

# 2019

**Analytical report on the state of eight pilot forestry MPUs (Bakanas, Uigur, Narynkol, Zharkent, Zhongar, Zaysan, Ridder, Pikhtovskoye)**



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Five pilot forestry MPUs (Municipal Public Utilities) in Almaty region cover the Tian Shan mountain forests (Narynkol and Zhongar), saxaul forests of Balkhash area (Bakanas) and floodplain forests of the Ile River (Uigur and Zharkent).

## 1. Narynkol forestry

### 1.1. General information

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Narynkol forestry MPU was established in 1947. It consists of five forest divisions: Bayankol, Tekes, Saryzhaz, Shalkuda, Oykaragay.

Table 1. Distribution of forestry area by forest divisions

No.	Name	District	Area, ha		Location of forest division and forestry offices
			Total	Including long-term forest use	
1.	Saryzhaz	Raiymbek	23657	440,0	Saryzhaz village
2.	Shalkuda	Raiymbek	19955	2568,9	Tuzkol village
		Uigur	7285	1250,0	
3	Oykaragay	Raiymbek	38922	8444,8	Sarybastau village
4	Tekes	Raiymbek	60803	2944,5	Narynkol village
5	Bayankol	Raiymbek	43444	4978,2	Narynkol village
	Total		194066	20626,4	

The total area is 194,066 hectares, of which 62,041 hectares are forests, located in the southeastern part of Almaty region in Raiymbek and Uighur administrative districts. The area is characterized by a pronounced mountainous terrain. The forest fund is represented by mountain forests growing on the mountain slopes of the Northeast Tian Shan and is unevenly located. The main massifs are situated in the southern part of the district, in the mountainous zone, along individual tracts and ravines on the slopes of various steepness and exposure. The most forested are the northern slopes of the Teriskey-Alatau mountain range. The forests mainly carry out a water regulating and soil protective role, and also have cultural and recreational functions.

Table 2. Total area

Total area (ha)			Change, ±
According to past forest inventory	according to present forest inventory		
	Total	Including long-term forest use	
188 298	194 066	20 626,4	+ 5 768

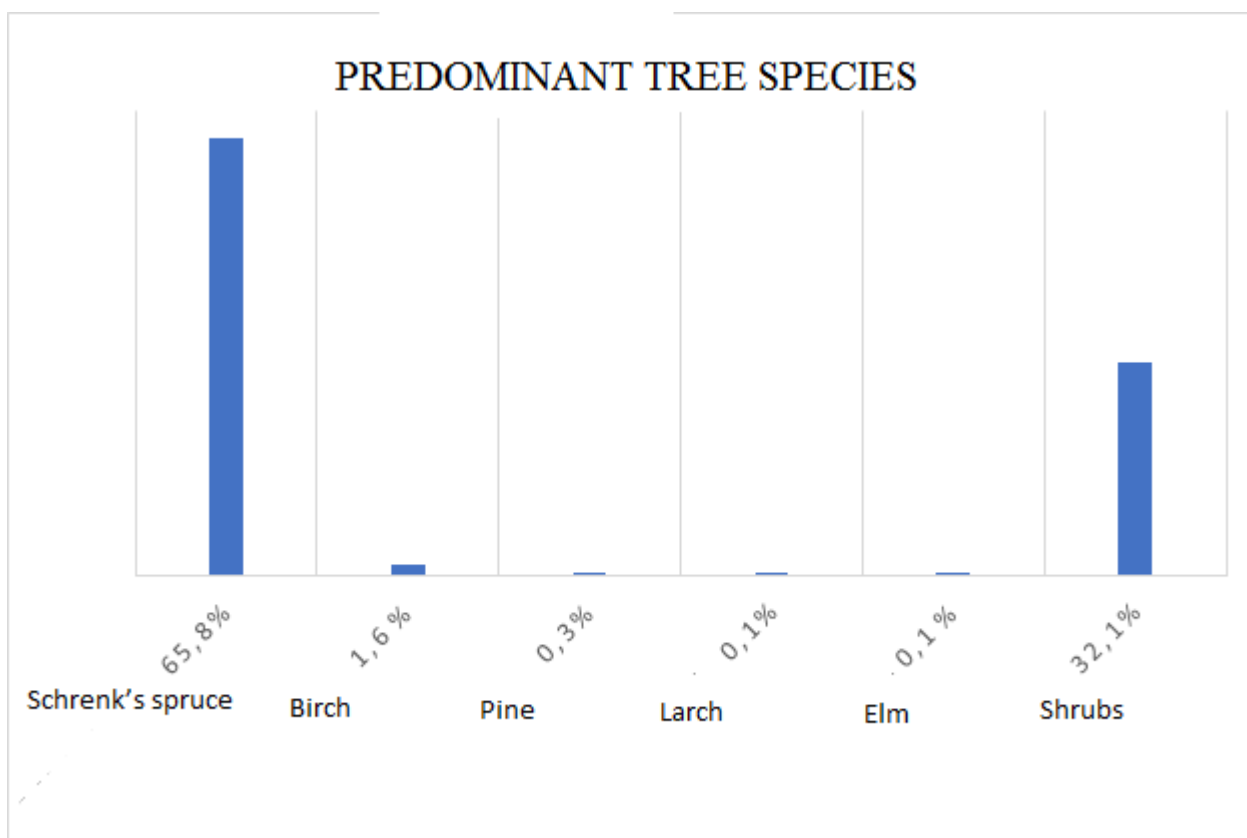
During the revision period, the forestry accepted 5836 ha into the forest fund, and transferred 68.5 ha from the forest fund. As a result, the total area increased by 5767.5 ha.

The predominant tree species are:

- Schrenk's spruce - 40823.3 ha (65.8%) of the forested land,
- birch –1027.3 ha (1.6%),
- pine - 158.6 ha (0.3%),
- larch - 37.9 ha (0.1%),
- elm - 24.5 ha (0.1%),

- mountain ash - 2.0 ha,
- apple tree - 1.4 ha.

Shrubs occupy 32.1% of the forested area. 1767.8 ha (2.8%) of the forested lands are artificial plantations (Schrenk's spruce - 1536.8 ha, pine - 157.1 ha, larch - 37.3 ha, elm - 22.5 ha, birch - 13, 1 ha, apple tree - 1.4 ha).



### 1.2. Carrying out forest management works

Forest management works were carried out in 2016 on an area of 194.1 thousand ha.

### 1.3. Reforestation and afforestation

Table 3. Reforestation for the period 2003-2018

Indicators	Reforestation for the period 2003-2018, ha															
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Including planting, ha	50	50	50	50	52	52	50	50	50	50	50	50	50	50	50	22
sowing, ha																
Promoting natural forest renewal																
Conversion to forested area, ha	50	50													23,2	

According to the data presented by the Office of Natural Resources and Environmental Management of Almaty region, reforestation was carried out annually, in particular, planting of forest crops on an area of 50-52 ha over the period 2003-2017, and in 2018 – on an area of 22 ha.

Forest management works covered 763.8 ha of forest crops of the revision period, of which 417.3 ha are closed forest crops, 346.5 ha are open forest crops, including under the forest canopy – 26.4 ha converted to forested area, 5.8 ha – open forest crops. The discrepancy in the data on areas

provided by the forestry and obtained during the forest inventory is 19.2 ha. The reason for the discrepancy is the inaccurate accounting of forest areas. The total area of kept forest crops, according to the present forest inventory, is 2108.9 ha, of which 1768.2 ha were converted to forested lands and 340.7 ha are open forest. In addition, the area of forest crops grown under the forest canopy is 423.7 ha, of which 417.9 ha were converted to forested areas and 5.8 ha are open forest.

There are areas of non-forested land that were not provided with sufficient natural renewal on an area of 312.3 ha designated for planting forest crops. The total area of glades and dead stands is to be planted with forest crops. Dead plantations on an area of 12,2 ha with a satisfactory renewal level are left for natural overgrowth. Glades and open stands on an area of 1374.7 ha not previously examined for suitability were designated for the soil examination.

#### 1.4. Forest conservation and protection

##### **Forest pests and diseases**

In accordance with the reporting documentation, there were no foci of mass reproduction of pests and forest diseases recorded in the area. The forest pathological examinations of the state forest fund plantations was conducted annually to detect any focus of pests and forest diseases. They were carried out by specialists, foresters with the participation of the forest guard to timely predict the occurrence of pests and forest diseases and the timing of their control. According to the results, pests and forest diseases were not detected. Of beyond focal pests, spruce barbel, Hauser's bark beetle, and large horntails are found in small numbers. Schrenk's spruce stands are affected by various types of rust, which does not cause mature trees' death and does not affect the growth.

##### **Fires**

Years	Total number of cases	Area covered by fire, ha				Damage (KZT, thousands)
		Total area	including forested area	of which by crown fire	Non forested	
2004	0	0	0	0	0	0
2005	1	20,1	0,1	0	0	5,6
2006	1	67,4	8,6	0	0	186,2
2007						
2008						
2009						
2010						
2011						
2012						
2013						
2014						
2015						
2016						
2017						
2018						
2019						
<b>Total</b>	<b>2</b>	<b>87,5</b>	<b>8,7</b>	<b>0</b>	<b>0</b>	<b>191,8</b>

Over the reviewed period, there were two cases of forest fires recorded in the area. The total area covered by forest fires according to the reporting data is 191.8 hectares. The main causes of forest

fires were careless handling of fire (80%) and others- agricultural burning (20%). Fires mainly started in rural areas and then spread to the forestry's area.

#### Illegal felling

Period (year)	Illegal felling		
	Number of cases	Volume, m <sup>3</sup>	Damage (KZT, thousands)
2004	18	15,1	90,1
2005	28	79,6	636,1
2006	29	60,9	283
2007	11	27,2	278,1
2008	4	16,64	77,8
2009	2	3,83	68,9
2010	0	0	0
2011	1	4,25	19,2
2012	0	0	0
2013	1	2,55	13,2
2014	0	0	0
2015	15	11,097	22
2016	4	0,5	1,45
2017	3	0,25	1,9
2018	1	2	14,4
2019	0	0	0
Total	117	223,917	1506,15

Protection of forests from illegal felling and other violations in the area is at the proper level. Many illegal felling cases were detected during the inventory. During the analyzed period, 117 cases of illegal felling were recorded with 223.917 m<sup>3</sup> of forest stands illegally cut down and the damage caused amounting to KZT 1506.15 thousand.

#### Poaching

For the analyzed period, there were no cases detected.

#### 1.5. Staff

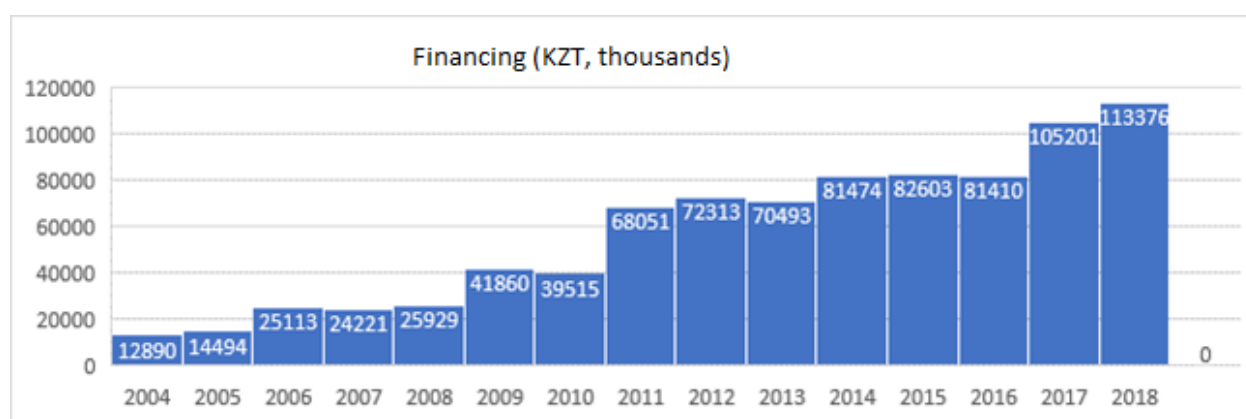
Year	Staff number	Staff turnover	Level of education		
			higher	Secondary professional	Secondary
2004	57	6	15	13	29
2005	57	5	19	20	18
2006	57	4	18	13	26
2007	59	4	18	14	27
2008	59	6	18	16	25
2009	59	3	18	16	25
2010	73	7	18	15	40
2011	74	5	17	16	41



2012	74	5	17	15	42
2013	81	9	20	21	40
2014	81	4	20	22	39
2015	82	7	21	21	40
2016	82	5	21	20	41
2017	82	5	20	19	43
2018	82	8	20	19	43
2019	84	3	22	21	41

Currently, the staff number is 84 people, including 48 foresters. The level of coverage of forestry workers with further training is not sufficient. Every year prior to the start of the fire danger period, forest guard training is conducted (according to the order of the Forestry and Wildlife Committee under the Ministry of Agriculture). Once every three years training (of deputy directors, engineers and foresters) on safety and labor protection is carried out by specialized organizations with certificates given after. Also, once every three years at the request of the Fire Safety Department, training (of deputy director, engineers and foresters) on fire protection is carried out with certificates issued after. Specialized further education programs and trainings were not conducted.

#### 1.6. Financing



The data show an upward trend in the level of financing, from KZT 12,890.0 million in 2004 to KZT 113,376.0 million in 2018.

### 1.7. Long-term forest use

Years	Types of forest use /area															
	For health, recreational, cultural, tourist and sports purposes		For hunting		For grazing		For haying		Placement of beehives and apiaries		For research		For plantations of special purpose.		Total:	
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004															0	0
2005															0	0
2006															0	0
2007	3	606			1	1000									4	1606
2008															0	0
2009	1	5	1	1,5	1	1000									3	1006,5
2010	4	22			4	3409									8	3431
2011	2	12			1	233,7									3	245,7
2012	2	8	1	1	4	1442									7	1451
2013	2	7			4	932,4									6	939,4
2014	5	23			7	3469,8									12	3492,8
2015	1	1	2	15,8	9	4853,8									12	4870,6
2016	2	3			4	1627,2									6	1630,2
2017	3	11,6			2	626									5	637,6
2018	2	7			5	1497,4									7	1504,4

Cattle grazing in the area is made on lands converted to long-term use. But there are cases of illegal cattle grazing on forest lands that were not converted to a long-term use, thereby causing damage to reforestation processes. No measures are taken to improve pastures by farms for which they are assigned for a long-term use. In some tracts, such as Shubartal in summer, pastures can be significantly overloaded, which leads to a decrease in the productivity of pasture lands and contributes to the development of erosion. Cattle grazing in the forest negatively affects natural renewal and plantations growth. As a result of excessive cattle grazing, forest leaf litter and fertile surface soil horizon are destroyed, soil is compacted, conditions for natural renewal worsen, and stand protective properties weaken.

### 1.8. Wood harvesting

Cutting types	Wood harvesting, m <sup>3</sup>																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intermediate use, including:	2500	1661	800	415	361	237	265	294	245	197	219	289	460	398	0	207	0
Forest thinning	0	0	0	0	0	0	0	0	0	0	0	211	172	99	0	164	
Selection sanitary felling	2500	1661	800	415	361	237	265	294	245	197	219	78	288	299	0	43	
Other types, including	0	0	0	0	103	378	78	104	169	416	0	430	81	0	90	150	0
Clear sanitary felling	0	0	0	0	0	0	0	0	80	0	0	28	0	0	0	0	
Cleaning forest clutter	0	0	0	0	103	378	78	104	89	416	0	402	81	0	90	150	
Forest clearing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

For the analyzed period, Narynkol MPU did not carry out primary-use cutting. Intermediate use cutting was carried out all the years, 8,548 m<sup>3</sup> of wood was harvested, of which selection sanitary felling accounted for 7,902.0 m<sup>3</sup>, forest thinning – 646.0 m<sup>3</sup>. Other purposes amounted to 1,999.0 m<sup>3</sup> of cut wood, of which clear felling – 108.0 m<sup>3</sup>, cleaning clutter– 1,891 m<sup>3</sup>.

### 1.9. *Technical equipment of Narynkol forestry for 2018*

Technical equipment (name, quantity (norm, availability, need)) in accordance with the norms and standards for forest conservation, protection and use, reforestation and afforestation, approved by orders of the Minister of Agriculture dated July 20, 2015 No. 18-02 / 664.

No	Name	Norm	Available	% degree of wear	Required additionally	Price KZT, thousands	Total amount KZT, thousands
1	Motor pump	7	10	50	5	180,0	900,0
2	Two-way disc plough	1	1	100	1	400,0	400,0
3	Milling machine						0
4	Fire-break equipment						0
5	Bulldozer	1	1	100	1	12840,0	12840,0
6	Tractors, 3 drawbar category	5	3	60	4	6799,5	27198,24
7	Tractor trailer	2	2	100	2		0
8	Mounted sickle bar mower	1	1	100	1	300,0	300,0
9	Disc harrow	1	1	97,5	1		0
10	Tine harrow						0
11	Cultivator	1	1	100	1	450,0	450,0
12	Trench digger						0
13	Chainsaw	7	10	66	4	50,0	50,0
14	Fire fighting knapsacks	195	175	60	110	25,0	2750,0
15	Radio transceiver:	112	122	0			0
16	stationary (fire-chemical station, office)	28	28	0			0
17	Fire flapper	1280	1280	0			0
18	Bucket	184	184	0			0
19	Shovel	301	301	0			0
20	Axe	127	127	0			0
21	Binoculars	63	40	50	23	25,0	575,0
22	Fire hose	720	620		100	9,0	45,0
23	Power generator	4	4	50	2	200,0	400,0
24	Mobile radio transceivers (Fire truck and patrol vehicles)	10	11	50	5		0
25	Hand-held two-way radio	74	86	0			0

26	Car mobile transceiver	10	8	0			0
27	Satellite navigation devices (cars)	1		0			0
28	Drip torch	6	4		2	115,0	230,0
29	Pike pole	25	25	0			0
30	Pry bar	6	6	0			0
31	Motorcycle, horse, ATV	Moto 5, a/t 63	Moto 2, a/t 43	100	20	200,0	4000,0
32	Fire engine	2	1				0
33	UAZ car (patrol)	5	5	80	2	6000,0	12000,0
34	Niva car	3	3	70	2	5000,0	10000,0
35	UAZ (onboard)						0
36	Other cars	3	3	50	1		0
37	Solar battery (included)	20	25	70	15	58,0	870,0
38	All-terrain Ural car	2	1	100	2		0
39	Snowmobile						0
40	Quadcopter (drone)						0
41	Winter clothes	62	62	100	62	30,0	1860,0
42	Summer clothes	62	62	100	62	25,0	1550,0
	Total:						

To strengthen technical equipment, KZT 76418.24 thousand is required.

## 2. Zhongar forestry

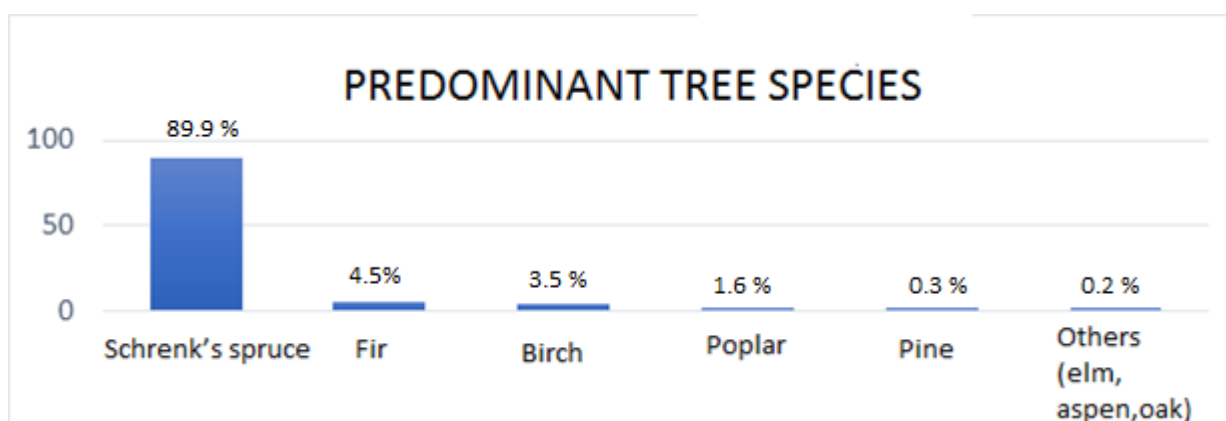
### 2.1. General information

Contacts: 1 Akkaiyn Str., Kapal village, Aksu district, Almaty region. Tel: 8 (72832) 3-18-11, email: [leshov.kapal@mail.ru](mailto:leshov.kapal@mail.ru). The office is located in Kapal village, 80 km of Taldykorgan and 50 km of Zhansugirov village.

Zhongar Forestry MPU was established in 1991. The total area is 33,077 ha, of which 11,357 ha are forested. The forestry consists of one forest division – Aksu-Arasan. The forestry is located within the Zhongar-Alatau mountain range. There are a total of two categories of SFF found here: restricted forest belts along the banks of rivers, lakes, reservoirs, canals and other water bodies, and defensive forests.

The main tree species occupy 4876.5 hectares or 37.6% of the forested land, and shrubs account for 8101.5 hectares or 62.4%.

The main species are: Schrenk's spruce - 4380.5 ha (89.9%), fir - 219.5 ha (4.5%), birch - 171.2.0 ha (3.5%), poplar - 79.7 ha (1.6%), pine - 14.8 ha (0.3%), elm, aspen and oak - 10.8 ha (0.2%).



The predominant species are spruce, fir and birch. They are mainly located on steep and very steep mountain slopes. So, 4035.8 ha (92.1%) of spruce stands are located on slopes of 21-31 degrees or more, 185.6 ha (93.6%) of fir stands are also situated on slopes of 21-31 degrees or more.

The distribution of tree stands by age is not uniform. Spruce stands are mostly of 5-7 age classes, fir – of 5 age class, pine stands – of 4 age class, birch trees – of 7 age class, poplar stands – of 5-6 age classes, elm – of 8 age class; juniper thickets – of 4-5 age classes, other shrubs – of 5 and 8 age classes.

### 2.2. Carrying out forest management works.

Forest management works were carried out in 2018 on an area of 31,6 thousand ha.

### 2.3. Reforestation and afforestation

Indicators	Reforestation for the period 2003-2018, ha															
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Including planting, ha	10	10	10	10	8	0	0	0	10	10	10	0	0	0		
sowing, ha																
Promoting natural forest renewal	20	20	20	20	20	20	20	20	20	20	20	20	20	20	10	10

Conversion to forested area, ha							12				20			0	0
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During the period from 2003 to 2018, the forestry planted 78.0 ha of forest crops, of which 23.5 ha or 30.1% were kept. The reason for the death of forest crops is the growing conditions mismatch (forest crops were planted on non-forested lands).

Currently, the forestry has one permanent forest nursery with an area of 20.0 hectares, of which only 2.0 hectares is used for cultivating planting material. The remaining 18 hectares of the nursery are partly overgrown with woody vegetation and are not used for forest farming. It is necessary to carry out reconstruction of this area and use it for cultivating tree species. The need for forest tree seeds is met by harvesting them on temporary forest seed plots.

Tree seeds harvesting was carried out during the entire inventory period. However, there are no data on this activity from 1995 to 2005, therefore, data only starting from the year 2006 are taken for analysis. On average, for the year of the analyzed period, 25 kg of seeds of oak, Schrenk's spruce, birch, elm, and oleaster tree were harvested. In the year preceding the inventory, 30 kg of seeds, including 5 kg of Schrenk's spruce, 20 kg of oak and 5 kg of elm seeds were obtained. The need for forest seeds is met by harvesting them on temporary forest seed plots. Seeds harvesting was carried out in accordance with the planned tasks of the Office of Natural Resources and Environmental Management of Almaty region. Seeds were collected and processed manually before being sent for check to the Kazakh State Forest Seed Institution.

There are no permanent forest seed plots on the territory.

#### 2.4. Forest conservation and protection

##### **Forest pests and diseases**

In accordance with the reporting documentation, there were no foci of mass reproduction of pests and forest diseases registered in the area.

##### **Fires**

According to forest fire zoning, the territory is assigned to Dzhungar-Alatau forest fire zone with a fire danger period of 204 days. The average fire danger level is 3.0. Forest fire protection and fire detection are carried out by both State Forest Guard Station and the Kazakh Base for Aviation Forest Protection and Forestry Services. Forest area covered by ground protection amounts to 8361.0 ha (26.4%), aviation protection - 23316.0 ha (73.6%). Hard-to-reach mountainous area is classified as forest aviation protection zone. For the analyzed period, according to the Office, there were no cases of fires.

##### **Illegal felling**

In accordance with the reporting documentation, there were no cases of illegal felling.

##### **Poaching**

For the analyzed period, there were no cases detected.

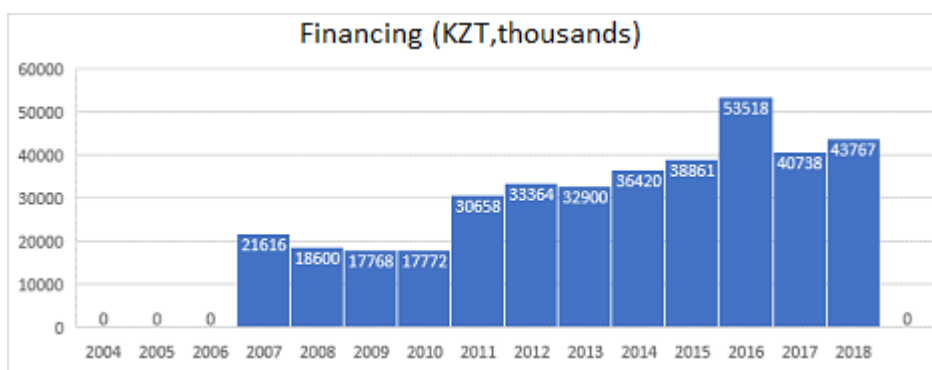
#### 2.5. Staff

Year	Staff number	Staff turnover	Level of education		
			higher	Secondary professional	secondary
2004	25	4	7	5	13
2005	25	10	7	5	13
2006	25	3	6	2	17
2007	25	9	5	6	14

2008	25	5	5	6	14
2009	25	6	5	6	14
2010	27	7	5	6	14
2011	27	5	5	6	14
2012	27	6	5	6	14
2013	34	4	8	8	18
2014	34	4	8	8	18
2015	34	5	7	11	16
2016	34	6	6	11	17
2017	34	8	7	6	21
2018	34	9	9	10	15
2019	35	7	10	10	15

Currently, the staff number is 35 people, including 14 foresters. The level of coverage of forestry workers with further training is not sufficient. Every year prior to the start of the fire danger period, forest guard training is conducted (according to the order of the Forestry and Wildlife Committee under the Ministry of Agriculture). Once every three years training (of deputy directors, engineers and foresters) on safety and labor protection is carried out by specialized organizations with certificates given after. Also, once every three years at the request of the Fire Safety Department, training (of deputy director, engineers and foresters) on fire protection is carried out with certificates issued after. Specialized further education programs and trainings were not conducted.

## 2.6. Financing





### 2.7. Long-term forest use

Year s	Types of forest use /area															
	For health, recreational, cultural, tourist and sports purposes		For hunting		For grazing		For haying		Placement of beehives and apiaries		For research		For plantations of special purpose.		Total:	
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004															0	0
2005															0	0
2006															0	0
2007															0	0
2008															0	0
2009															0	0
2010															0	0
2011															0	0
2012															0	0
2013					3	2201									3	2201
2014			1	1	3	2328,2									4	2329,2
2015															0	0
2016					2	557									2	557
2017															0	0
2018															0	0

The leading economic sector in the area where the forestry is located is agriculture, with animal husbandry and field husbandry being the main activities. Therefore, anthropogenic impact on forests here depends to a greater extent on agricultural enterprises. As a result of non-compliance by agricultural enterprises with rules for grazing cattle, in areas of intensive cattle grazing in the forests, undergrowth and ground cover are damaged.

## 2.8. Wood harvesting

Cutting types	Wood harvesting, m3																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intermediate use, including:	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
Forest thinning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Selection sanitary felling	0	23	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Other types, including	0	0	0	0	0	0	0	49	0	0	0	0	0	0	0	87	0
Clear sanitary felling	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Cleaning forest clutter	0	0	0	0	0	0	0	49	0	0	0	0	0	0	0	87	
Forest clearing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

## 2.9. Technical equipment of Zhongar forestry for 2018

No	Name	Norm	Available	% Degree of wear	Required additionally	Price, KZT thousands	Total amount KZT thousands
1	Motor pump	3	3	50%	-	-	-
2	Two-way disc plough	1	0	0	1	1000,0	1000,0
3	Milling machine	1	0	0	1	2850,0	2850,0
4	Tractors, 3 drawbar category	2	2	75	-	-	-
5	Tractor trailer	1	1	60	-	-	-
6	Mounted sickle bar mower	1	1	30	-	-	-
7	Disc harrow	1	1	60	-	-	-
8	Tine harrow	1	1	60	-	-	-
9	Cultivator	1	1	40	-	-	-
10	Trench digger	1	1	50	-	-	-
11	String trimmer	2	2	50	-	-	-
12	Chainsaw	5	5	50	-	-	-
13	Fire fighting knapsacks	79	84	70	-	-	-
14	Radio transceiver:	44	44	50	-	-	-
15	stationary (fire-chemical station, office)	7	7	50	-	-	-
16	Fire flapper	230	284	40	-	-	-
17	Bucket	20	21	50	-	-	-
18	Shovel	50	53	50	-	-	-
19	Axe	40	46	50	-	-	-
20	Binoculars	20	20	40	-	-	-
21	Fire hose	600	600	50	-	-	-
22	Blower	1	1	50	-	-	-
23	Power generator	2	2	50	-	-	-
24	Mobile radio transceiver (Fire trucks and patrol vehicles)	10	10	0	0	-	-
25	Hand-held two-	27	27	50	-	-	-

	way radio						
26	Car mobile transceiver	9	10	60	-	-	-
27	Satellite navigation devices (cars)	1	1	50	-	-	-
28	Drip torch	3	3	50	-	-	-
29	Pike pole	10	10	50	-	-	-
30	Pry bar	10	7	50	3	-	-
31	Motorcycle, horse, ATV	26	19	50	7	240,0	960,0
32	Fire engine	1	1	50	-	-	-
33	UAZ car (patrol)	3	3	50	-	-	-
34	Niva car	2	2	40		-	-
35	UAZ (onboard)	1	1	50	-	-	-
36	Other cars	1	2	50	-	-	
37	Solar battery (included)	1	1	40	-	70,0	70,0
	Total:	1220	1256				4880,0

In order for the forestry to carry out high-quality reforestation activities, forest cultivation works, as well as forest protection from poaching and forest fires, KZT 4880.0 thousand to improve technical equipment is required.

### 3. Bakanas forestry

### 3.1. General information

Contacts: 7 Zhabayev Str., Bakanas village, Balkhash district, Almaty region. Tel: 8 (72773) 91-3-40.95-3-18, e-mail: [boshmm@mail.ru](mailto:boshmm@mail.ru).

Bakanas forestry was established in 1959. The total area is 1,218,920.0 ha, of which 851,451 ha is forested.

Table 1. Total area

Total area (ha)			Change, ±
According to past forest inventory	according to present forest inventory		
	Total	Including long-term use	
1 558 997	1 218 920.0	20 626.4	- 340 077

The decrease in the area by 340,077 hectares happened due to the creation of Ile-Balkash natural reserve.

The forestry consists of four forest divisions.

Table 1. Distribution of forestry area by forest divisions

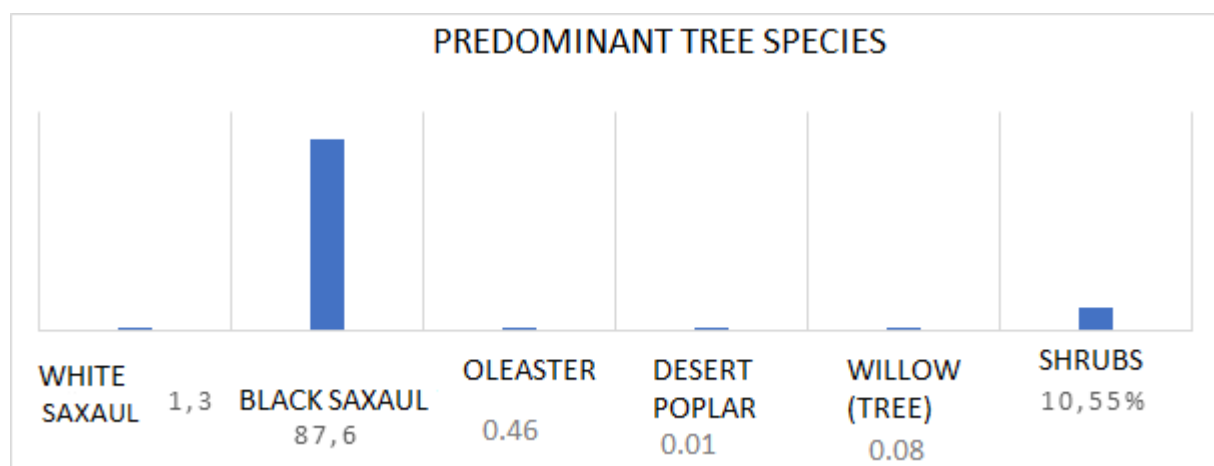
No.	Name	District	Area, ha		Location of forest division and forestry offices
			Total	Including long-term forest use	
1.	Bakanas	Balkash	305417		Bakanas village
2.	Karoy	Balkash	414707		Karoy village
3.	Akkol	Balkash	92278		Ushzharma village
4.	Koktal	Balkash	406518		-/-
	Total		1 218 920,0	12 441,0	

The percentage of forested area is 25.5%, while the average percentage of forest cover in Almaty region is 12%. Forests are mainly represented by saxaul thickets; tugai forests grow in the Ile River floodplain. The most productive plantations are located along the old streams (Shetbakanas, Naryn, etc.). Tugai stands along the Ile River floodplain, also do not form continuous massifs, but stretched along the river as narrow stretches.

In the district's economy forest husbandry is not a leading sector and its share in the district's gross output is rather small, however, it satisfies the district's need for firewood. Commercial timber is not available in the district; it is imported from Almaty.

There is a temporary forest nursery with an area of 5.0 ha, located in Bakanas forest division (compartment 258, subcompartment 6) where such species as Scots Pine, Apple Tree, Thuja, Schrenk's spruce, Birch, Ash tree are grown.

The predominant species are black saxaul - 745 996.0 ha or 87.6%, white saxaul - 11 706 ha or 1.3%, oleaster - 3 947 ha or 0.46%; a large area is occupied by tamarisk - 53 147 ha, desert poplar takes 3 hectares, shrubs (common salt tree, tamarisk, etc..) occupy 10.55%.



### 3.2. Carrying out forest management works

The latest forest management works were carried out in 1994; there are forest management works being carried out this year.

### 3.3. Reforestation and afforestation

Indicators	Reforestation for the period 2003-2018, ha															
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Reforestation, total	200	402	500	550	570	180	200	280	200	300	300	305	120	120	120	120
Including planting, ha								10	50	50	50	55	20	20	20	20
Sowing, ha	200	402	500	550	570	180	200	270	150	250	250	250	100	100	100	100
Promoting natural forest renewal			400	600	700	1000	1040	1040	1520	1520	1520	1520				
Conversion to forested area, ha				108		180	200	160	150	160					1924	5440

According to the data provided by the Office of Natural Resources and Environmental Management of Almaty region, reforestation was carried out annually; in particular, planting forest crops on 10-55 ha from 2010 to 2014, and from 2015 to 2018 annually on an area of 20 ha. Sowing work was carried out annually on areas from 100 to 570 ha per year. In total, reforestation covered the area of 4467 ha with natural forest renewal on an area of 9,340.0 ha promoted.

### 3.4. Forest conservation and protection

#### **Forest pests and diseases**

In accordance with the reporting documentation, there were no foci of mass reproduction of pests and forest diseases registered in the area

#### **Fires**

Year	Total number of cases	Area covered by fire, ha				Damage, KZT thousands
		Total area	including forested area	Of which by crown fire	Non forested	

2004	3	18,3	6,1		12,2	17,1
2005	3	7,1	5		2,1	49,9
2006	3	5,6	5,6			82,9
2007						
2008	2	2,3	0,4		1,9	51,6
2009						
2010						
2011						
2012	1	22	22			111,4
2013	1	39	39			130,2
2014						
2015						
2016						
2017						
2018						
2019	1	13,7	13,7	13,7		242,6
Total	<b>14</b>	<b>108</b>	<b>91,8</b>	<b>13,7</b>	<b>16,2</b>	<b>685,7</b>

For the analyzed period, there were 14 cases of forest fires recorded. The total area covered by forest fires according to the reported data is 108 ha, of which 91.8 ha are forested. Damage caused by fires amounted to KZT 685.7 thousand.

#### Illegal felling

Period (year)	Illegal felling		
	Number of cases	Volume, m <sup>3</sup>	Damage KZT, thousands
2004	59	86,15	325
2005	18	38,3	85,3
2006	22	42,7	131,4
2007	15	36	154,3
2008	20	42,7	238,8
2009	22	86,6	241,5
2010	5	9,5	67,1
2011	1	1	7,5
2012	15	30	242,7
2013	15	44,5	385,1
2014	4	2,5	21,2
2015	6	7,6	75,8
2016	2	1,65	17,4
2017	3	3,4	38,6
2018	1	2	24
2019	2	3,1	39,1
Total	<b>210</b>	<b>437,7</b>	<b>2094,8</b>

Over the analyzed period, there were 210 cases of illegal felling recorded with 437.7 m<sup>3</sup> of wood cut down and the damage caused amounting to KZT 2094.8 thousand. In recent years, the amount of illegal felling has decreased.

### Poaching

Over the analyzed period, there were 6 cases of poaching revealed, with the amount of damage making up KZT 66.8 thousand.

Period (year)	Number of cases	Number of poached animals	Damage KZT, thousands
2004	-	-	-
2005	-	-	-
2006	-	-	-
2007	-	-	-
2008	-	-	-
2009	-	-	-
2010	-	-	-
2011	-	-	-
2012	-	-	-
2013	-	-	-
2014	1	1	3,7
2015	1		18,5
2016	1	1	10,6
2017	3	3	34
2018	-	-	-
Total	6	5	66,8

### 3.5. Staff

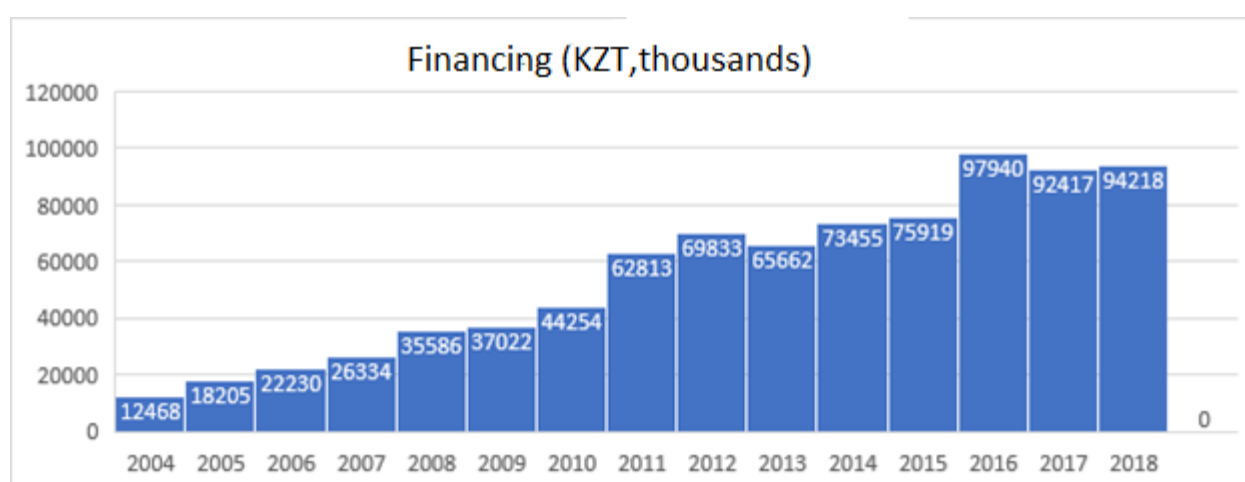
Year	Staff number	Staff turnover	Level of education		
			higher	Professional secondary	Secondary
2004	54	15	6	12	36
2005	54	4	6	10	38
2006	54	9	7	11	36
2007	57	6	9	16	1
2008	58	8	10	16	31
2009	61	5	14	18	17
2010	77	10	22	20	20
2011	79	8	22	25	32
2012	79	7	20	31	28
2013	86	5	25	30	30
2014	86	11	24	31	31
2015	86	9	24	34	28
2016	87	9	26	34	27



2017	87	4	27	33	27
2018	80	12	25	28	26
2019	82	26	25	27	29

Currently, the staff number is 82 people, including 25 people having higher education, 27 people having professional secondary education, 29 people with secondary education. The level of coverage of forestry workers with further training is not sufficient. Every year prior to the start of the fire danger period, forest guard training is conducted (according to the order of the Forestry and Wildlife Committee under the Ministry of Agriculture). Once every three years training (of deputy directors, engineers and foresters) on safety and labor protection is carried out by specialized organizations with certificates given after. Also, once every three years at the request of the Fire Safety Department, training (of deputy director, engineers and foresters) on fire protection is carried out with certificates issued after. Specialized further education programs and trainings were not conducted.

### 3.6. Financing



Financing volumes increased annually from 2004 to 2018, with a total increase of 7.5 times

### 3.7. Long-term forest use

Years	Types of forest use /area															
	For health, recreational, cultural, tourist and sports purposes		For hunting		For grazing		For haying		Placement of beehives and apiaries		For research		For plantations of special purpose.		Total:	
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004															0	0
2005															0	0
2006															0	0
2007															0	0
2008															0	0
2009															0	0
2010															0	0
2011	6	236													6	236
2012	12	1215,8			8	11270									20	12485,8
2013	10	890,8			6	5340									16	6230,8
2014	14	1674,4			7	7420									21	9094,4
2015	19	4792,8			8	7620									27	12412,8
2016	21	4885,7			12	18966									33	23851,7
2017	23	5013,7			11	19826,9									34	24840,6
2018	28	4899,5			12	20288									40	25187,5

The leading economic sector in the area where the forestry is located is agriculture, with animal husbandry and field husbandry being the main activities. Therefore, anthropogenic impact on forests here depends to a greater extent on agricultural enterprises. As a result of non-compliance by agricultural enterprises with rules for grazing cattle, in areas of intensive cattle grazing in the forests, undergrowth and ground cover are damaged.

### 3.8. Wood harvesting

Cutting types	Wood harvesting, m <sup>3</sup> .																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intermediate use, including:	3400	0	3866	0	0	383	608	310	300	0	0	0	0	0	0	0	0
Forest thinning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Selection sanitary felling	3400	0	3866	0	0	383	608	310	300	0	0	0	0	0	0	0	
Other types, including	6700	2731	3073	7409	6772	6295	5688	3818	3651	5448	1557	0	0	0	0	0	0
Clear sanitary felling	4700	0	3073	7409	6772	6295	5688	3818	3651	5448	1557	0	0	0	0	0	
Cleaning forest clutter	2000	2731	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Forest clearing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

Until 2013, intermediate and other cuttings were carried out; since 2014 there have been none. During the analyzed period, 48 411 m<sup>3</sup> of wood was harvested during clear sanitary felling; 8867 m<sup>3</sup> of wood was felled during selection sanitary felling.

### 3.9. Technical equipment of Bakanas forestry for 2018

No	Name	Norm	Available	% Degree of wear	Required additionally	Price, KZT thousands	Total amount KZT thousands
1	Motor pump	4	8	70%	-		
2	Two-way disc plough	1	1	80%	-		
3	Fire hose д-77; д-66: д-51	15	8	60%	7	10,2	81,9
4	Firefighter apparel	10	3	90 %	7	55,7	167,1
5	Bulldozer	1	-	0%	-		
6	Tractors, 3 drawbar category	5	3	30 %	2	5000,0	15000,0
7	Chainsaw	1	4	50%	-		
8	Fire fighting knapsacks	97	47	60%	50	21,0	987,0
9	Radio transceiver:	11	8	50%	3	50,0	400,0
10	stationary (fire-chemical station, office)	6	5	20%	1	80,0	400,0
11	Hand-held two-way radio	66	52	40%	14	43,0	2236,0
12	Satellite navigation devices (cars)	5	1	80%	4	75,2	75,2
13	Drip torch	3	4	80%	-		
14	Motorcycle,	15	11	60%	4	320,0	3520,0
15	Fire engine	4	3	50%	1	15000,0	45000,0
16	UAZ car (patrol)	8	7	50%	1	10996,0	21992,0
18	Solar battery (included)	7	5	60%	2	74,9	374,9
19	GAZ 66 car	1	1	60%	-		
20	Horse	20	20	50%	-		
21	Water distributor	3	2	70%	1	1350,0	2700,0
22	<b>Total:</b>	<b>282</b>	<b>193</b>		<b>97</b>		<b>92 934,1</b>

In order for the forestry to carry out high-quality reforestation activities, forest cultivation works, as well as forest protection from poaching and forest fires, KZT 92 934,1 thousand to improve technical equipment is required.

## 4. *Uigur forestry*

### 4.1. *General information*

Contacts: 7 Karibay Merekeev Str., Chundzha village, Uigur district, Almaty region. Tel: 8 (72778) 2-18-51, 2-21-82, 2-14-10, e-mail: [uigurleshoz@inbox.ru](mailto:uigurleshoz@inbox.ru). The office is located in Chundzha village, 360 km of Taldykorgan and 240 km of Almaty.

Uigur forestry was founded in 1947 and is located on the territory of Uigur district in the north-eastern part of Almaty region. The total area is 258,814.0 hectares, of which 117,524.2 hectares are forested.

Table 1. Total area

Total area (ha)			Change, ±
According to past forest inventory	according to present forest inventory		
	Total	Including long-term use	
264 014	258 814	6594.98	- 5 200

Compared to 1995, the total area has decreased by 5200 ha due to border demarcation with the People's Republic of China and the refinement of areas by forest management (currently amounts to 258 814 ha). The forestry consists of five forest divisions.

Table 1. Distribution of forestry area by forest divisions

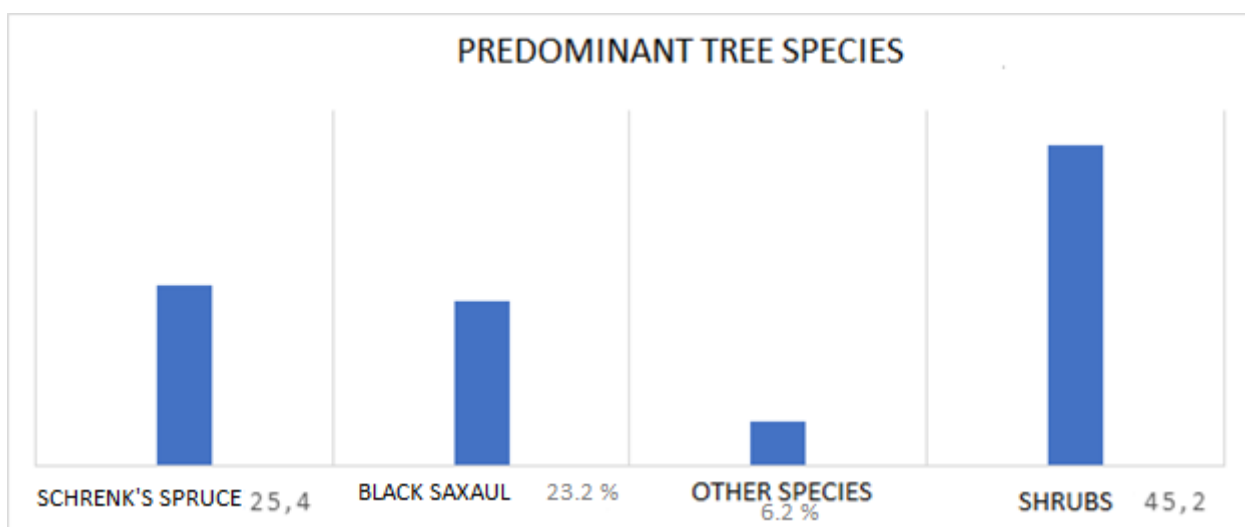
N o.	Forest division	District	Area, ha	Location of forestry office	Converted to long-term use		
					Area, ha	conversion document number and date	For a period of...years
1	Ketmen	Uigur	50540	Ketmen village	757,2	-	49
2	Aksu	Uigur	32369	Big Aksu village	2,0	-	49
3	Podgora	Uigur	15285		6,0	-	49
4	Charyn	Uigur	103120	Charyn village	4677,6	-	49
5	Upper-Ile	Uigur	57500	Arasan	2117,5		49
	Total		258814		7560,7		

Forest fund lands are located on the territory of Uigur district of Almaty region, 13.9% of which is forest cover. There are mountain and plain forests in the area. Mountain forests occupy 98 194 hectares, which is 37.9% of the forestry area, plain forests – 160 620 hectares or 62.1%. In terms of accessibility, mountain forests are distributed as follows: 6,450 ha (6.6%) are hard to access; 91,744 ha (93.4%) – accessible.

Four state forest fund categories are presented here: green zones - 350 hectares or 0.1% of the total area, restricted zones - 62 600 ha (24.2%), protective strips - 3 290 hectares (1.3%), protection forests – 192 574 ha (74.4%).

Forest land is distributed over state forest fund categories as follows: the largest area is occupied by protection forests 74.4% (105 591.3 ha), the smallest – green zone 0.1% (82.4 ha.); restricted zones occupy 24.5% (34830.6 ha), protective strips - 1.0% (1380.4 ha) of the total forest land.

Of the total forested area (117,524.2 ha), Schrenk's spruce occupies 25.4% (29,849.7 ha), black saxaul – 23.2% (27,224.8 ha), other tree species account for 6.2% (7259.8 ha), shrubs occupy an area of 45.2% (53189.9 ha).



There are no permanent forest nurseries on the territory. There are eight temporary forest nurseries with a total area of 29.2 hectares.

About fifteen tree and shrub species are grown in the nurseries, which are used by the local population for landscaping. So in 2015: 11.65 thousand Schrenk's spruce seedlings, 50.0 thousand saxaul seedlings, 3.03 thousand apple trees seedlings, 4.09 thousand apricot seedlings, 9.8 thousand oriental thuja seedlings, 25.0 thousand poplar seedlings, 16.0 thousand chestnut seedlings, 1.2 thousand oak seedlings, 1.0 thousand Crimean pine seedlings, 5.0 thousand Scots pine seedlings, 0.6 thousand hawthorn seedlings, 0.5 thousand birch seedlings, 0.24 thousand blue spruce seedlings and others were created, with 7.3 thousand units of planting material accounting for KZT 13,240.5 thousand being sold.

Also, there are plantations of Christmas trees with a total area of 17.4 hectares, which were planted over 1995-2016. In Ketmen forest division there are plantations of Christmas trees with an area of 8.4 hectares, in Aksu - 7.0 hectares, in Podgora - 2.0 hectares. In Charyn forest division (compartments 133,139,140,141), there is desert poplar genetic reserve with an area of 320.0 ha.

On the territory of Aksu forest division (compartment 30), there are certified plus trees of Schrenk's spruce (60 pieces) and plus stands of Schrenk's spruce with an area of 10 hectares. The volume of harvested seeds in 2015, according to the inventory data, was 77 kg, including: Schrenk's spruce - 20 kg, saxaul - 50 kg, oriental thuja - 7 kg. The forestry has a warehouse for storing seeds; seeds are stored in glass bottles.

#### 4.2. Carrying out forest management works

Forest management works were carried out in 2016

#### 4.3. Reforestation and afforestation

[illegible]

Conversion to forested area, ha	50	50													23,2	
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According to the data provided by the Office of Natural Resources and Environmental Management of Almaty region, reforestation was carried out annually, in particular, planting of forest crops on 32-35 ha from 2003 to 2016, and in 2017-2018 – sowing on an area of 45.5 ha. Of the total planted area of 487 hectares, according to the Office, only 100 hectares were converted to the forested area, which is 20.5%.

Forest inventory was carried out from 1995 to 2016. Of the 729.0 ha of planted crops, 559.9 ha (76.8%) were kept, 110.0 ha (15.1%) were written off, and 59.1 ha (8.1%) were counted as lost.

Information on older forest species planted is taken from past forest inventories. The total area of forest crops amounted to 10,420.2 hectares; in addition, forest crops under the forest canopy make up 363.7 hectares. Of the total area of forest crops of older ages, the forestry wrote off 899.0 ha, and 206.5 ha under the forest canopy.

The difference between the older forest species identified during the inventory (10784.4 ha) and accounting records of past inventories (10787.9 ha) is 3.5 ha. These are areas of kept forest species on the areas which were considered dead and written off by the forestry. The difference in the area of crops between the forest management records and information provided by natural resources Office shows that the conversion of forest crops to the forested area is not timely.

Forest crops in the accessible part are to be planted in glades - 157, 0 ha. In the accessible part, 38.0 ha of burnt areas and dead plantations with satisfactory renewal level are planned for natural overgrowing. In addition, 390.0 ha of cut areas are planned for natural overgrowth.

According to the minutes of the first forest management meeting, the following non-forested lands on an area of 23,733.2 ha were left without use:

- 1) glades and open stands - 21,045.5 ha, no sufficient reforestation, not previously examined for forest suitability, designated for soil examination;
- 2) glades and open stands of small area and complex configuration–158.3 ha;
- 3) glades of very dry and moist forest types - 20.0 ha;
- 4) glades and open stands of 295.7 ha with a yield of rocks of more than 30%;
- 3) glades and open stands of 2213.7 ha inaccessible for economic activity.

23.0 ha of glades and 62.0 ha of open stands in the inaccessible part were left without economic use. The annual forest crop production projected by forest management is 10.5 ha.

#### 4.4. Forest conservation and protection

##### **Forest pests and diseases**

During the analyzed period, forest protection measures were carried out on the territory, as provided for by the plan and sanitary necessity.

The following measures were carried out: ongoing forest pathological examination; soil excavation; making and hanging nests; ground fighter control measures (whitewashing, 2-time spraying), including treatment with Karate and Fastac; pruning dry branches infected with pests.

The sanitary condition of the forests is satisfactory.

Year	Forest pests and diseases, ha							Total area, ha
	codling moth	tortrix moth	winter moth	mottled umber	apple ermine moth	gypsy moth	rusty tussock moth	
2004								0

2005								0
2006								0
2007								0
2008								0
2009								0
2010								0
2011								0
2012		5,6						5,6
2013					3			3
2014					11			11
2015					11			11
2016					11			11
2017					11			11
2018					11			11
2019								0
<b>Total</b>	<b>0</b>	<b>5,6</b>	<b>0</b>	<b>0</b>	<b>58</b>	<b>0</b>	<b>0</b>	<b>63,6</b>

Analyzing the data given in the table, in the period from 2014 to 2018, apple moth damaged a total area of 55 hectares.

### Fires

Most of the area belongs to high classes 1 and 2 of fire danger (50.7%). In addition, with a fairly high grass and arid autumn, the likelihood of fires outside the state forest fund and its spread to the forestry area is quite high. For the analyzed period, 13 cases of forest fires were recorded on an area of 403.7 ha, including 166.7 ha covered with forest. Of all cases of forest fires, all were brush fires. The forestry has one forest fire station (FFS) of type 2 located in the central estate, responsible for the total area. There are 9 people in the FFS staff. The FFS has the following technical equipment: ZIL 43412 and GAZ 3308 fire trucks, MTZ 82.1 and MTZ 82 tractors, two water distributors (БРЗМП); plough (ПМН 335), seven motor pumps, mower (КДН 210), fire hoses; 38 buckets., 14 axes, 5 fire extinguishers, 6 firewater tanks, 1 pair of binoculars, 4 drip torches, flasks, bowls, spoons, ladles, cauldrons, mugs etc.).

Year	Total number of cases	Area covered by fire, ha				Damage KZT, thousands
		Total area	including forested area	Of which by crown fires	Non forested	
2004	1	23,1	6,1	-	17	344,4
2005	-	-	-	-	-	-
2006	2	40	33,3	-	6,7	148,6
2007	-	-	-	-	-	-
2008	1	2	2	-	-	262
2009	1	5	-	-	5	40,5
2010	1	1	-	-	1	-
2011	-	-	-	-	-	-
2012	1	95	49	-	35	87
2013	2	156	10,4	-	119,6	176



2014	-	-	-	-	-	-
2015	2	10	6,8		3,2	120,1
2016	1	62	50	-	-	708,8
2017	1	9,6	9,1	-	0,5	451,8
2018	-	-	-	-	-	-
2019	-	-	-	-	-	-
<b>Total</b>	<b>13</b>	<b>403,7</b>	<b>166,7</b>	<b>0</b>	<b>188</b>	<b>2339,2</b>

### Illegal felling

Period (year)	Illegal felling		
	Number of cases	Volume, m <sup>3</sup>	Damage KZT, thousands
2004	12	18,3	41,1
2005	10	68,19	115,3
2006	15	102	327,2
2007	4	17,48	56,6
2008	12	40,7	216,8
2009	15	70,26	612,1
2010	9	54,16	399,3
2011	14	66,64	767,6
2012	8	29,57	478,2
2013	6	27,21	321,1
2014	4	21,17	282,7
2015	20	92,14	1890,1
2016	13	24,61	411,7
2017	17	49,61	1508
2018	19	23,2	257,7
2019	2	0,27	4,5
<b>Total</b>	<b>180</b>	<b>705,51</b>	<b>7690</b>

From 2004 to 2019, 180 cases of illegal felling were recorded, with 705 m<sup>3</sup> of wood in the amount of KZT 7,690.0 thousand cut down.

### Poaching

Period (year)	Number of cases	Number of poached animals	Damage KZT, thousands
2004	-	-	-
2005	6	15	60,8
2006	5	2 (goitered gazelle)	824
2007	4	-	-
2008	2	-	-
2009	4	2	25,6
2010	2	-	-
2011	2	-	-

2012	5	-	-
2013	6	-	-
2014	-	-	-
2015	2	-	-
2016	1	-	-
2017	2	-	-
2018	-	-	-
Итого	<b>41</b>	<b>19</b>	<b>910,4</b>

From 2004 to 2018, there were 41 cases of poaching recorded, with the damage amounting to KZT 910.4 thousand. In recent years, the number of poaching cases has declined.

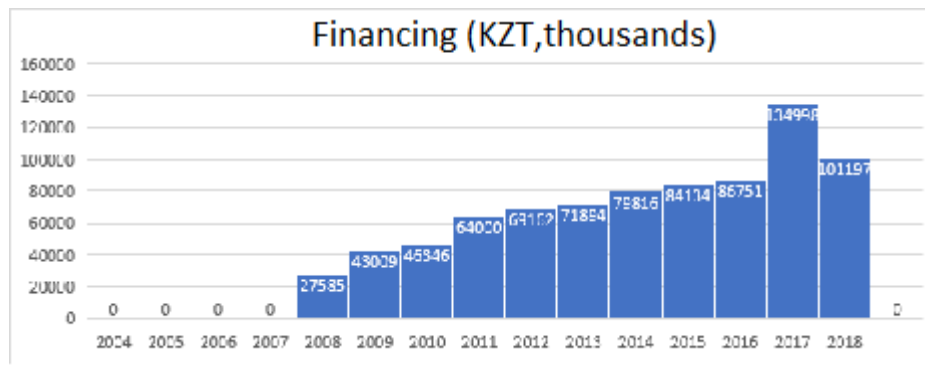
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#### 4.5. Staff

Year	Staff number	Staff turnover	Level of education		
			higher	Secondary professional	Secondary
2004	63	2	20	20	23
2005	63	1	20	22	21
2006	63	2	19	19	25
2007	67	1	20	19	28
2008	67	2	23	22	22
2009	67	2	23	22	22
2010	84	1	25	25	34
2011	86	6	33	26	27
2012	86	4	37	24	25
2013	93	6	37	27	29
2014	93	5	38	29	26
2015	93	2	38	32	22
2016	93	5	36	34	22
2017	91	1	33	33	23
2018	93	11	35	32	26
2019	92	3	35	30	27

Currently, the staff number is 92 people, including 35 people having higher education. The level of coverage of forestry workers with further training is not sufficient. Every year prior to the start of the fire danger period, forest guard training is conducted (according to the order of the Forestry and Wildlife Committee under the Ministry of Agriculture). Once every three years training (of deputy directors, engineers and foresters) on safety and labor protection is carried out by specialized organizations with certificates given after. Also, once every three years at the request of the Fire Safety Department, training (of deputy director, engineers and foresters) on fire protection is carried out with certificates issued after. Specialized further education programs and trainings were not conducted.

#### 4.6. Financing



#### 4.7. Long-term forest use

Years	Types of forest use /area															
	For health, recreational, cultural, tourist and sports purposes		For hunting		For grazing		For haying		Placement of beehives and apiaries		For research		For plantations of special purpose.		Total:	
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004															0	0
2005															0	0
2006															0	0
2007			2	22											2	22
2008															0	0
2009															0	0
2010	1	18			3	1555,8									4	1573,8
2011	1	4			1	337,8									2	341,8
2012					6	2101	4	530,5							10	2631,5
2013			1	5	1	250					1	0,88			3	255,88
2014	2	130			2	996	1	9,4							5	1135,4
2015			1	3											1	3
2016	1	2													1	2
2017			1	5			2	199,3							3	204,3
2018					1	447,1					1	0,2			2	447,3

Haying and grazing are regulated by the Rules for haying and grazing in areas of the state forest fund of the Republic of Kazakhstan (2015).

#### 4.8. Wood harvesting

Cutting types	Wood harvesting, m <sup>3</sup> .																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intermediate use, including:	1000	642	403	358	381	1924	831	1081	1536	2960	1725	1084	896	20	0	0	0
Forest thinning	0	0	0	0	0	0	0	0	0	240	0	0	0	20	0	0	
Selection sanitary felling	1000	642	403	358	381	1924	831	1081	1536	2720	1725	1084	896	0	0	0	
Other types, including	6100	5904	5666	13700	5175	4153	8197	3965	4110	2436	685	1534	1476	808	1228	1560	0
Clear sanitary felling	0	0	66	0	363	0	0	0	217	0	216	166	0	102	236	258	
Cleaning forest clutter	6100	5904	5600	13700	4812	4153	8197	3965	3893	2436	469	1368	1476	706	992	1302	
Forest clearing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

The previous forest management project provided for primary-use felling on an area of 640 hectares with cut down liquid stock of 53 thousand m<sup>3</sup>. Failure to comply with the volume of main-use felling is due to the lack of demand for wood, the collapse of agricultural production, which was the main wood consumer. In addition, the reasons for not meeting primary-use logging volumes were: poor condition and lack of forest roads, for the repair and construction of which no financial resources were allocated; the ban on primary-use felling for coniferous stands since 2004 for a period of 10 years. Logging by the past forest management was planned on an area of 26.0 hectares with a selectable liquid stock of 0.3 thousand m<sup>3</sup>, and clear-cutting and clutter clean-up measures were not planned. However, according to the forest inventory data, the state of the plantations required these activities to be carried out during almost the entire revision period.

On the basis of forest pathological examinations, forest areas were identified that needed sanitary cutting, and the volumes of felling were established independently by the forestry. The emergence of large areas with fallen spruce forest stands, as a result of the hurricane that took place in 2003, was the main reason for selective sanitary overfelling and carrying out clear sanitary felling and cleaning of forest clutter. As a result of droughts in some years, the lack of precipitation in the forests of the forestry, dead wood was accumulated. Therefore, the forestry cleaned the extra forest clutter with a selectable total supply of 65.0 thousand m<sup>3</sup>.

#### 4.9. Technical equipment of Uigur forestry for 2018

No	Name	Norm	Available	% Degree of wear	Required additionally	Price, KZT thousands	Total amount KZT thousands
1	Motor pump for dirty water (МПГ-1300-80)	35	17	-	18	210,0	3780,0
2	Three-way disc plough (ПЛН-3-35)	5	2	-	3	1000,0	3000,0
3	Milling machine (АЛФ-10)	1	-	-	1	2850,0	2850,0 тг
4	Fire-break equipment combined ПЛК-2(soil thrower)	5	-	-	5	1500,0	7500,0
5	Bulldozer T 170 (made in Russia)	3	2	-	1	27786,5	27786,5
6	Tractors, 3 drawbar category «Belarus-92,0»	31	3	-	28	7900,0	221200,0
7	Chainsaw	25	11	-	14	96,0	1344,0
8	Fire fighting knapsacks Ермак РП-18	113	89	-	24	37,0	888,0
	Radio transceiver:						
9	stationary (fire-chemical station, office)	17	17	-	-	-	-
10	Mobile radio transceivers (Fire truck and patrol vehicles)	24	18	-	6	108,0	648,0
11	Hand-held two-way radio	77	62	-	15	33,9	508,5
12	Satellite navigation devices (cars)	20	3	-	17	21,0	357,0
13	Drip torch АЗ-5 «Ермак»	6	4	-	2	108,0	216,0
14	Motorcycle, Peda BARS	29	24	-	5	590,0	2950,0
15	Fire engine АЦ-5,5-40 Ural-5557-1151-60	9	2	-	7	25000,0	175000,0
16	UAZ (onboard), Niva (patrol)	15	15	-	-		
17	Solar battery (included)	56	47	-	9	184,0	1656,0 тг
18	Snowmobile SNOWMAX 200 2018	5	-	-	5	650,0	3250,0
19	Quadcopter (drone)	6	-	-	6	619,9	3719,4

20	Firefighter apparel БОП-1 «Ткань арт.77»	8	-	-	8	77,7	621,6
21	Horses		59	-	-	-	
	<b>Total:</b>	<b>489</b>	<b>315</b>	<b>-</b>	<b>174</b>		<b>457275,0</b>

In order for the forestry to carry out high-quality reforestation activities, forest cultivation works, as well as forest protection from poaching and forest fires, KZT 457275,0 thousand to improve technical equipment is required.

## 5. Zharkent forestry

### 5.1. General information

Contacts: 47 Belalov Str., Zharkent city, Almaty region. Tel: 8 (72831) 5-14-69, 5-19-90, e-mail: [panf\\_leshoz@mail.ru](mailto:panf_leshoz@mail.ru). The office is located in Zharkent, 282 km of Taldykorgan.

Zharkent forestry was established in 1931 and is located on the territory of two administrative districts - Panfilov and Kerbulak. The total area is 171054.0 hectares, of which 57924.0 hectares are forested. The forestry consists of three forest divisions:

Table 2. Distribution of forestry area by forest divisions

No.	Name	District	Area, ha		Location of forest division and forestry offices
			Total	Including long-term forest use	
1	Ile	Panfilov	117 465	-	Zharkent city
2	Koktal	Panfilov	24 368,0	-	Koktal village
	Lesnov	Panfilov	29 221,0	-	compartment 93
	Total:		171 054,0		

According to forest vegetation zoning (Kazakh Research Institute of Forestry and Agroforestry, 1988), the forestry area is located is assigned to two forest zones:

- the northern part of the area (mountains) is located in Dzhungar fir-spruce forests with a belt of fruit trees;

- the southern part of the area (no mountains) is located in desert forests of southeastern Kazakhstan and is assigned to the forest area of the desert saxaul and tugai forests.

Coniferous vegetation is represented by Schrenk's spruce and juniper, deciduous vegetation - by birch, poplar, apricot, willow tree and shrubs (mountain willow, sea buckthorn, rosehip, meadowsweet, barberry and others). Forest massifs alternate with vast spaces of meadows covered with the orchard grass, tor-grass, Boehmer's cat's-tail, and others.

The desert part is characterized by continental and dry climate. Saxaul, desert poplar, oleaster, willow, salt tree, tamarisk and others grow here. Silky wormwood, bijurgun, salsola and ephemerals prevail in the desert grassy cover; reed, sea-lavender, couch grass, true sedge and others prevail in the floodplain.

The main role of forests is water protection, water regulation, soil protection, sanitary and hygienic functions.

Forests, in addition to the functions listed above, are habitats for wild animals and birds. The aesthetic value of forests is invaluable. The anti-erosion value of forests is also great. It is difficult to overestimate the role of saxaul plantations in fixing sand, their role for sheep breeding. Saxaul thickets serve as year-round pastures providing fodder regardless of climatic conditions. Floodplain and tugai forests are a place of recreation, sport fishing and hunting.

Forest plantations to a small extent serve as a source of wood for districts. However, the forestry is not able to fully satisfy the needs of the districts for timber; therefore, timber is mainly imported from other regions.

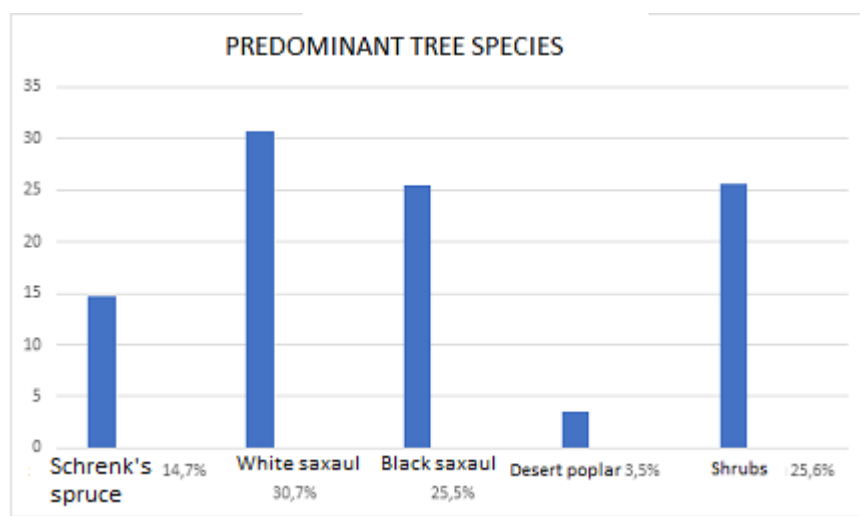
There are no large industrial enterprises in the area; no specialized industrial enterprises engaged in logging, wood processing, and chemical production.

The main species in the sandy part are white saxaul (30.7%) and black saxaul (25.5%). Saxaul forests are represented by plantations of natural and artificial origin of 2-8 age classes, of which 5-6 age classes prevail - 65.7% of the area of saxaul forests. In terms of productivity, spruce plantations, which occupy an area of 14.7% of the total forested area, have an average quality degree of 3.2. In the sandy part, saxaul stands, occupying an area of 56.2% of the total forested area, have an average quality level



of 3.0. Hardwood stands have an average quality level of 2.9-5.0, soft leaved species have an average quality level of 2.9-5.0, which corresponds to the habitat conditions for these species.

The forest fund is represented mainly by sparse forest stands with the average forest species density being 0.37.



There is a temporary forest nursery with an area of 2.0 ha, including 1 ha under seedlings and 1 ha under rooted cuttings. When harvesting seeds, the forestry is guided by the planned tasks of the regional territorial administration. On average, 675 kg of seeds of spruce, elm, oleaster, saxaul were harvested by the forestry per year for the revision period, which were checked at the Kazakh State forest seed institution. The collected seeds were used for the forestry's needs.

There is no seed storage in the forestry with no seed plantations and seed plots as well.

Based on the order of the Ministry of Forestry dated July 13, 1989 No. 3-32 / 1327, a genetic reserve of black saxaul with an area of 2 hectares was allocated in the compartment 110 of the Ile forest division.

### 5.2. Carrying out forest management works

The latest forest management works were carried out in 2016 by the Kazakh State Forestry Enterprise in accordance with the Forest Code, the Basic Provisions, the Forest Management Instructions, the Rules for forest felling, the minutes of the first forest management meeting and other regulatory documents.

### 5.3. Reforestation and afforestation

Indicators	Reforestation for the period 2003-2018, ha															
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Reforestation	50	160	215	270	275	125	138,5	110	120	64	22	22	22	22	50	50
Including planting, ha	10	10	15	20	25	25	38,5	10	20	64	22	22	22	22	50	50
sowing, ha	40	150	200	250	250	100	100	100	100							
Promoting natural forest renewal										311,3		194,3	207,4	171,3		
Conversion to forested area, ha	50	10	205	250	23,2		26								0	221,4

According to the data presented by the Office of Natural Resources and Environmental Management of Almaty region, reforestation was carried out annually, in particular, planting and sowing of forest crops in different areas with the minimum sowing area of 40 ha and planting area of 10 ha. After 2011, there have been no crops sown. For 15 years, the reproduction of forest crops was carried out on an area of 1715.5 ha, of which 785.6 ha were converted to a forested area.

#### 5.4. Forest conservation and protection

Forest pests and diseases								
Year	Forest pests and diseases, ha							Total area, ha
	codling moth	tortrix moth	winter moth	mottled umber	apple ermine moth	gypsy moth	rusty tussock moth	
2004			1250					1250
2005								0
2006								0
2007								0
2008								0
2009								0
2010			1200					1200
2011			1200					1200
2012			1200					1200
2013			1200					1200
2014								0
2015								0
2016								0
2017								0
2018			1200				359	1559
2019								0
Total	0	0	7250	0	0	0	359	7609

According to the data presented, during the analyzed period, there were foci of forest pests on a total area of 7,609.0 ha.

#### **Fires**

According to forest fire zoning (Kazakh Research Institute of Forestry and Agroforestry, 1985), the forestry's territory is assigned to two forest fire zones - Dzhungar-Alatau (mountains) and Pribalkhash (no mountains). Dzhungar-Alatau forest fire zone is visited by tourists almost all year round, and cattle is grazed in summer. Coniferous forest stands prevail, which increases the forest fire risk. The Balkhash region includes desert and tugai forests. Throughout the fire danger period, the territory is intensively visited by tourists, fishermen, hunters, shepherds. In this regard, there is a constant the forest fire risk in the area. In addition, tugai forests suffer from agricultural burning. In the mountainous part, the fire danger class is high - from 1 to 3. Saxaul plantations belong to the 1st class of fire danger.

Years	Total number of cases	Area covered by fire, ha				Damage KZT, thousands
		Total area	including forested area	of which by crown fire	Non forested	
2004	-	-	-	-	-	-
2005	2	9,5	1,5	-	8	19,8
2006	1	8,2	2,4	-	5,8	-
2007	-	-	-	-	-	-
2008	-	-	-	-	-	-
2009	-	-	-	-	-	-
2010	-	-	-	-	-	-
2011	-	-	-	-	-	-
2012	-	-	-	-	-	-
2013	1	85	9,5		75,5	336,5
2014	-	-	-	-	-	-
2015	-	-	-	-	-	-
2016	1	18,9	18,9	-	-	257,1
2017	1	2,5	-		2,5	6,1
2018	-	-	-	-	-	-
2019	-	-	-	-	-	-
<b>Total</b>	<b>6</b>	<b>124,1</b>	<b>32,3</b>	<b>0</b>	<b>91,8</b>	<b>619,5</b>

During the analyzed period, there were 6 cases of fires recorded on a total area of 124.1 ha with the damage caused amounting to KZT 619.5 thousand

#### Illegal felling

Period (year)	Illegal felling		
	Number of cases	Volume, m <sup>3</sup>	Damage KZT, thousands
2004	21	40,83	50,4
2005	50	31,91	16,1
2006	12	13,1	17,4
2007			
2008			
2009			
2010	2	2	1,4
2011	1		2,1
2012	5		12,1
2013			
2014	3		
2015			
2016			
2017			
2018			

2019	2	0,9	11
Total	<b>96</b>	<b>88,74</b>	<b>110,5</b>

From 2004 to 2019, there were 96 cases of illegal felling recorded in the area, with 88.74 m<sup>3</sup> of wood worth KZT 110.5 thousand cut down.

#### Poaching

Period (year)	Number of cases	Number of poached animals	Damage KZT, thousands
2004	6	-	-
2005	7	-	-
2006	8	-	-
2007	2	-	-
2008	1	-	-
2009	4	-	-
2010	6	-	-
2011	1	-	-
2012	0	-	-
2013	1	-	-
2014	2	-	-
2015	1	-	-
2016	11	-	-
2017	9	-	-
2018	8	-	-
Итого	<b>67</b>	-	-

From 2004 to 2018, there were 67 cases of poaching recorded, with the number of animals poached and the damage not indicated. Over the past three years, the number of poaching cases has increased.

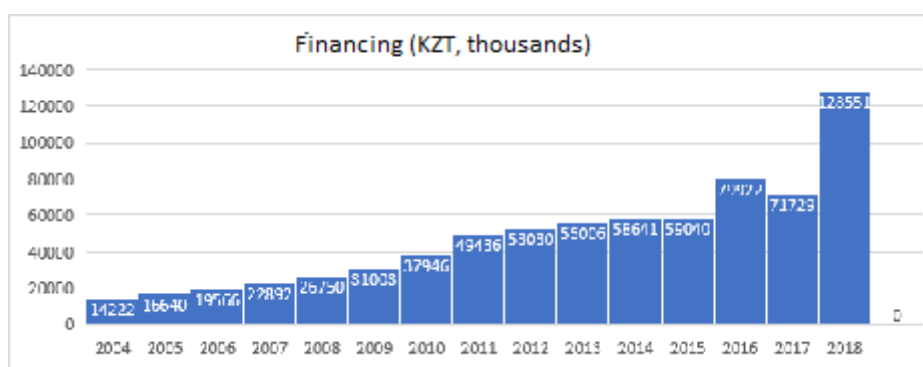
#### 5.5. Staff

Year	Staff number	Staff turnover	Level of education		
			higher	Secondary professional	secondary
2004	39	4	12	15	12
2005	39	2	12	15	12
2006	39	6	10	19	10
2007	42	4	10	22	10
2008	42	7	9	21	12
2009	42	5	9	18	15
2010	49	5	15	19	15

2011	50	4	16	19	15
2012	50	3	16	19	15
2013	57	7	15	13	29
2014	57	5	19	20	18
2015	57	6	18	13	26
2016	56	2	22	10	24
2017	56	9	21	8	27
2018	55	0	20	8	27
2019	55	1	20	7	28

Currently, the staff number is 55 people, with 20 people having higher education. The level of coverage of forestry workers with further training is not sufficient. Every year prior to the start of the fire danger period, forest guard training is conducted (according to the order of the Forestry and Wildlife Committee under the Ministry of Agriculture). Once every three years training (of deputy directors, engineers and foresters) on safety and labor protection is carried out by specialized organizations with certificates given after. Also, once every three years at the request of the Fire Safety Department, training (of deputy director, engineers and foresters) on fire protection is carried out with certificates issued after. Specialized further education programs and trainings were not conducted.

## 5.6. Financing



According to the data, the volume of financing increases annually: in 2004 financing amounted to KZT 14,222.0 million, while in 2018, KZT 128,551.0 million was allocated, which indicates a 9 times increase.

### 5.7. Long-term use

Years	Types of forest use /area															
	For health, recreational, cultural, tourist and sports purposes		For hunting		For grazing		For haying		Placement of beehives and apiaries		For research		For plantations of special purpose.		Total:	
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2005	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
2006	0	0	0	0	0	0	0	0	0	0	0	0	1	128,7	1	128,7
2007	4	1970,6	0	0	8	4766,7	0	0	0	0	0	0	1	128,7	13	6866
2008	5	4622,9	0	0	0	0	0	0	0	0	0	0	1	128,7	6	4751,6
2009	6	4629,4	0	0	0	0	0	0	0	0	0	0	1	128,7	7	4758,1
2010	6	4629,4	0	0	3	926,9	0	0	0	0	0	0	1	128,7	10	5685
2011	7	4794,1	0	0	3	926,9	0	0	0	0	0	0	1	128,7	11	5849,7
2012	9	4851,76	0	0	17	3869,1	0	0	0	0	0	0	2	150,7	28	8871,56
2013	11	4898,8	0	0	18	4069,1	0	0	0	0	0	0	2	150,7	31	9118,6
2014	20	5510,7	0	0	24	5304,2	0	0	0	0	0	0	2	150,7	46	10965,6
2015	26	5545,7	0	0	34	7785,4	3	144	0	0	0	0	2	150,7	65	13625,8
2016	33	5780,2	0	0	44	10811,9	3	144	0	0	0	0	2	150,7	82	16886,8
2017	44	5993,9	0	0	59	15388,6	5	373	0	0	0	0	2	150,7	110	21906,2
2018	49	6046,3	0	0	83	24929,4	8	664,9	0	0	0	0	3	157,2	143	31797,8

Haying and grazing are regulated by the Rules for haying and grazing in areas of the state forest fund of the Republic of Kazakhstan (2015). There are no hunting farms in the area. A total of 31,797.8 ha are in long-term use.

### 5.8. Wood harvesting

Cutting types	Wood harvesting, m <sup>3</sup> .																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Intermediate use, including:	700	0	300	817	81	1069	116	29	20	0	0	0	0	0	0	0	0
Forest thinning	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	
Selection sanitary felling	700	0	300	817	81	1069	116	29	20	0	0	0	0	0	0	0	
Other types, including	0	786	100	0	287	346	1680	1311	824	1225	1579	1120	356	90	260	745,5	0
Clear sanitary felling	0	416	0	0	241	0	780	1129	824	1101	1579	1113	188	90	260	72	
Cleaning forest clutter	0	370	100	0	46	346	900	182	0	124	0	7	168	0	0	673,5	
Forest clearing	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	

The forestry did not carry out primary-use felling due to the lack of demand for timber and the collapse of agricultural production, which was the main consumer of timber. In addition, the reasons for the non-fulfillment of volumes of primary-use logging were: poor condition and lack of timber roads, for the repair and construction of which no financial resources were allocated; the ban on main cutting for coniferous stands since 2004 for a period of 10 years, according to the Decree of the Government of the Republic of Kazakhstan dated April 23, 2004 No. 460 "On the prohibition of primary-use felling in coniferous and saxaul plantations on the state forest fund plots and measures for their conservation."

Thinning was also not carried out. Selection sanitary felling was carried out on drying plants, 3132 m<sup>3</sup> was cut down.

On the basis of forest pathological examinations, forest areas were identified that needed sanitary cutting, and the volumes of felling were established independently by the forestry. So in the course of other felling types, 10,709.5 m<sup>3</sup> was harvested, of which 7793 m<sup>3</sup> were clear sanitary cuttings, and 2916.5 m<sup>3</sup> was clearing forest clutter.

5.9. *Technical equipment of Zharkent forestry for 2018*

No	Name	Norm	Available	% Degree of wear	Required additionally	Price, KZT thousands	Total amount KZT thousands
1	Motorpumps	8	16	100%	3	102,4	307,2
2	Two-way disc plough	2	1	100%	2	260,0	260,0
3	Dump truck				1	20000,0	20000,0
4	Low loader trailer				1	3000,0	3000,0
5	Bulldozer	1	1	11%	0		
6	Tractors, 3 drawbar category	3	3	100%	1	7300,0	7300,0
7	Chainsaw	9	9	100%	7	87,9	615,3
8	Fire fighting knapsacks	42	82	100%	40	15,8	632,0
9	Radio transceiver:						
10	stationary (fire-chemical station, office)	8	8	100%	3	108,5	325,5
11	Mobile (fire truck and patrol vehicles)	11	11	100%	5	68,2	341,0
12	Hand-held two-way radio	57	37	100%	24	27,5	660,0
13	Satellite navigation devices (cars)	13	1	23%	13	130,0	1690,0
14	Drip torch	4	3	100%	3	73,5	220,5
15	Motorcycle,ATV	13	8	100%	8	317,7	2541,6
16	Fire engine	2	2	100%	1	28000,0	28000,0
18	Patrol car	9	9	100%	4	7000,0	28000,0
19	Solar battery (included)	12	7	100%	5	150,0	750,0
20	All terrain car		1	100%	1	25000,0	25000,0
21	Snowmobile				2	4000,0	8000,0
22	Quadcopter (drone)				4	700,0	2800,0
23	Horse	27	24	65%	3	350,0	1050,0
24	Fire tower		3	100%			
25	Blade cultivator				2	1600,0	3200,0
26	Cultivator				2	630,0	1260,0
27	Truck		1	100%	1	25000,0	25000,0
	<b>Total:</b>						<b>160953,1</b>



## 6. Ridder forestry

### 6.1. General information

Contacts: Leskhoz village (district 1), Ridder, East Kazakhstan region. Tel: 8 (72336) 30078, email: [lesxoz-ridder@mail.ru](mailto:lesxoz-ridder@mail.ru).

Ridder forestry was established in 1948, and is located in the northern part of the East Kazakhstan region in Glubokovsky district (148,751 ha or 48.8%) and Ridder city akimat lands (156171 ha or 51.2%).

The forestry consists of six forest divisions: Levo-Ubinskoye, Verkh-Ubinskoye, Central, Prigorodnoye, Chern-Ubinskoye, Zhuravlikhin.

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Table 1. Distribution of forestry area by forest divisions

No.	Name	District	Area, ha		Location of forest division and forestry offices
			Total	Including long-term forest use	
1	Levo-Ubinskoye	Glubokovsky district Ridder city akimat	65332 33503 <b>98835</b>	65332 33503 <b>98835</b>	Ridder city 48 Sadovaya Str.
	Total:				
2	Verkh-Ubinskoye	Glubokovsky district Ridder city akimat	83419 17487 <b>100906</b>	83419 17487 <b>100906</b>	Ridder city Leskhoz village
	Total:				
3	Zhuravlikhinskiy	Ridder city akimat	<b>29130</b>	<b>29130</b>	Ridder city Leskhoz village
4	Cherno-Ubinskoye	Ridder city akimat	<b>52639</b>	-	Poperechnoye village
5	Central	Ridder city akimat	<b>12871</b>	-	Ridder city Leskhoz village
6	Prigorodnoye	Ridder city akimat	<b>10541</b>	-	Ridder city Leskhoz village
	TOTAL:	Glubokovsky district	<b>304922</b>	<b>228871</b>	
	including.	Ridder city akimat	148751 156171	148751 80120	

1) Northeast mid-high-mountains with boreal forest, meadows, where the forestry's northeastern and southern parts are located

2) Northern low-mid-mountains with fir forests, which is divided into several subareas:

- northern part - Sinyushin-Galushin highlands of fir forests with birches
- central part - Uba-Ulba low-mountains of fir forests and birches;
- central part - Leninogorsk hills and plains of pine forests and steppe meadows

A variety of forest growing areas and subareas is explained by the forestry's great length from north to south and from west to east.

In the north-eastern part along the border with Russia from the north-west to the south-east, the Koksuz ridge is located, in the southern part from the south-west to the north-east is the Ivanovo ridge, in the western part from the south-east west to north-east is the Uba ridge. The above ridges with spurs extending from them form the landscape. Altitudes range from 660 m (Ridder forest) to 2028 m (Lyamin Belok mountain) and 2775 m (Vysheivanovsky Belok mountain) above sea level.

The soil cover within the territory was formed by mountainous terrain depending on its forms, amount of precipitation and growing vegetation. In the alpine zone at an altitude of 1900-2000 m above sea level under the alpine meadows, mountain-meadow alpine soils were formed. Soddy soils here alternate with pieces of rock and rock outcrops. Typical mountain meadow soils formed in the subalpine zone at an altitude of 1400-1500 to 1900-2000 m under meadows alternating with small copses. At altitudes below 1400-1500 m, a belt of fir, fir-spruce-cedar forests with birch is developed, under which mountain-forest acidic non-podzolized and slightly podzolized soils are formed. The island part is occupied by pine forests, under which mountain forest dark gray soils and mountain chernozems were formed.

The climate in the area is sharply continental and is characterized by high summer and low winter temperatures. In general, the climate of the area favorably affects the growth of trees, shrubs and grass. Of the climatic factors that negatively affect the growth and development of forest vegetation, the following should be noted: late spring and early spring frosts damaging young shoots; periodic strong south winds causing blow-down of trees; significant snow cover, especially in the upper zone of forests, adversely affecting the conservation of artificial stands. Snow covers the forest averagely 210 days. Low air temperatures, long winters cause deep freezing of the soil up to 100 cm, which negatively affects the root system of plants.

Factors such as high temperatures in summer, low temperatures in winter, strong winds, a short growing season (120 days) adversely affect the course of natural renewal, the survival rate of forest crops, and increase the fire danger. A rapid increase in air temperature in spring dictates the need for a short time to carry out all forestry, nursery and agricultural work.

There are no disturbed lands that would require restoration in the area.

The forestry is located in the basin of the two main tributaries of the Irtysh River - the Ulba River and the Uba River, the latter in turn is formed as a result of the confluence of the Black and White Uba rivers.

In general, a well-developed hydrographic network was developed on the forestry's territory, represented not only by the above-mentioned rivers, but also by other rivers and streams, which are their tributaries. The headwaters of many rivers are spawning grounds for valuable commercial fish. On the river banks, restricted forest strips were allocated that protect spawning sites of valuable commercial fish with a width of 500 to 1000 m on both banks of the rivers.

The forestry's total area is 304,922 ha, the area covered by forest is 215.5 thousand ha.

Table 2. Forest Fund lands

Forestry/ forested land, not included in the forest fund	Total area / subordinate to	Forest Area	Forest species/ha	Area of degraded forests retrospectively	Forest condition (main characteristics confirming degradation) in retrospect 5-10 years
Ridder MPU	304.9 thousand ha Akimat of East	215.5 thousa nd ha	Fir - 106.5 thousand ha, larch - 5595 ha, spruce - 2578 ha	felling - 3143 ha burned- 1151 ha weakening of	fires, felling, change of species pose a risk to the area

	Kazakhstan region		cedar - 3230 ha birch - 60559 hectares, aspen - 16770 ha	stands - 9465 ha	
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Forest areas account for 79.8% of the total forestry area. Forested land makes up 70.7% of the total forestry area or 88.6% of the forest area. The predominant species is fir– it makes up 53.4% of species. The distribution of forest land by major forest-forming species is uneven

Table 3. Distribution of forested land

Predominant species	Forest types	Index number	Area	
			ha	%
<u>Main species</u>				
Pine	Grassy pine forest	СТ	<b>3115,6</b>	<b>1,4</b>
Spruce	Mountain and valley spruce forest	ЕГД	<b>2480,7</b>	<b>1,2</b>
Fir	Mountain and valley fir forest	ПГД	804,9	0,4
	Fir forest with saw-wort	ПГД	5336,4	2,5
	Fir shrub stand	ПК	3303,6	1,5
	Subalpine fir forest	ПСА	4429,4	2,0
	Grass, fern, moss fir forest	ПТПМ	12665,6	5,9
	Grass and fern fir forest	ПТП	67695,8	31,4
	Blueberry fir forest	ПЧ	12518,6	5,8
<b>Total</b>			<b>106754</b>	<b>49,5</b>
Larch	Subalpine larch forest	ЛСА	1941,2	0,9
	Grassy larch forest	ЛТ	2559	1,2
	Blueberry-moss larch forest	ЛЧМ	1096,7	0,5
<b>Total</b>			<b>5596,9</b>	<b>2,6</b>
Cedar	Subalpine cedar forest	КСА	1647,5	0,7
	Grassy cedar forest	КТ	344,8	0,2
	Blueberry cedar forest	КЧ	1237,5	0,6
<b>Total</b>			<b>3229,8</b>	<b>1,5</b>
Birch	Boggy birch forest (indigenous)	ББ	54,4	0
	Forest-steppe birch forest (indigenous)	БЛС	2738,7	1,3
	Fern and moss birch forest (derivative)	БПМ	2257,7	1
	Grassy birch forest (derivative)	БТ	55836,5	25,9
<b>Total</b>			<b>60887,3</b>	<b>28,2</b>
Aspen	Mountain-valley aspen forest (derived)	ОСГД	2939,2	1,4

	Aspen shrub stand (derivative)	ОСК	1768,7	0,8
	Dry aspen forest (indigenous)	ОСС	4636,1	2,2
	Grass-fern aspen forest (derivative)	ОСТП	7240,7	3,3
<b>Total</b>			<b>16584,7</b>	<b>7,7</b>
Poplar	Mountain-valley poplar forest	ТГД	15,1	0
Willow	Streambed willow forest	ИВПР	1286,5	0,6
Maple	Maple forest	КЛ	5,0	0,0
<b>Total</b>			<b>1306,6</b>	<b>0,6</b>
<u>Other tree species</u>				
Bird cherry	Bird cherry forest	ЧР	1,3	0
Apple tree	Apple tree forest	ЯБ	3	0
<b>Total</b>			<b>4,3</b>	<b>0</b>
<u>Shrubs</u>				
Willow shrub	Streambed willow shrub stand	ИВКПР	1411,8	0,7
Juniper	Juniper stand	АРСТ	142,7	0,1
Bog birch	Subalpine bog birch stand	ЕРСА	191,4	0,1
Other shrubs (yellow acacia, honeysuckle, mountain willow, guelder rose, currant, meadowsweet, wild rose)	Shrubs	КУСТ	13998	6,4
<b>Total</b>			<b>15743,9</b>	<b>7,3</b>
<b>Sum total</b>			<b>215704,1</b>	<b>100</b>

The forestry has 2 nurseries for cultivating planting material, one– in Prigorodnoye forest division (compartment 18, subcompartment 1) with an area of 34.0 hectares, and the second one – in the Central forest division (compartment 13, subcompartment 17) with an area of 20.0 ha, and a 5.0 ha greenhouse complex. The greenhouse complex was created in 1976 with the aim of growing planting material for the forestry needs. The output rate of the standard planting material from one greenhouse for Siberian spruce is 60.0 thousand pieces. Watering is done through a drip system. All other types of work are done manually.

#### 6.2. Carrying out forest management works

Forest management works were carried out in 2009 (revision in 2014 and 2016)

#### 6.3. Reforestation and afforestation

No.	Year	Planting, ha	Planting in greenhouses, ha	Promotion of natural renewal, ha	Conversion to forested area, ha
1	2004	12.0	0.05	160.0	145.0
2	2005	30.0	0.20	160.0	229.0
3	2006	40.0	0.20	100.0	221.0

4	2007	80.0	0.30	140.0	1858.0
5	2008	75.0	0.20	100.0	1737.0
6	2009	80.0	0.16	101.0	513.0
7	2010	80.0	0.15	100.0	160.0
8	2011	91.0	0.15	100.0	116.0
9	2012	103.0	0.18	100.1	248.0
10	2013	104.7	0.45	100.1	433.8
11	2014	80.0	0.15	100.0	511.1
12	2015	90.5	0.15	100.0	129.0
13	2016	46.0	0.15	100.0	144.9
14	2017	27.7	0.05	100.0	563.7
15	2018	21.7	0.05	100.2	1110
<b>Total:</b>		<b>961.6</b>	<b>2.59</b>	<b>1661.4</b>	<b>8119.5</b>

According to the data provided by the Office of Natural Resources and Environmental Management of East Kazakhstan region, reforestation was carried out annually, in particular, planting forest crops on a total area of 961.6 ha, and sowing in a greenhouse on an area of 2.59 ha.

#### 6.4. *Forest conservation and protection*

##### **Forest pests and diseases**

There are following forest pests recorded in the area: black fir barbel, large pine beetle, small pine beetle and birch bark beetle. They do not bring much harm to the forest and are found only on windy, snow-covered and heavily weakened trees.

In view of the changing climatic conditions, fir plantations are strongly affected by late spring frosts. As a result of this, fir protective properties are weakened. Against this background, there is a significant damage to fir plantations by the annosus root, brown trunk rot, fir cancer, fir leaf cast and honey fungi. Prevention measures against these diseases include sanitary felling in deciduous stands and monitoring stands sanitary condition. Due to the poorly developed network of forest roads and poor technical equipment, the volume of activities carried out is insufficient.

##### **Fires**

Year	Total number of cases	Area covered by fire, ra					Damage, KZT thousands
		Total area	Including forest area	Including forested land	of which by crown fire	Non-forested	
2003	22	235.39	235.39	57.04			147.0
2004	21	56.485	56.485	27.375			633.5
2005	2	0.25	0.25	0.05			
2006	1	0.6	0.6	0.6			
2007	3	0.6	0.6	0.5			
2008	6	22.75	19.85	19.35	8.75	2.90	1027.20
2009	No fires						
2010	1	0.06	0.06				
2011	15	321.01	315.2	304.7	171.8	5.81	133953.90

2012	8	10.212	5.212	5.142	0.02	5	67.4
2013	1	2.0	2.0	2.0			2.8
2014	4	1.23	1.23	1.23			26.7
2015	2	0.35	0.35	0.1			2.6
2016	No fires						
2017	3	1.67	1.67				72.3
2018	3	0.031	0.031				3.5
<b>Total:</b>	<b>92</b>	<b>652.638</b>	<b>638.928</b>	<b>418.087</b>	<b>180.57</b>	<b>13.71</b>	<b>135936.9</b>

For the analyzed period, there were 92 cases of forest fires recorded. The total area covered by forest fires according to the reporting data is 652.6 ha. The main causes were the careless handling of fire and due to unknown reasons, as well as agricultural burning and lightning discharges

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### Illegal felling

Period (year)	Illegal felling		
	Number of cases	Volume, m <sup>3</sup>	Damage KZT, thousands
2003	19	91.09	441.3
2004	15	144.0	918.8
2005	17	144.2	1203.6
2006	13	125.4	914.7
2007	6	6.03	10.4
2008	13	37.7	332.3
2009	8	82.91	657.6
2010	5	305.5	5486.6
2011	8	133.39	1228.9
2012	9	133.45	1678.7
2013	6	84.49	886.4
2014	4	251.9	1043.9
2015	10	371.9	3599.1
2016	6	111.15	1092.4
2017	5	37.87	431.5
2018	8	331.58	2960.3
<b>Total:</b>	<b>152</b>	<b>2392,56</b>	<b>22886,14</b>

From 2003 to 2018, there were 152 cases of illegal felling recorded with 2,392.56 m3 of timber cut down and the damage amounting to KZT 22886.14 thousand.

### Poaching

In the period from 2004 to 2018, there were no cases of poaching recorded.

### 6.5. Staff

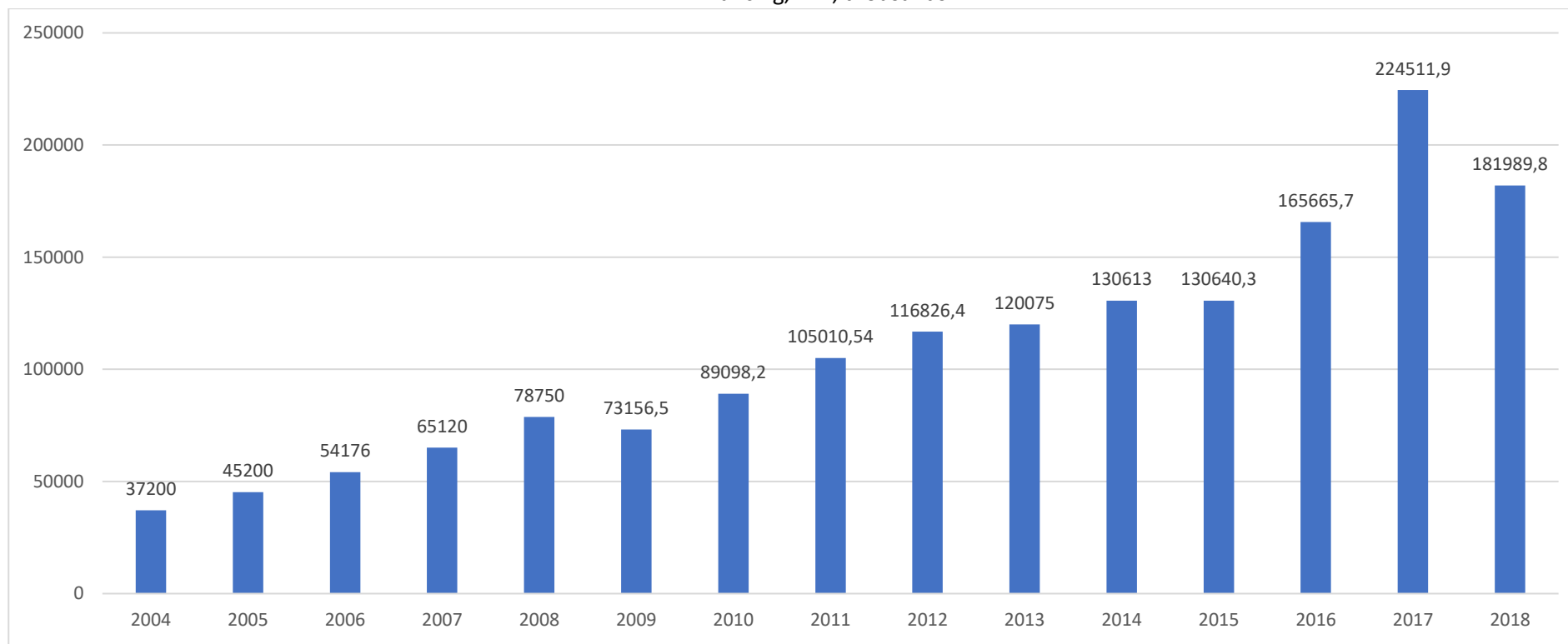
Year	Staff number	Staffing level	Staff turnover	Level of education	Further training	Financing
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			Employed	dismissed	higher	secondary		
2004	73		4	3	5	60		37200
2005	74	169,5	87	17	7	120		45200
2006	140	169,5	14	31	9	100		54176
2007	123	169,5	40	33	8	86		65120
2008	130	169,5	32	18	16,5	91		78750
2009	144,5	169,5	16	27	15,5	101		73156,5
2010	133,5	169,5	29	22	17,5	95		89098,2
2011	140,5	169,5	23	9	19,5	84		105010,5
2012	154,5	169,5	49	56	20,5	130		116826,4
2013	147,5	169,5	86	65	17,5	93		120075
2014	168,5	169,5	45	79	20,5	104		130613
2015	134,5	169,5	59	41	22,5	87		130640,3
2016	152,5	165,5	40	31	24,5	102		165665,7
2017	161,5	165,5	31	38	28,5	119		224511,9
2018	154,5	165,5	21	37	30,5	103		181989,8
2019	147,5	165,5	24	18	27,5	110		

Currently, the staff number is 147.5, including 27.5 – with higher education, 110 people with secondary professional education, 10 people with secondary education. Staffing level is 165.5 (0.5 –translator (part-time)).

## 6.6. Financing

Financing, KZT, thousands





### 6.7. Long-term forest use

Years	Types of forest use /area															
	For health, recreational, cultural, tourist and sports purposes		For hunting		For grazing		For haying		Placement of beehives and apiaries		For research		For plantations of special purpose.		Total:	
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004	2	4,07													2	4,07
2005	5	7,57													5	7,57
2006	5	7,57													5	7,57
2007	5	7,57													5	7,57
2008	5	7,57													5	7,57
2009	5	7,57					1	3,0							6	10,57
2010	6	9,22					1	3,0	1	3,2					8	15,42
2011	10	26,65					1	3,0	2	14,45					13	43,95
2012	17	26,65					1	3,0	4	17,5					22	47
2013	17	26,65					1	3,0	6	15,45					24	45,1
2014	17	26,65					1	3,0	6	15,45					24	45,1
2015	17	28,17					1	3,0	7	17,2					25	48,37
2016	22	35,17					1	3,0	7	17,2					30	55,37
2017	25	43,38					1	50,0	5	15,0					31	108,38
2018	25	46,45					2	168,2	5	15,0			1	4,0	32	233,65



### 6.8. Wood harvesting

Cutting types	Wood harvesting, m <sup>3</sup>																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use	15792	402	0	250	1353	300	703	1509	836	411	891	1614	1105	624	8118	16827	4946
Intermediate use, including:	35724	30106	33753	32473	44897	34878	16224	16499	21679	19418	16899	12993	11237	8790	2777	990	435
Forest thinning	520	687	490	469	169	704	2151	1875	2134	3985	2617	1675	1260	584	2161	682	115
Selection sanitary felling	35204	29419	33263	32004	44728	34174	14073	14624	19545	15433	14282	11318	9977	8206	616	308	320
Other types, including	5143	4557	5779	7507	3146	17642	19769	25027	24415	30541	22685	17828	11073	10960	5603	5934	4638
Clear sanitary felling	0	0	0	0	0	12080	14178	20252	21183	28670	19820	16035	9505	9297	3020	2753	3465
Cleaning forest clutter	2904	3334	5779	7507	3146	5085	5262	4775	3182	1871	2865	1590	1454	1368	1739	2368	543
Forest clearing	2239	1223	0	0	0	477	329	0	50	0	0	203	114	295	844	813	630

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### 6.9. Technical equipment of Ridder forestry

No	Name	Norm	Available	% Degree of wear	Required additionally	Price, KZT thousands	Total amount KZT thousands
1	Motor pump	9	9	50%	5	120,0	600,0
2	Two-way disc plough	2	1	75%	1	180,0	180,0
3	Milling machine	2	1	80%	1	240,0	240,0
4	Fire-break equipment	2	-		2	350,0	700,0
5	Bulldozer	2	1		1	40000,0	40000,0
6	Tractors, 3 drawbar category	7	3	100%	7	8000,0	56000,0
7	Chainsaw	12	12	78%	10	200,0	2000,0
8	Fire fighting knapsacks	229	124	60%	105	32,0	3360,0

9	Radio transceiver:						0,0
10	stationary (fire-chemical station, office)	3	3	25%	0		0,0
11	Mobile (fire truck and patrol vehicles)	12	12	80%	12	25,0	300,0
12	Hand-held two-way radio	139	104	65%	35	15,0	525,0
13	Satellite navigation devices (cars)	36	13		23	400,0	9200,0
14	Drip torch	5	5		0	0	0,0
15	Motorcycle, ATV	247	-		247	2000,0	494000,0
16	Fire engine	5	2	70%	4	16500,0	66000,0
18	UAZ car (patrol)	7	4	100%	7	5600,0	39200,0
19	Solar battery (included)	-	1		2	217,0	434,0
20	All-terrain Ural car	-	1	100%	2	26000,0	52000,0
21	Snowmobile	-	2	100%	5	2500,0	12500,0
22	Quadcopter (drone)	-	-		3	860,0	2580,0
	<b>Total:</b>						<b>779891,0</b>

In order for the forestry to carry out high-quality reforestation activities, forest cultivation works, as well as forest protection from poaching and forest fires, KZT 779 819 000 to improve technical equipment is required

## 7. *Pikhtovskoye forestry*

### 7.1. *General information*

Contacts: 11 Kedrovskaya Str., Ridder, East Kazakhstan region. Tel. 8 (72336) 37059, [pikhtovskoe@mail.ru](mailto:pikhtovskoe@mail.ru). The office is located in Belyi Lug village, 95 km of Ust-Kamenogorsk and 20 km of Ridder.

Pikhtovskoye forestry was founded in 1955, and is located on Ridder city akimat lands. The length from north to south is 37 km, from east to west - 60 km. It is divided into two forest divisions: Kedrovskoye - 57332 ha, Butakovskoye - 23269 ha, the total area is 80601 ha, including 40753 ha of forested land, the planting stock is 4392.4 thousand m<sup>3</sup>. All forests are classified as mountain forests.

Table 1. Distribution of forestry area by forest divisions

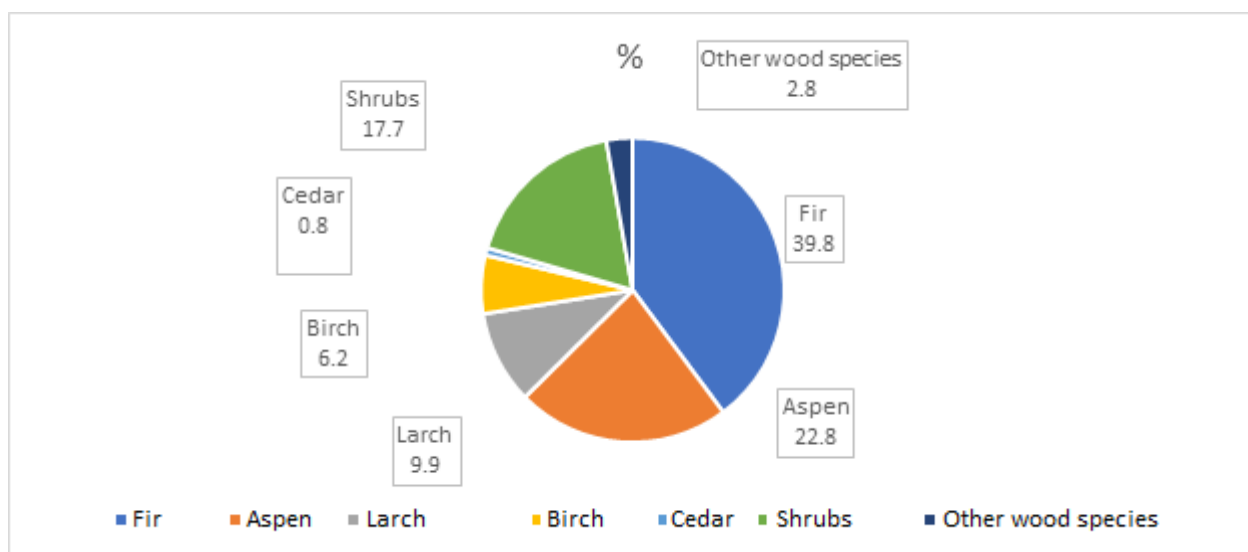
No.	Name	District	Area, ha		Location of forest division and forestry offices
			Total	Including long-term forest use	
1	Butakovskoye	Ridder city akimat lands	23269	23200	Ulba Stroi village
2	Kedrovskoye	Ridder city akimat lands	57332	57332	Belyi Lug village
		Total	80601	80532	

Table 2. Distribution of forested land

Predominant species	Forest types	Index number	area	
			ha	%
<u>Main species</u>				
Pine	Grassy pine forest	СТ	<b>577,5</b>	<b>1,4</b>
Spruce	Mountain and valley spruce forest	ЕГД	<b>57,8</b>	<b>0,1</b>
Fir	Mountain and valley fir forest	ПГД	31,9	0,1
	Fir forest with saw-wort	ПГ	2,8	-
	Fir shrub stand	ПК	2,5	-
	Subalpine fir forest	ПСА	381,1	0,9
	Grass, fern, moss fir forest	ПТПМ	104,6	0,2
	Grass and fern fir forest	ПТП	15559,2	38,2
	Blueberry fir forest	ПЧ	151,4	0,4
<b>Total for fir</b>			<b>16233,5</b>	<b>39,8</b>
Larch	Subalpine larch forest	ЛСА	2136,7	5,2
	Grassy larch forest	ЛТ	551,4	1,4
	Blueberry-moss larch forest	ЛЧМ	1332,8	3,3
<b>Total for larch</b>			<b>4020,9</b>	<b>9,9</b>
Cedar	Subalpine cedar forest	КСА	342,2	0,8
	Grassy cedar forest	КТ	4,2	-
	Blueberry cedar forest	КЧ	2,2	-
<b>Total for cedar</b>			<b>348,6</b>	<b>0,8</b>
Birch	Boggy birch forest (indigenous)	ББ	269,3	0,7

	Forest-steppe birch forest (indigenous)	БЛС	317,4	0,8
	Fern and moss birch forest (derivative)	БПМ	26,0	0,1
	Grassy birch forest (derivative)	БТ	1897,6	4,7
<b>Total for birch</b>			<b>2510,3</b>	<b>6,2</b>
Aspen	Mountain-valley aspen forest (derivative)	ОСГД	3334,6	8,2
	Aspen shrub stand (derivative)	ОСК	296,2	0,7
	Dry aspen forest (indigenous)	ОСС	1294,6	3,2
	Grass-fern aspen forest (derivative)	ОСТП	4369,5	10,7
<b>Total for aspen</b>			<b>9294,9</b>	<b>22,8</b>
Poplar	Moist grassy poplar forest	ТВЛТ	455,0	1,1
	Mountain-valley poplar forest	ТГД	11,9	-
<b>Total for poplar</b>			<b>466,9</b>	<b>1,1</b>
Willow	Streambed willow forest	ИВПР	20,3	-
<b>Total for main forest species</b>			<b>33530,7</b>	<b>82,3</b>
<u>Shrubs</u>				
Willow shrub	Streambed willow shrub stand	ИВКПР	494,7	1,2
Juniper	Juniper stand	АРСТ	15,0	-
Other shrubs (yellow acacia, honeysuckle, mountain willow, guelder rose, currant, meadowsweet, wild rose)	Shrubs	КУСТ	6713,1	16,5
<b>Total for shrubs</b>			<b>7222,8</b>	<b>17,7</b>
<b>Sum total</b>			<b>40753,5</b>	<b>100,0</b>

The most common species is fir – 39.8% of the forested land (16,233.5 ha), followed by aspen – 22.8% (9,294.9 ha), larch - 9.9% (4020.9 ha), birch - 6.2% (2510.3 ha), cedar - 0.8% (348.6 ha) and other tree species account for 2.8%. Shrubs occupy 17.7% of the area covered by forest. 2.2% of the forested land is represented by plantations of artificial origin (pine - 577.5 ha, spruce - 57.8 ha, fir - 13.2 ha, larch - 151.9 ha, birch - 218.7 ha, poplar - 28, 7 ha).



There are two nurseries, a total area of 6.0 hectares, including 0.41 hectares of land under sowing, 2.3 hectares of a transplant section. As of January 1, 2019, the nursery has: annual spruce seedlings – 193.9

thousand pieces, two-year-olds and older spruce seedlings – 33.1 thousand pieces, Scots pine – 327.6 thousand pieces, larch – 62.7 thousand pieces, fir – 101.0 thousand pieces.

In 2018, Siberian spruce forest species were planted on an area of 13.0 hectares, with 89% of it survived. Natural renewal was promoted on an area of 50.0 ha.

In 2019, it is planned to create forest crops under the afforestation project of non-forested lands of Kazgiproleskhoz-KZ LLP on an area of 20 hectares in Kedrovskoye forestry.

There are 201 ha forest species not converted to forested land. 50kg of seeds are collected annually.

### 7.2. Carrying forest management works

Forest management works were carried out in 2009 on the basis of agreement No. 2 dated January 29, 2009, concluded between the Forestry and Hunting Committee under of the Ministry of Agriculture of the Republic of Kazakhstan and the Kazakh Forest Inventory Enterprise. Forest inventory works were carried out throughout the territory with the use of color aerial photographs of 2008, at a scale of 1: 10000. In 2014, 2016, because of amendments and additions to the Forest Code of the Republic of Kazakhstan, the adoption of new Felling Rules in the areas of the State Forest Fund, adjustments were made to the forest inventory project.

The previous forest inventory was carried out by the Kazakh Forest Inventory Enterprise under the reduced program, according to the Working Rules for forest inventory in forestry enterprises of the East Kazakhstan Forestry Production Association for 1995-1997, approved by the First Deputy Chairman of the Forestry Committee under the Ministry of Ecology and Bioresources of the Republic of Kazakhstan dated June 15, 1995, No. 14. The main techniques used were the full-scale examination of areas affected by the economic activity and natural disasters in the revision period, and updating the data on the natural growth of the remaining stands

### 7.3. Reforestation and afforestation

Year	Planting, ha	Sowing, ha.	Promotion of natural renewal, ha	Conversion to forested area, ha
2004	-----	0,2	-----	
2005	-----	0,1	50,0	
2006	5,0 (written off)	0,1	50,0	
2007	30,0 (written off -5)	0,2	50,0	
2008	20,0 (written off)	0,2	50,0	
2009	20,0 (written off)	0,245	50,0	
2010	30,0 (written off)	0,31	50,0	
2011	30,0	0,26	50,0	
2012	30,0	0,2	50,0	
2013	30,0	0,2	50,0	
2014	30,0	0,2	-----	
2015	30,0	0,1	114,3	
2016	20,0	0,1	109,6	
2017	20,0	0,1	91,6	
2018	13,0	0,1	65,4	

According to the reporting data and the results of their study, the main causes of forest crops death are adverse weather conditions. All dead forest crops are written off in a timely manner.

### Forest conservation and protection

### Forest pests and diseases

No.	Year	Forest pests and diseases	Forest pathological examination, ha	Area of foci, ha	Preventive actions
1	2004	Gypsy moth	4000	1135	Selection sanitary felling, Cleaning forest clutter
2	2005	Trunk rot, black-veined white	4000	1335	Selection sanitary felling, Cleaning forest clutter
3	2006	Gypsy moth, annonus root rot, trunk rot	8000	1071	Selection sanitary felling, Cleaning forest clutter
4	2007	Gypsy moth, annonus root rot, trunk rot	8000	1187	Selection sanitary felling, Cleaning forest clutter, Clear sanitary felling
5	2008	annonus root rot, trunk rot	8000	2270	Selection sanitary felling
6	2009	annonus root rot, trunk rot	8000	4058	Selection sanitary felling, Clear sanitary felling
7	2010	annonus root rot, trunk rot	8000	9787	Selection sanitary felling, Clear sanitary felling, Bordeaux mixture use
8	2011	annonus root rot, trunk rot	8184	10259	Selection sanitary felling, Clear sanitary felling
9	2012	annonus root rot, trunk rot	8130	10220	Selection sanitary felling, Clear sanitary felling
10	2013	annonus root rot, insect pests	8313	9725	Selection sanitary felling, Clear sanitary felling
11	2014	annonus root rot, insect pests	8025	9541	Selection sanitary felling, Clear sanitary felling
12	2015	annonus root rot, insect pests	8084	9339	Selection sanitary felling, Clear sanitary felling
13	2016	annonus root rot, insect pests	8241	9408	Selection sanitary felling, Clear sanitary felling
14	2017	annonus root rot, insect pests	8241	9539	Selection sanitary felling, Cleaning forest clutter, Clear sanitary felling
15	2018	annonus root rot, insect pests	8034	9378	Selection sanitary felling, Cleaning forest clutter, Clear sanitary felling



There were outbreaks of pests and forest diseases in the area: gypsy moth, black-veined white on a bird cherry, trunk rot, annonus root rot. The forestry annually conducts the necessary examinations to identify new foci of infection and takes the necessary control measures.

#### Fires

Year	Number of cases	Area (forested, non-forested)	Damage (KZT, thousands)
2004	3	0,23 ha forested	8,3
2005	No fires	-	-
2006	2	0,3 ha forested	-
2007	2	0,31 ha forested	-
2008	1	0,7 ha forested	14,7
2009	No fires	-	-
2010	No fires	-	-
2011	3	3,8 ha forested	3,0
2012	1	0,5 ha forested	11,0
2013	No fires	-	-
2014	1	0,03 ha forested	0,08
2015	No fires	-	-
2016	No fires	-	-
2017	1	0,01	-
2018	No fires	-	-
Total:	14	5,88	37,08

#### Distribution of forestry area by fire danger classes

Forest division	Fire danger classes					Total	Average
	1	2	3	4	5		
Butakovskoe	377,6	4089,3	7974,6	7063,6	943,6	20448,7	3,2
Kedrovskoe	382,7	2810,9	9267,0	12099,4	989,0	25549,0	3,4
Total	760,3	6900,2	17241,6	19163,0	1932,6	45997,7	3,3

The highest, first class includes 1.7% of the area, the fire danger period begins in April and lasts until the end of October. Young coniferous trees, dry pine forests, dying and damaged stands, dry and new forest cuttings are classified as having first fire danger class.

The second class includes areas with mainly newly planted species, dense undergrowth and grass stands.

The third class includes indigenous and derivative forest cuttings, a block of moist pine forests, spruce forests, fir forests and cedar forests.

The fourth class includes compartments of moist pine forests, moist dark coniferous boreal forests, moist larch forests, spruce forests, moist birch forests and aspen forests.

The fifth class includes subalpine conifers, indigenous moist birch forests, moist aspen and poplar forests, as well as willow forests.

#### Fire protection measures

No.	Name of activity	Measurement unit	Amount
	<b>2004</b>		
1	Creation of mineralized strips	km.	-
2	Maintenance of mineralized strips	km.	20
3	Construction of fire roads	km.	-
4	Repair of fire roads	km.	5
5	Creation of helipads	units	
6	Creation of reporting points	units	
7	Arrangement of rest and smoking areas	units	1
8	Putting up signs	units	20
9	Conducting lectures, talks	units	19
10	Conducting checks	units	-
11	Prescriptions issued	units	-
12	Articles published	units	-
	<b>2005</b>		
1	Creation of mineralized strips	km.	10
2	Maintenance of mineralized strips	km.	35
3	Construction of fire roads	km.	2
4	Repair of fire roads	km.	5
5	Creation of helipads	units	-
6	Creation of reporting points	units	-
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	20
9	Conducting lectures, talks	units	22
10	Conducting checks	units	25
11	Prescriptions issued	units	17
12	Articles published	units	-
	<b>2006</b>		
1	Creation of mineralized strips	km.	10
2	Maintenance of mineralized strips	km.	50
3	Construction of fire roads	km.	2
4	Repair of fire roads	km.	5
5	Creation of helipads	units	2
6	Creation of reporting points	units	2
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	20
9	Conducting lectures, talks	units	43
10	Conducting checks	units	35
11	Prescriptions issued	units	21
12	Articles published	units	1
	<b>2007</b>		
1	Creation of mineralized strips	km.	20
2	Maintenance of mineralized strips	km.	70
3	Construction of fire roads	km.	4
4	Repair of fire roads	km.	9
5	Creation of helipads	units	2
6	Creation of reporting points	units	2

7	Arrangement of rest and smoking areas	units	3
8	Putting up signs	units	17
9	Conducting lectures, talks	units	46
10	Conducting checks	units	37
11	Prescriptions issued	units	22
12	Articles published	units	2
	<b>2008</b>		
1	Creation of mineralized strips	km.	15
2	Maintenance of mineralized strips	km.	90
3	Construction of fire roads	km.	1
4	Repair of fire roads	km.	3
5	Creation of helipads	units	3
6	Creation of reporting points	units	4
7	Arrangement of rest and smoking areas	units	4
8	Putting up signs	units	21
9	Conducting lectures, talks	units	91
10	Conducting checks	units	3
11	Prescriptions issued	units	20
12	Articles published	units	9
	<b>2009</b>		
1	Creation of mineralized strips	km.	15
2	Maintenance of mineralized strips	km.	95
3	Construction of fire roads	km.	6
4	Repair of fire roads	km.	13
5	Creation of helipads	units	1
6	Creation of reporting points	units	1
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	19
9	Conducting lectures, talks	units	95
10	Conducting checks	units	3
11	Prescriptions issued	units	16
12	Articles published	units	7
	<b>2010</b>		
1	Creation of mineralized strips	km.	15
2	Maintenance of mineralized strips	km.	100
3	Construction of fire roads	km.	6
4	Repair of fire roads	km.	14
5	Creation of helipads	units	1
6	Creation of reporting points	units	1
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	20
9	Conducting lectures, talks	units	90
10	Conducting checks	units	-
11	Prescriptions issued	units	31
12	Articles published	units	9
	<b>2011</b>		
1	Creation of mineralized strips	km.	10
2	Maintenance of mineralized strips	km.	105

3	Construction of fire roads	km.	1
4	Repair of fire roads	km.	5
5	Creation of helipads	units	1
6	Creation of reporting points	units	1
7	Arrangement of rest and smoking areas	units	3
8	Putting up signs	units	15
9	Conducting lectures, talks	units	90
10	Conducting checks	units	-
11	Prescriptions issued	units	28
12	Articles published	units	9
	<b>2012</b>		
1	Creation of mineralized strips	km.	10
2	Maintenance of mineralized strips	km.	105
3	Construction of fire roads	km.	1
4	Repair of fire roads	km.	5
5	Creation of helipads	units	1
6	Creation of reporting points	units	1
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	12
9	Conducting lectures, talks	units	90
10	Conducting checks	units	-
11	Prescriptions issued	units	34
12	Articles published	units	7
	<b>2013</b>		
1	Creation of mineralized strips	km.	10
2	Maintenance of mineralized strips	km.	105
3	Construction of fire roads	km.	1
4	Repair of fire roads	km.	5
5	Creation of helipads	units	1
6	Creation of reporting points	units	1
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	10
9	Conducting lectures, talks	units	90
10	Conducting checks	units	-
11	Prescriptions issued	units	44
12	Articles published	units	3
	<b>2014</b>		
1	Creation of mineralized strips	km.	5
2	Maintenance of mineralized strips	km.	105
3	Construction of fire roads	km.	1
4	Repair of fire roads	km.	5
5	Creation of helipads	units	1
6	Creation of reporting points	units	1
7	Arrangement of rest and smoking areas	units	2
8	Putting up signs	units	5
9	Conducting lectures, talks	units	90
10	Conducting checks	units	-
11	Prescriptions issued	units	36

12	Articles published	units	6
	<b>2015</b>		
1	Creation of mineralized strips	km.	5
2	Maintenance of mineralized strips	km.	105
3	Construction of fire roads	km.	-
4	Repair of fire roads	km.	-
5	Creation of helipads	units	-
6	Creation of reporting points	units	-
7	Arrangement of rest and smoking areas	units	1
8	Putting up signs	units	11
9	Conducting lectures, talks	units	95
10	Conducting checks	units	-
11	Prescriptions issued	units	45
12	Articles published	units	7
	<b>2016</b>		
1	Creation of mineralized strips	km.	-
2	Maintenance of mineralized strips	km.	100
3	Construction of fire roads	km.	-
4	Repair of fire roads	km.	-
5	Maintenance of helipads	units	4
6	Creation of reporting points	units	-
7	Maintenance of rest and smoking areas	units	8
8	Putting up signs	units	10
9	Conducting lectures, talks	units	95
10	Conducting checks	units	-
11	Prescriptions issued	units	50
12	Articles published	units	9
	<b>2017</b>		
1	Creation of mineralized strips	km.	-
2	Maintenance of mineralized strips	km.	100
3	Construction of fire roads	km.	-
4	Repair of fire roads	km.	-
5	Maintenance of helipads	units	4
6	Creation of reporting points	units	2
7	Maintenance of rest and smoking areas	units	4
8	Putting up signs	units	5
9	Conducting lectures, talks	units	95
10	Conducting checks	units	-
11	Prescriptions issued	units	60
12	Articles published	units	7
	<b>2018</b>		
1	Creation of mineralized strips	km.	-
2	Maintenance of mineralized strips	km.	100
3	Construction of fire roads	km.	-
4	Repair of fire roads	km.	-
5	Maintenance of helipads	units	4
6	Maintenance of reporting points	units	2
7	Maintenance of rest and smoking areas	units	4

8	Putting up signs	units	5
9	Conducting lectures, talks	units	90
10	Conducting checks	units	-
11	Prescriptions issued	units	54
12	Articles published	units	7

### Illegal felling

Year	Type	Number of cases	Volume, m <sup>3</sup>	Damage (KZT, thousands)	Number of raids
2004	Illegal felling	17	22,0	18,4	111
2004	Poaching	-	-	-	30
2005	Illegal felling	7	8,0	9,0	111
2005	Poaching	-	-	-	30
2006	Illegal felling	6	2,0	3,5	
2006	Poaching	-	-	-	38
2007	Illegal felling	4	44,8	513,4	317
2007	Poaching	-	-	-	28
2008	Illegal felling	2	30,2	321,3	234
2008	Poaching	6	-	-	28
2009	Illegal felling	1	1,4	5,7	297
2009	Poaching	4	-	-	28
2010	Illegal felling	2	6,8	45,4	327
2010	Poaching	3	-	-	28
2011	Illegal felling	5	21,8	168,1	317
2011	Poaching	1	-	-	28
2012	Illegal felling	3	109,5	1669,7	327
2012	Poaching	-	-	-	28
2013	Illegal felling	-	-	-	327
2013	Poaching	-	-	-	28
2014	Illegal felling	1	3,0	70,4	327
2014	Poaching	1	-	-	28
2015	Illegal felling	-	-	-	327
2015	Poaching	-	-	-	28
2016	Illegal felling	3	9,1	33,7	327
2016	Poaching	3	-	-	28
2017	Illegal felling	9	133,1	1080,9	327
2017	Poaching	3	-	-	28
2018	Illegal felling	1	133,0	995,7	327
2018	Poaching	2	-	-	28
	Total:	61	524,7	4935,2	4003/434

### Poaching

There were no cases of poaching for the period 2004-2018. There are no illegally obtained animals. No damage done

#### 7.4. Staff

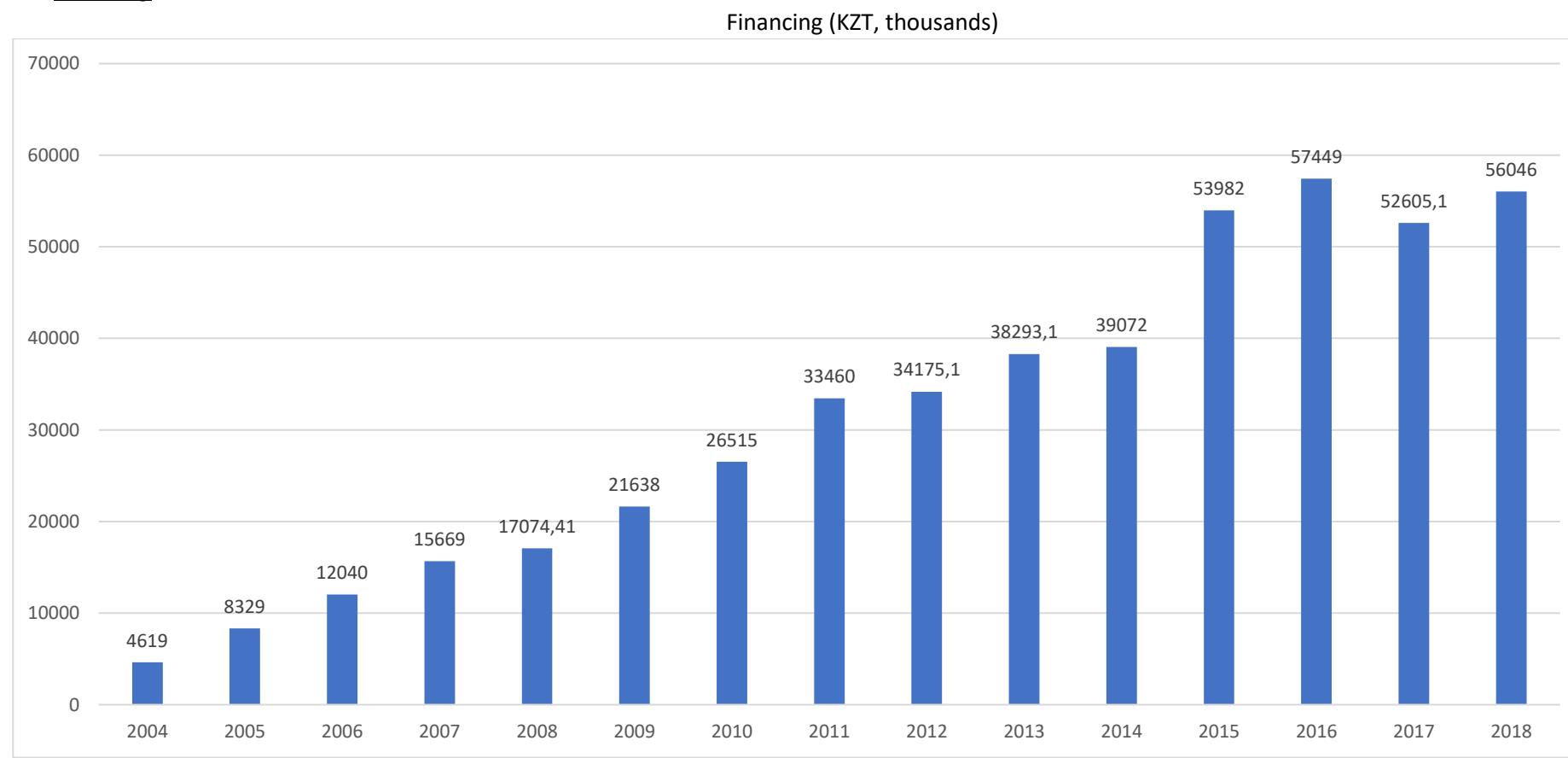
No.	Name	2004	2005	2006	2007	2008	2009r	2010	2011	2012	2013	2014	2015	2016	2017	2018
1	Staff number	32	32	32	32	45,5	42,5	41,5	46,5	46,5	40	41	48	42	41	49,5
2	Staffing size															
3	Staff turnover	19	15,6	12,5	6,25	19,5	18,5	19	11,5	19,5	17,5	14,6	15,5	15,5	22,7	19,8
4	Education level, including:	32	32	32	32	45,5	42,5	41,5	46,5	46,5	40	41	48	42	41	49,5
5	a) higher	2	2	2	2	3,5	3,5	3,5	5	5	10	8	8	8	7	10
6	b) secondary professional	9	11	10	10	19	18	18	27,5	27,5	15	15	20	19	16	15
7	c)secondary	21	19	20	20	23	21	20	13	13	15	18	20	15	18	24,5
8	Further training							1		1		1	1	22		

Currently, the staff number is 43 people, including 10 people with higher education and a part-time translator (indicated as 0.5).

**November 24, 2010** - 1 person trained in "Safety and labor protection training program"

**September 13, 2012** - 1 person. Further training courses for forestry workers under the Kazakh Research Institute of Forestry LLP "Conducting an inventory of forest crops, nurseries, areas with measures taken to promote natural forest regeneration and left under natural overgrowing." **July 3, 2014** - 1 person - Initial training program for drivers of fire engines. **March 18, 2015**, 1 person. - "Labor Protection". 2016 - 1 person - "Safety and labor protection in enterprises." **March 25, 2016** - 3 people - Training in fire safety (36 hours) to work in the non-governmental fire service; carried out on the basis of Ridder Agrarian and Technical College. **December 09, 2016** - 14 people. – Further training for forestry workers (36 hours) on the basis of Ridder Agrarian and Technical College. **December 14, 2016** - 4 people – Further training for senior specialists and forestry managers (48 hours) on the basis of Ridder Agrarian and Technical College.

### 7.5. Financing





### 7.6. Long-term forest use

Year	Types of forest use /area															
	For health, recreational, cultural, and tourist purposes	For hunting	For grazing	For haying	Placement of beehives and apiaries	For research	For plantations of special purpose.	Total:								
	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha	amount	Area, ha
2004																
2005																
2006																
2007																
2008																
2009																
2010																
2011	1	5,0							5	1,6					6	6,6
2012																
2013																
2014	6	5,8							2	1,15					8	6,95
2015																
2016	1	1,3													1	1,3
2017	1	2,4			1	10,0									2	12,4
2018																

### 7.7. Wood harvesting

Cutting types															
	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018
Primary use	0,0	0,0	0,0	0,0	0,0	0,0	0,0	1,2	0,0	0,0	3,7	1,0	1,7	15,8	18,2
Intermediate use, including:	6,6	12,5	10,9	9,4	8,6	10,6	10,8	1,8	16,5	9,9	10,3	7,4	22,3	0,8	0,3
Forest thinning	1,9	0,6	0,2	0,0	0,1	0,4	1,6	0,1	1,8	0,2	0,3	0,6	0	0,8	0,3
Selection sanitary felling	4,7	11,9	10,7	9,4	8,5	10,2	9,2	1,7	14,7	9,7	10,0	6,8	22,3	0,0	0,0
Other types, including	1,7	1,8	1,5	1,5	4,4	4,9	3,5	0,0	1,5	1,4	2,2	1,3	3,9	5,4	4,9
Clear sanitary felling	0,0	0,0	0,0	0,0	1,9	2,4	1,4	0,0	0,9	0,5	1,6	0,6	1,9	2,4	1,9
Cleaning forest clutter	1,7	1,8	1,5	1,5	1,3	1,5	1,0	0,0	0,6	0,6	0,5	0,6	1,2	2,8	3
Forest clearing	0,0	0,0	0,0	0,0	1,2	1,0	1,1	0,0	0,0	0,3	0,1	0,1	0,8	0,2	0,05

7.8. *Technical equipment of Pikhtovskoye forestry*

No.	Name	Norm	Available	Needed
1	Fire engine	1	1	-
2	Tractor	2	3	-
3	Bulldozer	-	-	-
4	Onboard vehicle	-	-	-
5	Tank truck	-	-	-
6	Patrol car	2	2	-
7	Motorcycle (horse)	65	-	65
8	Chainsaw	3	4	-
9	Trailed, mounted vehicles and equipment:	-	-	-
1)	brush cutter, uprooter	-	-	-
2)	Terracer	-	-	-
3)	Disc harrow	-	-	-
4)	Road roller	-	-	-
5)	Mower	-	-	-
6)	Skidder	-	-	-
10	Knapsack sprayer, blower sprayer	60	59	1
11	Tractor sprayer, blower sprayer	-	-	-
12	Motor pump	2	3	-
13	Fire plough	1	3	-
14	Milling machine	1	-	1
15	Fire-break equipment	1	1	-
16	Fire guns	1	1	-
17	Radio communication devices	61	63	-
18	Navigation devices	14	2	12

## 8. Zaysan forestry

### 8.1. General information

Contacts: 21 Kuniyarov Str., Zaysan, East Kazakhstan region. Tel: 8 (72340) 27199, [zsnleshoz@mail.ru](mailto:zsnleshoz@mail.ru).

The office is located in Zaysan, 435 km of Ust-Kamenogorsk.

The forestry is located in Zaysan district (88077 ha) and Tarbagatai district (683 ha), the total area of 88760 ha, of which 32100 ha is covered with forest.

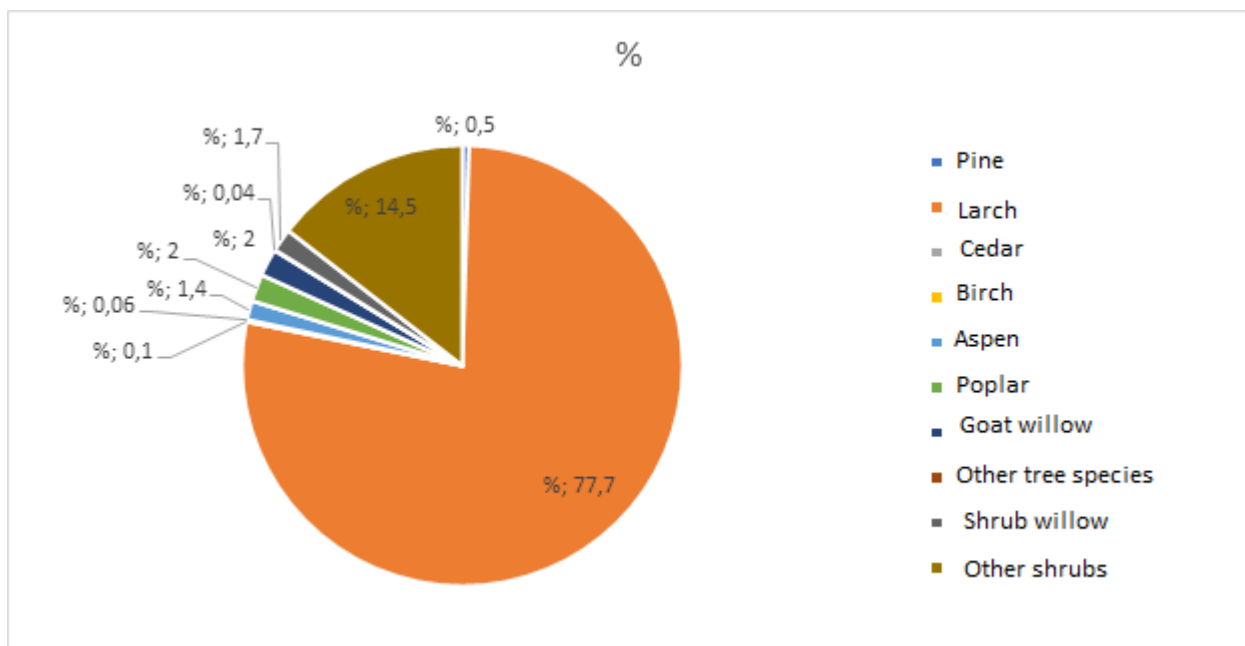
The forestry consists of two forest divisions: Zaysan and Karatal.

Distribution of forest area by forest divisions

Name	District	Area, ha		Location of forest division and forestry offices
		Total	Including long-term forest use	
Zaysan	Zaysan	43861	189,9	21 Kuniyarov Str., Zaysan
	Tarbagatai	683		
Total:		44544	189,9	
Karatal	Zaysan	44216	217,0	Karatal village
Total:		<b>88760</b>	<b>406,9</b>	
including:	Zaysan	88077	406,9	
	Tarbagatai	683	-	

The forestry has a temporary nursery (Zaysan forest division), which is located in the Shurshutsy tract with an area of 1.5 hectares. Currently, planting material is grown in open field. Irrigation is carried out with preliminary water intake by a motor pump from a river into a reservoir. Mountain water warmed by the sun is used for further irrigation. Basically, all work carried out in the nursery is done manually. There is no permanent nursery and forest seed plots of plus stands and plus trees in the forestry. When harvesting forest seeds, the forestry is guided by the plan tasks of the higher authority. Seed collection is carried out manually by foresters in temporary forest seed areas. There are practically no phenological observations, yield forecasting and control over seed collection. There are no special stationary storages, equipment or devices for collecting and cleaning seeds; the entire technology of work is carried out by means at hand. Due to insufficient funding, forest seed cultivation in the forestry is unsatisfactory.

The main species occupy 83.8% of the total forested area, shrubs - 16.2%. The predominant species are distributed as follows: pine - 0.5%, larch - 77.7%, cedar - 0.1%, birch - 0.06%, aspen - 1.4%, poplar - 2.0%, goat willow - 2.0%, other tree species - 0.04%, shrub willow - 1.7%, other shrubs - 14.5%. The predominant species are larch, aspen, poplar and goat willow tree.



### Distribution of forested land

Predominant species	Forest types	Index number	Area	
			ha	%
<u>Main species</u>				
Pine	Grassy pine forests	СТ	161,6	0,5
Larch	Larch forests:			
	Shrubby grassy	ЛКТ	16122,0	50,3
	Juniper	ЛМЖ	1629,9	5,1
	Mossy	ЛМ	7159,1	22,3
	total:		24911,0	77,7
cedar	Grassy cedar forests	КТ	34,9	0,1
birch	Birch shrub stands	БКТСВ	20,2	0,1
aspen	Fresh aspen stands (indigenous)	ОССВ	443,5	1,4
poplar	Moist grassy poplar forests	ТВЛТ	633,1	2
Goat willow	Streambed willow forest	ИВПР	645,6	2
Mountain ash	Mountain ash stands	Р	10,4	-
Bird cherry	Bird cherry stands	ЧР	2,3	-
Willow shrubs	Streambed willow shrub stands	ИВКПР	551,9	1,7
Juniper	Juniper stands	АРСТ	77,5	0,2
Sea buckthorn	Streambed sea buckthorn shrub stands	ОПР	618,5	1,9
Other shrubs (yellow acacia, honeysuckle, mountain willow, guilder rose, currant, meadowsweet, wild rose)	Shrubs	КУСТ	3959,1	12,4
Total			32069,6	100,0

### 8.2. Carrying out forest management works.

Forest management works were carried out in 2011.

### 8.3. Reforestation and afforestation

Year	Planting	Sowing	Promotion of natural renewal	Conversion to forested area	Notes
2004					
2005					
2006					
2007		0,15			
2008		0,1			
2009		0,07			
2010	20	0,1			
2011	20	0,1		7	
2012	25	0,1			Planned to be converted in 2019
2013	25	0,1	0,4		
2014	25	0,1			
2015	30	0,1			
2016	30	0,1			
2017	30	0,1			
2018	30	0,1			
2019	30	0,1			
<b>Total</b>	<b>265</b>			<b>7</b>	

### 8.4. Forest conservation and protection

#### **Forest pests and diseases**

Of the forest protection measures, the previous forest inventory planned annually to conduct forest pathological examination on an area of 10.0 thousand ha. Soil excavation of 130 pits, enclosing 25 anthills and hanging 15 bird nests were not carried out. From 1998 to 2002, forest pathological examination was not carried out. Since 2003, forest pathological examination has been performed on average annually on an area of 9.0 thousand ha. During the past revision period, there were foci of the Siberian silkworm revealed. In order to improve sanitary conditions, selection sanitary felling and cleaning of forest clutter (blown down by wind) were carried out. Preventive measures to control pests and diseases were not taken. Based on the analysis and the actual state of the stands, it can be concluded that the proper supervision of forest pests and diseases in forest institutions is carried out without special forest pathological training. The general sanitary condition, taking into account the foci of pests and forest diseases, as well as the burnt areas, which are designated for sanitary felling aimed at improving plantations, can be assessed as unsatisfactory.

#### **Fires**

Year	Number of cases	Total	Area		Damage (KZT,thous ands)
			Including forested area	Non-forested area	
2004					
2005					
2006					
2007					

2008					
2009					
2010					
2011					
2012	1	1	0,9		30,4
2013					
2014					
2015	1	1	20		535,68
2016	2	2	0,02		18,34
2017					
2018					
Итого	4	4	20,92		584,42

For the analyzed period, there were 4 cases of forest fires recorded. The total area covered by forest fires according to the reporting data is 20.92 ha. The main causes of forest fires were lightning discharges and agricultural burning.

#### Illegal felling

Year	Illegal felling		
	Number of cases	Volume, m <sup>3</sup>	Damage (KZT, thousands)
2004	15	54	15,3
2005	9	16	12,5
2006	33	15	9,4
2007	-	-	-
2008	-	-	-
2009	2	4	9,6
2010	-	-	-
2011	-	-	-
2012	-	-	-
2013	1	3,4	22,5
2014	-	-	-
2015	1	16,5	239
2016	-	-	-
2017	7	133,68	375,0
2018	16	119,7	2362,48
2019	-	-	-
Итого	84	362,28	3045,78

From 2004 to 2019, there were 84 cases of illegal felling recorded, with 362.28 m<sup>3</sup> of wood cut down and the amount of damage caused making up KZT 3045.78 thousand.

#### Poaching

From 2004 to 2018, there were no cases of poaching recorded.

#### 8.5. Staff

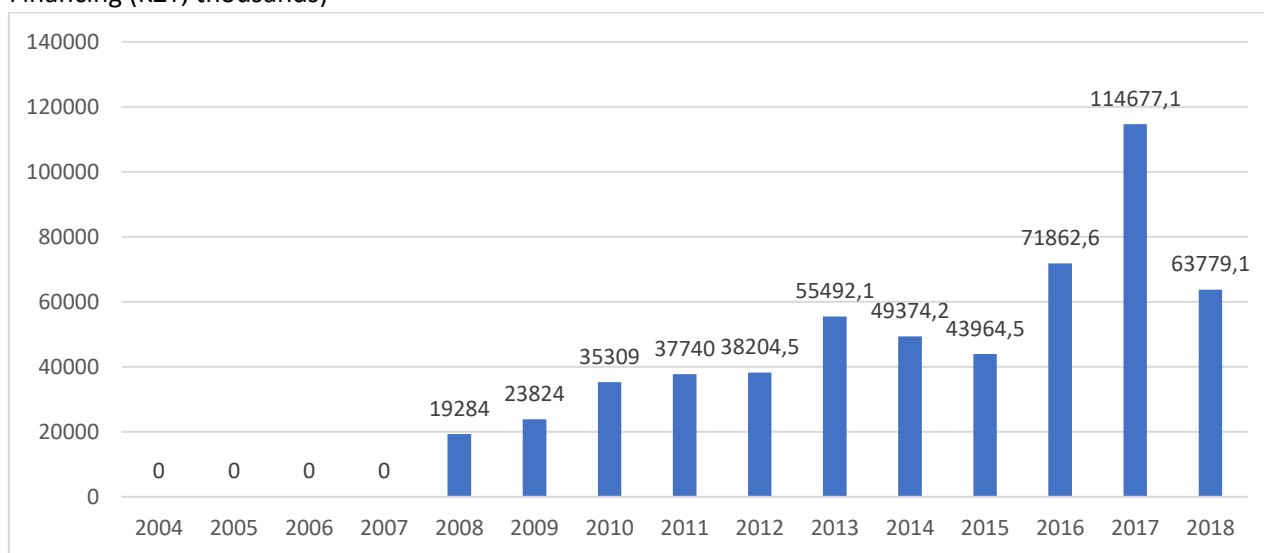
Year	Staff number	Staffing size	Staff turnover	Education level		Further training
				secondary professio	Higher	

				nal		
2004						
2005						
2006						
2007						
2008						
2009						
2010	54	54,5	12			
2011	54	54,5	10			
2012	54	54,5	10			
2013	54	54,5	13			
2014	54	54,5	5			
2015	54	54,5	9			
2016	54	54,5	2			
2017	55	55,5	5			
2018	55	55,5	10	29	9	

Currently, the staff number is 53.5, including 13 –with higher education, 29 – with professional secondary education and 11.5 (including a part-time translator) – with secondary education. The level of coverage of forestry workers with further training is not sufficient. Every year prior to the start of the fire danger period, forest guard training is conducted (according to the order of the Forestry and Wildlife Committee under the Ministry of Agriculture). Once every three years training (of deputy directors, engineers and foresters) on safety and labor protection is carried out by specialized organizations with certificates given after. Also, once every three years at the request of the Fire Safety Department, training (of deputy director, engineers and foresters) on fire protection is carried out with certificates issued after. Specialized further education programs and trainings were not conducted.

#### 8.6. *Financing*

Financing (KZT, thousands)





### 8.7. Long-term forest use

Year	For haying (amount/ha)		For cattle grazing (amount/ha)		For maral breeding (amount/ha)		For recreation and health purposes		For research	
	amount	ha	amount	ha	amount	ha	amount	ha	amount	ha
2004										
2005										
2006										
2007					1	217				
2008										
2009										
2010			1	189,9						
2011							1	3,0		
2012										
2013										
2014	1	191,0	3	801,5			1	2,0		
2015							1	0,5	1	0,5
2016			11	1934,6						
2017			6	1529,8						
2018			3	597						
<b>Total</b>	<b>1</b>	<b>191,0</b>	<b>24</b>	<b>5052,8</b>	<b>1</b>	<b>217,0</b>	<b>3</b>	<b>5,5</b>	<b>1</b>	<b>0,5</b>

The forestry is located in Zaysan and Tarbagatai administrative districts, the main economic sector of which is agriculture. According to natural resources and the farming specialization, the area where the forestry is located is included in the desert-steppe (irrigation) zone, the main branch of which is sheep husbandry. The main volume of agricultural products is produced by private farms and household farms, organized on the lands of former state farms. On the territory of the Karatal forestry (Kyzylkiya) a maral farm was organized on an area of 217 hectares. Private beekeeping is developing. On treeless spaces of slightly hilly plains cultivation of cereals and sunflowers is developed. Outside the territory of forest cottages, on the lands of rural districts along rivers and small ravines, individual areas that are not included in the state forest fund, natural plantings of larch and older forest species created outside the forest cottages area grow. It is necessary to resolve the issue of their prompt legal registration and transfer to the forestry. The role of forestry in meeting local wood needs is not great. The forests mainly have a water-regulating and climate-regulating role. They regulate the surface runoff and groundwater level, protect the fields from wind erosion. Thus, forests

contribute to climate mitigation and regulate the moisture content in the soil, increasing crop yield of crops, hayfields and pastures. The forest fund is also a forage base for animal husbandry. Cattle grazing is carried out on summer pastures, called zhailyau. But besides pastures, non-forested and forested lands adjacent to them are also used for grazing, and thereby harm the forestry.

#### 8.8. Wood harvesting

Cutting types	Wood harvesting, m <sup>3</sup> .																
	2003	2004	2005	2006	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016	2017	2018	2019
Primary use																<b>203</b>	<b>100</b>
Intermediate use, including:	<b>1815</b>	<b>2495</b>							<b>761</b>	<b>963</b>	<b>972</b>	<b>1383</b>	<b>1249</b>	<b>1437</b>	<b>1027</b>	<b>799</b>	<b>1165</b>
Forest thinning	117	244								461	180	277	482	637	737	640	1054
Selection sanitary felling	1698	2251							761	502	792	1106	767	800	290	159	111
Other types, including		<b>860</b>							<b>640</b>	<b>363</b>	<b>126</b>			<b>150</b>			
Clear sanitary felling														150			
Cleaning forest clutter		860							640	363	126						
Forest clearing																	

8.9. *Technical equipment of Zaysan forestry for 2018*

No.	Name	units	available	Average degree of wear %	To be written off	Needed (taking into account the written off )	Price per unit	Total amount KZT, thousands
1	Fire engine	2	3	100	1			
2	Tractors:							
3	3 drawbar category	3	1	10		2	15 000,0	30 000,0
4	1,4 drawbar category		1	20		1	9 000,0	9 000,0
5	Bulldozer		1	10				
6	Automobiles:							
7	Capable of carrying 2,5-3 t					1	14 000,0	14 000,0
8	Patrol car	5	3			2	6 000,0	12 000,0
9	Horse		31					
10	Chainsaw	7	3			4	75 000	300 000
11	Trailed, mounted vehicles and equipment:					1	1 500,0	1 500,0
12	brush cutter, uprooter							
13	Terracer							
14	Disc harrow					1		
15	Road roller							
16	Mower					1	300 000	300 000
17	Skidder							
18	Knapsack sprayer, blower sprayer		69		20	20	10 000	200 000
19	Motor pump		4			1	80 000	80 000
20	Two-way disc plough					1	400 000	400 000
21	Milling machine		1			1	2 850,0	2 850,0
22	Fire-break equipment	1				1	600 000	600 000
23	Drip torch		1		1	1	100 0000	100 000
	Total							71 330,0