous (135 million years) redbeds and boulder conglomerate were accumulated. Communities based on gymnosperms (horsetails, ferns, podosamites, coniferous, ginkgo, cycadous, bennettites, firs, spruces in the Triassic, coniferous ginkgo ferns in the Jurassic) dominated, but in the Cretaceous there appeared angiosperms (ferns, cycadous, coniferous were gradually substituted by magnolias, bay trees, plane trees and eucalyptus). Among fossils there were labyrinthodonts, dicynodonts, tectodonts in the Triassic; and sauropods, ornithomimids dinosaurs, rapacious carnosaurus, stegosaurs, ceratopsians, ankylosaurs, skolosaurus and among mammals – dinoceratas and creodontas in the Cretaceous.

### The Cenozoic

Last powerful sea transgression, which covered considerable part of the Western Tien Shan's territory occurred in early Tertiary in the Eocene (65 million years ago), but starting from the Neogene it represented a gulf coast and later the sea finally disappeared. The important event of the Tertiary is appearance and distribution of broadleaved woodlands including nut-fruit ones passed through the glacial era ended about 10 thousand years ago as relicts in refugiums of the Western Tien Shan.

During that period the biota of the region obtained contemporary features for the most part. However considerable part of plants types was represented by relicts of the Tertiary. The derivatives of the Tertiary include vegetation formations *Juglans regia*, *Malus sieversii* and others.

### History of development

Western Tien Shan is a unique part of Central Asia, climate, natural resources and favorable position of which were attracting ancient settlers hundreds of thousand years ago. Primitive people left traces of their lives in the form of caves (for example, grotts Obirakhmat and Khodjakent), instruments of labor and hunting, stone processing shops and picture galleries cut on stones and cliffs of the Neolithic stage. During Bronze period (3,000 before our

## Description

era) extraction of ores, first ferrous metals and then precious metals, started in the areas of the Western Tien Shan. In Kuhan-Turk times (IV-VII centuries) that region was already densely populated. Alongside with nomadic culture agriculture was developing, settlements and later, cities appeared. Main trade routes passed via Western Tien Shan, it was the center of cultural ties of nomad cattle breeders and settled agricultural tribes of Central Asia. The primary branch of the Great Silk Way passed here. Walnuts, furs and other goods were exported from the region. Principally population acknowledges Islam, however Islamic traditions are not as strong as in large cities. Many pre-Islamic traditions and customs preserved including those connected with ekfil life activity.

**KSNR.**

There are none and have never been ancient settlements on the territory of the reserve, mountain meadows were used as grazing lands only in summer. Nevertheless, several archeological monuments have remained in the reserve and protective zones – mainly they are repositories (Koktekshe and others) as well as other areas with plenty of petroglyphs (Tassharbak, Tanbalytas, Mont Tekturmas).

Immediately prior to the reserve foundation summer grazing lands of village Khantagi inhabitants entered its territory. At present local population was provided with alternative areas.

**History of establishment and development of the nature reserve**

In 1980 Academy of Sciences of KazSSR offered to establish Karatau nature reserve. During the period from 1981 to 1984 integrated studies directed to the scientific rationale development were carried out. By order of the General Committee of KazSSR AS in 1985 the Institute of Botany carried out additional research of the territory condition. The inspection and correction of the reserve's project were carried out in 1998 by order of the Ministry of ecology and bioresources of Kazakhstan. The studies have proved that nature of this region undergoes strong anthropogenic stress (cattle grazing, poaching, extraction of timber). In this connection it was necessary to organize a nature reserve within the marked boundaries as soon as possible. Over the long term it was supposed to settle the issue related to provision of land plots at the northern part of the reserve for extension of its territory. Feasibility Study development was based on materials of KSNR planning in 1998. Land Project was developed and Government Decree of the Republic of Kazakhstan No. 249 'On establishment of State enterprise 'Karatau State Natural Reserve'' (Appendix ), was adopted, dated March 1, 2004. Borders of the reserve were not changed from the moment of its creation.

Preserved wildlife sanitary zone with the area of 40,000 ha was established for Karatau SNR by the Resolution of Akimat of South-Kazakhstan province No. 244 'On the list of specially protected natural sites of local significance', dated June 28, 2002; at present 34,300 ha in the territory of Turkestan region are fully included into the reserve, the remaining 5,700 ha are in the territory of Suzak region of SKP as a reserve zone. In the long term it is necessary to ensure the transfer of these lands to the composition of KSNR.

Protected 3-kilometer zone along the borders of the reserve was established by the Resolution No. 1186 (Appendix ), made by Akim of Turkestan city on March 12, 2005.

The reserve has a status of the legal entity in the form of the state enterprise. The Committee of Forest and Hunting economy of the Ministry of Agriculture of the Republic of Kazakhstan is the authorized body of the reserve state administration.

**AJSNR.**

Contemporary territory of the reserve, as a result of nomad life of Kazakhs was not used by local population for construction of permanent settlements. Grazing lands were used only in summer. Ring-shaped stone cattle-pens as well as cave drawings – petroglyphs imaging scenes of hunting and household and figures of wild and domestic animals were found on the territory of the reserve. (Ivaschenko A.A., 1988). Petroglyphs were approximately dated by the Bronze Age.

Before 1926, when the reserve was founded, the alpine part of the reserve, as in past centuries, was used as summer grazing lands (zhailau). Besides, people cut the hay, cut down juniperus for wood and for construction.

## Description

Due to the paucity of population the depletion degree of natural resources in the territory was low. Prior to 1935 the anthropogenic impact on the reserve was minimal and starting from 1946 it sometimes took menacing proportions. From that time people started such types of exploitation of natural resources as cutting of trees and gathering of dead fallen wood (before 1954), planting of forest trees strange for the reserve flora (1951 to 1960), grazing of cattle (before 1986) and hay cutting (before 1984), geological exploration, organization of bee houses, mass tourism (before 1973) etc. (Kovshar, 1996). Nevertheless, all those types of exploitation of natural resources exerted inconsiderable influence as far as for the most part they were short-term and territorially limited.

History of establishment and development of the nature reserve

The nature reserve was established by the Resolution of Council of People's Commissars of Kazakh ASSR, dated July 14, 1926, approved by the Resolution of Council of People's Commissars of Russian Federation, dated May 27, 1927 at the suggestion of professors of Tashkent (then – Central Asian) University investigated that territory in 1922-1923. Their offer was supported by Turkestan Committee for preservation of ancient buildings and art memorials. It was the first reserve established in Kazakhstan and in all expansion of Central Asia, which is nowadays occupied by five sovereign states. Initial area of the reserve is 30545 ha. In 1929 the canyon of the river Aksu with the area of 825 ha was added, by the Decree of the Presidium of All-Russian Central Executive Committee of the Russian Soviet Federative Socialist Republic, dated February 16, 1935 new boundaries of the reserve were approved provided that its area would increase up to 48,570 ha by means of joining of juniperic forests in the valleys of rivers Bala-Baldybrek and Baldybrek. In 1937 based on the Resolution of Tyulkubass regional executive committee No. 161, dated April 10, and Presidium of Lenger regional executive committee the southern slopes of the right bank of Zhabaglysu river, headstreams of the rivers Aksu and Kshi-Aksu and part of Maidantal valley were added to the reserve. Thus, the area of the reserve increased up to 69,826 ha. Considerable change of configuration and area of the reserve took place in 1969, when based on the results of forest management it was added with headstreams of the river Aksu with the area of 6,3 thousand ha in substitution of Maidantal river valley. In spite of unbalance in areas exchange southern and south-eastern boundaries of the reserve were fixed along terrain lines – the top of Ugam ridge.

By the Resolution of the Cabinet of Ministers of the Republic of Kazakhstan No. 855, dated June 22, 1995, the reserve was issued with the rights for permanent use of the land plots of forest resources at the area of 10,660 ha and agricultural lands at the area of 6 ha. Besides, there are two paleontological areas under the jurisdiction of the reserve: 'Karabastau' having the area of 126 ha (Resolution of the CPC of Kazakh SSR, dated 1926) and 'Auliye' having the area of 100 ha (Resolution of Chymkent province executive committee No. 766, dated 26.12.1974).

The last territorial expansion of the reserve – Governmental Resolution of the Republic of Kazakhstan No. 1133, dated November 17, 2005, the reserve and grazing lands of Tyulkubass (1,000.0 ha) and Tolebi (45882,3 ha) regions of South-Kazakhstan province with the total area of 46,882.3 ha were included into it. Thus, today the area of the reserve reached 131,934 ha. 2-km protected zone with the total area of 25,800 ha was established along the borders of the reserve by the Resolution No. 289 of Akim of South-Kazakhstan province, dated August 4, 2006 and No. 286 of Akim of Zhambyl province, dated October 26, 2006.

The reserve has a status of a legal entity in the form of a state enterprise. The Committee of Forest and Hunting economy of the Ministry of Agriculture of the Republic of Kazakhstan is the authorized body of the reserve state administration.

## SUSNNP.

The lands of SUSNNP as well as the lands of adjacent AJSNR, even prior to its establishment underwent limited anthropogenic transformation. Generally, they were used as grazing land except but in summer from ancient times as is evidenced by petroglyphs of the Bronze Age. People hayed, cut juniperus and managed apiaries. Somewhere people produced construction materials for local needs (clay, stone etc.) there were artisan mines of precious metals. Prior to SUSNNP establishment, all its territory was part of three forestry farms called 'State Institutions for Protection of Forests and Wildlife' at the moment of establishment. Wild fruit (apples, apricots) harvesting, garden planting on small areas and forest recreation were carried out within the framework of their

## Description

activity. Active development of tourism started from the 1980s. However, all those types of exploitation of natural resources exerted inconsiderable influence on landscapes.

History of establishment and development of the nature reserve

The National Park was established by the Government Decree of the Republic of Kazakhstan No. 52 'On some issues of separate state enterprises of South-Kazakhstan province', dated January 26, 2006. It included entire territories of three State Institutions for Protection of Forests and Wildlife (former forestry farms): Ugam (Kazыrgurt region) with the area of 74,573 ha, Tolebi (Tolebi region) with the area of 36,409 ha, and Tyulkubas (Tyulkubas region) with the area of 26,971 ha. Besides, the park comprised state nature reserve lands used for grazing with the total area of 11,100 ha. Thus, from the moment of its establishment total area of the State National Natural Park made 149,053 ha. Its borders were not changed to date.

2-km protected zone with the total area of 27,000 ha was established along the whole border of the reserve by the Resolution No. 171 of Akim of South-Kazakhstan province, dated April 26, 2006.

The reserve has a status of a legal entity in the form of a state enterprise. The Committee of Forest and Hunting Economy of the Ministry of Agriculture of the Republic of Kazakhstan is the authorized body of the national park state administration.

## SCSNR.

Prior to the reserve establishment local population gathered apples, nuts, wood, people of the village Arkyt used the territory for grazing of their cattle. From the moment of the reserve establishment the discussins of the village Arkyt was particularly heated, attempts on transfer of its population to neighboring villages were taken. That initiative was not endorsed by local population and therefore, was not implemented. Currently, in order to reduce the influence of population to the reserve, the territory has been zoned and as a result, certain areas of buffer zone have been allocated to meet the demands of the population in hayfields and grazing lands. Since 1959, after the reserve establishment, active scientific and research work had been carried out in including acclimatization of animals and after SCSNR inclusion to the network of biosphere reserves of UNESCO the work became more complex.

### History of establishment and development of the nature reserve

The Council of Ministers of Kyrgyz SSR adopted the Resolution No. 118 'On improvement of forest management', dated June 5, 1959, Clause 7 of which stated: 'Taking into consideration high diversity of tree and shrub vegetation of great practical and scientific value, and for the purpose of preservation and further development of natural riches in Arkit and Aflatun forestry farms, organize Sary-Chelek nut-and-fruit reserve with inclusion in it part of forests of Arkit forestry farm and natural boundary Batrakhhan of Aflatun forestry farm in the territory of Djanghi-Djoly region of Osh province'. Scientific-methodological management of scientific and research works in newly established Sary-Chelek reserve was imposed on the Academy of Science of Kyrgyz SSR.

On June 1, 1960 by the Order for the Ministry of Agriculture of Kyrgyz SSR No. 295 'Issues of organization of Sary-Chelek nut-and-fruit and Kemin reserves' Sary-Chelek reserve was established on the area of 20,5 thousand hectares.

By the Resolution of Forestry Management and Nature Protection Central Administration Board of Collegium of Kyrgyz SSR dated February 9, 1962, the reserve was added with the part of Batrakhhan natural boundary of Aflatun forestry farm with the area of 3,053 ha. So at present the territory of the reserve is 23,868 ha and is divided into two parts: Arkyt with the area of 12,125 ha and Sary-Chelek - 11,743 ha.

Having considered the materials on approval of Sary-Chelek reserve protective zone presented by Djanghi-Djoly regional executive committee in execution of the Resolution No. 533 of the Council of Ministers of Kyrgyz SSR 'On approval of Regulation on natural-reserved fund and protection of remarkable natural objects in Kyrgyz SSR', dated November 4, 1976, members of Osh Province Soviet of Kyrgyz SSR by the Resolution No. 125 'On approval of protected zone of Sary-Chelek state nature reserve', dated March 15, 1984 resolved to:

1. Approve the Resolution of Djanghi-Djoly regional executive committee No. 268 'On approval of protected zone of Sary-Chelek state nature reserve', dated November 4, 1982, with total width of 2 km and total area of

## Description

18,080 ha, of which 6,102 ha belonged to Aflatun forestry farm, 8,597 ha – to Arkit forestry farm, 1,175 ha – to the collective farm named after Telman, 826 ha – to the state farm Kyzyl-Tuu.

Prior to 1991 the reserve was under the Soviet Union administration on the balance of the State Committee for nature protection of USSR. On 1991 it was transferred to the Republican administration and was fully financed from the republican budget.

**PASNR.**

Starting from forestry farms establishment (in the beginning of last century) general policy of the state was expressed in the intensive exploration of natural resources: planned nuts and timber harvesting was carried out. The main harm to the ecosystem was made during war and prewar years (30s and 40s years of 20th century), in the period of continuous felling of coniferous species.

History of establishment and development of the nature reserve

Based on the Government Decree of Kyrgyz Republic No. 425, dated July 3, 2003, Padysha-Ata state nature reserve was established on lands of Padysha-Ata forestry of Avletim forestry farm in the area of 30,560 ha. Enlargement of the reserve's area for another 15,798 ha was planned.

Thanks to the reserve establishment as well as its strict protection, poaching and other negative effects gradually reduce and animal number considerably increases.

In 2004 the lands with the area of 2,084.9 ha in the protected zone of the reserve were allocated for grazing of local people's cattle. At present, the area of lands used for grazing is 1,401 ha.

**BASNR.**

Under the early Iron encampments of Saka-Usun breeders-nomads appeared in the territory of contemporary Chatkal valley. In the lower reaches of the river Chatkal there were found over 200 burial hills, 30 tepes and 3 ancient settlements of that period.

During Kushan-Turk time (IV-VII вв.) the region was highly populated. One principal branches of the Great Silk Way passed there, it was the center of cultural ties of nomad breeders and settled agricultural tribes, as is evidenced by archeological finds next to the village of Zhany-Bazar. In the result of destructive invasion of Genghis Khan, change of kings and feudal wars of XIII – XVII centuries settled culture degraded. Several tribes of ethnic Kyrgyzs remained in the territory of Chatkal valley. Unlike Uzbeks and Tajiks they were breeding, hunting and leading a nomadic life down the ages.

Currently Chatkal valley is inhabited by ethnic Kyrgyzs. Generally local population is breeding animals: horses, cattle and small ruminants. Small areas are allocated for agriculture, where they grow grain crops and vegetables. Prior to the reserve establishment its territory was grazed by cattle the number of which reached 1 million. And after establishment of the reserve cattle grazing continued till 1994. About 2 – 3 thousands of small cattle remained for wintering in the area. Haying was carried out on the area exceeding 5 thousand ha, 700-800 tons of hay were cut in the areas of Barkyrak, Naiza-Сай, Ken-Bulun. Road network was constructed along the areas Barkyrak and Ken-Bulun for its transportation. Before 1979 in the territory of the nature reserve there was a village of Besh-Aral consisted of 22 houses, however, in the result of the nature reserve establishment population was transferred to other villages.

**History of establishment and development of the nature reserve**

For the purpose of Chatkal valley natural complexes preservation the Council of Ministers of Kyrgyz SSR adopted the Resolution under No. 140, dated 1979 'On organization of Besh-Aral reserve'. The reason for such resolution was motivated by the wide-spread cattle-grazing caused widespread disruption of mountain meadow alpine and subalpine communities, decrease in population of endemic and rare species of animals.

The initial area of the reserve was 116.7 thousand ha and consisted of areas around Chatkal valley, which were situated immediately near populated localities. It was impossible to achieve sufficient security arrangement with such configuration of the reserve. In 1994, according to the Government Decree of the Kyrgyz Republic No. 573, dated August 1, 1994 and Order of the State Committee of Kyrgyz Republic for Nature Protection No. 70

## Description

'On change of borders of Besh-Aral reserve and establishment of Chatkal forestry farm', dated August 4, 1994 and Order No. 17 dated August 10, 1994, after forest management works as of December 1, 2002 the area of Besh-Aral state nature reserve was 86,748 ha. By the Decree No. 291 dated 24.04.2006 the Government of the Kyrgyz Republic established Chandalash area of 25,270 ha. As a result, currently the total area of the nature reserve is 11,2018 ha.

**CSNR.**

One of the most ancient centers of human civilization is situated in the region as is evidenced by numerous archeological finds and monuments of history and culture. The territory forming the part of the reserve or immediately adjacent to it was inhabited by people since the Neolithic as is evidenced by petroglyphs found in the reserve and near the village of Nevich. Archeological studies showed that in III century before our era, the territory was occupied by large settlements. The remains of hills and fortresses referred to that period and to the times of Kushan empire (I – IV century before our era) were found in the territory. Since the 2nd century before our era and till 15-16 centuries active routes of the Great Silk Way connected East and West for many centuries passed through the territory. The history of separate settlements in the regions extends back over 2,000 years (kishlak Zarkent).

In Maidantal area of the reserve, in the natural boundary Karazau and in Bashkyzylsai area there are petroglyphs primarily depicting ibex. It is assumed that the earliest images refer to I – II millennium before our era.

At all times local population was engaged in agriculture, cattle breeding and hunting, only in VIII-XIII centuries ore mining was developed in the territory. In XIX – early XX century the impact of people on the territory was low. There were permanent settlements in the form of farm yards not numerous inhabitants of which were engaged in cattle breeding, to a lesser degree – husbandry on floodplain terraces. During many centuries the nomads elaborated the rules of stable pastures exploitation, which were mainly preserved in spite of the fact that ecosystems underwent certain changes. Generally, pastures were used in summer. After organization of collective farms the anthropogenic press in the form of overgrazing increased as previous nomad culture was destroyed and amount of cattle and methods of grazing become inconsistent with preservation of grass and forest ecosystems. By the moment of the reserve establishment separate ecosystems underwent strong degradation.

**History of establishment and development of the nature reserve**

In 1937 the employees of Tashkent University Zheleznyakov D.F. and Kolesnikov I.I. inspected the territory in the upper reaches of Kyzylsaya (Bashkyzylsaya) and drew up a substantiation for the reserve establishment. By the Resolution of the CM of Uzbek SSR, dated December 20, 1947 the reserve was established in the basins of rivers Bashkyzylsai and Shavassai. In 1953 the territory of Shavassai was withdrawn and the area of the reserve was equal to 11,018 ha. In 1960 the basin of left feeders of Akbulak river – Maidantal area was included into the reserve. The area of the reserve has been increased to 35,724 ha and remains so till present. In the same years the haying territory Kukchak with the area of 40 ha was given to the reserve (the allotment was registered in 1984). In 1997 by the Resolution of Tashkent regional department (khokimiyat) supervising the reserve, 115 ha of the reserve (Bashkyzylsai area, right bank of the river Shavazikhursai) was given to the local community of the village Nevich for cattle grazing. According to the documents the allocated area remained under the supervision of the reserve.

The areas of the reserve are situated in Parkent and Bostanlyk regions of Tashkent province; office (administration) – in the city of Parkent. Mutual arrangement can be described by the triangle with sides: 20 – 40 (field base – cordon of Maidantal area) – 80 km.

Ugam-Chatkal State Natural Park (1990) with the area of 574,590 ha was established in 1990, at present the reserve is in the territory of the park. In separate periods (70-80 years of last century) the reserve carried out protective measures on adjacent to its borders areas (basins of rivers Big and Small Maidantalsai, Kattasai) without official revision of the territory. After Ugam-Chatkal reserve establishment staff of inspectors designated for protection was aimed to strengthening of control in the reserve. The territory under the jurisdiction of Ugam-Chatkal national park is considered to be protected zone for the areas of the reserve; the national park fully exercises a function of the protected zone though it has not been officially separated and specifically designated. The lands adjacent to the national park cover 70-90% of the reserve's areas along the perimeter.

# 3

## JUSTIFICATION FOR INSCRIPTION



### 3.1.A BRIEF SYNTHESIS

Western Tien-Shan nominated serial property includes 13 component parts of 7 specially protected areas in Kazakhstan, Kyrgyzstan and Uzbekistan, with total size of 528,177.6 ha. Tien-Shan is included on the list of biologically outstanding and well-preserved Global Ecoregions (WWF Global 200 List of Ecoregions), and Western Tien-Shan is its very specific and exceptionally important part. It is characterized by exceptional diversity and beauty of a mosaic of landscapes, a unique combination of different types of ecosystems, rich flora and fauna that represent a considerable proportion of endemic species and communities, as well as a large number of rare and threatened species.

The nominated area reflects both the significant geological processes in the development of landforms and outstanding geomorphological and physiographic features of the relief. All the major landforms of Western Tien-Shan are represented here. A relatively small area combines a variety of geological structures that reflect successive stages of evolution of the earth's crust. Solidified sludge perfectly preserved footprints of plants and animals that lived in the pool and on the shores of the Jurassic seas around 150 million years ago. Prints of more than 60 species of plants, 100 species of insects and mollusks, crustaceans, turtles, ganoid fish, remains of dinosaurs were found there.

Western Tien-Shan has an exceptional value as a center of origin of cultivated plants. There are no full analogues found among other World Heritage sites located within the Central Asian focus of plant origin and within adjacent territories. Western Tien-Shan is home to approximately 10 wild species related to domesticated fruit plants, including wild apples *Malus Siversii* and *Malus Niedzwetzkyana*, the apricot *Armeniaca vulgaris*, *Pistacea vera*, common grape vine (*Vitis vinifera*), cherry plum *Prunus sogdiana*, pear *Purus regelii*, the Persian walnut *Juglans regia* and hawthorn *Crataegus pontica*.

The Western Tien-Shan is known to support an outstanding diversity of plant and animal species with a high level of endemism and many species of global conservation importance. The property supports the number of species listed as globally threatened by IUCN – 14 species of flora and 18 of fauna.

### 3.1.B CRITERIA UNDER WHICH INSCRIPTION IS PROPOSED (AND JUSTIFICATION FOR INSCRIPTION UNDER THESE CRITERIA)

#### Criteria viii

The nominated area reflects both the significant geological processes in the development of landforms and outstanding geomorphological and physiographic features of the relief. All the major landforms of Western Tien-Shan are represented here. A relatively small area combines a variety of geological structures that reflect successive stages of evolution of the earth's crust. Here can be found sediments dated from the lower Proterozoic till modern era: the Cambrian, Ordovician, Devonian and Carboniferous systems, in which traces of life of ancient times are found.

From the perspective of «traces of ancient life» Karatau paleontological field of Aksu Jabagly Reserve, which is considered one of the most interesting in the world, has an outstanding universal value. Solidified sludge perfectly preserved footprints of plants and animals that lived in the pool and on the shores of the Jurassic seas around 150 million years ago. Prints of more than 60 species of plants, 100 species of insects and mollusks, crustaceans, turtles, ganoid fish were found there. Found numerous remains of ancient dinosaurs. There is no other place in the

world with such a rich and interesting burial of Mesozoic insects.

Intense tectonic processes are going on in the nominated area even in the modern era: the earthquakes, that reached 7-9 on the Richter scale, indicate the continuing seismic activity. Major tectonic faults happen across the region, the most significant of them: along the centerline of Chatkal and Talas ridges.

### Criteria x

In addition to the diversity of plant communities, and even allowing for the variation in research activity between the sites, the Western Tien-Shan is known to support an outstanding diversity of plant and animal species with a high level of endemism and many species of global conservation importance. Within the major taxonomic groups, this diversity is summarized in table 6.

The Western Tien-Shan is internationally important because of the number of species the property supports listed as globally threatened by IUCN – 7 species of flora and 17 of fauna. These include several wild relatives of today's commercial fruit trees such as wild apricot *Armeniaca vulgaris* (EN), Siever's apple *Malus sieversii* (VU) and walnut *Juglans regia* (NT). Among the fauna, of particular note are saker falcon *Falco cherrug* (EN), Egyptian vulture *Neophron percnopterus* (EN), cinereous vulture *Aegypius monachus* (NT) and European roller *Coracias garrulus* (NT) which are widespread breeding species, and Eastern imperial eagle *Aquila heliaca* (VU) and pallid harrier *Circus macrourus* (NT) occur regularly on migration or in winter. The charismatic snow leopard *Uncia uncia* (EN) occurs at all of the sites apart from Karatau though whether there is interchange of animals between sites is unknown. The Western Tien-Shan is also renowned for its wild sheep with important populations of argali *Ovis ammon* at Karatau, Aksu-Jabagly, Sairam-Ugam and Besh-Aral. Two sub-species occur, *nigrimontana* at Karatau (80% of the global population) and *karaleni* at the other sites. Other important globally threatened species include dhole *Cuon alpinus* (EN) at Aksu-Jabagly and possibly Besh-Aral; Menzbier's marmot *Marmota menzbieri* (VU) at Aksu-Jabagly, Sairam-Ugam, Besh-Aral and Chatkal; European marbled polecat *Vormela peregusna* (VU) at Besh-Aral and Chatkal. Besh-Aral also holds the western Tien-Shan endemic Tien Shan ground squirrel *Spermophilus relictus*. Although incompletely studies, levels of endemism among invertebrates is also likely to be high with, for example, Aksu-Jabagly and Sairam-Ugam alone holding six species of weevil; two beetles; two orthoptera; seven bugs and a segmented worm.

Up to 2008, 540 species of higher and lower plant had been recorded from Karatau including 65 of the 76 species endemic to the Karatau ridge. The endemic and rare species are mostly of relict character and include representatives of Eocene subtropical flora, of Oligocene mesophilic-wood flora and ancient Mediterranean Miocene flora. Five species are globally threatened – wild apricot (EN), Shrenk's tavolgotsvet *Spiraeanthus schrenkianus* (EN), Siever's apple (VU), Sogdian ash *Fraxinus sogdiana* (NT) and *Cotoneaster karatavicus* (DD).

At Aksu-Jabagly and Sayram-Ugam State Nature Reserves, 1,700 species of plant have been recorded, this represents 50% of the flora of the entire Western Tien-Shan and 25% of the mountain-Central Asian province flora. Approximately 10% of the flora is endemic, at either the site or regional level, for example the reserves support 19 of 64 genera endemic to montane Central Asian, including two (*Pseuderemostachys*, *Rhaphidophyton*) from 10 monotypic endemic genera of Kazakhstan; 34 species endemic to the Kyrgyz district; 23 of the Ugam-Chatkal and 26 of the Karatav area. Nine species listed as globally threatened by IUCN occur – *Crataegus knorringiana* (CR); *Lonicera karataviensis* (CR); wild apricot (EN); *Betula talassica* (EN); Shrenk's tavolgotsvet (EN); Sogdian ash (NT); *Cotoneaster karatavicus* (DD) and *Crataegus ambigua* (DD). Thirty species are included in the Red Book of Kazakhstan (1981).

The flora of the Sary-Chelek nature reserve is representative of the flora of Western Tien-Shan, and 1,788 species of higher plants (44% of plant species of the Kyrgyzstan) have been recorded. Four species listed as globally threatened by IUCN occur – *Crataegus knorringiana* (CR); *Pyrus korshinskyi* (CR); Siever's apple (VU) and walnut *Juglans* (NT). Thirty species are listed in the Red Book of the Kyrgyzstan and more than 30 species of plants are used for medicinal purposes. The diverse fungal flora incorporates elements of ancient Mediterranean flora and tree flora of North America and Eurasia.

The flora of Besh-Aral State Nature Reserve has been poorly studied with only 388 species recorded, though it is estimated that the actual number of species present is at least 1,500. Sixty-five species are endemic to the Western Tien-Shan as a whole and approximately 80% are endemic to Central Asia. Five species are listed as globally threatened by IUCN - *Crataegus knorringiana* (CR); *Pyrus korshinskyi* (CR); Siever's apple (VU) and walnut (NT).

A total of 1,136 species and sub-species of plant have been recorded at Chatkal State Biosphere Nature Reserve, approximately 25 of which are endemic to the western part of the Chatkal ridge. These include three species listed as globally threatened by IUCN - *Betula tianschanica* (EN); Siever's apple (VU) and walnut (NT); and 37 species included in the Red Data Book of Uzbekistan.



Kyzyl'nura peak – extinct volcano. Yesipov A.V.

Table 6. Species diversity, endemism and global conservation importance in the Western Tien-Shan

Site	Taxonomic group																		
	Algae	Fungi	Mosses, liverworts and lichens	Ferns	Horsetails	Higher plants	No. endemic species/ subspecies	No. globally threatened species	Invertebrates	No. endemic species/ subspecies	No. globally threatened species	Fish	No. endemic species/ subspecies	Reptiles and amphibians	No. globally threatened species	Birds	No. globally threatened species	Mammals	No. globally threatened species
Karatau	2	4	75	5	4	459	65	5	182			2		11	1	118	8	20	1
Aksu-Jabagly and Sairam- Ugam	63	221	63			1300	93+	7	>5000	20+	1	2		13		240	8	54	4
Sary-Chelek		345	67			1788	9	3	2226	22		4	1	9		157	4	43	1
Besh-Aral						388	65+	3				4		8		150	2	36	3
Padysha-Ata								3				2				51	2	31	1
Chatkal						1136	25	3				6		16		184	2	36	3

### 3.1.C STATEMENT OF INTEGRITY

During the creation of protected areas (national reserves and national park), which are component parts of the nominated serial property «Western Tien-Shan», principles of integrity have been compiled. The protected areas included in the nominated serial property, are key parts of the natural complex «Western Tien-Shan», the main components of which are inextricably linked by common origin, historical fate, and dynamics of natural development and include the elements necessary to show its outstanding universal value.

Dimensions (from 15,846 to 149,053 ha) of component parts of the nominated property are sufficiently accurate in order to jointly maintain functioning of natural systems of Western Tien-Shan and fully represent the properties and processes that reflect their significance. The presence of buffer zones in the majority of SPA, comprised in the nominated territory (from 14,714 to 27,000 ha), gives her the additional guarantees of integrity.

Different forms of human activity (grazing, logging, haying, etc.), that existed in Western Tien-Shan prior to the establishment of the nominated SPA, had limited impact on the ecosystem, without causing major disturbances. Biophysical processes and components of natural landscapes of the nominated property were not violated. Limited grazing and controlled tourism are still the only forms of permitted economic use in the designated areas.

### 3.1 D. STATEMENT OF AUTHENTICITY (FOR NOMINATIONS MADE UNDER CRITERIA (I) TO (VI))

Not applicable

### 3.1 E. PROTECTION AND MANAGEMENT REQUIREMENTS

All component parts of the nominated serial property are state protected natural areas (SPA) of national importance and they are protected under national legislations of Kazakhstan, Kyrgyzstan and Uzbekistan. Reserves have status of strictly protected natural areas, where any use of animals and plants, and its economic use is prohibited. Also, a very limited access of visitors, that are to be accompanied by a security service workers, on specially designated areas is allowed. SUSNNP has sites with the same security control as in reserves and areas, accessible for visitors and for strictly limited use of nature. All areas of the nominated site are properties of the government, each of them have its own administration and staff and they are managed by an authorised state executive bodies of each country. The administration of SPAs and the security services are directly responsible for protecting natural and cultural values of the protected areas. The main source of financing for managing of all parts of the property are the state budgets of the countries.

The main pressures to the nominated property are poaching, cattle grazing, illegal logging, haying (illegal and legal), illegal harvesting of flowers etc. and unorganized tourism. There are some evidences of influence of climate change but they are not so clear as typical 5-10 years whether cycles. The typical kinds of natural disasters in the Western Tien-Shan are rock falls, landslides, mudslides, avalanches; droughts lead to fires in dry years. Territory of Western Tien-Shan is located in a seismic zone, in some parts with seismicity of 9 points. In general all component parts of the nominated property are surrounded by highly populated areas and as result they have possibility for good number of visitors from one side and threat from uncontrolled visitation from other side.

In all SPAs, these threats and pressures are taken into consideration in management plans; the staff is regularly trained for its control, prevention and for adequate reaction in case of disasters. Every of designated protected areas have its own management plan to be revised every 5 years.

The property as whole will be managed by Steering Committee (consisting of representatives of the protected areas and of responsible governmental bodies) with the main role for coordination of conservation and management efforts, exchange of experience and information. The Committee is planned for establishment after inclusion of Western Tien-Shan in World Heritage List and it will work as intergovernmental group with scheduled meetings (at least once a year) and teleconferences.

## 3.2. COMPARATIVE ANALYSIS (INCLUDING STATE OF CONSERVATION OF SIMILAR PROPERTIES)

### I. COMPARISON WITH OTHER WORLD HERITAGE SITES

A comprehensive comparative evaluation has been made looking at any possible equivalents in order to make a case for outstanding universal value of Western Tien-Shan. The evaluation focuses on mountain World Heritage sites, some of which are located in Central Asia. The evaluation also reviews the sites with paleontological values.

#### CRITERION VIII

**“The nominated area reflects both the significant geological processes in the development of landforms and outstanding geomorphological and physiographic features of the relief.”**

#### Paleontological Value of the Site

Among all Western Tien-Shan clusters, Aksu-Jabagly State Nature Reserve stands out for its paleontological values. Two paleontological areas Auliye and Karabastau of the total area of 225 hectares are separately located to the north-west of the mainland in the spurs of the Karatau ridge. These areas are best known for the precious traces of long-extinct species belonging to the Late Jurassic epoch (145-150 million years ago) which inhabited this long-extinct lake.

The first unique deposit of traces of insects, plants, fishes, reptiles, etc. was discovered in Karatau mountains in 1921 in carbon-bearing silt, the so-called “fishy” or “paper” slates. Director of Shymkent regional museum V.P. Trizna set up a protected area Auliye at this site in 1924. Eventually, Karatau natural reserve was set up in this area (48.3 hectares). The research conducted by Soviet scientists found many prints of dozens species of plants and insects, and fossil remains of mollusks, crustaceans, turtles, ganoid fish, Rhamphorhynchus and carcasses of Allosaurus. According to most paleontologists, the fragments of ancient organisms discovered here have an outstanding universal value and invaluable importance for world’s paleontology. The primary interest is focused on abundant fossil fish remains found in Jurassic Karatau lake Auliye. Prints of 6 species of ancient fish stand out for their excellent state of preservation and the prevalence of Pteroniscus (up to 70%), Coccolepis and Pholidophorus. This ichthyofauna is viewed as relict because it is well-known in other places from the Early Triassic, however, these fish species became extinct all over and preserved only in Karatau. Unique prints of unknown to science new genera and species of Jurassic vertebrata were discovered in Karatau slate and described, including flying reptiles of the order Pterosauria - *Batrachognathus volans* (Riabinin, 1948), and *Sordus pilosus* (Sharov, 1971); water turtle *Yaksartemys longicaudata* (Riabinin, 1948); tailed amphibian *Karaurus sharovi* (Ivachnenko, 1978); crocodile *Karatausuchus sharovi* (Efimov, 1976), and discoveries related to the Late Cretaceous, such as remains of hadrosaurus *Jaxartosaurus aralensis* (Riabinin, 1939).

Moreover, researchers discovered multiple prints of Late Jurassic plants in the above mentioned “fishy slates” of Aksu-Jabagly, about 70 plant species altogether (a scrupulous research of discovered spores and pollen helped to date these fragments as belonging to the Late Jurassic epoch.) The Late Jurassic flora of Karatau was rich and diverse: ferns, Caytoniales, Bennettitales and cycads with thick leather-like leaves, and multiple conifers with hard scaled or acerose leaves. Typical xerophytes made up 90% of this flora.

The nature reserve boasts abundant fossil remains dated back to a more ancient Paleozoic epoch. Thus, slides in the northern part of the nature reserve abound in remains of ancient invertebrates, such as shellfish, corals and bryozoans; and well-preserved remains of trilobites were discovered in Kazanchukur mountain area.

It is reasonable to compare the above mentioned discoveries with the sites that have been already inscribed on the World Heritage List. How many are they?

The answer is provided in GEOLOGICAL WORLD HERITAGE: A GLOBAL FRAMEWORK, a report released by IUCN and WCPA in September 2005 (Table 7).

**Table 7. The representation of geological time periods by fossil sites within the World Heritage List (at 2005) (Dingwall et al., 2005)**

Geological Period	Key Biological Event	World Heritage Site
Quaternary	Humans appear Ice Age	Naracoorte (Australia)
Pliocene		
Miocene		Riversleigh (Australia)
Oligocene		
Eocene		Messel Pit (Germany) Wadi Al-Hitan (Egypt)
Paleocene	First primates	
Cretaceous	Extinction of dinosaurs Origin of flowering plants	Dinosaur Park (Canada) 75m years
Jurassic	Age of dinosaurs First birds	Dorset/East Devon (U.K)
Triassic	First mammals/dinosaurs	Dorset/East Devon (U.K.) Ischigualasto-Talampaya (Argentina) Monte San Giorgio, (Switzerland)
Permian		Grand Canyon (USA)
Carboniferous	First reptiles	Mammoth Cave (USA)
Devonian	First amphibians/forests	Miguasha (Canada)
Silurian	First land plants	
Ordovician	First fishes/corals	Gros Morne (Canada)
Cambrian	First trilobites	Burgess Shale (Canada)
Precambrian	First algae/bacteria	

The report identifies 12 sites with unique paleontological features, namely:

**Riversleigh and Naracoorte** (Australia), **Messel** (Germany), **Wadi Al-Hitan** (Egypt), **Dinosaur Provincial Park, Miguasha National Park, Canadian Rocky Mountain Parks** (Burgess Shale), and **Gros Morne** (Canada), **Mammoth Cave and Grand Canyon** (US), **Ischigualasto-Talampaya** (Argentina), **Monte San Giorgio** (Italy and Switzerland), and **Dorset and East Devon coast** (Great Britain). They have all been inscribed on the List by Criterion viii (alone or in combination with other inscription criteria).

Several more locations valuable in terms of Criterion viii were designated as a World Heritage Site after 2005; although only three of them proved to be most valuable in terms of paleontology: **Joggins Fossil Cliffs** (Canada) – discoveries of the Carbonic period; Lena Pillars (Russia) and **Chengjiang fossil site**, China, known for the Cambrian Period discoveries.

Currently, there are 15 sites which have achieved World Natural Heritage status for their outstanding value in terms of paleontology. The unique paleontological discoveries specifically became in due time the main argument (one of the main arguments) for inscription of these sites on the World Heritage List. Notably, Northern America, i.e. Canada (4 sites) and the USA (2 sites), account for 6 of 15 "paleo-nominations".

Of all above mentioned sites, only one, the Dorset and East Devon Coast, Great Britain, covers the Jurassic epoch, as well as recommended Western Tien-Shan. It is a rocky coastline area in southern England. Cliff exposures display an almost continuous sequence of the Mesozoic epoch of the Earth's history spanning approximately 185 million years, including the Jurassic period. The outstanding fossils discovered here have been studied by paleontologists for over 300 years. They include fossil remains of ancient plants, vertebrates and invertebrates. The

site was inscribed on the List in 2001 by Criterion viii.

A comprehensive comparative evaluation, however, shows fundamental differences between discoveries in Aksu-Jabagly and on the Dorset and East Devon Coast along with some similarities and comparable value in terms of global paleontology.

The Late Jurassic fauna of Aksu-Jabagly includes over 1,200 insect species related to 500 genera, 150 families and 19 orders. Of them, 85% genera and 60% species are recognized as endemic, i.e. specific only of Karatau insect fauna. It ranks among the world's richest "ground disposals" of Mesozoic insects with exceptionally well-preserved prints which reveal formation of ancient insects as exactly as modern ones. Researchers have made unique collections in Karatau comprising over 18,000 samples of insect remains.

As regards vertebrate collection, it covers mostly Late Jurassic unique representatives of genera and species of fish, reptiles, crocodiles, turtles, and pterosaurs completely unknown to the Dorset and East Devon Coast. The British site, in turn, contains such discoveries as dinosaur's trace, remains of flying and sea reptiles of the Early and Middle Jurassic period and well-preserved fragments of the Late Jurassic fossil forest.

This implies that the Late Jurassic flora and fauna of Aksu-Jabagly has no equivalents, it is unique and unparalleled. Paleontological discoveries in Aksu-Jabagly are a good complement to the West European locations containing remains of the Mesozoic flora and fauna, in particular, the Jurassic epoch, and naturally fit into the general geochronological records of the Mesozoic.

## CRITERION X

**"The site contains the most important and significant natural habitats for in-situ conservation of biological diversity, including those containing threatened species of outstanding universal value from the point of view of science or conservation."**

### 1. Species Wealth

Western Tien-Shan along with representing its 13 component parts of potential World Natural Heritage site are marked by their high degree of biodiversity which involves plants and animals, both vertebrate and invertebrate. Local flora and fauna stand out for both diversity of species and high degree of endemism, presence of rare and threatened species, including those put on the IUCN Red List of Threatened Species by EN and VU categories.

This is evidenced by the fact that Tien-Shan is included on the list of biologically outstanding and well-preserved Global Ecoregions (WWF Global 200 List of Ecoregions) as Ecoregion 111 (Middle Asian Montane Steppe and Woodlands). Tien-Shan also ranks among the high biodiversity districts as Mountains of Central Asia defined by the Conservation International's 34 Global Biodiversity Hotspots.

The comparison results of Western Tien-Shan with other World Heritage sites located in Central Asia are shown in Table 8.

**Table 8.**

Key indicators of biodiversity:		Higher plants, number of species	including globally threatened species	Mammals, number of species	including globally threatened species	Birds, number of species	including globally threatened species
Western Tien-Shan viii / x	Karatau	459	9	20	4	118	11
	Aksu-Jabagly and Sairam-Ugam	1300		54		240	
	Sary-Chelek	1788		43		157	
	Besh-Aral	388		36		150	
	Padysha-Ata	Н.д.		31		51	
	Chatkal	1136		36		184	
Xinjiang Tien-Shan, China vii / ix		2 622	18	102	several dozens	370	several dozens
The Pamir Mountains, Tajikistan vii / viii		over 2,000	not available	33	2	over 160	not available.
Golden Mountains of Altai, Russia X		over 2,000	not available	about 70	2	about 300	not available
Ubsunur Hollow, Russia-Mongolia ix / x		over 1,000	not available	about 80	4	about 350	12

According to key biodiversity indicators, Western Tien-Shan ranges with other sites of the same geographic region which have been already inscribed on the World Natural Heritage List. This refers to both total number of species and abundance of species acknowledged as rare and endangered species. Most studied indicators of the above sites prove to be approximately the same.

## 2. Globally Endangered Species included in the IUCN International Red Book

The following four mammal species inscribed on the IUCN International Red List are found in Western Tien-Shan:

2.1. The snow leopard (*Uncia uncia*) is listed on the IUCN Red List of Threatened Species as globally Endangered (EN) as its population is very small and continuously reducing. The snow leopard inhabits some other regional World Natural Heritage sites, such as the southern part of Russia's Western Siberia (Ubsunur Hollow and Golden Mountains of Altai), the Pamir Mountains (Tajik Nature Reserve) and the Himalayas (Sagarm th National Park and Nanda Devi National Park).

2.2. The dhole (*Cuon alpinus*) ranks among the least populated species of large predators of Central Asia. It is included on the IUCN Red List of Threatened Species as globally Endangered (EN), while its population is continuously reducing. Of all other World Heritage sites located in Central Asia the dhole is found only in the mountains surrounding Ubsunur Hollow and the Pamir Mountains.

2.3. The Menzbier's Marmot (*Marmota menzbieri*) is specifically endemic to Western Tien-Shan and is found in most clusters of this site. It is not found in the eastern part of Tien-Shan (Xinjiang Tien-Shan) or Altai, Pamir, Himalayas and other mountain ranges of Central Asia. It is put on the IUCN Red List of Threatened Species as

Vulnerable (VU).

2.4. The argali (*Ovis ammon*) is one of the most well-known species inhabiting Tien-Shan. This mountain sheep is also found at other World Heritage sites in Central Asia, but only two Western Tien-Shan clusters are home to two of its specific subspecies, *Ovis ammon nigrimontana*, and *Ovis ammon karelini*. The argali is inscribed on the IUCN Red List as NT – Near Threatened.

Some comparison results of Western Tien-Shan with other World Heritage sites of Central Asia are shown in Table 9.

**Table 9.**

World Heritage sites with criterions	Globally threatened species and their conservation status			
	The snow leopard ( <i>Uncia uncia</i> ), EN	The dhole ( <i>Cuon alpinus</i> ), EN	The Menzbier's Marmot ( <i>Marmota menzbieri</i> ), VU	The argali ( <i>Ovis ammon</i> ), NT
Western Tien-Shan, viii / x	found	found	found (endemic to Western Tien-Shan)	found (two local subspecies are known)
Xinjiang Tien-Shan, China, vii / ix	found	not found	not found	found
The Pamir Mountains, Tajikistan, vii / viii	found	found	not found	found
Golden Mountains of Altai, Russia, x	found	not found	not found	found
Ubsunur Hollow, Russia-Mongolia, ix / x	found	found	not found	found

Thus, it appears that 3 of 4 most rare mammals found at Western Tien-Shan (the snow leopard, the dhole and the argali) inhabit other World Heritage sites located within the same geographical region.

This, however, does not downgrade the value of Western Tien-Shan nature reserves in terms addressed above. The species which range is limited by the mountains and uplands of Central Asia and adjacent regions increasingly need protection as their population is continuously going down along with their convenient habitat area and deteriorating food reserves.

It must be admitted that conservation of Tien-Shan uplands as a vital element of a comparatively small habitat of these emblematic and symbolic regional species is an urgent challenge. Mountain reserves of Kazakhstan, Uzbekistan and Kirgizia offer another chance at successful survival to all above mentioned species, the snow leopard, the dhole and the argali. This site is of paramount importance for conservation of the endemic Menzbier's marmot found only in Western Tien-Shan.

### 3. Western Tien-Shan as a center of origin of cultivated plants

The world has 12 centers of origin of cultivated plants. One of them, the Central Asian center, includes north-western India, Punjab, northern Pakistan, Afghanistan, Tajikistan, Uzbekistan and Western Tien-Shan.

The review of the sites inscribed on the World Heritage List, however, shows that no such properties have been identified in north-western India, northern Pakistan or Afghanistan. At the same time, Western Tien-Shan proposed for nomination is not the only site located within the Central Asian center. This geographic range (see below) also includes the Pamir National Park which was accepted as World Heritage in 2013.

Western Tien-Shan is home to approximately 10 wild species related to domesticated fruit plants, including wild

apples *Malus Siversii* and *Malus Niedzwetzkyana*, the apricot *Armeniaca vulgaris*, *Pistacea vera*, common grape vine (*Vitis vinifera*), cherry plum *Prunus sogdiana*, pear *Purus regelii*, the Persian walnut *Juglans regia* and hawthorn *Crataegus pontica*.

It is noteworthy that in addition to specific tree species, Western Tien-Shan includes the whole wild fruit forest areas which may be quite extensive.

Of particular value are apple forests formed by the relict endemic *Malus siversii*. They cover an extensive altitude range of Western Tien-Shan, mostly low and middle altitudes, such as Ugam ridge, Boroldai, Kokbulak clove in Karatau, Mashat and Talas Alatau. This indigenous species is an acknowledged grandparent of most existing varieties of apple.

*Malus siversii* is found in western China, Uzbekistan, Kirgizia and Tajikistan, but it forms forest stands structured as a typical forest only in Kazakhstan; in all other places it ranges in fragments.

The most monolithic wild fruit areas of Western Tien-Shan (wild apples and nards) are under protection in Aksu-Jabagly State Nature Reserve, Sairam-Ugam State National Nature Park and Boroldaitau area of Syrdarya-Turkestan Regional Nature Park (the latter is not included in the nomination discussed above.) A small number of Siverse's apple trees is conserved in mountain gorges within Karatau and Chatkal reserves.

As mentioned above, the Pamir Mountains, recently accepted as a World Heritage site in Tajikistan, formally falls within the borders of Central Asian center of origin of cultivated plants. It must be kept in mind, however, that the Pamir Mountains is a high-mountain area with a very high degree of glacierization and much more severe arid climate characterized with its specific flora. Thus, the role of these high-mountain ice areas as a focus of origin of cultivated plants compared with Western Tien-Shan is not so important (the western Pamir is not at all rich with plant ancestors, while these species are more common in its eastern part.)

Such plants as pistachio and almond are known to be common for Pamir and Western Tien-Shan. Although, the above species range is located at the far-northern border of their habitat in Western Tien-Shan (in particular, growing within Aksu-Jabagly Nature Reserve and Sairam-Ugam National Park) with their optimum habitat adjacent to the Pamir Mountains.

Despite this fact, population genetics of pistachio and almond from the northern offshoot of Western Tien-Shan has a special value as these plants have developed evolutionary tolerance to the temperate climate and have good prospects in terms of their cultivation in the temperate zones, such as southern deserts of Central Asia.

Xinjiang Tien-Shan, its closest geographical neighbor, is not included in the Central Asian focus according to the above world plan. It is worth mentioning, however, that wild fruit forest stands are found in one of the clusters of this Chinese site, namely the Kalajun reserve. The species composition of these stands is very much different due to a strong contrast in flora of Western Tien-Shan and Eastern Tien-Shan.

Of all wild fruit plants typical of Western Tien-Shan, only Siverse's apple tree and apricot tree can be found in the Chinese part of Tien-Shan, but they are almost extinct there with very small and separated populations. Besides, the above species have no pure genetics as large-scale fruit farming causes universal genetic erosion of natural populations resulting from including cultivated genes. This is the reason why the trees carry no genes of their wild ancestors.

Summing up the above, Western Tien-Shan has an exceptional value as a center of origin of cultivated plants. As far as we know, this rationale was only few times quoted as a ground for inscribing other natural territories on the UNESCO List. There are no full analogues found among other World Heritage sites located within the Central Asian focus of plant origin and within adjacent territories. The closest Xinjiang Tien-Shan site is also very much different in this respect.

## II. WESTERN TIEN-SHAN AND OTHER WORLD HERITAGE SITES OF CENTRAL ASIA HIGHLANDS

Central Asia, a giant underdeveloped region with a concentration of world's highest mountain ranges and systems, including the Sayan Mountains, the Altai Mountains, Tien-Shan, the Pamir Mountains, the Karakoram, the Hindu Kush, the Kunlun Mountains, the Himalayas and the Tibetan Plateau, boasts 8 World Heritage sites, namely, Lake Baikal, Ubsunur Hollow, Golden Mountains of Altai (all located in Russia); Nanda Devi National Park, India;

Sagarm th National Park, Nepal; Three Parallel Rivers and Xinjiang Tien-Shan, both located in China; and the Pamir Mountains, Tajikistan.

Each of the above sites has its own unique natural features which make them fundamentally different from discussed Western Tien-Shan. For example, the highest mountain sites – in the Himalayas, Tibet, Altai and Pamir – are distinguished by their unprecedented heights up to 7 and 8 thousand meters and a high degree of glaciation which is the reason for vital differences in the altitudinal belt structure, vegetation cover and wildlife.

This is primarily the case with Sagarm th National Park where the world-famous Everest is located. Three Parallel Rivers contain highlands divided by the deepest valleys of several large rivers. Such sites as Lake Baikal and Ubsunur Hollow represent quite different landscapes, including both high mountain ranges and huge lakes with their coastland, such as extensive swamped areas, steppes and forest steppes.

Only one of the above sites, Xinjiang Tien-Shan, located in the closest proximity, is worth special attention. This site covers the eastern areas of Tien-Shan.

Xinjiang Tien-Shan is the nearest geographical “neighbor” of the discussed cross-border site within China’s frontier zone with Kirgizia and Uzbekistan in Xinjiang Uyghur Autonomous Region. Xinjiang Tien-Shan comprises 4 clusters (national parks and reserves) which together represent the most valuable, interesting and picturesque areas of Eastern Tien-Shan. The site is nominated by criteria vii and ix.

Brief summary of the site:

Xinjiang Tianshan comprises four components—Tomur, Kalajun-Kuerdening, Bayinbuluke and Bogda— that total 606,833 hectares. Xinjiang Tianshan presents unique physical geographic features and scenically beautiful areas including spectacular snow and snowy mountains glacier-capped peaks, undisturbed forests and meadows, clear rivers and lakes and red bed canyons. These landscapes contrast with the vast adjacent desert landscapes, creating a striking visual contrast between hot and cold environments, dry and wet, desolate and luxuriant. The landforms and ecosystems of the site have been preserved since the Pliocene epoch and present an outstanding example of ongoing biological and ecological evolutionary processes. The site also extends into the Taklimakan Desert, one of the world’s largest and highest deserts, known for its large dune forms and great dust storms. Xinjiang Tianshan is moreover an important habitat for endemic and relic flora species, some rare and endangered.

Tien-Shan is divided by the borders of several Central Asian states and ranks among the largest mountain systems of Eurasia which extends for about 2,500 km from east to west. Being surrounded by several large deserts, it is a kind of huge isolated “mountain island” in a sharp contrast with its natural surroundings. Both eastern and western Tien-Shan clearly represent critical environmental and evolution processes and are home to many rare and endangered species and a conservation area for unique natural landscapes.

Some natural differences between Western Tien-Shan sites and Xinjiang Tien-Shan are shown in Table 10 below.

	Climate	Relief	Mountain glaciation	Paleontology	Cultivated plants
Western Tien-Shan (Kazakhstan, Kyrgyzstan and Uzbekistan) viii x	Western Tien-Shan is the warmest and the most damp part of the mountain site	Within clusters up to 4,503 meters (Aflatun peak); elevation difference about 4,000 meters	Separate small-sized mountain glaciers	Several world-class discoveries (Aksu-Jabagly Nature Reserve)	Wild fruit trees are found in most areas of the World Heritage site (Aksu-Jabagly Nature Reserve; Sairam-Ugam State National Nature Park and Chatkal reserve)
Xinjiang Tien-Shan (China) vii ix	Eastern Tien-Shan is distinguished by cold and dry climate.	Within clusters up to 7,443 meters (Tomur peak); elevation difference up to 7,000 meters	Tomur area is one of the three largest centers of mountain glaciation in Central Asia	Not found	Wild fruit trees are found in one World Heritage area (Kalajun-Kuerdening)

Along with certain similarities, the environment of Western and Eastern Tien-Shan has some critical differences which are easily traced in climate, geology, relief, glacial conditions, represented altitudinal belts and, consequently, biota. It could not have been otherwise considering a huge length of this mountain system. The differences in the "opposite" parts of the system are only natural. All the more so, because the distance between the nearest clusters of both sites is about 600-700 kilometers (between Tomur region located on the border of China and Kirgizia and Sary-Chelek Nature Reserve in Western Kyrgyzstan.)

a) Brief synthesis

## GENERAL CONCLUSION

Western Tien-Shan has specific features which distinguish it from other mountain World Heritage sites and clearly identify its potential place on the UNESCO World Heritage List. These features are revealed in the following aspects:

- 1) Unique paleontological discoveries, including fossil remains of Jurassic plants and animals, were found in one cluster of the site. The remains stand out both for their variety and excellent preservation. Of all other sites inscribed on the UNESCO List, only one represents the same epoch of the Earth's history, i.e. the Dorset and East Devon Coast in Southern England. The discoveries found on two above sites naturally complement each other and make it possible to describe Jurassic biota in more detail and fairness.
- 2) The area boasts high inherent biodiversity which is primarily revealed in abundant flora and fauna represented in 13 component parts, high level of their endemism and a great number of rare species included on the IUCN Red List. This ranks the discussed site together with its immediate competitors, such as the Pamir Mountains, Tajikistan; Golden Mountains of Altai, Russia; Ubsunur Hollow, Russia-Mongolia and Xinjiang Tien-Shan, China (see Table 8). Many of the main (symbolic or indicative) threatened species inhabiting the mountain areas of Central Asia are given extra protection in Western Tien-Shan reserves and parks (see Table 9).
- 3) Western Tien-Shan has a critical importance as one of the global focuses of origin of cultivated plants. None of World Heritage sites located in Central Asia can boast the same value.
- 4) The comparison with its nearest geographical "neighbor" Xinjiang Tien-Shan which 4 clusters cover the eastern part of the mountain site revealed fundamental differences. The differences are related to climate, relief, biotas and a set of other key parameters (see Table 10). Given that the East Tien-Shan site was nominated by criteria vii and ix, it seems reasonable to nominate Western Tien-Shan by criteria viii and x.

Thus, regardless of some similarities (by specific parameters) with other mountain sites of Central Asia which have been accepted as World Heritage, Western Tien-Shan may be acknowledged as a unique and unparalleled natural site well-deserving to be inscribed on the World Heritage List. The comparative evaluation shows that that it would be reasonable to nominate this site by at least two criteria, viii and x.

## 3.3. PROPOSED STATEMENT OF OUTSTANDING UNIVERSAL VALUE

a) Brief synthesis

a) Brief synthesis

The Western Tien-Shan trans-boundary serial nomination, lying within the Republics of Kazakhstan, Kyrgyzstan and Uzbekistan, consists of 13 component parts covering a combined area of 528,177 ha. Each of the component parts has its own specifics and at the same time they complement each other in terms of biodiversity, remarkable landscapes and monuments of paleontology. They represent the most valuable and preserved territory of a single natural complex that forms part of the extensive Tien-Shan mountain chain, one of the most impressive mountain ranges in Central Asia.

Western Tien-Shan is characterized by an exceptional diversity, mosaicism and beauty of landscapes, outstanding evidence of large-scale geological and evolutionary processes; a unique combination of different types of supporting ecosystems; rich flora and fauna, which represent a considerable proportion of endemic species and

communities, as well as a significant number of rare and endangered species, including 24 species of vertebrates and plants listed in the IUCN Red List (version 2013) with varying degrees of threat. The region is one of the world centers of origin of nut, fruit and many other cultivated plants.

#### b) Justification for Criteria

##### Criteria viii:

A relatively small area combines a variety of geological structures that reflect successive stages of evolution of the earth's crust. Here can be found sediments dated from the lower Proterozoic till modern era: the Cambrian, Ordovician, Devonian and Carboniferous systems, in which traces of life of ancient times are found. In Karatau paleontological field, solidified sludge perfectly preserved footprints of plants and animals that lived in the pool and on the shores of the Jurassic seas around 150 million years ago. Prints of more than 60 species of plants, 100 species of insects and mollusks, crustaceans, turtles, ganoid fish were found there. There is no other place in the world with such a rich and interesting burial of Mesozoic insects.

##### Criteria x:

Western Tien-Shan is one of the world's centers of origin of nut, fruit, and many cultivated plants. This huge gene pool is of exceptional importance for the agro-biodiversity in many countries. Characteristic of Western Tien-Shan combination of different types of coniferous and deciduous forests is preserved at the nominated territory: juniper, fir, maple, hickory, fruit trees, riparian, and more than 10 endemic plant communities.

Menzbier's marmot (*Marmota menzbieri*) is an endemic species that is found in Western Tien-Shan, distributed only in the territory of Kazakhstan, Uzbekistan and Kyrgyzstan. The snow leopard (*Panthera uncia*) and Karatau argali subspecies (*Ovis ammon nigrimontana*) deserve special attention in terms of biodiversity and gene pool.

The nominated area is home to many rare and endangered plant and animal representatives of the world, among which 24 species are included in the Red List of IUCN (version 2013) with varying degrees of threat.

#### c) Statement of Integrity

13 clusters of the nominated serial property, are key parts of the natural complex Western Tien-Shan, the main components of which are inextricably linked by common origin, historical fate, and dynamics of natural development and include the elements necessary to show its outstanding value in the world.

Dimensions (from 15,846 to 149,053 ha) of component parts of the nominated property are sufficiently accurate in order to jointly maintain functioning of natural systems of Western Tien-Shan and fully represent the properties and processes that reflect their significance. The presence of buffer zone gives the additional guarantees of integrity.

Different forms of human activity (grazing, logging, haying, etc.), that existed in Western Tien-Shan prior to the establishment of the nominated SPA, had limited impact on the ecosystem, without causing major disturbances. Biophysical processes and components of natural landscapes of the nominated property were not violated.

#### e) Requirements for protection and management

Currently, status of National Reserves (corresponds to category Ia IUCN) and National Park (II IUCN), that have all the component parts of serial nomination, guarantees preservation and further natural development of a unique complex of ecosystems of Western Tien-Shan. All SPA have sufficient financial and administrative resources for long-term preservation of the declared Outstanding Universal Value. Now, every of designated protected areas has its own administration and management plan. The process of creating a single coherent management system of a serial transnational property is going on.

# 4

## STATE OF CONSERVATION AND FACTORS AFFECTING THE PROPERTY



### 4A. PRESENT STATE OF CONSERVATION

All sites of the nominated territory are state protected natural areas (PNA) of national importance. Reserves have status of strictly protected natural areas, where any use of animals and plants, and its economic use is prohibited. Also, a very limited access of visitors, that are to be accompanied by a security service workers, on specially designated areas is allowed. SUSNNP has sites with the same security control as in reserves and areas, accessible for visitors and for strictly limited use of nature.

Some areas of **KSNR** correspond to the concept of «untouched nature's model,» as the internal parts of the territory are hard to access. In the outlying areas and the restricted zone after haphazard grazing and deforestation in 1990s; for four years, since the creation of the reserve, a very active natural regeneration and restoration of grass cover had begun. The number of animals, including the Karatau argali subspecies, increased. On the whole, ecosystems of the reserve are stable and self-sufficient. The decision by the Akimat of South Kazakhstan region of June 28, 2002 № 244 «About the list of specially protected natural areas of local importance» was on land reservation for creating the nature reserve; except for 34,300 ha, that were already included in the Turkestan region, 5,700 ha were reserved in the Suzak region. In the future, it's important to ensure that these lands will be transferred to the reserve in order to improve its protection and its inclusion in the habitat scheme of some rare plants.

**AJSNR** corresponds to the concept of «untouched nature's model.» For 74 year of existing as a reserve, vegetation of meadows and steppes of the reserve completely recovered, and cut-down juniper forests and thickets of juniper dwarf restored. The number of animals, including ungulates, four-legged predators, and birds increased. On the whole, ecosystems of the reserve have more natural look and are much abundant than neighboring areas, that are primarily used for cattle grazing.

Some areas of **SUSNNP** correspond to the concept of «untouched nature's model,» because the internal parts of the territory are hard to access. A large part of the territory that was used for grazing, is now recovering in a natural way; there is an active reforestation and active regrowth of juniper forests. Grass is being restored. The number of animals, including Menzbier's marmot, increased. In general, it is a stable and self-sufficient ecosystem. To improve protection it is necessary to include in the national park about 10,000 ha of high-mountain pastures of the land of government funds, located between Ugam and Tolebi sites. A large part of Menzbier's marmot population inhabits here, and poaching happens regularly.

Areas of **SCSBNR**, **PASNR** correspond to the concept of «untouched nature's model,» because the internal parts of the territory are hard to access. Part of the area, that was damaged during the war and the prewar periods, when conifers felling was carried out, was restored. In order to improve the effectiveness of security measures, it is necessary to find out the tourist load on buffer zones and other areas of the nature reserves.

**BASNR** generally corresponds to the notion of «untouched nature's model,» because the internal parts of the territory are hard to access. Grazing of livestock in the past has led to a strong or moderate degree of disturbance of natural balance and decrease in the number of many species of birds and mammals. Now there is a slow grass recovery in progress.

**CSBNR**. Due to an established protection, the natural complex of the reserve has recovered from a devastating past economic activity in 60 years; the state of the natural complex and its individual components are in equilibrium with environmental conditions. This is largely corresponds to the concept «untouched nature's model.» The level of «virginity» declines in the Bashkizilsya area, directly adjacent to the Tashkent oasis, with its developed industry and agriculture. In particular, emissions of hazardous substances Almayk Mining and Metallurgical Plant, located 60

km from the site, have a negative affect on the vegetation.

Outwardly, the areas of the reserve are strikingly different in the wealth of its biodiversity from contiguous lands, generally used for grazing. In grassy plant communities projective cover was increased due to overgrowing by grass of horizontal tracks, which were destroyed by cattle during grazing. Noticeable renewal took place in plant communities of big shrubs (*Crataegus turkestanica*, *Cotoneaster multiflorus*, *Lonicera nummulariifolia*, *Atraphaxis seravschanica*), and also transformation of light forests to thick forest areas (*Juniperus seravschanica*, *Malus sieversii*, *Padellus mahaleb*, *Populus alba*). There was an increase and stabilization of the number of key species of animals and birds.

## 4B. FACTORS AFFECTING THE PROPERTY

### (i) Development Pressures (reclamation, adaptation, agriculture, extraction of minerals)

The main pressures of these group are poaching, cattle grazing, illegal logging, haying (illegal and legal), illegal harvesting of flowers etc. and unorganized tourism; for some areas - air pollution. The factors for different areas are described below.

#### **KSNR, AJSNR, SUSNNP.**

These areas are located in one of the most densely populated regions of Kazakhstan, but population density in their immediate surroundings is relatively low, and in the protection (buffer) zone the population almost doesn't exist or is scarce. The main negative factors affecting the object are the following:

*Poaching.* Due to the complexity of the cross-territory control, poaching exists in all three areas, despite their constant protection. In the Karatau Region the mountains are relatively low, easily accessible and surrounded by settlements. This region was exposed to strong anthropogenic pressure long since, so that it led to the disappearance of such animals as Turkestan lynx, Tien-Shan bear. Now there and in the high ridges of AJSNR and SUSNNP large animals, primarily argali, Siberian ibex, wild boar, bear, badger, porcupine, are being pursued. They are killed for their meat and fat; stone marten is hunted for its valuable furs. In Talas and Ugam ridge Menzbier's and long-tailed marmots are found. Bears are at particular risk as they are pursued for export of bile to China. In order to combat poaching in recent years, protection services' equipment was improved, and in AJSNR protection services increased.

*Cattle grazing.* Was conducted in all three protected areas before their creation. Perennial excessive economic use of some areas as rangeland had a negative impact on the overall condition of vegetation. Thus, in late 1980s in the mountains of Suzak and Turkestan regions 250,000 heads of cattle were grazed, resulting in an etched, rare and depleted vegetation cover. Currently there is rehabilitation of degraded pastures, whereas they have fully recovered in Aksu Jabagly reserve, which took decades. In all protected areas, especially on their border areas, often due to unfixed borders, cases of illegal grazing and trespassing on the reserve are recorded annually; offenders are fined.

*Illegal logging* is the most important factor, contributing to a significant reduction in biodiversity of birds and animals of the region, contributing to the development of erosion, changes in hydrological and climatic conditions. In the buffer zone of KSNR and its outer adjacent areas in Khantagi, Bayyldyr and Biresik canyons over the last decades, local people cut down all the trees, as evidenced by stumps and very sparse stands. Currently forests near floodplains and mountain landscapes of the reserve and buffer zone are being restored. Outskirts of the mountains in AJSNR and SUSNNP are suffering from illegal cutting, fur trees are cut down as Christmas trees, building materials or firewood.

*Haying.* It is prohibited; it is allowed only in some parts of the security zone and restricted economic area of SUSNNP. Due unfixed borders there is only irregular haying in small border areas of the reserves.

*Unorganized tourism* is a very serious problem in all areas since the 1960's. Since 1973 AJSNR individual tourists access is prohibited. It is also prohibited in KSNR and SUSNNP. However, in ALSNR and SUSNNP due to lack of control in some areas individual tourists still regularly cross the border, creating a threat to habitats, primarily as a source of possible fires.

*Illegal harvesting of flowers, berries and mushrooms.* It is almost absent within the reserve, but is noticed in some security zones and restricted economic areas in SUSNNP. There is no serious threat to the object at the present time, except for some micro populations of Greig's tulips.

*Air pollution by industrial plants.* In regional scale air pollution is emitted by large chemical and energy enterprises in industrial cities of Shymkent and Taraz. In 1989 in Chuuldak hole in AJSNR due to accidental releases of Shymkent Phosphorus Plant there was a massive damage to junipers, when needles were drying and fruits were falling off on an area of about 3,000 ha; part of plantations was completely destroyed. The nature and level of impact of chemical pollution of industrial enterprises in Shymkent, Taraz on natural systems of this object require monitoring and investigation.

### **SCSBNR, PASNR**

There is no water and air pollution, no changes in hydrological regimes, no violations of the microclimate of individual areas, and no factors of concern because near there are no large businesses and industrial facilities near the reserve.

The total area where negative changes to SCSBNR are noticed is 2,400 ha (about 10% of the total reserve area), that is an economic zone adjacent to the village.

*Cattle grazing.* On the territory of SCSBNR grazing is prohibited. The most intensive grazing is in the buffer zone, in the Sary-Chelek forestry in the tract Makmal, Kolbashy, Ashubel in particular. As a result of intensive grazing, holes Makmal, Kichi-Makmal, Akdonkoch, Ashubel, and Ashuu were highly degraded. The total area is approximately 500 hectares. In PASNR in 2004, forest unit allocated summer pasture area of 2,084.9 hectares for livestock of local resident from the protection zone. Currently, the area of land used as pastures in the territory, mentioned above, reduced to 1,283 ha in 2005. This leads to increase in the anthropogenic impact on the reserve; every year maximum allowable rate is increasing, protected zone regime is disturbed, leading to the pasture digression. With the growth of livestock the factors of concern are gradually increasing.

*Illegal logging* has the greatest negative impact on the reserves. The local population is forced to use wood as fuel due to lack of coal and the difficulty of delivery to the mountainous population aggregate. In addition, imported timber is not available or very expensive, and the population is engaged in the unauthorized logging. Illegal logging has a great negative impact on the Tien Shan spruce *Picea schrenkiana* and rare Semenov fir *Abies semenovii*.

*Haying.* In 2007 haying was allowed in the following holes: Aramkol, Iyrikol, Ypali, Aktash Sary Chelek forestry, covering an area of 110 ha. In 2008 haying was allowed in The Upper Kechkil, Ashuu Arkitsk and Sary-Chelek forestries, covering an area of 60 ha. Approximately 170 ha in total.

### **BASNR**

*Cattle grazing.* In the past, parts of the reserve and reserve's border areas have been transmitted in the long-term lease to neighboring Uzbekistan, that used them for intensive grazing. At present, natural vegetation in these areas has been replaced to such weeds as *Cousinia umbrosa*, *Rumex tianschanicus*, *Ranunculus polyanthemos*, *Solenanthus circinnatus*. In the semi-savannas *Verbascum songoricum*, *Oedibasis platycarpa*, and *Centaurea squarrosa* are of great importance, and the role of cereals and other motley grasses decreased. In the steppe communities *Ligularia alpigena* acquired great importance. In some areas, where the vegetation is completely broken (at the parking places of livestock, etc.), weeds were spread: *Amaranthus retroflexus*, etc.

Natural vegetation renewal has been slow. Areas in Barkyrak, and former Besh-Aral, as well as alpine fescue steppes have suffered.

### CSBNR

Surrounding piedmont territories are some of the most heavily populated areas in the world with the deficit of water and grazing pastures.

*Air pollution by industrial plants.* Development of neighboring areas has an adverse impact on plants and animals. Polluted air emissions from the Almalik Mining Enterprise reach the nature reserve. This results in weakening of some species such as *Juniperus seravschanica*, a large amount of which is affected with rusts and dries out.

*Geological exploration works* that involved deep (up to the ledge rock) excavation and drilling activity were stopped 50 years ago in the nature reserve and 25 years ago in the buffer zone (Regeneration plot) of Maidantal area. However ditches, mine dumps and abandoned roads remain uncovered with vegetation; and abandoned equipment is still there. Traces of former exploration work are seen in a total area of about 60 ha.

*Cattle grazing.* A cattle passageway goes along the north-western border of the Bashkizilsay area, sometimes crossing it and running inside the reserve area at a distance of 50 m from the border. In the vicinity of Aktash town (the Sukoksay upper river) a whole section of the passageway runs inside the area. A total area allotted for cattle passageway (plotted on the map but never marked on the ground) is about 70 ha.

*Nature reserve's own economic activity* is minor and involves use of natural resources within the protected area: about 50 m<sup>3</sup> of firewood being annually logged from dead and fallen trees; and a herd of 40 – 55 stud-mares, young horses and geldings grazing at a low altitude land strip in Bashkizilsay area. Holes with area of 2,633 ha are officially allocated for pastures for reserve horses, but they are not marked specifically.

### (ii) Environmental Pressures (natural pollution, climate change, desertification and others)

There are some evidences of influence of climate change but they are not so clear as typical 5-10 years whether cycles. Snowfalls can make difficult the transportation within the sites and together with frosts can increase sharply the mortality of resident birds and ungulates. In some areas heavy diseases of different plants are observed.

In KSNR, located in the surrounding desert area, there are the evidences of the impact of global climate change. Meteorological observations show that the winters there are more severe and snowy, and summer daytime temperatures in June-July sometimes reach +40-+45 °C. In such circumstances, the main problem in the winter is fodder shortage for animals that in turn requires systematic biotechnical measures. Snow drifts make it more difficult for transport to access the reserve and cordons. Clearing roads with tractors, graders or bulldozers is required. In the summer, due to lack of rain from June to October, and risk of spontaneous fires, not caused by people, is increased.

### SCSBNR, PASNR, BASNR

Such climatic anomalies as snowy winters are repeated approximately every 5-10 years. Snow height that is above normal greatly reduces the winter pastures, causing the concentration of ungulates in small areas. In some cases it disrupts the development process of forest formation, but, in general, zoogenic successions that began during the snowy winters are not widely spread, and the number of ungulates usually recovers within 1-5 years. There is a natural change of conifers by apples, plums, and hawthorns. The observed reduction in glacier area changes water balance of rivers.

#### CSBNR

Diseases lasting for years or decades result in dried out individual trees of *Juniperus seravschanica*, *Crataegus pontica* in some areas. Once in several decades there is an intensive propagation of a butterfly species – *Limantria (Osneria) dispar* – whose caterpillars strip the tree tops of *Malus sieversii*, *Sorbus persica*, *Celtis caucasica*,

*Atraphaxis seravschanica*, *Lonicera nummulariiflora*, *Prunus sogdiana* and other arboreal species, affecting an area of up to 1,500 – 2,000 ha. Damage by leaf beetles – for-point leaf-cutting beetle (*Clytra quadripunctata* L.) is noticeable in shrubs' crowns.

The tops of trees of *Juglans regia*, *Malus sieversii*, *Salix pycnostachya*, *Amygdalus spinosissima*, *Elaeagnus angustiflora* and other species are rehabilitated after severe winters that recur every 10 – 15 years.

Recurrent severe droughts (every 3 – 5 years) cause drying of the tops or entire trees of *Aser semenovii*, *Rhamnus cathartica*, *Prunus sogdiana*, *Malus sieversii*. However, overall vegetation has adapted itself to subarid climate of the middle altitude zone. Renewal and restoration of forest within the boundaries of the reserve is carried out satisfactorily. During the stages of natural seeding and regrowth, majority dies out due to phytocenotic influence: occultation or competition from xerophyte grass. Vertebrate animals adapt themselves to recurrent droughts by undertaking short- and long-range migrations.

### (iii) Natural disasters and risk preparedness (earthquakes, floods, fires, etc.)

The typical kinds of natural disasters in the Western Tien-Shan are rock falls, landslides, mudslides, avalanches; droughts lead to fires in dry years. Territory of Western Tien-Shan is located in a seismic zone, in some parts with seismicity of 9 points. In all protected areas, these possible disasters are taken into consideration in management plans and in staff trainings.

#### **KSNR, AJSNR, SUSNNP**

Strong earthquakes have not been recorded on the territory of the object. Slight seismic oscillations occur rarely and do not lead to damages to building or any noticeable changes. Landslides is a typical phenomenon, due to dry climate, poor wetting slopes with ground water, low-power small-grained sediments on the slopes; they rarely occur in AJSNR and SUSNNP. As a rule, occurrence of landslides is related with abnormal increase in precipitation as wet snow and rain in spring, especially if rapid snowmelt and heavy rainfall at the same time. Mudflows can happen during such moment. For example, in 1959 all agricultural vegetation in the Zhabaglysu River's riverbed and its tributaries was destroyed. Landslides and mud-stream mass was formed, destroying about 10 km of road from the border of the reserve to Ulken Kaindy river.

In KSNR mudflows on rivers are rare and insignificant. Ravine erosion is very weak and occurs in the shallow beds of temporary streams and ravines of previously laid loose rocks. Landslides are not observed, but occasionally there are small slide-downs. In some areas modern detritus and boulder taluses on the steep slopes and under cliffs occur.

The main type of natural disaster, that threatens the ecosystems in these areas, is fire. Thus, in AJSNR since its creation 22 fires occurred, 14 of which were major, with area of 10 ha or more.

Fire brigades of all protected areas provide ongoing support in extinguishing fire.

Often fires occur in territories, adjacent to the protected areas. In KSNR in 2007 workers of the reserve together with the fire department extinguished 12 wildfires on the border areas, thereby fire across the steppes was averted; at present time no fires are allowed on the territory of the reserve.

All protected areas carry out specific fire prevention plans and have an appropriate fire-preventing equipment. Employees undergo special trainings, practices occur from time to time.

Machinery and other means of fire suppression were purchased for KSNR; security, buffer zone, and access road to the reserve are equipped with banners, asking for compliance with an anti-fire security. Mineralized bands have been plowed. All cordons are equipped with fire-preventing boards; every year fire teams are formed.

An operative firefighting team has been created at AJSNR; it is equipped with a backpack extinguisher, protective clothing and other firefighting equipment. Fire chemical station (FCS) is equipped in the farm center. The existing cordons fire protection panels are fully packaged. In each of the three areas of SUSNNP fire-fighting groups have also been formed.

Joint operative plans for fighting against major forest fires are compiled annually by all protected areas, and are agreed with the Office of Disaster and regional akimats. During the periods of fire risk, all employees of protected areas are on duty in the central office in order to mobilize voluntary groups. Radio allows to respond quickly to

incoming signals. Fire observation posts are located on the dominant heights.

Preventive work with local communities and land users plays a very important role. In danger of fire, protection service workers distribute leaflets, warning about the danger of fires. Annually in conjunction with fire-preventing services, fire-preventing classes are held.

### **SCSBNR, PASNR, BASNR**

Prolonged drought and grass cover lead to fire in dry years.

Geodynamic instability such as rock falls, landslides, mudslides, avalanches are linked to the ongoing tectonic movements, large amplitude of heights and sharply continental climate. In conducting trainings with the reserve staff, these threats need be taken into account and be observed at the most dangerous areas.

Windfalls, avalanches, rock falls, and fires have a significant impact on forest and alpine formation, but have local features. As a result of heavy precipitation the root systems of white fir and spruce are exposed. In general these factors have a limited impact on the ecosystems and do not require their prevention or liquidation. Prediction of natural disasters on Kyrgyz part of the nominated property is conducted by the Southern Kyrgyz territorial department of the Republican Service for Hydrometeorology and Environmental Monitoring (Jalalabad). However, seismically, territory of West Tien-Shan is located in a seismic zone, and almost all the Kyrgyzstani part of the territory is in the zone of seismicity of 9 points.

### **CSBNR**

In spring in normal years, high water in the rivers of the reserve does not reach the levels of inundation. Individual pondings and undercutting are localized. In some years on favorable conditions normal spring water discharge in Bashkizilsay rapidly increases from 3-6 cubic meters per second to 20-25 cubic meters per second. In 1981 during two days of high water, Bashkizilsay river carried out more than 100 cubic meters of deadfall and partly thicket from the reserve's 3 to 50 meters wide floodplain.

Fires are very seldom in the middle altitude mountain zone and, according to fire investigations, cause little damage to herbaceous, bushy and arboreal vegetation. These types of vegetation rehabilitate by next year. *Juniperus seravschanica* grows back on the places of fire in a few decades and reached the same sizes. Required fire prevention activities are carried out on an annual basis.

### **(iv) Visitors / tourists**

In general all parts of the nominated property are surrounded by highly populated areas and as result they have possibility for good number of visitors from one side and threat from uncontrolled visitation from other side.

### **KSNR, AJSNR, SUSNNP**

Both reserves are closed for public access, access is only allowed in limited areas in accordance with approved standards. SUSNNP also regulates the number of visitors, who are only allowed in the tourist and recreational zones, and in the zone of limited economic use. In order to follow these rules, in all three protected areas special routes («ecological trails») have been designed, for which passports (descriptions) have been compiled and approved by regional territorial inspectorates of FHC of Ministry of Agriculture. Access to the territory is controlled by security guards of protected areas, each tourist group must be accompanied by a guide or security inspector. However, access to the restricted area of SUSNNP for the economic use is possible without SNNP personnel. Access to the protected area is for a fee. Number of visitors, normal (about 6,000 people per year) and maximal (up to 9,650 people per year, subject to maximum number of visitors, specified in the passports of nature trails), does not have and will not have a future negative impact on the object.

In total, 18 tourist routes were approved by the facility. In AJSNR and KSNR such routes are the following: one day radial or circular/semicircular routes used for pedestrians and horse passage of relatively small groups of tourists, mostly for scientific and informative purposes. Group sizes do not exceed 10 people. In SUSNNP there are complex and several-day tours with overnight stays in the territory, but the number of groups and participants in them is also limited.

### SCSBNR, PASNR, BASNR

These three reserves are closed to public access, access is only allowed in limited areas in accordance with approved standards. SCSBNR also regulates the number of visitors, who are only allowed in the tourist and recreational zone of security, and in the zone of limited economic use. In order to follow these rules, in all three protected areas special routes («ecological trails») have been designed and passports (descriptions) compiled. Access to the territory is controlled by security guards, each tourist group must be accompanied by a guide or security inspector. However, access to the restricted area of SUSNNP for the economic use is possible without SNNP personnel. Access to the protected area is for a fee. Number of visitors, normal (about 2,000 people per year) and maximal (up to 4,000 people per the year, subject to maximum number of visitors, specified in the passports of nature trails), does not have a negative impact on the object.

Number of visitors in PASNR and BASNR is considerably smaller than in SCSBNR, and it is predominantly on the lower altitude zone. There are roads in SCSBNR, where private vehicles up to the Sary Chelek lake can pass. Outside the area of organized tourism there are almost no visitors.

### CSBNR

A limited number of visitors and outside researchers are allowed to work in the nature reserve. Many visitors go through the museum established in the building of the nature reserve headquarters 20 km distant from the nearest Bashkizilsay area. The grazing of work horses and pedigreed herd of horses puts some strain on the ecosystem. Besides, the presence of ungrounded visitors during summer can lead to fire.

### (v) Number of inhabitants within the property and buffer zone

#### KSNR, AJSNR, SUSNNP

**Table 11. Number of visitors in the territories and their buffer zones in 2009**

Site:	Karatau SNR	Aksu-Jabagly SNR	Sayram-Ugam SNNP	In total
In the object's territory	4	30	200	234
In the object's buffer zone	-	150-200	2,900	3,050-3,100
In total	4	180-230	3,100	3,280-3,330

In the vicinity of the Karatau SNR at a distance of 5 to 28 km there are settlements of Suzak district (Syzgan in 10 km, Sholak-Kurgan in 28 km, Abai, Taukent, Baldysu) and settlements of Kentau ( Hantagi in 5 km, Bayyldyr in 19 km). There are three settlements and a rural district included in the city administration of Turkestan. The population density is 137 persons per 1 km<sup>2</sup>. Kentau was formed in 1955; the population in 2007 was 58,900 people. Together with the villages the population is about 85,500 people, including 3,100 people in Achisai, 8,600 people in Hantagi, 2,100 people in Bayyldyr, and 12,800 people in Karnak.

Lands, bordering the northern part of AJSNR and SUSNNP, are the most densely populated regions of southern Kazakhstan; the population density is 20 to 40 people per 1 km<sup>2</sup>. In the immediate vicinity (up to 75 km) suburban settlement of regional centers are situated, which are the cities of Shymkent and Taraz with a population density of 50 to 60 and more people per 1 km<sup>2</sup> (Atlas of the Kazakh SSR, Volume 2, 1985). Within a radius of 5 to 30 km away from these protected areas there are several dozens of villages.

Lands adjacent to AJSNR and SUSNNP are mostly in state property and the right of permanent or temporary land use is provided. Among them there are forest lands where medicinal plants, fruit and mushrooms in small quantities are collected and hunting of large mammals is allowed. A significant portion of these lands is agricultural land

reserved for numerous local farmers and production agricultural cooperatives and associations. Medicinal plants and wild-growing fruit in small quantities are collected in the area of the special land fund. At the same time, mushrooms collection carried out recently on an industrial scale is very intense and is conducted with violations of the rules of collection, which can then lead to their extinction in the future. Harvesting trees and shrubs for fuel is carried out intensively here as well. Grounds around the settlements, which are the public pastures, have already severely degraded due to excessive loading. Regulation of the use of the land by local authorities is not performed. Reserve lands are not used because of the remoteness from populated areas, rugged terrain and difficult access to the high altitude.

## SCSBNR, PAGZ, BASNR.

**Table 12. Number of visitors in the territories and their buffer zones in 2009**

Site:	Sary-Chelek SR	Padysha-Ata SR	Besh-Aral SR	In total
In the object's territory	1,200	0	0	1,200
In the object's buffer zone	2,000	2,000	1,000	5,000
In total	3,200	2,000	1,000	6,200

Sary-Chelek Biosphere Nature Reserve is different from all nominated clusters of West Tien Shan, because a village (Arkyt) is located on its territory. Despite the unfavorable socio-economic conditions in the region, Arkyt residents are comparatively better off, unlike residents of other towns outside the reserves. In Arkyt 1,000 residents were recorded. Every family has a small subsistence farming, and many keep chickens, cows, sheep and horses. Residents of the reserve use natural resources extensively in order to meet their needs and to improve the socio-economic status. They mainly live, because the money they get from the sale of nuts, apples, honey and hay. Currently, there are no unauthorized visitors in the Besh-Aral reserve. Recreational use is not conducted. The main towns near the reserve are Ak-Tash and Kurulush. Ak-Tash village is located 7 km from the reserve and consists of 179 households and a population of 1,012 inhabitants. The village residents are mainly engaged in cattle breeding and agriculture. The village Kurulush is located in 20 km from the reserve and consists of 236 households with a population of 1,417 people. The main activities of the population are cattle breeding, farming, and very rarely beekeeping. They mainly grow potatoes, rye and wheat. The local population is far from the reserve and doesn't claim its territory.

## CSBNR

The inhabitants of five villages located near Bashkizilsay area (with a total populating of approximately 24,000 people) pose a threat, both potential and actual, to wildlife in the form of poaching, illegal grazing, collection of firewood and food plants, fishing, and other illegal activity.

Shepherds set up summer camps and graze sheep, cattle and horses near the border of both areas of the nature reserve. In the holes under the control of the the National park (that serves as a buffer zone to the reserve), norms of grazing are not observed, vegetation devolves, and mostly consists of unedible plants.

### (vi) Targeted intervention into the biotic community

In all parts of the nominated property, Alkali soils have been placed on the trails of argali concentration; feeders are installed for feeding birds and mammals in winter. In SUSNNP, reforestation works are held in the area of limited economic use in accordance with the management plan; improvement thinning, seeds and fruits harvesting for planting are also conducted there, as well as in CSBNR.



# 5

## PROTECTION AND MANAGEMENT



taslymbayev.golgo,  
Zhanatayev, Sh.

### 5A. OWNERSHIP

#### **KSNR, AJSNR, SUSNNP**

All areas of the nominated object are properties of the government, except for 13.2 ha of private property in the area of limited economic activity of SUSNNP.

The property is managed by an authorised state executive body – the Committee of Forestry and Wildlife at the Ministry of Agriculture of Kazakhstan

#### **Address:**

010000 Astana, Left Bank, Orynbor Street,  
House of Ministries, 5th porch  
Tel: +7 (7172) 743288  
Fax: +7 (7172) 743290  
e-mail: reserve@eco.gov.kz  
Head: Bagdat Azbayev  
Deputy Head: Kayrat Ustemirov

Lands are assigned to the nature reserves for their use only. They are not leased, and must not be used for exploitation of their natural resources. Lands and properties of the specially protected areas cannot be privatised (Law of Protected Areas, Part 1, Article 5). The lands of the buffer zone are state property and consist of agricultural lands and reserved lands. The agricultural lands are partly used by local farmers. Any actions to cause substantial changes of the natural conditions are prohibited within the buffer zone. The regime of the buffer zone is controlled by the administration of the nature reserves and the national park.

#### **SCSBNR, PASNR, BASNR**

Reserves and their buffer zones are specially protected natural territories of national significance, and are a property of the Kyrgyzstan and subordinated to State Agency on Environment Protection and Forestry under the Kyrgyzstan government (SAEPF RK).

#### **Address:**

720001 Bishkek,  
228 Toktogul Street  
Tel. + (996-312) 352985  
Fax: + (996-312) 611 396  
Head: Biymyrza Toktoraliyev

Land, water, minerals, flora and fauna on the territory of the object are given for the use of the reserve by the government; nature management right was given to Zhalalabat regional administration of SAEPP RK. Facilities, historical, cultural, and other real estate, located within the boundaries of protected areas, are entitled to the reserves on the rights of operational control.

Buffer zones of SCSBNR, PASNR, and BASNR are protected areas of regional importance and are subordinate to the Forestry Development Authority under Agency on Environmental Protection and Forestry.

There are lands of the state land funds and the state forest funds around the reserve (pastures and stone-grained placer). There are secondary users such as hunting enterprises in the forestries, and farmer enterprises on the state land funds.

### CSBNR

Nature reserve is a protected area of national importance and a public ownership of the Republic of Uzbekistan. At the 9-th meeting of the International Coordination Council of the UNESCO MAB Program the nature reserve was given a status of biosphere nature reserve. The nature reserve is subordinate to the regional authorities – Tashkent Regional Khokimiat.

#### Address:

A. Temur Lane, 15  
Tashkent, 100060  
Tel: (371) 2336740

Khakim – R.K. Kholmatov

The core area was allotted to the nature reserve in accordance with the established order on the basis of a state act.

## 5B. PROTECTIVE DESIGNATION

All sites included in the nominated property are protected under national legislations of Kazakhstan, Kyrgyzstan and Uzbekistan. There are some differences in laws in the countries that is why the designation is described separately for each of these.

### KSNR, AJSNR, SUSNNP

KSNR is a state nature reserve that was created by a decree of the Government of the Republic of Kazakhstan of March 1, 2004 № 249 «About creation of the state institution «Karatau State Nature Reserve. «

AJSNR is a state nature reserve that was originally established by the Council of People’s Commissars of the Kazakh ASSR on July 14, 1926, and approved by the Decree of the Council of People’s Commissars of the Russian Federation of May 27, 1927. Latest extension of reserve territories was approved by Decision of the Government of the Republic of Kazakhstan № 1133 of November 17, 2005. Its current status (as well as the other two sections of the nomination) was confirmed by the Resolution of the Government of the RK of November 10, 2006 № 1074 «About approving the list of specially protected natural territories of national importance.»

SUSNNP is a national park that includes three zones with different levels of protection: protected zone -74,970 ha (50.4%), the zone of tourist and recreational activities – 33,882 ha (22.7%), and a zone of limited practical use – 40,207 ha (26.9%). The latter two zones are protected and any action that may cause a change in landscape or damage fauna and flora is prohibited. Change of zoning is scheduled by the Management Plan that is submitted for approval. The following zones are provided: protected zone – 55,589.4 ha (37.3%), environmental stabilization zone (reserve regime with some allowance for tourism and recreation) – 13,124.6 ha (8.8%), area for tourism and recreational activities – 19,711 ha (13.2%), and a zone for limited practical use – 60,028 ha (40.8%).

Both reserves and national park are legal entities in the form of a government agency. Legislative body of the management of these institutions, as well as the body providing them with functions of public ownership is the Committee on Forestry and Wildlife Ministry of Agriculture of the Republic of Kazakhstan.

The legislation of Kazakhstan specifies nature reserves as higher category of protected areas of nationwide significance (Law of Protected Areas, Part 7, Article 34) and state ownership (Law of Protected Areas, Part 1, Article 5). Nature reserves have the status of nature conservation institution with a protection regime to conserve and study the natural state and development of natural processes, typical and unique ecosystems, biodiversity, and genetic base of vegetation and wildlife (Law of Protected Areas, Part 7, Article 34).

Following actions are prohibited in nature reserves (Law of Protected Areas, Part 5, Article 23 and Part 7, Article 35):

- C1. Building of properties which are not related to the purposes and functioning of protected areas
  - C2. Any surveys for raw materials
  - C3. Storing production and consumption waste and radioactive materials
  - C4. Use of water pools for sewage water
  - C5. Use of vegetation for economic purposes, including haying, and grazing, as well as hunting and commercial fishery
  - C6. Introduction of animals and plants
  - C7. Any chemical, biological, or physical impact on environment
  - C8. Any action which can change natural landscapes or break the stability of ecosystems
- With the changes in the law on protected natural territories from January 23rd 2001 it is now possible for the rangers and others to use the natural resources of the property in a limited way. The reserves administration has to give the permit in every single case and is controlled by the Committee of Forestry and Wildlife.

### **SCSBNR, PASNR, BASNR**

SCSBNR is a state biosphere nature reserve. Documents and legislative acts, defining its status are:

Decree by the Council of Ministers of Kyrgyz SSR of June 5, 1959 № 118 «On improving the administration of Kyrgyz SSR forestry.»

Order of the Ministry of Agriculture of the Kyrgyz SSR № 295 «The organization of the Sary-Chelek nut and fruit reserve and Kemin reserve» of June 1, 1960.

The decision of the collegial body of the Main Department of Forestry and Nature Conservation of the Kyrgyz SSR of February 9, 1962.

Decree of the Council of Ministers of Kyrgyz SSR of November 4, 1976 № 533 «On approval of the state nature reserve funds and protection of valuable natural objects in the Kyrgyz SSR.»

Resolution of the 21st session of the General Conference of UNESCO on assignment of the status of Biosphere State Nature Reserve to Sary Chelek of February 19, 1979.

Decision of Dzhangi-Dzhol Executive Committee of November 4, 1982 № 268 «On approval of the security zone of the Sary-Chelek State Reserve»

The decision of People's Deputies of the Osh regional council of the Kyrgyz SSR № 125 of March 15, 1984 «On Approving the buffer zone of Sary-Chelek State Reserve.»

PASNR is a state nature reserve, established by the decision of the Government of Kyrgyz Republic of July 3, 2003 № 405 «On Organization of Padysha-Ata State Reserve.»

BASNR is a state nature reserve. Documents and legal acts that determine its status are the following:

Decree of the Council of Ministers of Kyrgyz SSR № 140 of March 21, 1979 «On the management of Besh-Aral reserve.»

Decision of Government of Kyrgyz Republic of August 1, 1994 № 573 «On changes in the boundaries of the Besh-Aral reserve and management of Chatkal forestry.»

Order of State Committee of Kyrgyz Republic on nature preservation of August 4, 1994 № 70 «On changing the boundaries of Besh-Aral reserve and management of Chatkal forestry.»

Decree of the Main Department of forestry of the State Committee of Kyrgyz Republic № 17 of August 10, 1994

Decision of Government of Kyrgyz Republic of July 26, 2002 № 499 «On lands transmission under the jurisdiction of Besh-Aral State Reserve.»

Decision of Government of of April 24, 2006 № 291 «On the management of the reserved area» Sandalash» of Besharal State Reserve in the Chatkal district of Jalal-Abad region of Kyrgyz Republic.»

All protected areas are public reserves. General management of SCSBNR, PASNR, BASNR is carried out by the State Agency for Environment Protection and Forestry under the Government.

### **CSBNR**

Protected area of national importance – nature reserve established in 1947.

Legal status is defined by national legislation:

The Law of the Republic of Uzbekistan "On Protected Natural Areas" dated December 3, 2004;

Regulations for the Chatkal State Nature Reserve approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No262, dated 22.06.2001

Decision issued by the Bureau of International Coordination Council of MAB to upgrade reserve's status to biosphere nature reserve, dated February 15, 1993 and signed by UNESCO Director General.

## 5C. MEANS OF IMPLEMENTING PROTECTIVE MEASURES

### **KSNR, AJSNR, SUSNNP.**

Sections bordering the settlements are protected by range stations, and distant sections by operational groups perambulation. Protection of territory is carried out by ground patrols using horses because of practical absence of roads inside the protected areas.

There are 7 ranger stations and a mobile patrol group in Karatau SNR, 15 ranger stations and a mobile patrol group in Aksu-Zhabagly SNR, 34 ranger stations and 3 mobile patrol groups in Sayram-Ugam SNNP. All rangers are equipped with weapon (pistols or rifles), uniform, binoculars, at the ranger stations there are radio transmitters. The reserves and the national park are safeguarded by a special ranger service which is provided by the staff of the reserves and operates according to law on protected areas and the developed management plans for the reserves and the whole site. The territory of the proposed property is safeguarded by the rangers of the nature reserves and the national park. The director of the protected is himself its chief ranger. The rights of rangers to safeguard nature reserves may be handed over to other employees of a nature reserve who have no position of state rangers. The given rights are handed over by employee consent with a written request and Director's order approved by an executive body – Committee of Forestry and Wildlife of the Ministry of Agriculture. Public inspections established by governmental or non-governmental environmental organisations may be enlisted in safeguarding nature reserves.

The legislation of the Republic of Kazakhstan gives the following rights to the reserves rangers:

- C1. To examine authorising documents of people being in a nature reserve
- C2. To visit any places in a reserve and the buffer zone to control the observance of environmental legislation of the Republic of Kazakhstan
- C3. To examine documents authorising the right for environmental operation in the protection zone of a nature reserve
- C4. To hold up any activity of a person or executive in a nature reserve or buffer zone which contradicts the legislation
- C5. To arrest persons violating the environment legislation of the Republic of Kazakhstan in a nature reserve or buffer zone, draw up a statement of a breach, and convey an infringer to order-maintaining bodies
- C6. To examine vehicles of persons arrested in a nature reserve or buffer zone, confiscate vehicles, implements of unauthorised activities, weapons and illegal products with drawing up relevant confiscation documents in prescribed manner
- C7. While fulfilling the duties, rangers may carry arms and use special means according to the current legislation of the Republic of Kazakhstan

As well as the above-mentioned general rights the major state ranger and the deputy major state ranger have the following rights within a nature reserve and protection zone:

- C1. To prohibit any economic or other activities which are not in compliance with the regime of a nature reserve or protection zone
- C2. To impose an administrative penalty for a violation of the environment legislation of the Republic of Kazakhstan
- C3. To send in documents on violations of the environment legislation of the Republic of Kazakhstan to order-maintaining bodies
- C4. To put in claims to infringers of the environment legislation of the Republic of Kazakhstan to compensate for losses voluntarily or to prosecute Agency with management authority.

**SCSBNR, PASNR, BASNR**

Protection of specially protected state nature areas is carried out by government agencies in charge, in the manner prescribed by normative legal acts of the Kyrgyz Republic, as well as normative legal acts of the subjects of KR. The administration of reserves and the security are directly responsible for protecting natural and cultural values of the protected areas.

- Security in sections is provided on daily basis by forest guards (rangers), and on the whole territory by holding raid patrols.
- The sections bordering the settlements are protected by ranger stations, and distant sections by operational groups perambulation. Protection of territory is carried out by ground patrols using horses because of practical absence of roads inside the protected areas.
- The protection of forests from fires is performed by firefighting service, which possesses fire-chemical stations with necessary equipment and technology in accordance with the set rules.

**CSBNR**

The State Committee for Nature Protection of the Republic of Uzbekistan exercises control over compliance with the environmental legislation, coordinates scientific researches and activities on international environmental projects. Over 60 years, the nature reserve, as a protected area, serves to protect natural resources (land, bowels, water, flora and fauna), which, as an integral part of nature, as typical or rare landscape formations or areas to preserve genetic plant and animal resources, are of crucial importance for wildlife protection, science and environmental education. Pursuant to the Law of the Republic of Uzbekistan "On Protected Natural Areas" (2004) "... Land, water, bowels of earth, flora and fauna contained in the state nature reserves are entirely withdrawn from economic activity and gratuitously transferred to the nature reserves in permanent use. Any lease of land of the state nature reserves is prohibited...".

Protection is carried out by special inspection service established in the nature reserve pursuant to the Law of the Republic of Uzbekistan "On Protected Natural Areas" (2004). In accordance with the Administrative Code of the Republic of Uzbekistan nature reserve inspectors are entitled to detect/stop any violation of rules and regulations relevant to wildlife protection and impose penalties or initiate prosecution. Inspectors of the nature reserve enjoy rights similar to those of state inspectors for nature protection. There are 39 inspectors in the nature reserve staff.

## 5D. EXISTING PLANS RELATED TO MUNICIPALITY AND REGION IN WHICH THE PROPOSED PROPERTY IS LOCATED

**KSNR, AJSNR, SUSNNP**

There are no specific plans by the local authorities on different development issues including the nature reserves. In South-Kazakhstan region, there is joint "Program of development of tourism" by the Regional Departments of Culture and of Industries and Trade" in which Sayram-Ugam State National Nature Park is included. The reserves and the national park themselves have development programmes and plans as indicated in section 5e. – "Management plans".

Of international projects, there is

1) Project on "The inventory and protection of the Important Bird Territories in Kazakhstan", since 2005, run by ACBK with the support of Darwin Initiative (2005-2008) and RSPB.

AJSNR and part of KSNR are confirmed as IBAs by BirdLife International.

**SCSBNR, PASNR, BASNR**

Bioregional plan developed in the framework of the Central Asian cross-border project GEF / WB biodiversity of West Tien Shan is aimed primarily at conserving biodiversity outside of the protected areas. It analyzes the current state of biodiversity, socio-economic status, the status of legal and institutional structures, as well as methodical approaches to the planning. The plan gives suggestions and recommendations on the harmonization of the legal framework of biodiversity conservation, improvement of institutional structures and funding. It mainly focuses on measures for the conservation and sustainable use of biodiversity outside of natural protected areas. Meanwhile, the goal of biodiversity conservation is linked to socio-economic development of the region and strengthening

cooperation with neighboring countries.

### CSBNR

In its past activities the Chatkal Natural Reserve used the following guiding documents:

Forestry management project for the Chatkal State Biosphere Nature Reserve – prepared by “Uzgiptoles’ research institution in 1989;

Management Plan for the Chatkal State Biosphere Nature Reserve – developed under the GEF financed West Tien Shan Transboundary Biodiversity Project in 2001.

However, implementation of some important activities is pending due to a lack of funds.

## 5E. PROPERTY MANAGEMENT PLAN OR OTHER MANAGEMENT SYSTEM

The whole property will be managed by Steering Committee (consisting of representatives of the protected areas and of responsible governmental bodies) with the main role for coordination of conservation and management efforts, exchange of experience and information. The Committee is planned for establishment after inclusion of Western Tien-Shan in World Heritage list and it will work as intergovernmental group with scheduled meetings (at least once a year) and teleconferences.

Now, every of designated protected areas has its own administration and management plan.

### KSNR, AJSNR, SUSNNP

The properties are managed according to the statutes of the SPAs; they do bring out development plans every 5 years.

The statutes and the development plans specify the following functions and management needs of the nature reserves:

- Safeguarding the area (including water bodies) to protect biodiversity
- Investigate, develop and implement new scientific methods to conserve landscapes
- Monitoring of the environment within the nationwide environment monitoring system
- Research work in the reserves
- Providing environmental education and study trips
- Recreation and tourism
- Taking part in the state environmental expertise of projects and distribution of business and other properties, developing sustainable nature management in the region
- Training of scientists and experts in environmental conservation

In addition yearly workplans are developed to implement and plan aims formulated in the 5 year development plans. All this plans are adopted by the Committee for Forestry and Hunting. Questions are discussed on scientific and technical councils organized under the supervision of the Committee.

**KSNR.** Management Plan adopted in 2008, for 2009-2013.

**AJSNR.** Currently the third revision of the management plan is in force. The first, developed with the support of West Tien Shan project of the World Bank, was adopted for 2002-2004, the second - for 2005-2008, and current - for 2009-2013.

**SUSNNP.** Management Plan adopted in 2008, for 2009-2013.

Management Plans for all three of these protected areas underwent the state environmental review and were approved by the FHC of the Ministry of Agriculture. The activities of both reserves and the National Park shall be in accordance with these documents (see the Schedule in Section 7).

### SCSBNR, PASNR, BASNR

According to the provisions on the SCSBNR, PASNR, BASNR, each of them is managed as a whole and indivisible protected nature area.

Within the reserve any economic activity is prohibited, as well as any activities that violate normal development of

natural processes. The provisions of the reserves allow only those activities that are related to the carrying out of environmental activities, such as pursuing environmental economic activity aimed at ensuring the functioning of the reserve on especially designated restricted areas.

Management plans of SCSBNR, PASNR, BASNR for 2009-2013 passed the state environmental review and were approved in the SAEPF RK in 2009. Activities of reserves in 2009 were carried out in accordance with these documents (see the Schedule in Section 7).

### CSBNR

Management of the reserve is carried out on the basis of "Regulation of State Chatkal Reserve", approved by Cabinet of Ministers of the Republic of Uzbekistan dated June 22, 2001, № 262.

There is an Action Plan for the years 2010-2012 on ensuring the integrity and global significance of the reserve's biodiversity. Plan also includes commitments of the reserve to the state and public organizations, policy on presentations, education and object promotion. In the plan actual problems on protection of the object and the mechanism of their solving, proceeding from actual possibilities are presented. The plan includes such response monitoring actions responding to emergency situations, and financial requirements.

## 5F. SOURCES AND LEVEL OF FINANCE

### KSNR, AJSNR, SUSNNP

The main source of financing is the state budget of the Republic of Kazakhstan. Funding is provided through an authorized state agency - the FWC of the Ministry of Agriculture of the RK. Herewith, the amounts are constantly increasing; the total amount of state funding for all three protected areas was KZT 198,520,000, or USD 1,323,470 in 2009, and approved budget of KZT 242,230,000 or USD 1,614,870 in 2011. (Table 13).

**Table 13. The amount of state budget financing of West Tien Shan nominees (by year, in thousands of KZT)**

Number	Name of Area	2006	2007	2008	2009	2010	2011
1	Karatau State Nature Reserve	265,39.3	34,069.0	45,317.8	46,541.0	50,202.0	67,653.0
2	Aksu-Jabagly State Nature Reserve	26,561.0	37,088.0	41,763.2	49,078.0	47,405.0	60,906.0
3	Sairam-Ugam State National Nature Park	448,41.2	65,609.0	69,482.0	102,901.0	91,379.0	113,671.0
	Total, thousands of tenge	979,41.5	136,766.0	156,563.0	198,520.0	188,986.0	242,230.0
	Total, USD (indexed to the rate for 2009)	652,940	911,770	1,043,750	1,323,470	1,259,910	1,614,870

Specially protected natural territories get additional funding through the provision of services to visitors, guided tours, etc.; another source of income in SUSNNP is very limited hunting in designated areas. Total revenue capacities derived from these sources is KZT 11,943,800 or USD 79,630 in 2010 (see Table), representing about 6% of total funding.

**Table 14. Revenue received by SPNT from services to visitors (by year, in thousands of KZT).**

Number	Name of Area	2006	2007	2008	2009	2010
1	Karatau State Nature Reserve	92.4 (15.5 to budget)	228.9 (34.5 to budget)	62.2 (6.8 to budget)	220.0 (20.4 to budget)	215.6 (7.8 to budget)
2	Aksu-Jabagly State Nature Reserve	2,070.4 (407.1 to budget)	3,343.7 (320.1 to budget)	4,427.9 (439.3 to budget)	4,650.5 (442.2 to budget)	4,901.3 (294.9 to budget)
3	Sairam-Ugam State National Nature Park	-	1,821.0	3,705.0 (828.2 to budget)	3,557.1 (557.1 to budget)	6,826.9 (2,074.6 to budget)
	Total, thousands of tenge	2,162.8	5,393.6	8,195.1	8,427.6	11,943.8
	Total, USD (indexed to the rate for 2009)		35,960	54,630	56,180	79,630

Additional funding is required to improve performance on a number of parameters. Thus, KSNR requires equipment with high traffic passability such as all-terrain vehicles, snowmobiles and an additional fire car.

#### SCSBNR, PASNR, BASNR.

The main source of financing is the state budget of Kyrgyzstan. Funding is provided by an authorized state agency - SAEPF RK.

**Table 15. The amount of state budget financing of West Tien Shan nominees (by year, in thousands of KGS)**

Number	Name of the area	2006	2007	2008	2009	2010	2011
1	Sary-Chelek State Biosphere Nature Reserve	26,539.3	34,069.0	3,359.3	3,184.4	-	4,073.8
2	Padysha-Ata State Nature Reserve	1,132.1	1325.9	2,202.3	5,665.1	3,249.3	1,818.1*
3	Besh-Aral State Nature Reserve	?	?	?	919.2	1,207.3	1,349.8
	Total, thousands of Soms	27,671.4	35,394.9	5,561.6	9,768.7	4,456.6	7,241.7
	Total, USD (indexed to the rate for 2009.)	639,400	817,800	128,500	225,700	103,000	167,300

\*As of September 01, 2011

Specially protected natural territories get additional funding through the provision of services to visitors, guided tours, etc. Total revenue derived from these sources is KGS 568.1 in 2008 or about 13 thousand U.S. dollars (see Table 16), representing about 5% of the total amount of financing.

Table 16. Revenue received by SPNT from services to visitors (by year, in thousands of KGS)

Number	Name of the area	2006	2007	2008	2009	2010
1	Sary-Chelek State Biosphere Nature Reserve	-	-	103.0	108.8	116.2
2	Padysha-Ata State Nature Reserve	1.5	12.8	4.2	33.8	18.5
3	Besh-Aral State Nature Reserve	-	-	460.9	122.2	122.2
	Total, thousands of Soms	1.5	12.8	568.1	264.8	256.9
	Total, USD (indexed to the rate for 2009.)	34	290	12,910	6,020	5,840

**CSBNR.**

The reserve is financed from the state budget of the Republic of Uzbekistan through the authorized state body – Tashkent regional khokimiyat.

**Table 17.**

2008	2009	2010
UZS 373,422.0	UZS 357,090.0	UZS 639,307.0
USD 248,950	USD 237,000	USD 390,000

In certain years own funds are received for the sale of surplus young foals. Funds are spent for replenishment of hay. Financing is carried out by the state budget. Annual budget of the reserve for 2010 is UZS 639,307,000. It is supposed to keep budget financing in the same amount and to attract state and international grants for financing of certain activities.

## 5G. SOURCES OF EXPERTISE AND TRAINING IN CONSERVATION AND MANAGEMENT TECHNIQUES

**KSNR, AJSNR, SUSNNP**

A lawyer and the head of the security visit the cordon on a quarterly basis to test the knowledge of inspectors of the Law on Protected Areas and the Administrative Code, to verify the diary on protection of the SPNT, and to conduct phenological observations.

Personnel of the departments of science and monitoring hold regular training courses for inspectors (twice a year). At the seminars they are taught the first level technique for monitoring (simplified), rules of running diaries of phenological observations, and develop plans of joint work with employees of the department of science and monitoring.

Regular certification of inspectors is conducted on the knowledge of the «Law on Protected Areas,» the Administrative Code, the Labor Code, principles of safety and health regulations, as well as other regulations and acts.

Researchers and administrative staff members also regularly attend training organized by the FHC of the Ministry of Agriculture of RK. In 2008, a few protected areas of Kazakhstan held regional training courses organized by the eco-educational center Tabigat Alemi and the GEF/UNDP project on wetlands, which were attended by directors and representatives of academic departments of SPNT.

Employees of academic departments of KSNR, AJSNR и SUSNNP regularly seek scientific advice from the Institute of Zoology and the Institute of Botany and Phytointroduction of Ministry of Education and Science of RK.

**SCSBNR, PASNR, BASNR**

Personnel of the departments of science and monitoring hold regular training courses for inspectors (twice a year). At the seminars they are taught a simplified method of monitoring, the rules of running the diaries of phenological observations, plans, and develop plans for joint activities with the the employees of Department of Science and monitoring.

Regular certification of inspectors is held on the knowledge of the «Law on Protected Natural Areas», eligibility issues, and other regulations and acts.

Researchers and administrative staff members also regularly attend training courses organized by the SAEPF

**CSBNR.**

Safety instructing is regularly carried out, and skills on use of firearms are checked. Once per three years personnel certification of inspection of protection and scientific department is carried out. Qualification is improved at school of inspectors under the reserve, by the means trainings and workshops.

The 'School' for state nature protection inspectors exists in the nature reserve, where training is carried out following the curriculum approved by the Academic Council. A certification commission was established to give a qualification and is functioning. Post graduate courses were organized to train the nature reserve staff, at the Uzbekistan National University, Forestry Faculty of the Agriculture University, and Institute of Zoology under the Academy of Sciences. The Biologic Faculty of the National University and the Forestry Faculty of the Agriculture Institute train specialists in wildlife conservation and nature reserve management.

**5H. VISITOR FACILITIES AND STATISTICS****KSNR, AJSNR, SUSNNP**

In each of the three protected areas there are have special employees engaged in the reception and service for the visitors, as well as educating them on the environment.

**KSNR****Table 18. Statistics on tourism in 2005-2010 for KSNR**

Activity	Carried out, year					
	2005	2006	2007	2008	2009	2010
Conducted tours-total						
Including educational	5	38	64	18	37	9
Number of tour participants	5	4	15	7	9	9
Touristic and recreational events	35	138	316	58	163	54
The number of excursion paths (routes)	-	2	2	2	2	2
Number of people served on the routes (trails) - total	35	138	316	58	163	54
Equipped (lookouts and demonstration sites)	1	1	1	2	2	2
Parking for vehicles	-	-	1	1	1	1
Camping sites, hotels, motels, tourist camps	-	-	-	-	1	1

In the central manor (in Kentau) there is a hotel for 8 persons (4 rooms). In all three cordons there is a sauna and seven guest rooms which can accommodate 2-3 person. There is a small museum, which is in the process of creation, a small visitor center with a few benches and good photographs, used during excursions with students,

etc. There is a conference room for 30-40 people.

Strictly speaking, there are no houses on the reserve territory, all routes are laid on the security zone or outside. Safety on the routes is ensured by Security of the reserve; the inspectors are specially trained on safety and first aid. Two visiting routes been approved. Serpentine-like cleared path has been laid on the Climbing Hantagi path for the convenience of the tourists, it is equipped with staircases and places of recreation on the rising points. A resting place with 3 benches is provided on the way to Tastybau tract, near the spring brook. There is an observation deck 850 m away. Bivouac sites are not available in the reserve. The reserve provides:

- Instructor-guide services
- Inspector-guide services
- Services for the provision of tents
- Transportation services
- Horse rental
- Soccer and volleyball courts
- Professional photography
- Professional video services

### **AJSNR**

In the village Zhabagyly near the reserve's central office there is a private hotel for 25 guests offering a full range of services. In the immediate vicinity there is a former summer camp that is now privately owned and being re-equipped for the reception of guests. Sayramsu campsite is located in a gorge of the same name, very near to the reserve – it offers various types of recreation activities in the mountains of West Tien-Shan including rock climbing, horseback riding, etc. A network of hotels, resorts and guest houses for tourists and vacationers is under construction along the Tashkent - Almaty route, near the reserve.

A modern visitor center was built in AJSNR with help of the West Tien Shan project. The visitor center is composed of two rooms including a large hall with a relief map and a small hall with six information boards, the Red Book, and a wall map of Kazakhstan's SPNTs. Museum exhibits presented in 15 diorams. Besides, there is a children's playroom and a cabinet of the young naturalist.

In 2010, the reserve was visited by 2,087 people for various purposes including the tourists from all walk of life, officials of various levels, media, students, and others; among them there are about 600 foreigners. A relatively small number of visitors is due to observance of the established recreational load on each of the routes. All in all 1,020 tours were conducted to the environmental trails and the museum (for the most part, excluding visits to the protected area), in which 5,448 people participated; 3,361 people visited the visitor center.

Special tourist lodges in the reserve are not available. There are two field research bases (Kishi-Kaindy and Ulken Kaindy), which are from time to time used for touristic purposes. Near these bases there are historically formed bivouac sites used during visits by the scientific staff, security officers, and scientific expeditions. These sites are also used for environmental excursions participants' rest points. These sites have no special equipment.

Ten routes for ecological tours of the reserve were approved by the order of the Chairman of the Committee on Forestry and Hunting of the Ministry of Agriculture on April 28, 2008, № 111.

There is no mass tourism in the reserve. Environmental excursionists come for a visit, and they only travel together with guides and receive from them all the necessary information, which allows to keep the area in its original state. There are only information boards along the eco trails, and it is planned to install pointers and toilets (on the boundaries of the reserve). Due to the fact that the territory of the reserve is intended to preserve and study the natural state of typical and unique ecosystems, development of additional amenities such as road-trail network, benches, bivouac areas, etc. is not intended.

### **SUSNNP**

National Park offers seven environmental routes of different length and duration, as well as the opportunity to visit restricted areas of economic use without a guide.

There are five observation platforms, 88 bivouac glades, 36 parking places for vehicles, a hostel for 26 people, 74 containers for rubbish in public places, 37 toilets, etc. A number of guest houses are run by local residents in

the villages adjacent to the park (mainly in its buffer zone) such as Kaskasu and others. In 2007 1,997 people visited the territory (plus about 1,500 people visited the buffer zone during the Parks Showcase), in 2008 – 3,718 people, including 31 individuals who used the routes, and in 2010 visitor arrivals totaled to 3,111 people. There is no visitor center or museum due to lack of SNNP's own office building.

### SCSBNR, PASNR, BASNR

Ecotourism is an integral part of the protected areas for development and self-financing. Scientific and research organizations, as well as visitors are allowed in reserve. The number of visitors is gradually increasing each year. SCSBNR. In 2003 forest management allocated a zone of ecological tourism on the reserve. It is a 200 meter strip along the road by Sarah Chelek lake, a part of the southern shore of the lake and the area of small lakes. Two horse routes have been created that pass through the mountain passes Makmal, Ashuu, Kotormo, Kuldandbes. Two viewing platforms have been built on the route to the lake. On the southern shore of the lake there is a guest house for 14 persons, an arbor, place for cooking, camping site and a parking lot. Tourists are invited to rent horses, guide, cook, enjoy boat trips, etc. All of this is available in summer, the tourist season.

In all three reserves routes and zones for ecotourism have been identified, nature museum is supported by a system of guest houses and canteens.

In Zhaiyk village, there is a private medical health resort called «Nur» (created by the GEF project), and children's camps «Orbita» and «Kashka - Suu».

### CSBNR

The 'museum of nature' was established in the headquarters of the reserve and admits visitors. An 'ecological' trail was laid at the field base. An interschool contest "Nature and We" is conducted in the nature reserve on annual basis. The museum located in the administration building in Parkent is visited by organized groups of schoolchildren, mainly in spring and autumn.

**Table 19.**

	2009	2010
Museum visitors	370	360
Excursionists of an ecological trails	68	78

## 51. POLICIES AND PROGRAMS RELATED TO THE PRESENTATION AND PROMOTION OF THE PROPERTY

### KSNR, AJSNR, SUSNNP

Information on the nominated SPNT can be found in Russian language on [www.oopt.kz](http://www.oopt.kz) website launched by the UNDP project. The site provides contact details and general information about the nature, physical and geographical features, flora and fauna of the protected areas. The site is currently supported by the FHC of the Ministry of Agriculture of RK. In addition, information in English language is available on [www.ecotourizm.kz](http://www.ecotourizm.kz) website and on number of other websites of travel agencies. Both reserves have published brochures with fairly complete information. In the work plans of all three protected areas there is a section called «Environmental education activities;» this section provides for regular excursions to nature trails and the nature museums, lectures in schools, the publication of popular science articles in the media, and presentations on radio and television. Moreover, environmental actions take place such as «Parks Showcase», environmental festivals, exhibitions, and festivals and workshops.

Museums of nature and visitor centers play key roles. A modern visitor center was built in AJSNR with the help of the West Tien Shan project.

KSNR has a small museum with a few mounts, but SUSNNP has neither a museum nor a visitor center at the present time, because the newly established national park does not have its own office building (land plot for

construction has been allocated; funds are expected; a center is planned). In 2011 park's own website was launched: [www.sugnpp.kz](http://www.sugnpp.kz).

Information on the actions carried out related to the presentation of the object, publications, speeches in the media, etc., are reflected in the annual reports of each SPNT.

Example:

Information from the report by AJSNR for 2010:

27 popular scientific articles were published in national, regional and local publications on the topics of nature and specific types of plants and animals. There were nine TV broadcasts and nine radio broadcasts about the reserve on local, national, and foreign channels.

**Table 20. Information activity of AJSNR in 2010**

Nº	Activity	Amount	
1.		Museum visits	3,361 (832)*
2.		Exhibitions	8
3.		Lectures conducted	324
4.		Conducted interviews, consultations	365
5.		Seminars conducted	11
6.		Speeches in the media	45
7.		Produced booklets, copies	3,235
8.		Conducted tours	1,020
9.		Territory visits	2,087

\* - including the visitors who accessed the Museum of Natural History for free on open house days

### SCSBNR, PASNR, BASNR

Advocacy and promotional activities are carried out by publication and distribution of brochures, booklets, guides, and calendars. Reserve employees are currently engaged in raising environmental awareness among local people and visitors to the reserve. However, this work is not of a regular nature and does not have sufficient methodological support.

There is a museum at the SCSBNR, on the basis of which a number of educational programs are conducted for the local population and school children. From 2008 to 2010 the museum held seven large outdoor public events with participation of the school and the support of international organizations on the International Day of Biological Diversity, the World Day of Environment, the Day of Knowledge, etc.

Information work is also done through information centers, environmental organizations and museums, through lectures, excursions with students, and organization of school forestry clubs. With the help of the media (radio, television, newspapers), the reserve staff disseminates information on the status and conservation of biodiversity in the territories.

Information about the reserve is available at:

[http://ru.wikipedia.org/wiki/Сары-Челекский\\_государственный\\_биосферный\\_заповедник](http://ru.wikipedia.org/wiki/Сары-Челекский_государственный_биосферный_заповедник), <http://www.welcome.kg/ru/reserve/>

### CSBNR

The reserve is not connected to the Internet and e-mail. The web-site about reserve is in development stage. There is short information (sometimes incorrect) on travel agencies' web-sites. In the last ten years employees of the reserve published three booklets about the nature and rare animal species, a number of science-popular articles and source books. Two collections of works were published by the reserve's employees, and the employees

participate in contributing to the collections of the works about the reserves of Uzbekistan. Scientific articles on the reserve, its nature, dynamic processes, inventory of the nature complex components were published in recent years. Annually, scientific department employees publish about 10 science-popular articles in newspapers and journals. Also there are about 6-8 programs on national TV. There are three films about life on this protected area with participation of the reserve's employees.

In accordance with the plan for educating the populace, the SPNT holds excursions to the museum (reconstructed in 2002), the field base, and the environmental trail. Information about all educational activities is reflected in reports, including the Nature Annuals.

Environmental education (2009)

Lectures in regional schools	8
Publication of articles about the reserve in the regional newspaper	3
Participation in broadcast of republic radio	4
Popular scientific articles in magazines: "Fan va turmush" and "Discovery"	3
The film library includes 7 video films made in different time (some of them by employees of the reserve). Sometimes, once in several months, films are shown on national channels.	

## 5J. STAFFING LEVELS (PROFESSIONAL, MAINTENANCE, TECHNICAL)

### KSNR, AJSNR, SUSNNP

All three sites have slightly different staffing structures, but, besides administration, financial department and technical personnel, all have research departments, advanced security services, and departments or employees involved in environmental education.

The staff of KSNR consists of 44 people, including 10 employees of the department of science and education, and 17 employees of security service (besides them, there are 13 more inspectors from other departments). The staff of AJSNR consists of 69 people, including 9 members of the scientific department, and 30 inspectors. The staff of SUSNNP includes 110 people, including 4 members of the scientific department and 46 inspectors (see Table 21). Due to slightly different functions from a reserve, SUSNNP has a department for reproduction of the forest and plant life, department for wildlife, and a department for protection of natural complexes; branches have hunting guides. All of them partially conduct research, so it means 15 people more involved in monitoring.

**Table 21. Personnel composition of the Kazakhstan section for Western Tien-Shan nomination, 2010 (in people)**

Department	KSNR	AJSNR	SUSNNP
Management	3	4	4
Technical personnel	9	17	
Scientific department		9	4
Environmental education		5	7
Department of science, information, environmental education	10		
Security service	17 (besides them, there are 13 more inspectors from other departments)	30	(46 - including employees of the branches)
Accounting department		4	

Financial and organizational work	5		12
Reproduction of forest			4
Reproduction of wildlife			4
Protection of natural complexes			4
Branches of SUSNNP (Tolebi – 20, Ugam – 32, Tyulkubas – 19)			71
Total	44	69	110

### SCSBNR, PASNR, BASNR

All three sites have identical structure of staffing. Besides administration, financial departments and technical personnel, all have research departments, advanced security services, and departments with employees involved in environmental education.

**Table 22. Personnel composition of the areas for West Tien Shan nomination, 2011 (in people)**

Department	SCSBNR	PASNR	BASNR
Executive office	1	1	3
Department of science and environmental education	10	6	7
Department of security and monitoring	26	20	26
Maintenance department and junior technical staff	12	6	6
Total	49	33	42

### CSBNR

In the reserve the staff is divided into departments (2010): Management - 11, Security Inspection - 39, Research - 14, Assistant - 28. Total number of people is 92. At the recruitment stage, all persons involved in field work pass a medical examination. The largest share of employees is involved in Security Inspection (39) and in the Department of Science and Technology (14). Management is carried out by the Director with two Deputies. Besides, there are accounting department, personnel department, a lawyer, a chief mechanic, drivers, warehouse manager, a dispatcher, watchmen, cleaners, a groom, a vet, an electrician, and laborers.

Protection of the reserve is carried out by patrols in 15-day shifts. The reserves' territories are divided into sections, which are assigned to specific inspectors. The scientific department includes 3 candidates of science, 5 employees with higher education, and laboratory technicians with secondary technical and secondary education.

Job descriptions have been developed and approved for management staff, rangers, scientists, technicians, and laboratory assistants, and their knowledge and application of their specific job descriptions are checked at regular appraisals.

# 6

## MONITORING



Kolsay gorge, Ramolulyev, Ye.

### 6A. KEY INDICATORS FOR MEASURING STATE OF CONSERVATION

**KSNR, AJSNR, SUSNNP**

**Table 23. Indicators for Kazakhstan’s parts of the nomination**

Indicator	Periodicity	Records storage place
Quantity and state of the key (indicator) species populations	Annual registration and assessments of the numbers, seasonal distribution and frequency per year depending on the species biology; inspectors’ records on a daily basis	Annual reports with scientific sections – premises of SPNT and Ministry of Agriculture, Committee of Forestry and Agriculture (MA CFH); “The Nature Chronicle” – cordons and SPNT premises; registration materials – in SPNT premises
State of the landscapes and reservoirs	Annually; prompt registration in case of threats	Premises of SPNT and MA CFH (annual reports)
Incidents of protection regime violence	Prompt registration; quarterly informing the CFH MCX, annual summary report	Violations registration minutes - SPNT premises; annual reports - in SPNT and MA CFH
Incidents and effects of the fire	Instant registration; informing the MA CFH depending on the scale of fire, the season and fire threat level; annual summary report	Fire registration minutes, documentation on their causes investigation – in SPNT premises; annual reports - in SPNT and MA CFH

Each SPNT has a cadaster on the main groups of the fauna and flora species with indicator species, the list and basic numbers of which are entered in the SPNT Passports approved by the RK MA CFH (see Table ).

The quantity and the present state of the key (indicator) species of the populations are shown in the annual reports sent to the RK MA CFH.

The annual reports include also the following exponents:

- State of the landscapes and reservoirs
- Incidents of protection regime violence
- Incidents and effects of the fire

The sources of information for the listed above exponents are:

1. Scientific reports with the obligatory monitoring sections.
2. “The Nature Chronicle” – this standard form is approved by the RK MA CFH, and daily records are logged in by all inspectors.
3. Returns and reports on the fire and the incidents of the reserve rules violations, etc.

**SCSBNR, PASNR, BASNR****Table 24. Indicators for Kyrgyzstan's parts of the nomination**

Indicator, method	Periodicity	Records storage place
Data on the number of animals. Conducting of counts.	Continuously, annually. Quantitative characteristics of the populations of key species will be compared to the previous state after a certain period of time	Annual reports with scientific sections – premises of SPNT and MA CFH ; "The Nature Chronicle" – cordons and SPNT premises; registration materials – in SPNT premises
Standard indicators of the state of the forest and vegetation. Methods of forest monitoring; geobotanical methods	Continuously, annually. Quantitative characteristics of the populations of key species will be compared to the previous state after a certain period of time	Annual reports with scientific sections – premises of SPNT and MA CFH ; "The Nature Chronicle" – cordons and SPNT premises; registration materials – in SPNT premises
Data on reproduction or performance of some species, the state of the indicator species of animals and plants.	Annually. When changes are recorded indicative of degradation of ecosystems, immediate registration will follow together with identification of causes and, where appropriate, mechanisms to mitigate them.	Annual reports with scientific sections – premises of SPNT and MA CFH ; "The Nature Chronicle" – cordons and SPNT premises
Data on the state of rare and endangered species of animals and plants	Constantly with a certain periodicity. Immediate registration in case of threats.	Annual reports with scientific sections – premises of SPNT and MA CFH
Cases of violation of the protection regime	Immediate registration, quarterly provision of information into the Government Agency on Environmental Protection and Forestry, summary data in the annual report.	Fire registration minutes – SPNT premises; Annual reports – premises of SPNT and Government Agency on Environmental Protection and Forestry

The reserves monitoring activities programme includes:

- 1) meteorological observations programme execution;
- 2) keeping the "The Nature Chronicle" records by the researchers and reserves inspectors;
- 3) annual census of the ungulates, the bear, the large predatory and indicator species on their usual routes by the reserve employees;
- 4) monitoring of the state of separately taken and selected species of disappearing plants in the transects and in the permanent test sites;
- 5) observations in the fixed phenology routes;
- 6) revealing of the indicator species exponents links with the state of the primary preservation objects;
- 7) training of the reserves employees in the effective methods of protection;
- 8) Educating the reserve's employees of biodiversity monitoring methods

**CSBNR**

The main components of the nature complex were inventorised in the reserve including the following: lists of vessel plants, and invertebrates, a preliminary inventory of the invertebrates were made, the reserve vegetation

communities were described and mapped, annual reports on meteorology elements are annually compiled (including those in the net of summary precipitations measuring tools) and pollution of different mediums by the pollutants, a seasonal evolution of plants and vegetation communities report is compiled and annual registration of the mammals and birds numbers is conducted.

These exponents and parameters are used in the environmental monitoring. The monitoring efficiency is shown in several publications, while the quantitative data of the current monitoring are introduced in the scientific reports (mainly in the Nature Chronicle). The following exponents are the most valuable for the monitoring: meteoelements, environmental pollution, vegetation dynamics (perennial and seasonal), of the trees and shrubs crops and the animal amounts.

**Table 25. Indicator measures for Uzbekistan’s parts of the nomination**

Observation sites area	Bashkizilsay area	Maidantal	
	Frequency of observations		
Transects to monitor large mammal and bird populations	15	11	1-2 times per year
Transects to monitor murine rodents population	2	1	2 times per year
Transects to monitor bird populations	3	3	Once a year
Test sites for monitoring chuckar partridge population in winter	13	-	Once a year
Test sites for monitoring vegetation dynamics	25	5	Once every 2-3 years
Test sites to monitor rate of growth on landslides	5	-	Once every 3-4 years
Phenological test sites	20	10	10-15 times per year
Phenological transects	3	1	10-15 times per year
Meteorological station	1		Daily,
8 intervals			
Flow-measuring (hydrometric) posts	1		Daily
Background monitoring station	1		Daily
Fixed snow measuring rods (remote)	8		Every 0,5-1 month in winter

## 6B. ADMINISTRATIVE ARRANGEMENTS FOR MONITORING PROPERTY

### **KSNR, AJSNR, SUSNNP**

The administration is responsible for objects monitoring:

Karatau State Nature Reserve

South-Kazakhstan region,

160400, Kentau city,

Valikhanov street, 17

## Monitoring

Tel.: +7 (72536) 36965, 36966, 39008  
Fax: +7 (72536) 36965  
e-mail: karatau\_oopt@mail.ru  
Director: Zhasar Adilbaev  
Deputy Director: M. Alsheriev

Aksu-Zhabagly State Nature Reserve  
South-Kazakhstan region,  
161310, Tyulkubas district,  
Zhabagly village,  
Abay street, 34.  
Tel: +7 (72538) 55565  
Fax: +7 (72538) 55565  
e-mail: -  
Director: Aytbek Menlibekov  
Deputy Director:

Sayram-Ugam State National Nature Park  
Shymkent, 160000,  
Ilyayeva street, 24  
Tel.: +7 (7252) 212887, 212871  
Fax: +7 (7252) 212752  
e-mail: sayram\_ugam@mail.ru  
Director: Zhenisbek Turganov  
Deputy Director: K. Zhunisov

The overall supervision and inspection of annual reports is implemented by the RK MA CFH, which also approves and provides methodic materials and monitoring reporting forms:

Committee of Forestry and Wildlife at the Ministry of Agriculture of Kazakhstan  
010000 Astana, Left Bank, Orynbor Street,  
House of Ministries, 5th porch  
Tel: +7 (7172) 743288  
Fax: +7 (7172) 743290  
e-mail: reserve@eco.gov.kz  
Head: Bagdat Azbayev  
Deputy Head: Kayrat Ustemirov

### **SCSBNR, PASNR, BASNR**

The administration is responsible for objects monitoring:  
SCSBNR

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Arkyt village.  
Director: N. Torobekov

### **PASNR**

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Kara Suu village.  
Director: Mukhtar Anarkulovich Artykbayev.  
+996 (3742) 60024, off.: +996 (773) 783201  
Deputy director: Ermek Akynovich Bekmyrzayev  
Mobile: +996 (773) 756219, +996 (772) 742201

**BASNR**

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Chatkal region, Zhany-Bazar village

Director: Kansharbek Zhanybekovich Eshaliyev,

Phone: +996 (0772) 458565, +996 (770) 422487, 248663; fax: +996 (312) 293767;

Kangarbek78@mail.ru

Vice Director for the Research: Raikhan Mamyrovich Amankulov

The overall supervision and inspection of annual reports is implemented by the State Agency for the protection of environment and forestry under the Kyrgyz Republic government, which also approves and provides methodic materials and monitoring reporting forms:

State Agency for the protection of environment and forestry under the Kyrgyz Republic government.

720001 Bishkek, Toktogul street, 228

Tel. +(996-312) 35-27-27

Fax +(996-312) 35-31-02

Director Bayanbek Esenovich Kadyrov

**CSBNR**

The organization in charge is the Chatkal Biospheric State Nature Reserve.

702222, Uzbekistan, Tashkent obl.,

Parkent, 2 Mirsaidov str.

Director: Z.T. Dustov

**6C. RESULTS OF PREVIOUS REPORTING EXERCISES****KSNR, AJSNR, SUSNNP**

All data obtained in previous years are available in annual reports of the SPNT, copies of which are stored in their administration. Originals are transmitted and stored in the CFW, Ministry of Agriculture.

Primary data for monitoring phenological phenomena and weather conditions are stored in the «Chronicles of nature» of each SPNT's administrations. Some totals are provided below.

**Table 26. Numbers of some mammal species in the Karatau reserve**

№	Species	Records, by years					
		2005	2006	2007	2008	2009	2010
1	Wild boar <i>Sus scrofa</i>	25	21	21	29	36	42
2	Karatau argali <i>Ovis ammon nigrimontana</i>	92	105	131	159	181	207
3	Grey wolf <i>Canis lupus</i>	21	12	15	20	18	20
4	Red fox <i>Vulpes vulpes</i>	15	12	15	21	29	33
5	Corsac fox <i>Vulpes corsac</i>	10	2	3	6	5	7
6	Badger <i>Meles meles</i>	12	15	21	26	36	32
7	Indian crested porcupine <i>Hystrix indica</i>	11	11	13	16	16	18
8	Tolai hare <i>Lepus tolai</i>	10	21	12	11	?	?

**Table 27. Numbers of some mammal species in the Aksu-Jabagly reserve**

N°	Species	Year and numbers			
		2007	2008	2009	2010
1	Wild boar	51	51	82	104
2	Siberian roe	58	34	?	?
3	Siberian red deer	21xxx	29	25	27
4	Siberian ibex	598	753	770	781
5	Argali	65	75	79	82
6	Grey wolf	33	28	29	31
7	Red fox	31	33	?	?
8	Brown bear	55	67	57	49
9	Badger	5	18	15	19
10	Turkestan lynx	5	6	4	2
11	Long-tailed marmot	1,423	2,351	?	2,100

**Table 28. Numbers of some mammal and bird species in the Sairam-Ugam National Park**

N°	Species	Year and numbers		
		2008	2009	2010
1	Wild boar	1,006	89 (?)	136
2	Siberian roe deer	154	134	159
3	Siberian ibex	1,340	1,244	1,253
4	Argali	28	30	34
5	Grey wolf	162	20	16
6	Red fox	678	680	695
7	Brown bear	55	58	66
8	Badger	181	169	180
9	Snow leopard	-	2	2
10	Menzbier's marmot	13,718	12,700	12,920
11	Indian crested porcupine	28	30	41
12	Tolai hare	779	761	768
13	Black stork	-	4	6
14	Egyptian vulture	33	33	37
15	Short-toed snake-eagle	-	6	13
16	Golden eagle	11	14	16
17	Eurasian sparrowhawk	25	25	34
18	Pheasant	306	199	205
19	Himalayan snowcock	273	273	275
20	Chukar	3,371	3,320	3,220
21	Grey partridge	12,768	10,735	10,696
22	Quail	709	714	769
23	European roller	511	511	518
24	Blue whistling-thrush	32	32	38

In AJSNR the numbers of Siberian mountain goat, roe, wild boar and Tien Shan argali are going up. Following some increase in numbers, there has been a decline of brown bear. The number of large vulture birds remains relatively stable and there is a positive trend noted. In general, the condition of AJSNR habitats is stable, as well as the numbers of key protected species, including rare plant species. In recently organized Karatau SNR and Sairam-Ugam SNNP, there is an intense natural restoration and reforestation of a number of areas previously disturbed due to overgrazing. There are also efforts to increase the populations of indicator species of plants and animals, including argali. In SUSNNP in 2009 a sharp drop in the number of wild boar was noted, the reasons for which were not entirely clear (perhaps, there has been underestimation).

### SCSBNR, PASNR, BASNR

All data obtained in previous years are available in annual reports of SPNTs, copies of which are stored in their administrations. Originals are transmitted and stored in the Government Agency on Environmental Protection and Forestry of RK.

Primary data for monitoring of phenological phenomena and weather conditions are stored in the «Chronicles of nature» in the administrations of each SPNT.

**Table 29. Numbers of the main protected species in the Sary-Chelek nature reserve**

№	Species	Records, by years				
		1996	1997	1998	1999	2000
1	Wild boar	200	195	170	145	119
2	Siberian red deer	90	95	92	80	92
3	Siberian roe deer	54	50	54	75	81
4	Siberian ibex	199	210	220	223	225
5	Grey wolf	30	25	11	12	13
6	Golden jackal	18	20	15	25	24
7	Red fox	25	25	26	23	26
8	Brown bear	25	24	23	23	24
9	Stone marten	40	38	37	37	34
10	Weasel	65	62	55	57	55
11	American mink	35	33	-	37	31
12	Badger	25	24	20	21	24
13	Turkestan lynx	7	5	4	3	3
14	Snow leopard	5	5	4	3	3
15	Long-tailed marmot	850	820	800	796	811
16	Indian crested porcupine	35	33	27	28	32
17	Tolai hare	15	18	20	20	26

**Table 30. Numbers of some mammal and bird species in the Padysha-Ata nature reserve**

№	Species	Year and numbers							Trend
		2004	2005	2006	2007	2008	2009	2010	
1	Wild boar	14	10	7	4	-	3	2	Decreasing
2	Siberian roe deer	32	34	30	32	25	25	22	Decreasing

3	Siberian ibex	119	155	175	227	240	240	312	Increasing
4	Grey wolf	11	8	8	10	8	8	1	Decreasing
5	Red fox	24	26	26	24	25	26	25	Stable
6	Brown bear	6	7	7	9	9	9	9	Stable
7	Stone marten	37	49	49	49	42	40	43	Stable
8	Badger	26	31	31	35	44	44	51	Increasing
9	Turkestan lynx	2	2	2	2	3	3	3	Increasing
10	Snow leopard	3	3	2	2	1	2	3	Stable
11	Long-tailed marmot	1,012	1,106	1,130	1,130	1,012	1,140	1,165	Stable
12	Indian crested porcupine	18	20	20	25	22	22	21	Stable
13	Tolai hare	17	30	38	47	52	62	104	Increasing
Birds									
1	Golden eagle				5	6			-
2	Lammergeier				2	2	6	6	Decreasing
3	Griffon vulture				16	20	4	4	Decreasing
4	Saker falcon					2	2	2	Stable
5	Snowcock					45	60	82	Increasing
6	Pheasant							21	-

**Table 31. Numbers of some mammal and bird species in the Besh-Aral nature reserve**

N°	Species	Year and numbers		
		2008	2009	2010
1	Wild boar	229	240	244
2	Siberian roe deer	8	9	10
3	Siberian ibex	743	754	777
4	Argali	39	39	41
5	Grey wolf	48	54	53
6	Red fox	119	123	116
7	Brown bear	50	52	52
8	Stone marten	230	233	233
9	Stoat	186	190	190
10	Weasel	136	138	143
11	American mink	153	166	166
12	Otter	2	2	2
13	Badger	98	104	104
14	Turkestan lynx	14	15	15
15	Snow leopard	7	8	8
16	Menzbier's marmot	12,371	12,390	12,391
17	Long-tailed marmot	715	687	687
18	Indian crested porcupine	12	13	13
19	Tolai hare	140	145	148

20	Chukar	1,105	1,077	1,078
21	Daurian partridge	308	303	303
22	Quail	113	112	114
23	Snowcock	121	116	115
24	Golden eagle	45	59	57
25	Griffon vulture	110	112	112
26	Eurasian sparrowhawk	77	81	80
27	Saker falcon	16	17	17
28	Lammergeier	31	33	33
29	Short-toed snake-eagle	16	17	17
30	Eastern turtle dove	222	220	224
31	Rock pigeon	165	164	167
32	Asian paradise-flycatcher	20	20	20

Judging by the results of monitoring, the number of basic monitoring and protected species in the nature reserves is quite stable, with natural variations. Meanwhile, for some species the numbers are only estimates, but, nevertheless, can be used to assess trends.

### CSBNR.

Here, as an example, we will also mention some meteorological data and the results of phenological observations; we'd like to note that similar materials are available for all parts of the nomination.

A. Key meteorological data (Bashkizilsay meteorological station, 1960 – 2006)

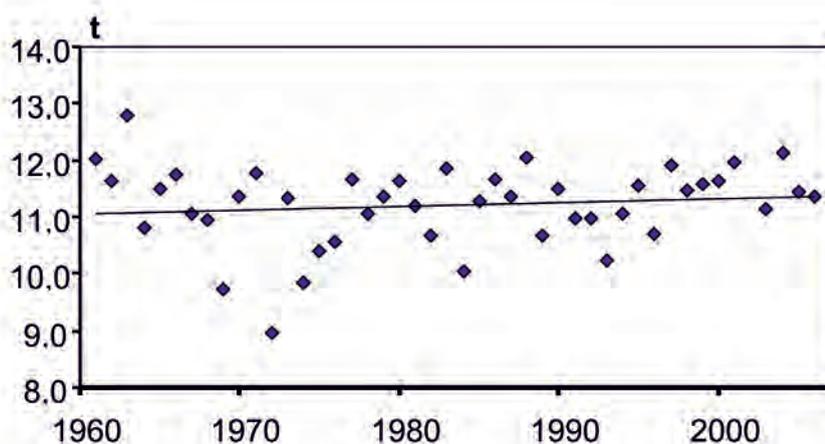


Figure. Dynamics of average annual air temperature

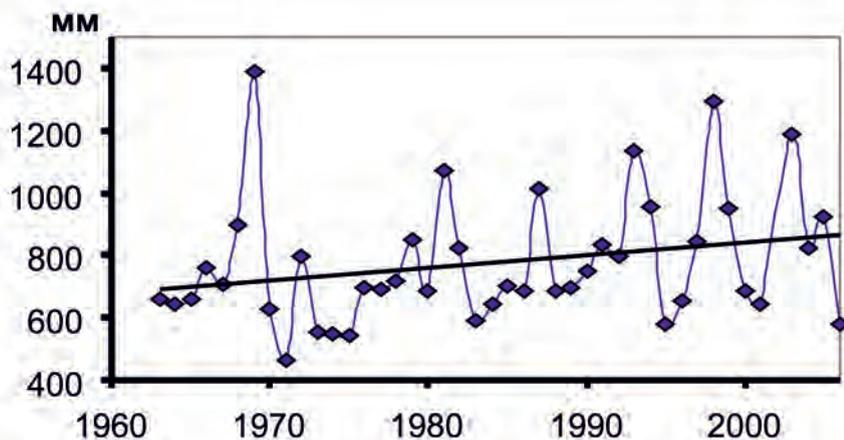


Figure. Dynamics of precipitation

A slight increase has been noted in mean annual temperature and precipitation. The increase is within the error of observation, so it might not be accurate, although it is to some extent consistent with the theory of global warming.

#### B. Environmental monitoring

Levels of air and precipitation pollution, and contents of key pollutants observed vary within the background limits. Hexachloran and DDT are annually registered at near zero levels. Higher concentrations of heavy metals (mercury, lead, cadmium, copper, and zinc) as well as sulfates and dust are registered annually and attributed to the vicinity of the Almalyk Mining Enterprise.

#### Tables 32, 33. Fluctuations of pollutant contents in surface water, by year

Pollutant	C, mg/l
Fluorides	0-3
Sulfates	3-20
Chlorides	0.1-3.9
Nitrates	0-20
Carbonates	50-120
Ammonium	0.005-0.1
Sodium	1-5
Potassium	0.1-1.5
Magnesium	3-15
Calcium	15-35
Total ions	1-186

Pollutant	C, microgram/l
Lead	0-8
Cadmium	0-0.7
Copper	-14
Zinc	1-260
Mercury	0.003-0.5
3,4- benzpyrene	0.001-5.7

1,12- benzperylene	0.001-5.7
$\alpha$ -hexachlorocyclohexane	Up to 0.008
pH	7.0-8.0

In some years concentrations of heavy metals is above background limits.

Pollution of vegetation (perennial herbs and mosses) and soil is within the background limits and shows minor fluctuations by year.

C. Annual monitoring of seasonal vegetation development (phenological monitoring)

**Table 34. Deviation of phenological dates in a lower middle altitude mountain zone (by year) over a period of 7 (8) years.**

Phenological phenomena	Average date	Margin of error, days	Early	Late
First spring rain	February 25	17.4	February 4	March 29
Masked wagtail arrival	March 3	5.1	February 25	March 14
Bluebell blossoming	March 21	5.2	March 10	April 2
First cuckoo	April 28	2.2	April 22	May 4
Dog rose blossoming	May 16	1.8	May 12	May 19
Last summer rain (downpour)	June 7	3.9	May 30	June 16
Last cuckoo	July 7	2.6	July 1	July 14
Red-headed bunting last seen	August 20	8.3	August 8	September 5
Walnuts begin to ripen	September 7	4.4	September 1	September 17
Altman's honeysuckle defoliation ended	October 10	6.2	September 26	October 21
Cherry plum defoliation ended	November 22	10.3	November 8	December 10
Partial freezing-over of Bashkizilsay river	December 15	9.6	November 22	January 2

D. Monitoring herbs and shrubs

Species composition and structure have stabilized, trend line is horizontal, and there are wide yearly fluctuations. Participation (by mass) of ephemerals and annual plants of long vegetation fluctuates from 0 to 10% for each species in dry conditions on unformed soil.

Progressive succession happens in damaged growth places; it is intensive on fire sites, clearly defined in places of landsliding, and almost unnoticeable on rock glaciers.

E. Monitoring of some vertebrate species populations

**Table 35. Monitoring trends for some vertebrates**

Species	Bashkizilsay	Maidantal
Siberian ibex	Stabilized at a low level	Population increased from 300 to 500
Wild boar	Depression in 1980-s. Increase during past two decades	Population increased from 20 - 30
Roe deer	High fluctuations by year, ranging 35 to 140 animals	Gradual increase in population number from 0 to 35

Brown bear	Invariably high population of 10 – 15 animals	Invariably high population of 30 – 35 animals
Grey wolf	Reduction of population (from 1-2 families to 0) because of plague among carnivorous animals	Reduction of population number (from 10 -15 to 5 animals) for the same reason
Red fox	Population dropped (from 30 -40 to 0 - 5 animals)	Population dropped (from 20 -30 to 0 – 5 animals)
Badger	Invariably low population – to 20 animals	Invariably low population – to 10 animals
Stone marten	Invariably high population	Lower population
Stoat / weasel	Population reduced	Locally high population
African wild cat	There are a few animals in the low altitude mountain zone	n/a
Snow leopard	Come from neighboring area, not every year	Invariably low population – one family
Turkestan lynx		Rare encounters in some years
American mink	Single penetrations. Alien species from neighboring areas.	
Predatory birds	Some reduction of population in nesting and wintering biotopes.	Stabilized at a normal density level.
Chukar	Wide fluctuations of numbers in wintering biotopes from 1,000 to 3,000 animals	High density in nesting biotopes. Some extent of increase in population over last decades
Himalayan snowcock	Invariable low population, reduction trend	Some reduction in nesting stations
Passerine species	Trend of decrease in number of migrant birds in nesting biotopes	Population of most of passerine species stabilized and reached optimal density.
Tolai hare	Invariably low population	Single encounters in some years
Tien Shan ground squirrel	Invariably low population in colonization biotopes.	Locally high population in typical biotopes.
Field mouse	Invariably low population in both areas	
Forest dormouse	Locally high population in typical biotopes.	Invariably low population
Turkestan rat	Increased density level in typical biotopes	Optimal density in typical biotopes.
Menzbier's marmot	Invariably low population. Habitat shrinkage.	Trend of population reduction. Some of habitat shrinkage.

**Table 36. Population of some vertebrate animals in the years 2000-2010 (according to spring records)**

Species	Bashkizilsay	Maidantal
Siberian ibex	140-160	380-490
Siberian roe deer	50-110	30
Wild boar	60-140	250
Brown bear	7-13	32-35

Red fox	30	20
Grey wolf	4	5-7
Snow leopard	-	3-4
Menzbier's marmot	120	4,500
Chukar	1,780	510
Golden eagle	5	7
Cinereous vulture	5	5

Consistent low density of some mammals and the decreasing tendency in typical lands is due to these species biology (Menzbier's marmot, tolai hare, badger, weasel, stoat, African wild cat, social vole, Kyrgyz vole, and tamarisk gerbil). Numbers of some predatory animals are decreasing in the last 10-15 years due to epizootic outbreak of plague among carnivores (grey wolf, red fox, badger). High anthropogenic pressure on the surrounding territories and small size of the reserve areas do not ensure the feliforms survival in the reserve and lead to ungulates migration outside of the reserve. Nonetheless, bear's and stone marten's densities can be considered normal under these conditions.



Mynzhylki gorge, Kenbaj

## 7

## DOCUMENTATION

## 7A. PHOTOGRAPHS AND AUDIOVISUAL IMAGE INVENTORY AND AUTHORIZATION FORM

## PHOTOGRAPHS AND AUDIOVISUAL IMAGE INVENTORY AND AUTHORIZATION FORM

Id. No	Format (slide/print/video)	Caption	Date of Photo (mo/yr)	Photographer/Director of the video	Copyright owner (if different than photographer/director of video)	Contact details of copyright owner (Name, address, tel/fax, and e-mail)	Non exclusive cession of rights
Karatau State Nature Reserve (KSNR)							
01	slide	Baytuyak tract	06/2010	Zhanatayev Sh.		karatau_oopt@mail.ru	yes
02	slide	Upper parts of Karaungir	08/2011	Sakauova G.		karatau_oopt@mail.ru	yes
03	slide	Koksay gorge	05/2010	Ramatullayev Ye.		karatau_oopt@mail.ru	yes
04	slide	Field of Tulipa greigii - an endemic of Western Tien-Shan	05/2009	Ramatullayev Ye.		karatau_oopt@mail.ru	yes
05	slide	Tulipa alberti - an endemic of Western Tien-Shan	04/2009	Sakauova G.		karatau_oopt@mail.ru	yes
06	slide	Hedusarum mindshelkense - an endemic of Karatau	07/2007	Sakauova G.		karatau_oopt@mail.ru	yes
07	slide	Cousinia mindshelkensis -an endemic of Karatau	07/2007	Sakauova G.		karatau_oopt@mail.ru	yes
08	slide	Akkuz plateau	07/2009	Zhanatayev Sh.		karatau_oopt@mail.ru	yes
09	slide	Tastynbauy gorge	05/2011	Zhanatayev Sh.		karatau_oopt@mail.ru	yes
10	slide	Juno orchioides - an endemic of Karatau	04/2009	Sakauova G.		karatau_oopt@mail.ru	yes
Aksu-Jabagly State Nature Reserve (AJSNR)							

01	slide	Juniper forests are typical for Western Tien-Shan	09/2001	Chalikova Ye.S.		echalikova@mail.kz	yes
02	slide	Koksay high-mountain lake	04/2011	Dzhumanov S.			
		aksu-jabagly@rambler.ru, otdelekturizma@mail.ru	yes				
03	slide	Tien-Shan mountain sheeps Ovis ammon karelini in Sarkrama gorge	09/2009	Kaspakov Ye.			
		aksu-jabagly@rambler.ru, otdelekturizma@mail.ru	yes				
04	slide	Petroglyphes in Baydaksay gorge	09/2010	Abilov Zh.			
		aksu-jabagly@rambler.ru, otdelekturizma@mail.ru	yes				
05	slide	Tien-Shan brown bear Ursus arctos isabellinus in Taldybulak gorge	04/2009	Shakula V.F.			
		aksu-jabagly@rambler.ru, otdelekturizma@mail.ru	yes				
06	slide	Tulipa greigii in Koilybayzhaylau valley	05/2009	Dzhumanov S.		aksu-jabagly@rambler.ru, otdelekturizma@mail.ru	yes
07	slide	Malus sieversii is a globally threatened endemic of Tien-Shan and one of ancestors of domestic apples	07/2010	Dzhumanov S.		aksu-jabagly@rambler.ru, otdelekturizma@mail.ru	yes
08	slide	Kishy-Aksu canyon	08/2009	Chalikova Ye.S.		echalikova@mail.kz	yes

09	slide	Primula minkwitziae at Aksay pass	06/2010	Dzhumanov S.		aksu-jabagly@ rambler.ru, otdelektorizma@ mail.ru	yes
10	slide	Winter is coming (Kaindy tract in Talas Alatau)	10/2008	Chalikova Ye.S.		echalikova@mail. kz	yes
Sayram-Ugam State National Nature Park (SUSNNP)							
01	slide	Sayramsu gorge in winter	01/2009	Kenbay T.		kenbay_tur@mail. ru	yes
02	slide	Sayram peak, 4236 m a.s.l.	07/2010	Kenbay T.		kenbay_tur@mail. ru	yes
03	slide	Mynzhylki gorge	06/2006	Kenbay T.		kenbay_tur@mail. ru	yes
04	slide	Saryaigyr gorge in autumn	10/2009	Kenbay T.		kenbay_tur@mail. ru	yes
05	slide	Menzbir's marmot at Tikenek pass	06/2006	Kenbay T.		kenbay_tur@mail. ru	yes
06	slide	Galiyatogay tract at Ugam	08/2010	Kenbay T.		kenbay_tur@mail. ru	yes
07	slide	Sayramsu lake	08/2009	Kenbay T.		kenbay_tur@mail. ru	yes
08	slide	Siberian Ibex ("tauteke")	10/2010	Berdaliyev M.		sayram_ugam@ mail.ru	yes
09	slide	Susingen lake	05/2006	Berdaliyev M.		sayram_ugam@ mail.ru	yes
10	slide	Ugam river	10/2009	Berdaliyev M.		sayram_ugam@ mail.ru	yes
Sary-Chelek State Biosphere Nature Reserve (SCSBNR)							
01	slide	Sary-Chelek lake, general view	05/2006	Mambetaliyev U.		-	yes
02	slide	Iyri-Kol lake	07/2005	Mambetaliyev U.		-	yes
03	slide	Sary-Chelek lake	07/2005	Mambetaliyev U.		-	yes
04	slide	Winter view	11/2005	Mambetaliyev U.		-	yes
05	slide	Mountain swamp with orchids	06/2011	Usupbayev A.		ermen78@mail.ru	yes
06	slide	High-grass meadow	06/2006	Usupbayev A.		ermen78@mail.ru	yes
07	slide	Abies semenovii	01/2007	Usupbayev A.		ermen78@mail.ru	yes
08	slide	Exochorda tienschanica	01/2007	Usupbayev A.		ermen78@mail.ru	yes
09	slide	Sary-Chelek lake	09.07	Ushakov V.		photo.kg@mail.ru	yes

Besh-Aral State Nature Reserve (BASNR)							
01	slide	Typical view in Besh-Aral	10/2003	Mambetaliyev U.		-	yes
02	slide	Middle stream of the river	10/2003	Mambetaliyev U.		-	yes
03	slide	Waterfowl	10/2003	Mambetaliyev U.		-	yes
04	slide	Alpine meadows with <i>Trollius dschungaricus</i>	06/2011	Usupbayev A.		ermen78@mail.ru	yes
05	slide	<i>Iris alberti</i>	06/2011	Usupbayev A.		ermen78@mail.ru	yes
06	slide	<i>Primula kaufmanniana</i>	06/2011	Usupbayev A.		ermen78@mail.ru	yes
07	slide	<i>Tulipa ferganica</i>	06/2011	Usupbayev A.		ermen78@mail.ru	yes
Padysha-Ata State Nature Reserve (PASNR)							
01	slide	Winter view	12/2007	Mambetaliyev U.		-	yes
02	slide	<i>Abies semenovii</i> and <i>Picea schrenkiana</i> associations	06/2011	Usupbayev A.		ermen78@mail.ru	yes
03	slide	<i>Picea schrenkiana</i> forest	06/2011	Usupbayev A.		ermen78@mail.ru	yes
04	slide	<i>Juniperus semiglobosa</i> (tianschanica) formation					
	06/2011	Usupbayev A.		ermen78@mail.ru	yes		
05	slide	<i>Picea schrenkiana</i>	06/2006	Usupbayev A.		ermen78@mail.ru	yes
06	slide	<i>Picea schrenkiana</i>	08/2013	Usupbayev A.		ermen78@mail.ru	yes
07	slide	Meadow formations with <i>Geranium collinum</i>	06/2011	Usupbayev A.		ermen78@mail.ru	yes
08	slide	<i>Primula eugeniae</i> - a species included in national Red Book	06/2011	Usupbayev A.		ermen78@mail.ru	yes
09	slide	<i>Abies semenovii</i>	07/2007	Usupbayev A.		ermen78@mail.ru	yes
10	slide	Flowering <i>Malus sieversii</i>	06/2006	Usupbayev A.		ermen78@mail.ru	yes
11	slide	<i>Eminium regelii</i> ( <i>lehmannii</i> )	05/2009	Usupbayev A.		ermen78@mail.ru	yes
Chatkal State Biosphere Nature Reserve (CSBNR)							
01	slide	Sparse juniper forest	06/2007	Yesipov A.V.		esipov@sarkor.uz	yes

02	slide	Minoratash tract - typical habitat of Siberian Ibex	06/2005	Yesipov A.V.		esipov@sarkor.uz	yes
03	slide	Terekli say river	06/2007	Yesipov A.V.		esipov@sarkor.uz	yes
04	slide	Birch forest in Terekli say valley bottom in autumn	10/2005	Yesipov A.V.		esipov@sarkor.uz	yes
05	slide	Kyzyl'nura peak - extinct volcano	06/2005	Yesipov A.V.		esipov@sarkor.uz	yes
06	slide	Middle-mountain belt in Bashkizilsay gorge	10/2005	Yesipov A.V.		esipov@sarkor.uz	yes
07	slide	Tulipa brachystemon - protected species	06/2005	Yesipov A.V.		esipov@sarkor.uz	yes
08	slide	Tulipa kaufmanniana - protected species	03/2006	Yesipov A.V.		esipov@sarkor.uz	yes
09	slide	Nemachilus kuschakewitschi is typical for mountain streams	08/2007	Yesipov A.V.		esipov@sarkor.uz	yes
10	slide	Juniperus semiglobosa	04/2006	Yesipov A.V.		esipov@sarkor.uz	yes
11	slide	Young Siberian Ibex	05/2006	Yesipov A.V.		esipov@sarkor.uz	yes
12	slide	Patrolling ranger of the nature reserve	06/2006	Yesipov A.V.		esipov@sarkor.uz	yes
13	slide	Flowering Amygdalus spinosissima	04/2009	Yesipov A.V.		esipov@sarkor.uz	yes
14	slide	Upstream of Terekli say	06/2007	Yesipov A.V.		esipov@sarkor.uz	yes
15	slide	Subalpine vegetation in high-mountain	06/2005	Yesipov A.V.		esipov@sarkor.uz	yes

## 7B. TEXTS RELATING TO PROTECTIVE DESIGNATION, COPIES OF PROPERTY MANAGEMENT PLANS OR DOCUMENTED MANAGEMENT SYSTEMS AND EXTRACTS OF OTHER PLANS RELEVANT TO THE PROPERTY

### TEXTS RELATING TO PROTECTIVE DESIGNATION

B1. Law of the Republic of Kazakhstan "On Specially Protected Natural Areas" (extracts)

B2. Decree of the Government of the Republic of Kazakhstan No.249 dated March 1, 2004 "On Creation of the State Institution Karatau State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture

of the Republic of Kazakhstan”

B3. Passport of Karatau State Nature Reserve

B4. Extract from the minutes of 25th session of the Council of People’s Commissars of Kazakh SSR of July 14, 1926 “On establishment of Nature Reserve Ak-Su-Djebagly in Chimkent uyezd (county) of Syr Darya guberniya (province)”.

B5. “On granting land for permanent use to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan”. Government Decree of the Republic of Kazakhstan No. 1133, dated November 17, 2005

B6. South Kazakhstan Regional Governor’s Office (Akimat) Decree No. 289 of August 4, 2006 “On establishment of the protective zone around the territory of the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan

B7. Zhambyl Regional Governor’s Office (Akimat) Decree No. 286 of October 26, 2006 “On establishment of the protective zone around the territory of the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan

B8. Passport of Aksu-Jabagly State Nature Reserve

B9. Resolution of the Government of the Republic of Kazakhstan of January 26, 2006, No 52 “On some issues related to certain government institutions of the South-Kazakhstan oblast”

B10. Resolution of akimat of the South-Kazakhstan oblast of April 26, No 171 “On establishment of the buffer zone around lands of the state institution “Sairam-Ugam state national natural park” of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan”

B11. Resolution of akimat of the South-Kazakhstan oblast of October 29, No 359 “On reservation of lands for expansion of Sairam-Ugam state national natural park”

B12. Passport of Sayram-Ugam State National Nature Park

B13. Government Resolution of August 1, 1994 N 573 “To change the boundaries of Besh-Aral State Reserve and Chatkalsky forestry organizations”

B14. Government Decree on July 26, 2002 N 499 “On the transfer of land under the jurisdiction of Besh- Aral State Reserve”

B15. Government Resolution on April 24, 2006 N 291 “On the organization of the reserved area « Sandalash » of Besh-Aral State Reserve in Chatkal district of Jalal -Abad region of Kyrgyz Republic”

B16. Regulations of the Besh-Aral State Reserve

B17. Decree of the Government of Kyrgyz Republic of July 3, 2003 N 405 “On the organization of the Padyshata State Nature Reserve”

B18. Provisions of Padysha-Ata State Nature Reserve

B19. Decree of Council of Ministers of the Kyrgyz SSR of March 5, 1959 № 118 “On the improvement of forest management in the Kyrgyz SSR”

B20. Order number 295 by the Ministry of Agriculture of the Kyrgyz SSR June 1, 1960 , Frunze “Questions of organization of Sary-Chelek nut-fruit and Kemin reserves”

B21. Provisions of Sary-Chelek State Biosphere Nature Reserve

B22. An extract from the law of the Republic of Uzbekistan “On protected natural areas’

B23. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan “On establishment of the mountain-forest nature reserve in Uzbekistan” No482, dated 20.12.1947

B24. A copy of the Order by the Head Department for Forestry and Nature Protection under CM of Uzbek SSR dated 4.10.1960 “On changing the name of state mountain-forest nature reserve for Chatkal mountain-forest nature reserve”

B25. The Chatkal mountain-forest nature reserve border description

B26. Order by the State Committee for Nature Protection of the Republic of Uzbekistan “On transfer of the Chatkal state biosphere nature reserve into the jurisdiction of Tashkent Regional Khokimiat”

B27. Regulations for the Chatkal State Nature Reserve approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No262, dated 22.06.2001

B28. An extract from the Regulations for the Ugam-Chatkal National Nature Park approved by Resolution of the

Cabinet of Ministers of the Republic of Uzbekistan No262, dated 22.06.2001

B29. A copy of certificate by the Bureau of MAB International Coordination Council on awarding the Chatkal nature reserve a status of biosphere reserve, dated February 15, 1993 and endorsed by signature of UNESCO's Director General.

## PROPERTY MANAGEMENT PLANS

B30. Management Plan for the Karatau State Nature Reserve (extractions)

B31. Management Plan of Aksu-Jabagly State Nature Reserve (extractions)

B32. Management Plan of Sayram-Ugam State National Nature Park (extractions)

B33. Management plan for Besh-Aral State Reserve for the years 2013-2017 (extractions)

B34. Management plan for Padysha-Ata State Reserve for the years 2013-2017 (extractions)

B35. Management plan for Sary-Chelek State Biosphere Reserve for the years 2013-2017 (extractions)

B36. Action plan on conservation of integrity, global significance and value of Chatkal reserve biodiversity for 2010 – 2012 (extractions)

## 7C. FORM AND DATE OF MOST RECENT RECORDS OR INVENTORY OF PROPERTY

### KSNR

KSNR Annual report for 2012

«Chronicles of nature» volume for 2012

KSNR Annual report for 2011

«Chronicles of nature» volume for 2011

### AJSNR

AJSNR Annual report for 2012

«Chronicles of nature» volume for 2012

AJSNR Annual report for 2011

«Chronicles of nature» volume for 2011

### SUSNNP

SUSNNP Annual report for 2012

«Chronicles of nature» volume for 2010 год

SUSNNP Annual report for 2012

«Chronicles of nature» volume for 2009 год

### SCSBNR, PASNR, BASNR

SCSBNR, PASNR, BASNR Annual reports for 2012

«Chronicles of nature» volumes for 2012 год

SCSBNR, PASNR, BASNR Annual reports for 2011

«Chronicles of nature» volumes for 2011

### CSBNR

1. «Chronicles of nature» volume for 2012

2. «Chronicles of nature» volume for 2011

Information reports of director of the reserve for 2007-2012

## 7D. ADDRESS WHERE INVENTORY, RECORDS AND ARCHIVES ARE HELD

### **KSNR, AJSNR, SUSNNP**

Karatau State Nature Reserve  
South-Kazakhstan region,  
160400, Kentau city,  
Valikhanov street, 17  
Tel.: +7 (72536) 36965, 36966, 39008  
Fax: +7 (72536) 36965  
e-mail: karatau\_oopt@mail.ru  
Director: Zhasar Adilbaev  
Deputy Director: M. Alsheriev

Aksu-Jabagly State Nature Reserve  
South-Kazakhstan region,  
161310, Tyulkubas district,  
Jabagly village,  
Abay street, 34.  
Tel: +7 (72538) 55565  
Fax:+7 (72538) 55565  
e-mail: aksu-jabagly@rambler.ru, otdelkoturizma@mail.ru  
Director: Aytbek Menlibekov  
Deputy Director: Vaghit Mamedov

Sayram-Ugam State National Nature Park  
Shymkent, 160000,  
Ilyayeva street, 24  
Tel.: +7 (7252) 212887, 212871  
Fax: +7 (7252) 212752  
e-mail: sayram\_ugam@mail.ru  
Director: Zhenisbek Turganov  
Deputy Director: K. Zhunisov

Committee of Forestry and Wildlife  
at the Ministry of Agriculture of Kazakhstan  
010000 Astana, Left Bank, Orynbor Street,  
House of Ministries, 5th porch  
Tel: +7 (7172) 743288  
Fax: +7 (7172) 743290  
e-mail: reserve@eco.gov.kz  
Head: Bagdat Azbayev  
Deputy Head: Kayrat Ustemirov

### **SCSBNR, PASNR, BASNR**

Sary-Chelek State Biosphere Nature Reserve  
The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Arkyt village.  
Director: N. Torobekov

**Padysha-Ata State Nature Reserve**

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Kara Suu village.

Director: Mukhtar Anarkulovich Artykbayev.

+996 (3742) 60024, off.: +996 (773) 783201

Deputy director: Ermek Bekmyrzayev

**Besh-Aral State Nature Reserve**

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Chatkal region, Zhany-Bazar village

Director: Kansharbek Eshaliyev,

Phone: +996 (0772) 458565, +996 (770) 422487, 248663; fax: +996 (312) 293767;

Kangarbek78@mail.ru

Vice Director for the Research: Raikhan Amankulov

State Agency for the protection of environment and forestry under the Kyrgyz Republic government

720001 Bishkek, Toktogul street, 228

Tel. +(996-312) 35-27-27

Fax +(996-312) 35-31-02

Director Bayanbek Kadyrov

**CSBNR**

Chatkal State Biosphere Nature Reserve

702222, Uzbekistan, Tashkent obl.,

Parkent, 2 Mirsaidov str.

Tel.: (370) 7222496

Fax: (370) 7221581

Director: Z.T. Dustov

**7E. BIBLIOGRAPHY****Western Tien-Shan as whole**

Aralbaev N.K., Kudabaeva G.M., Zhaparova N.K. Gosudarstvennyy kadastr rasteniy Yuzhno-Kazakhstanskoy oblasti. Krasnaya kniga. Dikorastutschie redkie i ischezayutschie vidy rasteniy.// Almaty, 2002, 148 pp..

(State inventory of plants of South Kazakhstan region. Red Book. Wild rare and endangered plant species).

Atlas biologicheskogo raznoobraziya Zapadnogo-Tyan'-Shanya. - Bishkek, 2005 g. 103 pp. (Atlas of Biodiversity of Western Tien Shan)

Dingwall P., Weighell T. and Badman T. Geological world heritage: a global framework. A Contribution to the Global Theme Study of World Heritage Natural Sites. - Protected Area Programme, IUCN, 2005.

Dzhangaliev A.D. Dikaya yablonya Kazakhstana. Alma-Ata, 1977. 284 p. (Wild apple of Kazakhstan)

Gavrilov E.I., Gistsov A.P. Sezonnnyye perelety ptits v predgor'yakh Zapadnogo Tyan'-Shanya. Alma-Ata, 1985. 223 p. (Seasonal migration of birds in the foothills of the Western Tien Shan)

Goloskov V.P. Osobennosti vidovogo endemizma vo flore Kazakhstana (materialy k analizu «Flory Kazakhstana». //Botan. mat-ly Gerbariya In-ta botaniki AN Kaz.SSR, vyp. 6, izd. «Nauka», Alma-Ata, 1969. (Features of species endemism in the flora of Kazakhstan (materials to analyze the «Flora of Kazakhstan»))

Gvozdetskiy N.A. Prirodno-geograficheskoe rayonirovanie Sredney Azii. /V kn.: Fiziko-geograficheskoe rayonirovanie SSSR. - M.: Izd-vo MGU, 1960. (Natural and geographical regionalization of Central Asia. / In: Physical-geographical regionalization of the USSR)

Kamelin R.V. Florogeneticheskiy analiz estestvennoy flory gornoy Sredney Azii. - L., 1973. - 356 p. (Florogeneticheskiy analiz of the natural flora of the mountainous of Central Asia)

Korovin Ye.P. Rastitel'nost' Sredney Azii i Yuzhnogo Kazakhstana. - Tashkent: Iz-vo AN Uz.SSR, 1961, - Kn. 1.

- 452 p.; 1962 - Kn. 2. - 547 p. (Vegetation of Central Asia and Southern Kazakhstan)
- Korovina O.N. Dikie sorodichi kul'turnykh rasteniy Sredneaziatskogo genotsentra. Katalog mirovoy kolleksii VIR. Vyp. 351. L., 1982. - 98 p. (Wild relatives of cultivated plants of Middle Asia genetic centre. Catalog of world-wide collection)
- Krasnaya kniga Kazakhstana. Tom 1. Zhivotnye. Chast' 1. Pozvonochnye. Izdanie 4, pererabotannoe i dopolnennoe. Almaty, 2012. (Red Book of Kazakhstan . Volume 1 . Animals . Part 1. Vertebrates . 4 edition , revised and enlarged)
- Lynov Yu.S. Fenologicheskie protsessy i struktura sezonnosti gornyykh territoriy (na primere Zapadnogo Tyan'-Shanya). Tr. Chatkal'skogo biosfernogo gosudarstvennogo zapovednika. - Leningrad: Gidrometeoizdat, 1991. Vyp. 4. - 191 p. (Phonological processes and structure of the seasonality of mountain areas (for example, the Western Tien Shan ). Proceedings of Chatkal Biosphere State Reserve).
- Mashkin V.I. Sovremennyy areal i chislennost' surka Menzbira v Zapadnom Tyan'-Shane. // Byull. MOIP, otd. biol. 1984. T. 89, vyp.1. pp. 33-43. (Modern distribution and abundance of Menzbir's marmot in the western Tien Shan)
- Mitropol'skiy O.V. Bioraznoobrazie Zapadnogo Tyan'-Shanya. Materialy k izucheniyu ptits i mlekopitayutschikh v basseynakh rek Chirchik i Akhangaran (Uzbekistan, Kazakhstan). - Tashkent-Bishkek, 2005. - 166 p. (Biodiversity of Western Tien Shan . Materials for the study of birds and mammals in the basins and Akhangaran Chirchik (Uzbekistan and Kazakhstan))
- Nikitin V.V., Bondarenko O.N. Dikie sorodichi kul'turnykh rasteniy i ikh rasprostranenie na territorii SSSR. L., 1975. 69 p. (Wild relatives of cultivated plants and their distribution on the territory of the USSR)
- Pavlov V.N. - Rastitel'nyy pokrov Zapadnogo Tyan'-Shanya. - M.: Iz-vo MGU, 1980. - 246 p. (Vegetation cover of Western Tien Shan)
- Pavlov V.N. Botaniko-geograficheskoe rayonirovanie Zapadnogo Tyan'-Shanya // Byul. MOIP, otd .biol., t.XXVII, vyp. 6. (Botanical- geographical regionalization of Western Tien Shan)
- Pavlov V.N. Endemizm flory Zapadnogo Tyan'-Shanya. // Botanicheskiy zhurnal. 1970. v. 55. № 9. p. 1232-1242. (Endemism of the flora of the Western Tien - Shan)
- Pavlov V.N. Rastitel'nyy pokrov Zapadnogo Tan'-Shanya. M.: Nauka, 1980. 246 p. (Vegetation cover of Western Tien-Shan Mountains)
- Popov M.G. - Dikie plodovye derev'ya i kustarniki Sredney Azii. // Tr. Po prikladnoy botanike, genetike i selektsii. - T. 22. -Vyp. 3. L. 1929. - pp. 241-294. (Wild fruit trees and bushes of Central Asia)
- Srednyaya Aziya (seriya «Prirodnye usloviya i estestvennye resursy SSSR). Moskva, 1968. 484 p. (Central Asia (series «Natural conditions and natural resources of the USSR ))
- Viydalepp Ya.R. Fauna pyadenits gor Sredney Azii. Moskva. 1988. 240 s. (Fauna Geometridae of mountains of Middle Asia)
- Zapovedniki Sredney Azii i Kazakhstana //V serii: Zapovedniki SSSR. Pod obtsch. red. V.Ye.Sokolova i Ye.Ye. Syroechkovskogo. M.: Mysl', 1990, 390 p. (Reserves of Middle Asia and Kazakhstan / / In series: Reserves of the USSR)

## KSNR

- Adil'baev Zh.A., Alsheriev M., Sakauova G.B. Sokhranenie biologicheskogo raznoobraziya v ekosistemakh tsentral'noy chasti Karatauskogo khrepta. // V kn.: Sokhranenie bioraznoobraziya ekosistem gornyykh territoriy Kazakhstana, Almaty, 2006 (Conservation of biological diversity in ecosystems of central Karatau ridge // In: Biodiversity of Ecosystems of mountain territories of Kazakhstan)
- Adil'baev Zh.A., Sakauova G.B., Nayzabekova E.Sh. Sovremennoe sostoyanie, rasprostranenie i okhrana populyatsii yabloni Siversa na territorii Karatauskogo zapovednika // v kn.: Problemy sokhraneniya gornogo rastitel'nogo agrobiorazno-obraziya v Kazakhstane, Almaty, 2007, pp.18 -21 (Current state, dissemination and protection of the population of Sivers apple in the territory of Karatau reserve // In: Problems of conservation of mountain vegetation agrobiodiversity in Kazakhstan).
- Antipin V.M. Ocherki nazemnykh pozvonochnykh khrepta Karatau // Byull. Mosk. inst. prirody, 1955, v. 60 №

1. (Essays of terrestrial vertebrates of Karatau Ridge)
- Baytulin I.O., Sakauova G.B. Materialy k flore redkikh i endemichnykh rasteniy Karatauskogo gosudarstvennogo prirodnogo zapovednika // Izvestiya NAN RK, ser. Biol. i med., № 2.2005, p.17-23. (Materials for the flora of rare and endemic plants of Karatau State Nature Reserve // Proceedings of the National Academy of Sciences of Kazakhstan)
- Dolgushin I.A. K faune ptits Karatau // Izv. AN KazSSR, № 105, seriya zoologich., 1951, № 10. p.72-117. (On the fauna of birds of Karatau)
- Gubin B.M., Karpov F.F. Gnezdyatschiesya ptitsy Malogo Karatau (Yuzhnyy Kazakhstan) // Russkiy ornitol. zhurn. Ekspress-vypusk. 2000, № 88. p. 3-14. (Nesting birds of Lesser Karatau (Southern Kazakhstan) // Russian ornitol. journal. Express-Edition).
- Kamelin R.V. Flora Syrdar'inskogo Karatau. L. 1990. 146 p. (Flora of Syrdarya Karatau)
- Kolbintsev V.G. Sovremennoe sostoyanie populyatsiy khitschnykh ptits-nekrofagov v khrebte Karatau // Ekol. aspekty izuch., praktich. ispol'zov. i okhrany ptits v gornyykh ekosist. Frunze, 1989. p. 57-58. (Modern state of populations of necrophages birds of prey in the Karatau ridge // Ecol. aspects of study, practical use and the protection of birds in mountain ecosystems)
- Kukenov M.K., Averina V.Yu. Rasprostranenie i zapasy lekarstvennykh rasteniy v zapadnykh otrogakh Tyan'-Shanya // Izuchenie lekarstvennykh rasteniy Kazakhstana. Alma-Ata, 1988. p. 15-29. (Distribution and stocks of medicinal plants in the western spurs of the Tian Shan // Study of medicinal plants in Kazakhstan)
- Myrzakulov P.M., Baytenov M.S. K okhrane endemichnykh rasteniy khrebta Karatau // Okhrana prirody i prirodopol'zovanie v Kazakhstane. Tselinograd, 1976, p.244-246. (On protection of endemic plants of Karatau Ridge // The conservation of nature and nature use in Kazakhstan)
- Nesterova S.G., Sakauova G.B. Listostebel'nye mkhi Karatau. // Vestnik Kaz NU, ser. Biologicheskaya, № 3 (15), 2001, p.35-42. (Mosses of Karatau)

## AJSNR

- Andreeva Ye.I., Medvedeva Ye.I. Lishayniki zapovednika Aksu-Dzhabagly // Trudy gos. Zapovednika Aksu-Dzhabagly. Vyp. 2 Alma-Ata. 1965. p.146-154. (Lichens of Aksu- Dzhabagly)
- Beskokotov Yu.A. Kadastr nasekomykh zapovednika Aksu-Dzhabagly // Trudy zapovednika Aksu-Dzhabagly, vyp. 7. Almaty, 1996. p. 103-194. (Inventory of insects Aksu- Dzhabagly / / Proceedings of the Aksu-Dzhabagly , vol. 7)
- Dlusskiy G.M. Murav'i severnykh sklonov Talasskogo Alatau // Trudy Instituta zoologii AN KazSSR, t. 18, Alma-Ata, 1962. p. 177-187. (Ants of northern slopes of the Talas Alatau / / Proceedings of the Institute of Zoology of the Kazakh SSR)
- Geobotanicheskaya karta gosudarstvennogo zapovednika Aksu-Dzhabagly. M 1:25 000 (Sostavlena Akimovoy G.V. pod redaktsiyey Moysechenko N.I. i Salykulovoy O.S, Nauchnye konsul'tanty - Ishankulov M.Sh., Ivatschenko A.A.), Alma-Ata, KIO Kaz giprozem, 1991. (Geobotanical map of state reserve Aksu- Dzhabagly)
- Ivatschenko A.A. Botanicheskie issledovaniya v zapovednike Aksu-Dzhabagly // Zapovedniku Aksu-Dzhabagly 50 let. Alma-Ata. 1976. p. 41-55. (Botanical research in Aksu Dzhabagly // Aksu Dzhabagly 50 years).
- Karmysheva N.Kh. Flora i rastitel'nost' zapovednika Aksu-Dzhabagly. Alma-Ata, «Nauka», 1973. (Flora and vegetation of Aksu-Dzhabagly)
- Kovshar' A.F. Ptitsy Talasskogo Alatau. Alma-Ata, 1966. 435 p. (Birds of Talas Alatau)
- Kovshar' A.F., Ivatschenko A.A. Zapovednik Aksu-Dzhabagly (nauchno-populyarnoe izdanie). Alma-Ata, 1982. 158 p. (Aksu Dzhabagly ( popular science publication ))
- Kurmangaliev A.B., Sokolov A. A. Pochvy zapovednika Aksu-Dzhabagly // Tr. zapovednika Aksu-Dzhabagly. Vyp.2. Alma-Ata, 1965. (Soils of Aksu- Dzhabagly)
- Orlovskaya E.R. Pervyy paleontologicheskii zapovednik. V sb. Trudy zapovednika Aksu-Dzhabagly.Vyp.7, 1966. (First paleontological reserve)
- Shul'pin L.M. Materialy po mlekopitayutschim i gadam Talasskogo Alatau // Izvestiya Akademii nauk Kazakhskoy SSR, seriya zoologicheskaya. 1948, vyp. 7. S. 65-83. (Materials on mammals and reptiles of Talas Alatau //

- Proceedings of the Academy of Sciences of the Kazakh SSR , the zoological series)  
Trudy zapovednika Aksu - Dzhabagly. Vypusk 7. Flora, fauna i kh izmeneniya za 70 let. Sostavitel' A.F. Kovshar':  
- Almaty, « onzhy », 1996, - 264 p. (Proceedings of Aksu - Dzhabagly. Issue 7 . Flora, fauna and their change  
for 70 years. Compiled by A.F. Kovshar)  
Trudy zapovednika Aksu-Dzhabagly, vyp. 2 (pod red. A.F.Kovsharya i P.P. Polyakova). Alma-Ata, 1965. 263 p.  
(Proceedings of the Aksu- Dzhabagly , vol. 2 ( eds. A.F.Kovshar and P.P. Polyakov))  
Vasyagina M.P. Griby zapovednika Aksu-Dzhabagly // Trudy zapovednika Aksu-Dzhabagly. Vyp. 7. Almaty,  
1996. p. 62-75. (Mushrooms Aksu- Dzhabagly)  
Zapovedniku Aksu-Dzhabagly 50 let (Yubileynyy sbornik nauchnykh trudov pod red. A.F.Kovsharya). Alma-Ata,  
1976. 182 p. (Aksu Dzhabagly 50 years ( Jubilee collection of scientific papers , ed. A.F.Kovshar))

## SUSNNP

- Abrosimov V.A. Proekt organizatsii i razvitiya lesnogo khozyaystva Chimkentskogo (golovnogogo)  
lesokhozyaystvennogo proizvodstvennogo predpriyatiya (rukopis'). Kazakhskoe lesoustroitel'noe predpriyatie.  
Alma-Ata, 1992. (Project management and development of Shymkent forestry production enterprise (manuscript).  
Kazakh forest inventory enterprise)  
Abrosimov V.A. Proekt organizatsii i razvitiya lesnogo khozyaystva Tyul'kubasskogo lesokhozyaystvennogo  
proizvodstvennogo predpriyatiya (rukopis'). Kazakhskoe lesoustroitel'noe predpriyatie. Alma-Ata, 1993.  
(Project management and development of Tjulkubas forestry production enterprise (manuscript). Kazakh forest  
inventory enterprise).  
Kapitonov V.I., Lobachev Yu.S. Ekologicheskie nablyudeniya nad surkom Menzбира v gorakh Karzhantau (Zapadnyy  
Tyan'-Shan') // Zoologicheskii zhurnal. 1964, v. 43, vyp. 8. p. 1211-1220. (Ecological observations on the  
Menzbir's marmot in Karzhantau Mountains (Western Tien Shan)  
Mashkin V.I., Baturin A.L. Surok Menzбира. Kirov, 1993. 143 p. (Menzbir's marmot)  
Nelina N.V. Materialy k brioflore gor Mashat Talasskogo Alatau. // Bot. mat. gerb. In-ta bot. AN KazSSR. Alma-  
Ata , 1982. Vyp.12. p. 12-13 (Materials to bryoflora of Mashat mountains of Talas Alatau).  
Plakhov K.N., Kovshar' A.F. O chislennosti surka Menzбира v verkhov'yakh r. Badam i merakh po ego okhrane //   
Redkie ptitsy i zveri Kazakhstana. Alma-Ata, 1991. p.313-317 (About the number of a Menzbir's marmot in the  
upper Badam river and measures for its protection // Rare birds and animals of Kazakhstan)  
Sarzhanov Ye.M. Proekt organizatsii i razvitiya lesnogo khozyaystva Ugamskogo lesokhozyaystvennogo  
proizvodstvennogo predpriyatiya (rukopis'). Kazakhskoe lesoustroitel'noe predpriyatie. Alma-Ata, 1992.  
(Project management and development of Ugamskiy forestry production enterprise (manuscript) . Kazakh forest  
inventory enterprise)  
Urmanov Kh.Kh. i dr. Geologicheskaya karta Zapadnogo okonchaniya khr. Talasskiy Alatau v predelakh  
verkhoviy rek Aksu, Maydantal, Oygaing (khr. Maydantal'skiy). Mashtab 1:100 000 (Otchyt Sayramskoy  
geologorazvedochnoy partii za 1951). Alma-Ata, 1951. (Geological map of west closure of Talas Alatau  
Ridge within the upper reaches of Aksu , Maydantal , Oygaing (Maydantal). Scale 1:100 000 (Report of  
Sairam exploration party in 1951).  
Zeman R.V. i dr. Geologicheskaya karta Zapadnogo okonchaniya khrebta Talasskiy Alatau (geologicheskiiy  
ocherk Susingenskoy geologo-s'yomochnoy partii za 1956 god po listam K-42-69-B-6 i K-42-69-B-G.  
Mashtab 1:25 000. Alma-Ata, 1957. (Geological map of Western closure of Talas Alatau Ridge (geological  
sketch of Susingenskoy geological survey party in 1956 by sheets K- 42 - 69-B -6 and K -42- 69-B -G. 1:25  
000 scale)

## SCSBR

- Borlakov Kh.U. Rastitel'nost' i flora Sary-Chelekskogo zapovednika i perspektivy ikh ispol'zovaniya. Dissertatsiya.  
1965. (Vegetation and flora of Sary Chelek Reserve and the prospects for their use. Dissertation)  
Cheremnykh M.A. Geobotanicheskoe kartografirovaniye travyanistoy rastitel'nosti na territorii Sary-Chelekskogo

- biosfernogo zapovednika. Otchet, 1982. (Geobotanical herbaceous vegetation mapping in the Sary-Chelek Biosphere Reserve. Report, 1982)
- Kashkarov D.N. Rezul'taty ekspeditsii Glavnogo Sredneaziatskogo muzeya v rayone ozera Sary-Chelek . Tashkent 1927 (Results of expedition of Main Middle-Asia Museum near Sary-Chelek Lake)
- Letopis' prirody Sary-Chelekskogo zapovednika. 1999-2002. (Annals of Sary Chelek Nature reserve)
- Lynov Yu.S. Dinamika korennykh rastitel'nykh soobtschestv v zapovednike i razrabotka putey ikh vosstanovleniya. Otchet, 1972. (Dynamics of indigenous plant communities in the reserve and development of ways to restore them . Report, 1972)
- Lynov Yu.S. Dinamika korennykh rastitel'nykh soobtschestv v zapovednike i razrabotka putey ikh vosstanovleniya. Otchet, 1973. (Dynamics of indigenous plant communities in the reserve and development of ways to restore them . Report, 1973)
- Mambetaliev U., Shukurov E. Sary-Chelekskiy gosudarstvennyy zapovednik. Plan upravleniya 2001-2004. Bishkek: Tsentral'noaziatskiy transgranichnyy proekt GEF. 2003. (Sary Chelek State Reserve. Management Plan 2001-2004 . Bishkek Central Asia Transboundary GEF project)
- Proekt organizatsii lesnogo khozyaystva po Sary-Chelekskomu zapovedniku. Lesoustroystvo 1979-1980. (Project of organization of forestry in Sary Chelek Reserve . Forest inventory 1979-1980)
- Trudy Sary-Chelekskogo zapovednika. Vypusk 2. Frunze, 1966. (Proceedings of Sary Chelek reserve. Issue 2 .)

### PASR

- Peshkova V. O. Rastitel'nye soobtschestva v zapovednike Padisha-Ata //Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Plant communities in the reserve Padisha-Ata // Proceedings of the reserves of Kyrgyzstan)
- Tillebaev T.T. Padyshatinskiy gosudarstvennyy zapovednik // Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Padyshaata State Reserve // Proceedings of the reserves of Kyrgyzstan)

### BASR

- Amankulov R. Raspredelenie i dinamika chislennosti kopytnykh i volka na territorii Besh-Aral'skogo gosudarstvennogo zapovednika // Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Distribution and population dynamics of ungulates and wolves in the territory of Besh-Aral State Reserve // Proceedings of the reserves of Kyrgyzstan)
- Bekmyrzaev E.A. Raspredelenie, chislennost' i monitoring khitschnykh mlekopitayutshikh, vklyuchennykh v Krasnyu knigu, na territorii Besh-Aral'skogo zapovednika // Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Distribution, number and monitoring of predatory mammals included in the Red Book , in the territory of Besh-Aral reserve // Proceedings of the reserves of Kyrgyzstan)
- Davranov E., Kataevskiy V. N. Naselenie ptits Besh-Aral'skogo zapovednika. - Bishkek, 2005. (Birds population of Besh-Aral Reserve).
- Dosumbetov Z. Sovremennoe sostoyanie i monitoring pochvennogo pokrova Besharal'skogo gosudarstvennogo zapovednika // Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Current status and monitoring of soils of Besharal State Reserve // Proceedings of the reserves of Kyrgyzstan)
- Lebedeva L.P., Ionov R.N. Vliyanie zapovednogo rezhima na travyanuyu rastitel'nost' Besh-Aral'skogo zapovednika. Otchet. Bishkek, 1988. - p. 1-50. (Effect of reserve status on grass vegetation in Besh-Aral reserve. Report.)
- Mambetaliev U., Shukurov E. Besh-Aral'skiy gosudarstvennyy zapovednik. Plan upravleniya 2001-2004. Bishkek: Tsentral'noaziatskiy transgranichnyy proekt GEF. 2003. (Besh -Aral State Reserve. Management Plan 2001-2004 . Bishkek Central Asia Transboundary GEF project)
- Sultanbekov K. Raspredelenie, ekologiya i chislennost' surka Menzbira i drugikh predstaviteley otryada gryzunov Besharal'skogo gosudarstvennogo zapovednika // Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Distribution, ecology and population of Menzbir's marmot and other species of rodents of Besharal State Reserve // Proceedings of the reserves of Kyrgyzstan)
- Turusbekov A. K. Svremennoe sostoyanie redkikh i ischezayutshikh vidov ptits Besh - Aral'skogo gosudarstvennogo zapovednika // Trudy zapovednikov Kyrgyzstana - Bishkek, 2005. (Modern status of rare and endangered species of birds of Besh-Aral State Reserve // Proceedings of the reserves of Kyrgyzstan)

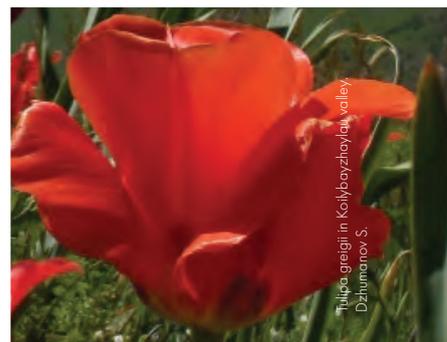
## CSBR

- Abdullaev Kh.A., Darveshov Z.D., Abdurakhmanov T.A., Ibragimov D.K. Pochva zapovednykh otrogov Chatkal'skogo khrebtta. // Povyshenie plodorodiya pochv i effektivnosti udobreniy. - Tashkent, 1984. (Soil of protected spurs of Chatkal ridge // Improvement of soil fertility and fertilizer efficiency)
- Butkov E.A. Sostoyanie archovykh lesov Chatkal'skogo biosfernogo gosudarstvennogo zapovednika. // Trudy Chatkal'skogo biosfernogo gosudarstvennogo zapovednika. - Tashkent, 2004. Vyp. V. p. 19-60. (Condition of juniper forests of Chatkal Biosphere State Reserve. // Proceedings of Chatkal Biosphere State Reserve.)
- Chernogaev Ye.A., Dustov Zh., Chikin Yu.A. Chatkal'skiy zapovednik. // Unikal'nye prirodnye kompleksy Sredney Azii i Kazakhstana. Predlozheniya dlya vkluycheniya v spisok Vsemirnogo prirodnogo naslediya YuNYeSKO.- Moskva, 2005. p. 117-124, 165-168. (Chatkal Reserve // Unique natural complexes of Central Asia and Kazakhstan. Proposals for inclusion in the list of UNESCO World Heritage Sites)
- Dustov D., Lanovenko Ye.N., Chinov V. Otsenka sovremennogo sostoyaniya krupnykh mlekopitayuschikh v Chatkal'skom zapovednike. // Bioraznoobrazie Zapadnogo Tyan'-Shanya: okhrana i ratsional'noe ispol'zovanie. - Tashkent: Chinor ENK, 2002. p. 85-88. (Assessment of the current state of large mammals in Chatkal reserve // Biodiversity of Western Tien Shan: the protection and rational use.)
- Golovtsov D.Ye. Pozvonochnye zhivotnye Chatkal'skogo zapovednika. // Tr. Chatkal'skogo gosudarstvennogo biosfernogo zapovednika - Tashkent, 2007. Vyp. VI. p. 178-220. (Vertebrates of Chatkal reserve. // Proceedings of Chatkal State Biosphere Reserve)
- Korelov M.N. Fauna pozvonochnykh Bostandykskogo rayona. // Priroda i khozyaystvennye usloviya gornoy chasti Bostandyka. - Alma-Ata: AN KazSSR, 1956. p. 259-325. (Vertebrate fauna of Bostandyksky district // Nature and economic conditions of mountainous part of Bostandyk)
- Krasovskaya L.S., Levichev I.G. Flora Chatkal'skogo zapovednika. - Tashkent: Fan UzSSR, 1986. - 176 p. (Flora of Chatkal Reserve)
- Lanovenko Ye.N. Znachenie Chatkal'skogo zapovednika dlya sokhraneniya bioraznoobraziya ptits v uzbekistanskoy chasti Zapadnogo Tyan'-Shanya. // Bioraznoobrazie Zapadnogo Tyan'-Shanya: okhrana i ratsional'noe ispol'zovanie. - Tashkent: Chinor ENK, 2002. p. 126-129. (Value of Chatkal reserve for conservation of bird biodiversity in the Uzbekistan part of the Western Tien Shan // Biodiversity of Western Tien-Shan : the protection and rational use)
- Tal'skikh V.N., Mustafaeva Z.A., Gerasimova O.D., Abdurakhimova A.N. Taksonomicheskoe raznoobrazie biotsenozov perifitona i zoobentosa v vodotokakh Chatkal'skogo zapovednika. Tr. Chatkal'skogo gosudarstvennogo biosfernogo zapovednika. - p. 111-131. (Taxonomic diversity of biocoenosis of periphyton and zoobenthos in streams of Chatkal reserve // Proc. of Chatkal State Biosphere Reserve)
- Tozhibaev K.Sh. Spisok sosudistykh rasteniy Chatkal'skogo biosfernogo zapovednika. // Tr. Chatkal'skogo gosudarstvennogo biosfernogo zapovednika. - p. 64-95. (List of vascular plants of Chatkal Biosphere Reserve. // Proc. of Chatkal State Biosphere Reserve)
- Vashetko E.V., Chebotarev S.O. Predvaritel'nyy obzor vidov bespozvonochnykh Chatkal'skogo zapovednika // Tr. Chatkal'skogo gosudarstvennogo biosfernogo zapovednika. - Tashkent, 2007. Vyp. VI. p. 132-177. (Preliminary review of invertebrate species of Chatkal reserve // Proceedings of Chatkal State Biosphere Reserve)
- Vashetko E.V., Yesipov A.V., Khodzhaev A.F. O vidovom sostave gerpetofauny Chatkal'skogo biosfernogo zapovednika. // Zoologicheskie issledovaniya v regionakh Rossii i sopredel'nykh territoriy. Tez. Dokl. - Nizhniy Novgorod, 2002. p. 95-96. (About the species composition of the herpetofauna of Chatkal Biosphere Reserve. // Zoological research in the regions of Russia and adjacent territories)
- Yesipov A.V. Sostoyanie izolirovannoy Chimganskoy populyatsii surka Menzbira. // Mezhdunarodnaya konferentsiya po surkam. - Tashkent: Chinor ENK, 2005. p. 50-51. (Status of isolated Chinghan population of Menzbir's marmot // International Conference on Marmots)
- Yesipov V.M. Chatkal'skiy zapovednik. // Zapovedniki Sovetskogo Soyuz. - Moskva: Kolos, 1969. p. 486-494. (Chatkal Reserve // Reserves of Soviet Union)



# 8

## CONTACT INFORMATION OF RESPONSIBLE AUTHORITIES



Tulipa greigii in Kalybozhtaylak valley,  
Dzhumenov S.

### 8A. PREPARER

#### KSNR, AJSNR, SUSNNP

##### **1. Name: Sergey Sklyarenko (including compiling and editing of nomination as whole)**

Title: Science Director, Head of the Centre for Conservation Biology of the Association for the Conservation of Biodiversity of Kazakhstan (ACBK)

Address: Orbita-1 district, 40, off. 203

City, Province/State, Country: Almaty, 050043, Kazakhstan

Tel: +7 - 727 - 2203877

Fax: +7 - 727 - 2203877

E-mail: sergey.sklyarenko@acbk.kz

##### **2. Name: Muratbek Muzhubayev**

Title: Leading specialist of Forestry and PA Department of the Committee of Forestry and Wildlife at the Ministry of Agriculture of Kazakhstan

House of Ministries, 5th porch, Left Bank, Orynbor Street,

City, Province/State, Country: Astana, Kazakhstan

Tel: +7 (7172) 743288

Fax: +7 (7172) 743290

e-mail: reserve@eco.gov.kz

#### SCSBNR, PASNR, BASNR.

##### **1. Name: Emil Shukurov**

Title: Director of "Aleine" Ecological Movement of Kyrgyzstan (NGO)

Address: Sovetskaya str., 137, app. 7

City, Province/State, Country: Bishkek, Kyrgyzstan

Tel: +996 – 312 - 298450

Fax: +996 – 312 - 680418

E-mail: shukurovemil@mail.ru

##### **2. Name: Iliya Domashov**

Title: Deputy chairman of the board of "BIOM" Ecological Movement (NGO)

Address: Molodaya Gvardiya str., 74, app. 106

City, Province/State, Country: Bishkek, Kyrgyzstan

Tel: +996 – 312 – 650136, 614501

Fax: +996 – 312 – 650136, 614501

E-mail: idomashov@gmail.com

### 3. Name: Kylychbek Zhundubayev

Title: Head of the Group of expert&analitical support of Department of international cooperation and programs of State agency for protection of environment and forestry under Government of the Kyrgyz Republic

Adress: 42, Gorkiy str.

City, Province/State, Country: Bishkek, Kyrgyzstan

Tel./fax: + 996 312 90-06-95

mob.: + 996 554 58-45-99

e-mail: min-eco@elcat.kg; kylychbekkg@gmail.com;

### 4. Name: Elnura Korchueva

Title: Secretary general of the National commission of the Kyrgyz Republic for UNESCO, the sector for culture programs

Address: 54, Erkendik ave.

City, Province/State, Country: Bishkek, Kyrgyzstan

Tel./fax + 996 312 62-67-61

e-mail: kyrgyznatcomunesco@gmail.com

## CSBNR

### 1. Name: Alexander Grigoriants

Title: Head of the Department of Control of Biological Resouces of State Committee for Nature Protection of the Republic of Uzbekistan

Address: Chashtepinskaya str., 21a

City, Province/State, Country: Tashkent, 100149, Uzbekistan

Tel: +998 371 215 79 36

Fax: +998 371 215 79 36

E-mail: a.grigor50@mail.ru

### 2. Name: Alexander Esipov

Title: Deputy director of Chatkal nature reserve

Address: Mirsaidov str., 2

City, Province/State, Country: Parkent, 102222, Tashkent region, Uzbekistan

Tel.: (370) 7222496

Fax: (370) 7221581

E-mail: esipov@sarkor.uz

### 3. Name: Yuriy Lynov

Title: senior research scientist of Chatkal nature reserve

Address: Mirsaidov str., 2

City, Province/State, Country: Parkent, 102222, Tashkent region, Uzbekistan

Tel.: (370) 7222496

Fax: (370) 7221581

### 4. Name: Gulshad Shagiakhmetova

Title: leading specialist of the Department of Control of Biological Resouces of State Committee for Nature Protection of Uzbekistan

Address: Chashtepinskaya str., 21a

City, Province/State, Country: Tashkent, 100149, Uzbekistan

Tel: +998 371 215 79 35

Fax: +998 371 215 79 36

E-mail: gulya8205@rambler.ru

**5. Name: Denis Nuridzhanov**

Title: specialist of the Department of Control of Biological Resources of State Committee for Nature Protection of Uzbekistan

Address: Chashtepinskaya str., 21a

City, Province/State, Country: Tashkent, 100149, Uzbekistan

Tel: +998 371 215 80 61

Fax: +998 371 215 79 36

E-mail: nuridjanov@mail.ru

**GENERAL CONSULTATIONS AND PARTICIPATION IN SOME CHAPTERS****1. Name: Alexey Butorin (general consultations)**

Title: President of the Natural Heritage Protection Fund

Address: Vyborgskaya str., 8-3, 125212

City, country: Moscow, Russian Federation

Telephone: (499) 159 83 20, (910) 414 53 15

Fax: (499) 159 83 20

e-mail: heritage1@yandex.ru

**2. Name: Nikolay Maksakovskiy (chapter 3.2. Comparative analyses)**

Title: Chief science researcher of the Russian Institute for Cultural and Natural Heritage

Address: Kosmonavtov str., 2

City, country: Moscow, Russian Federation

Telephone: (917) 528 78 95

Fax: (499) 159 83 20

e-mail: nmaks2007@rambler.ru

**3. Geoff Welch (biodiversity table, criterion formulations, consultations)**

Title: International Management Plans Adviser, RSPB

Address: The Lodge, Sandy

City, country: Bedfordshire SG19 2DL, UK

Direct dial: +44 (0)1767 693578; mobile +44 (0)7766 852 304

e-mail: geoff.welch@rspb.org.uk

**4. Chris Magin (participation in editing, consultations)**

Title: International Officer - Africa, in RSPB

Address: The Lodge, Sandy

City, country: Bedfordshire SG19 2DL, UK

Tel: (direct office line): + 44 (0)1767 693583

Fax: +44 (0)1767 683211

Mobile +44 (0)7764 656484

e-mail: chris.magin@rspb.org.uk

**5. Natalia Ogar (part on Western Tien-Shan as a Center of Origin of Cultivated Plants)**

Title: Deputy director, Head of Science Department of Enterprise "GIS-Terra"

Address: 83 Zhanabayev str., Kok-Tobe micro-district,

City, country: Almaty, 050010, Kazakhstan

Tel. +7 727 2939427

fax +7 727 2917887

e-mail: ogar@gis-terra.kz

## 6. Feruza Tleuberdina (paleontology information)

Title: Chief science researcher of Institute of Zoology of MES RK  
Address: 93 Al-Farabi str.,  
City, country: Almaty, 050060, Kazakhstan  
Tel. +7 727 2694876  
fax +7 727 2694870  
e-mail: feruz.bio@mail.ru

## 8B. OFFICIAL LOCAL INSTITUTION/AGENCY

### **KSNR, AJSNR, SUSNNP**

Karatau State Nature Reserve  
South-Kazakhstan region,  
160400, Kentau city,  
Valikhanov street, 17  
Tel.: +7 (72536) 36965, 36966, 39008  
Fax: +7 (72536) 36965  
e-mail: info@karatau-gpz.kz, adminsource@karatau-gpz.kz  
Director: Zhasar Adilbaev  
Deputy Director: M. Alsheriev

Aksu-Jabagly State Nature Reserve  
South-Kazakhstan region,  
161310, Tyulkubas district,  
Jabagly village,  
Abay street, 34.  
Tel: +7 (72538) 55565  
Fax: +7 (72538) 55565  
e-mail: aksu-jabagly@rambler.ru, otdelekturizma@mail.ru  
Director: Aytbek Menlibekov  
Deputy Director: Vaghit Mamedov

Sayram-Ugam State National Nature Park  
Shymkent, 160000,  
Ilyayeva street, 24  
Tel.: +7 (7252) 212887, 212871  
Fax: +7 (7252) 212752  
e-mail: sayram\_ugam@mail.ru  
Director: Zhenisbek Turganov  
Deputy Director: K. Zhunisov

Committee of Forestry and Wildlife  
at the Ministry of Agriculture of Kazakhstan  
010000 Astana, Left Bank, Orynbor Street,  
House of Ministries, 5th porch  
Tel: +7 (7172) 743288  
Fax: +7 (7172) 743290  
e-mail: reserve@eco.gov.kz  
Head: Bagdat Azbayev  
Deputy Head: Kayrat Ustemirov

**SCSBNR, PASNR, BASNR**

Sary-Chelek State Biosphere Nature Reserve

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Arkyt village.

Director: N. Torobekov

Padysya-Ata State Nature Reserve

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Kara Suu village.

Director: Mukhtar Anarkulovich Artykbayev.

+996 (3742) 60024, off.: +996 (773) 783201

Deputy director: Ermek Bekmyrzayev

Besh-Aral State Nature Reserve

The Kyrgyz Republic, Jalal-Abad oblast, Aksyi region, Chatkal region, Zhany-Bazar village

Director: Kansharbek Zhanybekovich Eshaliyev,

Phone: +996 (0772) 458565, +996 (770) 422487, 248663; fax: +996 (312) 293767;

Kangarbak78@mail.ru

Vice Director for the Research: Raikhan Amankulov

State Agency for the protection of environment and forestry under the Kyrgyz Republic government.

720001 Bishkek, Toktogul street, 228

Tel. +(996-312) 35-27-27

Fax +(996-312) 35-31-02

Director Bayanbek Kadyrov

**CSBNR**

Chatkal State Biosphere Nature Reserve

The reserve is state enterprise under control of Tashent regional authorities ("khakimiyat"):

100060, Tashkent, Timur alley, 15

Tel: (371) 2336740

Khakim: R. Kholmatov

At the local level, the management is implemented by Ugam-Chatkal State National Nature Park:

102180, Bostandyk district, Kurgan Iskandar, Furkat str. 112

Tel: (8-274) 22-026, 28-153

Fax: (8-274) 20-114

General Director: A. Abduzhamilov

The management of the object itself at the "ground" level is being done by Chatkal state biosphere reserve administration:

Mirsaidov str., 2; Parkent, 102222, Tashkent region, Uzbekistan

Tel.: (370) 7222496

Fax: (370) 7221581

Director: D. Dustov

**8c. OTHER LOCAL INSTITUTIONS****KSNR, AJSNR, SUSNNP**

Kazakhstan Tourist Association (KTA)

174 Tulebayev str., Almaty, Republic of Kazakhstan, 050000

тел.: +7 (727) 2 72 40 30, 2 72 58 72, 2 72 40 33,

факс: +7 (727) 2 72 39 92

kta@kaztour-association.com,

<http://www.kaztour-association.com>

Ecotourism information resource centre  
174 Tulebayev str., Almaty, Republic of Kazakhstan,  
050000  
Tel.: +7 (727) 272 53 63, fax: +7 (727) 272 39 60  
E-mail: [ecocentre.kz@gmail.com](mailto:ecocentre.kz@gmail.com)  
<http://www.eco-tourism.kz>

### SCSBNR, PASNR, BASNR

Department of Tourism under Ministry of Culture, Information  
and Tourism  
Agroprom building, 96-B Kiyevskaya str., Bishkek,  
Kyrgyzstan  
Tel./fax +996 312 621861

### CSBNR

"Uzbek Tourism" National Company  
47 Istyklol str., Tashkent, 1000047, Uzbekistan  
Tel.: +(998 71) 2335414  
Fax: +(998 71) 2338068  
E-mail: [info@uzbektourism.uz](mailto:info@uzbektourism.uz)  
Web: [www.uzbektourism.uz](http://www.uzbektourism.uz)

## 8D. OFFICIAL WEB ADDRESS

### KSNR

<http://www.karatau-gpz.kz>

### SUSNNP

<http://www.sugnpp.kz>

### AJSNR

<http://www.aksu-jabagly.kz>

### SCSBNR, PASNR, BASNR.

<http://www.welcome.kg/ru/reserve>

### CSBNR.

planned; a contact person: Alexander Esipov  
Tel: (+99897) 3303674  
E-mail: [esipov@sarkor.uz](mailto:esipov@sarkor.uz)



# 9

## SIGNATURE ON BEHALF OF THE STATE PARTY

### **On behalf of responsible authority of Republic of Kazakhstan**

*Position:*

*Name:*

*Signature:*

*Date:*

### **On behalf of responsible authority of Kyrgyz Republic**

*Position:*

*Name:*

*Signature:*

*Date:*

### **On behalf of responsible authority of Republic of Uzbekistan**

*Position:*

*Name:*

*Signature:*

*Date:*



Sayransu Lake, Kenbay T.

# ANNEXES

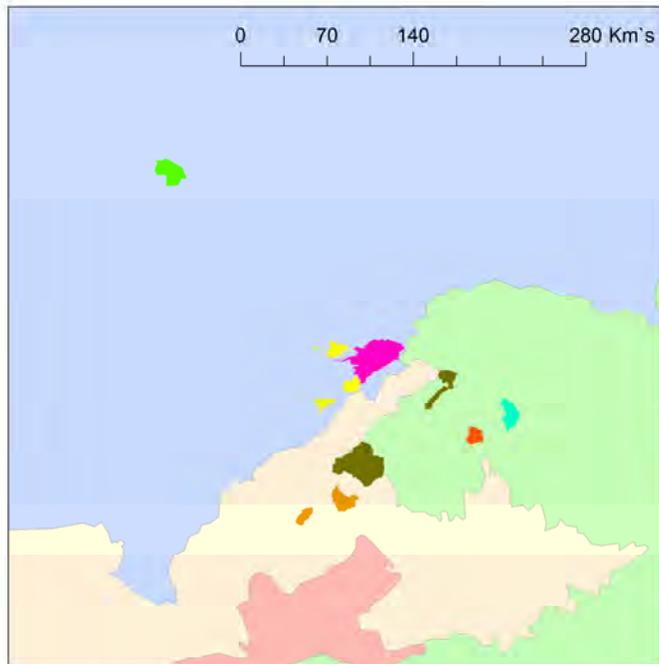


# ANNEX A

## MAPS

- A1. Administrative map of Central Asia and Kazakhstan with indication of the proposed territory
- A2. Topographic map of Western Tien-Shan with property boundaries. Scale: 1:1,000,000
- A3. Topographic map of Karatau State Nature Reserve. Scale: 1: 300,000
- A4. Topographic map of Aksu-Jabagly State Nature Reserve. Scale: 1: 300,000
- A5. Topographic map of Sairam-Ugam State National Nature Park. Scale: 1: 300,000
- A6. Topographic map of Sary-Chelek State Biosphere Nature Reserve. Scale: 1: 300,000
- A7a, b. Topographic maps of Besh-Aral State Nature Reserve. Scale: 1: 300,000
- A8. Topographic map of Padysha-Ata State Nature Reserve. Scale: 1: 300,000
- A9. Topographic map of Chatkal State Biosphere Nature Reserve. Scale: 1: 300,000

# Administrative map of Central Asia and Kazakhstan with indication of the proposed territory



## Legend

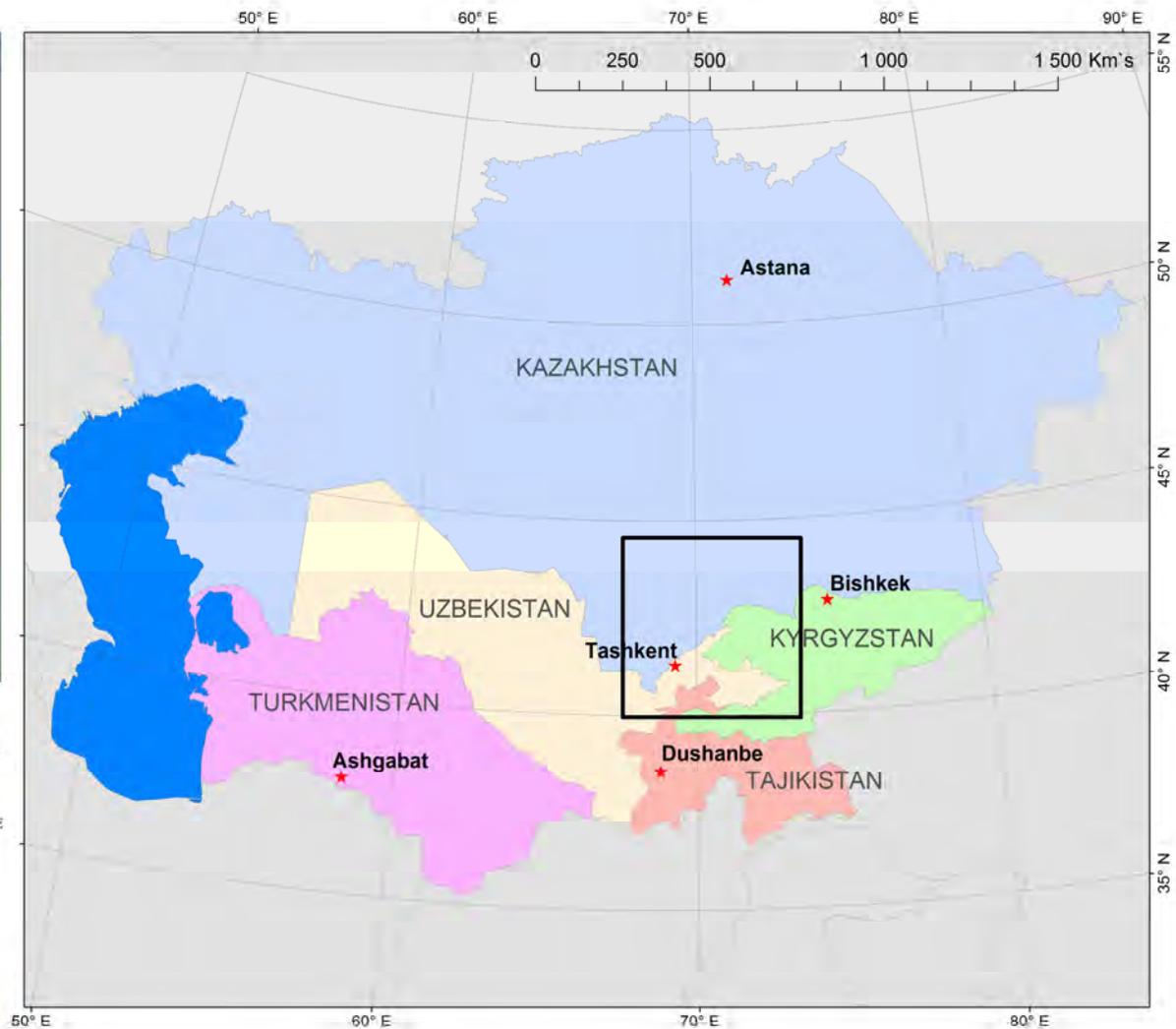
### Proposed territory

- Aksu-Zhabagly
- Karatauskiy
- Sayram-Ugamskiy
- Chatkalskiy
- Sary-Chelek
- Padysha-Ata
- Besh Aral

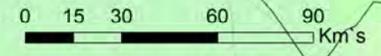
Projection: Lambert Conformal Conic  
 Datum: WGS 1984  
 Central Meridian: 67,0  
 Standart Parallel 1: 43,0  
 Standart Parallel 2: 53,0  
 Latitude of Origin: 40,0



Association  
 for the Conservation  
 of Biodiversity of Kazakhstan



# Topographic map of West Tien Shan with property and buffer zone boundaries



Projection: Lambert Conformal Conic  
Datum: WGS 1984  
Central Meridian: 67,0  
Standart Parallel 1: 43,0  
Standart Parallel 2: 53,0  
Latitude of Origin: 40,0

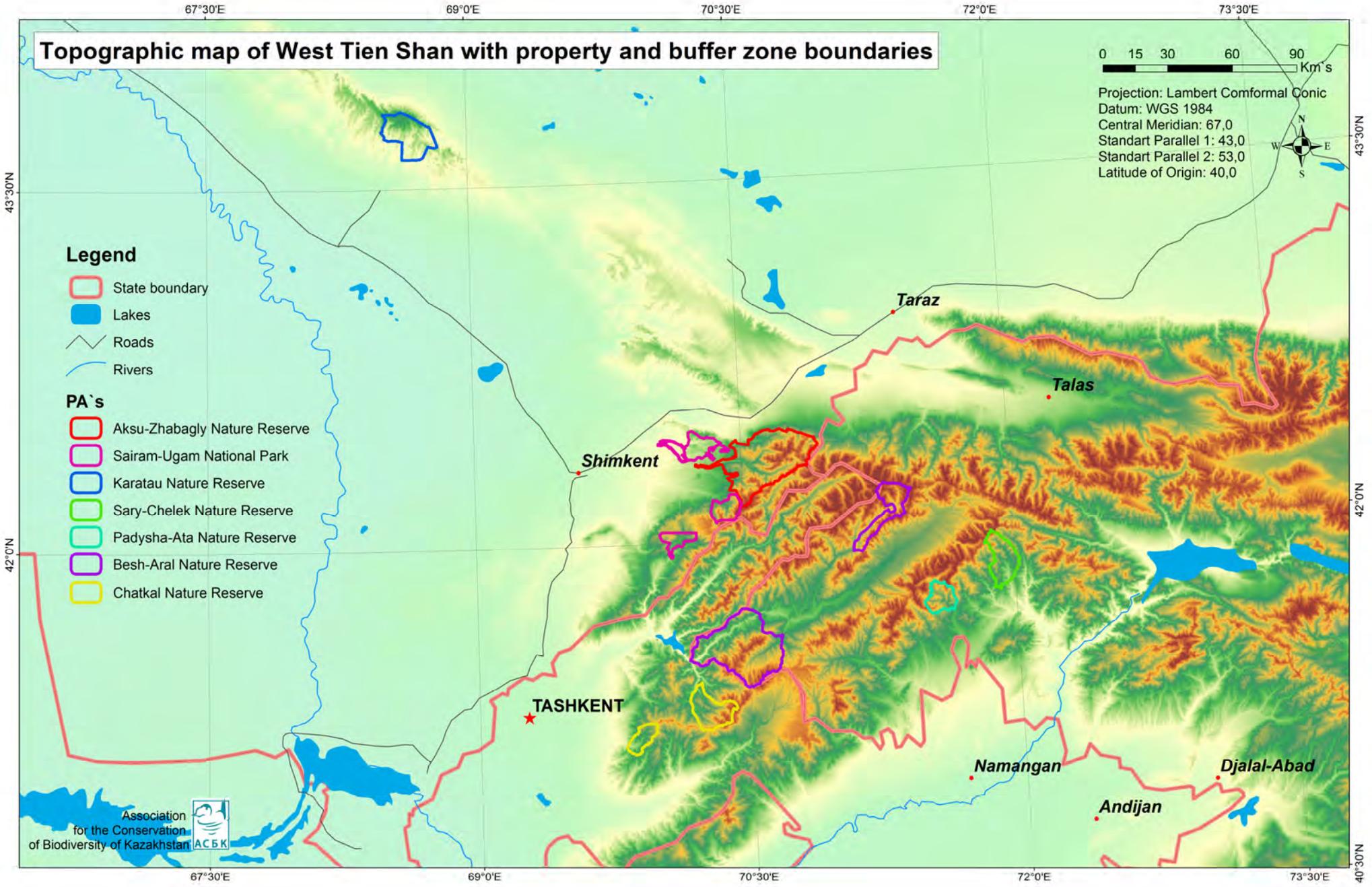


## Legend

- State boundary
- Lakes
- Roads
- Rivers

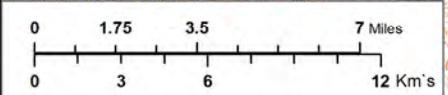
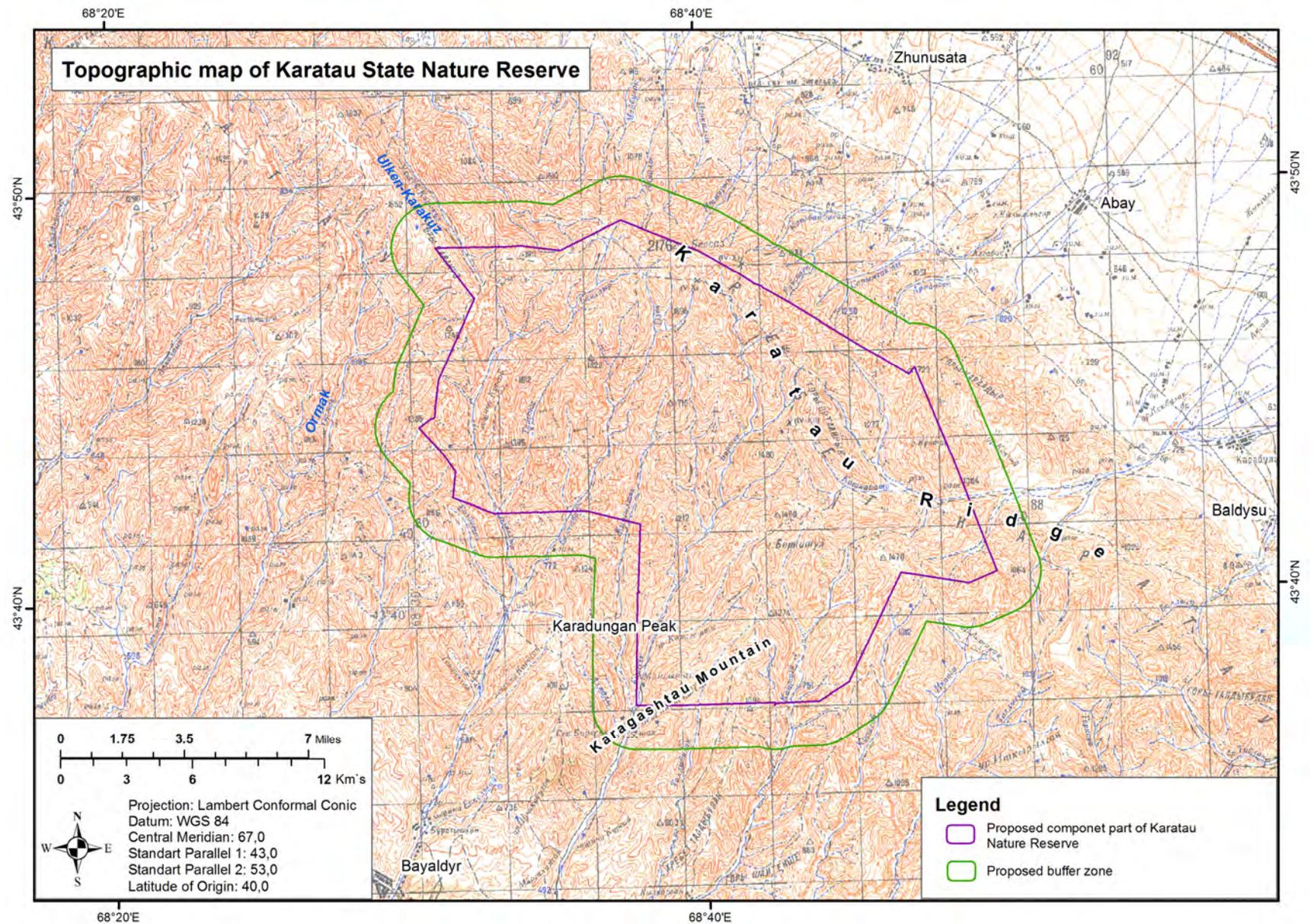
## PA's

- Aksu-Zhabagly Nature Reserve
- Sairam-Ugam National Park
- Karatau Nature Reserve
- Sary-Chelek Nature Reserve
- Padysha-Ata Nature Reserve
- Besh-Aral Nature Reserve
- Chatkal Nature Reserve



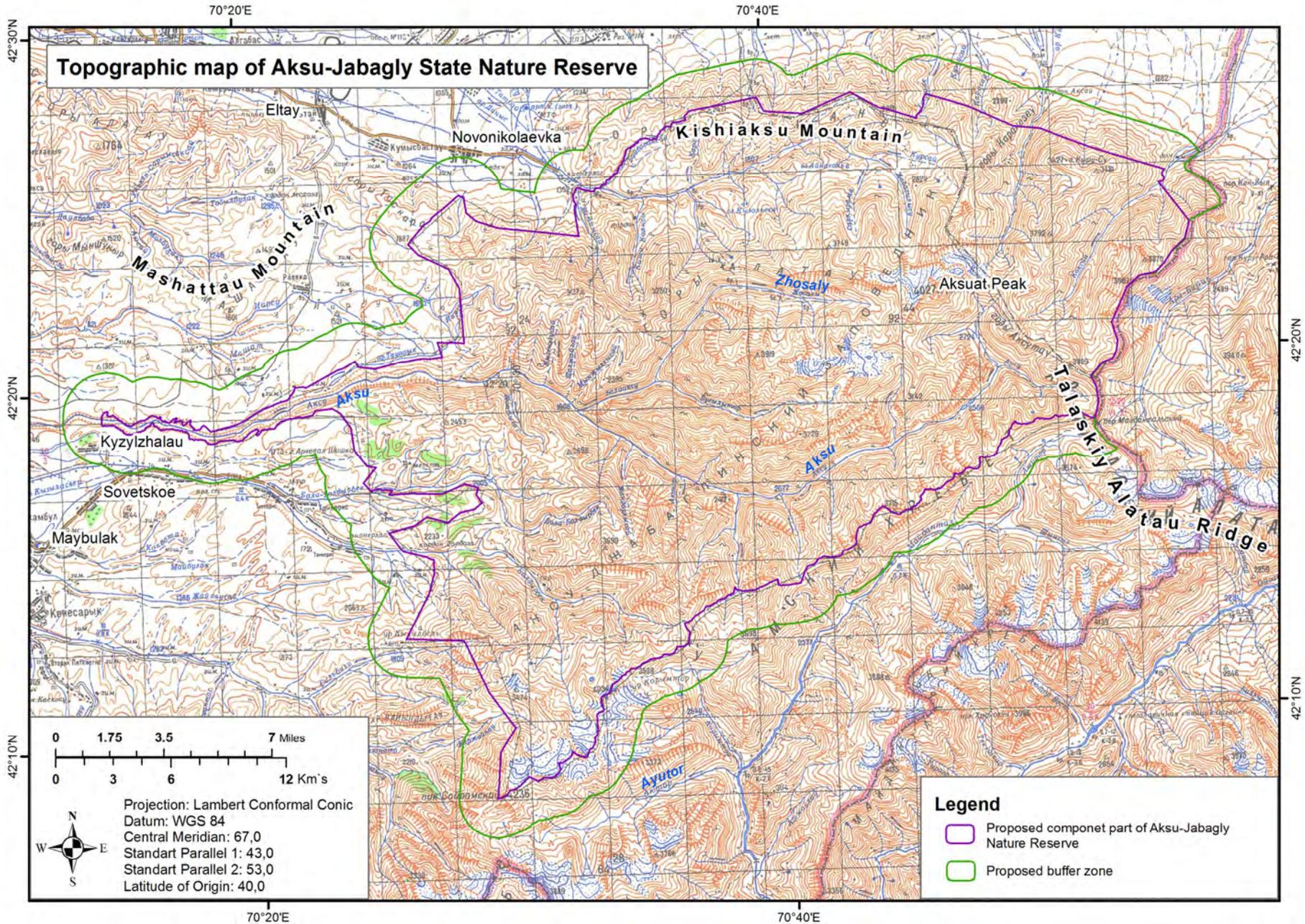
67°30'E 69°0'E 70°30'E 72°0'E 73°30'E  
43°30'N 42°0'N 40°30'N

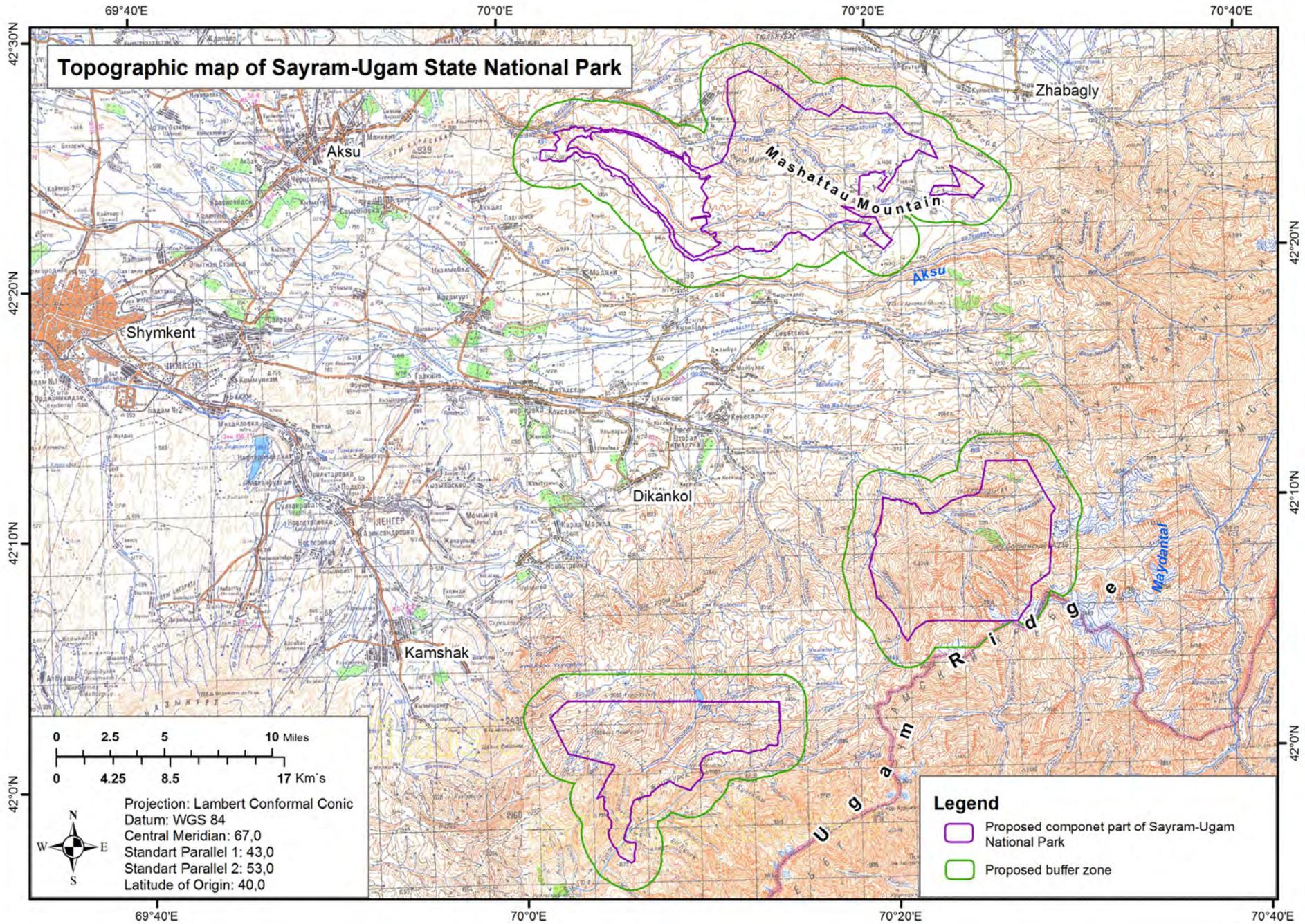
# Topographic map of Karatau State Nature Reserve



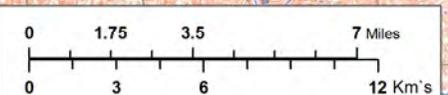
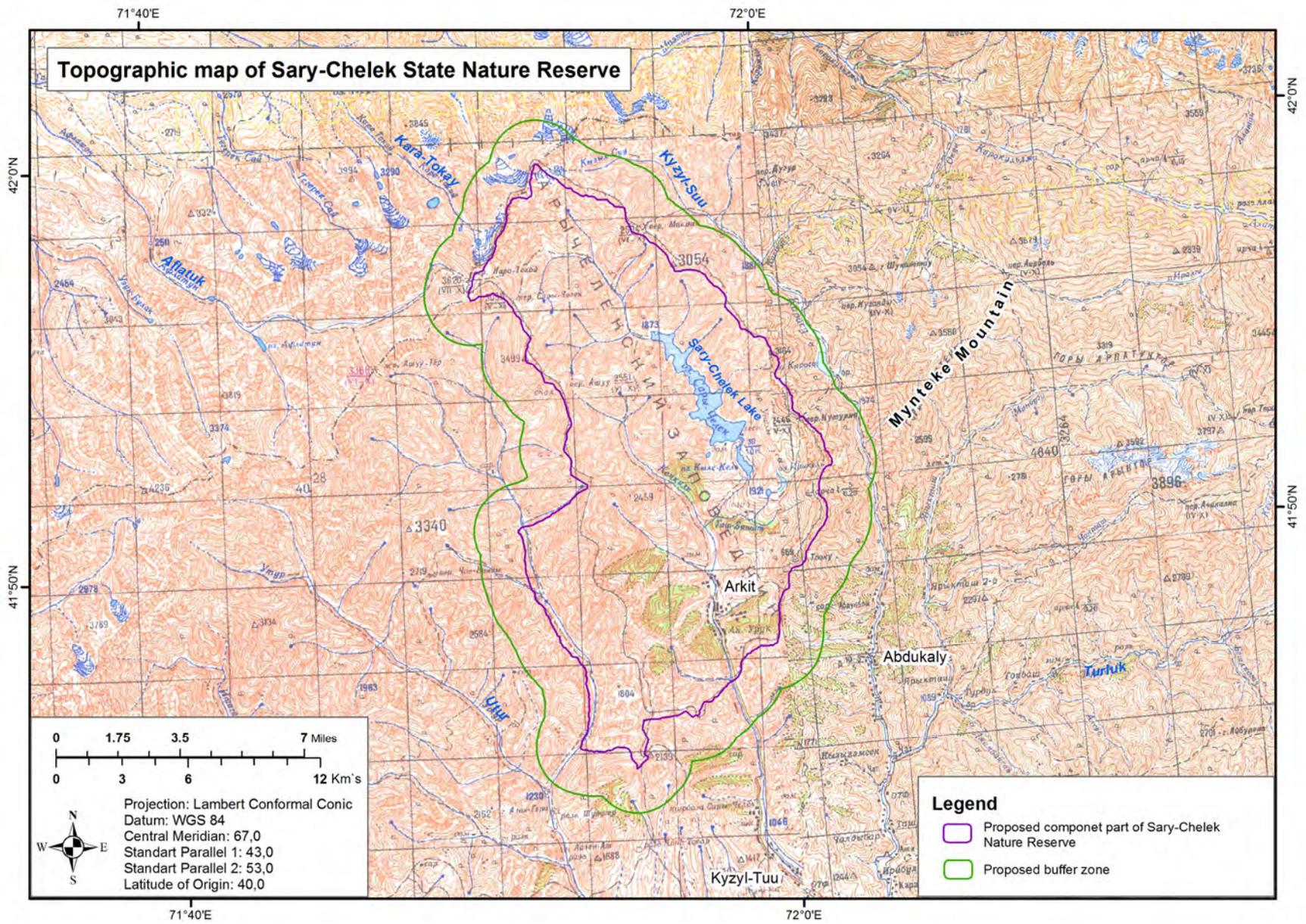
Projection: Lambert Conformal Conic  
Datum: WGS 84  
Central Meridian: 67,0  
Standart Parallel 1: 43,0  
Standart Parallel 2: 53,0  
Latitude of Origin: 40,0

- Legend**
- Proposed component part of Karatau Nature Reserve
  - Proposed buffer zone





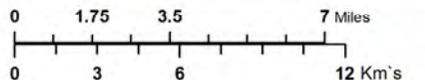
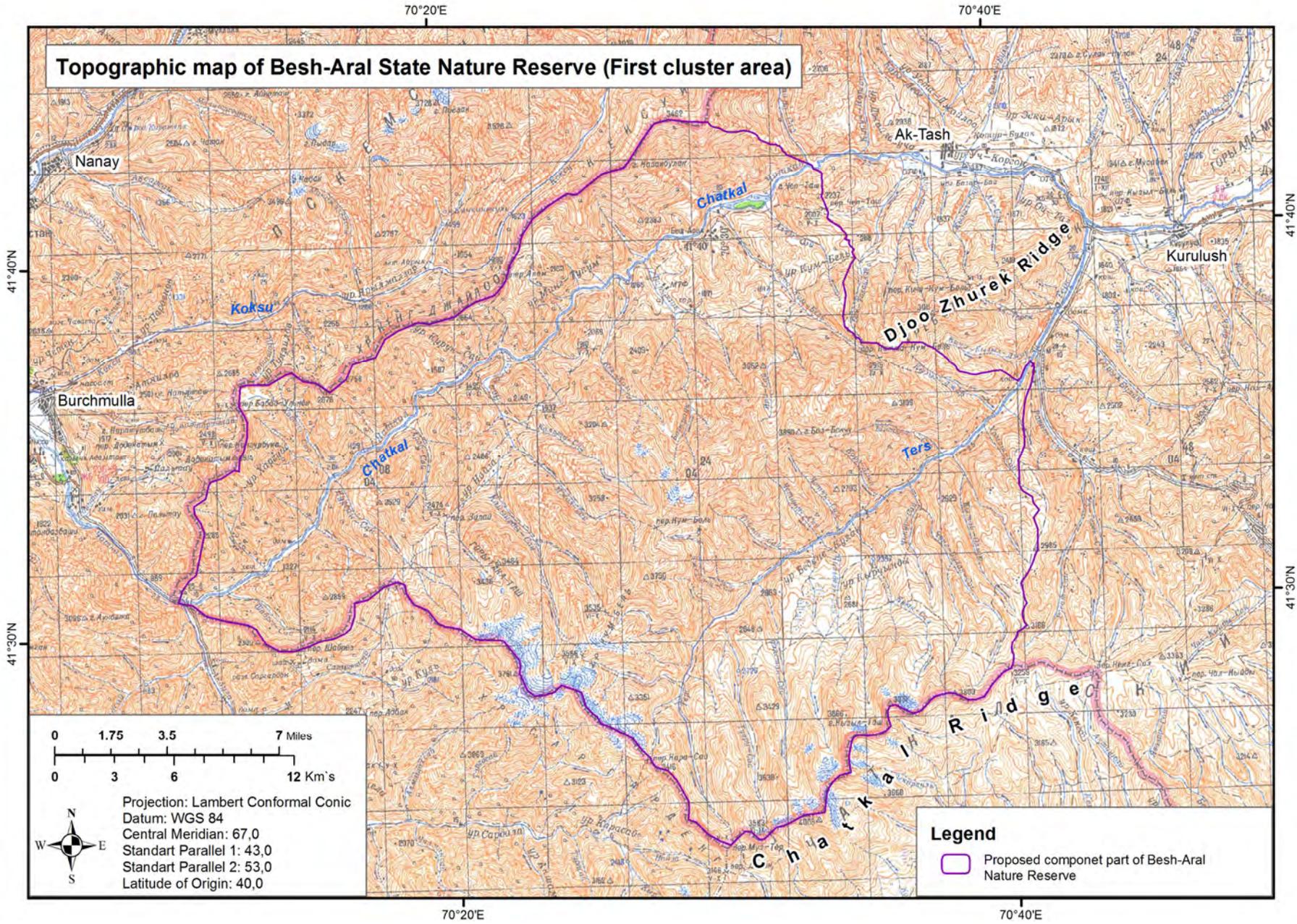
Topographic map of Sary-Chelek State Nature Reserve



Projection: Lambert Conformal Conic  
Datum: WGS 84  
Central Meridian: 67,0  
Standart Parallel 1: 43,0  
Standart Parallel 2: 53,0  
Latitude of Origin: 40,0

- Legend**
- Proposed component part of Sary-Chelek Nature Reserve
  - Proposed buffer zone

**Topographic map of Besh-Aral State Nature Reserve (First cluster area)**

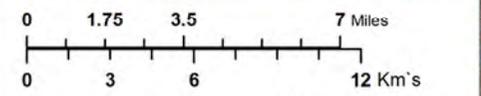
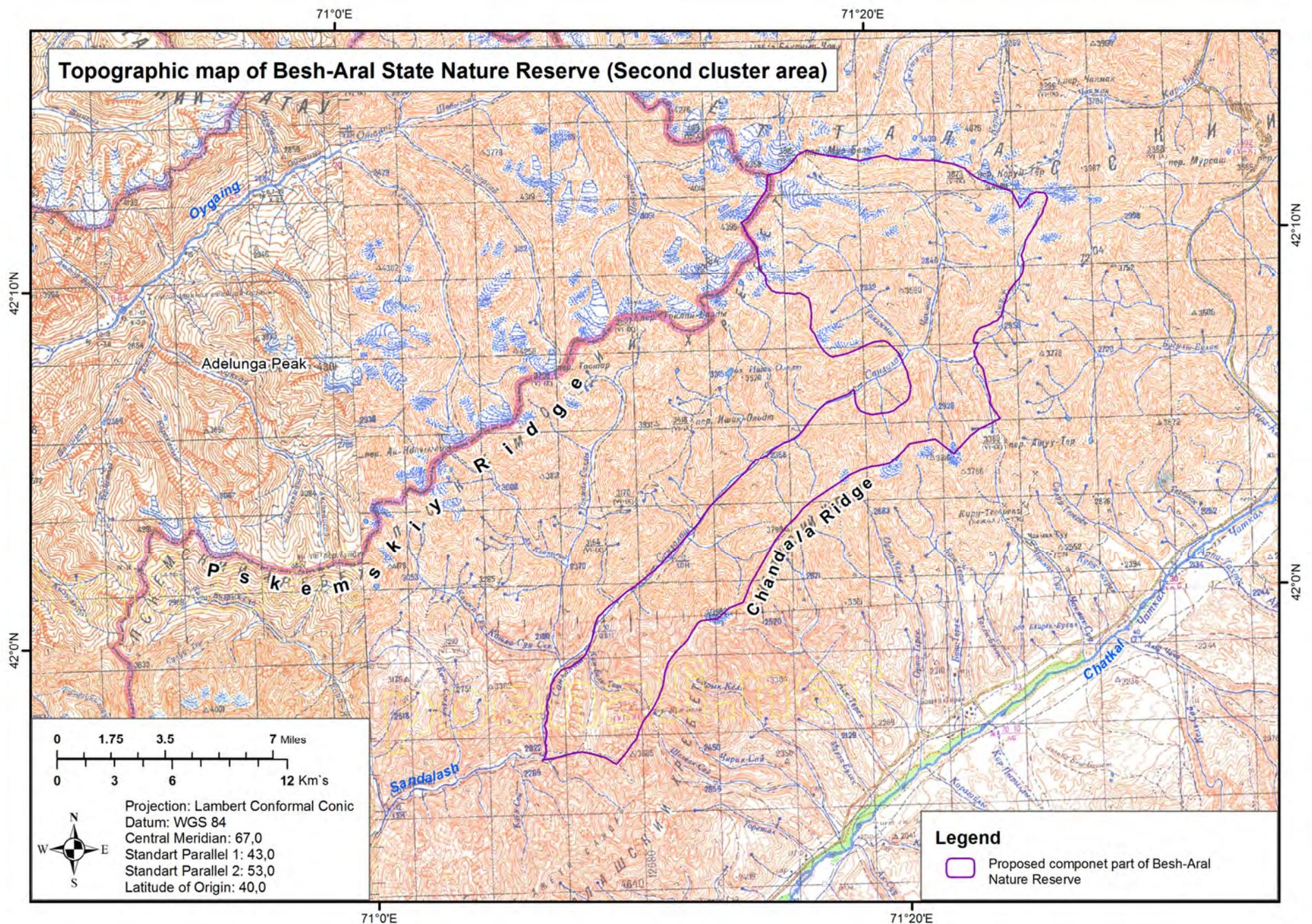


Projection: Lambert Conformal Conic  
Datum: WGS 84  
Central Meridian: 67,0  
Standart Parallel 1: 43,0  
Standart Parallel 2: 53,0  
Latitude of Origin: 40,0

**Legend**

 Proposed component part of Besh-Aral Nature Reserve

# Topographic map of Besh-Aral State Nature Reserve (Second cluster area)

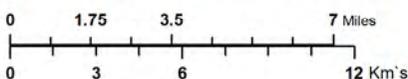
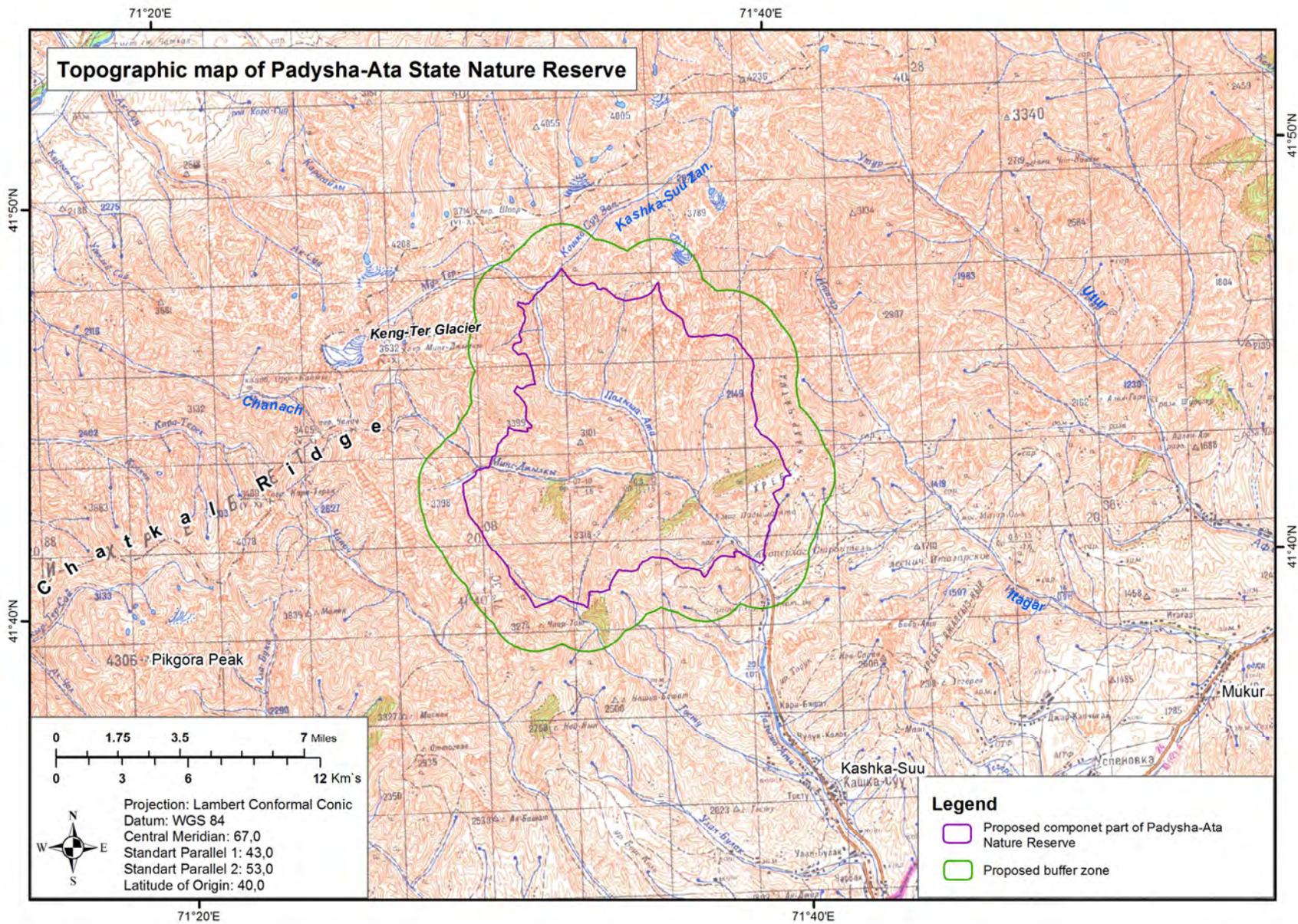


Projection: Lambert Conformal Conic  
Datum: WGS 84  
Central Meridian: 67,0  
Standart Parallel 1: 43,0  
Standart Parallel 2: 53,0  
Latitude of Origin: 40,0

### Legend

 Proposed component part of Besh-Aral Nature Reserve

# Topographic map of Padysha-Ata State Nature Reserve

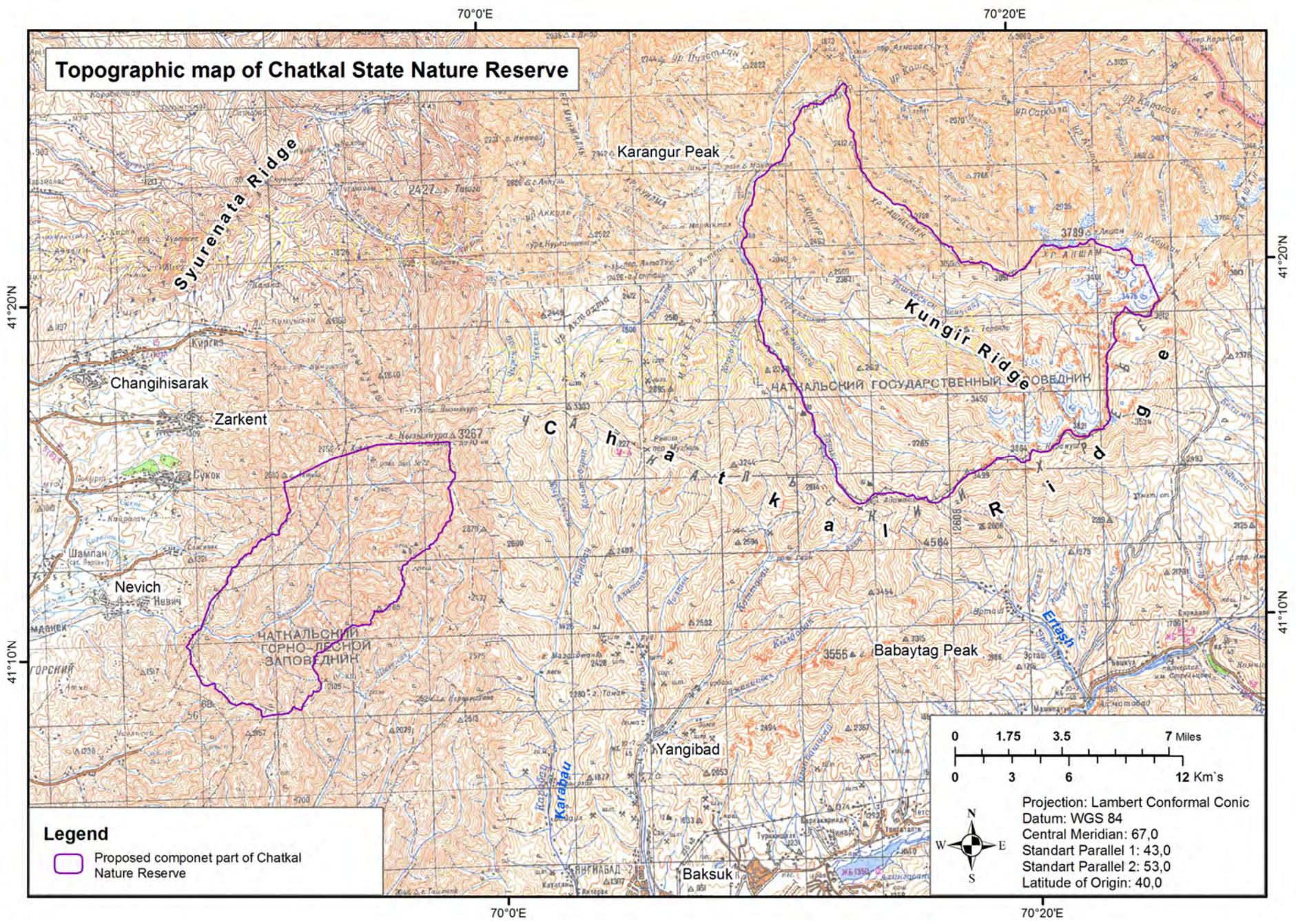


Projection: Lambert Conformal Conic  
Datum: WGS 84  
Central Meridian: 67,0  
Standart Parallel 1: 43,0  
Standart Parallel 2: 53,0  
Latitude of Origin: 40,0

## Legend

- Proposed componet part of Padysha-Ata Nature Reserve
- Proposed buffer zone

# Topographic map of Chatkal State Nature Reserve



**Legend**  
 Proposed component part of Chatkal Nature Reserve

0 1.75 3.5 7 Miles  
 0 3 6 12 Km's

Projection: Lambert Conformal Conic  
 Datum: WGS 84  
 Central Meridian: 67.0  
 Standart Parallel 1: 43.0  
 Standart Parallel 2: 53.0  
 Latitude of Origin: 40.0

# ANNEX B

Texts relating to protective designation, copies of property management plans or documented management systems and extracts of other plans relevant to the property

## TEXTS RELATING TO PROTECTIVE DESIGNATION

- B1. Law of the Republic of Kazakhstan "On Specially Protected Natural Areas" (extracts)
- B2. Decree of the Government of the Republic of Kazakhstan No.249 dated March 1, 2004 "On Creation of the State Institution Karatau State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan"
- B3. Passport of Karatau State Nature Reserve
- B4. Extract from the minutes of 25<sup>th</sup> session of the Council of People's Commissars of Kazakh SSR of July 14, 1926 "On establishment of Nature Reserve Ak-Su-Djebagly in Chimkent uyezd (county) of Syr Darya guberniya (province)".
- B5. "On granting land for permanent use to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan". Government Decree of the Republic of Kazakhstan No. 1133, dated November 17, 2005
- B6. South Kazakhstan Regional Governor's Office (Akimat) Decree No. 289 of August 4, 2006 "On establishment of the protective zone around the territory of the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan
- B7. Zhambyl Regional Governor's Office (Akimat) Decree No. 286 of October 26, 2006 "On establishment of the protective zone around the territory of the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan
- B8. Passport of Aksu-Jabagly State Nature Reserve
- B9. Resolution of the Government of the Republic of Kazakhstan of January 26, 2006, No 52 "On some issues related to certain government institutions of the South-Kazakhstan oblast"
- B10. Resolution of akimat of the South-Kazakhstan oblast of April 26, No 171 "On establishment of the buffer zone around lands of the state institution "Sairam-Ugam state national natural park" of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan"
- B11. Resolution of akimat of the South-Kazakhstan oblast of October 29, No 359 "On reservation of lands for expansion of Sairam-Ugam state national natural park"
- B12. Passport of Sayram-Ugam State National Nature Park
- B13. Government Resolution of August 1, 1994 N 573 "To change the boundaries of Besh-Aral State Reserve and Chatkalsky forestry organizations"
- B14. Government Decree on July 26, 2002 N 499 "On the transfer of land under the jurisdiction of Besh- Aral State Reserve"

- B15. Government Resolution on April 24, 2006 N 291 "On the organization of the reserved area " Sandalash " of Besh-Aral State Reserve in Chatkal district of Jalal -Abad region of Kyrgyz Republic"
- B16. Regulations of the Besh-Aral State Reserve
- B17. Decree of the Government of Kyrgyz Republic of July 3, 2003 N 405 "On the organization of the Padyshata State Nature Reserve"
- B18. Provisions of Padysha-Ata State Nature Reserve
- B19. Decree of Council of Ministers of the Kyrgyz SSR of March 5, 1959 № 118 "On the improvement of forest management in the Kyrgyz SSR"
- B20. Order number 295 by the Ministry of Agriculture of the Kyrgyz SSR June 1, 1960 , Frunze "Questions of organization of Sary-Chelek nut-fruit and Kemin reserves"
- B21. Provisions of Sary-Chelek State Biosphere Nature Reserve
- B22. An extract from the law of the Republic of Uzbekistan "On protected natural areas'
- B23. Resolution of the Cabinet of Ministers of the Republic of Uzbekistan "On establishment of the mountain-forest nature reserve in Uzbekistan" No482, dated 20.12.1947
- B24. A copy of the Order by the Head Department for Forestry and Nature Protection under CM of Uzbek SSR dated 4.10.1960 "On changing the name of state mountain-forest nature reserve for Chatkal mountain-forest nature reserve"
- B25. The Chatkal mountain-forest nature reserve border description
- B26. Order by the State Committee for Nature Protection of the Republic of Uzbekistan "On transfer of the Chatkal state biosphere nature reserve into the jurisdiction of Tashkent Regional Khokimiat"
- B27. Regulations for the Chatkal State Nature Reserve approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No262, dated 22.06.2001
- B28. An extract from the Regulations for the Ugam-Chatkal National Nature Park approved by Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No262, dated 22.06.2001
- B29. A copy of certificate by the Bureau of MAB International Coordination Council on awarding the Chatkal nature reserve a status of biosphere reserve, dated February 15, 1993 and endorsed by signature of UNESCO's Director General.

## PROPERTY MANAGEMENT PLANS

- B30. Management Plan for the Karatau State Nature Reserve (extractions)
- B31. Management Plan of Aksu-Jabagly State Nature Reserve (extractions)
- B32. Management Plan of Sayram-Ugam State National Nature Park (extractions)
- B33. Management plan for Besh-Aral State Reserve for the years 2013-2017 (extractions)
- B34. Management plan for Padysha-Ata State Reserve for the years 2013-2017 (extractions)
- B35. Management plan for Sary-Chelek State Biosphere Reserve for the years 2013-2017 (extractions)
- B36. Action plan on conservation of integrity, global significance and value of Chatkal reserve biodiversity for 2010 – 2012 (extractions)

LAW  
OF THE REPUBLIC OF KAZAKHSTAN

On Specially Protected Natural Areas

(extracts)

.....  
**Article 3. Basic principles in the field of specially protected natural areas**

Basic principles in the field of specially protected natural areas are as follows:

- 1) development of the system of specially protected natural areas as a basic component of the ecological network ensuring the preservation and restoration of biological diversity, unique and typical landscapes;
- 2) governmental regulation, control and supervision in the field of specially protected natural areas;
- 3) preservation of the state natural reserve fund and natural ecological systems;
- 4) use of specially protected natural areas for the development of science, culture, education and tourism;
- 5) payment for the use of specially protected natural areas;
- 6) liability for violations of legislation of the Republic of Kazakhstan in the field of specially protected natural areas;
- 7) participation of individuals and legal entities in solving problems in the field of specially protected natural areas;
- 8) availability of information in the field of specially protected natural areas;
- 9) international cooperation in the field of specially protected natural areas.

.....  
**Article 6. Protection system of specially protected natural areas**

The protection system of specially protected natural areas includes:

- 1) the Government of the Republic of Kazakhstan;
- 2) an authorized body including its agency with territorial subdivisions;
- 3) central executive bodies being in charge of specially protected natural areas;
- 4) representative bodies of oblasts, cities of republican status and the capital within their competence as defined by this Law and other laws and regulations of the Republic of Kazakhstan;
- 5) executive bodies of oblasts, cities of republican status and capital within their competence as defined by this Law and other laws and regulations of the Republic of Kazakhstan;
- 6) environmental organizations;
- 7) individuals and legal entities operating in the area of specially protected natural areas.

.....  
**Article 7. Competence of the Government of the Republic of Kazakhstan**

The competence of the Government of the Republic of Kazakhstan includes:

- 1) development of basic directions of the state policy in the field of specially protected natural areas;
- 2) the right of possession, use and disposal of specially protected natural areas and objects of the state natural reserve fund of the republican status;
- 3) identification of an authorized body in the field of specially protected natural areas;
- 4) approval of:  
the list of specially protected natural areas of the republican status;  
the list of objects of the state natural reserve fund of republican status;

the program of development of specially protected natural areas and ecological networks as advised by an authorized body;

rules for carrying out of tourist and recreational activities in state national natural parks and issue of permits to use areas of state national natural parks provided for use for the implementation of tourist and recreational activities as construction facilities;

the order of keeping the state register of specially protected natural areas;

.....

5) provision and withdrawal of land lots, including for state needs, out of lands of all categories of land in cases related to the establishment and expansion of specially protected natural areas of the republican status;

6) establishment and expansion of specially protected natural areas of the republican status;

.....

#### **Article 8. Competence of an authorized body and its local subdivisions**

The competence of an authorized body includes:

1) cross-sector coordination of activities carried out by state authorities in the field of specially protected natural areas;

2) implementation of the state policy in the field of specially protected natural areas;

.....

4) submission of proposals for the establishment and expansion of specially protected natural areas of the republican status, as well as for the transfer of lands of specially protected natural areas to reserve lands only in cases specified in the second part of paragraph 2 of article 23 of this Law;

.....

6) approval of:

tariff rates for services provided by specially protected natural areas of the republican status having the status of a legal entity;

.....

natural-scientific and feasibility studies for the establishment and expansion of specially protected natural areas of the republican status;

projects related to correction of feasibility studies of specially protected natural areas of the republican status;

symbols (emblem and flag) of environmental organizations, as well as the order of design and use of symbols (emblem and flag) of an environmental agency ;

.....

6-1) development and approval of:

rules for the design and registration (re-registration) of passports of specially protected natural areas of the national and local importance;

rules for the development of the management plan of an environmental organization;

rules for visiting specially protected natural areas by individuals;

.....

rules of the organization and conduct of scientific activities and research in environmental institutions;

.....

8) development of the program of development of the system of specially protected natural areas and ecological networks;

.....

10) organization of development and approval of management plans for specially protected natural areas under its jurisdiction;

11) management of specially protected natural areas that are under its jurisdiction, ensuring of their protection and recovery, as well as provision of scientific studies;

.....

12) organization of scientific activities in specially protected natural areas of the republican status;

13) keeping of the state register of specially protected natural areas;

.....

14-1) development of rules for carrying out of tourist and recreational activities in state national natural parks and issue of permits to build construction facilities for tourist and recreational activities on the areas of state national natural parks;

14-2) issue of permits to individuals and legal entities to areas of state national natural parks provided them for use for the implementation of tourist and recreational activities as construction facilities;

.....  
15) exercise of state control and supervision of the state, protection and use of specially protected natural areas and objects of the state nature reserve fund;

.....  
18) international cooperation and implementation of international treaties in the field of specially protected natural areas.

.....  
19) development and approval of forms of departmental reporting, checklists, risk assessment criteria and annual audit plans in accordance with the Law of the Republic of Kazakhstan "On the state control and supervision in the Republic of Kazakhstan";

.....  
**Article 18. Protective zones of state natural reserves, state national natural parks, state wildlife reserves and state regional natural parks**

1. To ensure special safety and protection against adverse external effects around and on lands of land owners and land users located within the boundaries of state natural reserves, state national natural parks, state wildlife reserves and state regional natural parks, protective zones shall be established subject to prohibition and (or) restriction of any activities within such zones that have a negative impact on the state and restoration of ecological systems of such specially protected natural areas and objects of the state natural reserve fund located within such areas.

2. Sizes, boundaries, types of regime and order of use of nature in protective zones of state natural reserves, state national natural parks, state wildlife reserves and state regional natural parks shall be determined by natural-scientific and feasibility studies for their creation and shall be established by decisions of local executive bodies of oblasts, cities of the republican status and the capital in accordance with this Law and the Land Code of the Republic of Kazakhstan.

In this case, the width of a protective zone, which is established along the boundaries of land lots of land owners and land users or along natural geographic boundaries and marked with special signs shall be no less than two kilometers.

.....  
**Article 22. Lands of specially protected natural areas**

1. Lands of specially protected natural areas include lands of state natural reserves, state national natural parks, state wildlife reserves, state regional natural parks, state zoological parks, state botanic gardens, state dendrological parks and state nature sanctuaries.

2. In the course of creation of state natural reserves, state national natural parks, state wildlife reserves, state regional natural parks, state zoological parks, state botanic gardens, state dendrological parks and state nature sanctuaries land lots shall be allotted out of other land categories and shall be reclassified as lands of specially protected natural areas by way of their withdrawal from land owners and land users.

.....  
6. Natural complexes shall be withdrawn completely or partially, permanently or for a definite period from economic exploitation and shall be used subject to their special ecological, scientific, historical, cultural and recreational values on terms of payment, except for state nature sanctuaries and state conservation areas, in a manner prescribed by this Law.

**Article 23. Legal status of lands of specially protected natural areas**

1. Lands of specially protected natural areas as well as land lots of other categories occupied by objects of the state natural reserve fund are owned by the state and shall not be subject to alienation.

2. Withdrawal of lands of specially protected natural areas shall not be allowed.

Transfer of lands of specially protected natural areas is not permitted, except for transfer to reserve land for the construction and operation of tourism facilities provided for by state programs, water facilities having special strategic importance, and except only for those land lots that are subject to the regime of limited economic activities, as well as for the construction of facilities of the State Border of the Republic of Kazakhstan, their development and maintenance in the absence of other variants of their possible placement subject to availability of a positive conclusion of the state ecological expertise in a manner prescribed by the Government of the Republic of Kazakhstan.

2-1. Specially protected natural areas may be used for scientific, cultural, educational, training, tourist, recreation and limited economic purposes in a manner and upon conditions stipulated by this Law.

3. On lands of specially protected natural areas any activity is prohibited if such activity does not meet the intended purpose of such areas.

.....

#### **Article 25. Passport of a specially protected natural area**

1. State authorities being in charge of specially protected natural areas shall draw up a passport of a standard pattern for each such area and shall register it in an authorized body.

Each copy of a registered passport is considered original.

Rules for the development and registration (re-registration) of passports of specially protected natural areas of the republican and local status shall be approved by an authorized body.

2. A passport of a specially protected natural area shall contain:

- 1) name of a specially protected natural area, its type and category;
- 2) name, number and date of the act of a state authority based on which such a specially protected natural area is created or expanded;
- 3) name of a state body being in charge of a specially protected natural area;
- 4) name of an organization being in charge of the protection of a specially protected natural area, which has no separate legal identity;
- 5) location of a specially protected natural area together with a map-scheme with indication of the tourist infrastructure, geographic coordinates, description of boundaries, area of its territory and the protective zone;
- 6) a list of state of objects of the of natural reserve fund located on a specially protected natural area including their quantitative and qualitative characteristics;
- 7) functional zones of a specially protected natural area and type of protection regime, data on adjacent land owners and land users, their obligations and burdens on use of natural resources in the protective zone;
- 8) permitted and prohibited types of activities, as well as restrictions on certain types of activities in specially protected natural areas;
- 9) rules for visiting, working pattern and recreational load.

.....

#### **Article 26. Management plan of an environmental organization**

1. Environmental organizations shall carry out their activities in accordance with a management plan approved by a state authority being in charge of such organizations, subject to availability of a positive conclusion of the state ecological expertise.

A management plan of an environmental organization shall be developed for a five-year period in accordance with the rules approved by an authorized body.

2. A management plan of an environmental organization shall include:

- 1) analysis of changes in natural and socio-economic conditions over a previous period;
- 2) assessment of activity carried out by an environmental organization over a previous period;
- 3) measures related to each type of environmental, ecological-educational, scientific, tourist, recreational and limited economic activities of an environmental organizations for the subsequent period;
- 4) for specially protected natural areas established on lands of the state forest fund - a section, which provides a comprehensive assessment of forestry and forest management for a previous period and contains measures with the aimed at protection, reproduction and care of such forest areas for the subsequent period;
- 5) mechanisms for implementation of the management plan through improvement of the management structure, regulatory framework, staffing and improvement of their skills, interaction with local population and local representative and executive bodies.

3. Development of a management plan of an environmental organization shall be provided by a public authority being in charge of such an organization.

.....  
**Article 28. Types of protection regimes of specially protected natural areas**

Depending on the type and functional zoning, the following types of protection regime are distinguished on the whole specially protected area or on its designated areas and sites:

- 1) reserve regime providing for the prohibition of any economic activity as well as other activities that violate the natural state of natural complexes and objects of the state natural reserve fund;
- 2) protection regime providing for a complete ban or seasonal restriction on certain types of economic and other activities for a definite or indefinite period of time;
- 3) controlled regime of economic activities providing for limited use of natural complexes as well as carrying out by land owners and land users of traditional economic activities using techniques and methods that do not have a negative impact on natural complexes and objects of the state natural reserve fund.

.....  
**Article 39. Concept and basic activity of state nature reserves**

1. The state nature reserve is a specially protected natural area having the status of an environmental and scientific institution, the purpose of which is to preserve, study and restore natural processes and events, flora and fauna, individual species and communities of plants and animals, typical and unique ecological systems and their recovery within the territory thereof.

2. Basic activity of state nature reserves include:

- 1) provision of the protection regime and restoration of biological diversity of the state nature reserve and its protective zone;
- 2) organization and conduct of scientific research related to study and monitoring of ecological systems and objects of the state natural reserve fund including the keeping of the Nature Records;
- 3) conduct of ecological and educational activities;
- 4) participation in the state environmental expertise of projects and layouts of economic and other objects that may have adverse effects on ecological systems of the state nature reserve;
- 5) control over the use of the territory of the state nature reserve and its protective zone for ecological and educational, scientific and limited tourist purposes.

**Article 40. Protection regime of state nature reserves**

1. The reserve regime of protection shall be established in the whole territory of the state natural reserve subject to specific features provided for in article 43-1 of this Law, according to which the following shall be prohibited:

- 1) actions that change the hydrological regime of the territory;
- 2) construction of buildings (structures and facilities), roads, pipelines, power lines and other communications and objects not related to the functioning of the state nature reserve;
- 3) geological exploration and mining operations;
- 4) soil disturbance, destruction of minerals prospects and rock outcrops;
- 5) all types of forest management including procurement of food, medicinal and industrial plants as well as their parts and derivatives, haying, grazing and other types of use of flora leading to soil disturbance, except for sanitary cutting required for the implementation of forest-protection activities;
- 6) hunting and fishing;
- 7) trapping and killing animals, disturbance of conditions of their habitats;
- 8) introduction of new species of plants and animals, execution of measures to increase the number of individual species in excess of the number permitted depending on the natural capacity of agricultural lands;
- 9) gathering of collection materials, except for formation of collections of the state nature reserve;
- 10) use of chemical and biological methods to control pest, plant and animal diseases as well as to regulate the number of animals;
- 11) running pets;

12) noise and other acoustic effects of artificial origin exceeding the standards specified by the Government of the Republic of Kazakhstan;

13) activities that may lead to changes in the natural appearance of protected landscapes or destabilization of ecological systems or that threatens the preservation and reproduction of the most valuable natural resources.

2. In the territory of state nature reserves ground and aerial works may be carried out to prevent and extinguish forest and steppe fire.

3. Stay of individuals in the territory of the state nature reserve is allowed only upon availability of permissive documents, except for employees of state nature reserves as well as officials of state authorities being in charge of state nature reserves.

4. In order to provide access to places respected by followers of any religion (places of pilgrimage) located within or outside the territory of the state nature reserve and along the roads passing through the territory of the state nature reserve, the administration of the state nature reserve may, in consultation with an appropriate religious association, permit gratuitous group visits to such places or approach to such places accompanied by inspectors of the state nature reserve.

.....

#### **Article 43. Regime of protective zones of state nature reserves**

1. In protective zones of state nature reserves the following activities are prohibited:

1) creation of new and expansion of existing populated areas;

2) placement, design, construction and operation of facilities, introduction of new technologies that have harmful effects on ecological systems of the state nature reserve;

3) conduction of intensive forms of agriculture and forestry using pesticides, fertilizers and herbicides that are toxic for flora and fauna;

4) emission into the atmospheric air and discharge into open water sources and to the land surface of pollutants and sewage, as well as waste disposal;

5) mining operations;

6) amateur (sports) and commercial hunting;

7) disposal of radioactive materials and industrial wastes;

8) activities, which may change the hydrological regime of ecological systems of the state nature reserve (construction of dams, dikes, hydraulic structures and other objects resulting in the termination or reduction of the natural water flow);

9) introduction of alien species of wild animals and plants;

10) other activities, which may have adverse effects on ecological systems of the state nature reserve.

2. In the territory of protective zones of state natural reserves various forms of economic activity may be carried out; provided that they do not have a negative impact on the state of ecological systems of the reserve:

1) forestry activities;

2) traditional land use, including grazing and haying, as well as other activities within the framework of long-term preservation and invulnerability of biological diversity;

3) tourist and recreational activities;

4) use of mineral water, balneological and climatic resources;

5) commercial and amateur (sports) fishing;

6) performance of ground and aerial works to extinguish forest and steppe fire;

7) recultivation of disturbed soils;

8) recovery of forest and other plant communities;

9) recovery of the living environment and number of wildlife;

10) use of land lots for the arrangement of places of stay of tourists, nurseries for artificial propagation, cultivation, breeding of endemic, rare and endangered species of plants and animals, as well as for the construction of office buildings (cordons) for living of employees of the state nature reserve and providing them with office land allotments.

3. During the implementation of activities specified in paragraph 2 of this article in protective zones of state natural reserves measures shall be provided and carried out to preserve the habitat and breeding conditions of flora and fauna, migration routes and places of concentration of animals as well as to ensure integrity of areas having a particular value as wildlife habitat as well as other objects of the state natural reserve fund.

4. Restrictions on economic activities of land owners and land users in protective areas of state natural reserves shall be established by decisions of local executive bodies of oblasts, cities of republican status and the capital.

.....  
**Article 44. Concept and basic activity of state national natural parks**

1. The state national natural park is a specially protected natural area having the status of an environmental and scientific institution intended for conservation of biological and landscape diversity and use of unique natural complexes and objects of the state natural reserve fund having special ecological, scientific, historical, cultural and recreational value for environmental, ecological-educational, scientific, tourist and recreational purposes.

2. Basic activity carried out in state national natural parks include:

1) preservation of natural complexes, unique and reference natural sites, objects of the state natural reserve fund, natural, historical and cultural heritage;

2) provision of the protection regime of the state national natural park and its protective zone;

3) environmental education;

4) development of scientific methods of conservation of biological diversity;

5) Monitoring of ecological systems and individual natural objects according to the Nature Records Program;

6) restoration of damaged natural complexes and objects of the state natural reserve fund, natural, historical and cultural heritage;

7) control over the use of the territory of the state national natural park and its protective zone for eco-educational, scientific, tourist, recreational and limited economic purposes.

**Article 45. Zoning, regime of protection and use of territories of state national natural parks**

1. In the territory of state of national natural parks the following zones are distinguished:

1) zone of reserve status;

2) zone of environmental stabilization;

3) zone of tourist and recreational activities;

4) zone of limited economic activity.

2. In the zone of reserve status any economic activity and recreational use of the territory of the state national natural park shall be prohibited, and the reserve protection regime corresponding to the type of regime of the state nature reserve referred to in paragraph 1 of Article 40 of this Law shall be established.

3. In the zone of environmental stabilization the reserve protection regime shall be established subject to prohibition of economic and recreational activities, except for controlled ecotourism and measures aimed at restoration of damaged natural complexes and objects of the state natural reserve fund.

4. The zone of tourist and recreational activity is divided into areas of controlled short rest and long-lasting stay of visitors of the state national natural park.

In the zone of tourist and recreational activities the protection regime shall be established to ensure preservation of natural complexes and objects of the state natural reserve fund, in the territory of which controlled tourist and recreational use (except for hunting) is permitted, including the organization of tourist routes, trails, arrangement of bivouac rests and viewing points, beaches, boat stations, rental stations for water vehicles and beach equipment taking into account the norms of recreational load.

5. The zone of limited economic activity shall be used to locate administrative objects, to carry out economic activities necessary to ensure the protection and functioning of the state national natural park, servicing of its visitors, including the organization of amateur (sports) hunting and fishing, as well as to build and operate recreational centers, hotels, camp sites, museums and other tourist service facilities.

6. Security, protection and rehabilitation measures stipulated by the management plan shall be carried out in all zones of the state national natural park.

7. In state national natural parks scientific and eco-educational activities shall be carried out in the manner prescribed in articles 41 and 42 of this Law.

.....  
**Article 47. Special aspects of restrictions on economic activity of state national natural parks**

1. In the area of limited economic activity state national natural parks are allowed to carry out the following types of activity:

1) secondary forest use (limited grazing, maral breeding, haying, amateur picking mushroom, fruits and berries);

2) growing of planting material of woody species and shrubs, medicinal herbs and other plants on limited areas of traditional use;

3) conducting sanitary felling, cleaning cutting, except thinning and processing of generated wood material;

4) production of souvenirs, homecraft and handicrafts products;

5) growing fish seed and commercial fish of native species;

6) migratory beekeeping using mobile yards of bees;

7) amateur (sports) hunting;

8) amateur (sports) fishing;

9) meliorative fishing;

10) scientific research fishing;

11) fishing in reproductive purposes.

2. Limited economic activities of state national natural parks shall be carried out subject to conservation and restoration of objects of the state nature reserve fund and based on relevant approvals of state authorities being in charge of such parks.

.....

#### **Article 48. Protection regime of protective zones of state national natural parks**

1. In the protective zone of the state national natural park:

1) main types of traditional economic activities carried out by land users to ensure sustainable use of natural resources are permitted;

2) types of use of natural resources and economic activity adversely affecting the ecological systems of the state national park established by paragraphs 1-3 of article 43 of this Law are prohibited or restricted.

2. Restrictions on economic activities of land owners and land users in the protective zone of the state national park shall be established by decisions of local executive bodies of oblasts, cities of republican status and the capital in accordance with this Law.

.....

**President of the Republic of  
Kazakhstan**

**N. NAZARBAYEV**

Astana, Akorda, July 7, 2006

No 175-III 3PK

Decree of the Government of the Republic of Kazakhstan No.249 dated March 1, 2004

On Creation of the State Institution Karatau State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan

For the purpose of conservation and restoration of the unique natural complexes of the Karatau Ridge of the West Tien Shan Mountains, Government of the Republic of Kazakhstan DECREES:

1. To create the state organization Karatau State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan (hereinafter referred to as the Organization);
2. To take 196 hectares of land out of the agricultural lands in the territory of the town of Turkestan of the South Kazakhstan Region and 34104 hectares of the reserve lands and provide them to the Organization for permanent land use according to the Appendix.  
To transfer the specified land plots from the category of agricultural and reserve lands into the category of specially protected natural reservations. All forests existing in the territory shall be included into the protection category "Forests of the State Nature Reserves";
3. The Land Resource Agency jointly with the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan shall determine borders of the Organization under the established procedure;
4. The Akim of the South Kazakhstan Region shall establish a protection area around the Organization and forbid any activity with negative impact on the ecosystem of the territory;
5. The Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan shall:
  - 1) Approve the Articles of Organization and provide its state registration under the procedure established by the law;
  - 2) Take other measures arising from this Decree;
6. The Organization shall be financed at the expense and within the limits of the funds provided in the state budget for the specially protected natural reservations;
7. To amend some decrees of the Government of the Republic of Kazakhstan as follows:
  - 1) Into the Decree of the Government of the Republic of Kazakhstan No.229 dated February 12, 2000 On Limits of the Staff of the State Institutions Reporting to the Central Executive Bodies of the Republic of Kazakhstan:  
Within the limits of the Staff of the State Institutions Reporting to the Central Executive Bodies of the Republic of Kazakhstan financed from the Republican Budget approved by the specified Decree:  
In Section 2 "Agricultural Ministry of the Republic of Kazakhstan", to add the line "West Altai Nature Reserve 32" with the following words:  
The Karatau State Nature Reserve 43;
  - 2) Into the Decree of the Government of the Republic of Kazakhstan No.1239 dated November 22, 2002 Some Issues of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan (SAPP of the Republic of Kazakhstan, 2002, No.42, para 423):  
Paragraph 26-1 with the following wording shall be added into the list of the organizations controlled by the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan approved by the specified Decree:  
"26-1. State Organization Karatau State Nature Reserve".
8. This Decree shall come into force on the date of signing.

(signature)

D.Akhmetov

Prime Minister of the Republic of Kazakhstan

Approved by Directive of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan No. 117 of 06 May 2008

PASSPORT OF KARATAU STATE NATURE RESERVE  
2008

*(excerpts)*

1. Name of the specially protected natural territory with indication of its type and category

State Institution "Karatau State Nature Reserve"

2. Name, number and date of adoption of the act of state authority body which established or expanded the specially protected natural territory

The Karatau State Nature Reserve has been organized by Decree No. 249 of the Government of the Republic of Kazakhstan dated 1 March 2004.

3. Name of the state authority body which is supervising the specially protected natural territory

The Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan

.....

5.2.1. Total area of the Karatau State Nature Reserve: 34300 ha

5.2.2. Area of the protected zone amounts to 17490 ha, established by Resolution of the Akimat of the city of Turkestan No. 1391 of 11. 01. 2008 "On allocation of protected zone to the Karatau State Nature Reserve"

.....

7. Functional zones on the specially protected natural territory and regimes of their protection, information on adjacent land owners and land users, their obligations and encumbrances with respect to natural resource usage in the protected zone

7.1. Protection regimes of the specially protected natural territory by functional zones:

S/n	Functional zone description	Area, ha	Protection regime
1	2	3	4
1	Karatau State Nature Reserve	34300 ha	Reserve regime
2	Protected zone	17490 ha	protection regime
	TOTAL:		

7.2. Information on owners and users of land plots located on the territory of the Karatau State Nature Reserve and its protected zone, their obligations and encumbrances with respect to natural resource usage.

There are no adjacent land owners and land users on the territory of the Karatau SNR.

8. Allowed and prohibited types of activities, as well as limitations on some types of activities on specially protected natural territories:

## **Zone description** - State Nature Reserve - Main Area

**Area, ha** - 34300

**Usage type.** The Karatau State Nature Reserve is a specially protected natural territory with a status of nature protection and scientific institution, the spheres of activities of which are preservation and study on its territory of the natural course of naturally occurring processes and phenomena of nature, objects of plant and animal life, individual species and communities of plants and animals, typical and unique ecological systems and their restoration.

Main activities of state nature reserves include:

- Ensuring the regime of protection and restoration of biological diversity of the state nature reserve and its protected zone;
- Organizing and conducting scientific research on studying and monitoring ecological systems, objects of the state nature reserve fund, including maintenance of Nature Records;
- Conducting ecological education activities;
- Participating in state ecological expert evaluation of projects and schemes of deployment of commercial and other facilities which may exert harmful impact on ecological systems of the state nature reserve;
- Regulating the usage of the state nature reserve's territory and its protected zone for ecological education, scientific and limited tourism purposes.

On the whole territory of the state nature reserve, the reserve protection regime is established, which prohibits:

- Actions which change the hydrological regime of the territory;
- Construction of buildings (erections and structures), roads, pipelines, electricity transmission lines and other utility lines and facilities which are not related to functioning of the state nature reserve;
- Geological exploration works and extraction of mineral resources;
- Disturbance of soil cover, destruction of mineral prospects and subsurface rock outcroppings;
- All types of forest usage, including sanitation cutting and forest maintenance cuttings, collection of edible, medicinal and technical plants, flowers, seeds, hay mowing, cattle grazing and other types of plant life usage which lead to disturbance of the vegetation cover;
- Hunting and fishing, with the exception of amateur fishing, which is allowed for the needs of the local population residing in the protected zone of the state nature reserve, in specially allocated sites in accordance with the procedure established by an authorized body;
- Capture and destruction of animals, disturbance of their environment and habitat conditions;
- Introduction of new animal and plant species, performance of actions on increasing the numbers of individual species of animals above the values allowed according to natural capacity of the lands;
- Gathering of collectible materials, with the exception of formation of the state nature reserve's collections;
- Application of chemical and biological methods of combating pests and plant and animal diseases, as well as for control of animal numbers;
- Passage of domestic animals;
- Noise and other acoustic effects of artificial nature, which exceed the norms established by an authorized body in coordination with an authorized state body in the sphere of environment protection;
- Activity, if it can entail changes of natural appearance of the protected landscapes or disturbance of stability of ecological systems or if it presents a threat to preservation and reproduction of especially valuable natural resources.

It is allowed to perform ground and air operations on the territory of state nature reserves for prevention and extinguishing of forest and steppe fires.

## **9. Rules of visiting the specially protected natural territory.**

The reserve territory may be visited by guarding service inspectors for walk-downs of the area which is entrusted to them and employees of scientific department for performance of scientific research works, gathering of collectible materials with the purpose of identification of the flora and fauna species diversity, for conducting monitoring and phenological observations in the natural complexes, in accordance with the approved program

of scientific research work. Killing of animals is strictly prohibited and is punishable by law. Places of largest accumulations of endemics and Red Book species are declared to be the zones of biological lull. Ecological tourism is conducted along the protected zone which is not directly included in the reserve's territory.

During fire hazard period, increased security measures are taken and observations are conducted from equipped fire watch towers.

Presence of individuals on the territory of the state nature reserve is only allowed with possession of permit documents, with the exception of the state nature reserve's employees and officials of state authority bodies which are supervising the state nature reserves.

To provide access to places worshiped by followers of one or another religion (places of pilgrimage), which are located on the territory of the reserve or outside its boundaries, by roads passing through the reserve's territory, the administration of the state nature reserve, in coordination with the appropriate religious association, may allow unpaid group visit of these places or approach to these places in the company of inspectors of the state nature reserve.

Amateur fishing in the state nature reserves is allowed for the needs of the local population residing in the protected zone of the state nature reserve, in specially allocated areas.

Amateur gathering of wild fruits, berries, mushrooms, medicinal herbs, hay mowing, collection of firewood and other types of traditional usage of natural resources in specially allocated places, in accordance with the procedure established by the legislation of the Republic of Kazakhstan, except areas with the reserve protection regime.

Sporting and ecological education events, tourist rallies are conducted by agreement with the reserve's administration.

It is allowed to perform professional and amateur photographing and video recording, conduct practical training, as well as to collect herbarium, take soil samples for educational purposes in the protected zone of the reserve, except areas with the reserve protection regime.

**On the reserve territory, it is not allowed to:**

- Be present without a document confirming payment for usage of the specially protected natural territory;
- Go off and drive outside general usage roads or special excursion paths and tourist routes;
- Park motor transport and other mechanical devices outside established places;
- Park and wash motor transport and other mechanical devices on the shores of water bodies, wash dishes, wash clothes, wash domestic animals;
- Start fires, set up charcoal grills, fireplaces for food cooking outside specially established and equipped places;
- Set up camps, set up tents outside places specially established for these purposes;
- Catch fish by nets and other prohibited gear and means, as well as to exceed the fish catching norms established by the legislation of the Republic of Kazakhstan;
- Withdraw wild animals without an appropriate permit;
- Scare and bait wild animals;
- Devastate nests, animal holes, lairs and ant hills;
- Cut, break and damage trees and shrubs, procure twigs for brushes and brooms for domestic purposes;
- Destroy and spoil monuments of nature, history, culture and archeology;
- Collect and dig out trees, shrubs, grass plants and medicinal materials outside the allowed places of collection;
- Collect wild fruits, mushrooms and berries outside places specially designated for this;
- Break and spoil visual propaganda means (stands, panels, information boards, etc.), forestry, forest management and land management signs;
- Put inscriptions and drawings on buildings, trees, rocks and cliffs;
- Graze cattle, mow hay, collect wood and perform other unlawful forest usage without authorization;
- Litter the soil cover with domestic garbage and waste;

- Apply noise and other acoustic effects on the environment in excess of the norms established by the legislation of the Republic of Kazakhstan.

It is prohibited to perform any activities which disturb natural development and preservation of the the state nature reserve assets and natural complexes.

In order to exclude the disturbance factor, the reserve's administration introduced a prohibition of visiting places of mass flocking of wild animals, including fish, during their migration and reproduction.

The basis for visiting the territory of a nature protection institution is the visitor's possession of a document confirming payment for usage of the specially protected natural territory for scientific, ecological education, tourist, recreational and limited domestic purposes, the form of which is established in accordance with the tax legislation of the Republic of Kazakhstan.

**Passport prepared by:** State Institution "Karatau State Nature Reserve" of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan

Seal

Passport preparation date:  
25 March 2008

EXTRACT

from the minutes of 25<sup>th</sup> session of the Council of People's Commissars  
of Kazakh SSR

July 14, 1926

**AGENDA:**

On establishment of Nature Reserve Ak-Su-Djebagly in Chimkent uyezd (county) of Syr Darya guberniya (province).

Spokesperson: People's Commissariat for Education – Lebedeva

**DECREED:**

Based on the decrees of the Council of People's Commissars of RSFSR dated September 16, 1921 (Collection of Laws (C.L.) No. 65 Article 492, 1921) and January 7, 1924 (C.L. No. 18, Article 179, 1924) and also based on the Instruction on record keeping and protection of antique memorials of art, household and nature, approved by the Presidium of the All-Russian Central Executive Committee on July 7, 1924 (C.L. No. 66, Article 654, 1924), taking into account the number of scientific studies that have established high scientific value of physiographic, botanical and zoological features of the area near the headwaters of rivers Ak-Su and Dzhebagly-Su in the western part of Ak-Su Mashatsky forest estate of Chimkent uyezd of Syr Darya guberniya, the Council of the People's Commissars of Kazakh SSR, decrees:

to put the existing laws on the state nature reserves in effect on this territory in order to preserve in an untouched state to the extent possible, for the primary study of the extremely rare and unexplored species from zoological and botanical worlds, occurring in this area.

2. The nature reserve is established for the purpose of full preservation of the headwaters of rivers Ak-Su and Dzhebagly-Su with all its trees and bushes, carpet plants and wildlife and with the aim of keeping them in their untouched state as nature landmarks.

3. The nature reserve is united in the western part of Ak-Su Mashatsky forest estate within approximate borders: from north along Dzhebagly-Su river on the boundary of Chimkent and Aulie-Atinsky uyezds on the mountain ridge. Ala-Tau to south-east direction on the boundary of Chimkent and Tashkent uyezds throughout 18-20 versts, thence to north-east on the offshoot of a mountain range along Balda-Brek river and further on the right bank of this river along the boundary of Ak-Su Mashatsky forest estate, and it borders with former lands of Rudnevo, further eastwards till former lands of Kamennaya Balka and Krasnovodsk, further eastwards on the right bank of Ak-Su river up to the final mountain ridge of Dzhebagly-Su and along these final ridges to the headwaters of Ir-Su river, thence eastwards along the broken line of the Forest Estate's boundary and again eastwards along the boundary with the lands (b) of Nikolaevsk village and public land of Dzhebagly-Su, it approaches to the Dzhebagly-Tau mountains, and the west part makes a sharp turn to north to the starting point near Dzhebagly-Su river on the territory of approximately 20 000 tithes.

4. The conditions of the nature reserve's use and the order of nature protection are set according to paragraph 6-II of the decree dated October 5, 1925 and the instruction issued by the People's Commissariat for Education of RSFSR in the order, prescribed by paragraph 12 of that decree.

On granting land for permanent use to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan

Government Decree of the Republic of Kazakhstan No. 1133, dated November 17, 2005

In order to preserve valuable species of flora and fauna of South Kazakhstan region, as unique natural objects of Western Tian Shan that have national and international importance, and in compliance with the Law of the Republic of Kazakhstan "On specially protected natural territories" dated July 15, 1997, the Government of the Republic of Kazakhstan **DECREES:**

1. To withdraw from the reserve land category of Tulkubas and Tolebi districts of South Kazakhstan region the land lots with the total area of 46 882.3 hectares and provide them to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan (hereinafter – Government Facility) for permanent use, according to the appendix.
2. To re-classify the land lots, specified in paragraph 1 of this decree, from the reserve lands to the category of specially protected natural territories.
3. The Agency of the Republic of Kazakhstan on Land Management together with the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan shall establish the borders of the Government Facility on the territory as required by law.
4. Governor (Akim) of South Kazakhstan region shall establish the protective zone around the land of the Government Facility, with prohibition of any activity within this zone, which will have negative impact on the condition and restoration of the ecological system of these territories.
5. This decree shall enter into force upon its signing.

Prime Minister of the  
Republic of Kazakhstan      D. Akhmetov

Appendix  
to the Government Decree  
of the Republic of Kazakhstan  
No. 1133, dated November 17, 2005

Explication of land granted for permanent use to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan

No.	Category of land and agricultural lands	Area, ha
1.	Tulkubas district of South Kazakhstan region Reserve lands, pastures	1000.0
2.	Tolebi district of South Kazakhstan region Reserve lands (Maidantal site), pastures	45882.3
	Total	46882.3

/National emblem of the Republic of Kazakhstan/

SOUTH KAZAKHSTAN REGIONAL GOVERNOR'S OFFICE (AKIMAT)

DECREE

No. 289

August 4, 2006

the city of Shymkent

On establishment of the protective zone  
around the territory of the government  
facility Aksu-Zhabagly State Nature Reserve  
of the Forest and Hunting Committee of the  
Ministry of Agriculture of the  
Republic of Kazakhstan

In compliance with articles 11, 24 of the Law of the Republic of Kazakhstan "On specially protected natural territories" and pursuant to paragraph 4 of the Government Decree of the Republic of Kazakhstan No. 1133 dated November 17, 2005 "On granting land for permanent use to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan," according to the letter No. 25-11-28/2341 from the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan, dated July 28, 2006, the Regional Governor's Office DECREES:

1. To establish two-kilometer protective zone around the territory of the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan, with prohibition of any activity within this zone, which will have negative impact on the condition and restoration of the ecological system of these territories.

2. To entrust the control for the implementation of this decree to the First Deputy Governor (Akim) of the region – I.A. Abishev.

Governor (Akim) of the region      /signature/      B. Zhylkyshiyev

/Round Stamp/

/National emblem of the Republic of Kazakhstan/

ZHAMBYL REGIONAL GOVERNOR'S OFFICE (AKIMAT)

DECREE

No. 286  
2006

October 26,

the city of Taraz

On establishment of the protective zone  
around the territory of the government  
facility Aksu-Zhabagly State Nature Reserve  
of the Forest and Hunting Committee of the  
Ministry of Agriculture of the  
Republic of Kazakhstan

In compliance with articles 11, 24 of the Law of the Republic of Kazakhstan "On specially protected natural territories" and article 123 of the Land Code of the Republic of Kazakhstan, pursuant to paragraph 4 of the Government Decree of the Republic of Kazakhstan No. 1133 dated November 17, 2005 "On granting land for permanent use to the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan," according to the letter No. 2-81 from the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan, dated August 21, 2006, Zhambyl Regional Governor's Office DECREES:

1. To establish two-kilometer protective zone around the territory of the government facility Aksu-Zhabagly State Nature Reserve of the Forest and Hunting Committee of the Ministry of Agriculture of the Republic of Kazakhstan, with prohibition of any activity within this zone, which will have negative impact on the condition and restoration of the ecological system of these territories.

2. To entrust the control for the implementation of this decree to the Deputy Governor (Akim) of the region – E.O. Usenbayev.

Acting Governor (Akim) of the region /signature/ A. Savchenko

/Round Stamp/

PASSPORT OF AKSU-JABAGLY STATE NATURE RESERVE  
2007

*(excerpts)*

**1. Name of the specially protected natural territory with indication of its type and category**

State Institution "Aksu-Jabagly State Nature Reserve"

Category 1 A.

**2. Name, number and date of adoption of the act of state authority body which established or expanded the specially protected natural territory**

The Reserve was organized by decree of the Council of People's Commissars of Kazakh SSR No. 25 of 7/14/1926.

Last expansion of the Reserve territory – Decree of the Government of the Republic of Kazakhstan No. 1133 of November 17, 2005

S/n	Category of land and agricultural land uses	Area, ha
1.	Tyulkubas District of South Kazakhstan Oblast Undistributed lands	1000.0
2.	Tolebiysky District of South Kazakhstan Oblast Undistributed lands (Maidantal area), pastures	45882.3
	<b>Total:</b>	<b>46882.3</b>

**3. Name of the state authority body which is supervising the specially protected natural territory**

The Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan

*(description of boundaries)*

5.3. Total area of State Institution "Aksu-Jabagly State Nature Reserve" – 131934 ha.

5.4. Area of protected zone of SI "Aksu-Jabagly SNR" – 258 km<sup>2</sup> – 25800 ha.

A 2 km protection zone is allotted around the Reserve's territory.

1. Resolution of Akimat of South Kazakhstan Oblast "On establishment of protection zone around the territory of the State Institution "Aksu-Jabagly State Nature Reserve" of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan" No. 289 of August 04, 2006.
2. Resolution of Akimat of Zhambyl Oblast "On establishment of protection zone around the territory of the State Institution "Aksu-Jabagly State Nature Reserve" of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan" No. 286 of October 26, 2006.

*(indicator species, protected objects, etc.)*

**7. Functional zones on the protected natural territory and type of regime of their protection, information on adjacent land plot owners and land users, their obligations and encumbrances with respect to natural resource usage in the protected zone**

7.1. SI "Aksu-Jabagly SNR" protection regimes by functional zones:

The Reserve's territory is not divided into functional zones.

S/n	Functional zone description	Area, ha	Protection regime
1.	Main area of the Reserve	131657.3	permanent all-year reserve regime
2.	Karabastau palaeontological area	125	
3.	Auliye palaeontological area	100	
4.	lands allotted for: - the Reserve's administrative building - the Jabagly cordon - the Kara-Alma cordon - the Teke-Kamal cordon - the Topshak cordon - the Aksay cordon - the Koksay cordon - the Auliye cordon	2.4574 2 5 6 16 8 7 5	protected zone
	<b>TOTAL:</b>	<b>131933.8</b>	

In the zone of limited traditional economic activities, it is allowed to mow hay for the Reserve's needs (9 plots), graze service horses (1 plot). The total area of usage for these purposes amounts to 80 ha, including area for hay mowing – 77.1 ha, livestock grazing – 2.9 ha.

No.	Description of Aksu-Jabagly SNR area	No. of compartment and subcompartment	Area, ha
1	Jabagly	Compartment 8, subcompartment 20 a	3.0
2	Taldybulak	Compartment 13, subcompartment 3	0.6
3	Aksu-right	Compartment 27, subcompartment 18 a	6.6
4	Aksu-left	Compartment 43, subcompartment 53 a	3.0
5	Aksu area	Compartment 27, subcompartment 1 Compartment 29, subcompartment 18	30.0 10.0
6	Shuyldak	Compartment 64, subcompartment 52	7.0
7	Shuyldak weather station	Compartment 64, subcompartment 47	5.1
8	Darbaza 1	Compartment 84, subcompartment 55	6.0
9	Darbaza 2	Compartment 92, subcompartment 23	5.8
10	Ulken-Kaindy area	Compartment 19, subcompartment 9	2.9
<b>Total:</b>			<b>80</b>

Areas for hay mowing have been allotted on the basis of the letter of the Chief Administration of Reserves and Forestry under the Council of Ministers of the Kazakh SSR (No. 3-14-288 of 2/26/1985) and the resolution of the second forest management conference on review of the project of organization and development of forestry of the Aksu-DJabagly Reserve of the Chief Administration of Reserves and Hunting under the Council of Ministers of the Kazakh SSR of 8/30/1985.

In 2006, the areas for hay mowing were repeatedly reviewed and approved by the Committee for Forestry and Hunting: Letter No. 25-11-27/724 March 07, 2006.

## 7.2. Information on owners and users of land plots located on the territory of the SI "Aksu-Jabagly SNR" and its protected zone, their obligations and encumbrances with respect to natural resource usage:

Besides the Reserve, there are no other land plots and land users on the territory of the Reserve.

..... *(list of land users in the protected zone)*

In accordance with Article 43, Chapter 7, Section 2 of the Law of the Republic of Kazakhstan On Specially Protected Natural Territories:

1. In the protected zones of state nature reserves, the following is prohibited:

- 1) Creation of new expansion of existing residential settlements;
- 2) Deployment, design, construction and operation of facilities, implementation of new technologies, which render harmful effect on ecological systems of the state nature reserve;
- 3) Conducting intensive forms of agricultural and forestry activities with application of chemicals, fertilizers and herbicides which are toxic for the animal and plant life;
- 4) Atmospheric emissions and discharges into open water sources and onto the terrain of pollutants and effluents, emplacement of waste;
- 5) Mining of mineral resources;
- 6) Amateur (sporting) and commercial hunting;
- 7) Burial of radioactive materials and industrial waste;
- 8) Activities which can change hydrological regime of the ecological systems of the state nature reserve (construction of dykes, dams, hydrotechnical structures and other facilities which lead to cessation of or reduction in natural water runoff);
- 9) Introduction of extraneous species of wild animals and wild plants;
- 10) Other activities which can render harmful effect on ecological systems of the state nature reserve.

2. Various forms of economic activities, which do not render negative effect on the condition of the ecological systems of the reserve, may be conducted on the territory of protected zones of the state nature reserves:

- 1) Forest management activities;
- 2) Traditional land usage, including livestock grazing and hay mowing, as well as other activities in the framework of ensuring long term conservation and invulnerability of biological diversity;
- 3) Tourist and recreational activities;
- 4) Usage of mineral waters, balneological and climatic resources;
- 5) Commercial and amateur (sporting) fishing;
- 6) Performance of ground and aerial operations on extinguishment of forest and steppe fires;
- 7) Reclamation of disturbed lands;
- 8) Restoration of forest and other plant communities;
- 9) Restoration of habitats and numbers of wild animals;
- 10) Usage of land plots for arrangement of places for temporary stay of tourists, organization of nurseries for artificial reproduction, growing, breeding of endemic, rare and endangered species of plants

and animals, as well as for construction of service buildings (cordons) for accommodation of the employees of the state nature reserve, provision of service land allotments to them.

3. In conducting the activities specified in item 2 of this article, it is necessary to plan and execute in the protected zones of the state nature reserves measures for conservation of habitats and conditions of reproduction of the animal and plant life entities, animal migration paths and places of their concentration, to ensure the inviolability of the plots which are of special value in their capacity of habitats of wild animals, as well as of other assets of the state nature reserve.

4. Limitations on economic activities of the owners of land plots and land users in protected zones of state nature reserves are established by resolutions of the Oblast (city of republican status, capital) executive bodies.

## **8. Allowed and prohibited types of activities, as well as limitations on some types of activities on the territory of SI "Aksu-Jabagly SNR":**

In accordance with Article 40, Chapter 7, Section 2 of the Law of the Republic of Kazakhstan On Specially Protected Natural Territories:

1. On the whole territory of the state nature reserve, the reserve protection regime is established, which **prohibits:**

- 1) Actions which change the hydrological regime of the territory;
- 2) Construction of buildings (erections and structures), roads, pipelines, electricity transmission lines and other utility lines and facilities which are not related to functioning of the state nature reserve;
- 3) Geological exploration works and extraction of mineral resources;
- 4) Disturbance of soil cover, destruction of mineral prospects and subsurface rock outcroppings;
- 5) All types of forest usage, including sanitation cutting and forest maintenance cuttings, collection of edible, medicinal and technical plants, flowers, seeds, hay mowing, cattle grazing and other types of plant life usage which lead to disturbance of the vegetation cover;
- 6) Hunting and fishing, with the exception of amateur fishing, which is allowed for the needs of the local population residing in the protected zone of the state nature reserve, in specially allocated sites in accordance with the procedure established by an authorized body;
- 7) Capture and destruction of animals, disturbance of their environment and habitat conditions;
- 8) Introduction of new animal and plant species, performance of actions on increasing the numbers of individual species of animals above the values allowed according to natural capacity of the lands;
- 9) Gathering of collectible materials, with the exception of formation of the state nature reserve's collections;
- 10) Application of chemical and biological methods of combating pests and plant and animal diseases, as well as for control of animal numbers;
- 11) Passage of domestic animals;
- 12) Noise and other acoustic effects of artificial nature, which exceed the norms established by an authorized body in coordination with an authorized state body in the sphere of environment protection;
- 13) Activity, if it can entail changes of natural appearance of the protected landscapes or disturbance of stability of ecological systems or if it presents a threat to preservation and reproduction of especially valuable natural resources.

2. It is allowed to perform ground and air operations on the territory of state nature reserves for prevention and extinguishing of forest and steppe fires.

According to the Regulations of the State Institution "Aksu-Jabagly State Nature Reserve" of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan, approved by the directive of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan of 7/6/2005 No. 149, the Institution, within the limits of its competence and in accordance with the procedure established by the legislation, conducts the following types of **core** activities:

- 1) Preservation of natural complexes and objects in their natural condition;
- 2) Participation in development and execution of the programs on issues of protection and restoration of the state natural reserve assets, historical and cultural complexes and sites;
- 3) Execution of audits of observance of the requirements of legislation in the sphere of specially protected natural territories, forestry legislation and wild life legislation on the territory of the Institution and in its protected zone;
- 4) Performance of scientific research on the territory of the Institution, including maintenance of the Nature Records;
- 5) Ensuring protection of animal and plant life, prevention and liquidation of harmful effects on the Institution's ecological systems;
- 6) Participation in keeping of the state records of the forest resources and animal life, monitoring of the forests, state forest cadaster, records and cadaster of rare and endangered species of animal and plant life;
- 7) Usage of the Institution's territory for scientific, ecological education purposes within the limits of its competence and under the consent of the authorized body;
- 8) Interaction with nature protection organizations;
- 9) Performance of ecological monitoring;
- 10) Participation in international cooperation in the sphere of specially protected natural territories and conservation of biological diversity.

Also, the Institution, within the limits of its competence and in accordance with the procedure established by the legislation, performs the following types of activities which **do not belong to core activities**:

- 1) Organization and execution of educational excursions and lessons, practical training of schoolchildren and students, training of scientific personnel, re-training and improvement of qualifications of specialists in the sphere of nature reserve activities, environment protection, sustainable natural resource usage;
- 2) Provision of tourist paths, observation sites, vehicle parking sites, yurts, tent camps;
- 3) Conducting amateur (sporting) hunting and fishing;
- 4) Provision of services of attendants, guides and interpreters, performance of filming, video recording and photo taking in the course of visiting and studying the resources of the state nature reserve, natural and historical-cultural heritage, nature museums and petting zoos;
- 5) Provision of services on sanitary cleaning and land improvement of the specially protected natural territory;
- 6) Provision of transportation services.

## 9. Visiting rules, work schedule and recreational load of SI "Aksu-Jabagly SNR":

### Visiting rules:

In accordance with items 3 and 4, Article 40, Chapter 7, Section 2 of the Law of the Republic of Kazakhstan On Specially Protected Natural Territories:

3. Presence of individuals on the territory of the state nature reserves is only allowed with possession of permit documents, with the exception of the state nature reserve's employees and officials of state authority bodies which are supervising the state nature reserves.

4. To provide access to places worshiped by followers of one or another religion (places of pilgrimage), which are located on the territory of the reserve or outside its boundaries, by roads passing through the reserve's territory, the administration of the state nature reserve, in coordination with the appropriate religious association, may allow unpaid group visit of these places or approach to these places in the company of inspectors of the state nature reserve.

In order to visit the territory of the reserve, an individual must first visit the reserve's administrative building to make payment for visiting the specially protected natural territory and for the services provided by the reserve to the reserve's cash office and to receive a pass in accordance with the established form, approved the reserve's director or his deputies.

In exceptional cases, payment for visiting the specially protected natural territory and for the services provided by the reserve may be made directly at the reserve's cordons, but only by preliminary agreement with the administration over the phone.

It is mandatory for each tourist group to have escort: a guide or an inspector of the reserve's guarding service. A group may also be escorted by the reserve's non-staff worker, who must have experience of escorting tourist groups in the Aksu-Jabagly Reserve (at least 1 year) and who must annually receive confirmation of his qualifications.

### Work schedule:

SI "Aksu-Jabagly SNR" working hours are from 9:00 to 19:00 hours, with a lunch break from 13:00 to 15:00 hours, 5 days a week (Monday through Friday). For non-working days and holidays there is an established duty schedule of the Ecological Education Department of the Reserve. On non-working days and holidays, at least 2 employees of the Ecological Education Department are on duty at the administrative building of the Reserve from 9:00 to 19:00 hours with a lunch break from 13:00 to 15:00 hours.

Under preliminary agreement with the Reserve's administration, ecological excursions on the territory of the Reserve may be conducted from 6:00 to 20:00 hours.

### Recreational load:

All tourist routes of the Reserve, both currently and in the nearest future, are characterized by approximately equal visiting mode: single day radial or circular / semi-circular routes, which are used for on-foot or on-horse passage of relatively small groups of tourists, mostly with scientific and educational purposes.

Taking into account that all routes go through the reserved territory with rather high biological diversity of animal and plant life and where there are remaining representatives of fauna and flora which are listed in the Red Book of Kazakhstan, the number of tourist groups must not exceed two groups per week. The allowed number of people in the tourist group is 8-10 persons. In exceptional cases on some routes it is allowed to increase the number of people in the group up to 10-12, but not more often than 1-2 times per month.

Load norms on the 3 training-educational paths of the Reserve are different from those on the tourist routes. They all go along the Reserve's boundary and enter its limits at very short sections. These paths pass through the territory which differs from the main territory of the Reserve by much lower biodiversity due to natural and historical reasons. Thus, the load norms here are determined by physical and psychological comfort factors.

The allowed number of people in the group is 10-15, the route may be visited 3 times per week.

**Passport prepared by:** SI "Aksu-Jabagly State Nature Reserve"

Seal

Passport preparation date:  
23 July 2007

RESOLUTION OF THE GOVERNMENT OF THE REPUBLIC OF KAZAKHSTAN

Astana

Date: January 26, 2006

No 52

On some issues related to certain government institutions  
of the South-Kazakhstan oblast

The Government of the Republic of Kazakhstan RESOLVES:

1. To accept into the republican ownership the Ugam, Tolebi and Tyulkubass state institutions in the field of forest and fauna protection of the regional administration of natural resources and nature management of the Akimat of the South-Kazakhstan oblast as property complexes being in the municipal ownership of the Akimat of the South-Kazakhstan oblast.
2. Akim of the South-Kazakhstan oblast jointly with the State Property and Privatization Committee of the Ministry of Finance of the Republic of Kazakhstan and the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan shall take necessary steps to implement clause 1 hereof in a manner prescribed by the legislation.
3. To reorganize the, Tolebi and Tyulkubass state institutions in the field of forest and fauna protection of the regional administration of natural resources and nature management of the Akimat of the South-Kazakhstan oblast by way of merging into the state institution "Sairam-Ugam state national natural park" of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan (hereinafter – "the institution").
4. To withdraw land lots with the total area of 11,100 ha from the categories of reserve lands in the territory of Kazygurt and Tolebi regions of the South-Kazakhstan oblast pursuant to the annex to this Resolution and grant them to the institution on the right of permanent land use.
5. To include the land lots of the institution referred to in the annex hereto in the category of lands of specially protected natural areas, whereas the forests located thereon shall be included in the category of the state forest fund "forests of state national natural parks".
6. Akimat of the South-Kazakhstan oblast shall establish a protective zone around the lands of the institution subject to prohibition of any activities within the protective zone, which have harmful effects on the state of ecological systems.
7. The Land Resources Management Agency of the Republic of Kazakhstan jointly with the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan shall establish boundaries of the institution's lands in a prescribed manner.
8. In accordance with the prescribed procedure, the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan shall:
  - 1) approve the Regulations for the institution and ensure their state registration with judicial bodies;
  - 2) take any other steps resulting from this Resolution.
9. To state that financing of the institution shall be provided out of the republican budget at the cost and within the amount of money provided for in the republican budget for the relevant year for maintenance of specially protected natural areas.
10. To introduce the following amendments and supplements to certain resolutions of the Government of the Republic of Kazakhstan:
  - 1) into the resolution of the Government of the Republic of Kazakhstan No 214 dated March 5, 2005 "On approval of limits of the staff number of state institutions, which are under the jurisdiction of central executive bodies of the Republic of Kazakhstan":

into the limits of the staff number of state institutions, which are under the jurisdiction of central executive bodies of the Republic of Kazakhstan and which are financed at the cost of the republican budget, approved by the said resolution:

the section 2 "the Ministry of Agriculture of the Republic of Kazakhstan":

the following line shall be added after the line "Charyn state national natural park 46":

"Sairam-Ugam state national natural park 105";

- 2) into the resolution of the Government of the Republic of Kazakhstan No 310 dated April 6, 2005 "Some issues of the Ministry of Agriculture of the Republic of Kazakhstan (SAPP of the Republic of Kazakhstan, 2005, No 14, page 168):

The following line (serial number 21-1) shall be added into the list of organizations, which are under the jurisdiction of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan approved by the said resolution:

"21-1. The state institution "Sairam-Ugam state national natural park";

- 3) into the resolution of the Government of the Republic of Kazakhstan No 746 dated July 19, 2005 "On approval of the list of specially protected natural areas of the republican status" (SAPP of the Republic of Kazakhstan, 2005, No 30, page 387):

The list of specially protected natural areas of the republican status approved by the said resolution:

the following line (serial number 104-1) shall be added:

"104-1	Sairam-Ugam state national natural park	149053	Kazygurt, Tolebi and Tyulkubas regions	Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan
--------	---	--------	--	--

lines with serial numbers 106 and 111 shall be excluded.

11. This Resolution shall come into force from the date of signing.

Prime Minister  
of the Republic of Kazakhstan

D. Akhmetov

Explication

of land lots granted for temporary land use to the state institution "Sairam-Ugam state national natural park" of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan" in the territory of the South-Kazakhstan oblast

No	Category of land and agricultural lands	Area, ha
1	<b>Kazygurt region –</b> 1) Reserve land (grazing land) 2) Land of the forest fund: Ugam state institution in the field of forest and fauna protection <b>Total:</b>	 2,000 74,573  <b>76,573</b>
2	<b>Tolebi region –</b> 1) Reserve land (grazing land) 2) Land of the forest fund: Tolebi state institution in the field of forest and fauna protection <b>Total:</b>	 9,100 36,409  <b>45,509</b>
3	<b>Tyulkubas region –</b> Land of the forest fund: Tyulkubas state institution in the field of forest and fauna protection  <b>Total:</b>	 26,971   <b>26,971</b>
	<b>Total:</b>	<b>149,053</b>

RESOLUTION  
OF AKIMAT OF THE SOUTH-KAZAKHSTAN OBLAST

---

6, Tauke khan Ave., 160007, Shymkent

April 26, No 171

On establishment of the buffer zone around lands of the state institution "Sairam-Ugam state national natural park" of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan"

In accordance with articles 11, 24 of the Law of the Republic of Kazakhstan "On specially protected natural areas" and pursuant to the resolution of the Government of the Republic of Kazakhstan No 52 dated January 26, 2006 "On some issues of certain state institutions of the South-Kazakhstan oblast", letter of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan No 25-11-23/1058 dated April 5, 2006, Akimat of the South-Kazakhstan oblast **RESOLVES:**

1. To establish a 2-kilometer protective zone around lands of the state institution "Sairam-Ugam state national natural park" of the Forestry and Hunting Industry Committee of the Ministry of Agriculture subject to prohibition of any activities that have a negative impact on the state and recovery of ecological systems of the above-mentioned national natural park.
2. To impose control over the execution of this resolution on the First Deputy Akim of oblast I.A. Abishev.

Akim of the South-Kazakhstan oblast

B. Zhylkyshiyev

AKIMAT OF THE SOUTH-KAZAKHSTAN OBLAST

6, Tauke khan Ave., 160007, Shymkent

October 29, No 359

**On reservation of lands for expansion of Sairam-Ugam state national natural park**

In accordance with the Law of the Republic of Kazakhstan «On specially protected natural areas» and the resolution of the Government of the Republic of Kazakhstan No 943 dated September 29, 2006 «On approval of the Rules for reservation of land lots intended for creation and expansion of specially protected natural areas of the republican and local status» as well as based on the letter of the Forestry and Hunting Industry Committee of the Ministry of Agriculture of the Republic of Kazakhstan No 25-11-23/626 dated February 26, 2008, proposals of the committee of oblast for reservation of lands for expansion of the territory of Sairam-Ugam state national natural park dated September 9, 2008, Akimat of oblast **RESOLVES:**

1. To reserve 3.1 ha of land out of the territory of Badam state institution in the field of forest and fauna protection for expansion of the territory of Sairam-Ugam state national natural park for the purpose of construction of a complex of an administrative building in accordance with the attached explications and layout of the land lot.
2. To use the reserved land lot for its intended purpose and establish a protection regime for specially protected natural areas subject to subsequent improvement of the land lot, provided that any other economic activities shall be prohibited.
3. To impose control over the execution of this resolution on the First Deputy Akim of oblast I.A. Abishev.

Akim of the South-Kazakhstan oblast

N. Ashimov

Annex  
to the resolution of Akimat of the South-Kazakhstan oblast  
No 359 dated October 29, 2008

**Explication  
of a land lot of the state forest fund intended for reservation for expansion of a specially protected natural area**

Land user name	Total area, ha	Including:
Sairam-Ugam state national natural park	3.1	Forestry crops
		3.1

APPROVED BY DIRECTIVE OF THE COMMITTEE FOR FORESTRY AND HUNTING OF THE MINISTRY OF AGRICULTURE OF THE REPUBLIC OF KAZAKHSTAN  
2008

REGISTERED BY DIRECTIVE OF THE COMMITTEE FOR FORESTRY AND HUNTING OF THE MINISTRY OF AGRICULTURE OF THE REPUBLIC OF KAZAKHSTAN

## PASSPORT of SAYRAM-UGAM STATE NATIONAL NATURE PARK

### 1. Name of the specially protected natural territory with indication of its type and category

The Sayram-Ugam State National Nature Park, State National Nature Park, Republican status

### 2. Name, number and date of adoption of the act of state authority body which established or expanded the specially protected natural territory

The Sayram-Ugam State National Nature Park was established by Decree of the Government of the Republic of Kazakhstan of 26 January 2006 No. 52 "On some issues of individual state institutions of the South Kazakhstan Oblast", by merging the Ugamskiy, Tolebiyskiy and Tyulkubasskiy state institutions on forest and animal life protection.

### 3. Name of the state authority body which is supervising the specially protected natural territory

The Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan.

### 4. Name of the organization which is entrusted with guarding of the specially protected natural territory which does not have a legal entity status

### 5. Location of the specially protected natural territory with schematic map with specification of the tourist infrastructure, geographical coordinates, description of boundaries, area of its territory and protected zone:

#### 5.1. Location the specially protected natural territory

Republic of Kazakhstan, South Kazakhstan Oblast, 050061, city of Shymkent, Zheltoksan str. No. 18.

#### 5.2. Description of the boundaries of the specially protected natural territory

1) The Boraldytau area: the northern boundary goes along the Zhambyl Oblast border, the eastern, western, southern boundaries go along the border of the Kayrchakty, Kanay and Kokbulak forest estates;

2) The Irsu-Daubabinskiy area: the northern boundary goes along the dividing ridges between the valley of the Daubaba and Mashat river, western boundary – along the road from Seslavino settlement to the Aksay winter road, eastern – the Tyulkubas-Rayevka road. The southern boundary goes along the Mashat river canyon, including the canyon itself;

3) The Sayram-Ugam area: the northern boundary coincides with the boundary of the Aksu-Jabagly Reserve, the eastern and south-eastern boundaries go along the state border of the Republic of Kazakhstan, the western boundary goes along the slopes and foothills of the Karzhantau ridges and the north-western part of the Ugam ridge.

5.3 Total area of the Sayram-Ugam SNNP amounts to 149053 ha

5.4. The area of the protected zone of the Sayram-Ugam SNNP is 27000 ha

Decree of the South Kazakhstan Oblast Akimat "On establishment of protected zone around the lands of the State Institution "Sayram-Ugam State National Nature Park" of the Committee for Forestry and Hunting of the Ministry of Agriculture" No. 171 of 04/26 /2006

### 5.5. Schematic map of th SPNT with specification of the SPNT infrastructure

6. The list of the assets of the state natural reserve stock with their quantitative and qualitative descriptions is given in Appendix 1 to the Passport

6.1. List of indicator species which determine the condition of the Sayram-Ugam SNNP plant and animal life

6.1.3. The numbers of the animal indicator species is given in Appendix 2 to the Passport

6.2. Assets of historical and cultural heritage located on the Sayram-Ugam SNNP territory:  
Petroglyphs in the upper reaches of the Sazanata river, Togutba petroglyphs.

6.2.1. The list of the historical and cultural heritage assets is given in Appendix 3 to the Passport

7. Functional zones on the specially protected natural territory and type of regime of their protection, information on adjacent land plot owners and land users, their obligations and encumbrances with respect to natural resource usage in the protected zone

7.1. Protection regimes of the specially protected natural territory by functional zones \*

S/n	Functional zone description	Area, ha	Protection regime
1	2	3	4
1.	Reserve regime zone	74964	Ensuring natural development of ecosystems, without human interference. Any economic activities, recreational usage are prohibited
2.	Zone of tourist and recreational activities	33882	Limited reserve regime is established, with prohibition of economic usage of the territory, construction of stationary recreation and medical treatment institutions, primary use and thinning forest felling, hay moving and cattle grazing. Regulated tourist and recreational usage is allowed, including organization of tourist routes, paths, arrangement of bivouac sites and observation sites with due consideration of the recreational load norms.
3.	Zone of limited economic activities	40207	Limited reserve regime is established in the zone. It is allowed to deploy facilities of administrative and economic designation, construct and operate recreation centers, hotels, camping sites, museums; it is allowed to harvest minor forest products, grow planting materials, perform sanitary felling, amateur hunting and fishing, provide services to visitors.
	TOTAL	149053	

\* Note: Functional zoning of the Sayram-Ugam SNNP will be more accurately specified after adjustment of the technical and economic substantiation with respect to design of the general plan of infrastructure development and putting it in compliance with RK Law "On specially protected natural territories" of 7 July 2006

7.2. Information on the owners of land plots and land users located in the SPNT and in its protected zone

(list)

## 8. Allowed and prohibited types of activities, as well as limitations on some types of activities on specially protected natural territories:

On the territory of the Sayram-Ugam State National Nature Park, the following is **prohibited**:

- Creation of new and expansion of existing residential settlements, industrial facilities, agricultural and land improvement facilities, power, transport and communication facilities, military and defense facilities and structures, not related to the goals and functioning of the specially protected natural territories;
- Atmospheric emissions and discharges into open water sources and onto the terrain of pollutants and effluents, emplacement of waste;
- Storage and burial of production and consumer waste, as well as radioactive materials;
- Activities capable of changing the hydrological regime and the ecological system of the national park.

Various forms of economic activities, which do not render negative effect on the condition of the ecological systems of the national park, may be conducted on the territory of the national park:

- Forest management activities;
- Traditional land usage, as well as other activities in the framework of ensuring long term conservation and invulnerability of biological diversity;
- Amateur hunting and fishing;
- Recreational activities and tourism;
- Scientific research and ecological education activities.

## 9. Visiting rules, work schedule and recreational load of the specially protected natural territory

To avoid the factor of wild animals' disturbance, it is prohibited to make noise, honk vehicle horns during passage of the tourist routes. Presence of tourists unaccompanied by the state national nature park's guides is not allowed. The following is PROHIBITED on the territory of the national park!

- Destruction, damage of natural sites, monuments of history, culture;
- Contamination of water bodies and soil;
- Cluttering the territory with domestic waste;
- Unauthorized hunting, fishing, devastation of nests, ant-hills;
- Unauthorized cutting and breaking of trees;
- Starting fires outside designated places;
- Gathering of nicely blossoming and medicinal plants;
- Gathering of mushrooms, berries, fruits without permission;
- Unauthorized grazing of cattle and hay mowing;
- Presence with domestic animals (dogs, cats);
- Arrangement of tourist camps outside places specially designated for this purpose;
- Putting inscriptions on stones, trees;
- Scientific, surveying works without permission;
- Driving vehicles off the main body of the road to places not designated for this purpose.

The Park's work schedule is seasonal.

The national park's recreational load, depending on the route, is specified in Appendix 1 to the Schematic Map of the Sayram-Ugam SNNP

Passport prepared by: Sayram-Ugam State National Nature Park of the Committee for Forestry and Hunting of the Ministry of Agriculture of the Republic of Kazakhstan.

Seal

Passport preparation date:

"\_\_" \_\_\_\_\_ 2007



Sayramsu lake. Kenbay T.

Bishkek , Government House on August 1, 1994 N 573

### Government Resolution

#### To change the boundaries of Besh-Aral State Reserve and Chatkalsky forestry organizations

In order to preserve the unique natural complexes and Chatkal valley forests and endangered species of animals and plants, the Government of the Kyrgyz Republic decides:

1. Along with proposals Jalalabad Oblast State Administration and the State Committee of the Kyrgyz Republic for the Conservation of Nature :

- to change the boundaries of Besh-Aral State Reserve and establish its area of 63,200 hectares, including 2,810 hectares of its own land and 60,390 hectares of the national reserve in the north- western part of the reserve in accordance with the description and explication of land borders (Annex 1, 2);

- on the organization of Chatkalsky forestry with area 35968 hectares, including land transferred by Besh-Aral State Reserve - 24,911 hectares, the land of floodplain forests of Chatkalsky district - 5885 hectares and of Ala-Buka forestry technical area " Terek-Say " - 5172 hectares ( Annex 3, 4, 5, 6).

2. Kyrgyz Republic State Committee for Nature Protection to conduct organization of Chatkalsky forestry within staffing levels the management department and limit of their allowance.

3 . Jalal -Abad regionstate administration to allocate the necessary funds for the organization a of Chatkalsky forestry and for implementation of forestry activities within the amounts provided in the regional budget.

4 . Jalal-Abad region State Administration, Chatkal district state administration in the prescribed manner to issue materials Surveying land acquisition for Besh-Aral State Reserve and Chatkal forestry and give them the state acts on the right of land use.

5 . Recognize as cancelled the decision of the Council of Ministers of the Kyrgyz SSR from March 21, 1979 N 140 " On the organization of Besh- Aral State Reserve of State Committee of the Kyrgyz SSR on Forestry in Ala- Buka district of Osh region."

Prime Minister of the Kyrgyz Republic

A.Dzhumagulov

Bishkek , Government House on July 26, 2002 N 499

**Government Decree**

**On the transfer of land under the jurisdiction of Besh- Aral State Reserve**

In order to preserve the unique natural complexes , as well as endangered rare species of animals and plants of Chatkal valley and in accordance with Article 20 of the Land Code of the Kyrgyz Republic, the Government of the Kyrgyz Republic decides :

1. Accept the offer of Jalal-Abad regional and Chatkal district state administrations, consistent with the Republican Commission on issues related to land acquisition, the transfer 18400 hectares of state land reserve in the territory of Chatkal district, Jalal -Abad region to Besh-Aral State Reserve according to the annexes 1 and 2.

2 . Transfer the lands referred to in paragraph 1 from the category " Reserve land " in the category of "Lands of specially protected areas ."

3 . To approve the attached description of borders of the lands transferred to Besh-Aral State Reserve.

4 . State Forestry Service of the Kyrgyz Republic to determine the necessary additional staff units to ensure the protection of transferred land and provide funding within the funds budgeted for this reserve by the national budget for 2002.

5 . Jalal -Abad regional administration in the prescribed manner to make a corresponding change in the land records.

6. Monitoring on the implementation of this resolution shall be assigned to the department of agriculture and nature of the Administration of Prime Minister of the Kyrgyz Republic.

Prime Minister of the Kyrgyz Republic

N.Tanaev

Appendix 1 to the resolution of the Government  
of Kyrgyz Republic of July 26 , 2002 N 499

EXPLICATION  
of lands of state land reserve of Chatkal district

N	Name of the lands	Total area, ha	Including						
			tillages	ravines	grasslands	pastures	forests	wetlands	other
1	State land reserve before the transfer	440705	18	2054	3	244541	19	205	193865
2	State reserve lands transferred to Besh-Aral State Reserve	18400	-	-	-	9750	-	83	8567
3	State land reserve after the transfer	422305	18	2054	3	234791	19	122	185298

Appendix 2 to the resolution of the Government  
 of Kyrgyz Republic of July 26 , 2002 N 499

EXPLICATION  
 of lands of Besh-Aral State Reserve of Chatkal district

N	Name of the lands	Total area, ha	Including					
			pastures	forests	bushes	wetlands	roads	other
1	Lands of Besh-Aral State Reserve of Chatkal district before joining of transferred lands	63200	26431	4120	1197	1157	22	30273
2	Lands transferred to Besh-Aral State Reserve of Chatkal district	18400	9750	-	-	83	-	8567
3	Lands of Besh-Aral State Reserve of Chatkal district after joining of transferred lands	81600	36181	4120	1197	1240	22	38840

Bishkek , Government House on April 24, 2006 N 291

**Government Resolution**  
**On the organization of the reserved area " Sandalash "**  
**of Besh-Aral State Reserve**  
**in Chatkal district of Jalal -Abad region of Kyrgyz Republic**

(as amended by the Decree of the Government of the Kyrgyz Republic  
on March 31, 2011 N 130)

In order to improve the ecological environment and improve the protection of the unique biological resources of the region , pursuant to the requirements of the Convention on Biological Diversity , ratified by the Law of the Kyrgyz Republic "On the accession of the Kyrgyz Republic to the Convention on Biological Diversity " , as well as for the conservation of biological diversity of the republic as a whole, based on Article 8 of the Convention on Biological Diversity, the Government of the Kyrgyz Republic decides :

1. Arrange reserved portion " Sandalash " with area of 25,715.3 hectares in the lands of the state land reserve, in a part of land of Sandalash state hunting reserve located in the Chatkal district of Jalal-Abad region in accordance with Annex 3 hereto.

(As amended by the Decree of the Government of the KR dated March 31, 2011 N 130 )

2. Translate lands named in Annex N 1 hereto, from the categories of "Reserve land (state)" to the category "Lands of specially protected areas (state)".

3. Convey reserved portion " Sandalash " in keeping of Besharal State Reserve.

4. Approve :

- Explication of land transferred into the category of "Lands of specially protected areas" , in accordance with Appendix 1 ;

- Description of the boundaries of the land to be transferred into the category of "Lands of specially protected areas" , in accordance with Appendix 2 .

(As amended by the Decree of the Government of the KR dated March 31, 2011 N 130 )

5. State Agency on Environment Protection and Forestry under the Government of the Kyrgyz Republic to ensure the appropriate regime for protected area " Sandalash " with the financing costs from funds allocated in the national budget for 2006, for its subordinate organizations.

6. State Registration Service of the Kyrgyz Republic, the State Administration of Jalal- Abad region:

- according to established procedure to formalize materials on protected areas land acquisition;

- add under the established order the proposal for the transfer of land to be allocated under the reserved portion " Sandalash " in the category of " Lands of specially protected areas " , arising from the present decision.

( As amended by the Decree of the Government of the KR dated March 31, 2011 N 130 )

7. Monitoring of the implementation of this resolution shall be assigned to the department of fuel and energy complex and mineral resources of the Government Office.

( As amended by the Decree of the Government of the KR dated March 31, 2011 N 130 )

Prime Minister of the Kyrgyz Republic

F.Kulov

Appendix N 1  
to the governmental resolution  
of Kyrgyz Republic, April 24, 2006 N 291

EXPLICATION  
of land transferred into the category  
" Lands of specially protected areas "

(Name of the appendix as amended by Resolution of the Government of the Kyrgyz Republic on March 31, 2011 N 130 )

Territory	Total area, ha	Including				
		pastures	forest/bushes	wetlands	roads	other
Sandalash state hunting reserve	25269.5	5610.7	1058.2	37.3	4.5	18559.2
In the district in total	25270	5611	1058	37	5	18559

Chief of Staff of the Prime Minister -  
Minister of the Kyrgyz Republic

T.Koenaliev

Approved by directive of State Agency  
on Environment Protection and Forestry under the  
Government of the KR of May 18, 2006 No. 109

## REGULATIONS OF THE BESH-ARAL STATE RESERVE

### 1. General provisions

The Besh-Aral State Reserve (hereinafter – State Reserve) was established in accordance with the Decree of the Government of the Kyrgyz Republic (Council of Ministers of the Kyrgyz SSR) of 21 March 1979 No. 140, it is a nature protection, scientific research institution, and belongs to the category of specially protected natural territories (hereinafter – SPNT) of the Kyrgyz Republic.

2. The State Reserve constitutes a legal entity, its legal organizational form is an Institution, based on the right of operational management, ownership form – state ownership, it has a coat-of-arms seal, stamps, accounts in the local branch of the Treasury, it is maintained at the expense of the republican budget and other sources, and it acts in accordance with the Law of the Kyrgyz Republic "On specially protected natural territories", other laws and sublaws which regulate its activities and these Regulations, approved by the Founder.

3. The State Reserve Founder: State Agency on Environment Protection and Forestry under the Government of the KR (hereinafter – the State Agency).

4. Name of the institution:

«Бешаральский государственный заповедник Государственного агентства по охране окружающей среды и лесному хозяйству при Правительстве Кыргызской Республики» (The Besh-Aral State Reserve of the State Agency on Environment Protection and Forestry under the Government of the Kyrgyz Republic) in the Russian language;

«Кыргыз Республикасынын окметуно караштуу курчач турган чойрону коргоо жана токой чарбысы боюнча мамлекеттик агенттигинин Бешарал мамлекеттик коругу» - in the Kyrgyz language.

Legal address of the State Reserve: 715720, Kyrgyz Republic, Djalal-Abad Oblast, Chatkal District, s. Zhanybazar.

5. The areas of land and water bodies (water areas) which are allocated to the State Reserve, with all natural resources and sites located within their boundaries, are withdrawn from economic exploitation. Also, these lands (the reserved zone and the protected zone) are to pass registration in accordance with the established procedure at the territorial divisions of the State Registry, which is to issue an act for termless usage of the land in accordance with the established procedure. The State Reserve has its own staff of guarding service, research associates and administrative and utility personnel and is headed by its director.

6. The State Reserve's activities are funded from the republican budget, the republican and local nature protection funds, as well as other sources which do not contradict the legislation.
7. The structure, staff and numbers of the State Reserve employees, expenditure estimations, plans of scientific research activities, protection-reproduction and ecological education works, as well as procurement of materials and technical resources are approved by the State Agency.
8. There is a scientific and technical council (hereinafter – STC) functioning at the Reserve, which includes: director, deputy director, employees of the department of science and reserved zone

guarding services, as well as specialists of separate research & development institutions and higher education institutions. The STC compositions and its Regulations are approved by the State Agency on Environment Protection and Forestry under the Government of the KR. The STC is entitled to make decisions for the purposed of improving the scientific and production works which are conducted.

## II. Main objectives and tasks of the State Reserve.

9. The State Reserve is organized with the following objective:

- Preservation in natural condition of the whole natural complex (plant and animal life, geological formations, water bodies, ground waters, soils, etc.) which is most typical for the given geographical zone or an area thereof, as well as unique natural sites;
- Protection of rare animals and plants, preservation of the genetic stock of biological diversity which is peculiar to the given geographic zone or its region;
- Preservation and study of the natural course of natural processes in comparison to their dynamics on economically used territories;
- Acting the role of preservation of rare species of wild animals and plants, their propagation and reproduction;
- Participation, in accordance with the established procedure, in international agreements, conventions on the issues of preservation of biodiversity, wild flora and fauna, SPNT development;

10. Execution of the following main tasks is entrusted to the State Reserve:

- Observance of the established regime on the territories of the Reserve;
- Conducting scientific research, assistance in performance of scientific research by other research organizations and educational institutions;
- Assistance in training of reserve management scientific personnel and specialists;
- Introduce an evaluation on ecological situation of the given region;
- Propaganda of the issues of environment condition and preservation of biological diversity by publication of scientific papers, articles, as well as by organizing a Nature Museum;
- Conducting protection-reproduction activities.

## III. State Reserve regime.

11. On the territory of the reserved zone, it is prohibited to conduct any economic and other activities not related to fulfillment of the main tasks by them, to disrupt the natural process of the natural complex, including:

- Actions which change the hydrological regime of the territory;
- Construction of buildings, structures, roads, pipelines, electricity transmission lines and other utility lines and facilities which are not related to functioning of the State Reserve.
- Geological exploration works and extraction of mineral resources;
- Disturbance of soil cover, destruction of mineral prospects and exposure of subsurface rocks;
- All types of forest usage, collection of fodder grass, medicinal and other plants, flowers, seeds, cattle grazing and other usages of the plant life;
- Fishing, hunting and destruction, as well as disturbance of the habitat conditions, of animals;
- Infusion (acclimatization) of new species of animals and plants;
- Gathering of collectible materials, except materials required for performance of scientific research in the Reserve;
- Application of chemical substances for control of pests, plant and animal diseases, with the exception of cases which present special danger to the population of animal and plant life, as well as to human health;

- Passage of domestic livestock, movement of mechanized transportation means outside general usage roads and water ways;
- Wood rafting on water bodies;
  - Noise and other acoustic impacts of artificial origin.
  - Flying of airplanes lower than 2000 m above ground and breaking the sound barrier by them over the territory of the State Reserve, as well as other types of noise effects exceeding the established norms.

12. On the territory of the protected zone, under the STC recommendations, as well as in other cases and the State Agency, it is allowed to conduct the following actions on preservation of the reserved natural complexes, as on ensuring execution of the plan of scientific research, protection-reproduction and ecological education actions:

- Rehabilitation actions in the area where the native natural complexes were disturbed by human activities or natural disasters, as well as actions on prevention of changes of natural complexes as a result of economic activities in territories which are adjacent to the Reserve;
  - Actions to preserve endangered plant and animal species;
  - Performance of fire safety, sanitary actions, as well as actions to take care of forest plantations of artificial origin which require silvicultural care;
  - Regulation, in accordance with the established procedure, of the numbers of animals to preserve the natural ratios of animals in the natural complex;
  - Capture, in accordance with the established procedure, of animals for marking and dispersal;
  - Capture and shooting, in accordance with the established procedure, of animals for collection of scientific materials;
  - Performance of biotechnical actions for preservation of rare and endangered animal species;
  - Erection, in accordance with the established procedure, of structures, as well as roads, bridges, information boards and panels which are required for the State Reserve to fulfill its main objectives;
  - Performance of forestry management, hunting management, topographical and geodetic works;
  - Conducting ecological, scientific-educational tourism;

13. Development of ecological tourism in the State Reserve. Ecological tourism is conducted in the State Reserve on developed ecological routes in the company of a guide and on a paid basis.

Visiting of other persons is conducted under special permits issued by the State Agency on Environment Protection and Forestry under the Government of the KR, as well as by the administration of the State Reserve.

14. Funds received from payments for visiting the State Reserve, nature museum, collected claims and other sources go to the non-budgetary account of the State Reserve and are spent in accordance with the approved expense estimation.

#### **IV. Scientific research activities in the State Reserve.**

15. Scientific research activities of the State Reserve are conducted by way of stationary round-the-year, multi-year, comprehensive observations to study natural complexes, individual natural assets, dynamics of natural processes with the purpose of evaluating and forecasting the ecological situation, in accordance with the normative and methodological instructions of the State Agency on Environment Protection and Forestry under the Government of the Kyrgyz Republic.

The main task of the State Reserve's scientific research activities consists in development and implementation of scientific base of nature protection, biodiversity preservation and rational usage of natural resources.

The scientific research work at the Besh-Aral State Reserve is performed by:

- Employees of the Reserve's scientific department – according to plans of scientific research work, actions for preservation and restoration of natural composition of ecosystems, regulation of their disturbed natural relations, approved by the State Agency on Environment Protection and Forestry under the Government of the Kyrgyz Republic;

- Research and development institutes and higher education institutions of appropriate profile, which perform both stationary and expeditionary studies and observations under the program of natural environment condition monitoring – on a contractual basis according to programs agreed with the Reserve administration. The scientific research cooperation contracts are to be agreed with the State Agency on Environment Protection and Forestry under the Government of the Kyrgyz Republic.

The scientific research activities must not lead to change of the Reserve status and tasks and its constituent components.

## V. Guarding of the State Reserve.

16. Guarding of the State Reserve is performed by the staff of the special service for guarding of the State Reserve. ("Preservation, restoration of the natural complex").

17. The State Reserve's director is the Chief State Inspector (hereinafter – state inspector) for environment protection, in absence of the director the acting environment protection state inspector of the State Reserve is the guarding service manager.

18. Functions of the State Reserve's state inspector may be performed by the Reserve employees who are not state inspectors according to their positions. Granting of such rights may be performed on the basis of a directive of the State Reserve's director.

19. In order to reinforce the guarding regime, an institute of non-staff inspectors is engaged from representatives of the civil society acting under the control of the Reserve administration.

20. The state inspector is entitled to:

- Demand from the reserve regime breachers explanation with respect to breach of the State Reserve regime;
- Check citizens' official documents for the right of presence, passage and other activity on the reserved and protected territory;
- Execute reports on regime and environmental legislation breaches on the territory of the Reserve;
- Suspend the activities of institutions, organizations, enterprises, citizens and officials which contradict the reserve regime and environmental legislation;
- Perform inspection of belongings, vehicles, checking of tools and products of persons who are present on the territory of the Reserve and nearby territory;
- Confiscate from the reserve regime breachers the unlawfully acquired products, tools of unlawful natural resource usage, vehicles and relevant documents for them in accordance with the established procedure, detain them until clarification of the circumstances;
- Deliver the reserve regime breachers to local police departments and authority bodies for establishment of the breachers' identity.

21. The State Reserve is entitled to sell through trading outlets and institutions the items and tools of unlawful usage of the animal and plant life assets, as well as products from them, confiscated by the judicial bodies, which were withdrawn on the territory of the State Reserve.

The sums and funds of the charged claims, as well as from sale of the items, tools, products confiscated by judicial bodies, which were collected and received on non-budgetary accounts, are designated, in accordance with the established procedure, for bonus payments to the State Reserve employees, as well as for nature protection purposes.

## VI. Management of the State Reserve.

General management of the State Reserve's activities is performed by the State Agency on Environment Protection and Forestry under the Government of the KR.

22. Direct management of the State Reserve is performed by its Director, and in his absence – by Deputy Director - Science Department Manager. Director, Deputy Director, Chief Accountant are

appointed and released from their positions by directive of the State Agency on Environment Protection and Forestry under the Government of the KR.

23. Director of the State Reserve acts on the basis of the Law of the Kyrgyz Republic "On civil service", these Regulations, and represents the State Reserve at all state institutions, organizations without a power of attorney.

24. Director of the State Reserve organizes execution of actions entrusted to the State Reserve:

- Bears personal responsibility for safekeeping of property, equipment, tangible items;
- Performs hiring and dismissal of all employees of the State Reserve with the exception of officials in the nomenclature of the State Agency on Environment Protection and Forestry under the Government of the KR;
- Enters into agreements with organizations and individuals, in accordance with the established plans and budgetary assignments, issues powers of attorney with respect to the Reserve's business without the right of their subsequent sub-delegation;
- Receives and distributes belonging funds, property, goods and other valuables, on behalf of the establishment performs operations in branches and offices of the National Bank of the Kyrgyz Republic and other credit institutions, and signs checks, and payment orders;
- Supervises execution of the scientific work plan which is imposed on the State Reserve;
- Organizes relations with scientific organizations and other institutions of the Republic within the limits of the scientific research plans;
- Organizes guarding of the State Reserve's territory, check and transfers to the appropriate bodies the reports and acts of breaches of the Regulations and regime of the Reserve, and passes resolutions on the executed reports;
- Presents claims to enterprises, institutions, organizations, citizens and officials for compensation of damages inflicted as a result of breach of the reserve regime and penalties in accordance with the current legislation.

26. Deputy Director:

- Organizes and directly manages scientific research conducted at the Reserve;
- Jointly with the Director bears responsibility for the state of scientific work, scientific assets and execution of the scientific research plans;
- Equally with the Director bears responsibility for observance of safety during scientific research works;
- Checks execution of work plans and reports of the Reserve's research associates;
- Manages pre-printing preparation of the results of scientific research accomplished on the Reserve's territory;
- Exercises control over journals and summarizing of the Nature Records materials of the Reserve;
- Bears responsibility for proper quality preparation of reports on scientific research work and their timely provision at the institution;
- Bears responsibility for the state of works on ensuring observance of the reserve regime;
- Directly ensures and is responsible for performance of protection-reproduction, ecological education works;
- Bears responsibility for observance of safety rules during all types of work performed on the Reserve's territory.

27. Chief Accountant performs organization of management and control of financial issues.

28. Responsibilities of other employees of the Reserve are determined by job descriptions approved in accordance with the established procedure.

29. The State Reserve employees wear uniforms of established standard form and are provided service weapons in accordance with the established procedure.

## VII. Reorganization and liquidation.

30. Reorganization and liquidation, as well as change of the State Reserve's boundaries are performed in accordance with the procedure established by the legislation of the Kyrgyz Republic.

31. In case of the State Reserve liquidation, the fixed assets, monetary funds after settlement of labor remuneration and other mandatory payments, settlements with the budget and other creditors, are transferred to the Founder in the remaining sum.

The liquidation (reorganization) shall be deemed to have been completed upon making an entry to this effect in the State Registry of Legal Entities.

32. The documents which appear in the course of the State Reserve's activities, in case of its liquidation are to be stored and used in accordance with the Law of the Kyrgyz Republic "On the national archive fund of the Kyrgyz Republic".

**Director, Besh-Aral State Reserve**

E. Seytaliyev

Bishkek , Government House  
July 3, 2003 N 405

## DECREE OF THE GOVERNMENT OF KYRGYZ REPUBLIC

### On the organization of the Padyshata State Nature Reserve

(As amended by the Decree of the Government of the Kyrgyz Republic of December 11, 2012 N 822 )

In order to preserve the unique juniper forests , Semenov fir , recorded in the Red Book of the Kyrgyz Republic, and the biodiversity of Republic in general, and also based on Article 8 of the Convention on Biological Diversity, the Government of the Kyrgyz Republic decides :

1. Organize Padyshata State Nature Reserve on lands of Padysha-Ata section of Avletimsky forestry located in Aksy district of Jalal-Abad region in the area 15,846 hectares, according to Annex 1.

2. Set boundaries of land use of Padyshata State Nature Reserve and its buffer zone in accordance with Appendix 2.

3. Transfer the lands referred to in paragraph 1 of this resolution, from the land category "Forest lands " to the category of "Lands of specially protected areas".

4. Approve :

- Description of the boundaries of the Padyshata State Nature Reserve according to Annex 3;

- Description of the boundaries of the buffer zone of Padyshata State Nature Reserve in accordance with Annex 4.

5 . State Forestry Service of the Kyrgyz Republic to finance costs of the newly organized Padyshata State Nature Reserve within the funds provided by the State Forest Service in national budget for 2003.

6. State Agency for Registration of Rights to Immovable Property under the Government of the Kyrgyz Republic, Jalal -Abad regional state administration in accordance with the established procedure to formalize the materials on land acquisition for newly established Padyshata State Nature Reserve.

7. Control for the implementation of this resolution shall be assigned to the department of agriculture and nature of the Apparatus of Prime Minister of the Kyrgyz Republic.

Prime Minister of the Kyrgyz Republic

N.Tanaev

Annex 1 to the Decree of Government of Kyrgyz Republic  
of July 3, 2003 N 405

#### EXPLICATION of lands of Padyshata State Nature Reserve

( As amended by the Decree of the Government of the Kyrgyz Republic  
of December 11, 2012 N 822 )

Total area of lands, ha	Forest lands			
	area covered by forest, ha	open forest communities, ha	area not covered by forest, ha	forest lands in total, ha

1	2	3	4	5
15846.0	4419.6	-	1298.6	5718.2

Non-forest lands					
arable, ha	grasslands, ha	pastures, ha	farms, ha	other lands, ha	non-forest lands in total, ha
6	7	8	9	10	11
-	-	2168.8	1.1	7967.9	10127.8

Chief of Staff of the Prime Minister  
Minister of the Kyrgyz Republic

B.Talgarbekov

Annex 2 to the Decree of Government of Kyrgyz Republic  
of July 3, 2003 N 405

EXPLICATION  
of lands assigned to buffer zone of Padyshata State Nature Reserve

( As amended by the Decree of the Government of the Kyrgyz Republic  
of December 11, 2012 N 822 )

Total area of lands, ha	Forest lands			
	area covered by forest, ha	open forest communities, ha	area not covered by forest, ha	forest lands in total, ha
1	2	3	4	5
14714.0	9146.0	120.6	336.8	9603.4

Non-forest lands					
arable, ha	grasslands, ha	pastures, ha	farms, ha	other lands, ha	non-forest lands in total, ha
6	7	8	9	10	11
86.0	17.6	3106.9	21.8	1878.3	5110.6

Chief of Staff of the Prime Minister  
Minister of the Kyrgyz Republic

B.Talgarbekov

State Agency for Environment Protection and Forest Management  
under the Government of the Kyrgyz Republic

Stamp:

[Department of Justice of Zhalal-Abad province.

State re-registry of the legal entity No. 0085049, dated December 11, 2007

Date of state registry: July 31, 2003]

PROVISIONS  
OF PADYSHA-ATA STATE NATURE RESERVE

Approved by the Order of  
the State Agency for Environment  
Protection and Forest  
Management  
under the Government of the  
Kyrgyz Republic  
No. 107, dated 18.05.2006

**I. General**

1. Padysha-Ata State Nature Reserve of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic (hereinafter referred to as the "State Reserve") was established by the Government Decree of the Kyrgyz Republic No. 405, dated July 3, 2003. It is a structural subdivision of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic as well as environmental, scientific and research institution and is qualified as specially protected natural area of the Kyrgyz Republic.

2. The State Reserve is a legal entity, according to the legal form of incorporation it is an Institution established on the basis of operational management and a state-owned legal entity, it has an official seal, stamps, accounts in the regional treasury branch, it is maintained by means of republican budget and other sources and acts in compliance with the Law of the Kyrgyz Republic 'Concerning Specially Protected Natural Areas', other laws and by-laws regulating its activity, and these Provisions approved by the Founder.

3. Founder of the State Reserve is the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic (hereinafter referred to as the "State Agency").

4. Official name:

In Russian language: 'Падышати́нский госуда́рственный запо́ведник Госуда́рственного аге́нства по охра́не окружа́ющей сре́ды и лесно́му хозя́йству при П́равительстве Кы́ргызской Респу́блики' ('Padysha-Ata State Nature Reserve of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic');

In Kyrgyz language: 'Кыргыз Республикасынын Өкмөтүнө караштуу курчап турган чөйрөнү коргоо жана токой чарбысы боюнча мамлекеттик агенттигинин Падышата мамлекеттик коругу' ('Kyrgyz Respublikasynyn Okmotuno karashtuu kurchap turgan choironu korgoo tokoi charbysy boyuncha mamlekettik agenttiginin Padysha-Ata memlekettik korugu').

Legal address of the State Reserve: village of Kashkasuu, Aksy region, Djalalabad province, Kyrgyz Republic.

5. Land and water areas (aquatories) with all natural resources and objects granted to the State Reserve on a permanent basis are withdrawn from economic use. Besides, these lands (preserved and protected areas) undergo registration in territorial departments of State Registry, which issues acts for land use on a permanent basis in accordance with the established procedure. The State Reserve has its own staff of Protection Service, scientific employees and office and management personnel and is headed by the Director.

6. The activity of the State Reserve is financed from the republican budget, republican and regional funds of nature protection as well as other sources not contradicting the law. Structure, staff and number of employees of the State Reserve, estimates of costs, plans of scientific research, protective-reproduction and ecologically-educational works as well as material and technical support of the State Reserve is approved by the State Agency.

7. The Director, Deputy Director, employees of Scientific department and Protection service of the reserve area as well as specialists of separate research institutions and higher education establishments are the members of Scientific and Technical Council (hereinafter STC), which functions in the Reserve. Memberships of STC and Provisions on STC are approved by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic. STC has the right to make decisions for the purpose of improvement of carried out scientific and production works.

## II. Main objectives and tasks of the State Reserve

8. The State Reserve is established for the purpose of:

- Preservation in the natural state of all natural complex (flora and fauna, geological formations, water reservoirs, ground waters, soils etc.), the most typical for this geographical zone or its area as well as its unique natural objects;
- Protection of rare animals and plants, preservation of genetic stock of biological diversity, typical for this geographical zone or its area;
- Preservation and study of the course of natural processes as compared with their dynamics in economically used territories;
- Execution a function of preservation of valuable types of wild animals and plants, their propagation and reproduction;
- Participation, in the prescribed manner, in international agreements, conventions concerning preservation of biodiversity, wild flora and fauna and specially protected nature territories;

9. The Reserve is entrusted with performance of the following main objectives:

- maintenance of established protection conditions in the territory of the Reserve and its buffer zone;
- carry out research works, assistance in performance of research works by other research organizations and educational institutions;
- assistance in training of scientific manpower and specialists in the field of nature reserves;
- make proposals concerning ecological situation of this region;
- outreach of issues related to environment situations and biological diversity preservation by publication of scientific works, academic papers as well as organization of Museums of Nature and preservation of historical and social heritage (repositories, mazars, tombs);
- performance of protective and reproductive measures.

### III. Legal status of the State Reserve

10. The State Reserve is a legal entity according to the legislation of the Kyrgyz Republic. The State Reserve obtains rights and obligations of the legal entity from the date of state registration in accordance with established procedures.

11. For the purpose of realization of its tasks, the State Reserve, in compliance with the State Committee of RK, Laws of the Kyrgyz Republic 'On specially protected nature territories', 'On non-commercial organizations', shall have the right to:

- carry out business, including production activity without allocation of realized profit between officers, other employees and members of the Board. Such activity may include production and sales of goods, performance of works, rendering of services and receipt of remuneration and other types of business activity if they comply with objectives and tasks of the State Reserve and regulatory legal acts of the Kyrgyz Republic.
- In the procedure provided for by the legislation of the Kyrgyz Republic, consider materials related to administrative violations in the field of protection of the environment, wildlife and foliage, impose guilty persons with fines and other administrative sanctions, where necessary, refer to law enforcement bodies in order to bring guilty persons to responsibility, enter amounts recovered to its accounts in the prescribed manner and within the limits of their competence.
- Establish Mass Media in compliance with the prescribed order;
- Distribute information on their objectives and tasks without restraint;
- Possess, use, dispose property, enter into any transactions not prohibited by the law of the Kyrgyz Republic;
- Appear in court on its own behalf; have other powers provided by the legislation to similar organizations of corresponding organizational-legal status and form.
- Open accounts in financial institutions of the Republic;
- Establish organizations, including educational institutions, scientific, cultural and other establishments, open their branches and representative offices, including abroad;
- Carry out educational, creative, scientific and research activity, conduct competitions for the purpose of performance of its primary tasks.

### IV. Protection conditions of the reserve

12. The territory of the State Reserve is divided into three zones and land use boundaries of the State Reserve, its protected zone as well as their description have been determined by the Government Decree of the Kyrgyz Republic, dated July 3, 2003. Any business activity not connected with performance by the State Reserve of its principle tasks and disturbing of the natural processes of the natural complex is prohibited in the territory of the major zone (I a under International Union for Conservation of Nature Resources), particularly:

- Actions changing hydrological regime of the State Reserve;
- Construction of industrial and agricultural enterprises and storage facilities, tourist camps, rest houses, sanatoriums, country houses and other facilities;
- Construction of roads, power lines and other communications;
- Performance of geological and other research works;
- Land disturbance, extraction of minerals, excavation, disturbance of rock exposures and other works;
- Transfer of land and water resources within the boundaries into practical use to other enterprises;
- Use of forests, destruction and splitting of separate trees, shrubs and other disturbance in of natural processes;
- All types of land use, collection of plants, flowers, seeds, fruits and berries, mushrooms, haying and other disturbances of natural vegetation;
- Hunting, fishing, extermination and capture of wildlife, devastation of nests, holes and other shelters and habitations as well as any disturbance of protected animals;

- Gathering of collection and other materials except for materials required to performance of scientific subjects of the reserve;
- Fertilization and chemical methods of control of blights and harmful animals;
- Any types of pollutions and littering of the territory of the reserve and damage of appearance of natural objects;
- Cattle grazing and cattle driving through the territory of the State Reserve;
- Travel of power-driven transportation vehicles off the general use roads and waterways;
- Noise and other acoustical effect of human origin;
- Other disturbances of natural bounds and relations of the reserve's ecosystem;

13. In the territory of other zones (I b, II and others areas by IUCN categories) the activity shall be carried out in compliance with standards established for these zones by the reserve forest management.

14. The State Reserve can be visited upon permissions issued by the management of the reserve.

15. Stay of citizens (including foreign citizens), non-employees of the reserve, from research establishments, higher educational institutions, Mass Media and cinema professionals in the territory of Padysha-Ata State Natural Reserve shall be allowed for the purpose of:

- performance of research and development according to the working plan of the reserve;
- Scientific and popular science cinematographing and TV filming;
- Studying natural, historical complexes and activity of the reserve;

16. Based on recommendations of the Academic Board and decision of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic carrying out of following measures on preservation of the reserved natural complexes as well as ensuring implementation of plan of scientific measures and educational campaigns shall be allowed in Padysha-Ata State Nature Reserve, in particular:

- Recreational measures in areas disturbed by human's activity or natural disasters as well as measures on prevention of ecosystems change in the result of economic activity in areas adjacent to the reserve;
- Measures on preservation of rare and endangered species of animals and plants;
- Salvage felling in plantations damaged by insects, diseases and natural disasters;
- Carrying out of fire-preventive measures;
- Regulating the population of animals for preservation of natural states in reserved complexes;
- Trapping for marking and dispersal as well as entrapment and shooting for collection of scientific materials (in protective zones of the reserve) according to research and development plan and completing of the 'Museum of nature';
- Publishing, publication of scientific works, catalogues, booklets and other propaganda materials;
- Erection of structures, name plates, panels and other facilities necessary for primary objectives realization and perspective development of the State Reserve;
- Carrying out of land and forest use and hunt arrangement, geodetic and topographic works;
- Realization of ecological, scientific and educational tourism;
- Organization and realization of works on preservation of historical and social heritage objects of regional significance (repositories, mazars, tombs etc.).

## V. Protection conditions of the State Reserve buffer zone

17. Buffer zone of the State Reserve shall be approved in order to decrease effect of economic activity of adjacent territories to the reserve ecosystem, determination of social status of local population by ecologically-oriented method within the framework of complex background for the development of the Kyrgyz Republic.

18. Based on the decision of Science and Engineering Board, in coordination with the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic it is allowed to carry out the following types of activity in the buffer zone:

19. Principal types of economic activity carried out not damaging natural resources and consistent with functions of the buffer zone.

20. Means received on the special account from permitted activity such as distribution of ecological knowledge, bee-keeping, payments for visits of the 'Museum of Nature' and other objects and sources as well as from the use of the buffer zone of the State Reserve in accordance with the established procedure, shall be received on its special account and spent in compliance with the approved estimates.

21. The following activity is prohibited in the buffer zone of the State Reserve:

- Damaging and destruction of trees and shrubs;
- Gathering of drug raw materials, fruits, berries and flowers, types of plants included into the Red Book of the Kyrgyz Republic;
- Hunting, trapping, devastation of nests, holes and other shelters and homes of wild animals as well as collection of birds' eggs;
- Acclimatization of wild animals;
- Any types of the territory pollution and damage of appearance of natural objects.

## **VI. Research activity in the State Reserve**

22. Research activity of the State Reserve shall be carried out by means of stationary all year round, long-term, complex observations for study of natural complexes, separate natural objects, dynamics of natural processes for the purpose of valuation and forecasting of ecological situation, according to standard procedural guidelines of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

23. The principal task of research activity of the State Reserve is development and implementation of scientific basis of nature protection, biodiversity preservation, reproduction and rational use of nature resources.

24. Research activity in Padysha-Ata State Nature Reserve shall be carried out by:

- The employees of the reserve scientific department – in accordance with research plans, measures on preservation and recreation of ecosystems natural composition, correction of affected natural bounds in them, approved by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic;
- Scientific and research establishments and higher educational institutions in the appropriate field, carrying out both stationary and field works and observations on the program of monitoring of the state of the natural environment – on a contractual basis on programs agreed with the management of the reserve. Scientific cooperation agreements shall be coordinated by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

25. Research activity shall not result in change of the status and tasks of the reserve and, generally, shall not be performed by its constitutive parts.

## **VII. Protection of the State Reserve and its buffer zone**

26. Protection of the State Reserve and its buffer zone shall be carried out by the staff of special services on the State Reserve protection.

27. The Director of the reserve shall act as the Senior State Inspector (hereinafter 'State Inspector') for environmental protection of the State Reserve and its buffer zone, in the absence of the State Inspector his duties shall be performed by the Head of Security Department of the State Reserve.

28. Functions of the State Inspector of the State Reserve may be performed by the reserve employees not holding an appointment of State Inspectors. Such authorization shall be granted upon written application of an employee and by the Order for the State Reserve.

29. For the purpose of strengthening of protection regime the reserve may engage employees from regional subdivisions of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic, employees of the Ministry of Internal Affairs and voluntary groups acting under the reserve administration.

30. The State Inspector shall be entitled to:

- Demand explanations from breakers concerning breach of protection condition of the reserved or buffer zone;
- Check documents of citizens and officials giving them right to stay, travel and carry out other activity in the reserved and protected territory;
- Draw up protocols and act on violation of protection conditions and environmental regulations in the territory of the reserve or protected zone;
- Suspend activity of institutions, organizations, enterprises, citizens and officials, carried out not in compliance with protection conditions of the reserved and buffer zones, environmental regulations;
- Seize products, instruments for illegal use of nature resources, means of transport and corresponding documents from breakers of protected conditions, in accordance with the established procedure;
- Carry out inspection of things, means of transport, inspection of instruments and products of persons staying in the territory of the State Reserve and its buffer zone;
- Deliver breakers of protected conditions to regional bodies of MIA and local authorities for verification of breakers' identities;
- Institute claims and penalties to enterprises, institutions, organizations, citizens and officials for damages caused in the result of environmental regulations violation.

31. State Inspectors for protection of the State Reserve ecosystem shall exercise all powers of State inspection of the State Agency system for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

32. The State Reserve shall be authorized to sell items and instruments for illegal use of flora and fauna resources seized by the law enforcement agencies in the territory of the reserve and its buffer zone, through retail outlets and facilities.

33. Collected and received on the special accounts amounts and means on claims as well as from sales of items and instruments seized by the law enforcement bodies as well as products produced with the use of these instruments shall be directed to environment-oriented purposes as well as to motivation of the State Reserve employees.

## **VIII. Management**

34. General management of the State Reserve's activity shall be performed by the State Agency system for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

35. Direct supervision of the State Reserve shall be performed by the Director and in its absence – by the Deputy Director – Head of Science Department. Head of Science Department and Chief accountant shall be appointed

and dismissed by the Director of the State Agency system for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

36. The Director of the State Reserve shall act on the basis of the Law of the Kyrgyz Republic 'Concerning State Service', these Provisions and shall represent the State Reserve without the Power of Attorney in all state government and administrative bodies, public authorities, institutions, organizations and courts.

37. The Director of the reserve shall:

- Control the reserve in terms of one-man management and collegiality;
- Endure financial, employment and contractual discipline in the reserve;
- Control and hold responsibility for implementation of laws, decrees, orders and resolutions of higher authorities;
- Organize work and effective mutual understanding between all structural subdivisions of the reserve;
- Supervise the work on development of programs for scientific and environmental protection measures, plans of scientific manpower training and publication of scientific works of the reserve, preparation and performance of financial and economic activity as well as material support of all activity of the reserve;
- Dispose of commodities and materials, monetary funds and other valuables appertaining to the management unit, according to the applicable law, sign bills, payment orders, issue promissory notes; thereat, all monetary, financial, property and credit documents shall be signed by the Director and Chief accountant;
- Conduct transactions in branches and offices of the National bank, treasury system of the Kyrgyz Republic and other financial institutions on behalf of the management unit;
- Conclude agreements for performance of research or economic works with concerned institutions, organizations, individuals, in compliance with established plans and budget appropriations;
- Issue powers of attorney with regard to the reserve;
- Supervise the activity of Science and Engineering Board of the reserve and execution of its decisions;
- Represent and control the work of the reserve for liaison with international organizations;
- Organize patrolling of the reserve and its protected zone, check and transfer protocols and acts on violation of protection conditions of the reserve and its buffer zone as well as other documents for bringing guilty persons to responsibility;
- Supervise protection and reproduction in the territory of the reserve, promptness and correctness of paperwork at detection of forestry violations, impose penalty provisions and their movement in judicial authorities, execution of their resolutions;
- Institute claims and penalties to enterprises, institutions and organizations, citizens and officials for damages caused in the result of violation of protection conditions of the reserve and its buffer zone, in compliance with the applicable law.
- Establish relationships and cooperation with scientific organizations and educational institutions within the Kyrgyz Republic and beyond;
- Hire and dismiss all employees of the reserve, except for officials included into the nomenclature of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic;
- Issue orders for the reserve related both to appointments of personnel and economic activity;
- Request and receive necessary materials and documents related to issues of the reserve's activity;
- Represent interests of the reserve in organizations and institutions;
- Take full responsibility for scientific and economic activity of the reserve, enforce compliance with law in all spheres of activity;
- Take responsibility for selection, distribution and training of personnel, correct paperwork as well as performance of approved plans and programs;
- Take responsibility for safekeeping of property, equipment and material values.

38. Work duties of office and management personnel, employees of scientific and security departments shall be determined by job instructions.

39. The employees of Padysha-Ata State Nature Reserve shall wear standard uniform clothes, be provided with duty weapon in accordance with the procedure established by the legislation of the Kyrgyz Republic.

40. The employees of Padysha-Ata State Nature Reserve shall be lodged with all powers, responsibilities and benefits established for State Forest Protection Center of the Kyrgyz Republic in compliance with the Forestry Code of the Kyrgyz Republic, Provisions on State Forest Protection Center of the Kyrgyz Republic, and other regulatory legal acts of the Kyrgyz Republic.

## IX. Reorganization and liquidation

43. Reorganization and liquidation as well as change of the State Reserve boundaries shall be carried out in accordance with the procedures established by the law of the Kyrgyz Republic.

44. Upon the liquidation of the State Reserve the amount of fixed assets and monetary funds remained after wage settlement and other compulsory payments, settlement with budget and other creditors shall be transferred to the Founder.

Liquidation (reorganization) shall be deemed completed from the date of entry about it to the State Register of Legal Entities.

45. Documents developed in the process of the State Reserve's activity, in case of its liquidation, shall be stored and used in compliance with the Law of the Kyrgyz Republic 'Concerning National Archive Materials of the Kyrgyz Republic'.

Director of Padysha-Ata  
State Nature Reserve

/signature/

Ibrayev E.B.

Stamps:

1. Round seal of the Justice Department of Zhalal-Abad province
2. Stamp: /Justice Department of Zhalal-Abad province, December 11, 2007, numbered and laced on 12 pages.

ON THE IMPROVEMENT OF FOREST MANAGEMENT IN THE KYRGYZ SSR

Decree of Council of Ministers of the Kyrgyz SSR  
of March 5, 1959 № 118

Kirghiz SSR Council of Ministers decides:

7. Given the wide diversity of tree and shrub vegetation, a great scientific and practical value, in order to fully preserve and develop natural resources in Arkitskom, Aflatunskom and Kemin forestry enterprises, to organize the Sary Chelek walnut reserve in the territory of Dhangi-Dzholskogo district of Osh region, included in the reserve the part of forests of Arkitskogo and Aflatunskogo forestry of tracts " Batrahan " and the Kemin reserve based on forests of Upper Kemin section of Kemin forestry in the territory of Kemin district.

Assign scientific guidance of research work in the newly organized Sary Chelek and Kemin reserves at the Academy of Sciences of the Kyrgyz SSR . Oblige the presidium of the Academy of Sciences of the Kyrgyz SSR to organize the accomplishment of steady research in the reserves.

Order number 295 by the Ministry of Agriculture of the Kyrgyz SSR  
June 1, 1960, Frunze

Questions of organization of Sary-Chelek nut-fruit and Kemin reserves

In accordance with the Decree of Council of Ministers of the Kirghiz SSR from March 5, 1959 № 118 "On the improvement of forest management in the Kirghiz SSR", the letter from the USSR Ministry of Finance 12 February 1960 № 13- 235 in addition to the order № 344 of May 3, 1959 by the Ministry of Agriculture of the Kyrgyz SSR ,

ORDER:

1. Include in the Sary- Chelek walnut-fruit reserve the whole territory Sary Cheleksky forestry, blocks 14 , 15, 20 , 25, 26 and part of blocks 29 and 30 of Arkitskogo section of Arkitskogo forestry with total area of 20,500 hectares.

2. Turn in Kemin reserve the whole territory of the Upper-Kemin section of Kemin forestry with total area of 19.8 hectares.

3 . In connection with the organization of Sary-Cheleksky nut-fruit and Kemin reserves, as well as to a more comfortable activities on forestry:

a / lands of the former collective farm " Kyzyl -Tuu " Jangi - Dzholskogo area located within the state forest fund of Arkitskogo SFE include in Arkit section and approve a total area of Arkit section of Arkitskogo forestry (including quarters 31, 32,33 and part of quarters 29 and 30) in the amount of 8594 hectares;

b / convey to Arkit forestry the Turduk section of Jangi - Dzholskogo forestry with total area of 43,273 hectares;

c / transfer to the Jangi- Dzholskogo forestry the Renzhitskoe section of Pistachio forestry, with total area of 22,696 hectares;

g / abolish the Lower- and Little-Kemin sections of Kemin forestry and since July 1, 1960 to convert Kemin forestry to forestry without division into sections;

d / pass to the Kemin forestry the quarters from 22 to 27 inclusive of Shamsinskogo section of Chui forestry with total area of 3066 hectares in the territory of Kemin district;

e / move central office of Arkitskogo forestry into the economic center of the former collective farm " Kyzyl -Tuu " of Jangi-Dzholskogo district.

4 . To Head of the forest and field-protective afforestation Comrade CHEBOTAREV and to chief of South-Kyrgyz Department of nut forests management Comrade PASECHNIK:

a / before June 15, 1960, to complement Sary-Chelek nut-fruit and Kemin reserves by managers, specialists and employees in accordance with the approved staff;

b / before 15 June 1960 to share houses, industrial buildings , tractors, farm machinery , motor vehicles, working cattle and other material property values between Arkitsky forestry and Sary-Cheleksky walnut reserve, and between Kemin reserve and Kemin forestry, based on the amount of work of these enterprises;

c / approve plans for production and hunting management activities for Sary- Cheleksky walnut and Kemin reserves in 1960 and since the month of June this year to provide funding for them in accordance with the approved production and financial plan for the year 1960 for General Directorate of forestry and field-protective afforestation of the Ministry of Agriculture of the Kyrgyz SSR.

5. To Head of the Department of forest and field-protective afforestation Comrade . CHEBOTAREV and to Chief Financial management Comrade SIDOROV amend states and estimates of the content of Kemin and Chui forestries arising out of this order.

6. Until the creation of the economic center of Kemin reserve, to place office and other workers of Kemin reserve at the central manor and premises of Kemin forestry.

7. Oblige the Department of Capital Construction of Comrade MIKHAILYUK:

a / in frame of the approved project plan / survey work until July 15, 1960 , the produce construction documents for the construction of the economic center of Kemin reserve ;

b / allocate in the III quarter of the year 1960 the capital for Kemin reserve to build two semi-detached houses, sheds and bathhouse for 15 seats.

8. Control for the implementation of this Order shall be Chief of Main Department of forestry and field-protective afforestation Comrade CHEBOTAREV I.N.

**Minister of Agriculture of  
Kyrgyz SSR**

**M. Umuraliev**

---

Circulated : Sary Cheleksky walnut and Keminski Reserves, Arkit, Jangi - Dzhol, Pistachio , Keminskomu and Chui forestries, South -Kyrgyz department for management of nut forests , Jangi - Dzholskomu District Committee, Kemin District Party Committee , Kemin District Executive Committee, Osh regional Party committee , Osh Regional Executive Committee , the Chief Department of forestry management and field-protective afforestation, land management, planning and economic management departments, financial management department of Ministry of Agriculture of Kyrgyz SSR .

State Agency for Environment Protection and Forest Management  
under the Government of the Kyrgyz Republic

Stamp:

/Department of Justice of Zhalal-Abad province.

State re-registry of the legal entity No. 2076418, dated 14.07.2006

Date of state registry: 19.02.1996/

PROVISIONS  
of Sary-Chelek State Biosphere Nature Reserve

Approved by the Order of  
the State Agency for Environment  
Protection and Forest  
Management  
under the Government of the  
Kyrgyz Republic  
No. 108, dated 18.05.2006

I. General

1. Sary-Chelek State Biosphere Nature Reserve (hereinafter referred to as the "State Reserve") was established according to the Resolution of the Council of Ministers of the Kyrgyz SSR No. 118, dated May 5, 1959. It is an environmental, research institution and is qualified as specially protected natural area of the Kyrgyz Republic (hereinafter SPNA). By the Resolution of UNESCO, dated February 19, 1979 the reserve was included into the global network of biosphere reserves. Total area of Sary-Chelek State Biosphere Nature Reserve is 23868 ha.

2. The State Reserve is a legal entity, according to the legal form of incorporation it is an Institution established on the basis of operational management and a state-owned legal entity, it has an official seal, stamps, accounts in the regional treasury branch, it is maintained by means of republican budget and other sources and acts in compliance with the Law of the Kyrgyz Republic 'Concerning Specially Protected Natural Areas', other laws and by-laws regulating its activity, and these provisions approved by the Founder.

3. Founder of the State Reserve is the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic (hereinafter referred to as the "State Agency").

4. Official name:

In Russian language: 'Сары-Челекский государственный биосферный заповедник Государственного агентства по охране окружающей среды и лесному хозяйству при Правительстве Кыргызской Республики' ('Sary-Chelek State Biosphere Nature Reserve of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic');

In Kyrgyz language: 'Кыргыз Республикасынын өкмөтүнө караштуу курчап турган чөйрөнү коргоо жана токой чарбысы боюнча мамлекеттик агенттигинин Сары - Челек мамлекеттик биосфералык коругу'

*(‘Kyrgyz Respublikasynyn okmotuno karashtuu kurchap turgan choironu korgoo tokoi charbysy boyuncha mamlekettik agenttiginin Sary-Chelek memlekettik biospheralyk korugu’).*

5. Legal address of the State Reserve: 715705, village of Arkyt, Aksy region, Djalalabad province, Kyrgyz Republic.

6. Land and water areas (aquatories) with all natural resources and objects granted to the State Reserve on a permanent basis are withdrawn from economic use. Besides, these lands (preserved and protected areas) undergo registration in territorial departments of State Registry, which issues acts for land use on a permanent basis in accordance with the established procedure. The State Reserve has its own staff of Protection Service, scientific employees and office and management personnel and is headed by the Director.

7. The activity of the State Reserve is financed from the republican budget, republican and regional funds of nature protection as well as other sources not contradicting the law. Structure, staff and number of employees of the State Reserve, estimates of costs, plans of scientific research, protective-reproduction and ecologically-educational works as well as material and technical support of the State Reserve is approved by the State Agency.

8. The Director, Deputy Director, employees of Scientific department and Protection service of the reserve area as well as specialists of separate research institutions and higher education establishments are the members of Scientific and Technical Council (hereinafter STC), which functions in the Reserve. Memberships of STC and Provisions on STC are approved by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic. STC has the right to make decisions for the purpose of improvement of carried out scientific and production works.

## **II. Main objectives and tasks of the State Reserve**

9. The State Biosphere Reserve is established for the purpose of:

- Preservation in the natural state of all natural complex (flora and fauna, geological formations, water reservoirs, ground waters, soils etc.), the most typical for this geographical zone or its area as well as its unique natural objects;
- Protection of rare animals and plants, preservation of genetic stock of biological diversity, typical for this geographical zone or its area;
- Preservation and study of the course of natural processes as compared with their dynamics in economically used territories;
- Execution a function of preservation of valuable types of wild animals and plants, their propagation and reproduction;
- Participation, in the prescribed manner, in international agreements, conventions concerning preservation of biodiversity, wild flora and fauna and specially protected natural areas;

10. The Reserve is entrusted with performance of the following main objectives:

- maintenance of established protection conditions in the territory of the Reserve and its buffer zone;
- carry out research works, assistance in performance of research works by other research organizations and educational institutions;
- assistance in training of scientific manpower and specialists in the field of nature reserves;
- make proposals concerning ecological situation of this region;
- outreach of issues related to environment situations and biological diversity preservation by publication of scientific works, academic papers as well as organization of Museums of Nature and preservation of historical and social heritage (repositories, mazars, tombs);
- performance of protective and reproductive measures.

## **III. Protection conditions of the State Reserve**

11. Any business and other activity not connected with performance by the State Reserve of its principle tasks and disturbing natural processes of the natural complex is prohibited in the territory of the protected, particularly:

- Actions changing hydrological regime of the State Reserve;
- Construction of buildings, structures, roads, pipelines, power lines and other communications and facilities not connected with the activity of the State Reserve;
- Geological exploration and resource development;
- Land disturbance, disturbance of rock and minerals exposures;
- All types of land use, preparation of forage grasses, collection of drug and other plants, flowers, seeds, cattle grazing and other types of plant life use;
- fishing, hunting and destruction as well as animal habitat disturbance;
- Immigration (acclimatization) of new species of animals and plants;
- Gathering of collection and other materials except for materials required to performance of scientific subjects of the reserve;
- Use of chemical agents for pest control, plant and animal diseases, except for cases constituting special hazard for animal and plants population as well as for human health;
- Cattle driving, travel of power-driven transportation vehicles off the general use roads and waterways;
- Raft on water objects;
- Noise and other acoustical effect of human origin;
- Airplanes flying lower than 2000 m above ground and breaking the sound barrier by airplanes over the territory of the State Reserve as well as other types of noise effect beyond enforceable standards;

12. Based on recommendations of STC as well as the State Agency otherwise, carrying out of the following measures on preservation of the reserved natural complexes as well as ensuring implementation of plan of scientific measures and educational campaigns shall be allowed in the territory of the protected zone, in particular:

- Recreational measures in areas where primary ecosystems were disturbed by human's activity or natural disasters as well as measures on prevention of ecosystems change in the result of economic activity in areas adjacent to the reserve;
- Measures on preservation of rare and endangered species of animals and plants;
- Carrying out of fire-preventive and sanitary measures as well as measures on tending of artificial forest stands requiring silvicultural care;
- Regulating the population of animals, according to established procedure, for preservation of natural proportion of animals in the ecosystem;
- Trapping, according to established procedure, for marking and dispersal;
- entrapment and shooting of animals, according to established procedure, for collection of scientific materials;
- Implementation of biotechnical measures for preservation of rare and endangered animal species;
- Erection, in the permitted manner, of structures as well as roads, bridges, name plates and panels necessary for realization of primary objectives of the State Reserve;
- Carrying out of forest use and hunt arrangements, geodetic and topographic works;
- Realization of ecological, scientific and educational tourism;

13. Development of eco-tourism in the State Reserve. Eco-tourism in the State Reserve shall be conducted on developed ecological routes, on a paid and escorted basis.

Other persons may visit the reserve by special permissions issued by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic as well as administration of the State Reserve.

14. The funds received from payments for visits of the State Reserve, Museum of Nature, satisfied claims and other sources shall be received on extra-budgetary account of the State Reserve and spent in compliance with the approved estimate.

#### **IV. Research activity in the State Reserve**

15. Research activity of the State Reserve shall be carried out by means of stationary complex observations and should be directed to study of economically valuable rare and endangered animal and plant species, to the development of scientific backgrounds for preservation of biodiversity, reproduction and efficient use of natural resources as well as control over the change of biosphere baseline. The State Reserve shall carry out spring and autumn scientific and complex expedition.

Plans of measures and scientific subjects shall be coordinated and approved by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

#### **VII. Protection of the State Reserve and its buffer zone**

16. Protection of the State Reserve shall be carried out by the staff of special services on the State Reserve protection ('Preservation and recreation of the natural complex').

17. The Director of the reserve shall act as the Senior State Inspector (hereinafter 'State Inspector') for environmental protection of the State Reserve and its buffer zone, in the absence of the State Inspector his duties shall be performed by the Head of Security Department.

18. Functions of the State Inspector of the State Reserve may be performed by the reserve employees not holding an appointment of State Inspectors. Such authorization shall be granted by the Order of the Director of the State Reserve.

19. For the purpose of strengthening of protection regime the reserve may engage the institute of freelance inspectors – civil society actors, acting under the reserve administration.

20. The State Inspector shall be entitled to:

- Demand explanations from breakers concerning breach of the State Reserve's protection conditions;
- Check citizens' and officials' documents, which allow them to stay, travel and carry out other activity in the reserved and protected territory;
- Draw up protocols and act on violation of protection conditions and environmental regulations in the territory of the reserve;
- Suspend activity of institutions, organizations, enterprises, citizens and officials, carried out not in compliance with protection conditions of the reserved and buffer zones, environmental regulations;
- Carry out inspection of things, means of transport, inspection of instruments and products of persons staying in the territory of the State Reserve and adjacent area;
- Seize illegally produced products, instruments for illegal use of nature resources, means of transport and corresponding documents for them from breakers of protected conditions, in accordance with the established procedure, until understanding of circumstances;
- Deliver breakers of protected conditions to regional police and governmental authorities for verification of breakers' identities;

21. The State Reserve shall be authorized to sell through retail outlets and facilities, items and instruments seized by the law enforcement agencies for illegal use of flora and fauna resources in the territory of the reserve and its buffer zone.

Collected and received on the special accounts amounts and means on claims as well as from sales of items and instruments seized by the law enforcement bodies as well as products produced with the use of these instruments shall be used, within the legal terms, for bonus payment to employees of the State Reserve as well as for environment-oriented purposes.

## VIII. Management of the State Reserve

22. General management of the State Biosphere Nature Reserve's activity shall be performed by the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

23. Direct supervision of the State Reserve shall be performed by the Director and in his absence – by the Deputy Director – Head of Science Department. Head of Science Department and Chief accountant shall be appointed and dismissed by the Director of the State Agency system for Environment Protection and Forest Management under the Government of the Kyrgyz Republic.

24. The Director of the State Reserve shall act on the basis of the Law of the Kyrgyz Republic 'Concerning State Service', these provisions and shall represent the State Reserve without the Power of Attorney in all state government and administrative bodies, public authorities, institutions, organizations and courts.

25. The Director of the State Reserve shall organize realization of measures imposed on the State Reserve, in particular:

- Take personal responsibility for safekeeping of the property, equipment and material values;
- Hire and dismiss all employees of the State Reserve, except for officials included into the nomenclature of the State Agency for Environment Protection and Forest Management under the Government of the Kyrgyz Republic;
- Conclude agreements with organizations and individuals, in compliance with established plans and budget appropriations, issue powers of attorney for the matters of the reserve, without the right of substitution;
- Receive and distribute means and property, goods and other valuables appertaining to the management unit, conduct transactions in branches and offices of the National bank of the Kyrgyz Republic and other credit institutions, sign bills and payment orders;
- Control implementation of plans of scientific works imposed on the reserve;
- Establish relationships and cooperation with scientific organizations of the republic within research plans;
- Organize patrolling of the State Reserve, check and transfer protocols and acts on violation of protection conditions of the reserve and issue decrees on drawn up protocols;
- Institute claims and penalties to enterprises, institutions and organizations, citizens and officials for damages caused in the result of violation of protection conditions of the reserve and its buffer zone, in compliance with the applicable law.

26. Deputy Director shall:

- Organize and realize direct supervision of research studies carried out in the reserve;
- Take joint responsibility with the Director for the state of research, scientific funds realization of research plans;
- On an equal basis with the Director take responsibility for safety performance at research works;
- Check realization of working plans and reports of scientific staff of the reserve;
- Supervise preparation for publishing of results of scientific researches, carried out in the territory of the reserve;
- Exercise control over work-books and generalization of materials on the 'Nature records' of the reserve;
- Take responsibility on qualitative preparation of reports on research work (RW) and their timely submission for establishment;

- Take responsibility on the status of works on compliance with protection conditions;
- Directly ensure and take responsibility for realization of protective-reproduction and ecological-educational works;
- Take responsibility for compliance with safety regulations at all types of works carried out in the territory of the reserve;

27. Chief accountant shall carry out organization of management and control on financial issues.

28. Duties of other employees of the reserve shall be determined by job instructions approved in accordance with the established procedure.

29. The employees of Sary-Chelek State Biosphere Nature Reserve shall wear standard uniform clothes and be provided with duty weapon in accordance with the established procedure.

30. Reorganization and liquidation of the State Reserve shall be carried out by the Government of the Kyrgyz Republic in accordance with the procedures established by the applicable law of the Kyrgyz Republic.

31. Upon the liquidation of the State Reserve the amount of fixed assets and monetary funds remained after wage settlement and other compulsory payments, settlement with budget and other creditors shall be transferred to the Founder.

32. Liquidation (reorganization) shall be deemed completed from the date of entry about it to the State Register of Legal Entities.

33. Documents developed in the process of the State Reserve's activity, in case of its liquidation, shall be stored and used in compliance with the Law of the Kyrgyz Republic 'Concerning National Archive Materials of the Kyrgyz Republic'

Director of Sary-Chelek  
State Biosphere Nature Reserve

/signature/

U. Arstanbayev

Stamps:

Round seal of the Justice Department of Zhalal-Abad province

Stamp: /Justice Department of Zhalal-Abad province, 14.07.2006, numbered and laced on 9 pages.

## ABOUT PROTECTED NATURAL AREAS

*(extractions)*

Bulletin of the Parliament (Oliy Majlis)  
of the Republic of Uzbekistan, 2005 r., № 1, pp.

### *Article 4. Protected Natural Areas*

Protected natural area means an area of terrain and/or water having a priority ecological, scientific, cultural, esthetical, recreational and health-improving value, partially or fully withdrawn from economic use on a temporary or permanent basis.

Natural protected areas are assigned a mode of protection and use (hereinafter – ‘regime’) for the purpose of protection, regeneration and rehabilitation of natural complexes.

Protected natural areas form an integrated ecological system aimed to ensure biological and landscape diversity and to maintain ecological equilibrium.

### III. STATE NATURE RESERVES

#### *Article 18. Establishment of state nature reserves*

State nature reserves are protected natural areas of national importance with strict security regime to ensure protection of natural property and complexes, and aiming at conservation and study of typical ecological systems and gene pools of plant and animal species.

State nature reserves are established as state nature protection and research institutions on a basis of decision by the Cabinet of Ministers upon submission of relevant application by a designated governmental authority.

A state nature reserve functions in accordance with specific regulations for this state nature reserve to be approved the Cabinet of Ministers of the Republic of Uzbekistan.

#### *Article 19. Regime of state nature reserves*

Any activity, other than research work and wild life and environmental monitoring, is prohibited in the state nature reserves. Fire prevention measures are allowed in the state nature reserves.

Introduction of alien species and subspecies for the purpose of acclimatization is prohibited in the state nature reserves.

Individuals not employed by a state nature reserve or authorities within whose jurisdiction this reserve falls are allowed to enter the nature reserve subject to obtaining permission issued by these authorities or the state nature reserve administration.

#### *Article 20. Research activity in the state nature reserves*

Research work on the territory of state nature reserve is carried out by scientific staff of the nature reserve. Other research organizations and experts can be involved on a contractual basis.

Scientific councils shall be established in the state nature reserves. The state nature reserves are obliged to carry out wild life and environmental monitoring.

Proprietary rights to results of research activity carried out in the state nature reserves and financed out of the proceeds of the national budget and/or nature protection funds belong to government. Proprietary rights to results of research activity financed by entities or individuals are specified in the contract entered by and between the state nature reserves and above mentioned entities or individuals. State nature reserves enjoy the results of research work free of charge.

Scientific information and data on natural objects and complexes of the state nature reserves is subject to publication. State nature reserves may have their own printing.

The scientific collections of state nature reserves are subject to permanent storage.

Research work of the state nature reserves is coordinated by the Academy of Sciences of the Republic of Uzbekistan.

Resolution of the Cabinet of Ministers of the Uzbek SSR

No 2020

December 20, 1947

Tashkent

*On establishment of mountain-forest nature reserve in Uzbekistan*

The Cabinet of Ministers of Uzbek SSR resolves as follows:

1. Establish a mountain-forest nature reserve covering a total area of 22,000 ha on the territory of Parkent and Akhangaran districts of Tashkent region.
2. Suggest the Ministry of Forestry of the UzSSR to transfer, and the Department for Nature Reserves, Zoos, and Zoological Gardens under the Cabinet of Ministers of the UzSSR to take over the land plots (of 22,000 ha in total) in Parkent and Akhangaran districts for establishing the nature reserve within boundaries as specified in the appendix.
3. Allocate 35,000 roubles to the Department for Nature Reserves, Zoos, and Zoological Gardens under the Cabinet of Ministers of the UzSSR to design service premises for the mountain-forest reserve, at the expense of undisbursed (in the first half-year of 1947) funds allocated to the Academy of Science of the UzSSR for the construction of machinery room of their printing house in Tashkent.
4. Bind the Department for Nature Reserves, Zoos, and Zoological Gardens under CM of UzSSR (Mr. Usmanov):
  - a. To staff the mountain-forest reserve with appropriate personnel in accordance with manning table approved by the State Commission for Personnel Arrangements under the CM of UzSSR;
  - b. To install boundary posts along the nature reserve border before January 1, 1948;
5. Bind the State Planning Committee of UzSSR;
  - a. To make amendments to the capital construction plan for 1947 as per paragraph 3 of this Resolution;
  - b. To include (in the Plan for the 1<sup>st</sup> quarter of 1948) one truck to be assigned to the Department for Nature Reserves, Zoos, and Zoological Gardens under CM of UzSSR for the mountain-forest nature reserve;
  - c. To include the construction of service premises for Uzbekistan's mountain-forest nature reserve, in the capital construction plan for 1948.
6. Approve a budget of the mountain-forest nature reserve in amount of 57,000 roubles.

The above mentioned expenses shall be covered at the expense of credits undisbursed by the Department for Nature Reserves, Zoos, and Zoological Gardens under CM of UzSSR during the first six months from item 'research work'.

7. To bind the Ministry of Finance of UzSSR (Mr. Isametdinov) to finance above expenditures in December 1947 in amount of 57,000 roubles, including salary (7,000 roubles), procurement of equipment (41,000 roubles) and other expenses (9,000 roubles).

A. Abdurakhmanov  
Chairman, CM of the UzSSR

S. Rakhimirzaev  
Deputy administrator, CM of the UzSSR

ORDER  
of the head department for forestry and nature protection  
Under the Cabinet of Ministers of Uzbek SSR  
No 84D

*Tashkent*

1960

*October 4,*

In connection with the expansion of existing mountain-forest state nature reserve area and for the purpose of more precise definition with respect to its location, I hereby ORDER as follows:

1. Change the name of the State Mountain-Forest Nature Reserve for the Chatkal State Mountain-Forest Nature Reserve.
2. Oblige Mr. Buresh V.I., the Chief of Maintenance Division of the Head Department for Forestry and Nature Protection, to make a seal and a stamp for the Chatkal State Mountain-Forest Nature Reserve within a period of 10 days.
3. Mr. Yesipov, Director of the Chatkal State Mountain-Forest Nature Reserve, shall inform all organizations related to the nature reserve of renaming the State Mountain-Forest Nature Reserve.

M. Isamukhamedov

Chief,

Head Department for Forestry and Nature Protection  
Under the Cabinet of Ministers of Uzbek SSR

## I. Description of the Chatkal Mountain-Forest Nature Reserve Boundary

The Chatkal Mountain-Forest Nature Reserve consists of two separated areas – Bashkizilsay and Maidantal.

### Bashkizilsay area:

The Bashkizilsay area occupies Bashkizilsay river basin. Its border runs westward from Kizil-Nura mountain (3,265.4 m) along the watershed line between Parkent-say and Bashkizilsay river basins through an altitude of 2,667.3 m to Khavlya mountain.

Western border runs south-westward from Khavlya mountain to an altitude of 2,506.8, then southward to an altitude of 2,354.3 m a.s.l. and on to Bezimyanniy pass being crossed by a trail leading from Bashkizilsay gorge to Sukok village. From the pass it runs southwestward to an altitude of 1,759.1 and on to an altitude of 1,468.3 m a.s.l.

From an altitude of 1,468.3 m border line runs to an altitude of 1,458.3 and on to an altitude of 1,773.8 m where it turns south-eastward and runs along the watershed line between Kizilsay and Chauli-say rivers and crossing an altitude of 2003.4 m goes to an altitude of 2,190.3 m. Then it turns north-eastward running along the watershed line between Bashkizilsay and Shavazsay rivers and crossing altitudes of 2,176.4; 2,103.9; 2,049.3; 2,331.7; and 2,434.3 it reaches Takali mountain (2,762.7 m). From Takali mountain it runs through altitudes of 2,509.9; 2,865.9; and 2,952.3 m to Kurgantash mountain (2,991.7 m). From Kurgantash mountain it returns to its original point – Kizil-Nura mountain.

### Maidantal area:

The Maidantal area occupies Tashkesken-say, Kungur-say, Terekli-say, Zymnan-say river basins and an area situated on the right bank of Tavak-say river.

The border of Maidantal area runs north-westward from Adam-Tash pass (2,892.7 m) along Tavak-say river to its confluence with Terekli-say. From there it goes along the Serkali-say river to the inflow of Tashkesken-say. Here it turns north-eastward and goes along Tashkesken mountain ridge (2726.3; 3159.2 m) reaching Aksham ridge and further to Maliy Piyazli pass and on along the Chatkal range through Bolshoy Piyazli pass to Adam-Tash pass to an altitude of 2892.7 m.

State Committee for Nature Protection of the Republic of Uzbekistan

ORDER

*"On transfer of the Chatkal State Biosphere Nature Reserve into the jurisdiction of  
Tashkent Regional Khokimiat"*

Tashkent

October 11, 2000  
No 65

Pursuant to the Government Decision concerning the transfer of the Chatkal State Biosphere Nature Reserve, I hereby ORDER as follows:

1. Establish a commission for transfer and acceptance of the Chatkal State Biosphere Nature Reserve composed of:

Atadjanov A. K. – Head of State Biological Control	Chairman
Thai E.G. – Chief Accountant, State Committee for Nature Protection	Member
Filatov A. K. – Head, Division for Strictly Protected Natural Areas, State Biological Control	Member
Dustov Dj. – Director, Chatkal State Biosphere Nature Reserve	Member
Karimbaeva M. – Chief Accountant, Chatkal State Biosphere Nature Reserve	Member

2. The Commission shall execute the transfer of the Chatkal State Biosphere Nature Reserve into the jurisdiction of Tashkent Regional Khokimiat in accordance with the established procedure.
3. Ms. Thai E.G., Chief Accountant of the State Committee for Nature Protection of the RU, shall increase number of inspectors by 4 positions within approved number of jobs in the manning table and the labor remuneration fund.
4. To take into account that inspectors will be provided with communication equipment, vehicles and horses at the expense of the Central Asia Transboundary Biodiversity Project in the West Tien Shan.
5. The Head of State Biological Control (Mr. Atadjanov A. K.) and the Chairman of Tashkent Regional Committee for Nature Protection (Mr. Irgashev T.I.) shall act in compliance with Article 7 of the Government resolution according to which the State Committee for Nature Protection of the Republic of Uzbekistan is responsible for:
  - exercising state control over environment status and protection, sustainable use and reproduction of land and water resources, fauna and flora in protected natural areas and forestry enterprises of Tashkent region;

- carrying out research work in the field of ecology, monitoring of flora and fauna status, international projects for biodiversity conservation in strictly protected natural areas of Tashkent region;
  - development of methodological recommendations and guidelines for environment-friendly development, conservation and sustainable use of natural resources in strictly protected natural areas of Tashkent region.
6. The Head of State Biological Control (Mr. Atadjanov A. K.) shall:
- Ensure to provide arms to these additional inspectors in accordance with the established procedure;
  - Coordinate activities of the nature reserve's research department and those of the State Biological Control to ensure adequate research work;
  - Make proposals for the distribution of functions and the provision of good working relations to be incorporated in the draft Regulations for the interaction between forest guards and inspectors of the State Committee for Nature Protection in Tashkent region;
  - Make proposals to be incorporated in the draft Regulations for the Chatkal State Biosphere Nature Reserve, draft Regulations for the Ugam-Chatkal National Nature Park, and the charters of forestry enterprises to ensure unimpeded access of inspectors, researchers and other staff of the State Committee for Nature Protection and its subordinate branches to the Ugam-Chatkal National Nature Park, the Chatkal State Biosphere Nature Reserve and the forestry enterprises, to enable them to perform their relevant functions with respect to research activity, work under international programs and exercising state control over compliance with established regimes of protection and use of natural resources.
7. The functions of control over the execution of this Order are reserved for myself.

Kh. S. Sherimbetov

Acting Chairman  
State Committee for Nature Protection  
Republic of Uzbekistan

## REGULATIONS for the Chatkal State Biosphere Nature Reserve

- I. General provisions
- II. Tasks and objectives
- III. Structure
- IV. Research activity
- V. Regime and protection
- VI. Financing
- VII. Reporting and supervision
- VIII. Closing down and restructuring

### I. GENERAL PROVISIONS

1. The Chatkal State Biosphere Nature Reserve (hereinafter referred to as "Reserve") is a nature protection and research institution. The Reserve is located on the west extremity of Tien Shan Mountains on the territory of Bosttanlyk and Parkent administrative districts of Tashkent region.

2. The Reserve was established pursuant to the resolution of the Council of Ministers of the UzSSR dated December 29, 1947, No2020.

At the IX session of the International Coordination Council the Reserve was given a status of biosphere nature reserve in accordance with the Minutes No16732 dated April 24-25, 1986.

Pursuant to the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan No378-55 dated October 2, 2000 the Reserve was incorporated in the Ugam-Chatkal National Nature Park.

3. The activity of the Reserve is regulated by the law of the Republic of Uzbekistan "On strictly protected natural areas", "On nature protection" and other acts of legislation, decisions of Khokim (Governor) of Tashkent region and these Regulations.

4. Territory of the Reserve is classified as nature protection area. Any activity incompliant with the designated purpose of the Reserve is prohibited within its boundaries. All land and water resources, bowels of earth, flora and fauna inside the Reserve are under protection of the Reserve.

The area of the Reserve is taken into account when plans and programs, land management schemes and district layouts are designed. Any alteration or modification of the

Reserve boundary can be made only on exceptional basis in accordance with statutory procedures of the Republic of Uzbekistan.

5. The territory of the Reserve is an important state property designated for monitoring and use of natural processes and phenomena in the West Tien Shan, analyzing their current status, forecasting their alterations and making recommendations for sustainable use of nature resources in the region.

6. The Reserve falls under the jurisdiction of the Khokimiat (the Regional Administration) of Tashkent region and is under direct management of the Ugam-Chatkal National Nature Park administration. The Reserve is a legal entity being financed from the state budget. It has its bank accounts and state seal with the imprint of national emblem of the Republic of Uzbekistan, and stamp with the imprint of its title.

7. Pursuant to the law of the Republic of Uzbekistan "On the state border of the Republic of Uzbekistan" and "On terrorism control" the Reserve shall undertake protection and security measures to prevent and suppress potential penetration and location of armed bands in the area within its jurisdiction in close cooperation with local authorities and subdivisions of the Committee for State Border Security (CSBC), Ministry of Internal Affairs (MIA), National Security Service (NSC) and Ministry of Defense (MD).

The Reserve shall undertake to perform set tasks in accordance with the Regulations for interactions of Reserve's inspectors with security, defense and law enforcement organizations.

8. Procedures for performance of duties by the staff of the Reserve that involve carrying, storage and use of firearms are determined by law.

9. Full official title of the Reserve appears as follows: *the Chatkal State Biosphere Nature Reserve*.

Mailing address: 1, M. Mirsaidov Street, Parkent, 102222, Tashkent region, Republic of Uzbekistan.

## II. TASKS AND OBJECTIVES

10. Objectives of the Reserve are to conserve and study both typical and unique natural complexes and biodiversity of the West Tien Shan, monitor natural processes, develop and introduce scientific fundamentals for wildlife protection and sustainable development.

11. The Reserve is responsible for:

- conservation of natural conditions of the entire natural complex under its custody in the core zone, and maintaining established management practices in the buffer and transition zones;
- implementation of theoretical and applied research work;
- involvement in state environmental expertise to evaluate projects and plans for placement of production and/or other facilities, implementation of which may adversely affect the core area and other zones of the Reserve;
- assistance in training researchers and nature protection specialists;
- dissemination of knowledge in ecology;
- participation in global ecological monitoring;
- design of sustainable development practices;

- organization and coordination of research activity carried out by relevant domestic and international research institutions;
- introduction of sustainable development practices through training activity and demonstration projects.

### III. STRUCTURE

12. The Reserve is directly managed by Director and its his/her Deputies.

13. Director of the Reserve is appointed by order of the General Director of the Ugam-Chatkal National Nature Park in agreement with the Khokimiata of Tashkent region.

14. Deputy Director, Head of inspection service and Chief Accountant are appointed or dismissed by order of Director of Reserve in agreement with the General Director of the Ugam-Chatkal National Nature Park, while Deputy Scientific Director is appointed in agreement with the State Committee for Nature Protection of the Republic of Uzbekistan,

15. The Reserve includes administrative and maintenance department, scientific department and special inspection service for natural area protection.

16. Acting on the basis of the Regulations, Director of the Reserve guides Reserve activities and is in command of assets and property of the Reserve in accordance with statutory procedures. He/she is responsible for protection of woodlands and property, timely reporting and keeping budget, financial, contractual and labor discipline in the Reserve.

17. Director of the Reserve is responsible for:

- development of standard operation procedures (distribution of responsibilities) for Reserve staff subject to approval by General Director of the Ugam-Chatkal National Nature Park;
- organization of research and other activity;
- organization of protection of property, equipment, tangible and other assets of the Reserve;
- hiring and dismissing the Reserve staff in accordance with established procedure;
- making of contracts;
- execution of all financial and cash transactions with bank institutions on behalf of the Reserve;
- organization of woodland, flora and fauna protection; verification and submission to law enforcement organizations of materials to institute criminal or administrative proceedings against lawbreakers; making decisions, within his/her terms of reference, with regard to infringements of the law on the territory of the Reserve;
- safekeeping and proper uses of arms and ammunition, uniforms, means of communication, special equipment and outfit, etc.;
- representation of the Reserve's interests in governmental institutions, judicial setting and public organizations.

18. Deputy Scientific Director of the Reserve is responsible for proper organization and conducting research activity and compliance with established requirements.

#### IV. RESEARCH ACTIVITY

19. Research activity of the Reserve involves long-term comprehensive stationary studies and investigation of ongoing natural processes; identification of interrelation between specific components of the natural complex; monitoring and control of changes in background conditions of biosphere; development of scientific fundamentals for conservation of natural complexes, rare and endangered plant and animal species; and making recommendations for sustainable use of natural resources in the West Tien Shan.

20. Research activity by the Reserve is carried out according to Guidelines for carrying out research activity in the nature reserves of the country, approved by the State Committee for Nature Protection. The maintenance of the 'Records of Nature' is mandatory. International project activities are to be carried out in compliance with relevant (management) plans to be approved in accordance with established procedures.

21. To conduct research work the Reserve shall accommodate scientific paper depository, field bases and cordons. Scientific funds of the Reserve are subject to permanent storage.

22. Methodological guidance and research coordination are carried out by the Academy of Sciences of the Republic of Uzbekistan.

23. The Reserve shall establish scientific council. Regulations for the scientific council and its composition are subject to approval by the State Committee for Nature Protection in agreement with the Khokimiat of Tashkent region.

24. The Reserve shall be entitled to publish its scientific papers.

#### V. REGIME AND PROTECTION

25. Specific regimes (of land management) shall be introduced for the core and buffer zones of the Reserve. The inspection service of the Reserve shall ensure that these zones are protected and the regimes are complied with. The inspect service shall perform their relevant duties in accordance with Operational Guidelines for special inspection services in the state nature reserves, approved by the State Committee for Nature Protection of the Republic of Uzbekistan.

26. Inspectors of the Reserve have right to:

- check and examination of individuals and vehicle on the territory of the Reserve to ensure wild life protection;
- to draw up a record on detected infringements to enforce fine for caused losses of flora and fauna of the Reserve;
- act according to the Regulations for interaction between inspectors and security, defense and law enforcement authorities in the event that suspicious characters are detected in the Reserve;

27. Any development activity is strictly prohibited in the core zone of the Reserve. The following activities are allowed subject to permission obtained from the Reserve administration:

- undertaking veterinary measure required to prevent dangerous diseases common for human and animal populations;
- necessary fire prevention and sanitary measures;
- researches.

28. Any development activity is prohibited in the buffer zone of the Reserve. The following activities are allowed subject to permission obtained from the Reserve administration in agreement with the State Committee for Nature Protection:

- rehabilitation activity to prevent alterations of natural complexes in neighboring areas;
- researches;
- establishment of nurseries for rare plant and animal species;
- undertaking veterinary measure required to prevent dangerous diseases common for human and animal populations;
- necessary fire prevention and sanitary measures;
- construction of structures, in accordance with the established procedures, that are needed to enable the Reserve to perform its main functions.

29. Individuals not employed by the Reserve or the authorities within whose jurisdiction the Reserve falls are allowed in the Reserve subject to permission issued by these authorities or the administration of the Reserve.

30. Entities and individuals involved in violation of the regime are made answerable for it in accordance with the established procedures.

Individuals guilty of regime violation shall compensate for damage caused to the Reserve in accordance with statutory procedures.

31. Employees of the Reserve, inspectors of the State Committee for Nature Protection and experts involved in international programs are allowed to freely visit the Reserve for the purposes relevant to conducting research work, after producing their ID cards and being registered on special log-book.

An area neighboring the state border is allowed to visit subject to permission issued by the MIA and CSBS in accordance with the established procedures.

## VI. FINANCING

32. Sources of finance for the Reserve are as follows:

- budgetary allocations;
- revenues from scientific, wild life protection and advertising and publishing activities;
- compensations for losses/damage caused to the Reserve;
- fines collected in accordance with the established procedures;
- income from sales of confiscated hunting and fishing tools.
- charity funding granted by governmental and public organizations, enterprises, institutions and individuals; and fees for issuing licenses for wild life use.
- donations from entities and individuals.

33. The Reserve is independent in allocating funds in accordance with its budget to be approved by the superior authority.

## VII. REPORTING AND SUPERVISION

34. The Reserve maintains accountability and reporting of its activity according to existing legislation of the Republic of Uzbekistan.

35. Control over the Reserve activity is exercised by the superior authority.

#### **VIII. CLOSING DOWN AND RESTRUCTURING**

36. Closing down and restructuring of the Reserve shall be carried out in accordance with the statutory procedures.

An EXTRACT from the "Regulations for the Ugam-Chatkal National Nature Park"

*Approved by the Resolution of the Cabinet of Ministers of the Republic of Uzbekistan  
No 262 dated 22.06.2001*

Article 16. Regime of protection and use varies across the national park area, subject to condition and integrity of natural complexes, features of landscape, and other factors.

For this reason functional zones of the national park are segregated as follows:

- Protected area – includes the territory of the Chatkal State Biosphere Nature Reserve, functioning according to the specific regulations;

- Frontier area - governed by the boundary regime regulations of the Republic of Uzbekistan;

- Zone of natural and rehabilitated landscapes with regulated recreation and economic uses. Conditions for conservation and rehabilitation of affected natural complexes, state monuments of nature, history, culture, tourism and excursions are created, and environment-friendly development activity is carried out;

- Active recreation zone – accommodates recreation sites, boarding guest-houses, children's health camps, camping sites, and sanatoria. Preservation of this area is ensured by a high level of engineering accomplishments and implementation of necessary nature conservation measures.

United Nations Educational, Scientific  
and Cultural Organization



Programme on Man and the Biosphere

By decision of the Bureau of the International  
Co-ordinating Council of the Programme on Man  
and the Biosphere, duly authorized  
to that effect by the Council

*Sary-Chelek Unit  
Chatkal Mountains Biosphere Reserve*

is recognized as part  
of the international network of Biosphere Reserves.  
This network of protected samples of  
the world's major ecosystem types  
is devoted to conservation  
of nature and scientific research  
in the service of man.  
It provides a standard against which can be measured  
the effects of man's impact  
on his environment.

Date Paris, 15 February 1993

A handwritten signature in black ink, appearing to be 'Boutros Ghali', the Director-General of Unesco at the time.

Director-General  
of Unesco

# PROPERTY MANAGEMENT PLANS

Annex B 30  
(translation)

## MANAGEMENT PLAN FOR THE KARATAU STATE NATURE RESERVE for the years 2009-2013

*(excerpts, operational part)*

### 3. MECHANISMS FOR IMPLEMENTATION OF THE MANAGEMENT PLAN

#### 3.1. Objectives

##### Short term objectives

##### Preservation of the Reserve's ecosystems

- Establishment of protected zone around the Reserve's territory;
- Complete land allotment and receipt of state acts for land usage;
- Ensure preservation of the integrity of ecosystems and their component natural complexes by performing protection actions on the territory of the Reserve and the protected zone;
- Establish protection regime;
- Ensure preservation of biological diversity.

##### Scientific research and monitoring

- Performance of ecological monitoring in the framework of integrated state system of environment monitoring;
- Identification of places of concentration of rare, endemic, diminishing and endangered plant and animal species;
- Ensure preservation and protection of the typical habitats of rare, endemic species of flora and fauna, their genetic resources and unique types of vegetation and ecosystems.
- Development of methodological recommendations for performance of monitoring observations;
- It is necessary to prepare the Reserve's scientific research personnel for performance of monitoring of the natural complexes and for conducting scientific research works.
- Ensure preparation of the guarding service inspectors for performance of monitoring and phenological observations on the territory of the Reserve.

##### Ecological education and ecotourism

- Organization of ecological education, conducting instructional and scientific and educational excursions;
- Support of public interrelations, rendering scientific and scientific methodology assistance to local schoolchildren and students;
- Organization of ecological tourism and arrangement of tourist paths.
- Prohibit unorganized access of visitors to the Reserve's territory.

##### Long term objectives:

##### Objective in the sphere of natural biological diversity protection:

### ***Increase the efficiency of natural biological diversity protection***

#### **Tasks:**

1. Improve the organizational structure of the guarding service, as well as the forms and methods of work on protection of natural sites.
2. Strengthen the material and technical equipment of the Karatau Reserve guarding service, including in the framework of the UNDP project.
3. Engage the near-boundary land users and population in the nature protection activities of the Reserve.
4. Improve the qualifications of the Reserve's research associates and guarding service employees.
5. Development and implementation of measures on mitigation and liquidation of the results of degradation of reserved areas and the effect of negative human-induced factors.

### **Objective in the sphere of scientific research activities:**

#### ***Development of scientific bases and practical implementation of the results of research aimed at preservation and restoration of the Reserve's natural complexes and its adjacent territories.***

#### **Tasks:**

1. Regular inventory taking of the Reserve's flora and fauna and monitoring of the natural phenomena in the Reserve's natural complexes;
2. Creation of information analysis database of the accumulated material and development of the basics of nature reserve activities and ensuring efficient guarding;
3. Conducting integrated studies of terrain, soil, water bodies, human-induced factors, systematic plant groups, vertebral and invertebrate animals;
4. Engagement of external scientific organizations and performance of coordination of scientific research on the territory of the Reserve, emphasizing the following priority areas:
5. Performance of the territory mapping by the most important ecological indicators,
6. Studying the condition of populations and development of the basics of preservation of rare, endemic, Red Book plant and animal species, first of all the endangered species and species with sharply decreased numbers.
7. Inventory and inspection (cadaster preparation) of the most valuable natural areas, preparation of methodology guidelines on monitoring studies.
8. Conducting works in the testing and experimental area on re-introduction of rare, endemic, Red Book plant species.
9. Performance of works on keeping records of the numbers and reproduction dynamics of the Karatau arkhar (wild sheep).
10. Upkeep and development of the Reserve's scientific library.

### **Objective in the sphere of ecological education:**

#### ***Formation of positive attitude of the community to the Karatau Reserve and its support.***

#### **Tasks:**

1. Further development of propaganda and population of the Reserve through mass events, speeches in the mass media on the territory of the city, the Oblast and beyond its borders.
2. Informational support of the excursion and tourist activities.
3. Ensure provision of information to management bodies and the public on the condition of natural assets of the territory and the threats to their preservation.
4. Organization of training of the inspectors in methods and practices of work with visitors of the territory, schoolchildren and population, as well as participation in monitoring and inventory inspections.

5. Development of museum activities, with organization of a special section of the museum, dedicated to unique natural assets of the Reserve.
6. Provide the possibility of exhibiting the territory's landmarks through visits of the territory by arranged routes, photo and video materials, printed materials.
7. Development of advertising and publishing activities, increase the Reserve's printed materials, including the materials for propaganda of the results of scientific research.
- 8.

### **Objective in the sphere of territorial management and planning:**

#### ***Organization of the territorial structure of the Reserve***

##### **Tasks:**

1. Arrangement of protected zone around the Reserve's territory.
2. Preparation of documentation for expansion of the Karatau SNR territory on the side of the Suzak District by 5700 ha.
3. Agreeing with the other Specially Protected Natural Areas of South Kazakhstan region on organization of an ecological corridor on the paths of the Karatau arkhar migration
4. Execution of fire safety measures in the Karatau SNR and arrangement of firebreak lines in accessible places along the protected zone perimeter.

## **3.2. Boundaries and zoning**

### **3.2.1. Boundaries**

#### ***3.2.1.1. Review of the existing boundary***

The current area of the Reserve amounts to 34300 ha. The area of the protected zone amounts to 17490 ha. The main motives of the need to expand the territory on the side of the Suzak District by 5700 ha are protection of the places of growth of narrowly endemic, rare plant species, which are distributed locally in small groupings, and protection of the migration paths of the Karatau wild sheep.

#### ***3.2.1.3. Near-boundary signs***

Along the routes, dirt roads at the Reserve perimeter and in the protected zone, boards have been put up with information on the Reserve establishment, which prohibit cattle grazing, passage of motor vehicles, hay mowing, gathering of fruits and with fire safety content. More than 88 information boards, 1 panel, 7 boom barriers at 7 cordons have been placed in the Reserve's protected zone. The text of the information boards is updated annually.

### **3.2.2. Management zones**

#### ***3.2.2.1. Reserve regime zone***

In the reserve regime zone (34300 ha), the reserve regime of protection of is established, which excludes economic exploitation of natural resources. In the buffer zone of the Reserve (17490 ha), it is allowed to allot special areas, which do not include especially valuable ecosystems and sites, to organize ecological routes and paths, to mow hay, to graze service horses and to construct new cordons.

The Reserve territory is divided into 7 inspector walkdowns and 2 areas: 1 area on the side of the Turkestan District, 2 area on the side of the Suzak District. The walkdowns adjacent to residential settlements are guarded by stationary posts, and remote walkdowns are guarded by patrolling with the use of operational groups. Guarding of the territory is performed by ground patrolling with the use of horse transportation.

Each inspector post is outside the main territory of the Reserve and constitutes a cordon with a household land plot (service land plot), where the territory guarding inspector resides with his family for

the whole year. In the reserve regime zone, grazing of service horses, hay mowing, firewood collection and other recreational activities are not allowed.

Special areas for ecological tourism. The areas for ecological tourism have been allotted at 2 routes adjacent to the Reserve's protection zone, "Hantagi-Tastynbauy", "Hantagi-Kusuya", and they are used for ecological education, scientific, scientific-educational purposes, as well as for taking summer field practical training by students with the purpose of getting acquainted with the local natural and historical landmarks of their native land.

### **3.3. Management programs**

#### **3.3.1. *Natural resource management***

##### **3.3.1.1. *Habitat management***

Habitat management envisages the following measures:

- 1) Specification of the habitats of rare, endemic and endangered plant species to determine no-take zones by route reconnaissance studies;
- 2) Provision to the guarding service of mobile and fixed communication means, transport, clothing, field equipment;
- 3) Improvement of ecological education work with the local population;
- 4) Strengthening the Reserve territory protection from fires and improvement of the performance of fire safety measures: explanatory actions among the populations, equipping the Reserve with additional fire safety equipment, creation of firebreak line (fire line plowing) along the Reserve perimeter, organization of round-the-clock patrolling of the Reserve's protected zone by guarding service during the fire hazardous season.

##### **3.3.1.2. *Wildlife management***

For the Karatau Reserve territory, the need for regulating actions is determined by reduction of the Karatau arkhar numbers, reduction of the areas and disappearance from former habitats of a number of endemic plants, as well as by degradation of floodplain forests which suffered from felling.

Previously, local population used the natural landscapes for domestic livestock grazing, performed uncontrolled cutting of near-floodplain forests, which led to aridization and early drying of river beds.

The key to efficient wildlife management is thorough scientific research work to identification of species composition and seasonal monitoring of the SNR assets.

(See in Section 3.3.3. "Scientific research and monitoring")

#### **3.3.2. Human resource management**

##### **3.3.2.1. *Program for improvement of the local population living conditions***

Local population engagement in management of the Reserve:

a) Training of non-staff inspectors for inclusion in the composition of operational groups for territory patrolling during the fire hazardous season. The non-staff inspectors must take an appropriate course to learn the nature protection legislation and practical activities on the Reserve territory guarding (jointly with the Reserve inspectors in accordance with the established procedure);

b) Engagement of public tour guides for rendering services during the high visiting season (April-June).

##### **3.3.2.2. *Tourism and education programs***

The Karatau State Nature Reserve and its protected zone are in the harsh continental climate zone and are characterized by low, often not easily accessible, mountain groups. On the Reserve territory there are concentrations of deciduous forest, steppe, savanna-like, phryganoid, mountain dwarf semishrub plant communities, which are original in their composition and are rich in rare and endemic plant species. The tourism infrastructure is well developed in the city of Turkestan. In the city of Kentau the tourism infrastructure is poorly developed. The Reserve territory hasn't been developed with respect to organization of ecological tourism. In the Reserve's buffer zone, two ecological routes have been organized, with the total length of 21 km. Passports of the "Hantagi-Tastynbauy" and "Hantagi-Kusuya" ecological paths have been approved by the Committee for Forestry and Hunting directive No. 337 of 11/26/2007.

Due to the fact that the Reserve is intended for preservation and study of natural processes in their natural condition, it is not planned to develop and organize here the elements of public amenities and recreation (road and path network, benches, bivouac sites, etc.). In the Reserve's buffer zone, along the planned ecoroutes, 600 m from the Khantagi cordon, a resting place has been arranged (the site has been paved with local materials and a well spring has been cleaned), and an observation site has been built 1400 m from it, also from local material.

Educational routes have been divided into two categories – the general and the special purpose routes. The general purpose routes must combine in them the features of landscape-aesthetic tracks. They must go through scenic places and include sites of various origin – botanical, zoological, geomorphological. The difficulty level here must not be high, and the routes should be built on the principle of minimum difficulty and length. Such routes include the Hantagi – Tastyn-bauy route (6.5 km).

The special purpose routes are detailed and complicated by divergences. The designations include botanical, zoological, biocenological, etc. routes. The route is intended for equestrian and pedestrian excursions. This route is not easily accessible, its length amounts to 13.5 from the Molalysay area through Kursay to Kusuy area.

According to the ecological tourism program, it is planned to equip the ecological routes with two information boards.

To acquaint the tourists with the ecological routes, A4 size advertising leaflets will be prepared, 1 page on each side. The advertising leaflet will describe the ecoroute's landmarks with photographic illustrations.

Organization of ecological education of the population will be ensured by the ecological education employees. The ecological education work must be oriented at local residents, city population, students and schoolchildren.

### **3.3.2.3. Personnel performance improvement program**

To improve personnel performance, training of the inspector personnel has been organized at the institution on the subject of: "Fundamental legal principles of nature reserve activities and keeping of Nature Records at specially protected natural territories" for learning the law on specially protected natural territories, the Administrative Offenses Code, the Criminal Code of the RK, The Labor Code, Safety Rules.

Training of the inspector personnel in methodology of keeping the Nature Records is conducted annually. In addition to that, there is an ongoing training of scientific research personnel for mastering the methodology of biological research in laboratory conditions (preparation of taxonomic catalogs of identified plant and animal species, keeping scientific logs, work with microscope, keeping herbariums, keeping records of herbarium stocks, keeping records of entomological collections), training in methods of performing phenological observations of natural phenomena in the life of plants and animals on the territory of the Reserve.

In 2008, instructional shooting drills were held, with case studies of situations in which weapons are lawfully used, training in the rules of carrying and keeping of weapons was conducted with

participation of the Department of Internal Affairs of the city of Kentau. Shooting drills will be conducted annually in accordance with the established procedure.

#### **3.3.2.4. Appraisal of civil servants.**

Appraisal of civil servants is performed in accordance with the directive of the Ministry of Justice of the RK No. 168 of 20 July 2007 "On approval of the Rules for conducting and conditions of appraisal of civil servants", developed in accordance with Article 233 of the Labor Code of the Republic of Kazakhstan. Appraisal of civil servants is a periodically performed procedure for determining the level of their professional and qualification training, business qualities, establishment of qualification grades (ranks). The civil servants undergo appraisal upon expiry of each three years of civil service, but not earlier than six months from the date of taking the given position.

The appraisal includes a number of consecutive stages:

- 1) Preparation for performance of the appraisal;
- 2) Interview with the civil servant conducted by the appraisal commission;
- 3) Passing of the appraisal commission resolution.

The questions posed to the person undergoing appraisal must be aimed at identification of the level of the person's competency in the issues of professional efficiency.

#### **3.3.2.5. Raising of qualifications**

The Karatau Reserve employees annually undergo on-the-job training and attend qualification raising courses. The informational, methodology support on keeping the Nature Records and on organization of participation in the qualification raising courses is rendered by the Tabigat Alemi ecological education center for training of employees of specially protected natural territories, established in the framework of the GEF / UNEP program "Strengthening the Network of Training Centers for Protected Area Managers through Usage of Available Experience".

### **3.3.3. Scientific research and monitoring**

1. *Study of the the higher vascular plant flora on the territory of the Karatau State Nature Reserve. Performance period – 2007-2012*

*Objective:* The studies are conducted with the purpose of establishing species diversity of the higher vascular plant flora for inventory, preparation of taxonomic list of the Reserve's plants and conducting monitoring observations under the Nature Records program.

*Justification:* The Syr-Darya Karatau is characterized by abundance of endemic and rare plant species, which distinguishes it from all other floristic regions of Kazakhstan.

Study of the species diversity of the Reserve's higher vascular plant flora is the main priority, currently the most important area of scientific research works of the scientific department, dictated by the overriding necessity of plant inventory. The Karatau SNR Scientific Department is to establish the areas and to study the biological and biotope features of the endemic and Red Book plant species. Most likely, plant species unknown to science may be discovered on the territory of the Karatau ridge.

2. *Brioflora of South Kazakhstan. Performance period – 2007-2012*

*Objective:* Identification of bryophytic species diversity of South Kazakhstan, study of ecological and synusial features, study of the regularities of moss distribution and zonal placement, performance of geographic and floristic analysis will allow elucidation of the issues related to the history of formation and development of the South Kazakhstan moss flora.

*Justification:* Until now, the South Kazakhstan brioflora remained poorly explored. Very little information on South Kazakhstan brioflora is contained in scientific sources.

..... Study of the moss flora of the central part of Karatau is currently continuing, information on 75 species has been published.

3. *Observations of phenomena and processes in the natural complex of the Karatau State Nature Reserve under the Nature Records program. Section 1. Monitoring of indicator plant species of Karatau SNR. Performance period – 2006-2012*

*Objective:* The purpose of the studies is performance of monitoring of the Reserve's indicator plant species. The task of the research includes studying the annual dynamics of the monitoring profile indicator plants, identification of the indicator species. Another task is setting up the technique of phenological observations of the Reserve's inspectors and documentation of the received materials for the Nature Records.

*Justification:* Until now, no work on indicator plant monitoring has been performed on the Reserve territory. Recommendation assume performance of various level monitoring – by the Reserve's inspectors and research associates. Control over performance of the monitoring, as well as performance of the monitoring and its analysis are entrusted to the research associates. Therefore, one of the priority areas of scientific research work of the Reserve's scientific department is the development of the first level, i.e. inspector, monitoring methodology, selection of permanent phenological sites suitable for observations, and training of the inspectors in the methodology of phenological observations. In the course of the work performance, it is necessary to perform analyses and processing of the obtained data. It is necessary to perform classification of the vegetation which characterizes the Reserve's plant communities in the available literary sources. In view of the absence of complete scientific data on this subject, it is necessary to perform scientific research observations of the indicator plant species which characterize the whole diversity of the phytocenoses.

..... A simple and efficient, less labor-intensive method of ecological monitoring is the vegetation indicator method, which allows evaluating the degree of the ecosystem disturbance with higher accuracy and lower labor costs. Using the phytoindication methods, it is possible to make a simple and quick evaluation of the condition of the Reserve's environment, flora and vegetation during the research period and to forecast their future changes.

.....

*Section 2. "Current condition and monitoring of the Karatau SNR theriofauna"*

*Objectives and tasks:* Theriofauna monitoring on the territory of the Karatau SNR is performed for the purposes of identification and evaluation of changes in the life of mammals, for prevention and elimination of consequence of negative processes and phenomena with the purpose of preserving ecological systems, biological diversity and preserving the genetic stock of the animal life.

Main tasks of the theriofauna monitoring consist in determining the density of the mammals population, identification of the migration paths, study of the behavior, seasonal and biological peculiarities, determining the age and species composition of the mammals.

*Justification:* According to the data of the Karatau SNR organization project of 2002 and the data of autumn records of mammals of 2004, as well as scientific research, there were 20 species of mammals identified on the territory of the Karatau SNR, of which 7 species are in the IUCN Red List and in the RK Red Book. The only endemic of the region is the Karatau arkhar, which is currently endangered, the biology of which hasn't been fully studied.

It is necessary to perform integrated scientific research works on studying the biology of the mammals, to establish a system of regular observations of the dissemination, distribution and structure of the animal populations which are subject to protection, as well as to observe the growth of their numbers, the quality and the area of their habitats.

.....

*Section 3. Composition and distribution of the Karatau SNR bird fauna. Performance period – 2007-2012*

*Objective:* Main purpose of the bird fauna monitoring is to identify and determine the bird species diversity, to determine their zonal distribution and biotope confines within the Reserve, as well as to perform observations of the dynamics of populations and communities. This will allow

determining indicator species in each ecosystem. It is necessary to determine permanent routes of research and to set up key areas for subsequent monitoring.

*Justification:* ..... The highest bird species diversity has been noted for the Northern part of Karatau (62) and lower diversity for the southern spurs of Karatau (48). Biodiversity conservation "hot spots", i.e. zones of high significance and endangered species have been determined. There is little scientific information on bird fauna for the Central part of Karatau. According to our data, 12 species of rare and endangered birds have been encountered in passage at the Reserve.

.....  
The closest interrelation of the birds and ecosystems with the environment conditions allows using them as indicators of its status. Bird species sensitively react to changes of ecosystems in either direction. There are bird species which are characteristic for primary, undisturbed ecosystems, and species which are encountered only in disturbed ecosystems. .... The integrity of birds and ecosystems, determined with the help of indicator species, allows evaluating their capability of sustaining biodiversity. Identification of the species condition deterioration or improvement trends will allow taking measures on prevention of environment degradation and restoration of capability to sustain the plant and animal species diversity.

.....  
In order to determine any regularities in formation of bird fauna and population in this or that period, and to forecast such changes subsequently, it is necessary to perform regular bird observations for a number of years.

#### *Section 4. Species diversity and monitoring of the Karatau SNR entomofauna Performance period – 2006-2012*

*Objective:* The research is conducted with the purpose of establishing the species diversity of the Reserve's entomofauna.

*Justification:* The unique natural conditions on the Reserve's territory enable habitation of various populations of insects – the most interesting wildlife representatives. Study of the Reserve's entomofauna species diversity is the priority area of research.

Scientific work on entomofauna studies was previously performed on the Reserve's territory, however, due to a number of reasons, review of the scientific data hasn't been accomplished so far. Mastering of the entomological research and observation methodology is still ahead. Putting together a collection of insects will in no small way help the study of biodiversity of the Reserve's territory. For performance of these works, the scientific department currently needs to acquire the invertebrates field guides.

#### *Section 5. Study of hydrometeorological conditions of the Karatau State Nature Reserve*

*Objective:* To create a computer information system on physical and geographic, hydrological, methodological characteristics of the Reserve, it is necessary to solve the following tasks: perform field surveys of the Reserve's hydrological features (rivers, well springs); organize ongoing monitoring of the Reserve's hydrological conditions; perform statistical analysis of hydrological, meteorological data to establish their variability; establish the dependency of the water content of rivers (Bayyldyr, Hantagi, Biresik) on meteorological factors (precipitation, average temperature, evaporability) and to evaluate the impact of human-induced activities on the water content of the Reserve's rivers.

.....  
*Justification:* Currently, there are no information systems for formation of data on the condition and dynamics of biogeocenoses. The most reliable and complete information is available on hydrological and meteorological data in library and archive stocks of natural process monitoring services. .... Having computer information on physical and geographical characteristics, hydrological, meteorological characteristics of the Reserve, it is possible to start building the data bank and making forecasts of all changes which occur in the natural complexes.

#### *4. Study of biological features, reproduction dynamics*

and migration paths of the Karatau arkhar on the territory of the Karatau SNR.

*Objective:* To study the arkhar's biological features and adaptation in modern conditions; study the arkhar numbers growth dynamics by keeping seasonal records; study the migration paths and refine of taxonomic affiliation of the Karatau arkhar subspecies; organize the Karatau arkhar record keeping and monitoring.

.....  
*Justification:* The biology and systematics of the Karatau arkhar have been studied in detail. This subspecies is endemic to the Syr-Darya Karatau.

.....  
In the last decades, the numbers of Karatau arkhar have significantly dwindled as a result of its ruthless extermination by poachers.

.....  
In modern conditions, the behavior of animals, population dynamics, places of concentration on the Reserve territory and in adjacent areas require new scientific research aimed at development of nature protection measures. The annual dynamics of the animal numbers require setting up of monitoring sites.

### **3.3.4. Work with the public on nature protection issues**

Work with the public on ecological education at the Reserve is conducted in accordance with the annual plan of cultural and educational activities. Duties of three research associates include ecological education: lecturing at the city schools, in pilot settlements and at various organizations, preparation of materials for mass media in the state language. Educational lectures and excursions for students are conducted by the other research associates of the scientific department. All employees of the scientific department are engaged in conducting experience exchange workshops at local administrative and republican level.

The scientific department replenishes the bank of photographic materials on beautiful landscapes, rare, endemic and nicely blossoming plants, animals of the Reserve and their habitats. For efficient work of the scientific department with respect to publishing activities: to issue booklets, copy leaflets, educational posters, methodology recommendations and other materials it is more practical to acquire an office printing machine or set. The annual March for Parks, the World Environment Day are becoming mass participation events. The city schoolchildren apply to the scientific department for consultations on the subject of their works, the scientific department employees often act as their research advisors. Scientific works are on the subject of nature protection. Staff members of the International Kazakh-Turkish University and other higher education institutions apply to the scientific department on the issues of reviewing their works, on conducting practical field training in botany and zoology. This ensures permanent interrelations of the Reserve with research organizations, city administration, schools and departments of education of Kentau city and Suzak district. Relations with schoolchildren and teachers of the pilot settlements are constantly maintained. A good effect was achieved by mass participation of the local population in greenery planting in the city of Kentau, Khantagi settlement, as well as participation of schoolchildren of Baldysu settlement in planting of greenery at the Karatau cordon under the Zhasyl Yel program.

### **3.3.5. Administration and personnel**

#### **3.3.5.1. Structure and organization**

The existing organizational structure of the Reserve must take into account the following main functions:

- 1) Protection of biological diversity;
- 2) Scientific research and monitoring;
- 3) Ecological education.

Execution of the above specified functions will be performed by the guarding service, the scientific department and the ecological education service.

Provision of special guarding of the Reserve territory is performed by the Guarding Service (State Inspectorate for Territory Guarding) numbering 15 people, of whom 14 are the guarding service inspectors and one is the guarding service manager. The Law of the Republic of Kazakhstan dated 23 January 2001 No. 151-II "On introduction of amendments and supplements to some legislative acts of the Republic of Kazakhstan on the issues of specially protected natural territories" strengthened the inspectors' rights with respect to execution of their control and inspection functions.

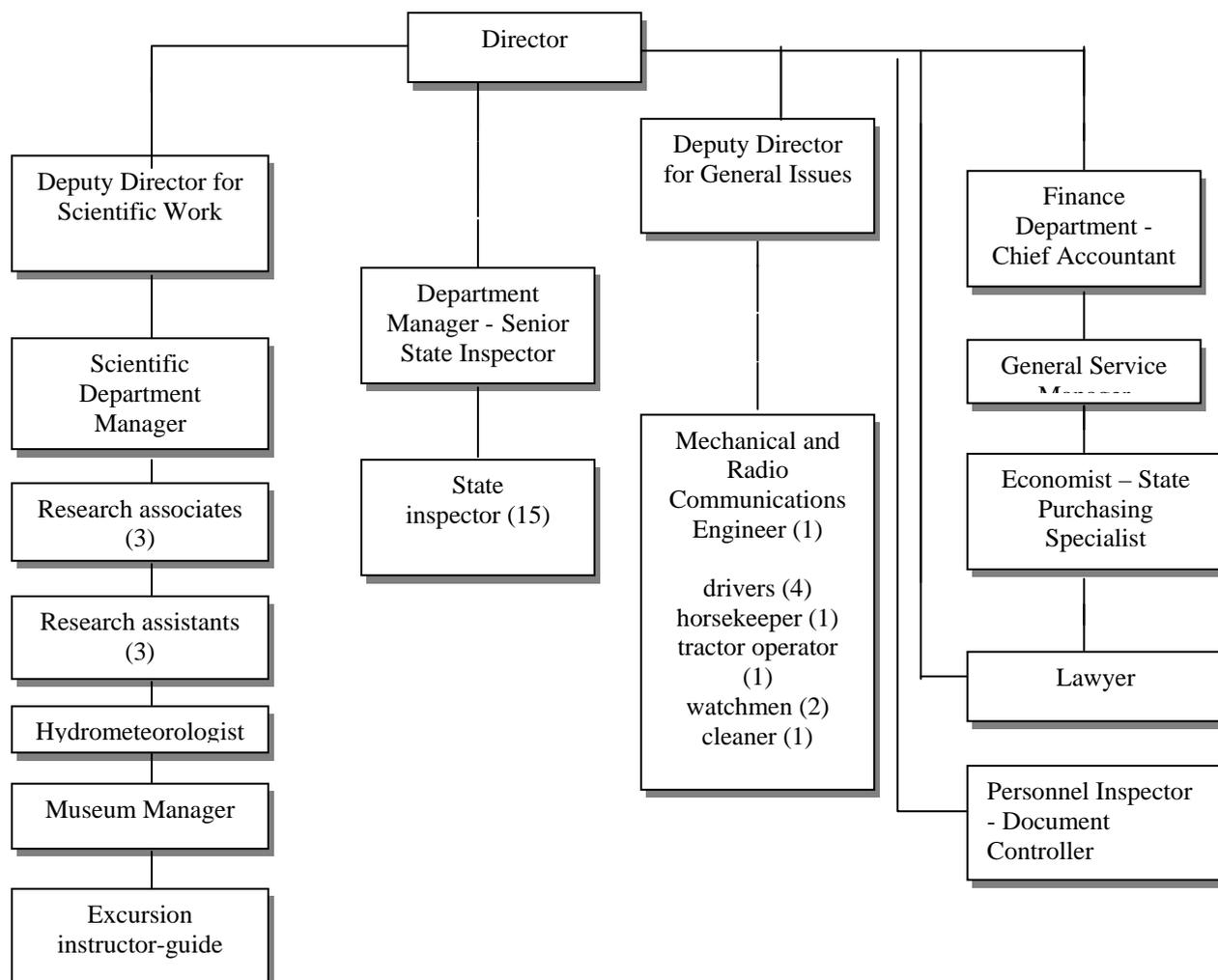
For the fire hazardous period, annually from June to October (5 months), it is necessary to hire and maintain fire service personnel. Personnel payment may be performed from special funds of the Reserve. In case of occurrence of big fires, the fire guarding crew may be reinforced by the Reserve employees up to 15 people.

The scientific research and monitoring will be performed by the scientific department, composed of the manager of the scientific department - botanist, senior research associate - botanist, senior research associate - entomologist, junior research associate - ornithologist, research associate - hydrometeorologist, who is also entrusted with studying the theriofauna, 2 laboratory specialists will be performing monitoring and phenological observations in the Reserve's natural complex.

Two research assistants of the scientific department, the instructor-guide and the museum manager, will be working on ecological education. In the period of seasonal activity of tourism (April-June, August-September), the same employees will be performing the function of excursion instructors, guides without engagement of third persons from external organizations.

The staff numbers of the Reserve's employees shall for now remain unchanged.

The structure of the Reserve's main divisions is given below.



Department	Functions
Department of Science, Information, Monitoring and Ecological Education	<p>Performs scientific research related to the inventory and study of the dynamics of the nature reserve assets; creates systems for regime observations, evaluation and forecasting of the natural environment condition; develops scientifically justified measures to protect them; studies phenomena in the Reserve's natural complex and impact of protection regimes on ecosystems. Takes part in propagation of ecological knowledge among population. Takes part in training of the Reserve guarding service employees under the Nature Records program.</p> <p>Performs and organizes ecological education activities in the following areas: Work in mass media, advertising and publishing activities, museum activities, ecotourism, interrelation with the teaching staff and education bodies. Designs posters, leaflets and other forms of visual propaganda which are required for the Reserve. Participates in training of guarding service employees of the Reserve and other specially protected natural territories of the region in the issues which belong to the department's competence.</p>
Guarding service	<p>Ensures guarding of the Reserve territory, performs supervision over observance of the established reserve regime and suppression of all activities which cause disruption of this regime. Participates in fire safety, forest protection and scientific research activities, incl.: in research and monitoring, keeping records of the numbers of wild animals. Renders assistance to wild animals during natural disasters and when there is a threat of their perishment.</p>

### 3.3.5.3. Training

1. The scientific department and guarding service of the Reserve have organized inspector staff training course at the central estate of the Reserve at least one or two times per quarter under the Nature Records program and on studying the RK laws on specially protected natural territories and the Administrative Offenses Code. The workshops are of a topical nature, the guarding service inspectors and the Reserve employees get acquainted with the species composition of the higher vascular plants, with the species composition of animals, master the methods of performing phenological observations of animals and plants and methods of meteorological observations, study the law "On specially protected natural territories", the Administrative Offenses Code, the Labor Code and other documents.

2. Raising of qualifications and specialization of the scientific department employees in biology subdisciplines – botany, entomology, ornithology and theriology. Preparation of own scientific staff will allow conducting scientific research on inventory of the flora and fauna species diversity.

For more accurate determination of the Reserve's flora and fauna species composition it is necessary to conclude contracts with leading institutes of the Ministry of Education and Science of the RK (Institute of Botany and Phytointroduction of Plants and Institute of Zoology) in order to receive scientific consultations and for practical training of the Reserve's research associates in the above specified subdisciplines of botany and zoology. For execution of annual and intermediate scientific research reports, the Reserve's employees must go on academic trips to acquire scientific literature, to work in the Central Scientific Library of the Ministry of Education and Science of the RK, to undergo practical training at the above specified institutes.

3. Efficient guarding of the territory depends on its proper organization. In accordance with the law of the Republic of Kazakhstan "On specially protected natural territories", directors, deputy directors and managers of guarding services of reserves ensure proper organization of reserve regime actions and bear responsibility for their implementation.

To improve the nature protection activities of the Reserve, it is necessary to exchange experience among reserves at the level of director, deputy director and manager of guarding service.

#### **3.3.5.4. Infrastructure and equipment**

Repairs Unfavorable stormy weather conditions during the autumn-winter period require current repairs, trimming of the cordon buildings, for which it is necessary to acquire construction materials and to hire seasonal worker (whitewashing of buildings, plastering and other Works) according to cost estimation documentation.

Landscape improvement at the central estate. The central estate has a territory of 0.5 ha, on which the office building with an autonomous mini-boiler plant are located. The territory of the central estate requires improvement (plot layout, planting ornamental trees and shrubs, planting flowers, information stands, etc.) Improvement of the central estate territory will be performed by employees and workers of the Reserve. Provision of ornamental indoor plants for office rooms and lobby of the Reserve's office building. Monetary funds for these activities have been allocated from the budget.

New construction. In 2008, garage and storage facilities for vehicles, administrative & utility block, workshop on the territory allocated behind the office building, as well as 3 cordons on the Suzak District side have been built and commissioned. For 2010, design and cost estimation has been prepared for construction of a horse stable.

Construction of the Visiting Center There is no wild nature museum at the Reserve. The museum serves for ecological education, for work with tourists and local population with the purpose of acquainting them with the places of interest of this land. Annually, a budget request is prepared for construction of a Visiting Center building, as well as for execution and preparation of materials for it (taxidermic works, artistic decoration, etc.).

Fire fighting equipment. In 2005, a ZIL-131 fire truck was acquired, the central estate and the cordons are equipped with fire-fighting boards. The protected zone, buffer zone and access roads to the Reserve are equipped with information boards containing texts on observance of fire safety measures. Firebreak lines have been plowed. All cordons are equipped with fire-fighting boards, back-pack sprayers, 5 fire-fighting crews 9-10 people each are annually formed from 45 employees on an annual basis. The employee duty schedule at the cordons during the fire hazardous season is being established.

Radio communication means To organize radio communication, it is necessary to receive a radio frequency. In 2005, the following has been acquired: KENWOOD TK 7108 H fixed radio stations – 7 units, KENWOOD TK7108 H mobile radios – 4 units, KENWOOD TK 2107 – portable radios 15, repeater station – 1 unit. The 167, 575 MHz radio frequencies have been received. There is constant radio link with the inspectors at the cordons and mobile groups of the guarding service. Due to the fact that the received frequency ranges proved to be insufficient for coverage of the whole territory of the Reserve and the protected zone, in 2007 there were additionally purchased 5 KENWOOD TK-80 short-wave radio stations in accordance with centralized procedure. One of these is a stationary radio station and 4 are mobile. Documentation is currently being prepared for receipt of a radio frequency.

Energy supply In 2007, in the city of Kentau an integrated heating system has been established and CHP-5 has been connected. Due to the fact that the city's heating system is not set up in full volume, the central estate building is heated by an autonomous mini-boiler plant, which works on liquid fuel (diesel oil). Funds for fuel and lubricants are allocated in the organization's budget. The office building is fully supplied with electricity. All cordons have been provided VOYAGE power generators for connection to the mobile radio station.

Means of transportation Each guarding service inspector, who performs patrolling, is provided service horses. The livestock consists of 29 horses. Upkeep of such livestock requires large volumes of hay and fodder grain for the winter period (6 months). There are no areas allocated for hay mowing on the territory of the Reserve. Provision of hay and fodder grain is performed by labor resources of the general service department with partial assistance from the guarding service inspectors. Management staff and guarding service require an off-road vehicle. To conduct scientific expeditions, an off-road

vehicle is required. To conduct ecological education activities, a 12-13 seat mini-bus is required. Requirements for transportation and technical means for subsequent years are reflected in Section 4 of the Management Plan.

Field equipment The field equipment must be adapted to mountain conditions, must withstand high loads, be of small weight and ensure water tightness. Field equipment includes the whole range of tourist equipment.

Scientific equipment. To perform scientific research and conduct regime observations, modern instruments and equipment are required, which are necessary for meeting the modern requirements under the Nature Records program. The equipment must correspond to the research associates' specialization:

- Equipment for determining geographic coordinates and altitudes of locations, personal portable GPS navigators and altimeters – for all research associates;  
Land usage map;
- Administrative map with indication of the specially protected natural territory location;
- Map of modern territory of the specially protected natural territory;
- Map of the specially protected natural territory boundary changes
- Map of soils
- Map of plant life
- Map of ecological systems
- Map of animal life
- Map of land usage
- Map of the specially protected natural territory zoning
- Map of tourist paths (routes) and other objects of tourist and recreational designation
- Topographic maps of scales 1:100000, 1:25000;
- Hydrological equipment;
- Meteorological equipment;
- Equipment for the botanist;
- Equipment for the ornithologist;
- Entomological equipment;
- Scientific literature.

More detailed specializations of the required scientific equipment are given in part 4 – Budget Requirements.

Computer and video equipment. Almost all employees of the Reserve's scientific department (11 people) and accounting department (2 people) possess personal computer and Windows 98 and 2000 software usage skills. The Administration and the Scientific Department require upgrading of computer equipment (scanner, color and ink jet printer) and software. A portable computer (notebook) is required for operational recording of data in field conditions. The scientific department possesses a rather large base of photographs taken on color and slide film, on digital cameras, and a slide scanner is required for creating databases of digitized pictures. For convenient storage of pictures and creation of digital film copies, it is necessary to have a DVD-Writer, a VW-DTM20 (Motion DV STUDIO) graphics card, SD Memory Card (RP-SDH512) for Panasonic NV-MX500 and a set of CD-Rw-DVD disks for recording, as well as large capacity Hard Drives.

For performance of work, the work group requires a computer network. Detailed specialization of required computer equipment is given in Section 4 – Budget Requirements.

#### Arrangement of experimental testing area in the protected zone of the Khantagi cordon

For conducting works on study of the development biology of rare and endemic species of tree and shrub and perennial grass plants of the Karatau State Nature Reserve and their in situ reproduction (back into natural habitat), an action plan has been prepared and work has been envisaged on planting the seeds of rare and endemic plants. A state act for 0.5 ha land plot usage

right has been received. The action plan includes plowing on the land plot, its fencing, cleaning, arrangement of amenities, which assumes financial expense. Arrangement of the exposition area is performed for scientific and ecological education purposes. It is planned to plant on the plot rare, unique and endangered species of tree, shrub and grass plants from seeds, transplants and grafts collected from various habitats on the Reserve territory on adjacent territories, then, after their germination in the future, it is planned to conduct comparative observations of the plants' phenology.

Internal communications. An automatic telephone exchange is installed for internal communications.

THE REPUBLIC OF KAZAKHSTAN  
THE MINISTRY OF AGRICULTURE  
THE COMMITTEE FOR FORESTRY AND HUNTING

MANAGEMENT PLAN  
OF AKSU-JABAGLY STATE  
NATURE RESERVE

*(extractions)*

### III. Mechanisms for Implementation of the Management Plan

#### 3.1. Management programs

##### 3.1.1. Habitat management

Habitat management envisages the following measures:

1) Reinforce guarding of juniper plantations, mountain deciduous forests (riparian woodlands, flood valley willow and birch forests, fruit tree forests), rare and endangered plant species by implementing the method of group patrolling, increasing the numbers of inspectors, guarding service and provision to the guarding service of mobile and fixed communication means, transport, clothing and field equipment, improving the work with population on ecological education;

2) Strengthen protection of territories from fires and improve performance of fire safety measures: preventative (explanatory) actions with the population, provision of fire-fighting equipment and vehicles to the Reserve, creation of fire-break line (soil plowing) along the Reserve's perimeter;

3) Conduct research on the dynamics, natural regeneration and sanitary condition of the forests;

4) Perform evaluation of the current condition of meadows and establish degree of the main transformation factors' (fires, hay mowing, grazing) impact on them.

No research was conducted on evaluation of the current condition of the Reserve's meadows in relation to the impact of human-induced factors.

##### 3.1.2. Wildlife management

For the territory of the Aksu-Jabagly State Nature Reserve, the need for regulatory actions is determined by decreasing numbers of the populations and degradation of communities.

The state inspectors for the Reserve territory guarding must ensure their protection by way of patrolling and exercising supervision over observance of the established regime on the territory of the Reserve and its protected zone, restraint of all violations causing disruption of this regime.

Performance of monitoring and collection of data on these species will also be executed by the inspectors under the guidance of the guarding service manager and scientific department employees.

#### Management of the arkhar population

Traditional censuses of arkhars are performed in spring and autumn on the territory of the Reserve according to P. Yanushko method (1943) Winter censuses are performed on the first snow by animal tracks in the Jabaglytau mountains.

Management of large predator and hoofed mammal populations.

Currently there is a need to determine the degree of impact of predators, such as wolf, snow leopard, lynx, bear on populations of hoofed animals (arkhar, wild sheep, roe deer, maral, boar).

Appropriate studies of their interrelations will be performed with the purpose of developing proposals on management of the populations of predators and large mammals on the territory of the Reserve and on adjacent territories.

### 3.2. Human resource management

#### 3.2.1. Program for improvement of the local population living conditions

a) Training of non-staff inspectors among the population and from LLP managers for inclusion in the composition of operational groups for patrolling in the buffer zone of the Reserve's territory totalling 10 persons, so as to pass the appropriate training course on nature protection legislation and practical activities on the reserve territory guarding (jointly with the Reserve's inspectors according to established time periods)

b) Engagement of public tour guides for rendering services during the high visiting season (May-August).

c) Engagement of local population in conduct of ecological tourism.

There are 4 guest houses in the Zhabagyly village:

1. Zhenya and Liuda's House LLP – for 26 persons;
2. K/Kh Ruslan or family holiday camp Ruslan for 12 persons;
3. NGO Wild Nature guest houses 14 persons;
4. Lazzat Guest House – 4 persons;

The local population receives benefits from ecological tourism by providing them accommodation in guest houses. The people who stay there are coming with the purpose of visiting the Reserve. At some guest houses, there are hired workers whose salaries depend on the number of visitors, besides, for the guest house owners, provision of accommodation to visitors is the main source of income.

The residents of the Zhabagyly village, where the guest houses are located, sell dairy products to the visitors, such as milk, sour cream, kurt and also honey, koumiss, thus receiving additional income.

#### Types of services (alternative types of activities) of the local population with good prospects of development in the Aksu-Jabagly SNR

Table 20

N o.	Residential settlements	Services / alt. activities of the local population
1	2	3
<b>The Jabagly rural district</b>		
1	Jabagly village	Guest houses, meal services, including national cuisine, sale of honey, bakery, transport services, processing of agricultural produce, tourism, production and sale of koumiss, processing of animal products
2	Abail village	Dairy products, production and sale of koumiss, processing of animal products
<b>The Karatobinskiy rural district</b>		
3	Baldybrek village	Tourism, food enterprises, craftsmanship, processing of agricultural produce, dairy products, sale of honey, production and sale of koumiss, horticulture, processing of animal products
4	Tonkerys village	Bee keeping, tourism, food enterprises, bakery, craftsmanship, production and sale of koumiss, horticulture, processing of animal products
<b>The Tyulkubasskiy rural district</b>		
5	Irsu village	Dairy products, production and sale of koumiss, processing of animal products

Practically every residential settlement possesses a certain potential for organizing tourist services. Where the sites of interest to tourists are at significant distances from the settlements, the population can engage in production and sale of koumiss and food outlets.

The network of guest houses and tourist shelters will allow planning of the most diverse routes for any visitor categories.

The population of the Zhabagyly village is also actively engaged in development of ecological tourism.

### Locations of guest houses and list of services rendered

Table 21

No.	Full name	Location	Information on the house	Utilities	San. conditions	Services	Price (person/night)
1	Belousov EM LLP Zhenya and Liuda's House 8(72538) 55584	Zhabagyly village Abay str. No. 36	Guest house for 26 persons	Telephone, automatic washing machine, Refrigerator Computer Internet	Toilet Shower stall Central sewage	Accommodation Excursion to the South Kazakhstan Oblast	6000 ₸ Without meals 3000 ₸
2	K/Kh Ruslan family holiday camp Ruslan 8(72538) 55585	Zhabagyly village Abay str. No. 24	12 persons Guest house 7 rooms 1-storey house	Telephone, TV, automatic washing machine, Refrigerator Computer Internet	3 toilets, Shower stall, Bath house Central sewage	Accommodation Meals Excursion to Turkestan, Shardaryinskoye water storage reservoir, Taraz	5000 ₸ Without meals 2500 ₸
3	Lazzat hotel	Zhabagyly village Shalgyn str. No. 16	4 persons Two rooms	Telephone TV Refrigerator Wash. machine	Toilet Shower	Accommodation, meals Excursion to South Kazakhstan Oblast	3500 ₸ Without meals 2000 ₸
4	NGO Wild Nature	Zhabagyly village Taldybulak str. No. 15	14 persons	Telephone TV Refrigerator Wash. machine Computer Internet	Toilet Shower	Accommodation, meals	5000 ₸
5	Hotel of the Aksu-Jabagly SNR	Zhabagyly village Abay str. No. 28	8 persons Hotel	Telephone TV Refrigerator Wash. machine	Separate toilet shower	Accommodation Meals Excursion to Aksu-Jabagly SNR	4500 ₸

### 3.2.2. Program for guarding service performance improvement

This organizational structure for territory guarding can be currently considered efficient. When compared against the period from 2004 to 2008, the fight against poaching and fire forests is improving every year. Since the work on suppression of poaching and fires is improving every year thanks to modern radio communications, availability of off-road motor transport in sufficient quantities. Fires mostly occur in the vicinity of protected zones. In order to stop the fires in time and quickly it is necessary to have a fire truck with 5 staff units of firemen. Analysis of data on the number of identified breaches for the last five years indicates their insignificant growth. During winter time, patrolling is made much more difficult due to deep snow in the conditions of mountain terrain. To improve guarding in winter time, the Reserve requires snowmobiles 2 each. Also, the work is improving with local population and schoolchildren located close to the Reserve's territories. This improvement is related to financing of such

actions. The information collected on the Reserve territory by the guarding inspectors for the Nature Records in due time also influences for improvement and facilitation of the scientific department work.

### **3.2.3. Scientific research work and monitoring**

The guarding department participates in all biotechnical actions, During every walkdown, guarding inspector is on a daily basis keeping a journal and entering data for the Nature Records (on the weather, animals, insects, plants). Takes part in performance of large mammals census at certain points in spring for one day, the autumn census of large mammals is performed for three days. Census of mammals on the first snow is performed in one day. Observes plants at phenological sites in each of the inspection areas. Observations are performed not less than once a week over individual species and enters data in the journal starting from when the snow melts until a deep snow cover. Keeps records of indicator species of birds, insects and rodents. Birds are recorded from end of May to beginning of July once a week for 6 weeks. Individually in each inspection area using a defined route. The guarding inspector also observes weather conditions at the cordons and enters data in the journal.

#### **Work plan for performance of biotechnical actions by the guarding department**

Table 22

No.	Actions	Month
2	Keeping the inspector's journal	daily
4	Performance of spring census of large mammals	April
5	Performance of autumn census of large mammals	August
6	Performance of animal census on first snow - mammals	November - December
7	Performance of insect, rodent and bird census on routes	August
8	Observation of plants at phenological sites	March - November
9	Observation of meteorological changes in nature	round the year

Jointly with the department of ecological education and tourism, mass propaganda work is conducted in the media, among the population and at schools located in residential settlements close to the territories of the Reserve.

#### **Public relations work plans**

Table 23

No.	Actions	Month
1	Mass propaganda work among the population and schoolchildren located close to the territories of the Reserve on preservation of the SPNT protection regime.	round the year
2	Mass propaganda work among with legal entities and individuals located close to the territories of the Reserve on preservation of the SPNT protection regime.	round the year
3	Joint propaganda works with NGOs and the media	round the year
4	Approvals of plans with local executive bodies on holding the March for Parks nature protection event	February - March

### **3.2.4. Program for ecological education department performance improvement**

- Development of the program for provision of information to the population.
- Expansion of participation in the ecological education activities of the state inspectors of the Reserve's guarding service.
- Publicizing of the results of activities on preservation of natural complexes, performed in the Reserve for large sections of the public.
- Creation of video and photo products and their demonstration.
- Creation of electronic base of the Reserve's library.
- Expansion and reinforcement of interaction with the media, creation of information package for the press (press releases on the SPNT, copies of articles, comments of well-known personalities and organizations on the SPNT, photographs)
- Development of a network of children's and youth ecological associations, coordination of their activities, with the purpose of preparing future specialists for work at the Reserve.
- Arrangement and improvement of ecological paths
- Creation and support of own web page on the Internet
- Ensuring safety of the Reserve's visitors (rendering first medical aid, training in skills of rendering before-doctor medical aid, communication devices)
- Develop guidelines on rare and endangered species of animals and plants of the Reserve for biology teachers of secondary schools. Total circulation 150 copies.
- Develop new types and subjects of excursions at the Visiting Center and ecological path with due consideration for school curricula.
- Organize the "Young Friends of the Reserve" ecological club at the Jabagly village.
- Hold ecological events
  - March for Parks (February - May)
  - Bird Day (1 April)
  - Earth Day (22 April)
  - Ecological Education Day (12 May)
  - Environment Day (5 June)

### **3.4. Management and personnel:**

#### **3.4.1. Structure and organization:**

The current structure of the institution was approved by the Directive of the Committee for Forestry and Hunting of the Ministry of Agriculture of the RK No. 160 of 28 May 2008

The management apparatus structure is represented by management and department:

- Director
  - Deputy Director
  - Deputy Director for Scientific Work
  - Lawyer
  - Department for guarding of natural complexes and sites - 30
  - Department of science, information and monitoring – 9
  - Department of ecological education – 5
  - Department for financial and organizational work – 4
  - Mechanic – Warehouse Manager
- Total – 53.0 full-time equivalents**

The staff numbers correspond to the existing structure, hiring and dismissal are performed in accordance with the Labor Code of the RK of 15 May 2007 and the Collective Agreement adopted at the general meeting of the workforce on 03 March 2008 with due account for the requirements of the current legislation for enrollment for work at state institutions.

The are job descriptions and functional duties at the institution, which are approved by the Reserve's Director. General provisions of these instructions clearly state what needs to be known by each employee, his rights, responsibilities and qualification requirements for the occupied position. The workers know who they are subordinate to, what they are responsible for and how the results of their work are evaluated. The job descriptions and functional duties are presented in Appendix 11.

Management of the institution is performed by the Director, who is subordinate to the authorized body and bears personal responsibility for execution of the tasks entrusted to the Institution and performance of its core activities. Acts on a principle of unity of command and independently resolves the issues of the Institution's activities in line with his competence, which is determined by the legislation of the Republic of Kazakhstan and individual Regulations of the Reserve, approved by Directive of the Committee for Forestry and Hunting of the RK of 5 January 2003 No. 4.

He also conducts his work in accordance with the annual work plan of the Institution, the Reserve's development program and individual plan. Holds meetings of the top echelon of management apparatus, at which reports for the past week and plans for the coming week are heard. The directive instructions, orders, directives are communicated for execution to all structural divisions, responsible persons exercise control over their execution. Twice a year, a workshop is held on the basis of the autumn and spring audit at the Reserve's office. At the Institution, there is a functioning Scientific & Technical Council (STC) – a consultative-deliberative body, there is a schedule of meetings at the issues and prospects of the Reserve's development are considered, results of the year are summarized, plans, scientific research programs and passports of organized ecological paths are approved, etc. The STC conducts its activities on the basis of Regulations, approved by the Director.

The Reserve's staff size amounted to:

- in 2004 – 52 units, with annual payroll fund of 866570 tenge. The average monthly salary amounted to 13835 tenge.
- In 2005, the staff size amounted to 52 units, with an annual payroll fund of 5926476 thous. tenge, the average monthly payroll fund amounted to 19037 tenge.
- In 2006, the staff size amounted to 52 units, with an annual payroll fund of 11879916 thous. tenge, the average monthly payroll fund amounted to 19074 tenge.
- In 2007, the staff size amounted to 52 units, with an annual payroll fund of 15827959 thous. tenge, the average monthly payroll fund amounted to 24550 tenge.
- In 2008, the staff size amounted to 53 units, with an annual payroll fund of 16329979 thous. tenge, the average monthly payroll fund amounted to 24582 tenge.

Analysis of the provided data indicates that there were no significant increases of salaries both for administrative and management personnel and for the whole workforce. The industry increments are not determined and not developed. Premiums for workers in rural areas (25%) are not paid, whereas all the state institutions of the district are receiving this premium. The very low salary results in high staff turnover.

Analyses of the staff size data for the years 2004-2008 have indicated that the average staff turnover at the Institution amounted to 19.0%, of which the highest indicator – 24% falls on the year 2008.

The Reserve's staff is represented by workers having sufficient qualifications for performance of the actions which are required for achievement of the management goals.

### 3.4.2. Hiring

In the process of hiring it is necessary to take into account qualification requirements imposed for acceptance for work at a state institution in accordance with the Labor Code of the Republic of Kazakhstan of 15 May 2007 and the Decree of the Government of the Republic of Kazakhstan No. 849 of 27 September 2007 "On approval of the Rules of acceptance for civil service and holding a contest for filling a civil servant vacancy".

## Functions performed by main divisions of the Reserve.

Table 24

Departments	Functions
Scientific Department	Performs scientific research related to the inventory and study of the dynamics of the nature reserve assets; creates systems for regime observations, evaluation and forecasting of the natural environment condition; develops scientifically justified measures to protect them; studies the natural course of processes in nature and impact of protection regimes on ecological systems. Takes part in propagation of ecological knowledge among population. Takes part in provision of practical training to students of nature protection profile at the Reserve.
Guarding service	Ensures guarding of the Reserve territory, performs supervision over observance of the established reserve regime and suppression of all activities which cause disruption of this regime. Takes part in performance of fire safety, limited economic science events, including: research and monitoring, keeping records of the numbers of wild animals (appendix). Provides help to wild animals in case of natural disasters and a threat of their perishment. Takes part in provision of practical training to students of nature protection profile at the Reserve base
Ecological education service	Organizes and conducts ecological education activities in the following main areas: Work with schoolchildren and students, with the mass media, advertising and publishing activities, museum activities, ecological tourism, interaction with the teaching staff and education authorities. Performs designs of posters, leaflets and other forms of visual propaganda which are required for the Reserve. Participates in training of guarding service employees of the Reserve in the issues which belong to the department's competence. Takes part in provision of practical training to students of nature protection profile at the Reserve base.

### 3.4.3. Training

The absence of systemic training and raising of professional qualifications of the inspector staff lowers the level of inspectors' professional work, which, in turn, does not allow full capture of the available opportunities in observance of the nature protection legislation.

- Expansion of the practice of engaging young specialists of profession-oriented higher education institutions with serious preparation for work at the Reserve.
- Raising the level of computer literacy of the SPNT personnel and teaching foreign languages.
- Development of personnel provision program, including the schedule for raising and changing qualifications, as well as estimations of required expenses (payments for courses, literature, etc.)

Scientific research at the Reserve is performed by the research associates. The Reserve's scientific department has been granted the status of a scientific organization. Management and coordination of scientific activities of the Reserve is performed by Deputy Director for Science.

The Ministry of Agriculture of the Republic of Kazakhstan  
The Committee for Forestry and Hunting

MANAGEMENT PLAN

SAYRAM-UGAM STATE NATIONAL  
NATURE PARK

*(excerpts – operational part)*

### 3. MECHANISMS FOR IMPLEMENTATION OF THE MANAGEMENT PLAN

#### 3.1. Management programs

##### 3.1.1. Habitat management

Habitat management envisages the following measures:

1) Reinforce guarding of juniper plantations, mountain deciduous forests (riparian woodlands, flood valley willow and birch forests, fruit tree forests), rare and endangered plant species by implementing the method of operational group patrolling, increasing the numbers of guarding service inspectors. Provision to the guarding service of mobile and fixed communication means, transport, clothing and field equipment. Improvement of ecological education work with the population;

2) Strengthen protection of territories from fires and improve performance of fire safety measures: preventative (explanatory) actions with the population, restoration of bridges and main access roads to the Park, repair of main roads, equipping the Park with fire safety appliances, creation of a firebreak line (soil plowing) along the Park perimeter;

3) Conduct and sanitary condition of the forests;

4) Conduct research on the dynamics and natural regeneration of areas previously subjected to human-induced impact

##### 3.1.2. Wildlife management

On the territory of the Sayram-Ugam SNNP, 10 endangered mammal species have been noted. Species listed in the Red Book of Kazakhstan: Menzbier's marmot, Tien Shan arkhar, Tien Shan bear, snow leopard, stone marten, mottled polecat, Indian porcupine, long-eared bat and European free-tailed bat. Menzbier's marmot, Tien Shan arkhar and Tien Shan bear are experiencing pressure from hunting. Of the 28 bird species listed in the Red Book of Kazakhstan, which are encountered in the Park, 13 are nesting species (of which 5 species require clarification).

State inspectors of the reserve must ensure protection of wildlife representatives by way of patrolling and execution of supervision over observance of the established regime on the territory of the reserve and its protected zone.

Performance of monitoring and collection of data on monitored and key species of wildlife representatives will be conducted by the inspectors of the guarding service of the reserve and scientific department employees.

The scientific research and monitoring programs are presented in ch. 3.1.3.3

##### Management of the Karatau arkhar population

#### Objective.

Improve the arkhar habitat conditions in areas adjacent to the Park's territory.

#### Justification.

Of the remaining several dozen of Karatau arkhar on the South Kazakhstan Oblast territory, annually about 27 animals are found on the Park's territory. Besides, it is necessary to note the increasing danger to them from humans. Due to the fact that arkhar is an active migrant and performs movements, preservation and reproduction of this species is impossible in a small area of the mountains, the protection actions must be conducted on the scale of the whole area of its distribution.

#### Key actions:

- Regular patrolling of arkhar habitat territory by the Park's guarding service inspectors
- Regular monitoring of arkhar on the Park's territory
- Cooperation with arkhar preservation projects
- Along with the traditional counts of arkhar in spring and autumn periods on the Park's territory, it is necessary to perform late autumn and winter counts in the wintering grounds of these animals in Karatau and Boraldai mountains
- The problem of safeguarding the arkhar young stock from predators, including the wolf, deserves careful attention. Required regulation actions with respect to the wolf numbers may be applied only after clarification of the degree of the wolf's impact on arkhar numbers
- In order to retain the arkhar population on the protected zone territory, it is necessary to organize salt licks on the Park's territory, so that the arkhar population will not leave the protected zone in search of salt, to become an easy prey for poachers. However, the degree of propriety and efficiency of this method will be demonstrated by scientific studies of the arkhar.

### **Management of the Menzbier's marmot population**

Objective. Development of proposals on preservation and reproduction of natural components of the natural environment and genetic stock of Menzbier's marmot.

#### Justification.

Territorial detachment of habitats of the Menzbier's marmot, Western Tien Shan endemic, and multi-year absence of proper guarding have led to reduction of marmot numbers, therefore it is necessary to take measures for preservation of populations of this species.

For many years, the Menzbier's marmot habitats were not properly guarded.

By 1973, 25 thousand individual animals were counted in the northern part of its distribution area (Sokolov, 1986). Censuses taken in 1990 and 1991 indicated that in the last 40 years the habitat area of this species here significantly dwindled, and its population decreased by 30-40% (Vyrypaev, Obidina, 1990; Plakhov, Kovshar, 1991). Observations conducted during this census indicated that Menzbier's marmot habitats are under strong human-induced pressure (mostly cattle grazing and poaching). In mid 90-ies the marmot numbers, most likely, amounted to 9.1 thousand animals (Mashkin, 1980, 1996). Currently, due to changes of socio-economic situation in the region, active cattle diminished, but, along with that, poaching probably intensified. Exact current numbers of this rodent are unknown.

Field research will allow developing specific recommendations on preservation and restoration of the Menzbier's marmot numbers and identifying experimental observation zones for subsequent monitoring.

#### Key actions

- Regular patrolling of marmot habitat territory by the Park's guarding service inspectors;

- Performance of regular monitoring of Menzbier's marmot population

### *Interrelationship of large predators (wolf, snow leopard, lynx, bear) and hoofed mammals (wild sheep, roe deer, boar)*

Objective: Determine the degree of predator impact on populations of hoofed animals and significance of hoofed animals in the predators' feed. Develop recommendations on conducting census of predators and hoofed mammals. Issue proposals on management of predator and hoofed animal populations on the Park's territory.

#### Justification:

Reduction in the numbers of most species of hoofed mammals on the Park's territory has been noted in the last decade. It is assumed that, besides poaching and natural factors (snowy winters, diseases), a significant role in this process could be played, under certain circumstances, by predators. In particular, the wolf (with respect to all hoofed mammals), the snow leopard (first of all, with respect to wild sheep, to a lesser extent with respect to other species), the lynx and, partially, the bear (predominantly with respect to hoofed mammals' young stock, and, in some cases, mature animals as well). This is confirmed by previous observations of zoologists in the Aksu-Jabagly Reserve and adjacent areas (Kovshar, Yanushko, 1965; Grachev, 1981, 1982; Vyrypaev, Vorobyev, 1983 et al.).

In view of this, it is necessary to determine, first of all, territorial deployment of the above named species (biotope confines, preferred sites, seasonal vertical/nomadic migrations and other possible movements), quantitative ratios of predators and hoofed mammals, determine the extreme periods and circumstances which conduce predation, the success rate of hoofed mammal hunting by predators, etc.

#### Key actions:

- Regular observations of the above listed species
- Along with the traditional censuses in spring and autumn on the Park territory, late autumn and winter censuses are required
- Registration of dwelling holes, shelters, etc.
- Study of trophic links

### *Evaluation of current condition of forests and their resources*

#### Objective:

Inventory of forests and their resources (commercial shrubs, medicinal materials, etc.) with the use of ocular and measurement-recalculation valuation surveys, methods of remote probing (space photography). Study of the progress of natural regeneration and sanitary condition of juniper forests (including juniper forests damaged as a result of fires and human-induced impact).

#### Justification:

To develop decisions on preservation of the reserved stock, authentic data is currently required on the condition of forests, plant and animal life. Regrettably, the Park does not possess such data, because the last forest management surveys of its territory were performed in 1992.

It has been 16 years since the last forest survey, which, even for woody vegetation, is a significant period. The Park's territory experienced significant changes in the period since 1992.

There currently is no reliable data on the structure of the forest stock, its condition, there are no plan and mapping materials for the whole territory of the Park: map-boards, plans of forest plantations and schematic map.

Taking the inventory will allow to receive new data on the structure of forests and their condition, the course of natural regeneration of areas affected by fires, sanitary condition of the damaged juniper forests, to receive new digitized plan and map materials on the basis of which various special purpose maps will subsequently be prepared.

### 3.1.3. Human resource management

#### 3.1.3.1. Program for improvement of the local population living conditions

Population of Tyulkubas, Tolebiy and Kazygurt districts, specifically, residents of the mountain villages located in direct vicinity of the Park's territory, have indigenously been engaged in animal husbandry, horticulture, growing of potatoes, vegetables and grain crops.

For peasants and farmers, farm keeping is the only source income and the base for improvement of socio-economic condition of the members of their families. For employees of budgetary institutions of the rural settlements (teachers, doctors, cultural workers), the lands of former collective farms and state farms, distributed on the basis of shares, serve as the second source of income.

There is currently ongoing active construction and repair of schools, rural ambulance stations, hospitals, roads are being repaired, bridges are being built. Along with that, in large residential settlements of the districts, old water supply networks are being repaired and new ones are being built under the "Taza su" program. Along the streets and around public buildings, trees and flowers are planted under the "Zhasyl yel" program.

The salary level of employees of budgetary organizations and institutions is gradually increasing, pensions are growing. An annual medical allowance in the amount of one month's salary is paid to budgetary sphere employees since 2008.

Since 2006, from the time of the Sayram-Ugam SNNP, there is a growing flow of holiday makers and tourists who visit the Park's territory. Passage to the Park's territory is often made through the nearby mountain villages. Some enterprising residents of the mountain villages build along the travel route to the Park small canteens, cafes and shopping stalls for sale of agricultural products, national foodstuffs are especially popular (kymyz, ayran, kaymak, kurt, sarymay, boursak, kazy, tapanan, etc.). Though rarely, they are selling mountain honey.

Currently the Part does not have sufficient livestock of horses and the required number of guest houses for tourists, since the service only started to be developed in 2006.

Taking this opportunity, some local residents are reconstructing their homes as guest houses for receipt of holiday makers, others are renting out their horses and helping the Park employees in serving the visitors on equestrian routes.

In 2008, the general plan of the Park infrastructure is being prepared. In 2009, there will be active construction of various facilities on the Park's territory, conditions for presence of visitors on the Park's territory will be improved. It is planned to create new jobs for the local population on provision of services to the Park visitors, which will lead to improvement of living conditions.

#### 3.1.3.2. Program for guarding service performance improvement

Objective. Preservation of biodiversity and habitats of the Sayram-Ugam SNNP and adjacent territory

Key actions

- Strengthening the work of inspectors with respect to prevention of the reserve regime breaches
- Strengthening the territory guarding
- Raising the inspectors' level of knowledge of the Park's biodiversity

- Improvement of material and technical base of the guarding service department

### 3.1.3.3. Scientific research and monitoring

*1. Monitoring of bird fauna, theriofauna, entomofauna, environment monitoring in accordance with the developed Monitoring Programs.*

Objective:

Obtaining regular objective data on the condition of the most important biodiversity components of the Sayram-Ugam SNNP biodiversity – plants and animals, as well as on the condition of their habitats. Based on the monitoring data – evaluation of the condition of populations and ecosystems, efficiency of the SPNT. Development of measures on prevention (elimination) of critical situations and undesirable phenomena

Justification:

Previous scientific research on the fauna of the Kazakhstan part of the Western Tien Shan region was performed partially on the territory of the Sayram-Ugam SNNP. Starting from 2006, the flora studies were started. The Park's theriofauna, unfortunately, hasn't been properly studied. Also, the entomofauna data is available not in proper volume. In 2005, an integrated field team of the Transboundary Project for Preservation of Western Tien Shan Biodiversity worked on the territory of the Park, which determined the composition of flora and fauna and issued recommendations on further monitoring performance.

Monitoring sites were selected, monitoring species were proposed. According to that, monitoring will be performed for all main components of biological diversity by the Park employees, and, if required, it is planned to engage other specialists (on a contractual basis) from the leading research & development institutes of the RK on the SPNT territory.

The data received as a result of long-term monitoring will allow, to some degree, to determine the causes of change of the numbers of representatives of various species of fauna and flora, to notice the threats to biodiversity in a timely manner and to take measures on their mitigation or elimination.

Key actions.

1. Hold a training workshop for employees inspectors of the Park on performance of monitoring, data analysis, form filling.
2. Marking of monitoring sites.
4. Performance of monitoring:
  - of water amounts (level regime)
  - of terrestrial plants
  - of birds of terrestrial ecosystems
  - of mammals
5. Analysis of received data
6. Taking measures to mitigate or eliminate threats to biodiversity

*2. Continuation of the work on scientific research topics of the Sayram-Ugam SNNP (see Section 1.9.2.)*

Objective:

Regular study of the objects of scientific topics (according to the research programs), to identify the causes of the dynamics of the species numbers, develop recommendations on their protection and reproduction.

Key actions:

1. Field work
2. Office processing
3. Report writing

4. Publication of scientific articles

3. *Creation of database for Nature Records of the Sayram-Ugam SNNP*

Objective.

Provision of convenient storage of the Nature Records and usage of input materials. Provision of wide access of interested parties to the NR.

Justification.

Nature Records are kept in the Sayram-Ugam SNNP since 2006. There are electronic versions since 2006. Creation of the database will allow to gradually enter into it the whole accumulated material, to organize it in a system and to provide it to the client on request with maximum speed in analytical or factual form.

Key actions:

- 1) Engagement of a database specialist;
- 2) Participation in the analysis and improvement of keeping the Nature Records;
- 3) Regular provision of information and data for filling the base.

### 3.1.3.4. Program for ecological education and tourism department performance improvement

Objective:

Formation of ecological literacy of the population, understanding the key role of the protected territory, importance of preservation of the unique nature, generation of public support. Fostering the feeling of patriotism, responsibility for the environment and, as a result, reduction of the pressure on the region's biodiversity on the part of the local population. Development of ecotourism and recreation on the territory of the Park.

Key actions:

- Raising qualifications of the ecological education department employees
- Improvement of material and technical base of the ecological education department
- Organization of a Visiting Center
- Work with mass media
- Reinforcement of advertising and publishing activities
- Creation of film and video products
- Interaction with public associations and other non-commercial organizations
- Ecological excursions and educational tourism
- Ecological festivals and events
- Scholastic and other forms of work with schoolchildren
- Interaction with teaching staff and educational authorities

*1. Raising qualifications of the ecological education department employees*

Main actions:

1. Training workshops
2. Experience exchange at other SPNTs

*2. Improvement of material and technical base of the ecological education department*

Equipment acquisition.

*3. Organization of a Visiting Center*

Main actions:

1. Development of the Visiting Center concept

## 2. 2. Construction of the Visiting Center

### 4. *Work with mass media*

This is one of the traditional areas. Special significance is to be given to the Park cooperation with the local (District and Oblast) mass media, including electronic media. Success of this form of ecological education work to a large extent depends on the information periodicity and emotional intensity. In the course of this systematic work it is critically important to set up feedback with the audience by holding various contests, surveys, etc.

### 5. *Advertising and publishing activities*

#### Actions:

1. Making A3 size advertising prospectus, 4000 copies. The prospectus must contain color illustrations. The text part of the booklet must contain description, its main ideas and tasks.
2. Publishing of a brochure with the purpose of acquainting the tourists with the Sayram-Ugam Park. It is necessary to include in it a tourist map with routes, price list of the services offered (including the entrance fee) and Behavior Code for the visitors. It is recommended to publish the brochures in the Kazakh, the Russian and the English languages. Total 2000 copies.

3. The Park symbols.

Design a programs of their usage.

4. Creation of film and video products

This labor and finance intensive work allows to demonstrate to the wider public the beauty, richness and diversity of the protected nature. Semi-professional and amateur films may be shot by the Park employees, part of them may be successfully used in the Oblast television transmissions. At the same time, the most important element of this work area is the Park's cooperation with highly professional production units of the biggest TV companies, both domestic and foreign, as well as with the production units of the regional TV companies and film studios.

### 6. *Interaction with public associations and other non-commercial organizations*

Public associations render significant assistance in execution of ecological education actions and attraction of public attention to solving their problems. It is necessary to initiate establishment of a society of the Park's friends with the purpose of direct support of the SPNT and assistance in development of the nature protection activities.

In many cases, real assistance in the ecological education activities and work with local population could be rendered by constructive cooperation with the public organizations and movements of ecological orientation which are active in the region.

### 7. *Ecological excursions and tourism*

The Sayram-Ugam State National Nature Park is one of several places in the region that are attractive for tourists.

Ecological excursions and educational tourism are traditional and highly efficient forms of ecological education activity in the SPNT. The possibility to get in touch with the world of nature, to feel and study it, can turn the visitors into active supporters of the SPNT, and sometimes into investors. Of special significance is the possibility of direct acquaintance with the protected nature of the decision makers in the sphere of republican and regional politics, local self-government, business.

#### Actions:

1. Development of the ecotourism concept
2. Detailed inventory of the existing routes
3. Inventory of the resources required for development of existing, worked out projects.
4. Evaluation of investments required for development of the infrastructure of existing routes.
5. Provision of necessary facilities for ecological routes and paths
6. Description of each route (brochure issuance)
7. Publications about tourist routes
8. Advertising of the routes for individual visitors and tour operators.
9. Develop training programs, as well as guide teaching programs.

#### *8. Ecological festivals and events*

Ecological festivals and events, various festivals which have a sufficiently pronounced nature protection character, etc., are quite effective means of attracting people's attention to the nature protection problems. Engage public organizations, educational structures, authorities and local self-government bodies, the mass media, as well as potential sponsors in organization and joint holding of such nature protection events.

##### Actions:

1. Holding the March for Parks
2. Holding the Bird Day
3. World Environment Day
4. Children's ecological festivals

#### *8. Scholastic and other forms of work with schoolchildren*

In work with schoolchildren, of importance are also such traditional forms as sponsorship of local schools by national parks, work with young naturalists' circles, including those who are undergoing field practical training in the parks during school holidays, as well as with institutes. The last two forms may also play a significant role with respect to facilitating professional orientation of schoolchildren and students. Of no little significance here is the direct engagement in participation in research and nature protection actions conducted by the Park's specialists.

#### *9. Interaction with teaching staff and educational authorities*

The efficiency of ecological education work in the state national nature park will be strengthened manifold if the work is conducted in close cooperation with educational structures, first of all with the administration and teachers of the local educational institutions. It is necessary to hold workshops for school teachers, organizers of additional education, round tables on current issues of ecological education work with children, to develop and implement joint ecological education projects and events

Organization of ecological education of the population will be ensured by the ecological education service which is to pass special training. The ecological education work must be oriented at residents of settlements located in the immediate vicinity of the SPNT territory, residents of the city of Shymkent and schoolchildren.

## **3.2. Management and personnel**

### **3.2.1. Structure and organization**

Like any organization, the Sayram-Ugam Park is going through the stages of formation, evolvement, balanced stable development and structural transformation. Each stage has corresponding specific structures and relations. The evolvement period depends on the functions entrusted to the Park in accordance with the regulatory base of the Republic of Kazakhstan.

The existing organizational structure of the Park must take into account the following main functions:

- 1) Protection of biological diversity;
- 2) Scientific research and monitoring
- 3) Ecological education and ecotourism;
- 4) Reproduction of forests and plant life;
- 5) Reproduction of animal life

Performance of the above specified functions will be executed by departments of guarding service, science, information and monitoring, ecological education, reproduction of animal life and reproduction of forests and plant life.

To perform operational management and daily control, three affiliates have been formed in the composition of the Park.

The total headcount of the Park employees amounts to 110 persons, of whom 43 state inspectors are assigned forest walkdowns, 4 inspectors are assigned botanical reserves – Zhambylskiy, Akdalinskiy, Timurskiy and Zadarinskiy.

The Park's General Director is the Chief State Inspector, and his deputies are Deputies of Chief State Inspector. Directors of affiliates and managers of departments in the Park's Directorate are senior state inspectors. Other employees (except workers of the department of financial and organizational work and lawyer of the Park's Directorate) are state inspectors. Thus, the total number of inspectors in the Park amounts to 99 people.

In accordance with Article 562, Part 5 of the RK Code "On administrative offenses", the state inspectorate of the Park is assigned a legal status according to which it belongs to an Authorized Body in the sphere of forestry and hunting.

Efficiency of guarding is ensured by interaction with law enforcement bodies of the district, local population, their attitude towards the Park, quality of the explanatory work.

In the territory guarding work, a well proven practice is conducting regular missions by a group of specialists of Park's natural complex protection department jointly with the specialists of the Park's affiliates, as well as with the employees of law enforcement bodies and territorial inspectorate.

For the period of fire hazardous season from May through October (6 months), it is necessary to establish a fire service staff (10 persons in each of the Park's affiliates) from among the best prepared state inspectors. In case of fire occurrence, the fire crew may be reinforced by state inspectors of all departments of the Park up to 60-70 people.

Currently there are fire-chemical stations in the Tolebiyskiy and Ugamskiy affiliates, each of which is equipped with 1 tractor, 1 fire truck and 1 passenger car. There is no fire-chemical station in the Tyulkubasskiy affiliate. To ensure fire safety of the forests, it is necessary to urgently organize a fire-chemical station equipped with modern equipment for fire extinguishing.

By the year 2012, the total number of state inspectors assigned to the forest walkdowns must be brought to 107 units and forest masters – to 26 units by staff schedule (according to the availability standards).

Scientific research and monitoring will be performed by the scientific department, consisting of 6 persons: one senior research associate, one research associate-botanist, one research associate-ornithologist, one research associate-theriologist, one research associate-entomologist, one research associate-hydrometeorologist.

The scientific department structure is determined by the need to reflect the condition of the nature components in their interaction and dynamics, as well as by facilitation of the solution of the problems of

human relations with the environment, preservation of biological diversity and ecosystems of the Park. The basic structure of the scientific department is determined by the list of dominant components of the ecosystem and landscape which are subject to research with due consideration for their interaction. There are currently three research associates in the scientific department – one research associate-phenologist, one research associate-theriologist, one research associate-entomologist.

The existing scientific potential of the Park does not allow tracking the condition of all the natural components of the Park, much less in their interaction and dynamics. The following specialists are required: one research associate-botanist, one research associate-hydrometeorologist, one research associate-ornithologist. There are difficulties in attracting such specialists for permanent work in the Park. One of the solutions of this problem is to conclude, when required, short-term contracts with specialists of the institutes of zoology, botany, etc.

#### Limited economic activities

In accordance with Article 45 of the Law "On SPNT", it is possible to place in the zone of limited economic activity facilities of administrative and economic designation, to conduct economic activities required for provision of guarding and functioning of the state national nature park, providing services to its visitors, including organization of amateur (sporting) hunting and fishing, to conduct construction and operation of recreation centers, hotels, camping sites, museums and other tourist service facilities.

With the approved of the Park's general plan on infrastructure, starting from 2009, it is intended to sharply increase the volumes of new facility construction: the Park's administrative building, visiting center, laboratory, nature museum, storage facilities, motor transport garages, tourist service facilities, cordons, etc.

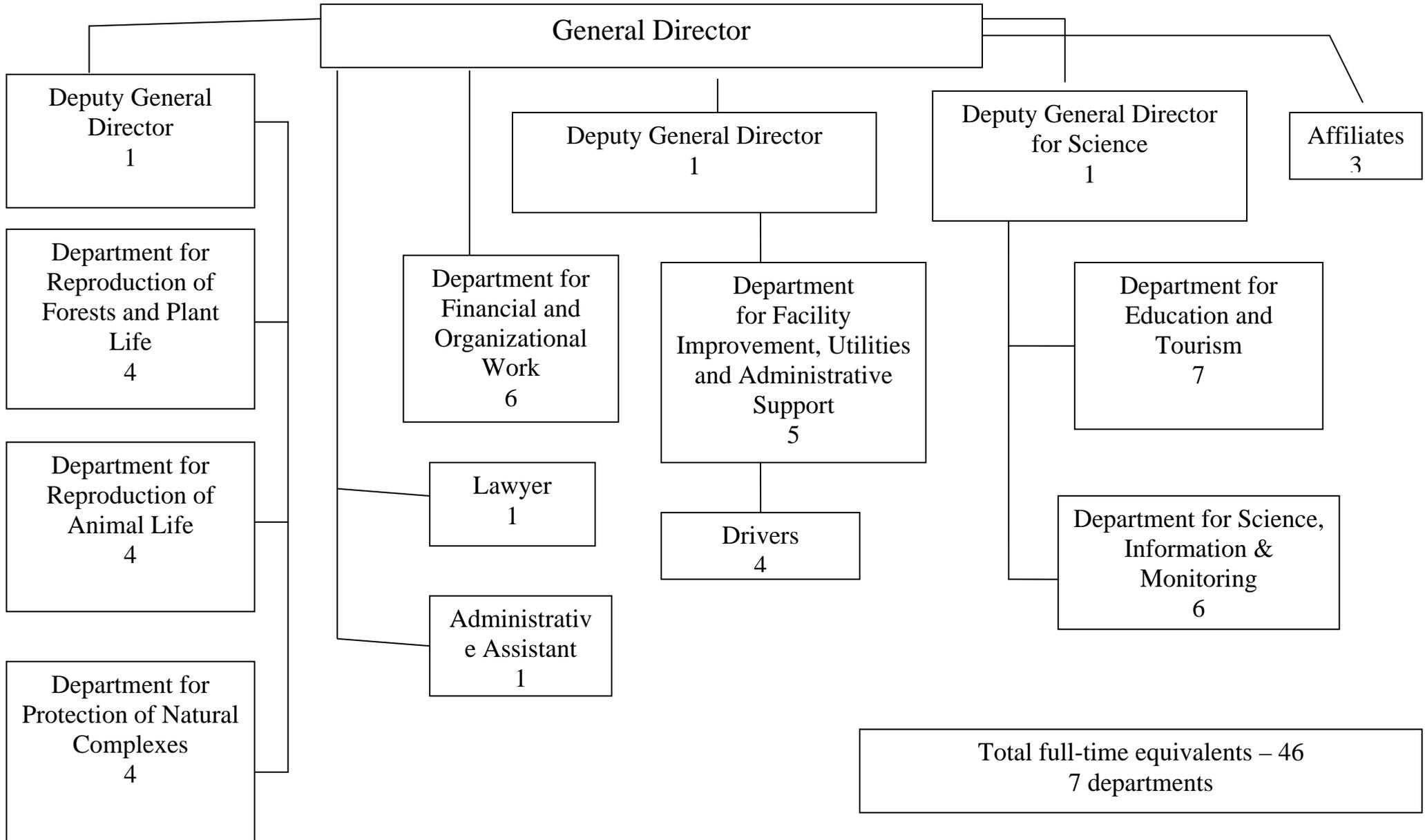
Therefore, it is necessary to introduce in the Park's structure the following changes:

1. In the composition of the Directorate, to form a department for improvement of utilities and administrative support, which will be dealing with the issues of construction, development of services for tourism and recreation, improvement of the Park's facilities and planting of greenery, keeping records of fixed assets and provision of the Park's transportation service.

2. It is also necessary to introduce an additional position of Deputy General Director for Construction and Facility Improvement.

3. In each affiliate, it is necessary to open 1 position – Construction Engineer (3 full-time equivalents in all).

Planned structure of the Sayram-Ugam SNNP



### 3.2.3. Training

I. The absence of systemic training and raising of professional qualifications of the inspector staff lowers the level of inspectors' work, which, in turn, does not allow full capture of the available opportunities in observance of the nature protection legislation.

To resolve this problem, it is necessary to train the Park's personnel, which will allow them to realize their authorities in accordance with the management plan.

It is necessary to hold annual winter special training courses for the inspector staff in administrative buildings of the Park's affiliates in accordance with an approved program with mandatory participation of scientific workers of the Republic's research & development institutes, as well as experienced workers of the Park's scientific department.

The workshops will be conducted in stages, with training of the whole inspector staff.

1. Workshop – 4 Quarter 2008

- The Basics of Inspector Activities in the SPNT System (with respect to tactics, operational work methods of discovery and detention of breachers, inspection of the incident scene, resolution of conflicts, required defense, use of service weapons and special devices;

2. Workshop – 2 Q 2009 (three days)

- Training workshop for the Park's inspectors on performance of habitat monitoring with a trip to the territory (inspection of phenological sites).

3. Workshop – 2 Q 2009 (three days)

- Training workshop for the Park's inspectors on performance of biodiversity components monitoring with a trip to the territory.

4. Workshop – 4 Q 2009

- First medical aid in field conditions, survival in nature conditions, and safety in territory patrolling. Practical training.

5th workshop – 1 Q 2010

- The Basics of the existing nature protection legislation in the Republic of Kazakhstan as applicable to the National Park.

6th workshop – 2 Q 2010

- Tactics and techniques of forest fire extinguishing in mountain conditions

II. One of the main measures is training of research associates in the modern method of digital information processing, modern software and GIS technology.

Venue – Almaty city,

1. Training in GIS technologies:

1 stage – November 2009 – 7 days.

2 stage – March 2010 – 7 days.

Number of trainees at the first stage – 3 associates, at the second stage 2 persons will be selected for more detailed study of the GIS systems.

Required subjects for study:

- Goals and tasks of GIS technologies;
- GIS equipment specifications;
- Acquaintance with the ARC/INFO software;
- Application of ArcObjects;
- Concept of Geodatabase;
- Work with workstations.

Venue: Almaty city.

2. Practical training of research associates at leading research & development institutes of the

RK.

2008 – 1 person,

2009 – 2 persons,

2010 – 2 persons.

III. To provide high quality services of guides during ecological tours on the Park's territory it is planned to conduct:

1. Workshop – 2009

- Training workshop for guides

IV. Efficient guarding of the territory depends, first of all, on proper organization of the Park's territory guarding. In accordance with the law of the Republic of Kazakhstan "On specially protected natural territories", directors, deputy directors and manager of guarding service of the Park ensure proper organization of reserve regime actions and bear responsibility for their implementation.

To improve the nature protection activities of the Park, it is necessary to exchange experience among reserves and parks at the level of director, deputy director and manager of guarding service department. In this respect, the experience exchange in the end should include a course of qualification raising. Duration – 2 weeks (including week-long course), venue – reserves and national parks of the Republic of Kazakhstan under direction of the Committee for Forest and Hunting.

### 3.2.4. Infrastructure and equipment

The existing infrastructure and equipment are described in detail in Appendices 7 and 8.

In accordance with the main areas of resource management and requirement definition, the current infrastructure requires reinforcement in the following items:

#### Repairs and construction.

The following buildings and structures are subject to repair:

A) Cordons

Of the 34 cordons on the Park's balance sheet, 28 cordons require capital repairs. This is due to the date of their construction (1950-1965) and construction material (sun-dried bricks). The remaining 6 cordons are currently in satisfactory condition: 3 of them are being repaired in 2008, 3 are in satisfactory condition.

B) Storage facilities, cubicles, workshops

In the Ugamskiy and the Tolebiyskiy affiliates of the Park, it is necessary to build storage facilities, cubicles and workshops for efficient functioning of the institution.

The construction sites are given in the list of facilities planned for the years 2009-2013. This list corresponds to the budget application submitted to the Committee for Forestry and Hunting of the Ministry of Agriculture of the RK and the draft Plan for the Park's infrastructure development which is currently being prepared.

For the guarding service state inspectors and research associates, due to the operating situation and performance of scientific research works on the territory, it is necessary to acquire 2 mobile accommodation wagons.

#### Roads.

It is imperative to perform capital repairs of the 36 km long Zhigergen-Ugam road. This is the only road that connects the forest settlement of Ugam of the Ugamskiy affiliate of the Park (near the state border with Uzbekistan) with the District and Oblast centers. The road was built in 1973. It goes through mountainous terrain and has gravel surface. In the years since then, it was not repaired and in some places sections of the road currently have gravel surface. In spring and autumn, after heavy precipitation, the road becomes impassable for automobile transport.

For repair of the road, the gravel will have to be transported from sites near the Zhigergen mountain village (for a distance of up to 36-40 km). The repair works will be very labor intensive and costly (especially with respect to fuel and lubricants). Therefore, these works need to be executed at the expense of budgetary funds.

#### Fire safety equipment and measures

Of the three affiliates of the Park, two (Tolebiyskiy and Ugamskiy) have one fire truck each and temporary fire-chemical stations. And in Tyulkubasskiy affiliate there is neither fire-chemical station nor fire truck, which makes it difficult to extinguish the occurring fires.

In the Park as a whole, the following fire-fighting equipment is lacking: sprayers OVR-18 (OBP-18) (40 ea.), power driven pump (4 ea.), gasoline-powered saw (4 ea.), fire-resistant work clothes (50 ea.), fire extinguishers (60 ea.), etc. A more detailed list of equipment is given in item 3.3 (Financial requirements for 2009-2013).

Among the planned preparatory fire-fighting actions annually performed by the Park, a special place belongs to creation of fire-barrier lines, fire-breaks and plowing of fire-hazardous areas along the perimeter of the Park territory. It is necessary to purchase fire-fighting equipment.

#### Radio communication means

Stable communication between cordons, areas, affiliates of the Park and the central directorate is ensured by radio communications and telephone communications. Besides fixed radio stations (17 ea.), vehicles of the guarding service, affiliate directors, fire trucks are equipped with radio communications. Part of the Park's employees are equipped with portable VHF radio stations (22 ea.). Portable radio stations are indispensable in performance of inspections, recording mammals and fire extinguishing. In all, the Park currently possesses 57 units of radio stations, of which: 17 are stationary, 18 mobile and 22 portable. There currently is a shortage of portable radio stations for inspectors and guarding of 4 reserves in the amount of 38 each.

#### Energy supply.

Due to their location characteristics, most cordons of the Park do not have electricity supply. To support the life of the inspector personnel who live in the mountains, to charge batteries for radio stations it is necessary to acquire diesel (or gasoline) powered electrical power plants of Yamaha type in the amount of 23 each. Besides that, it is planned to acquire two 50 kW diesel powered power plants for the forest settlements of Ugam and Kokbulak. For the Keles forest settlement, it planned to build an electrical transmission line at the expense of the local budget funds.

Of the 47 inspectors who reside with their families, 30 require provision of fuel in the form of hard coal. In 2008, a total of 80 thousand tenge was designated for these purposes, which will allow acquiring about 20 tons of coal. Therefore, from 2009 it is necessary to plan acquisition of coal in the full volume (90 tons).

Besides the above specified, in the course of the general plan development the issues of building cascaded mini hydroplants are being worked out, on Ugam river (6 ea.), on Sairamsu river (4 ea.) – with the total capacity up 40 Mega W.

#### Transport.

Currently, the Park requires the following vehicles: fire truck and GAZ-66 or KAMAZ type truck for transportation of people in mountain conditions.

There are 4 light patrol vehicles in the Park, which were acquired in 2006. As a result of the vehicle usage in mountain conditions, the vehicles wear out quickly and break down. Therefore, for 2012-2013 it is planned to acquire the following vehicles: NIVA (3 ea.) and UAZ (1 ea.).

To conduct scientific expeditions, trips of research associates, 1 off-road light vehicle is required. To conduct ecological education activities, a 9-seat UAZ-3962 is required.

Each year the Park's territory becomes more attractive for tourists, both from our country and from near and far abroad. It is planned to organize equestrian routes, for which it is necessary to acquire horses. During the spring and autumn bad road seasons, as well as in winter time, when the roads are blocked as a result of heavy snow falls and storms, the cordons remain "cut off from the external world". With acquisition of horses, the inspectors will be able, if required, to reach the settlements directly. The current horse shortage is 75 horses.

It is necessary to acquire breeding stock in the amount of 20 ea. (mares) for organization of a horse breeding farm, which will be annually providing work horses to the inspectors.

Scientific equipment. To perform scientific research and conduct monitoring of the Park's habitats and biodiversity, modern instruments and equipment are required. The equipment must correspond to the research associates' specialization. Since the current staff and scientific potential of the Science and Monitoring Department do not allow conducting scientific research work in the full extent, it is planned to engage specialists from leading research & development institutes of the RK for individual research works. Taking this into account, it is necessary to purchase the equipment for such works and to build a laboratory.

STATE AGENCY ON ENVIRONMENT PROTECTION AND FORESTRY UNDER THE GOVERNMENT  
OF THE KYRGYZ REPUBLIC

MANAGEMENT PLAN

FOR BESH-ARAL STATE RESERVE FOR THE YEARS 2013-2017

*(excerpts – operational part)*

### 3. MANAGEMENT RECOMMENDATIONS

#### 3.1. Objectives

1. Preserve in its natural condition the most typical area of Western Tien Shan's nature, the rich gene bank of the animal and plant kingdom and the unique mountain ecosystem, first of all – the grass ecosystems of medium and high altitude mountains – habitats of rare and endemic species.

2. Maintain natural condition of the processes which occur in nature on the territories not subjected to economic impact, restore the areas which were previously subjected to pasture degradation.

3. Facilitate increased level of population awareness and education with respect to biodiversity issues to ensure support and engagement of local community in achievement of management objectives.

4. Ensure natural reproduction and restoration of the main conservation object – Menzbiev's marmot population, as well as other conservation objects.

#### 3.2. Legal status

Change of the Reserve's legal status, described in section 2.4.2, is not recommended. Improvement of the legislative environment deficiencies is reviewed in the legal component which is implemented by the GEF project.

#### 3.3. Boundaries and zoning and determination of the current status of conservation objects

Forest management works on the territory of Besh-Aral Reserve were conducted in 2002. In view of formation of the new Sandalash area, there were changes of the Reserve's territory. Therefore it is necessary to perform forest management works on the reserve's territory with due consideration for expansions of the boundaries. The forest management works will include records of fauna and flora and assessment of their current status, development of measures to preserve the protected species, mapping the arkhar sheep distribution area. The issues of boundary expansion, zoning, demarcation will also be covered by the forest management works.

##### 3.3.1. Forest management and assessment of biodiversity (FMAB)

In the framework of FMAB, nature protection measures will be defined with respect to location and timing and the most important areas and groups of species (communities) will be determined for monitoring. It is necessary to perform ranking of the conservation objects and to determine the groups

and species which are currently not under threat. It is also necessary to determine the species and associations which are under threat as a result of certain factors and which require specific nature protection measures. Such study is required for developing specific action on biodiversity management in the Reserve. It will allow identifying the most important locations from the protection perspective and determining the most important seasons with respect to reproduction.

The following actions have been planned:

- Perform field studies for determining general condition and distribution of the most valuable and threatened species of the Reserve's flora and fauna. The following results will be received:

Availability of reliable and multilateral information on conservation objects and their dynamics (for vegetation – the condition of the main forest-forming tree and shrub species, including the species composition, storeyed structure, completeness, species mixing percentage, stocks, area, revegetation condition, phytosanitary condition, soil description, description of the grass cover; for animals and birds – main conservation objects: habitat areas, density of the animals, seasonal and daily migration, numbers (females, males), quality assessment of the lands, feed base, characteristics of the land types, reproduction capability, maps of animal and bird distribution). All material will be presented in the book of assessment descriptions, extensive mapping materials will be prepared.

- Analysis of risk factors for each reviewed species. In connection with this, the contemporary status and ranking of conservation objects will be determined, as well as the groups and species the existence of which at the Reserve is not threatened by anything, and species and communities which are threatened by some or other circumstances and for which special protection measures will be developed. The materials will be published in the book of assessment descriptions.

- Development of recommendations on preservation of the threatened flora and fauna of the Reserve. After determination of the current status of the conservation objects and performance of analysis, scientifically substantiated recommendations will be prepared on preservation of the most threatened communities and areas of the Reserve in accordance with the identified distribution of the most threatened species, in accordance with the usage regimes and allowed activities in the buffer zone. These materials will be presented in the book of assessment descriptions.

#### **3.3.1.1. Demarcation of the Reserve boundaries**

It is planned to perform demarcation of accessible boundaries of the Reserve in the Chandalash area with the purpose of on-site marking of the Reserve boundaries to exclude misunderstandings in crossing of the boundaries by the Management Plan. In the course of this work, demarcation signs will be installed (wooden poles 1.5 m high with a warning inscription about the start of the Reserve boundary). The Reserve's territory will be split into a network of compartments (along natural boundaries (rivers, streams, ridges, depressions, etc., with areas of 300-600 ha), with installation of compartment poles (wooden poles 1.5 m high with compartment numbers) for facilitating location referencing.

#### **3.3.1.2. Reserve zoning**

Preliminary field studies confirmed heterogeneity of the Reserve's territory and identified reasons for zoning the Reserve's territory with the purpose of improving the Reserve protection. Forest management operations will include study of the existing zones and determination of the boundaries of two zones: the main zone and the recovery zone, and digital maps will be prepared with plotting of these zones.

Taking into account the facts of fire occurrences on the Reserve's territory, it is planned to perform pyrological zoning. The Management Plan proposes assignment of two zones, which will be determined by forest management field groups in accordance with the following requirements:

1. Main Zone – the zone which corresponds to the evolutionary concept of nature protection, which was preserved in its pristine form. All types of human activity are prohibited – recreational, economic, reforestation, etc. This zone is distinguished by rich flora and fauna of rare, endemic species and communities of plants and animals. The scientific research work must be aimed at tracking the natural course of development (evolution) of the ecosystem as a whole. Protection of the zone is performed by active ground patrolling or walk-downs by inspectors of their respective areas.

2. Recovery Zone – the zone which suffered the most from human-induced disturbances (intensive cattle grazing, etc.). Such areas exist in the newly established Sandalash area of the Besh-Aral State Reserve. The area of the Recovery Zone will be specified and mapped in the course of forest management operations. It is necessary to restore the natural habitats of flora and fauna, degraded territories, landscapes. There is research work ongoing under the environment restoration and monitoring programs. Protection is performed by active patrolling of respective areas.

It is also necessary to perform pyrological zoning for determining fire-hazardous areas and for developing fire prevention and liquidation measures. The existing condition of fire-fighting measures will be studied in the course of forest management operations. Three classes of fire hazard have been studied and identified on the territory of the Reserve, on the basis of which it is necessary to prepare digital maps with plotted pyrological zones. Also, recommendations will be prepared on prevention and containment of fires and on placement of fire-fighting equipment of the territory of the Reserve.

### **3.3.1.3. Mapping and census taking of the Tien Shan wild sheep ("arkhar")**

Actions of the following content are designated for forest management operations:

- Perform census taking of the arkhar population in the Reserve and in the adjacent territories, determine the boundaries and distribution of the colonies;
- Visually determine the condition, numbers and age structure of animals in the population;
- Determine human-induced and natural factors which have negative effect on the condition of the arkhar population;
- Assess the areas suitable for arkhar colonization in immediate vicinity of their current dispersal locations;
- Provide recommendations on ensuring stability of the arkhar populations and determine the prospects for expanding the boundaries of these populations;
- Map the populations in the dynamics of their development by years.

### **3.3.1.4. Mapping the nests of birds of prey listed in the Red Book of the Kyrgyz Republic**

There is a rather wide spectrum of predatory bird species which are nesting on the territory of the Reserve, the other species lead sedentary lives. In recent years, however, the condition of the predatory bird population and places of their nesting have not been studied.

Due to the fact that there currently appeared an interest to illegal export of some predatory bird species, such as saker falcon, barbery falcon and golden eagle, with the purpose of sale, the local population and visiting poachers are catching the birds and devastating the nests on the territory of the Reserve. In the last five years, poachers have been annually withdrawing nestlings from practically all nests. Therefore, keeping records of the nests and observing the condition of population constitute an inseparable part of the works which will be performed during forest management operations. It is also necessary to determine the period when there is the greatest danger of these nests being visited by poachers. In this respect, actions of the following content are planned during forest management operations:

- Plot on the Reserve map the places of predatory bird nesting, with indication of their species type;

- Prepare registration cards for each nesting place and for species of predatory birds;
- Identify the factors which influence the reduction in the numbers of nesting pairs;
- Determine the timing for the highest level of protection against poachers.

As a result of the accomplished works, recommendations will be prepared on protection and support of stable existence of predatory bird populations of the local fauna which are listed in the Red Book.

Technical assignment, time schedule and budget of the forest management and biodiversity assessment operations are given in Appendix No. 14.

### 3.4.1. Habitat management

According to the existing threats, the following is necessary for execution of resource management in the Reserve:

#### 3.4.1.1. Restoration of natural vegetation in degraded areas

The longstanding intensive economic activities on the territory of the Reserve have led to pasture degradation on significant areas and appearance, in place of native barley-bulbiferous savanna-type plants and tallgrass meadows with cocksfoot grass, of "semi-natural" type cenoses dominated by stalky rough-stem plants: Modesta blue cornflower – *Centaurea modesti*, large-leaved elecampane – *Inula macrophylla*, Kokand morina – *Morina kokaninica*, Chimgan glob thistle – *Echinops tchimganicus*. Vegetation cover of the Besh-Aral Reserve (the Sandalash area) is weeded with imported weed plants. The following plants have become widespread: horse sorrel – *Rumex paulsenianus*, gymnospermous burdock – *Arcticum leiospermum*. In intensely damaged, disturbed areas these species create almost pure "patches" of weeds. Restoration of the initial natural vegetation is not occurring here. Special measures are required (methods and cost estimations are given in Appendix No. 15) for suppression of the development of rough-stem tall plants and stimulating the growth and development of the typical plants of the Reserve's phytocenoses on the basis of nearby areas with remaining natural vegetation.

#### 3.4.1.2. Establish the base and bank of data and scientific library

Currently, all data related to the Besh-Aral Reserve biodiversity are segmented, not standardized, and their accessibility is very limited. This hampers the usage of the existing information and its further accumulation. Traditional ways of information collection and storage do not meet the modern requirements for biodiversity management.

Due to the above, it is necessary to create the structure and shell of a database for management of the Reserve and to develop classifications and forms for collection and presentation of the following information:

- Fauna and flora information;
- Forest management data;
- Topical maps;
- Maps of findings (encounters);
- Monitoring data;
- Information on management decisions and actions;
- Routes of migration and movements inside and outside the Reserve;
- Current observations;
- Numbers of animals withdrawn by poachers and their impact on the condition of the population;
- "Nature records", prepared by research associates and inspectors;

- Meteorological and phenological observations.

The data base and bank will be built in such a way that any user, even with minimum skills, would be able to receive the required information. Besides that, the data base and bank will be open for continuous supplementation, and special forms by main areas of information support will be developed for this purpose.

The data base and bank on the basis of electronic technologies do not revoke and do not replace the establishment of information bank by conventional method on hard copy media. They are built by supplementing the existing system of information accumulation and constitute its operational part.

Forms for information provision will also be developed, i.e. data base usage instructions for various levels and groups of users, training sessions will be conducted for the Reserve employees for mastering the data bank creation and usage (see Appendix No. 16).

It is also necessary to establish the Reserve's scientific library and provide the required literature, periodic publications which are closely related to the subjects of the Reserve's work.

#### **3.4.1.3. Installation of information boards and panels at the Reserve's boundary**

At crossings of the Reserve's boundaries by main roads going to the Reserve (Kum-Bel and Chaarat), at crossings of horseways with the Reserve boundaries on mountain passes, 30 information boards are installed with warning inscriptions about the start of the Reserve area and its protection regime, as well as with general information on the Reserve and its protected species. Two panels are installed at the Kum-Bel mountain pass and the Kara-Buura mountain pass respectively.

#### **3.4.1.4. Organize artificial salt licks**

In wild nature, the naturally occurring salt licks are known to animals, however, taking into account the long-standing organization of artificial salt licks as one of the Reserve's biotechnical measures, we are faced with the fact of the wild animals, who come to these places in search of salt, habituation with this situation. It is planned to organize artificial salt licks at traditional points of animal salt licking. When organizing the salt licks, provide for their remoteness from the Reserve boundaries, as well as their organization in open areas where the animals, having a good view, would be protected from poachers. In total, 40 salt licks will be organized, with salt stocks to be continuously replenished as required. On the average, 50 kg of salt are estimated for one salt lick, with filling up according to its consumption. It is desirable to have a 5 tons stock of salt in the reserve.

### **3.4.2. Population occupation management**

#### **3.4.2.1. Near-border settlements**

In the framework of the project, a small grants program will be implemented, which will be aimed at development of alternative sources of income and reduction of human-induced impact on the Reserve. It is planned to include in this program's coverage the villages of Ak-Tash, Leylek, Dzhany-Bazar, Kurulush, Bashky-Terek, Chakmak-Suu, which are located close to the Reserve.

#### **3.4.2.2. Tourist and visitor programs**

Conducting these activities is possible with cooperation of two reserves: The Besh-Aral Reserve and the Chatkal Reserve (Uzbekistan), which must be given consideration at the regional level. There is a possibility of equestrian tourism to the south-western part of the Reserve (the Imankan area) from the Uzbekistan side. Due to special remoteness of the Reserve and absence of good roads, development of tourism in this region is problematic.

#### **3.4.3. Public relations with respect to nature protection issues**

The Reserve has an ecological education department. This department can also establish contacts with other nature reserves, with other organizations, foundations, which could find grant funds and other form of support for execution of a nature protection reserve's activities. It is necessary to acquire flora and fauna exhibits in the museum, to create the Reserve's biogroups in order to demonstrate the Reserve's rich and unique nature and the work of its employees on its protection. Besides the ecological education department's employees, high class specialists from the National Academy of Sciences of the KR will be involved in creation of the Nature Museum's concept.

2. Produce and disseminate through the media a video film on the Besh-Aral Reserve for the wider public with the following content:

3) The Menzbier's marmot, the Tien Shan wild sheep (arkhar) – main conservation object.

3. There is a booklet about the Besh-Aral Reserve, but it is necessary to publish a booklet about the Sandalash area. The booklet is especially useful for the schoolchildren.

This color publication (500 copies, soft cover, containing 5 pages) will contain information on the Reserve and adjacent territories, landscapes, vegetation, wildlife and the Reserve's regime (see Appendix No. 22).

4. Ecological education activities and participation in the international nature conservation event "March of Parks and Reserves". The Besh-Aral Reserve is one of the remotest and most isolated reserves of Kyrgyzstan. The country's public is poorly informed about the Reserve's activities and its needs. In the framework of the "March for Parks" event, the Besh-Aral Reserve will establish contacts with other reserves of Kyrgyzstan, the CIS and the world. There will be an increase of the public awareness of the Reserve, of its problems and difficulties. There will be a unification of the efforts of the Reserve's employees, some government structures, local self-governance bodies, mass media, entrepreneurial structures, non-governmental organizations, international organizations on rendering public support and real practical assistance to the Besh-Aral Reserve.

It is necessary to design various forms and methods of ecological education, which must cover various layers and groups of population with different interests and levels of preparedness. The forms and methods of ecological education must be aligned with each other, must support each other and must have a certain kind of succession. The Reserve's employees must organize exhibitions, lectures, discussions, demonstrations of slides, video films, albums on the natural environment and on its conservation tasks. Support the activities of the "Green Patrol", "Natural Science Club" ecological circles in the settlements of Ak-Tash, Zhany-Bazar, Kurulush, Bashky-Terek, Chakmak-Suu.

In the framework of the March for Parks international nature conservation event, the Reserve estate's territory will be cleaned and greenery will be planted on it, contests will be held for best drawings, best compositions on ecological subjects, quiz games, sports games, tours to the reserve and the museum, ecological sorties of schoolchildren and young people to beautify the reserve territory. Schoolchildren who win top places will receive awards: caps, T-shirts with the Besh-Aral Reserve emblem, merit certificates. The mass media organizations will be involved: nature conservation employees and workers, NGO representatives, students will speak on the local TV and radio. Work on finding additional financing will be performed.

#### **3.4.4. Research and monitoring**

##### **A. Research**

To verify the success of the accomplished biodiversity preservation actions, monitoring will be performed for indicator species of plants, birds and mammals. Recording of three different types of biological resource characteristics will be performed:

- Quantitative characteristics of the populations of the main plant and animal species at certain time intervals, comparison with previous condition;
- Assessment of the quality or condition of species and their habitats;
- Measuring the species reproduction or productivity indicators.

The monitoring methodology is designed for minimum level of preparation and minimum time and labor expenses with sufficiently reliable results. Usage of the refined regional monitoring methodology, proposed by field trip team in 2001, and refined lists of indicator species, common for the whole region, will allow receiving comparable results for all reserve territories.

The task consists in acquainting the Reserve's employees with the routes, methods and skills of determining the indicator species directly in the conditions of the Reserve, as well as preparing tables of correspondence for main characteristics of the indicator species which signify disturbed, weakly disturbed, medium disturbance and intensely disturbed ecosystems.

To obtain the reference base data (characteristics) of the indicator species condition and determine the links of their characteristics with the condition of the priority preservation objectives, it is planned to conduct monitoring in accordance with the methodology developed by the regional group. Receipt of current data on the condition of indicator species and communities will allow making judgment on the success or failure of biodiversity preservation. The Besh-Aral Reserve monitoring program includes:

- 1) Execution of the meteorological observation program according to the existing program;
- 2) Keeping the "Nature Records" by the Reserve's research associates and inspectors;
- 3) Conducting annual recording of the numbers of hoofed animals, bear, large predators and indicator species along constant fixed location routes (15) by the Reserve's staff employees;
- 4) Monitoring the condition of individual selected species of endangered plant species by transepts and on constant test areas (7);
- 5) Observations on fixed phenological routes (6);
- 6) Identification of the link of indicator species characteristics with the condition of the priority conservation objects;
- 7) Conducting the Reserve employee training in efficient methods of protection activities;
- 8) Conducting the Reserve employee training in methods of monitoring the biodiversity condition on the basis of indicator plant and animal species records.

The cost estimation for training in methodology of conducting monitoring of indicator species of flora and fauna is given in Appendix No. 24.

## **B. Monitoring of the condition of rare and endangered species of animals and plants**

The tasks of this monitoring consist in tracking the processes of change of numbers and distribution in the Reserve of the most significant species of animals and plants, such as the endemics, rare, endangered and economically significant species.

Here are the Reserve's animal species which require regular monitoring:

- Large mammals (mountain goat, roe deer, boar, bear, snow leopard, arkhar sheep). They are recorded on constant routes which already exist in the Reserve, according to previously developed methodologies. It is necessary to review the routes from the point of view of extrapolation of their data to the habitual area. For the snow leopard, which is encountered in the Reserve irregularly, all encounters with the beasts or signs of their presence are noted, with detailed descriptions of the encounter circumstances. For observations of the snow leopard and the bear we need a trail camera. Large species of birds of prey (bearded vulture, Himalayan vulture, griffon vulture, golden eagle, booted eagle), which are nesting in the Reserve, are recorded by the Reserve's scientific personnel on routes,

both constant and single-time, with calculations of the numbers by the route length, time of recording and distance of discovery. Besides that, with the help of the whole personnel of the Reserve which is noting all encounters with this group of species in April - June period, retrospective maps are annually prepared for distribution of each species during nesting periods. These maps may serve as the basis for determining the absolute numbers of nesting pairs in the Reserve and their changes over a number of years. It is necessary to acquire the required accessories (net, ring) for bird banding.

### C. Stimulating the research activities of the Reserve's scientific department, attraction of young specialists and practical training for students

To increase the efficiency of scientific research by the Reserves research associates, it is necessary to conduct regular consultations with scientific supervisors and associates from scientific research and higher education institutions which are located in Osh.

The longstanding scientific research papers of the Besh-Aral Reserve research associates, which are relevant to the more detailed studies of biodiversity, should be published after required reviewing on the part of the scientific supervisors.

For proper quality performance of scientific research in the field conditions, it is of no little importance to pay trip expenses (ration allowances) to the research associates and laboratory specialists performing the research work.

The Management Plan recommends including these cost items in the operational expenses.

Table No. 9.

#### Operational expenses of the scientific department

S/n	Expense item	Unit of measure	Q-ty of units	Unit cost ( \$ )	Sum \$
1.	Field expenses for 2013–2015*	man-days	630	2	1260
2.	Trip expenses**				
	Per diems	man-days	294	2	588
	Accommodation allowances	days	294	5	1470
	Travel to the city of Bishkek and back	times	42	45	1890
3.	Scientific publications***	copies	300	10	3000
<b>Total:</b>					<b>8208</b>

\*6 research associates and 1 laboratory specialist (7 persons 30 days per year each) x 3 years = 630 days

\*\*7 research associates 2 trips per year (3 years – 42 trips 7 days each) = 294 days

\*\*\*1 publication per year of "The Scientific Works of the Besh-Aral Reserve" (3 publications 100 copies each), total 300 copies

It is necessary to establish cooperation with the higher education institutions of appropriate profile with respect to the issues of practical training of students at the Reserve, with their subsequent hiring for employment.

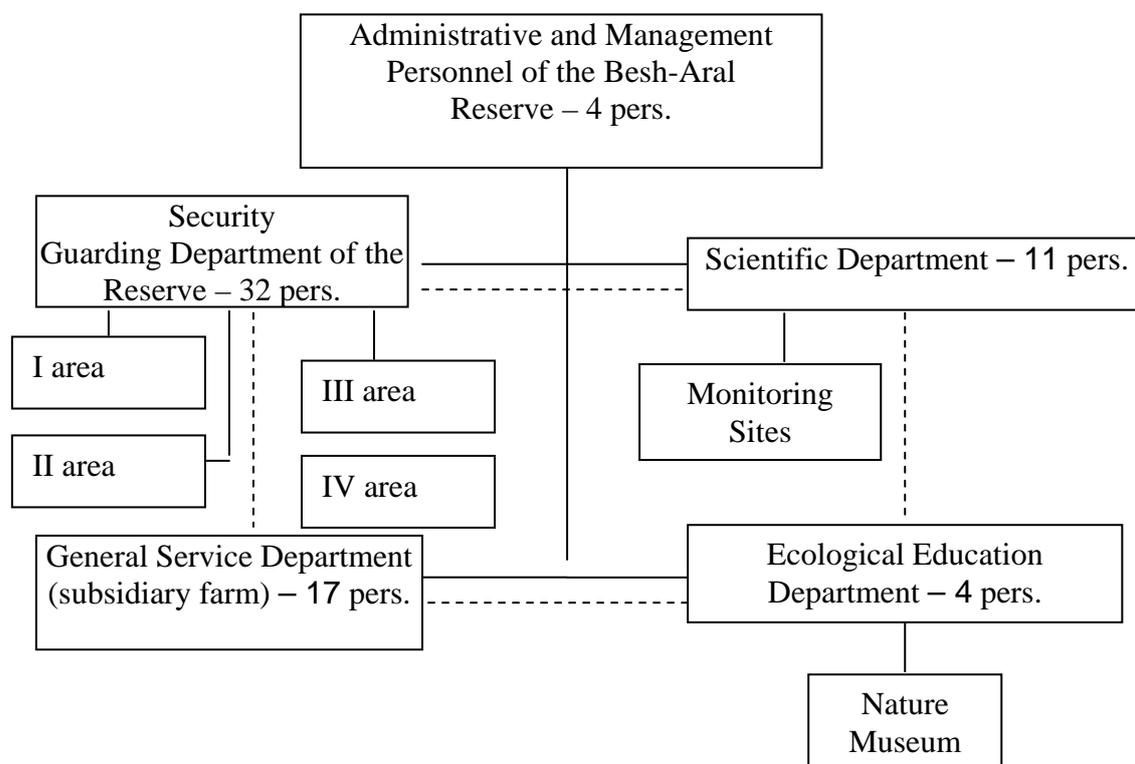
### 3.4.5. Administration and personnel

#### 3.4.5.1. Structure and organization

To strengthen the Reserve management structure and eliminate the identified shortcomings and inconsistencies (specified in item 2.3.1), it is necessary:

- For the Reserve Director to be guided by main normative legal acts (see Appendix No. 17).

• In accordance with the Reserve Regulations and definitions of the functional duties of the Reserve's structural divisions, establish the following organizational structure of the Reserve's management:



In accordance with the approved Reserve Regulations and definitions of the functional duties of the Reserve's structural divisions, approve the Besh-Aral Reserve management structure according to the above proposed scheme.

To step up the work on raising population awareness of the environment protection and of the works conducted for biodiversity preservation, establish the Ecological Education Department, increasing the Reserve's staff.

To increase operational efficiency, it is necessary to separate the Security Guarding Department of the Reserve from the Scientific Department in accordance with the above proposed management structure.

### 3.4.5.2. Personnel hiring

Taking into account the shortcomings in the existing structure of the Reserve (see item 2.3.1), it is proposed to the Reserve's management:

- Staff the Reserve with required specialization specialists, informing each hired employee of his/her technical assignment, professionally prepared specialists according to the proposed staffing structure;
- When hiring new employees, be guided by the approved technical assignments for performance of specific duties;
- Ensure appropriate training of the Reserve's employees.

Table No. 10.

## Staff Structure of the Besh-Aral Reserve

S/ n	Staff of the Reserve	Existing	To be hired	Hiring schedule
	<b>Management apparatus</b>			
1.	Director	1		
2.	Chief Accountant	1		
3.	Personnel Inspector		1	
4.	Document Controller – Secretary	1		
	Subtotal:	3	1	
	<b>Scientific Department</b>			
1.	Department Manager – Deputy Director	1		
2.	Senior Research Associate (botanist, zoologist)	1	1	
3.	Research Associate	1	2	
4.	Junior Research Associate	1	2	
5.	Senior Laboratory Specialist	1		
6.	Laboratory Specialist	1		
	Subtotal:	6	5	
	<b>Security Guarding Department</b>			
1.	Department Manager – Chief Forest Warden	1		
2.	Engineer for Fauna Protection and Record Keeping		1	
3.	Senior Yager (forest warden)	3	1	
4.	Yager	20	6	
	Subtotal:	24	8	
	<i>Ecological Education Department</i>			
1.	Department Manager		1	
2.	Museum Manager	1		
3.	Ecological Education Specialist	1	1	
	Subtotal:	2	2	
	<i>General Service Department</i>			
1.	Department Manager		1	
2.	Veterinarian		1	
3.	Warehouse Manager	1		
4.	Mechanical Engineer	1		
5.	Driver	2	1	
6.	Security Guard	2		
7.	Cleaner	1	1	
8.	Stoker		1	
9.	Electrician		1	
10.	Carpenter		1	
11.	Horsekeeper		2	
12.	Beekeeper		1	
	Subtotal:	7	10	
	<b>Total:</b>	<b>42</b>	<b>26</b>	

### 3.4.5.3. Training

The Management Plan envisages differentiated trainings for the Reserve's employees. The training program includes:

#### 1. Training tours in active international nature reserves and parks.

To acquire experience and raise professional reserve management qualifications, it is planned to dispatch management personnel of the Besh-Aral Reserve: Director, Deputy Director for Science, 1 Senior Research Associate, Security Department Manager, 4 Senior Yagers of areas, Manager of Ecological Education Center – 9 people in all – for training and exchange of experience to similar mountain reserves in one of foreign countries during the summer season of 2014 and 2015. This action will be performed in two stages of 4 and 5 people.

It is proposed to include this action in regional planning.

Cost estimation:

Airline tickets (round trip) – 9 pers. x 350\$ x = 3150 \$

Trip expenses – 9 pers. x 30 \$ x 12 days = 3240 \$

Accommodation allowances 9 pers. x 15 \$ x 12 days = 1620 \$

Training cost – 9 pers. x 50\$=450\$

Total: 8460 \$

#### 2. English language course for the Scientific Department employees

For the purpose of training and improving the English language qualifications of the Reserve employees, it is proposed to hold courses in accordance with programs, transporting the people to the settlement of Kerben, the district center of the Aksy district.

Trainee groups have been determined: Scientific Department – 11 persons

Cost estimation:

Bus hiring for delivery to the settlement of Kerben and back to Dzhanly-Bazar – 150 km x 2 x 15 som. = 4500 som. = 100 \$

Trip expenses – 11 pers. x 7 \$ x 7 days = 539 \$

Accommodation allowances – 11 pers. x 6 \$ x 7 days = 462 \$

Cost of one week course – 11 pers. x 10\$=100\$

Office supplies – 42 \$

Total: 1209\$

#### 3. Meteorologist's training

Train 2 meteorologists for the purpose of determining the Besh-Aral Reserve weather forecast.

**Cost estimation:**

Motor transport hiring – 2000 km x 7 som. = 14000 som.= 291 \$

Trip expenses (2 employees + 1 driver) – 3 pers. x 10 \$ x 5 days = 150 \$

Accommodation allowances – 3 pers. x 5 \$ x 5 days = 75 \$

Total: 516 \$

### 3.4.6. Infrastructure and equipment

Assessment of the existence and condition of the Reserve's infrastructure and equipment is given in item 2.3.2.6. and in Appendix No. 11.

### 3.4.6.1. Buildings and structures of the Reserve

New constant usage cordon in the Kum-Bel area. It is necessary to control the road which leads to the Reserve and as a transfer base between the settlement of Zhany-Bazar (Zhany-Bazar – Kum-Bel 50). A single-apartment cordon (3-room) with bath-house, toilet, shed for keeping horses, with fire-fighting equipment storage room, etc. (standard set). If possible, provide for autonomous power supply.

### 3.4.6.2. Utility networks

For the cordon lighting and heating, 4 sets micro hydro-electric power stations will be required.

### 3.4.6.4. Communications

There is radio communication in the Reserve, which includes installation of base short-wave (KB) stations, 2 sets of KV (KB) for transmission of data and fax messages, 3 sets of short-wave communication equipment, 3 sets of VHF communication equipment. 14 sets of mobile equipment: including 7 short-wave and 7 VHF for usage in automobile. Portable equipment: 3 sets of short-wave equipment for usage in portable version, 35 sets of VHF equipment for usage in portable version. Additional communication equipment includes 8 sets of solar charging devices for fixed stations with backup battery. Currently in inoperable condition. Require repairs.

### 3.4.7. Equipment and accessories

Scientific department and security guarding department of the Reserve was binoculars. All employees were provided summer and winter uniforms, camping equipment and accessories, tents, sleeping bags, dispatch cases, fire-fighting tools. Despite this, the previous inventory is morally obsolete. Therefore provide to all the Reserve employees field equipment and clothing.

Table 11.

DRAFT  
financing the Besh-Aral State Reserve for the years 2013-2017

In thousand som

Financing sources	total for the period of 2013-2017	Including by years				
		2013	2014	2015	2016	2017
<b>II Total:</b>	<b>6800.0</b>	<b>1150.0</b>	<b>1320.0</b>	<b>1350.0</b>	<b>1450.0</b>	<b>1530.0</b>
State Budget of the Republic	3700.0	650.0	750.0	750.0	750.0	800.0
Own funds	-	-	-	-	-	-
Non-tax revenues funds of the Republican Fund for Nature Protection and Forestry Development	3100.0	500.0	570.0	600.0	700.0	730.0
Other funds	-	-	-	-	-	-

Table 12.

DRAFT  
financing the Besh-Aral State Reserve for the years 2013-2017 for items no  
сг.2111.2121.2211.2212.

In thousand som

		Including by years				

Level of econ. class	Expense item description	Total for the period of 2013-2017	2013	2014	2015	2016	2017
2111	Salaries	12740.5	2496.1	2556.1	2556.1	2556.1	2556.1
2121	Deductions to Social Fund	2394.3	474.3	480.0	480.0	480.0	480.0
2211	Trip expenses inside country	1400.0	200.0	300.0	300.0	300.0	300.0
2212	Utility services	500.0	100.0	100.0	100.0	100.0	100.0
22121200	Payments for electricity	400.0	80.0	80.0	80.0	80.0	80.0
22122100	Telephone and fax communication services	100.0	20.0	20.0	20.0	20.0	20.0
2214	Transportation services	1200.0	200.0	250.0	250.0	250.0	250.0
2215	Acquisition of other services	1000.0	200.0	200.0	200.0	200.0	200.0
3111	Buildings and structures	1400.0	200.0	300.0	300.0	300.0	300.0
3112	Machinery and equipment	1250.0	250.0	250.0	250.0	250.0	250.0
	<b>TOTAL:</b>	<b>22364.8</b>	<b>4220.4</b>	<b>4536.1</b>	<b>4536.1</b>	<b>4536.1</b>	<b>4536.1</b>

Table 13.

**Draft Cost Estimation  
for formation of special funds of the Besh-Aral State Reserve for the years 2013-2017**

level econom classif	Expense item description	total for the period of 2013-2017	Including by years				
			2013	2014	2015	2016	2017
	<b>I. Revenues</b>						
	<b>Revenues for the year – total</b>	<b>2679.5</b>	<b>535.9</b>	<b>535.9</b>	<b>535.9</b>	<b>535.9</b>	<b>535.9</b>
	Including by types:	-	-	-	-	-	-
1332	Funds received under mutual settlements	-	-	-	-	-	-
142	Revenues from sale of goods and service rendering	-	-	-	-	-	-
1415	Rental payment	<b>300.0</b>	60.0	60.0	60.0	60.0	60.0
14152	Payment for usage of natural resources	-	-	-	-	-	-
14152300	Payment for usage of forest resources	-	-	-	-	-	-
14152900	Other payments for usage of natural assets	-	-	-	-	-	-
14233200	Fees for admission to national parks, recreation places						
14311200	Revenues from sale of identified contraband goods	-	-	-	-	-	-
14311400	Revenues from accomplished control and supervision actions	-	-	-	-	-	-
1451	Other non-tax revenues	<b>2830.9</b>	460.9	500.0	570.0	600.0	700.0
14232300	From hotel services	<b>75.0</b>	15.0	15.0	15.0	15.0	15.0
	deductions to superior organization						
	4% deduction to TURLROR						
	25% and 5% deductions to RFOP and MFOP						
	20% deductions to GKNS	<b>536.0</b>	107.2	107.2	107.2	107.2	107.2
	0.2% bank services	<b>5.5</b>	1.1	1.1	1.1	1.1	1.1
	Contributed to revenues of the						

	Republican Budget						
	<b>Revenues – TOTAL</b>	<b>2138.0</b>	<b>427.6</b>	<b>427.6</b>	<b>427.6</b>	<b>427.6</b>	<b>427.6</b>
	<b>II. Expenses</b>						
	including:						
2111	Salaries						
2121	Contributions to Social Fund						
2211	Expenses on business trips						
2212	Utility services	300.0	60.0	60.0	60.0	60.0	60.0
2213	Rental payment	-	-	-	-	-	-
2214	Transportation services	200.0	40.0	40.0	40.0	40.0	40.0
2215	Acquisition of other services	1638.0	327.6	327.6	327.6	327.6	327.6
3111	Buildings and structures						
3112	Machinery and equipment						
3113	Other fixed assets						
	<b>TOTAL:</b>	<b>2138.0</b>	<b>427.6</b>	<b>427.6</b>	<b>427.6</b>	<b>427.6</b>	<b>427.6</b>

STATE AGENCY ON ENVIRONMENT PROTECTION AND FORESTRY UNDER THE GOVERNMENT  
OF THE KYRGYZ REPUBLIC

MANAGEMENT PLAN

FOR PADYSHA-ATA STATE RESERVE FOR THE YEARS 2013-2017

*(excerpts, operational part)*

**Management recommendations**

**Objectives**

1. Preservation in natural condition of the whole natural complex (plant and animal life, geological formations, water bodies, ground waters, soils, etc.) which is most typical for the given geographical zone or an area thereof, as well as unique natural sites.
2. Restore natural ecosystems on the territories subjected to economic impact.
3. Monitor biodiversity management success by status of indicator species and communities.
4. Facilitate increased level of population awareness and education with respect to biodiversity issues to ensure support and engagement of local community in achievement of management objectives.
5. Strengthen the reserve infrastructure, with due account for educational and ecological tourism in a certain part of the reserve.

**Management programs**

**Habitat management**

According to the existing threats, the following is necessary for execution of resource management in the Reserve:

***Resolution of the Reserve boundary expansion problems.***

As specified above, due to the magnitude of human-induced disturbances in the protected zone of the Reserve, the ecosystem of this area is disintegrating. The animals inhabiting these territories will be forced to leave them. With entry into the main zone, the problems of habitats for migrating animals are not resolved. Even as it is, there is an insufficient size here for reproduction of the populations of animals and birds. It only remains to resolve the issue of expansion of the boundaries in the interests of the Reserve.

***Establishment of the base and bank of data and scientific library***

For performance of scientific research works in the Padysha-Ata Reserve with proper quality, it is necessary to create the structure and shell of a database for management of the Reserve and to develop classifications and forms for collection and presentation of the following information:

- Fauna and flora information;
- Forest management data;
- Topical maps;
- Maps of findings (encounters);
- Monitoring data;
- Information on management decisions and actions;
- Routes of migration and movements inside and outside the Reserve;
- Current observations;
- Numbers of animals withdrawn by poachers and their impact on the condition of the population;
- "Nature records", prepared by research associates and inspectors;
- Meteorological and phenological observations.

The data base and bank will be built in such a way that any user, even with minimum skills, would be able to receive the required information. Besides that, the data base and bank will be open for continuous supplementation, and special forms by main areas of information support will be developed for this purpose.

The data base and bank on the basis of electronic technologies do not revoke and do not replace the establishment of information bank by conventional method on hard copy media. They are built by supplementing the existing system of information accumulation and constitute its operational part.

Also, forms for information provision will be developed, i.e. data base usage instructions for various levels and groups of users, training sessions will be conducted for the Reserve employees for mastering the data bank creation and usage.

It is also necessary to establish the Reserve's scientific library and provide the required literature, periodic publications which are closely related to the subjects of the Reserve's work.

### ***Organize artificial salt licks***

In wild nature, the naturally occurring salt licks are known to animals, however, taking into account the long-standing organization of artificial salt licks as one of the Reserve's biotechnical measures, we are faced with the fact of the wild animals, who come to these places in search of salt, habituation with this situation. It is planned to organize artificial salt licks at traditional points of animal salt licking. When organizing the salt licks, provide for their remoteness from the Reserve boundaries, as well as their organization in open areas where the animals, having a good view, would be protected from poachers. In total, 5 salt licks will be organized, with salt stocks to be continuously replenished as required. On the average, 50 kg of salt are estimated for one salt lick, with filling up according to its consumption. It is desirable to have a 2 tons stock of salt in the reserve.

## **Population occupation management**

### **Near-border settlements**

According to the TACIS program research, the alternative types of activity for the population may be the provision of services to tourists, the growing of planting material for sale and for creation of commercial plantations with the purpose of subsequent satisfaction of own wood requirements, the folk crafts, the organization of forest produce processing (fruit, berries, medicinal herbs), etc. In the framework of the GEF project, a small grants program will be implemented, which will be aimed at

development of alternative sources of income and reduction of human-induced impact on the Reserve. It is planned to include in this program's coverage the villages of Tostu, Zhayyk, Karabashat, Olon-Bulak, Kara-Tobo, which are located close to the Reserve.

### ***Establish a subsidiary farm***

To improve provision of material needs of the Reserve employees, it is planned to establish a subsidiary farm: horse breeding (9 breeding mares and 1 stud). This will ensure the renewal of horse numbers. To achieve partial self-financing in the given economic situation, the Management Plan proposes to purchase bee families, honey receptacles with accessories.

### ***Tourist and visitor programs***

Based on Instruction "On visiting the specially protected natural territories of the Kyrgyz Republic", it is proposed to organize commercial ecotourism in the education and ecotourism zone. It is proposed to establish the ecotourism infrastructure and to organize automobile, horse-riding and walking routes.

Development of ecotourism may mitigate the unemployment problem, reduce pressure on the Reserve, and provide for part of the Reserve's financial resource requirements. It is necessary to purchase the inventory specified in item 4.

### ***Public relations with respect to nature protection issues***

Taking into account the previous experience and the changing socio-economic conditions, it is necessary to:

1. Establish an Ecological Education Department and a Nature Museum to raise the population, tourists' and other visitors' awareness of the rich and unique nature of the Reserve, to improve the ecological knowledge among the population, to engage it in participation in nature protection activities, to conduct learning, training sessions. Since the Reserve has only been established recently, local residents of the buffer zones have poor knowledge of the Reserve's activities, of its significance and role in the protection of nature. The level of ecological knowledge of the population is extremely low. One of the most important tasks of the Reserve is to engage the local population in cooperation in the business of nature protection. Yet, the Reserve does not possess even the most basic items for conducting such type of work. There is practically no literature in the Reserve, no methodology guidelines for conducting work with the local communities. There are no materials in the Reserve which could be used for work with the local population. The Reserve's employees have encountered the circumstances under which the experience and information are not accumulated. There is no place where it would be possible to conduct regular studies with the population, where visitors could come in order to receive the required information about the Reserve. It is necessary to establish an ecological education department with a museum, library. All that will allow arranging planned work with the population, the public, engage it in active support of the Reserve's activities, find new forms of interaction with the population, foster their caring conscientious attitude to nature.

This department can also establish contacts with other nature reserves, with other organizations, foundations, which could find grant funds and other form of support for execution of a nature protection reserve's activities. It is necessary to acquire flora and fauna exhibits in the museum, to create the Reserve's biogroups in order to demonstrate the Reserve's rich and unique nature and the work of its employees on its protection.

2. Produce and disseminate through the media a video film on Padysha-Ata Reserve for the wider public with the following content:

1) Main landscapes: High altitude subalpine and alpine meadows.

- 2) Representatives of animal and plant life.
- 3) Padysha-Ata Mazar.
- 4) At a security check-point, detention of a poacher, touring of the Reserve's territory by the yagers (forest wardens).
- 5) Receipt of equipment and outfit.
- 6) Villages of Tostu, Karabashat, Zhayyk, Olon-Bulak, Kara-Tobo – houses, people, cattle grazing.
- 7) Ecological education activities of the Reserve.  
(will be produced by the Reserve's employees)

3. With respect to tourism development, from the start of the Padysha-Ata Reserve creation the work on infrastructure creation was ongoing with the care of the Reserve and the local residents on adjacent territories. With support of different projects, in recreation zones there currently are private guest houses, holiday houses and historic cults (the Padysha-Ata mausoleum). It is necessary to acquire accessories for the Reserve's property, construct houses to create amenities for the holiday-makers (item 4)

4. Conduct ecological education activities. The Reserve's employees are currently conducting ecological education work among the local population and the Reserve's visitors. This work, however, is not of a regular nature, it does not have sufficient methodological substantiation of the diversity of forms. Therefore, its effectiveness and population coverage are not great.

It is necessary to design various forms and methods of ecological education for population with different interests and levels of preparedness. The forms and methods of ecological education must be aligned with each other and must have a certain kind of succession. The Reserve's employees should organize exhibitions, lectures, discussions, demonstrations of slides, video films, albums on the natural environment and on its protection tasks. Develop methodology basis for conducting educational work among various groups of the local population.

## Research and monitoring

### *Research*

Currently in the Padysha-Ata Reserve's protection zone, which is the zone of mitigation of and protection against human-induced impact on the main zone of the Reserve, there is excessive cattle grazing and a threat of powerful human-induced load which affects the whole ecosystem.

- Therefore, the first task of the Reserve, based on the scientific research results, is the issue of expanding the boundaries of the main zone of the Reserve.
- Lately, there has been observed a massive yellowing of the Semenov fir needle foliage with the trees drying out.

It should be noted that, due to the absence of a coniferous species disease specialist, no specific steps on inspection, studying and development of recommendations to protect the fir from this disease have been taken on the part of the Reserve. With the exception of the member of the Institute of Forestry and Nut Growing of the National Academy of Sciences of the Kyrgyz Republic G. Kalykova, who performed multiple fields trips to study the Semenov fir disease jointly with the research associates of the Reserve. A herbarium has been collected with various types of diseases and it has been taken to the Forestry Institute's laboratory for determination. But it will be necessary to wait for the results of the studies, because there is no laboratory in Kyrgyzstan for analysis of such diseases of coniferous species (G. Kalykova). It is necessary to dispatch one employee to Saint Petersburg (Russia) for obtaining a precise analysis of the disease and combating methods.

To verify the success of the accomplished biodiversity preservation actions, monitoring will be performed for indicator species of plants, birds and mammals. Recording of three different types of biological resource characteristics will be performed:

- Quantitative characteristics of the populations of the main plant and animal species at certain time intervals, comparison with previous condition;
- Assessment of the quality or condition of species and their habitats;
- Measuring the species reproduction or productivity indicators.

The task consists in acquainting the Reserve's employees with the routes, methods and skills of determining the indicator species directly in the conditions of the Reserve, as well as preparing tables of correspondence for main characteristics of the indicator species which signify disturbed, weakly disturbed, medium disturbance and intensely disturbed ecosystems.

To obtain the reference base data (characteristics) of the indicator species condition and determine the links of their characteristics with the condition of the priority preservation objectives, it is planned to conduct monitoring in accordance with the methodology developed by the regional group. Receipt of current data on the condition of indicator species and communities will allow making judgment on the success or failure of biodiversity preservation. The Padysha-Ata Reserve monitoring program includes:

- 1) Execution of the meteorological observation program according to the existing program;
- 2) Keeping the "Nature Records" by the Reserve's research associates and inspectors;
- 3) Conducting annual recording of the numbers of hoofed animals, bear, large predators and indicator species along constant fixed location routes by the Reserve's staff employees;
- 4) Monitoring the condition of individual selected species of endangered plant species by transects and on constant test areas;
- 5) Observations on fixed phenological routes;
- 6) Identification of the link of indicator species characteristics with the condition of the priority preservation objectives;
- 7) Conducting the Reserve employee training in efficient methods of protection activities;
- 8) Conducting the Reserve employee training in methods of monitoring the biodiversity condition on the basis of indicator plant and animal species records.

The cost estimation for training in methodology of conducting monitoring of indicator species of flora and fauna is given in item 4.

### ***Monitoring of the condition of rare and endangered species of animals and plants***

The tasks of this monitoring consist in tracking the processes of change of numbers and distribution in the Reserve of the most significant species of animals and plants, such as the endemics, rare, endangered and economically significant species.

Here are the Reserve's animal species which require regular monitoring:

- Large mammals (mountain goat, roe deer, boar, bear, snow leopard). They are recorded on constant routes which already exist in the Reserve, according to previously developed methodologies. It is necessary to review the routes from the point of view of extrapolation of their data to the habitual area. For the snow leopard, which is encountered in the Reserve irregularly, all encounters with the beasts or signs of their presence are noted, with detailed descriptions of the encounter circumstances.

- Large species of birds of prey (bearded vulture, Himalayan vulture, griffon vulture, golden eagle), which are nesting in the Reserve, are recorded by the Reserve's scientific personnel on routes, both constant and single-time, with calculations of the numbers by the route length, time of recording and distance of discovery. Besides that, with the help of the whole personnel of the Reserve which is noting all encounters with this group of species in April - June period, retrospective maps are annually prepared for distribution of each species during nesting periods. These maps may serve as the basis for

determining the absolute numbers of nesting pairs in the Reserve and their changes over a number of years.

It is necessary to staff the scientific department with specializing employees.

## Administration and personnel management

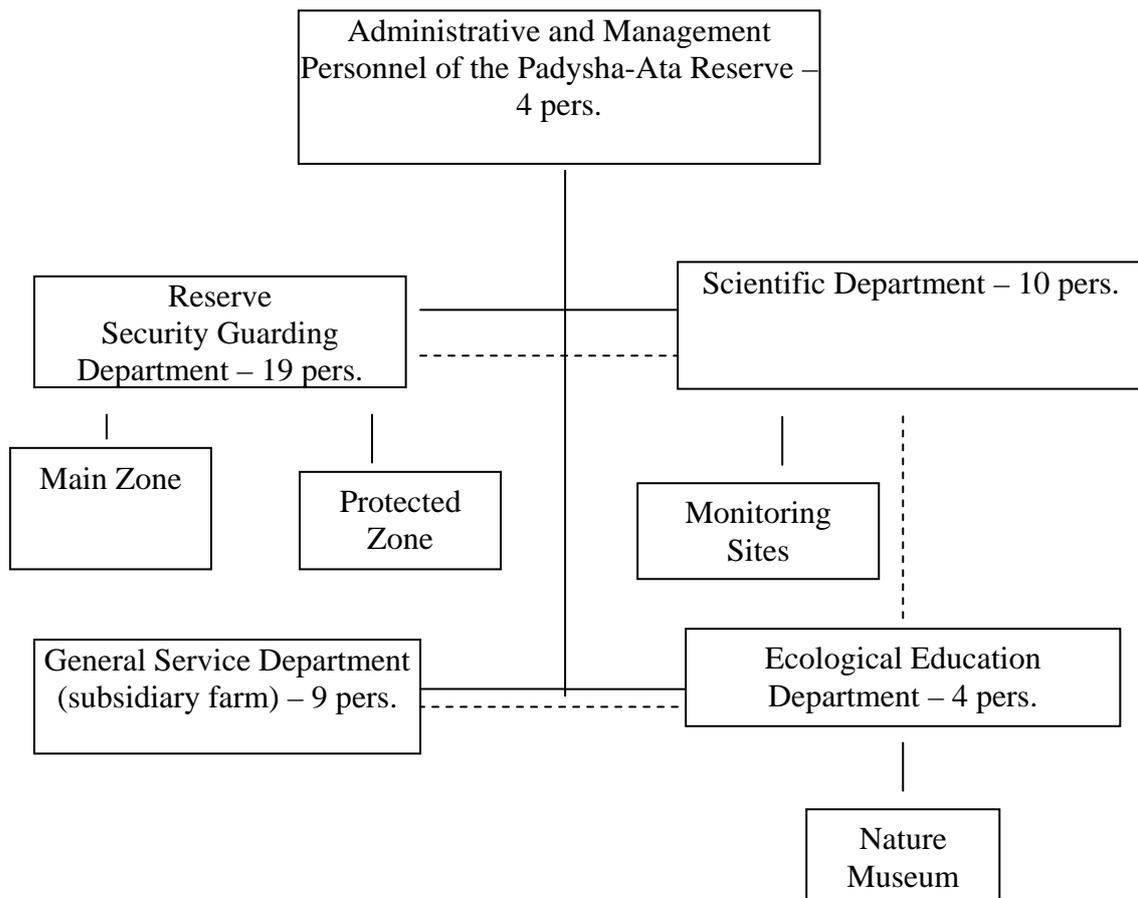
### Structure and organization

To strengthen the Reserve management structure and eliminate the identified shortcomings and inconsistencies, it is necessary to:

- Establish an ecological education center, increasing the staff for conducting works on raising population awareness of environment protection and of the works which are conducted for biodiversity preservation.

- Taking into account the Reserve's zoning features in the framework of the legal component of this GEF project, it is necessary to staff the Reserve with the following full-time equivalents: forest guarding and protection engineer, reproduction engineer, research associates, laboratory specialists, ecological education center employees, etc.

- In accordance with the Reserve Regulations and definitions of the functional duties of the Reserve's structural divisions, establish the following organizational structure of the Reserve's management:



In accordance with the approved Reserve Regulations and definitions of the functional duties of the Reserve's structural divisions, approve the Padysha-Ata Reserve management structure according to the above proposed scheme.

To step up the work on raising population awareness of the environment protection and of the works conducted for biodiversity preservation, establish the Ecological Education Department, increasing the Reserve's staff.

Also increase the Scientific Department's staff, since the Reserve is a scientific research institution, it is necessary to have staff for performance of scientific research work.

### ***Personnel hiring***

Taking into account the shortcomings in the existing structure of the Reserve, it is proposed to the Reserve's management:

- Staff the Reserve with required specialization specialists, informing each hired employee of his/her technical assignment, professionally prepared specialists according to the proposed staffing structure;
- When hiring new employees, be guided by the approved technical assignments for performance of specific duties;
- Ensure appropriate training of the Reserve's employees.

Planned Staff Structure of the Padysha-Ata Reserve

S/n	Staff of the Reserve	Existing	To be hired	Hiring schedule
	Management apparatus			
1.	Director	1		
2.	Chief Accountant	1		
3.	Accountant-Cashier	1		
4.	Document Controller – Secretary	1		
	Subtotal:	3		
	<b>Scientific Department</b>			
1.	Department Manager – Deputy Director	1		
2.	Senior Research Associate (botanist, zoologist)	1		
3.	Research Associate	1	2	June 2013
4.	Junior Research Associate	1	1	June 2013
5.	Meteorologist		1	January 2014
6.	Senior Laboratory Specialist		1	June 2013
7.	Laboratory Specialist		1	June 2013
	Subtotal:	4	6	
	<b>Security Guarding Department</b>			
1.	Department Manager	1		
2.	Forest Guarding and Protection Engineer		1	June 2013
3.	Reproduction Engineer		1	June 2013
4.	Senior Yager (forest warden)	2		
5.	Yager	14		
6.	Security Check-Point Inspector		2	
7.	Security guard - fireman (seasonal)	2		
	Subtotal:	19	4	
	<b>Ecological Education Department</b>			
1.	Department Manager		1	October 2013
2.	Museum Manager		1	October 2013
3.	Ecological Education Specialist	1		
4.	Ecotourism Specialist	1		
	Subtotal:	2	2	
	<b>General Service Department</b>			
1.	Department Manager		1	January 2013
2.	Veterinarian		1	January 2013
3.	Warehouse Manager	1		
4.	Driver	1	1	January 2013
5.	Security Guard	2		
6.	Cleaner	1		
7.	Electrician		1	Jan 2013
8.	Carpenter		1	Jan 2013

9.	Horsekeeper	1		
	Subtotal:	6	5	
	<b>Total:</b>	<b>35</b>	<b>17</b>	

## Training

### *Training tours in active international nature reserves and parks under the GEF program*

To acquire experience and raise professional reserve management qualifications, it is planned to dispatch management personnel of the Padysha-Ata Reserve: Director, Deputy Director for Science, 1 Senior Research Associate, Security Department Manager, 3 Senior Yagers of divisions, Manager of Ecological Education Center – 8 people in all – for training and exchange of experience to similar mountain reserves in some foreign countries during the summer season. Execution of these actions will be performed in several stages depending on the financing possibilities.

## Infrastructure and equipment

### *Buildings and structures of the Reserve*

First of all it is planned to start construction of the Ecological Education Center and the Director's House

On the territory of the central estate it is necessary to build a new garage building with an automobile repair workshop and storage premises, to install a new transformer. It is also planned to build 2 cordons for the check-points, in the areas of Tostu, Mazar-Say (one of them with a boom barrier, one with a gate).

New constant usage cordon in the lower part of the Tostu area. It is necessary for control of forest trespassing, cattle numbers when crossing to the summer pastures. A single-apartment cordon (3-room) with toilet, shed for keeping horses, with fire-fighting equipment storage room, etc. (standard set).

**Check-point in Mazar-Say area (with boom barrier).**

**Check-point in Tostu area (with gate).**

It is necessary to install sliding gate, with nice-looking inscription on the arch, bearing the Reserve's name and its logo. It is also necessary to perform repair works on the Check-Point No. 1 building.

To provide tourism infrastructure, it is recommended to build a hotel complex (4 houses with double rooms).

- o Building of the Ecological Center (Museum with a conference hall)
- o Garage building for 3-4 automobiles with an automobile repair workshop and a storage facility for keeping the Reserve's inventory and equipment.
- o A house for visitors.

Taking into account the Reserve's uniqueness, it is planned that the Reserve will be visited by scientific research groups and other interested visitors. Also, the visitors' house will serve as a hotel for tourists. The scope of this management plan includes the work on construction of a visitors' house for 10 persons. It is planned to have a hall and rooms in the house: rooms for 3, 4 people, double and single rooms, equipped with: furniture, refrigerator, etc. The hotel architecture must be attractive, with a place

for meals, laundry, utility room and a room for service personnel. It is necessary to envisage planting of greenery, fencing, etc.

#### **Official house for the Reserve Director**

Requirements: 3-4 room one and a half storey building with basement storey (hot and cold water, etc.), outbuildings, bath-house, etc. (standard set).

#### **Weather station building.**

The second part of the Check-Point No. 2 building will also serve as a weather station building.

#### **Utility networks**

Taking into account the circumstances described in the clause, it is proposed to install own transformer on the territory of the central estate.

#### **Roads**

The technical condition of the road from the village of Kashka-Suu to the Padysha-Ata mausoleum, which is the only road for reaching the Reserve, is unsatisfactory. It is planned to repair the road from the village of Kashka-Suu to the Padysha-Ata mausoleum (10 km). The main part of the Reserve is unreachable by transport. Patrolling is performed only by horse routes, on a rotational basis.

#### **Communications**

The management plan proposes HF communication equipment, which provides stable communication for more than 100 km at any time. Due to absence of operational radio communication between parts of the Reserve and the central estate, communication with the security service during inspection trips is difficult, which lowers the guards' operational efficiency and effectiveness, does not allow timely notification of emergency situations and fires. It is necessary to provide to the Reserve HF communication equipment for 3 check-points and 2 cordons. It is also necessary to connect the Reserve's central estate buildings to HF communications and to the Internet. In total, 6 units of HF communication equipment.

#### **Transportation, agricultural equipment**

It is necessary to acquire 1 long wheelbase off-road vehicle 4 WD minibus type 4WD for the Scientific Department (besides that, during the tourist season auto services will bring revenues to the Reserve), two motorcycles with side-cars for senior yagers (forest wardens), general purpose wheeled tractor with attachable implements (EO-2621 V-3 excavator bucket, bulldozer blade), PLN-5-35 plough, grain seeder and tractor trailer for usage at the Reserve's subsidiary farm.

For full provision to the Reserve's employees, taking into account additional staffing, it is proposed to acquire 20 work horses and a herd for stock reproduction (1 stud and 9 breeding mares). It is also necessary to purchase 30 sets of harness accessories for the horses.

#### **Scientific infrastructure**

There is no monitoring infrastructure in the Reserve. In accordance with the monitoring program, it is necessary to establish monitoring infrastructure on the locations of the Reserve's territory with due consideration for further work prospects. Determine the system for unified end-to-end numbering of the infrastructure, introduce it and formalize it in appropriate documents. Perform demarcation of the monitoring elements on the ground, full description and methodology of work.

It is necessary to build several weather station buildings, fences of fixed observation points, etc.

#### **Equipment for the Scientific Department**

The equipment and special outfits for performance of field work, which are available at the Reserve, do not meet the requirements.

It is necessary to acquire special equipment – microscopes, binoculars, photo cameras, outfits for collection of plants and insects, camping equipment (tents, sleeping bags), summer and winter uniforms for inspection personnel and scientific personnel, according to item 4.

#### ***Equipment and accessories***

Provide binoculars for the scientific department and security guarding department of the Reserve. All employees are to be provided summer and winter uniforms, camping equipment and accessories, tents, sleeping bags, dispatch cases, fire-fighting tools. To improve the resource management efficiency, it is necessary to provide computer and office equipment to the Reserve. The list of such equipment and accessories is presented in item 4.

#### ***Procurement for the Reserve (operational expenses)***

To achieve partial financial (economic) independence, it is necessary to envisage operational expenses until the end of the project: provision of fuel and lubricants and spare parts for the transport, forage for the horses and so on (see item 4). The norm of fuel and lubricant consumption will be determined on the basis of linear fuel and lubricants consumption norms approved by the Ministry of Transport. Forage for the horses – on the basis of the norms approved by the Ministry of Agriculture.

DRAFT  
 Cost Estimation for financing the Padysha-Ata State Reserve for the years 2013-2017  
 In thousand som

Financing sources	Total for the period of 2013-2017	Including by years				
		2013	2014	2015	2016	2017
<b>II Total:</b>	14664.89	2102.9	3654.8	2871.11	3003.49	3032.59
State Budget of the Republic	3750.0	650.0	850.0	950.0	650.0	650.0
Special funds own funds and non-tax revenues, i.e. funds of the Republican Fund for Nature Protection and Forestry Development	2408.19	401.4	426.3	451.11	524.79	604.59
Receipts of grants for the GEF Tien Shan Ecosystem Development Project	8506.7	1051.5	2378.5	1470.0	1828.7	1778.0
Other funds						

**Note:** Items financed from the state budget are not given in this table.

DRAFT  
 Cost Estimation for financing the Padysha-Ata State Reserve for the years 2013-2017 for items financed from the state budget  
 In thousand som

Level of econ. class	Cost item description	Total for the period of 2013-2017	Including by years				
			2013	2014	2015	2016	2017
2111	Salaries	7336.4	1363.3	1363.3	1536.6	1536.6	1536.6
2121	Deductions to social fund	1393.85	259.0	259.0	291.95	291.95	291.95
2211	Business trips inside the country	750.0	150.0	150.0	150.0	150.0	150.0
2212	Utility services	250.0	50.0	50.0	50.0	50.0	50.0
22121200	Payments for electricity	134.0	14.0	20.0	30.0	35.0	35.0
22122100	Telephone and fax communication services	180.0	36.0	36.0	36.0	36.0	36.0
2214	Transportation services	1150.0	200.0	200.0	250.0	250.0	250.0
2215	Acquisition of other services	1500.0	300.0	300.0	300.0	300.0	300.0
3111	Buildings and structures	1300.0	200.0	300.0	400.0	200.0	200.0
3112	Machinery and equipment	950.0	150.0	250.0	250.0	150.0	150.0
	<b>TOTAL:</b>	14944.25	2708.3	2714.3	3294.55	2999.55	2949.55

**Draft Cost Estimation**  
for formation of special funds of the Padysha-Ata State Reserve for the years 2013-2017

Level of econ. classif.	Cost item description	Total for the period of 2013-2017	Including by years				
			2013	2014	2015	2016	2017
	<b>I. Revenues</b>						
	<b>Revenues for the year – total</b>	<b>3940.9</b>	<b>550.9</b>	<b>675.0</b>	<b>785.0</b>	<b>915.0</b>	<b>1015.0</b>
	Including by types:						
1332	Funds received under mutual settlements						
142	Revenues from sale of goods and service rendering	334.0	44.0	50.0	60.0	80.0	100.0
1415	Rental payment	350.0	60.0	65.0	70.0	75.0	80.0
14152	Payment for usage of natural resources	40.0		10.0	10.0	10.0	10.0
14152300	Payment for usage of forest resources	110.0		20.0	25.0	30.0	35.0
14152900	Other payments for usage of natural assets						
14233200	Fees for admission to national parks, recreation places	205.0	25.0	30.0	40.0	50.0	60.0
14311200	Revenues from sale of identified contraband goods						
14311400	Revenues from accomplished control and supervision actions						
1451	Other non-tax revenues	2871.9	421.9	500.0	600.0	650.0	700.0
14232300	From hotel services	50.0				20.0	30.0
	deductions to superior organization						
	4% deduction to TURLROR						
	25% and 5% deductions to RFOP and MFOP						
	20% deductions to GKNS	788.2	110.2	135.0	157.0	183.0	203.0
	0.2% bank services	7.88	1.1	1.35	1.57	1.83	2.03
	Contributed to revenues of the Republican Budget						
	<b>Revenues – TOTAL</b>	<b>3144.82</b>	<b>439.6</b>	<b>538.65</b>	<b>626.43</b>	<b>730.17</b>	<b>809.97</b>
	<b>II. Expenses</b>						
	including:						
2111	Salaries	367.72	20.3	60.8	84.3	101.16	101.16
2121	Contributions to Social Fund	69.91	3.9	11.55	16.02	19.22	19.22
2211	Expenses on business trips	194.0	4.0	30.0	50.0	55.0	55.0
2212	Utility services	105.0	10.0	10.0	25.0	30.0	30.0
2213	Rental payment						
2214	Transportation services	800.0	100.0	100.0	200.0	200.0	200.0
2215	Acquisition of other services	1608.19	301.4	326.3	251.11	324.79	404.59
3113	Other fixed assets						
	<b>TOTAL:</b>	<b>3144.82</b>	<b>439.6</b>	<b>538.65</b>	<b>626.43</b>	<b>730.17</b>	<b>809.97</b>

STATE AGENCY ON ENVIRONMENT PROTECTION AND FORESTRY UNDER THE GOVERNMENT  
OF THE KYRGYZ REPUBLIC

MANAGEMENT PLAN

FOR SARY-CHELEK STATE BIOSPHERE RESERVE FOR THE YEARS 2013-2017

*(excerpts – operational part)*

Part II. Proposed Management Plan

6. Action Plan.

6.1. Objectives.

1. Preserve in its natural condition the most typical natural area of Western Tien Shan, the rich gene bank of the animal and plant kingdom (nut and fruit forests) and the unique mountain and lake ecosystem.
2. Restore natural ecosystems on the territories subjected to economic impact.
3. Monitor biodiversity management success by status of indicator species and communities.
4. Facilitate increased level of population awareness and education with respect to biodiversity issues to ensure support and engagement of local community in achievement of management objectives.
5. Strengthen the reserve infrastructure, with due account for educational and ecological tourism in a certain part of the reserve;
6. Achieve harmony of man and nature, without violation of coexistence laws and naturally occurring processes, and engaging local community in the management.

6.2. Tasks:

1. Observe established protection conditions in accordance with the requirements of all zones of the reserve. Strengthen the requirements of the buffer zone.
2. Conduct the reserve zoning in accordance with the requirements of the Seville Strategy and the legislation on biosphere reserves.
3. Conduct scientific research, including introduction of new technologies for performing the research work, assist in performance of scientific research by other research organizations and educational institutions. Take complete inventory of flora and fauna.
4. Create genetic data base of the reserve plants, identify the best tree and shrub seed-production plots.
5. Assist in training of reserve management scientific personnel and specialists. On the basis of contracts with higher education institutions, engage young specialists and students in work in the reserve, create a database for conducting on-the-job and undergraduate training.

6. Conduct ecological education work and organize ecological tourism, propaganda of nature protection ideas among population, students and schoolchildren. Create an ecological education department, specify its functions as part of the reserve activities.
7. Conduct presentation of ecological situation and biodiversity preservation by publishing scientific papers, articles. Create the reserve's site on the Internet.
8. Organize and take part in ecological movements, actions and other international events.
9. Public relations. Develop a technology for participation of local communities in the reserve management and engage them in the reserve management.
10. Resolve the population's problems (land plots, pastures, hayfields and other types of land usage, their relations with the local self-government bodies).

### **6.3. Territory and its guarding.**

- Expansion of the reserve boundaries. Resolve the issue of the transfer of the buffer (protection) zone to the reserve on legislative level. Since the Aflatun and the Arkyt Forestry Administrations are under the supervision of the State Agency on Environment Protection and Forestry, this issue can be resolved without involvement of other structures. The most problematic areas are the Aflatun, the Kyzyl-Tuu and the Kyzylkol forestry divisions of the above specified forestry administrations. It is necessary to resolve the issue of transfer of the State Reserve Zone land of the Aksy and the Chatkal districts.
- Include the Batrakhhan Semenov Fir Protected Area in the composition of the Reserve.
- Perform the Reserve territory zoning with due consideration for the Seville Strategy.
- Legislatively raise the yagers' (game wardens') authority. Many issues of fine imposition and fine collection are problematic. When a case is brought to representatives of internal affairs departments, public prosecution office or court, the rights of yagers (game wardens) are largely prejudiced. This makes the yagers' (game wardens') initiatives punishable and therefore the game wardens are not interested in execution of reports. The 30% rewards from administrative penalties are not paid. Grant to the yagers (game wardens) the authority to use handcuffs and to detain trespassers for some time in service premises.
- Change the "yager" position name to forest ranger, forest warden, etc. Since the "yager" name is derived from "hunter".
- Raise the forest protection employees' salaries, the employees are not interested to work for the current salary, on the contrary, they are interested in selling natural resources for a living.
- Introduce prohibition of goat and dog pasturing and walking in the protected zone regulations.
- Develop and introduce the regimes of intermediate or transit, managemental, protected and ecotourism zones.
- Legitimize natural resource usage for residents of Arkyt settlement: hay mowing in the intermediate zone, firewood collection, pastures, beehive yards, collection of nuts and fruit and other usages in the managemental and buffer zones. Legitimize usage of the territories by local population for tourist services.
- Legitimize the tourist service activities, expand participation of local communities in provision of services for tourists and visitors.

### **6.4. Execution of forest management works in the years 2013-2014.**

A new audit period starts in 2013. With the new arrangement, introduce new zoning of the territory and contemplated activities in the transit or intermediate zone, managemental and buffer zones.

### **6.5. Scientific research and natural environment monitoring.**

- Annual execution of nature record keeping plans.

- Execution of scientific research works by subjects, under the contemplated new scientific research technology, i.e. introduce research to be performed by employees on the basis of contractual work. (Develop the technology in accordance with the labor legislation).
- Prepare work plans for taking the inventory of flora and fauna species composition jointly with research institute. On a contractual basis, acquire execution of scientific research work by third-party organizations.
- Create the reserve flora database (annotated listing and photo herbarium). Seed base for tree and shrub plants.
- Research populations of the Kyrgyzstan Red Book species, rare, endemic and relict species.
- Prepare contracts with research and higher education institutions for engagement of research field teams, students for performance of research, on-the-job training and work in the Reserve upon completion of education.
- Publish the reserves works for recent years of research. Annually publish scientific and popular science articles in various publications.

#### **6.6. Ecological education work and development of tourism.**

- Conduct systematic ecological education work with the local population;
- Conduct promotional and informational activities;
- Establish material & technical and information & methodology base for conducting efficient ecological education work on a modern level;
- Participate in exchange of ecological education work experience both between the specialists of Specially Protected Natural Areas and with international organizations and persons;
- Organization of and participation in various international events in the republic;
- Communicate with all ecological movements, NGOs, public authorities on the issues of nature protection, coordination of actions, information exchange, etc.;
- Work with students, higher education institutions, schools, the media.
- Create the reserve's website.
- Raise the level of services for tourists and holiday makers.
- Expert analysis and planning.
- Promotional and informational materials.
- Marketing, promotion of ecotourism product.
- Staffing support for ecotourism development.

#### **6.7. Reproductive actions to restore ecosystems.**

- Establish a forest nursery for Red Book species (Niedzwetzky apple, Semenov fir).
- Establish a nursery for restoration of maral deer in the reserve.
- Strengthen protective guarding, explanatory work in order to restore the population of large mammals.
- Biotechnical measures. We consider it inexpedient to implement such biotechnical measures as: manufacturing feeding troughs, hay preparation, fencing ant-hills, hanging tomtit houses in the main zone. All appropriate work scopes are to be planned and executed in the other zones.
- Perform forest clearance from littering and cluttering in the managerial zone and the restoration zone. There are very large accumulations of snow breakage and wind breakage in these areas, which create high level of cluttering.

6.8. Proposed organizational structure of the reserve.

Table 6.2.

Planned and existing staff schedule

No.	Organizational structure	Existing	To be hired	Hiring schedule
	<b>Administrative and management personnel</b>			
1	Director	1		
2	Chief Accountant	1		
3	Document Controller	1		
4	Accountant-Cashier	1		
	Subtotal:	4		
	<b>Science Department</b>			
1	Deputy Director for Scientific Research	1		
2	Senior Research Associate	1		
3	Research Associate	1		
4	Junior Research Associate	1		
5	Meteorologist	1		
6	Senior Laboratory Specialist	1		
7	Laboratory Specialists	2	1	2015
8	Librarian	-	1	2015
	Subtotal:	8	2	
	<b>Protection and Monitoring Department</b>			
1	Department Manager	1		
2	Senior Yagers (Game Wardens)	2		
3	Yagers	20		
4	Security Check Point Service	3		
	Subtotal:	26		
	<b>Ecological Education Department</b>			
1	Department Manager	-	1	2015
2	Ecological Education Specialist	1		
3	Ecotourism Specialist	1		
4	Nature Museum Guide	1		
	Subtotal:	3	1	
	<b>General Service Department</b>			
1	General Service Manager	1		
2	Driver	1		
3	Electrician	1		
4	Tractor Operator	-	1	
5	Watchman	1		2015
6	Horsekeeper	1		
7	Cleaner	1		
8	Accountant	1		
	Subtotal:	7	1	
	<b>Total:</b>	<b>48</b>	<b>4</b>	<b>Bcero: 52</b>

## 6.9. Procurement.

Table 6.3.

### Materials and equipment purchasing plan for the year 2014

No.	Description of materials and equipment	UOM	Unit cost	Q-ty of units	Sum (som)
1	VAZ 2121 Niva	ea	2005000	1	205000
2	Harness accessories	set	8000	40	320000
3	Fax machine	ea	15000	1	15000
4	Portable VHF handie-talkies	ea	18950	10	189500
5	Tents for 2 persons	ea	6000	15	18000
6	Sleeping bags	ea	4000	40	160000
7	Field bags	ea	500	20	10000
8	Winter uniforms	set	1500	50	75000
9	Summer uniforms	set	1000	50	50000
10	Mountain boots	pair	700	50	35000
11	Karrimat	ea	250	40	10000
12	Pointed shovels	ea	150	50	7500
13	Square-faced shovels	ea	150	50	7500
14	Axes	ea	250	25	6250
15	Gasoline-powered saws	ea	8000	5	40000
16	Laboratory tools	set	300	10	3000
17	Surgical gloves	pair	10	100	1000
18	Herbarium nets	ea	150	10	1500
19	Pincers	ea	100	10	1000
20	Drill for measuring forest age	ea	12000	2	24000
21	Ropes	m	10	500	5000
22	Rifles (carbines)	ea	50000	10	500000
23	Ammunition	-	-	-	50000
	<b>Subtotal:</b>				<b>1733500</b>

## 6.10. Infrastructure reinforcement.

- Capital repair of Arkyt – Kyzyl-Tuu road.
- Capital repair of Arkyt – Kyzyl-Tuu 10 kVA power line.
- Capital repair of 0.4 kVA power line in Arkyt settlement.
- Installation of cellular telephone exchange in Arkyt settlement.
- Construction of the Khodjata river bridge in Bokchob.
- Construction of cordons in Batkak.

## 6.11. Training.

- Annual improvement of yager (game warden) service qualifications.
- Annual improvement of scientific personnel qualifications.
- Annual improvement of ecological education department's personnel.

## 6.12. Work with population

- Introduce in the reserve regulations a provision for limitation of livestock keeping numbers for the Arkyt settlement population. Achieve allocation of summer pastures for the Arkyt settlement residents.

- Organize or initiate organization of an action group of Arkyt residents for participation in management of the reserve. Initiate establishment of an NGO in Arkyt.
- Introduce a prohibition of keeping dogs and goats in the summer pastures of the reserve's buffer zone (Kyzyl-Kol, Karasuu, Zhylgyn, Kyzyl-Tuu, Aflatun).
- Involvement of population in ecotourism work (guest houses, guides, horse rental, etc.).
- Population training in hospitality, development of folk crafts.
- The ecological education department's work must be aimed at different groups of population; local residents and residents of nearby settlements, workers of government bodies, management and business spheres and, first of all, pupils on the territory of the reserve and nearby schools. Special methods and forms of ecological education work must be developed for each group.
- Conducting, jointly with the local residents, events and actions which attract attention to the reserve, involving a wide layer of the public (the media, NGOs, schools, neighboring forestry administrations and nature reserves and local self-government bodies).

### 6.13. Action Plan

No.	Management task	Actions	Results and indicators	Timing	Partners and executors	Cost (thousand som)
1	Expansion of the reserve boundaries.	Resolve the issue of the buffer zone transfer to the reserve, introduce the above proposed protected zone regime	Transfer territories to the reserve supervision, incl. Batrakhan reserve	2015	State Agency on Environment Protection and Forestry	-
2	Legislatively raise the yagers' (game wardens') authority.	Introduce changes in the yager rights, provide uniforms, execute identity documents, provide service weapons	Legislative raising of the yager service authorities and rights Introduction of the "forest ranger" name	2014	State Agency on Environment Protection and Forestry	(Uniforms, weapons in the purchasing plan)
3	Salary raise	Increase the annual salary fund	Increase salaries	From the year 2013	State Agency on Environment Protection and Forestry	In staff schedule
4	Performance of forest management	Order a forest management team	Forest management materials	2013	Chief Administration for Forest Management, State Agency on Environment Protection and Forestry	1173.7
5	Taking inventory of the reserve's flora and fauna. Database creation.	Take inventory of the reserve's flora and fauna, prepare flora database	Flora and fauna materials, photo albums, lists	2015	Research associates and Biology & Soil Institute of National Academy of Sciences	156.6
6	Publish the reserve's papers	Collect the papers and publish at	Books of materials	2016	Research	40

		a printshop			associates	
7	Determine the ecotourism zone capacity	Establish a specialists' study group	Quantitative data for limitation of tourists	2013	Specialists	24
8	Create the Reserve's website	Install communication equipment and create the reserve's website	Site on the internet	2013	Aksy Telecom, the reserve	200
9	Establish nurseries of Red Book species	Allocate areas for the nursery and plant the nursery	Functioning nursery	2014	The Reserve	387
10	Establish a maral deer nursery	Determine the place for the nursery, fence it, purchase and deliver marals, organize keeping	Marals in the Reserve	2015	The Reserve	387
11	Clean the forest from cluttering	Annual scheduled forest cleaning from cluttering	Results of accomplished works	Annually	The Reserve	In the plans
12	Supplements to staff schedule	Supplement staff schedule	New staff schedule	2013	State Agency on Environment Protection and Forestry	In staff schedule
13	Accomplish purchases	Purchasing according to plans	Acquired materials	2013	State Agency on Environment Protection and Forestry	Purchasing plan
14	Repair roads to Karazhygach	Capital repair of roads	Good roads	2014	Aksy Road Maintenance Administration	
15	Repair power lines	Capital repairs of power lines (10 and 0.4 kV)	Good power lines	2014	Aksy Electrical Network District	
16	Install satellite telephone communications	Purchase and install satellite communications, connect to the Internet	Telephone communications, website on the Internet	2013	Bitel, Megacom	
17	Bridge construction	Construction of bridge in Bokhchob	Functioning bridge	2013	The Reserve	
18	Construction of cordons	Construct cordons in Batkak and Kaly	Cordons	2014	The Reserve	400
19	Employee training	Annual improvement of employee	-	Annually	State Agency on	56

		qualifications			Environment Protection and Forestry	
20	Introduce amendments to the Reserve Regulations	Introduce limitations on livestock keeping for Arkyt settlement, and in the buffer zone regime	New Regulations	2014	State Agency on Environment Protection and Forestry	-
	<b>Sum</b>					<b>2824.3</b>

## 7. Monitoring and evaluation.

Table 7.1.

Monitoring of management plans implementation

Program	Indicators	Methods	Procedure
Monitoring of management activities	Management apparatus performance	Tracking the passage of control assignments	Once a year for each service
	Execution of operational management plan	Ongoing control	Continuously
Monitoring the condition of natural complexes and sites	Standard indicators of forest fund condition	Forest monitoring methods	Continuously, annually
	Data on animal numbers	Keeping various records	Annually
Monitoring of financial activities	Execution of the Reserve's budget	Audits, checks, reports	According to auditing and tax control schedule
	Execution of extrabudgetary fund programs		
Monitoring of tourist and recreational activities	Number of certified routes, equipped locations	Preparation of certification document packages, reports	Annually
	Revenues from tourist and recreational activities	Keeping revenue records	Upon completion of seasons
	Dynamics of visitor numbers	Records of visitor numbers	Continuously
Monitoring of scientific activities	Execution of scientific research plans	Approval of scientific research plans and reports	Annually
	Quantity of works accomplished by external organizations		
	Volume of disbursed funds	Financial reports	Annually
	Number of scientific research works implemented in practical activities	Expert evaluation	According to completion of scientific research works

Prepared by Deputy Director for Scientific Research  
Akynaly Dubanayev 07/16/2013

Approved by Scientific & Technical Council of the Reserve 07/17/2013  
Minutes No. 23.

Approved by Directive of the Director dated 07/17/2013 No. 104.  
Director of the Reserve Kapar Bekmyrzayev.

## ACTION PLAN

On conservation of integrity, global significance and value of Chatkal reserve biodiversity for  
2010 – 2012

*(extractions)*

Commitments of the reserve for state, district institutions, local communities and society

### Communications

- ✓ Regular reports on conservation state, scientific researches, building and resources outlays for higher government instances;
- ✓ Provisions by state institutions and private enterprises: horses, equipment, machinery, outfit, footwear, clothes, etc;
- ✓ Participation of reserve staff in public work of district, region;
- ✓ Providing with hydrometeorological information according to standard form of Center of Hydrometeorological Service of Republic of Uzbekistan (Uzhydromet);
- ✓ Admission and allowance to work for strange scientists in the territory of Uzbekistan;
- ✓ publication of scientific materials in digests and learned journals printing in Uzbekistan, participation in conferences, workshops;
- ✓ communication with law machinery of district by administration (and promptly – by controller) regarding state and compliance of legality and law order in the territory of reserve;
- ✓ usage of facilities (board rooms, lobbies) for organization of meetings, hustings and so on;
- ✓ excursions for local community members представителей in museum – in mass; and in field - limited;
- ✓ publication of popular science editions contributing to public education.

### Negative communication:

According to Regulations the reserve prevent business utilization on its territory: this aspiration is observed among members of local communities in neighboring settlements. As a result of such efforts administrative sanctions are applied for guilty.

## Territory conservation

Activity	Executor	Necessary resources (thousands of standard unit)	Financing source
Organization, design, siting and on-site marking in buffer zone with width of 0,3-2 km	Republic trust «Lesoprojekt», district land manager	2,0	Tashkent region khokimiat
Marking of pasture zone in Bashkiziliksay area, 20 posts and metal indicators.	Reserve	-	Salary schedule, budgetary funds
Horses keeping: feed, breaking in	Reserve	-	Salary schedule, budgetary funds
Transport: providing with fuels and lubricants	Reserve	17,3	Salary schedule, budgetary funds
Electricity	Reserve	2,7	Salary schedule, budgetary funds
Fire prevention, fire-fighting equipment purchase	Reserve	-	Salary schedule, budgetary funds
Saddles and other harness purchase (10 saddles annually)	Reserve	3,0	Tashkent region khokimiat
Field glasses purchase (3 binoculars annually)	Reserve	0,5	Head Department for forestry and reserves
Training of inspectors. Attestation and workshops	Reserve	0,2	Salary schedule

## Scientific researches. Monitoring

Activity	Executor	Necessary resources (thousands of standard unit)	Financing source
Database in electronic form. GIS. Web-site of reserve. Internet	Reserve	1,5	Tashkent region khokimiat
Office equipment, software	Reserve	5,0	Tashkent region khokimiat
Researches (scientific, scientific-technical, engineering) according to program Chronicles of nature	Reserve	-	Salary schedule, budgetary funds

Research of pruritic range of ungulates, carnivore plague in the reserve and surrounding territory	Institute of Zoology of the Uzbek Academy of Sciences of Uzbekistan	-	State budget
Identification of biocoenotic role of wolf	Institute of Zoology of the Uzbek Academy of Sciences of Uzbekistan	-	State budget
Biology and ecology of gipsy moth. Monitoring	Center of forestry and decorative cultivation	-	State budget
Research of juniper forests. Monitoring	Center of forestry and decorative cultivation	-	State budget
Биология и экология редких видов		-	

### Work with community

Activity	Executor	Necessary resources (thousands of standard unit)	Financing source
Social research	Center on public opinion poll	-	Center on public opinion poll
Presentations on meeting of citizens in kishlaks regarding environmental issues and environmental legislative.	Reserve	-	Salary schedule
Routine works in museum and with collections	Reserve	-	Salary schedule
Publication of booklets, brochures, advocacy of nature conservation ideas	Reserve	-	Salary schedule
Execution of relevant documentation on offences and bringing a case	Reserve	-	Salary schedule

### Repair, construction

Activity	Executor	Necessary resources (thousands of standard unit)	Financing source
Reparation of access road to filed base (Bashkizilsay)	Reserve, road-building organization	5,0	Reserve
Routine repair of buildings and facilities	Reserve	5,0	Reserve

### Logistics

Activity	Executor	Necessary resources (thousands of standard unit)	Financing source
Regular purchase of uniform and field equipment in return of disabled ones	Reserve	6,0	Department (National park)
Repair and purchase of weapon, radio facilities in return of disabled ones	Reserve	-	Department (National park)



# ANNEX C

## Lists of plants and animals

Annex C1. Globally and nationally threatened species of mammals, birds, trees and bushes observed in the territory of Western Tien-Shan nominated property

Annex C1. Globally and nationally threatened species of mammals, birds, trees and bushes observed in the territory of Western Tien-Shan nominated property

Species	IUCN Red List	National Red Data Books	Kazakhstan			Kyrgyzstan			Uzbekistan
			Karatau	Aksu-Jabagly	Sayram-Ugam	Sary-Chelek	Besh-Aral	Padysha-Ata	Chatkal
1	2	3	4	5	6	7	8	9	10
<b>Mammals</b>									
<i>Cuon alpinus</i>	EN	KZ, UZ		?	?				
<i>Otocolobus manul</i>	NT	KZ, KG	?	?	?	●	●?		
<i>Hystrix indica</i>		KZ, KG	●	●	●	●	●		
<i>Lutra lutra seistanica</i>		KZ, KG, UZ		●	●		●?		
<i>Lynx lynx isabellinus</i>		KZ, KG, UZ		●	●	●	●	●	●
<i>Marmota Menszibieri</i>	VU	KZ, KG, UZ			●		●		●
<i>Martes foina</i>		KZ, KG	●	●	●	●	●	●	
<i>Mustela eversmanni</i>		KG	●	●	●		●		
<i>Ovis ammon karelini</i>	NT	KZ, KG		●	●		●		
<i>Ovis ammon nigrimontana</i>	NT	KZ	●						
<i>Rhinolophus hipposideros</i>		UZ		●	●				●
<i>Uncia uncia</i>	EN	KZ, KG, UZ		●	●	●	●	●	●
<i>Ursus arctos isabellinus</i>		KZ, KG, UZ		●	●	●	●	●	●
<b>Birds*</b>									
<i>Aegypius monachus</i>	NT	KG, UZ	●	●	●	●	●	●	●
<i>Aquila chrysaetus</i>		KZ, KG, UZ	●	●	●	●	●	●	●
<i>Aquila heliaca</i>	VU	KZ, KG, UZ	●	●	●	●			
<i>Aquila nipalensis</i>		KZ, KG, UZ	●						
<i>Bubo bubo</i>		KZ, KG	●	●	●	●			
<i>Ciconia nigra</i>		KZ, KG, UZ	●	●	●	●	●	●	●
<i>Circaetus gallicus</i>		KZ, KG, UZ	●	●	●	●	●	●	●
<i>Circus macrourus</i>	NT	-	●	●	●				
<i>Columba eversmanni</i>	VU	KZ, UZ	●	●	●				
<i>Coracias garrulus</i>	NT	-	●	●	●	●	●	●	●

1	2	3	4	5	6	7	8	9	10
<i>Crex crex</i>	NT	-		•	•	•	•	•	•
<i>Dendrocopos leucopterus</i>		KG		•		•			
<i>Falco cherrug</i>	EN	KZ, KG, UZ	•	•	•	•	•	•	•
<i>Falco naumanni</i>	VU	UZ	•	•	•				•
<i>Falco pelegrinoides</i>		KZ, KG, UZ	?	•	•				•
<i>Falco peregrinus</i>		KZ, KG, UZ				•			
<i>Falco rusticolus</i>		KZ, KG				•			
<i>Grus virgo</i>		KZ, KG	•	•					
<i>Gypaetus barbatus</i>		KZ, KG, UZ	•	•	•	•	•	•	•
<i>Gyps fulvus</i>		KG, UZ	•	•	•	•		•	•
<i>Gyps himalayesis</i>		KZ, KG, UZ		•	•	•	•	•	•
<i>Hieraetus pennatus</i>		KZ, KG, UZ	•	•	•	•	•		•
<i>Neophron percnopterus</i>	EN	KZ, KG	•	•	•	•			
<i>Otis tarda</i>	VU	KZ, KG, UZ	?	•					
<i>Pelecanus onocrotalus</i>		KZ, KG, UZ					•		
<i>Strix aluco haermisi</i>		KG				•	•		
<i>Terpsiphone paradisi</i>		KZ, KG	•	•	•	•	•		
<i>Tetrax tetrax</i>	NT	KZ, KG, UZ	?	•					
<b>Trees and bushes</b>									
<i>Abies semenovi</i>		KG				•		•	
<i>Amygdalus petunnikovii</i>		KZ, KG	•				•		
<i>Armeniaca vulgaris</i>	EN	KZ	•	•	•				
<i>Betula talassica</i>	EN	KZ		•	•				
<i>Celtis caucasica</i>		KZ		•	•				
<i>Cotoneaster karatavicus</i>	DD	KZ	•						
<i>Crataegus ambigua</i>	DD	-	•						
<i>Crataegus knorringiana</i>		KG				•	•		
<i>Fraxinus sogdiana</i>	NT	KZ	•						
<i>Hippophae rhamnoides</i>		KG						•	
<i>Juniperus semiglobosa</i>		KG						•	

1	2	3	4	5	6	7	8	9	10
<i>Juniperus seravschanica</i>		KZ		•	•				
<i>Lonicera paradoxa</i>		KG						•	
<i>Lonicera karataviensis</i>	CR	KZ	•						
<i>Malus nedzwetzkyana</i>	EN	KZ, KG, UZ		•	•	•	•	•	
<i>Malus sieversii</i>	VU	KZ, KG, UZ	•	•	•		•	•	
<i>Populus cataracti</i>		KG						•	
<i>Pyrus asiae-mediae</i>		KG					•		
<i>Pyrus korshinskyi</i>		KG				•	•	•	
<i>Ribes janczewskii</i>		KZ		•	•				
<i>Sorbus persica</i>		KZ, KG	•	•	•	•	•		
<i>Sorbus turkestanica</i>		KG						•	
<i>Spiraeanthus schrenkianus</i>	EN	KZ	•						
<i>Vitis uzunachmatica</i>		KG				•	•		
<i>Vitis vinifera</i>		KZ, UZ	•						•

\* The birds have different character of stay (breeding, transitory migrants or winter visitors)