

“Russian State Hydrometeorological University”

## BACHELOR THESIS

Analysis of status of snow leopard *Panthera uncia*  
in Sarychat-Ertash nature reserve

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Special thanks for Bagrova Tatyna Nikolaevna for providing help with thesis, Annelisa Cabant from OSI-Panthera for information assistance, the Sarychat-Ertash team for sharing valuable data of wild animals of the reserve and so on.

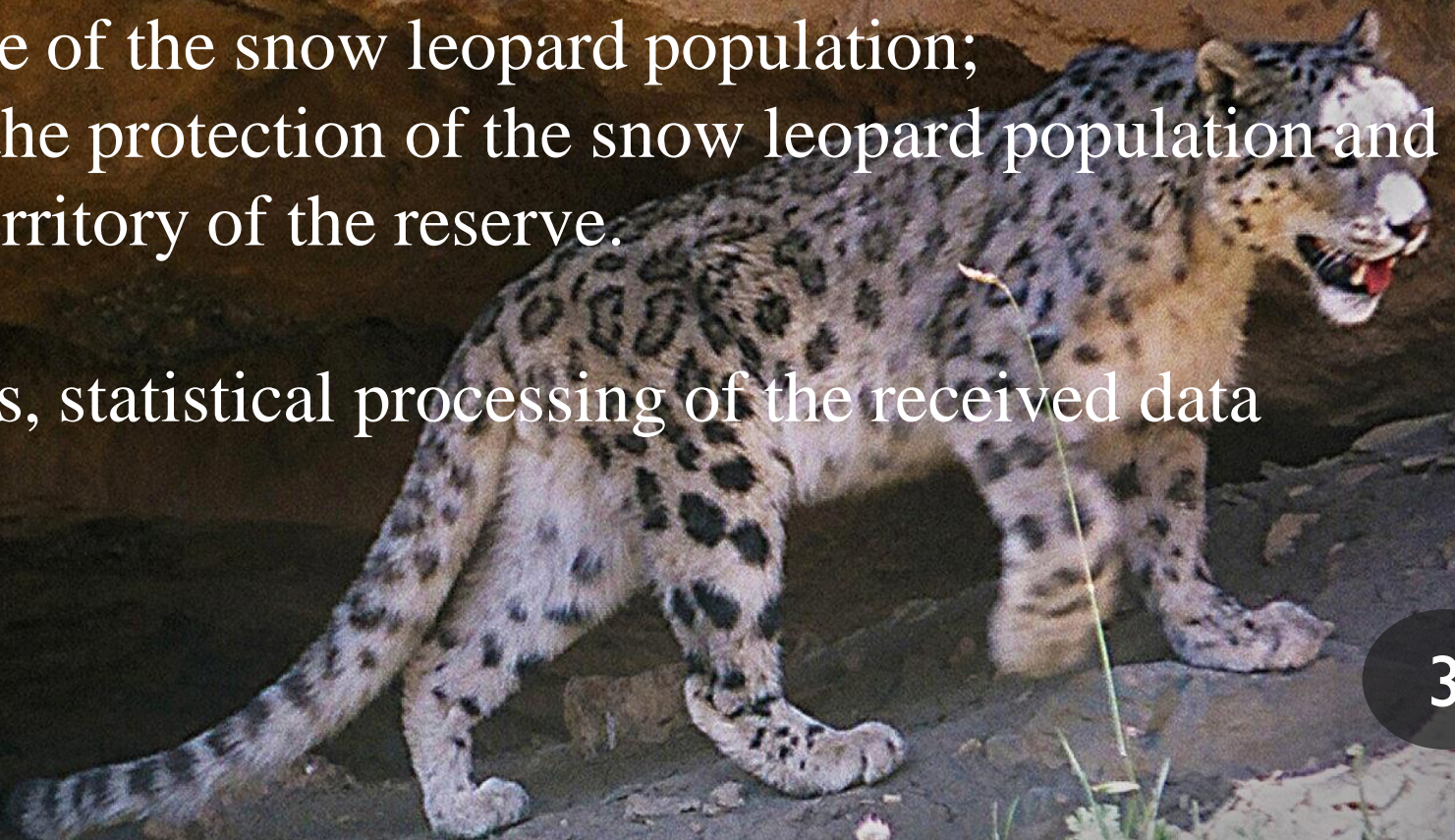


The purpose of the work is to identify the state of the snow leopard population in Sarychat-Ertash state nature reserve.

Tasks:

1. Describe the physical and geographical features of the research region;
2. Explore the snow leopard's habitat;
3. Identify the current state of the snow leopard population;
4. Develop proposals for the protection of the snow leopard population and its ecosystems on the territory of the reserve.

Methods: field observations, statistical processing of the received data



The Kyrgyz Republic is a mountainous country in Central Asia

The country's area is 199.9 thousand km<sup>2</sup>

Population-6,389.5 million people (2019).



# Area

The Republic is located within two mountain systems: Tien Shan and Pamir-Alay

More than 90% is occupied by mountains, the highest point is Pobedy Peak (7439 m)

The area is represented by hilly-uvallisty foothills of different heights (adyrs), dissected, sometimes with bedlands of low mountains, steep-sloping erosional middle mountains, alpine highlands with peaks, circuses, spurs, morainic ridges.



# Climate

The climate is moderate continental, high-altitude with signs of Subpolar.

With the height vertical climate zoning is expressed.

The average temperature in January in the foothills in the North is about  $-8^{\circ}\text{C}$ , in the southwest  $-3^{\circ}\text{C}$ , in the highlands  $-27^{\circ}\text{C}$ ;

July –  $22^{\circ}\text{C}$ ,  $25^{\circ}\text{C}$  and  $10^{\circ}\text{C}$ .

Average annual precipitation amounts on the slopes of the ridges from North to South vary from 1000-1500 mm to 600-800 mm



# Protected areas of the Republic

The Republic has a network of specially protected natural territories with a total area of 1,476,121.6 ha or about 7.4% of the total area of the Republic, including:

- 10 state nature reserves;
- 13 national nature parks;
- 2 complex;
- 8 forest;
- 12 hunting (zoological);
- 19 geological and
- 23 botanical reserves.

# Sarychat-Ertash nature reserve

- was founded by Government resolution No. 76 of March 10, 1995 on the territory of the Issyk-Kul region in order to preserve unique natural complexes, rare and endangered species of flora and fauna of the Issyk-Kul region, as well as to maintain the overall ecological balance of the region



Карта 1.1 Расположение Сарычат-Эрташского заповедника



The *climate* of the reserve is very hard and sharply continental.

The average temperature in January is  $-21.5^{\circ}\text{C}$ , in June  $+4.2^{\circ}\text{C}$ .

About 200 days a year the territory is covered with snow.

The area is located at altitudes from 2000-5000 m by high mountain ranges with alternating valleys and basins

The territory of the reserve is divided into 3 zones:

- core area - 128 868.9 ha (86.42% red color);
- buffer zone – 16,778 ha (11.25% blue);
- security / alienated zone-3,471 ha (2,33% yellow)

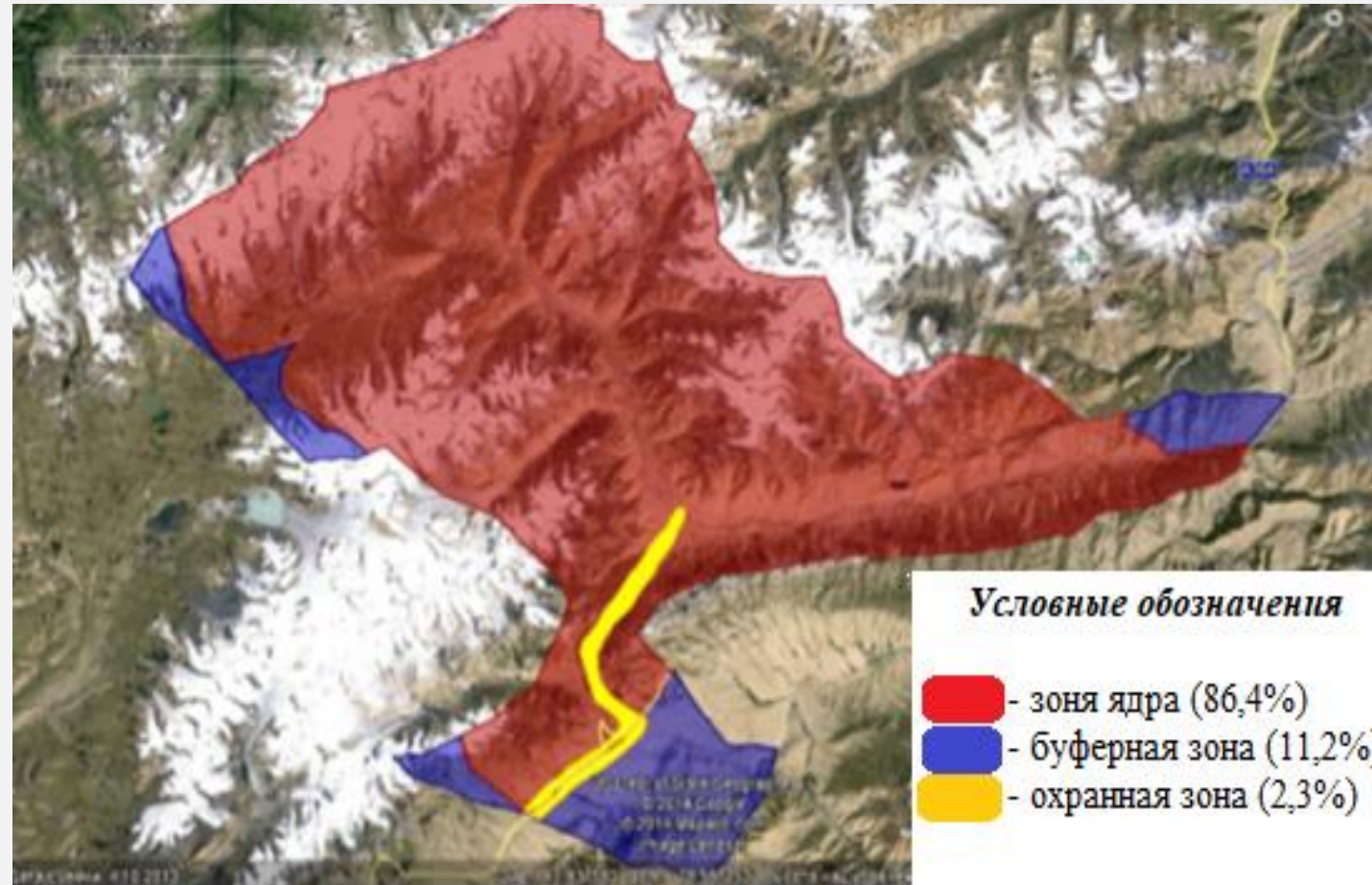


Схема Сарычат-Эртаишского заповедника по зонам

## **Snow leopard (*Panthera uncia*)**

– a unique mammal of the cat family, included in the red book of the Kyrgyz Republic and the IUCN Red list, with the status of a vulnerable species (VU).

The number of snow leopards in the wild is estimated from 4500-7500 individuals (Jackson et al. 2010)

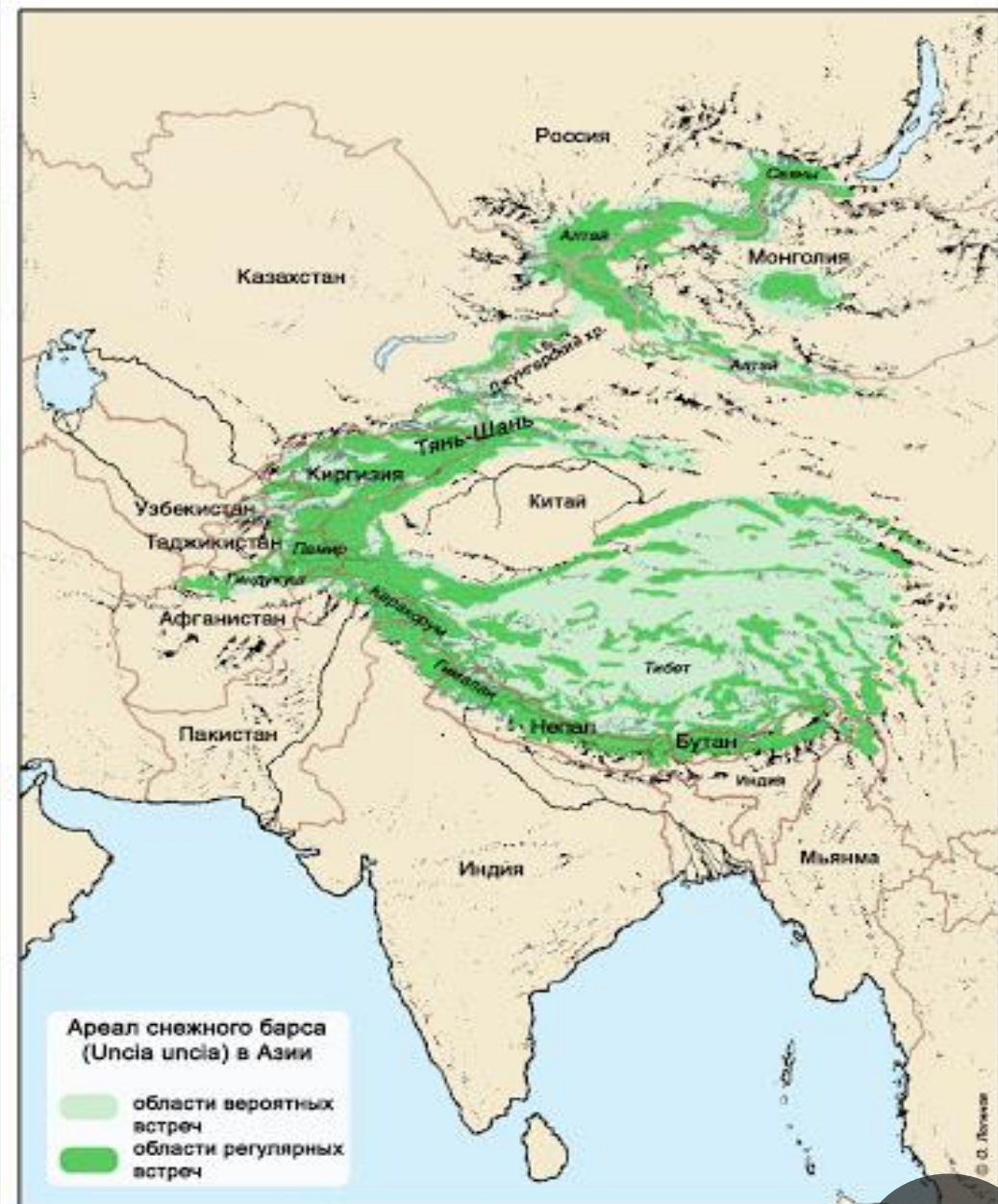


# Habitat

The snow leopard covers the mountainous regions of Central Asia And Southern Siberia with a total area of 1 200 000 – 1 600 000 km<sup>2</sup>, mainly in subalpine, alpine and nival zones.

For the Kyrgyz Tien Shan and Pamir-Alai, the potential area of the area is 54,000 km<sup>2</sup> or 1/4 of the Republic. The number of snow leopards in the Republic is about 300 individuals, which is approximately equal to 5.7% of the global population.

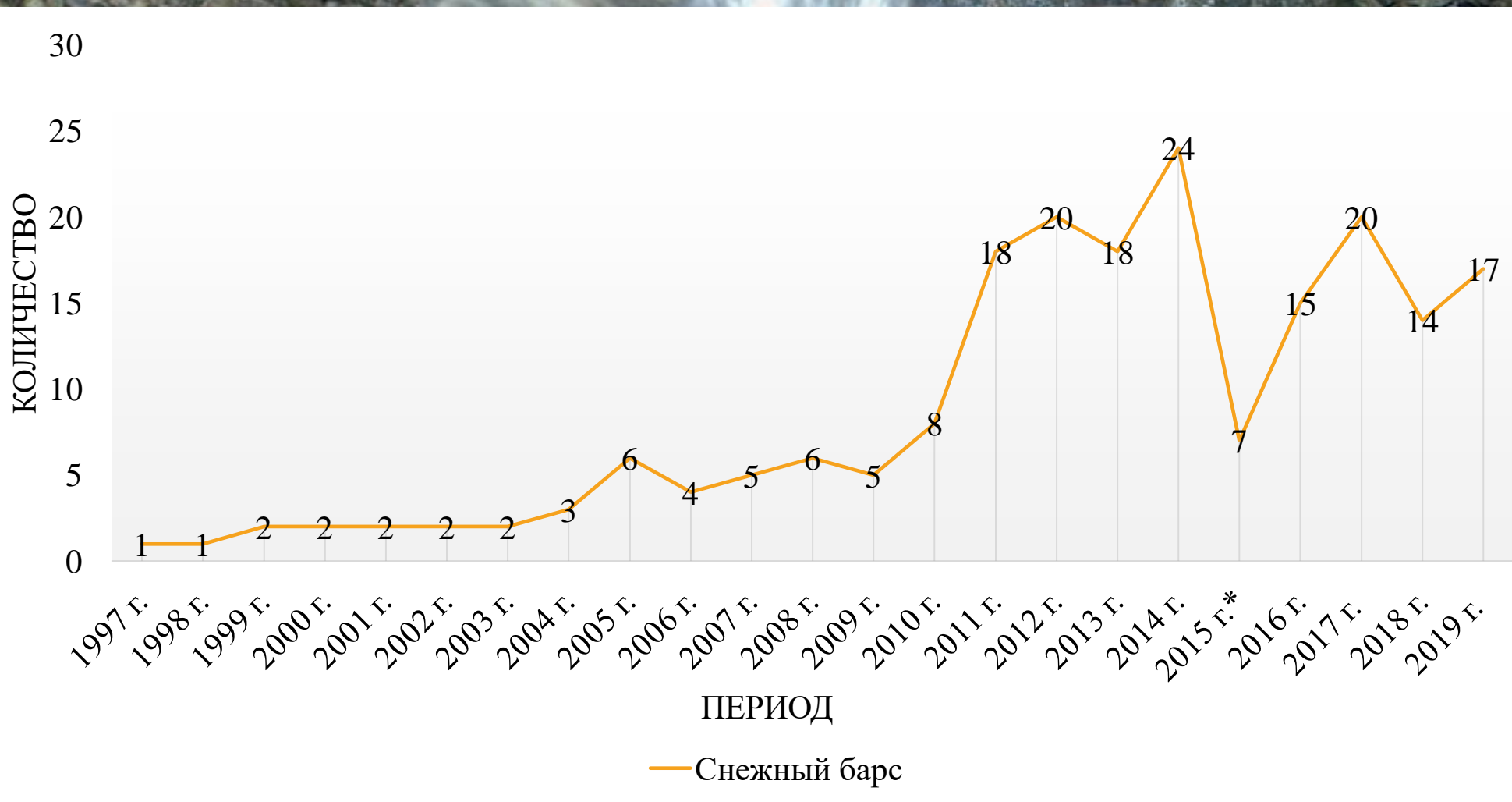
In Russia, the Northern part of the snow leopard's range is located with an area of at least 60,000 km<sup>2</sup>, mainly in the Republic of Altai, Tuva and Buryatia. In Russia, there are from 70 to 90 individuals, or 2% of the global population.



*Ист.: Глобальная программа по сохранению  
снежного барса и его экосистем*



## Dynamics of numbers for the snow leopard population in the reserve



Res: Data on wildlife registration in the Sarychat-Ertsha nature reserve

# Dynamics of the snow leopard population (a) in the Kyrgyz Republic and (b) Russia

a)



*Ист.: Национальная стратегия сохранения снежного барса в КР*

b)



*Ист.: Годовые отчеты WWF России*

# Types of food base of the snow leopard and its food competitors

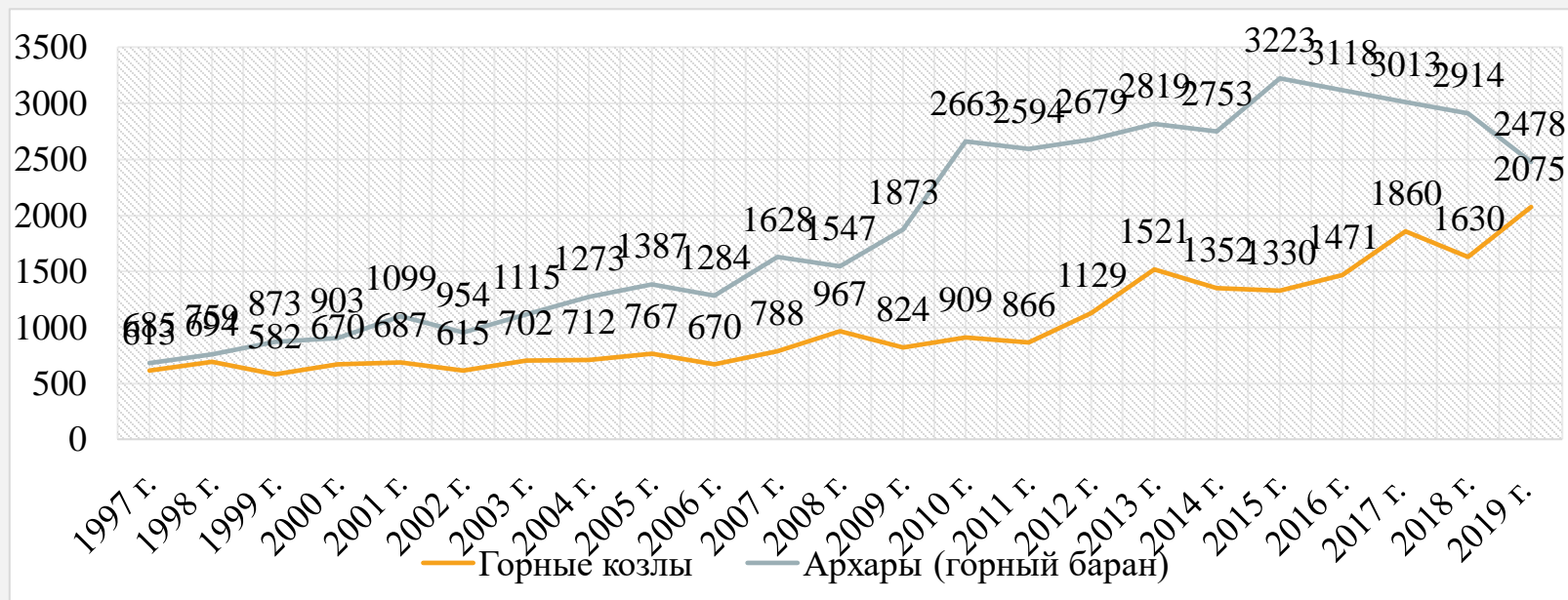


# Dynamics of the number of species of the feed base of the snow leopard in the reserve

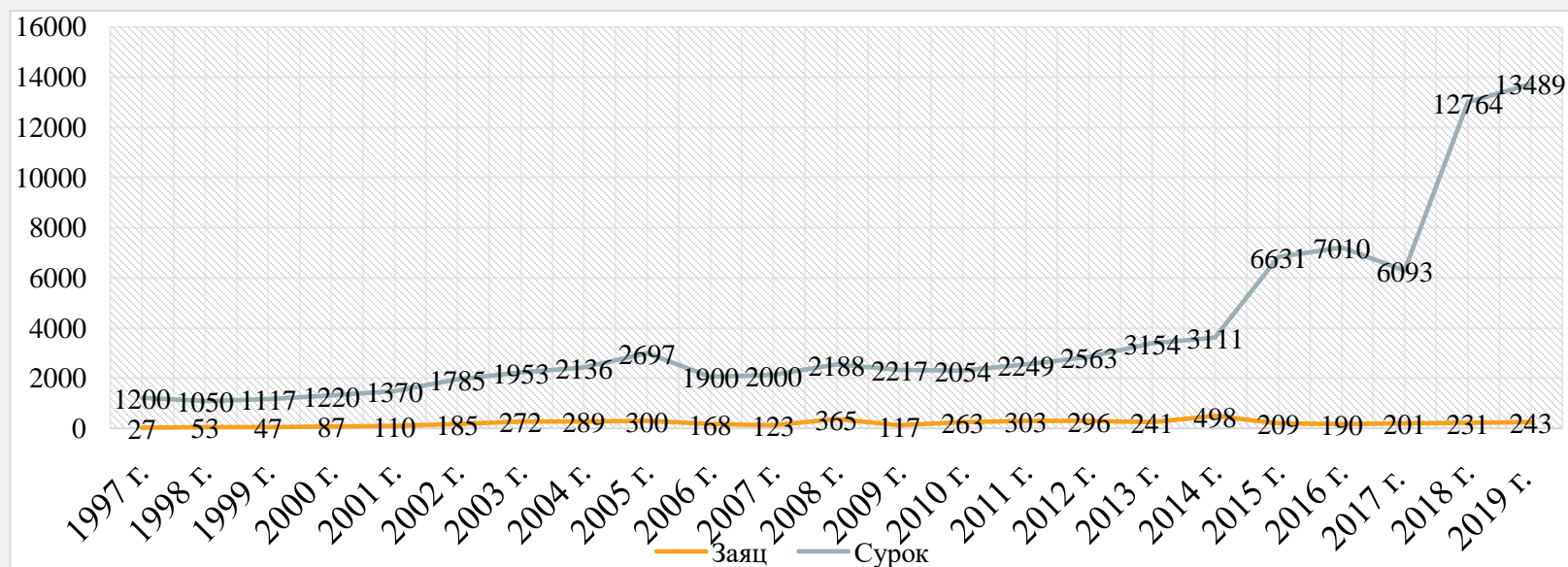
a) Main (hoofed animals)

b) Seasonal (rodents, birds)

a)

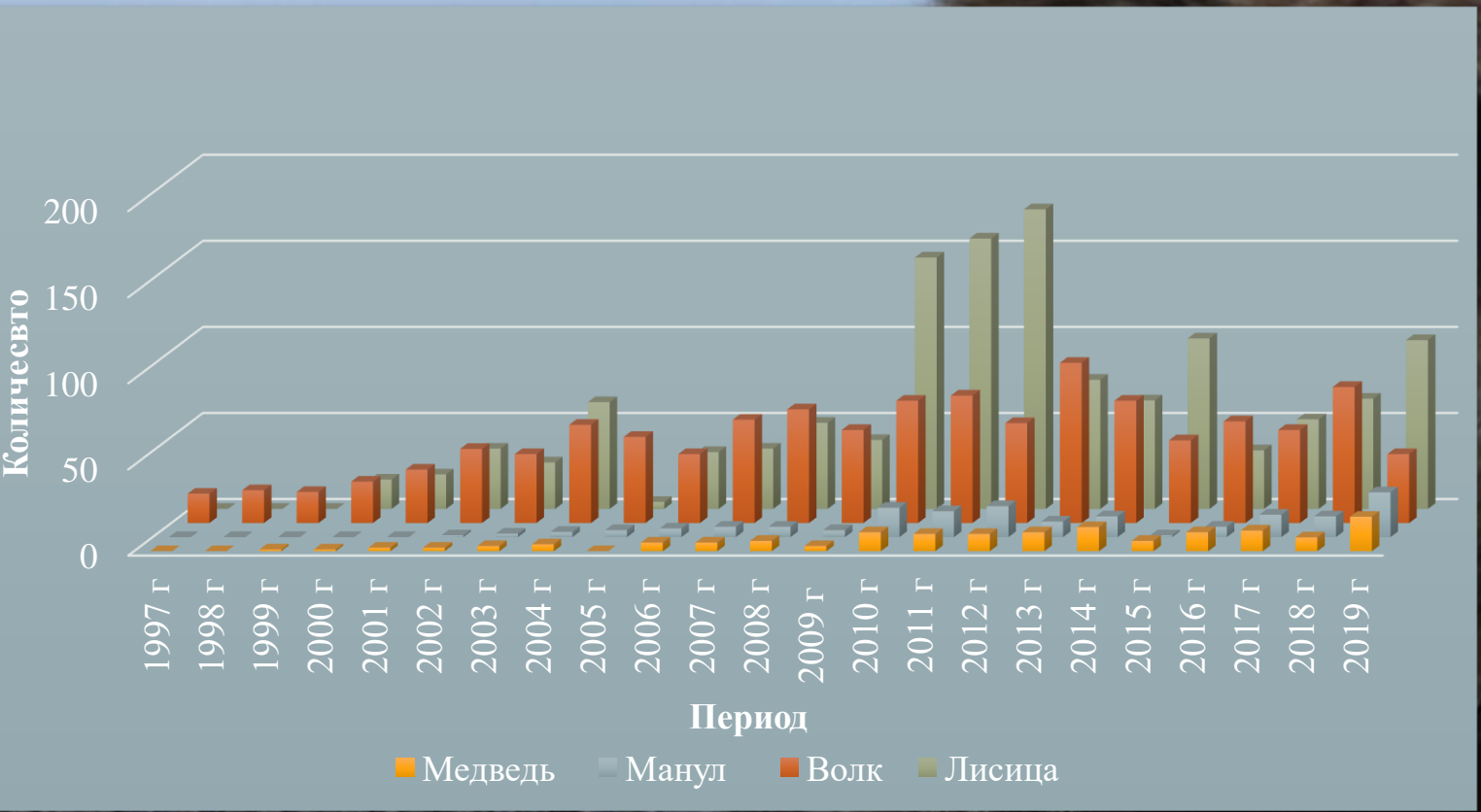


b)



Ист.: Данные по учету диких животных Сарычат-Эртишаского заповедника

# Dynamics of the number of snow leopard food competitors in the reserve



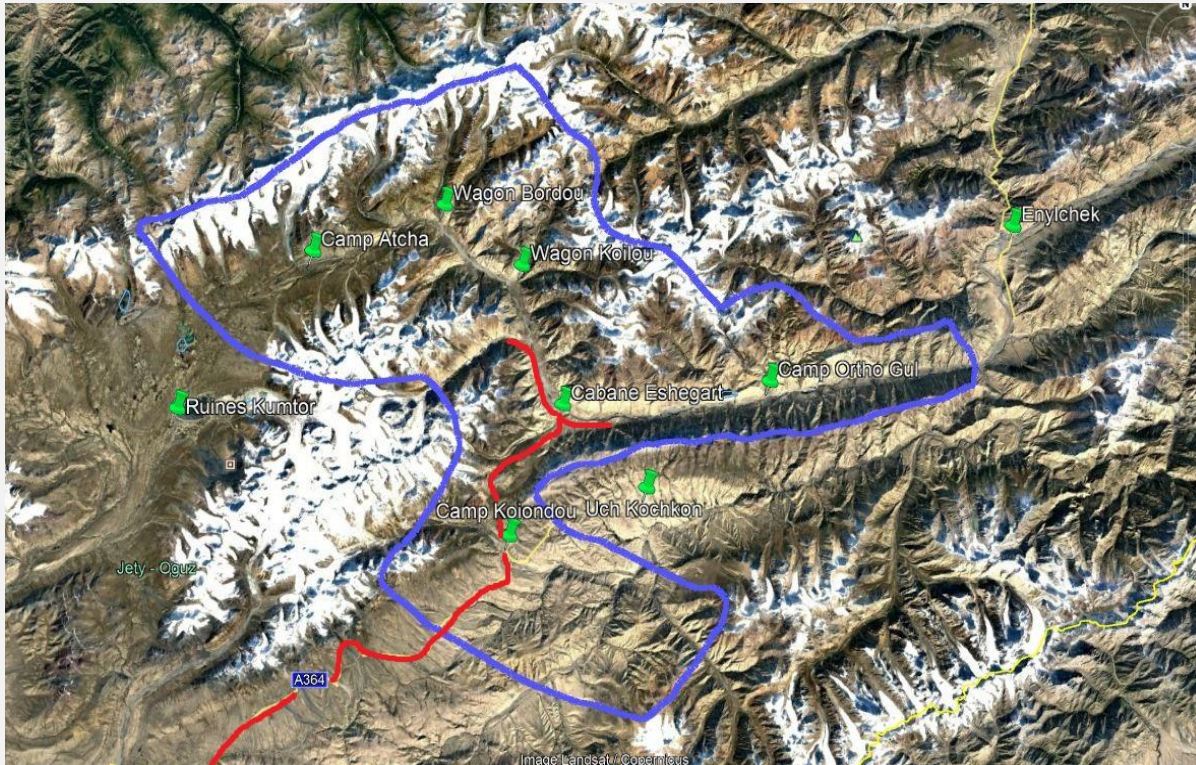
Ист.: Данные по учету диких животных Сарычат-Эртишаского заповедника



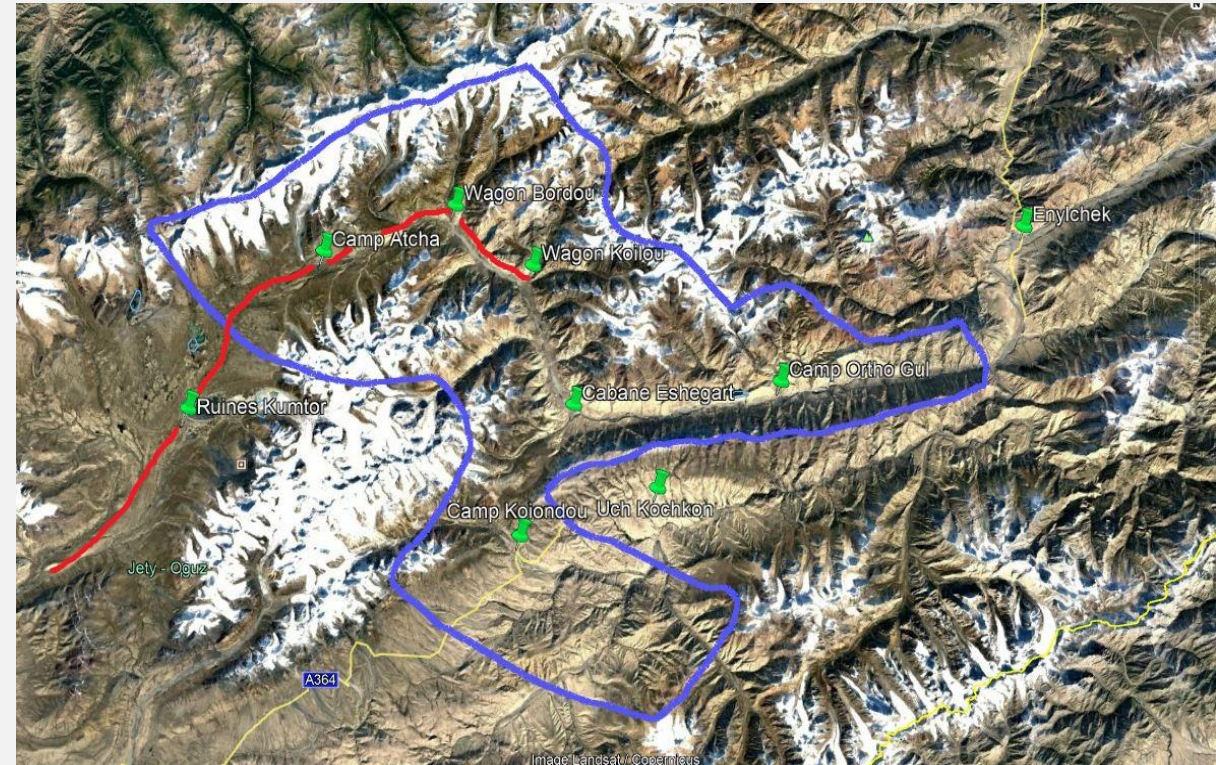
# Route of the "OSI-Panthera " expeditions in the Sarychat-Ertash reserve

a) from the South-West, June-July 2017

b) from the Northwest, August 2017



**a)**

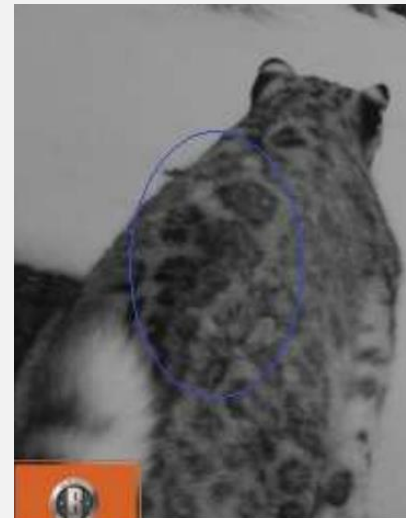
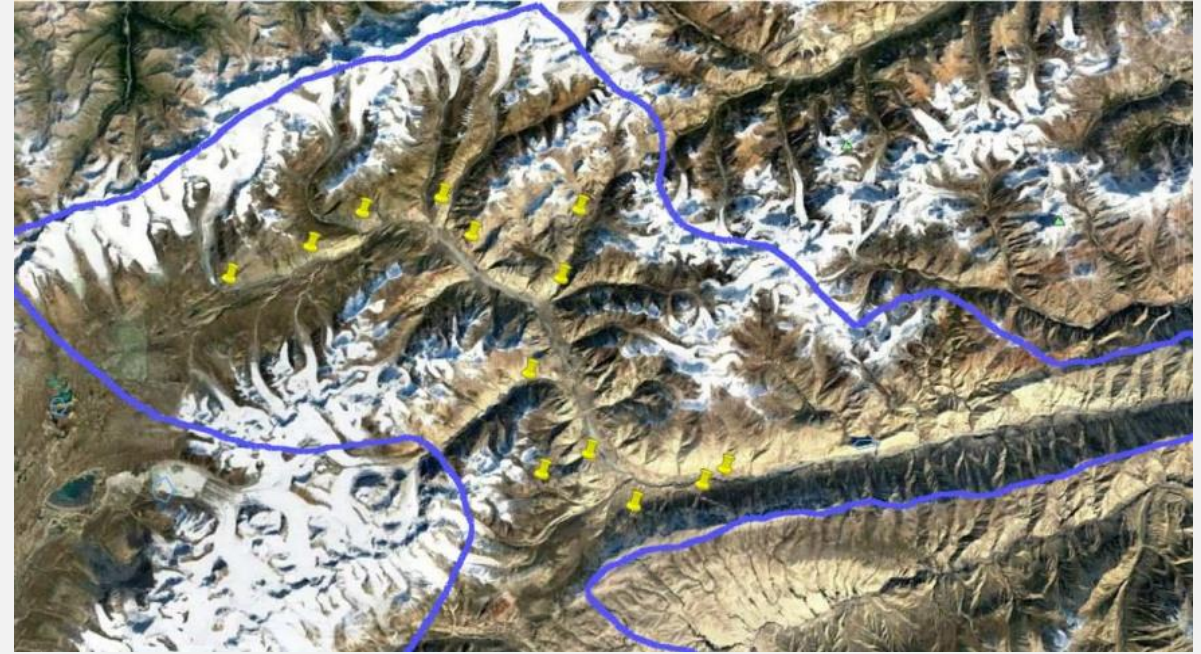


**b)**

## Handling images of camera traps

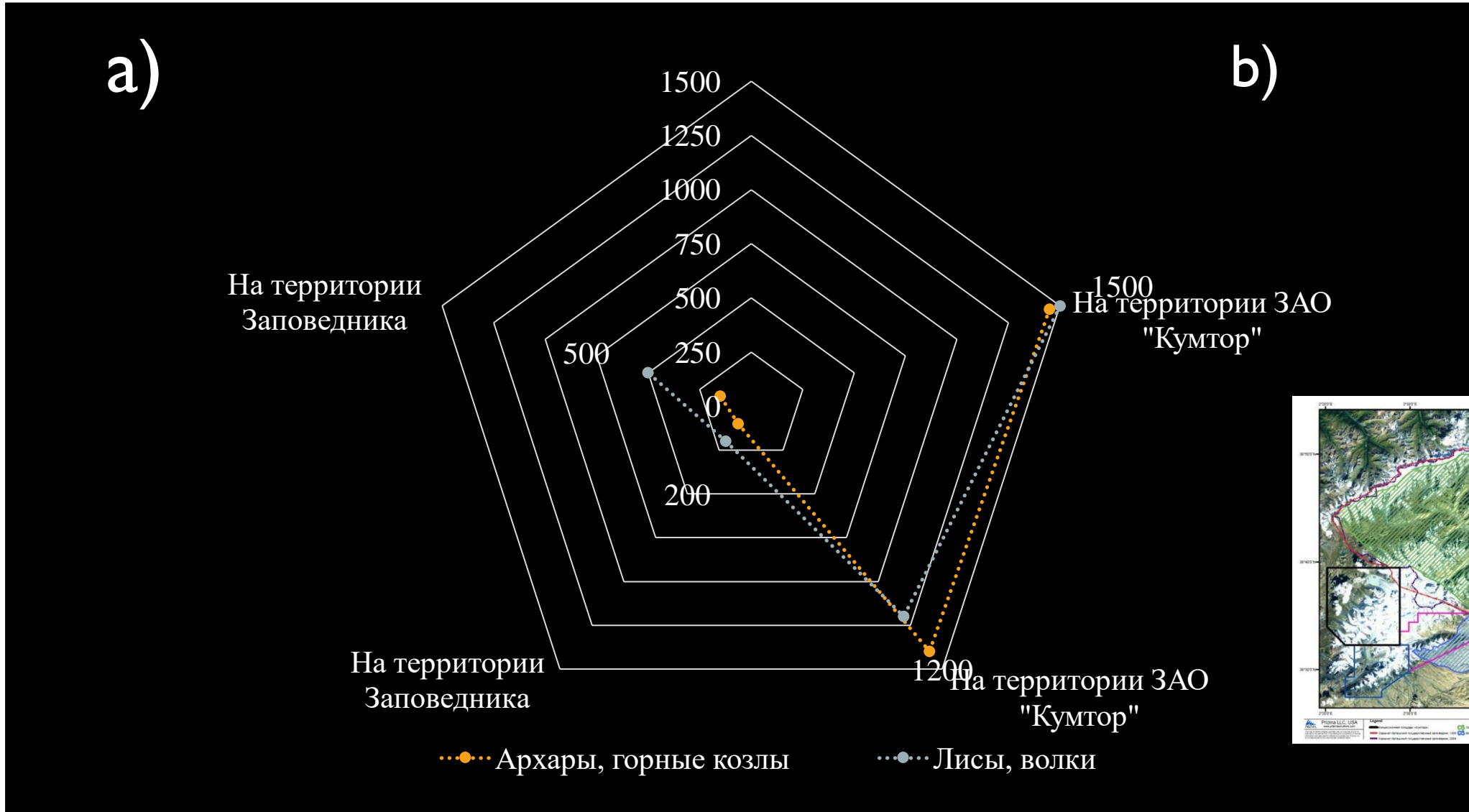
120 images of snow leopards were captured on 13 camera traps and up to 13 individuals were identified

To identify each snow leopard, all photographs are processed, taking into account the patterns of large ring-shaped dark brown spots, especially on the back, tail and forehead, because they are unique for each snow leopard as fingerprints for a person.



# Comparative behavior of animals to external objects (timidity), m

a) on reserve area      b) on "Kumtor" mining company area



№	proposal
1.	<i>Methodological part</i>
	<b>Develop a unified system for monitoring flora and fauna</b>
2.	<i>Material-technical part</i>
	<b>Provide the material needs of the reserve</b>
3.	<i>Hunting and poaching</i>
	<b>Strengthen the protection of the reserve from illegal hunting</b>
4.	<i>Herding livestock</i>
	<b>Limit grazing in the buffer zone</b>
5.	<i>Feed base of the snow leopard</i>
	<b>Take under strict control the accounting of ungulates and rodents</b>
6.	<i>The increase in the population of snow leopards</i>
	<b>Increase the number of snow leopards in their potential habitats</b>

## Conclusion

The Tien Shan range for the snow leopard is one of the main areas that serves as a shelter and permanent habitat for the population, as well as an ecological corridor between the Northern and southern sections of the population.

1. The study Region is characterized by a variety of ecosystems and extremely hard conditions-from hot deserts to the Nival-glacial levels;
2. The highest density of the species on the territory of the Sarychat-Ertash reserve is provided by a high protection regime;
3. On the territory of the reserve there is a trend of moderate growth in the number of snow leopards;
4. The proposed measures for protection of the snow leopard population on the reserve

A group of approximately ten people are riding horses along a dirt path in a vast, open landscape. The sun is high in the sky, creating a bright, hazy atmosphere and casting long shadows. The background features rolling hills and mountains. The overall scene is peaceful and scenic.

Thank you for attention!