

Wildlife monitoring in Sarychat-Ertash State Nature Reserve

Kyrgyzstan – 2022

OSI-PANTHERA
Citizen Science Expeditions



Cub of few months on Ortho Bordou crest, by OSI-Panthera camera trap

Compiled and drafted by Anne-Lise Cabanat



Details about the surveys

The expeditions took place in July 2022 in the reserve Sarychat-Ertash (Issyk Kul area).

Expedition: Sarychat-Ertash Nature State reserve (North part)

Dates: 3rd to 21/07/2022

Itinerary: North of the Reserve from Koiendou camp – Eshegart- Jaman suuand then mainly on the left side of the Sarychat River (Atcha – Bordou – Koilou – Sary Etchki) and two transects on the right side of the river (Chomoï and Oroï Suu). Way back to Koiendou.

Weather: Beautiful weather, some days of snow and rains for 2-3 days

Scientific educator: Anne-Lise Cabanat

Kyrgyz guide: Adinai Begalievna

Rangers: Oeumourbek, Joki and Elmir

Eco-volunteers: Louis Etwiller, Axelle Le Floch, Juliane Goninet, Sylvie Magnier, Mireille Coulon.



Pictures 1 – Team of OSI-Panthera’s July expedition

Expedition: Sarychat-Ertash Nature State reserve (South part)

Dates: 31/07/2022 to 18/08/2022

Itinerary: North of the Reserve from Kumtor gold mine, mainly on the left side of the Sarychat River (Atcha – Bordou – Koilou – Sary Etchki) and two transects on the right side of the river (Chomoï and Oroï Suu). Way back to Kumtor.

Weather: Beautiful weather, some days of snow and rains for 2-3 days

Scientific educator: Anne-Lise Cabanat

Kyrgyz guide: Adinai Begalievna

Rangers: Ulan, Timchtik and Mishka

Eco-volunteers: Manon Lhomme, Nicolas Wattine, Amélie Regef, Vianney Houard, Kim Alsina.





Picture 2 – Team of OSI-Panthera’s August expedition



Results

During this expedition we collected hundreds exhaustive data including locations, headcounts and dates. They are available on OSI-Panthera database. We will present here only a summary highlighting the most remarkable ones. Locations have been intentionally kept vague for wildlife protection purposes. For more information, please contact us at direction@OSI-Panthera.org.

We will present in the following sections a list of the species for which evidence was gathered during 2022 expeditions, along with some noticeable observations (pugmarks, feces, pictures on camera traps, direct observations, etc.).

Some data were already shared with organization working on specific species.

Species are listed first by their Latin name, followed by their English, French and Russian name.

List of species in Sarychat-Ertash State Nature Reserve

Birds

A first data of Black throated accentor by camera trap in Kitchi Uch Baital and a first data of Blue capped redstart by camera trap in Ortho Bordou.

This year we hadn't any ornithologists with us in the reserve for identifying small birds, so it was impossible for us to collect all the information.

However, more information about mains species of birds monitored during ours expeditions in Sarychat Ertash Nature State Reserve can be found in the report of Aline Knoblauch, 2014, *Guide of the avifauna found in the Sarychat-Ertash State reserve in Kyrgyzstan* (available in French and English, here <http://www.OSI-Panthera.org/Rapports-de-stages-d-anciens-participants-aux-expeditions-PANTHERA.html>) and in previous expedition reports (2017 and 2018).

You can find in **Annexe 1** the complete list of all birds observed in Sarychat-Ertash reserve since the beginning of our expeditions there.

Mammals

You can find in **Annexe 2** the complete list of all mammals observed in Sarychat-Ertash reserve since the beginning of our expeditions there.



Comments and noticeable observations

Raptors

- Very few observations of Golden eagles (*Aquila chrysaetos*). All the nest registered by Bastien Chaix seems empty...
One individual was photographed by our camera trap in Tchong Koilou area.
- One adult bearded vulture (*Gypaetus barbatus*) was photographed by our camera trap face to Oroï suu. It was eating a bone. And one immature was photographed having a rest in the valley of Kitchi Uch Baital.



Pictures 3 – Bearded vulture adult and immature one on OSI-Panthera's camera trap

- One Eurasian Sparrowhawk (*Accipiter nisus*) female was photographed by camera trap in September 2021 in Solomo area.





Picture 4 – Eurasian Sparrowhawk female on OSI-Panthera’s camera trap

Nocturnal raptors

- One owl was captured by a camera trap in October 2021 in Solomo valley with a prey in claws (rodent). We are still not sure of the identification, maybe a Eurasian eagle-owl (*Bubo bubo*). Eurasian eagle-owls are common in the reserve.
- A pen of Eurasian eagle-owl (*Bubo bubo*) was found in Koilou area (close to the river).



Picture 5 – Owl captured by one of our camera traps in Solomo valley in October 2021.

Snow leopard (*Panthera uncia*)

- Many signs of presence of snow leopards such as scrapings, urine sprays, scats, tracks, pugmarks, sometimes very fresh, have been collected on most of the transects such as Atcha area, Ortho Bordou, Kizil Keregue, Chon Koilou valley and “castle”, Kitchi and Chong Sary Etchki, Kirk Choro, Ortho Koilou, Chomoï and Oroï Suu.



Really fresh signs were observed in July close to Tchong Bordou river and in August after Solomo camp, along the river and on the crest of Bir baital with really fresh grass cut in 2 or 3 scrapes. The GPS coordinates with various parameters have been systematically retrieved. For more details, one should contact us at direction@OSI-Panthera.org.

- One individual was observed few seconds by Anne-Lise and Ulan the 11th of August in the morning very far by telescope in Tchong Sary Etchki area, from the camp on the right bank of the Ertash river, close to Uch baital.
- Many snow leopards were monitored by our camera traps from summer 2021 to July 2022. Main results of this study are one female with three cubs of few months in summer 2021 in Kitchi Uch Baital and net year in Jaman suu, one female with a cub in Ortho Bordou, one snow leopard that seems to lost his right eye was photographed with another individual in February 2022 and then alone in Sirdibai in April 2022. (More details on the following part).



Pictures 6 - Snow leopard adult in Kitchi Uch baital and another in Kizil Keregue, by OSI-PANTHERA's camera trap.

- Eighteen feces samples have been gathered for genetic analyses during the July expedition and twenty-seven during August expedition. Analyses of these samples will lead to an article later.



Pallas' cat (*Otocolobus manul*)

Presence of Pallas's cat has been confirmed by our camera traps in the rocky valley of Jaman Suu.

A first data for this species has been revealed in Kizil Keregue by our camera trap.

We have only few data because we don't set up camera trap for it, so we have less chance to capture it, but other organizations more interested already got data about this species in the reserve.

We shared this data with the *Pallas's Cat Working Group*.



Picture 7 – Pallas' cat in Kizil Kérégué, by OSI-PANTHERA's camera trap.

Turkestan lynx (*Lynx lynx isabellinus*)

A lynx was photographed alone in Solomo area in November 2021.



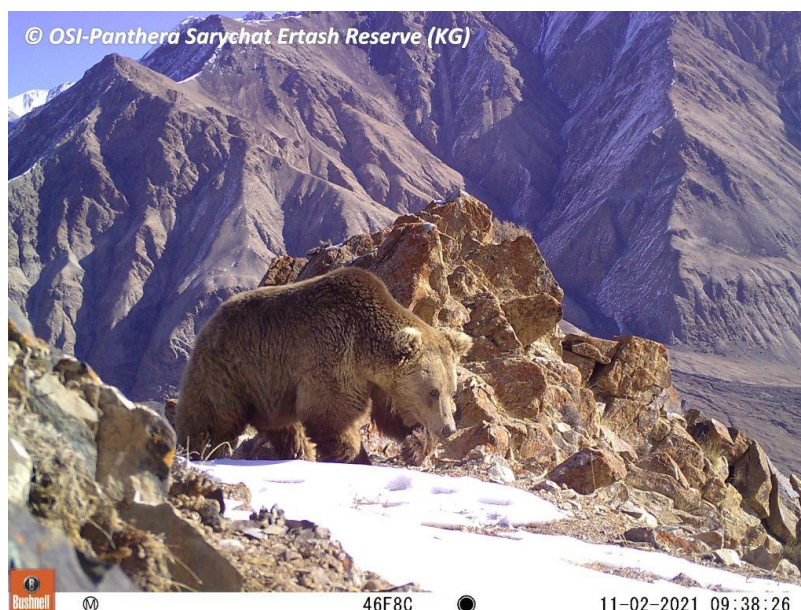
Picture 8 – Turkestan lynx in Solomo area, by OSI-PANTHERA's camera trap.



Tian Shan brown bear (*Ursus arctos isabellinus*)

- Many bears were photographed by our camera traps : one big bear was photographed in Kitchi Uch baital in March 2022, another big in Sirdibai 1 in May 2022, one small in July 2022 in Jaman suu, a big one in November 2021 on Bir Baital crest, one in Ortho Bordou in August 2021, 3 times in Oroï suu, in July 2022 in Kitchi Kashkateur, in April 2022 face to Oroï suu and eight times in Koilou close to the camp.
- Many signs of presence such as scrapes, feces and pugmarks (including mother and 1 young in Boroko valley and on the right bank of the Ertash river, face to Koilou). One should contact us to have access to the database at direction@OSI-Panthera.org.

An estimation of the population based only on camera trap pictures seems difficult to realize at this time because of a lack of experience about this species, so any specialized organization is welcome if they are interested by our data collected for many years.



Picture 9 – Tien Shan brown bear in Bir baital crest, pictured by OSI-Panthera camera trap

Grey wolf (*Canis lupus*):

- Many feces and footprints were found in the whole reserve.
- Three times grey wolves were observed, the 13th of July an adult and 4 cubs were observed in Atcha area, on the right bank of the Ertash river. Close to their station we found rest of an argali freshly killed. Next one wolf was observed under Sidibai 1 the 3rd of August and another the 12th of August in Tchong Kashkateur.
- Few individuals were captured on OSI-PANTHERA's camera traps: two "red" wolves were photographed on Ortho Bordou crest in August 2021 (maybe *Canis lupus chanco*), in October and December 2021 close to the camp of Koilou, in November 2021 in Tchong Bordou, in October 2021 in Kitchi Sary Etchki, in May 2022 in Oroï suu, in January 2021 and April and June 2022 in Jaman suu and in May 2022 face to Oroï suu.





Pictures 10 – Wolves on Ortho Bordou crest and one wolf in Solomo area, pictured by OSI-Panthera camera traps

Siberian ibexes (*Capra sibirica*)

During the expedition in July and the few days out of expedition in August, we were able to localize and count several herds in the main valley and in the entrance of secondary valleys.

- A female was found freshly killed (few hours before) probably by a snow leopard (there were fang marks in the neck) and eaten by a bear (3 really fresh fecal of bear) in Sirdibai 2 the 8th of August 2022.



Pictures 11 – Female ibex found freshly killed, pictures by Anne-Lise CABANAT

The main groups monitored were:

- A herd of ~200 individuals (males, females and young) was observed in Chomoi.
- A hundred was counted in Bordou valley.
- Around 70 females with young were counted in Acha area.
- Around 100 males, females and young in Sirdibai
- Around 30 in Jaman suu area
- Around 50 in Tchong Sary Etchki

During the summer season it is easier to observe female ibexes with kids than old males because females are in lower cliffs for feeding kids whereas males are in crests at higher altitudes.

Siberian ibexes are one of the main preys for snow leopards in Sarychat-Ertash State Nature Reserve. As we can see, where camera traps pictured snow leopards, most of the time they also pictured ibexes. They are mainly concentrated where there are cliffs in the reserve. This is why the monitoring and conservation of this species is particularly important for snow leopard conservation.





Pictures 12 - Female Siberian ibex in Bir baital, kid in Kizil Kérégué, female and a male in Bich Jilga, pictured by OSI-PANTHERA's camera traps

Differentiating females and kids can sometimes be tricky. Hence, female counting might include a few kids.

We voluntarily underestimated the observed ibex population because all ibexes were not counted on each valley during the same day. To be more realistic, here we chose to present the number of ibexes observed in each area. So, we represented the herds' census that live in each area. In the next graphs, in color one can see the mean number of ibexes observed in each place. However, it is more interesting to focus on the census that shows the maximum and minimum number of individuals observed in each area according to our various counts. Moreover, the following counts were made in the main valley and in the beginning of each secondary valley. However, we did not estimate herds that live deeper in each secondary valley.

Tian Shan argali (*Ovis ammon*)

When we were moving from one camp to another, we were moving by horse, all together. During that shifting across the valley we were constating many fresh (around one month) corpses of argali (males, females and lambs), sometimes many together. That's corpses were not predated, they were died of starvation and exhaustion and date from the beginning of June. At this period on the High Plateau it was snowing during 3 days without



stop, depending of the valleys the was a accumulation of 1,50 m to 1,80 m (according to the rangers). Then the snow was lying on the ground during around one week. The bodies are already in advanced decomposition, some horns are already detaching from the sheaths. The scavengers have already attacked most of the corpses. A total of 31 corpse was constated and it is important to understand that we were not looking, it was just what we crossed.

A lot of livestock (sheep, horses, etc.) died also because of this climate event and we constated many horses (even horses of the reserve) were eating their hairs each other because they were not able to feed.



Picture 13 –Argali female and 2 lamb, male freshly dead after heavy snowfall, pictures of rangers.

During our morning and evening observations and our shifting in the valley, we were counting argali such as the rest of the fauna and we constated that in most of the places where we used to observe female with lambs or big males during previous years, they were absent or in very small groups.

~70 females and lambs on the left banf of Ertash river, face to Eshegart camp

~40 in Chomoi area

~20 in kitchi Bordou

~100 close to Sirdibai

~50 in Tchong Sary Etchki

~60 males and 15 females in Kashkateur

Tian Shan argalis are also snow leopard's preys in Sarychat-Ertash State Nature Reserve, which is why monitoring and conservation of this species is particularly important for snow leopard conservation. We can see that camera traps are not photographing a lot of argalis, probably because it is a species of lowland and camera traps are setted up on crest or at the entrance of valleys close to cliffs. So, it is not favorable places for argalis.





Picture 14 –Tien Shan argali female in Tchong Bordou, pictured by OSI-Panthera camera trap.

Differentiating females and kids can sometimes be tricky. Hence, female counting might include a few kids. Moreover, in July and August it is easier to observe females and kids that are lower in the valleys than males.

Moreover, argalis live in flatter spots than ibexes and are more ambulant in the reserve. We counted argalis every day, so it is highly possible that one argali counted in one area was also counted in another place another day. To be more realistic, here we chose to present the number of argali observed in each area. So, we represented the census of the herds that live in each area. In the next graphs, in color one can see the mean of argali observed in each place. However, it is more interesting to focus on the census that shows the maximum and minimum number of individuals observed in each area according to our various counts.

Here one can see the herds observed in the main valley and at the entrance of each secondary valley. We did not estimate herds that live deeper in each secondary valley.

To be more correct we should count all the argali of the reserve with a large team spread out the same day on all the valleys. Nonetheless, as it is not the goal of our expeditions, because we lack human resources for that, and because we know that rangers are practicing this monitoring every spring.

Others

- Two to three bats were observed every evening flying near the cliff of Koilou camp, and in Solomo camp but we were not able to identify the species.
- No data of wild boar (*Sus scrofa*) this year.





Pictures 15 – Marmot in Jaman suu and 2 beech martens in Kitchi Uch baital, photographed by OSI-Panthera camera traps



Picture 16 – Red fox in Tchong Sary Etchki, pictured by OSI-Panthera camera trap.



Snow leopard study

Since 2006 our teams of volunteers are collecting signs of snow leopard's presence in Kyrgyzstan all along transects they have realized (on crests and valleys of the reserve):

- Pugmarks,
- Scrapes,
- Urine,
- Feces (sampled),
- Hairs (sampled).

We also set some camera traps in strategic areas in order to get pictures of snow leopards.

All this information allows us to work on three axes:

- Camera trap studies (mainly in Sarychat-Ertash and Naryn Nature State Reserves),
- Genetical analyzes of feces,
- Study of presence/absence signs by GIS.

We will describe camera trap analyses below. Results of genetic analyses and presence/absence signs will be analyzed later in another report.

Camera trap

Methods, means and observations

The main objective is to evaluate the minimum number of snow leopards in the sample area. The visual identification of each snow leopard through the details of each fur rosette allows recognition of individuals. Thus, we try to estimate the frequency at which an animal passes in front of the various camera traps and hence an estimate of the number of individuals in a given area.

The study of the camera traps was realized along the main valley but also in some secondary valleys and on crests. Ideally, and according to protocols, since the 2017 season, camera traps were set at five kilometers (more or less) one from another. The deviation is due to the rough terrain and logistical constraints.

Some of them have been in the same place for a few years. It allows us to see, more or less, how many times per year each individual comes in this area and also, registering species present in this area throughout the year.

All camera traps did not take pictures of snow leopards. They are controlled one to two times per season, no more. It is the opportunity to adjust the position in order to discriminate better individuals on the pictures, or to recover it if necessary.

Our twenty-two OSI-PANTHERA's camera traps were placed in the reserve from summer 2021 to summer 2022 at the following locations:

- Solomo road;
- Bir Baital on a crest;
- Solomo entrance of the valley;
- Kizil Keregue;



- Koilou close to the camp;
- Kizil djar;
- Tchong Bordou;
- Kitchi Sary Etchki;
- Tchong Sary Etchki;
- Tchong Koilou castle;
- Chomoï;
- Kitchi Bordou;
- Oroï suu;
- Jaman suu;
- Kitchi Kashkateur;
- Atcha cliff;
- Boroko valley;
- Ortho Bordou crest;
- In front of Oroï suu;
- Sirdibai 1 near a cliff;
- Bich Jilga;
- Kitchi Uch Baital.

During summer 2022, only nineteen OSI-PANTHERA camera traps were controlled in Sarychat-Ertash Reserve.

Two of our camera traps were stolen... one on Ortho-Bordou crest and the other in Atcha. A third one disappeared, washed away by a mudslide.

We also noticed that 2 of our camera traps set up was modified by people checking them. They were on photos and moved to video, so in few days after modification the SD card were fulls and not able to do the monitoring as expected... Some of them were left in the same place, sometimes in a better position and some old ones were changed by a new one. To respect our protocol and to get a bigger study area, ten new camera traps were installed this season. At the end of the season we had twenty-four camera traps ready to stay until summer 2023 in Sarychat-Ertash Nature State Reserve.

Twenty-four OSI-PANTHERA's camera traps were placed in the reserve at the end of summer 2022 at the following locations:

- Solomo road;
- Bir Baital on a crest (one on photo and one on video);
- Solomo entrance of the valley;
- Kizil Keregue;
- Koilou close to the camp;
- Tchong Bordou;
- Kitchi Sary Etchki;
- Tchong Sary Etchki;
- Tchong Koilou castle;
- Chomoï;
- Kitchi Bordou;
- Jaman suu;
- Boroko valley;
- Ortho Bordou crest;
- In front of Oroï suu;



- Sirdibai 1 near a cliff;
- Bich Jilga;
- Kitchi Uch Baital;
- Kizil djar;
- Atcha cliff;
- Oroï suu;
- Uch baital;
- Kitchi Kashkateur.

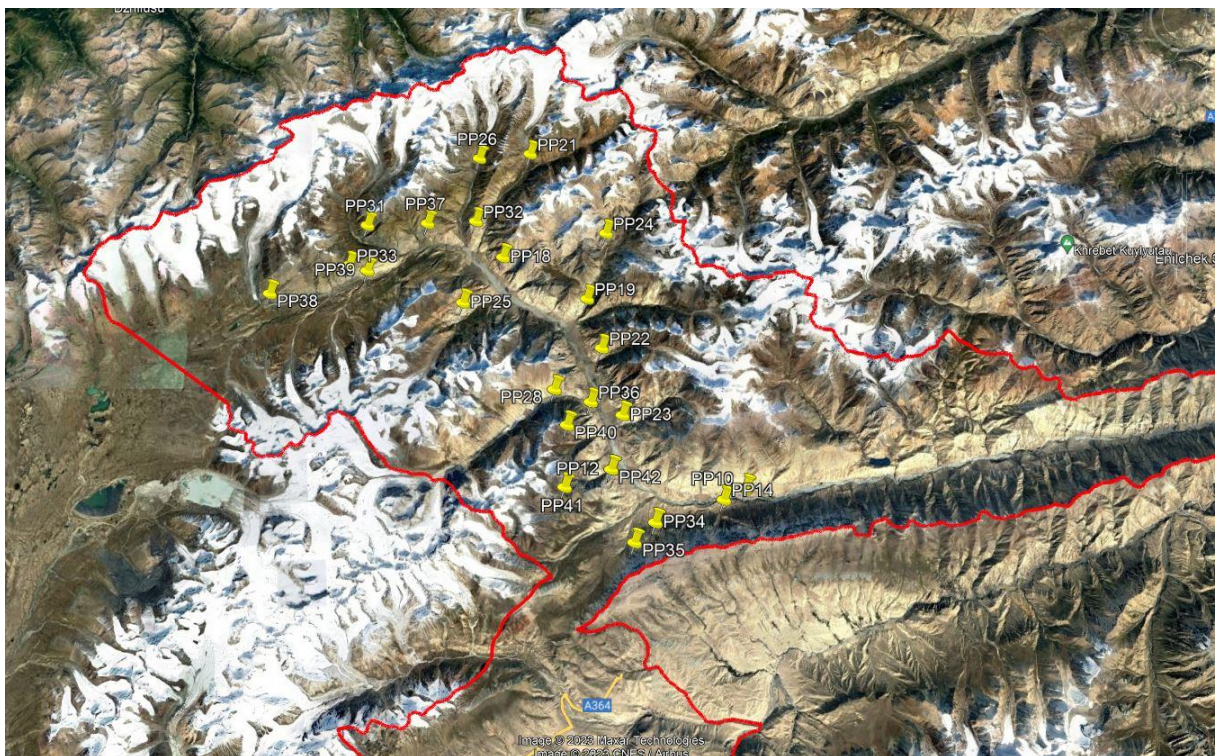


Figure 1 – Locations of OSI-PANTHERA’s camera traps (yellow spots) in Sarychat-Ertash State Nature Reserve at the end of the season 2022.

In order to get usable images for analyses we are setting camera traps on picture mode preferentially and placing them in areas where there are signs of snow leopards. Moreover, we are placing them where urine was found because in these areas snow leopards turn on themselves in order to smell other individual’s marks and to leave marks of their own. Like that we obtain more profile of a same individual (another solution is to place two camera traps, one on each side of a snow leopard’s way, but we don’t have finance to buy enough of them).

We also try to determine in which direction snow leopards are traveling. After, we installed camera traps at an angle of 45° to their direction. It permits to get two to three pictures of each individual and to register more pattern of the fur for each individual.





Pictures 17 – Set up of Kizil Keregue camera trap, transect on the crest of Kirk Choro and transport from one camp to another, by Anne-Lise Cabanat

This year, only few of the camera traps had empty batteries or a full SD card when we controlled it.

And only one camera trap did not photographed snow leopard !

➤ [On Solomo road](#)

Since the beginning this camera trap was installed mainly to follow lynx.

It registered wolves (in October, November and December 2021), lynx (in November 2021), but also foxes, argali, hares, snow leopard (in December 2021, January and February 2022) and Chukar partridge.

It also registered yacks and their shepherd with weapons (see further in the report) and many cars crossing the reserve...

➤ [On Bir baital](#)

This camera trap captured wolves (in December 2021, January, February and May 2022), bear (in November 2021), foxes, ibexes, hares, Himalayan snowcocks, Chukar partridges and snow leopard (many times each month).

This spot his very interesting, snow leopard are having rest there many times in front of the camera.

➤ [Valley Solomo](#)

The camera trap was checked by somebody that changed the set up on video the 16th of April, so the SD card was full in the half of May....

It took pictures ok ibexes, pika, a nocturnal raptor with a prey and snow leopards (in October and November 2021 and February and March 2022).

➤ [On Kizil Kérégué](#)

This camera trap was taking hares, ibexes, foxes, Chukar partridges and snow leopard alone (few times in September and November 2021, many times in December 2021, January and February 2022 and few times in April, May and June 2022).

➤ [Close to the camp of Koilou](#)

This camera trap stopped in March 2022 because of SD card full.

It photographed wolves (in August and December 2021), bear (in August, many times in September 2021, and in October and November 2021), foes, marmot, beech marten, ibexes, Chukar partridge and snow leopard (in October, November and December 2021 and minimum 2 individuals in January 2022 including one individual that seems to have fight).





Picture 18 – Individual that seems to have fight (no fur on the tail, scar on the face, etc.), pictured by OSI-Panthera camera trap.

➤ **Kizil djar**

We did not find this camera trap...

There had a big mudslide and after a long search, we only found the rope on the rock, blocked few hundred meters down, in the mud. The camera was probably broken.

➤ **Tchong Bordou**

This camera trap photographed wolf in November 2021, foxes, marmot, argali and snow leopard (in April 2022 and one with a big scar on the face in December 2021)



Picture 19 – Individual that have a scar on the face, pictured by OSI-Panthera camera trap.



➤ [Kitchi Sary-Etchki](#)

This camera trap registered wolf (in October 2021), ibexes, hare, pika, stoat and snow leopard (in August 2021: a mother with 2 cubs, in September, November and December, in January 2022 including 1 individual without fur on the tail and 2 snow leopard together: probably one adult and one subadult, in February, April, May, June and July 2022). This model (Bushnell E3) gave us many pictures overexposed by night...

➤ [Tchong Sary-Etchki](#)

This camera trap was checked by a ranger with a dog the 5th of December 2021. The ranger changed the set up in video, so the batteries were empty when we arrived...

Until that, it photographed foxes, beech marten, Chukar partridges, hares, pika and snow leopard (in September 2021 including a female and a subadult, October and November including a female and a subadult).

Somebody turned this camera on video...



Picture 20 – Female and subadult in Tchong Sary Etchki, pictured by OSI-Panthera camera trap.

➤ [On Tchong Koilou “castle”](#)

This camera photographed Golden eagle, marmot, ibexes, beech marten, Himalayan vulture, pika, Himalayan snowcock and snow leopard (in November 2021 and June 2022).

➤ [On Chomoi](#)

This camera trap monitored mainly foxes, ibexes, Himalaya snowcock, Chukar partridge and snow leopard (few times each month and 2 individuals in January 2022 including one rubbing on the ground).

➤ [On Kitchi Bordou](#)

This camera trap monitored maybe a wolf (in April 2022), ibexes, marmot, foxes, and snow leopard (in November 2021 and May 2022).



➤ [On Oroï suu](#)

This camera trap monitored bear (in May, June and July 2022), wolf (in May 2022), ibexes, Chukar partridges, foxes, marmot, stoat, pika and snow leopard (in December 2021, February and March 2022).

The angle of setting needs to be improved.

This model of camera (Bushnell E3) did not give us satisfaction for night pictures that are overexposed.

➤ [On Jaman suu](#)

This camera trap falls over in May 2022 but was still working.

It photographed bear (in July 2022), Pallas cat (in February 2022), wolf (in January 2021, April and May 2022), beech marten, stoat, ibexes, Chukar partridges, foxes, pika, marmot and snow leopard (September and October 2021, November 2021: a female with 3 cubs, an individual alone in November 2021, a female with 3 cubs in February 2022, March and May 2022 including the female with 3 cubs).



Picture 21 – Female and 3 subadult in Jaman suu, pictured by OSI-Panthera camera trap.

➤ [On Kitchi Kashkateur](#)

This camera trap photographed a bear (in July 2022), Himalayan snowcock, ibexes, pika, beech marten, foxes and snow leopard (September, October, December 2021, January, February, May, June and July 2022).

➤ [On Atcha](#)

This camera trap was stolen.

The rock was still in place but without camera, or rope and we didn't find anything around the spot...

➤ [On Boroko](#)

This camera trap photographed foxes, marmot, stoat, ibexes, Chukar partridge, beech marten and snow leopard (in February, March and April 2022 including a female and a cub last time).



➤ [On the crest of Ortho-Bordou](#)

This camera had an error of hour setting, AM and PM were reversed.

There one of our camera trap was stolen in spring 2021 (Elmir, a ranger had controlled it in March 2021 and did not find it in May 2021). The rock was still in place but without camera or rope and we didn't find anything around the spot... At the same time, a camera trap of the SLFK was also stolen few meters higher on the crest...

The new camera set up in summer 2021 photographed: wolves (maybe "red" wolves in August 2021), bear (in August 2021), foxes, ibexes, hare, Himalayan snowcocks, pika, beech marten, Chukar partridges, stoat, marmot and snow leopard (August 2021, September 2021 including a female and a cub few times and another female with a subadult, October, November: including the female with a cub, December 2 individuals together and the female with the cub, February, March, April and July 2022).



Picture 22 – Mother and subadult, pictured by OSI-Panthera camera trap.

➤ [Face to Oroï suu](#)

This camera trap monitored a bear (in April 2022), a bearded vulture (in December 2021), foxes, ibexes, pika, argali, hares, marmot and snow leopard (in September, October, November and December 2021, March 2022 a female with a cub, April and June 2022).

➤ [On Siridibai1](#)

The camera trap was shifted by a bear the 9th of May 2022.

Until that, it photographed bear (in May 2022), stoat, pika, Himalayan snowcock, ibexes, beech marten, Chukar partridge, foxes and snow leopard (in September, October and November 2021, January and February 2022 including an individual with blood on the fur, 2 individuals in April including one that seems to lost right eye, May 2022).





Picture 23 – Individual with blood on the face, pictured by OSI-Panthera camera trap.

➤ **Bich jilga**

This camera trap stopped in May 2022 because the SD card was full.

It monitored beech marten, ibexes, Chukar partridges, Himalayan snowcock, foxes, stoat and snow leopard (in September 2021 and April 2022).

➤ **Kitchi Uch baital**

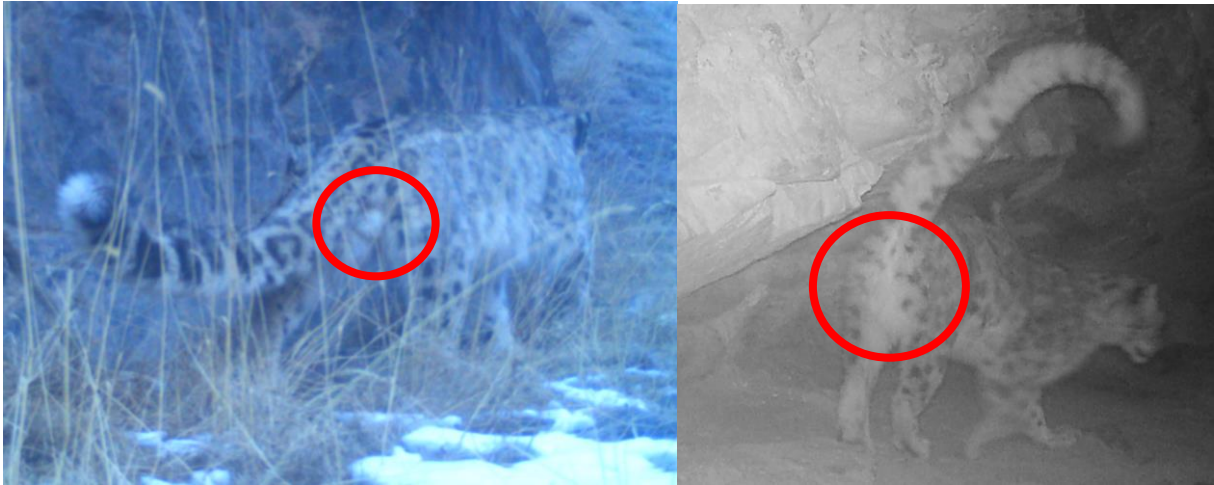
This camera trap monitored beech marten family, ibexes, Chukar partridge, bear, pika, immature bearded vulture, pika and snow leopard (September 2021 a female with minimum 2 cubs, October 2021, a female with 3 cubs in November and December 2021, in February 2022 a female with cubs and 2 adults, one without right eye, March, April, May, June 3 subadults, July 2022).



Picture 24 – Two individuals, one individual without right eye, pictured by OSI-Panthera camera trap.



Gender determination was sometimes possible based on the presence of testes, the presence of cubs and mating pictures.



Pictures 25 – Aiperi a male with testes (left) and Elmikau a female (right), by OSI-PANTHERA’s camera trap

Currently we still don’t have all the profiles for each individual to compare with previous years. So, for some individuals we will need more pictures, from previous and future years to cross-check data. Results will be compiled in a special report.

This season no collared snow leopard were photographed by our camera traps. It seems that they all lost material.



Collected samples

- We have collected 18 samples expected of snow leopard in July 2022 during transects in all the North of Sarychat-Ertash valley, crests and secondary valleys and 27 in August, in the South of the reserve. That collection will complete our study with samples collected since 2009.



Pictures 26 – Sampling part of snow leopard feces with Aliya, Mathilde and Morgan, July 2019 by Anne-Lise Cabanat.

During the expedition in the North of the reserve we collected one sample in Chomoï valley, 3 samples in Kizil Keregue cliff, 4 samples on Ortho Bordou crest, 1 sample (very old) in Boroko valley, 1 sample in Oroï suu cliff, 1 sample on the crest of Tchong Koïlou, 1 sample on Ortho Koïlou crest, 5 samples in Tchong Sary Etchki valley and 1 sample in Kitchi Sary Etchki. In August we collected 6 samples on Sirdibai1 crest, 1 sample close to the Ertash in Solomo, 4 samples on Ortho Solomo crest, 3 samples on Sirdibai3 crest, 1 sample in Uch baital valley, 2 samples at Kitchi Kashlateur cliff, 10 samples on Bir Baital crest.

As we concurred with the *Department of Biodiversity Conservation and Specially Protected Natural Territories*, Laboratory analyses will be conducted by *Antagene* laboratory (France). All samples collected in Kyrgyzstan during the season 2022 will be genotyped and the results will be used along with the results of previous years. All our Kyrgyz samples genotyped should allow assessing the genetic diversity, sex and number of individuals by a non-invasive method in the sampled areas of Sarychat-Ertash Reserve and Naryn Reserve but also in other Kyrgyz areas such as Chon Jarchuilchak and Shamschy. A first paper showing our results from 2011 to 2015 in Sarychat Ertash reserve [“Diachronic monitoring of snow leopards at Sarychat-Ertash State Reserve \(Kyrgyzstan\) through scat genotyping: a pilot study.”](#) by Rode *et al.* is available on BioRxiv.org.



Other information

Disease in Sarychat Ertash Nature State Reserve

Since few years we observed skin diseases on Siberian ibex population of Sarychat-Ertash Nature State reserve, this year a young male ill was photographed by our camera trap in Kizil Keregue.

It seems to lead to the isolation of the individual from the herd, its weakening and death.

We showed some of our pictures to a French veterinary and they gave us two possibilities: scabies or nutritional deficiencies conducing to a hyperkeratosis (such as zinc deficiency because of soil or vegetation).



Pictures 27 – Young male infected, by OSI-PANTHERA’s camera trap

Information on hunting and poaching

During our transects we still regularly find old shell casings, this year around Atcha and Sirdibay. We also found a rifle cartridge (which seems to be fresher) in the Solomo camp.



Picture 28 – 3 old rifle cartridges and 1 shotgun shell found in area Solomo



Presence of non-scientist person in Sarychat-Ertash Nature State Reserve

On 10/22/2021 at 09:53, two cars (license plates K72269 22 and 917ACY 09) make a one-way flight to the east (Enylchek).



Pictures 29 – cars photographed by OSI-Pantheras' camera traps

01/12/2021 at 02:09 there are still two different cars (license plates illegible) that make a one-way trip to the east (Enylchek).

There are also many photos where we see them opening and manipulating our camera trap for 10 minutes...



Pictures 30 – cars photographed by OSI-Pantheras' camera traps

02/26/2022 at 11:35 three cars (562ABJ01 and others, numbers not visible) are moving west (Eshegart).





Pictures 31 – cars photographed by OSI-Pantheras’ camera traps

On 02/27/2022 at 17:24 the same 3 cars return to Enylchek and this time we can clearly see the numbers 396 AFL01, 266AGO01 and 562ABJ01.





Pictures 32 – Cars photographed by OSI-Pantheras’ camera traps

Other :

From the end of September to mid-October, yaks pass in front of our camera trap several times, in particular, once on 10.14.2021 with armed shepherds...



Pictures 33 – Yacks and shepherds with a weapon photographed by OSI-Pantheras’ camera traps

During the expedition in Sarychat-Ertash Nature State reserve, area officially prohibited to access for public (except rangers and scientists in company of rangers), we noted:

- Many horse pugmarks going and coming back from Kumtor area (possibly poachers);
- 2 of our camera traps were stolen this year and other during previous years;
- We have seen on the web that some Kyrgyz agencies sold trips across the reserve.

Propositions:

- Presence of rangers more often in the North of the reserve that implies to make repairs in Atcha house and Bordou wagon that are dilapidated. That is why it seems really important for us to organize expeditions between May and October in the North of the reserve. Like that rangers have more chance to cross tourists.
- Changing the panel (mentioning the limits of the reserve, fines for hunting, etc.) when we come from Kumtor area and installing more of them (because there is just one in this very wide valley...)
- Installing some panels mentioning the limits of the reserve, fines for hunting, etc. in Altyn Arashan, Karakol, Jety Oguz, Koilou and other valleys coming from Issyk Koul to



mention for alpinist the presence of the reserve in the other side of the mountain range. Hence, hikers, alpinists and hunters (local and/or foreigners) will be informed (even if their guide did not mentioned the reserve).

In addition, we would like to mention that since 2017 the fines for hunting Kyrgyz wildlife are more expensive, and even more when the wildlife is hunted inside the reserve. So, it becomes more and more dangerous for the rangers to come across poachers. Indeed, they have no weapons and no way to communicate directly with their director if poachers are not cooperative and don't give their identities and take the fine.

Waste collection

One of the objectives of our NGO *Objectif Sciences Internationnal* is sustainable development. So, during our expeditions with volunteers and/or local people we tried to bring back or to burn most of the garbage produced.

In the entire world, people are now speaking about ecology and how to preserve nature and the planet. It is important to discuss with local people who live in remote places and to share our experience about the fact that metal, glass and plastic garbage are a source of pollution for soil, water and the place they live in. It is possibly a source of diseases and a source of crash by horse (for people studying wildlife but also for rangers) as they are afraid of garbage left on the ground and flying with the wind (glass, metal and plastic). Animals can also become ill when they eat garbage or die when they are trapped in pylons, old fences, metal garbage, etc.

Before it was a reserve, the area was used by USSR shepherds, so it seems that most of the wastes, such as metal waste, came from this period. Around camps there are also old metal fences that can be dangerous and act like traps for horses and fauna. In 2016 we discovered a male argali dead because his horns were blocked in a pylone (fences can have the same consequences). There are also wastes left by foreigner's expeditions and by rangers themselves along the years.



Picture 34 - Argali male found freshly dead because his horns were blocked in the pylone of the electric line in the South of the reserve in June 2016.



As every year we are confronted to waste left by rangers and/or peoples studying (or not) wildlife in the reserve. This year again we have burned a lot of garbage in the area of Koilou and Bordou wagons.

Near Eshegart house, a hall was made in order to burry wastes, but it was never closed. So, for many years wastes are scattered by foxes, wolves and wind around the house.

In Bordou and Atcha area, the enclosure for livestock is old as is mechanical equipments. Pieces of them are scattered all around the camp.

At each expedition we try to collect pieces of metal, glass, etc. and to store them in a small spot. But there is still a lot of work to be done.

Propositions:

- It can be good to organize a campaign to collect garbage with all the rangers for example. As they have no way to bring back all those waste from one camp to another (they are moving only by horse) they could begin by burning all that is possible, burry glasses and metals waste in a small spot.
- The office of the reserve could impose to the people studying Kyrgyz wildlife to burn all the waste that are burnable (papers, packages, food scrapes, etc.) and to bring back to the cities all the glass and metallic wastes. Some of the people that are studying wildlife use a car to go to the first camp of Eshegart, so they can easily bring back all their waste.
- A short message should be installed on the wall of each camp (written in Kyrgyz, Russian and English) in order to explain the risks for environment but also people and animals (accident, disease, etc.).

At this time recycling of plastics, glass and metal is not efficient in Kyrgyzstan but it will hopefully be the case soon. So, it would be good to bring back also plastics downtown.

Material bought for rangers of Sarychat Ertash reserve

During each expedition, horses used for volunteers, scientist educator and material are rented to the reserve 800 COM / horse/ day.

A small part of this money was directly used to buy 7 halters and 4 saddlebags for rangers.

During our way to the reserve we also allowed to transport the material bought by the SLFK from Barskoon to Koiendou in order to restore the camp of Bordou.

It is important to notice that in Bordou camp the wagon is really old, windows are closed by a plastic film, it is raining inside, the ceiling and the floor are collapsing, etc.

In Atcha the roof of the hut collapsed, it is now impossible to have a rest there...



Conclusion

These expeditions have allowed implementing the monitoring of wildlife in Sarychat-Ertash Nature State Reserve.

Signs of presence of snow leopards (*Panthera uncia*) have been abundant - and often fresh - on almost all transects made in the reserve supporting the idea of a significant population there. Camera trapping in the reserve has allowed us to assess the presence of at least seven different adults on the sample-area in 2022 but also many litters. We hope to get more precise results soon by completing with data collected during previous and future years. Moreover, genetic analyses will also give us complementary information on that subject.

Grey wolves (*Canis lupus*) are omnipresent in the reserve. However, signs of presence and observations have been more frequent in the lowland.

Tian Shan brown bears (*Ursus actos isabellinus*) have left signs of presence in the whole reserve (valleys and crests). We also observed directly one in August (out of expedition).

Eurasian lynxes (*Lynx lynx isabellinus*) were registered in the reserve. We shared those data with *Ilbirs Foundation* that made a report about this species occurrence in all Kyrgyzstan.

For the first time we got data on Pallas's cat (*Otocolobus manul*) in Kizil Keregue and a new data in Jaman Suu. It can be explained by the fact that we are prospecting snow leopard favourable places which aren't favorable for Pallas's cat.

Concerning ungulates, monitoring in spring and October would be more interesting in order to count more precisely Siberian ibexes (*Capra sibirica*) and argalis (*Ovis ammon* spp). They are more active, less shy and they are all going down in the valleys at this period of the year. Rangers are doing this kind of monitoring every year, so the best is to ask data to the office of the reserve. However, data collected at the end of spring and during the summer allow getting information about their reproductive rate. For argali the snow of the beginning of June was a real catastrophe, more precise counting will allow to estimate losses in the population...

A station of *Saussurea involuocrata* (red book of protected species in Kyrgyzstan) was registered on a crest of Tchong Koilou.



Pictures 35 – Station of *Saussurea involuocrata* in Chong Koilou, by Anne-Lise Cabanat



Proposed conservation actions

In the South of the reserve, Jangart valley is a very interesting area for Kyrgyz fauna. Snow leopards and their main preys (argali and ibex) are present as well as key species such as Tien Shan brown bears and wolves (you can find more details in our report *Wildlife monitoring in Sarychat-Ertash State Nature Reserve and Jangart Valley - Kyrgyzstan – July and August 2018*). This valley should get a conservation status or be proposed as an extension of the reserve of Sarychat. This extension could support populations of ungulates and predators and allow creating an ecological corridor between Sarychat-Ertash Nature State Reserve and Enylchek National Park. Thus, it could help the GSLEP program to better protect one of the 20 healthy populations of snow leopards selected across the cat's range.

Sarychat-Ertash State Nature reserve is surrounded by hunting concessions on most of its side (including Jangart area), which makes it a very vulnerable area for poaching in the absence of permanent control. In the northern part of the reserve the gold mine concession of Kumtor gives an access by car close to the reserve. The ranger's village (Uch Kochkon) and the camp (Koiendou) where one ranger lives all year long are located in the South. Moreover, the camp on the reserve northern part isn't comfortable and warm. There is no window and it is not protecting people from rain and wind. This is why the northern part of the reserve seems more vulnerable for poaching. Signalization with a set of signs warning people about the limits of the reserve and explaining the penalties incurred in case of poaching would be highly necessary in Atcha, Bordou and Koilou crests and passes, in the valleys of Altyn Arashan and Jety Oguz, but also in each camp. This signalization should be written in Kyrgyz, Russian and English.

Camp rehabilitation for strengthening the team of rangers within the northern area also seems primordial (Atcha and Bordou camps). We could also propose guard shifts for the rangers between May and October to assure a presence in this area. One could imagine that rangers will go by teams of two during one to two weeks to live in Atcha and/or Bordou cabins and so, restrict crossings there. However, a non-negligible constraint to which we need a solution is the following: even if the two camps were renovated, there isn't any heating medium in both of them (neither wood nor tezek). Consequently, it's hard to ask the rangers to guard there if coal is not provided.

Another positive contribution of these expeditions is the exchanges between the volunteers of OSI-PANTHERA and the reserve's rangers, as much on a scientific and naturalistic ground as from a human and cultural point of view.

We hope these expeditions have highlighted useful data for the reserve and have efficiently contributed to the fascinating assignment of rangers.



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Annexe 1: Complete list of birds observed in Sarychat-Ertash reserve

You can find the complete list of birds observed in Sarychat-Ertash reserve since the beginning of our expeditions there.

- **Podicipedidae**
Podiceps cristatus cristatus, Great Crested Grebe, Grebe Huppé, Большая поганка
- **Ardeidae**
Botaurus stellaris, Great Bittern, Butor étoile, Большая выпь
- **Ciconiidae**
Cicogna nigra, Black Stork, Cigogne noire, Чёрный аист
- **Anatidae**
Anas platyrhynchos platyrhynchos, Mallard, Canard colvert, кряква
Anas querquedula, Garganey, Sarcelle d'été, Чирок-трескунок
Anser anser rubrirostris, Greylag Goose, Oie cendrée, серый гусь
Mergus merganser, Goosander, Harle bievre, Большой крохаль
Tadorna ferruginea, Ruddy shelduck, Tadorne casarca, Огарь
- **Phasianidae**
Alectoris chukar, Chukar partridge, Perdrix chouckar, Азиатский кеклик
Coturnix coturnix, Common Quail, Caille des bles, Обыкновенный перепел
Perdix dauurica dauurica, Daurian Partridge, Perdrix de Daourie, Бородатая куропатка (data not sure)
Tetraogallus himalayensis, Himalayan snowcock, Tétragoalle de l'Himalaya, улар
- **Accipitridae**
Accipiter gentilis, Nothern Goshawk, Autour des palombes, Ястреб-тетеревятник
Accipiter nisus dementjevi, Eurasian Sparrowhawk, Epervier d'Europe, Ястреб перепелятник
Aegypius monachus, Cinereus vulture, Vautour moine, Черный гриф
Aquila chrysaetos daphanea, Golden eagle spp daphanea, Aigle royal spp daphanea, Беркут
- Buteo buteo vulpinus*, Common Buzzard, Buse variable de Russie, канюк; Сарыч
Buteo hemilasius, Upland buzzard, Buse de Chine, Мохноногий курганник
Buteo rufinus rufinus, Long-legged, Buzzard, Buse féroce, Курганник
Gypaetus barbatus, Bearded vulture, Gypaète barbu, Бородач
Gyps fulvus, Eurasian Griffon, Vautour fauve, Белоголовый сип
Gyps himalayensis, Himalayan griffon, Vautour de l'Himalaya, Снежный гриф
Milvus migrans lineatus, Black Kite, Milan noir, Коршун чёрный
Pernis apivorus, European Honey-buzzard, Bondrée apivore, Осоед
- **Falconidae**
Falco cherrug, Saker falcon, Faucon sacré, Балобан
Falco columbarius, Merlin, Faucon émerillon, Дёрбник
Falco subbuteo subbuteo, Eurasian Hobby, Faucon hobereau, Чеглок
Falco tinnunculus, Common kestrel, Faucon crécerelle, Обыкновенная пустельга
Falco pelegrinoides, Barbary Falcon, Faucon de Barbarie, Шахин
- **Rallidae**
Fulica atra, Common Coot, Foulque macroule, Лысýха
- **Charadriidae**



Charadrius leschenaultii, Greater Sand Plover, Pluvier de Leschenault (ou Gravelot de Leschenault), Большеклювый, Толстоклювый зуёк

Charadrius mongolus pamirensis, Lesser Sand Plover, Pluvier de Mongolie ou Gravelot mongol, Монгольский зуёк

➤ **Haematopodidae**

Ibidorhyncha struthersii, Ibisbill, Bec-d'ibis tibetain, Серпоклюв

➤ **Scolopacidae**

Actitis hypoleucos, Common Sandpiper, Chevallier guignette, Перевозчик

Tringa glareola, Wood Sandpiper, Chevallier sylvain, Фифи

Tringa ochropus, Green Sandpiper, Chevallier culblanc, Черныш

➤ **Laridae**

Larus minutus, Little Gull, Mouette pygmee, Мала́я ча́ика

➤ **Apodidae**

Apus apus, Common swift, Martinet noir, Черный стри́ж

➤ **Columbidae**

Columba palumbus, Woodpigeon, Pigeon ramier, Вяхи́рь; витю́ тень

Columba rupestris, Hill pigeon, Pigeon des rochers, Скалистый голу́бь

Streptopelia decaocto decaocto, Eurasian Collared Dove, Tourterelle Turque,

Кольчатая горлица

Streptopelia orientalis meena, Oriental Turtle Dove, Tourterelle Orientale, Большо́ ая

го́рлица

➤ **Cuculidae**

Cuculus canorus, Common Cuckoo, Coucou gris, Обыкновенная куку́шк

➤ **Strigidae**

Bubo bubo, Eurasian eagle-owl, Grand-duc d'Europe, Филин

➤ **Upupidae**

Upupa epops, Eurasian Hoopoe, Huppe fasciée, Удод

➤ **Coraciidae**

Coracias garrulous semenowi, European Rollier, Rollier d'Europe, Сизоворонка (а pen)

➤ **Alcedinidae**

Alcedo atthis, Common Kingfisher, Martin pecheur, Обыкновенный зимородок

➤ **Alaudidae**

Eremophila alpestris, Horned Lark, Alouette hausse-col, Рогатый жаворонок

➤ **Hirundinidae**

Delichon urbicum, Common House Martin, Hirondelle de fenêtre, Городская

ласточка

Hirundo rustica, Barn Swallow, Hirondelle rustique, Ласточка

Ptyonoprogne rupestris, Eurasian Crag Martin, Hirondelle de rochers, Скалистая

ласточка

➤ **Motacillidae**

Anthus spinoleta, Water Pipit, Pipit spioncelle, Горный конёк

Motacilla alba, White wagtail, Bergeronnette grise, Белая трясогузка

Motacilla cinerea, Grey wagtail, Bergeronnette des ruisseaux, Горная трясогузка

Motacilla citreola, Citrine wagtail, Bergeronnette citrine, Желтоголовая трясогузка

➤ **Prunellidae**

Prunella atrogularis, Black throated accentor, Accenteur à gorge noire, Черногорлая

завирушка



Prunella collaris, Alpine Accentor, Accenteur alpin, Альпийская завирушка
Prunella fulvescens, Brown Accentor, Accenteur brun, Бледная завирушка
Prunella himalayana, Altai Accentor, Accenteur de l'Altai, Гималайская завирушка

➤ Turdidae

Turdus merula, Eurasian Blackbird, Merle noir, Чёрный дрозд

Turdus viscivorus, Mistle Thrush, Grive draine, Деряб

➤ Muscicapidae

Calliope pectoralis, Himalayan Rubythroat, Rossignol à gorge rubis, Черногрудая красношейка (data collected out of expedition)

Luscinia svecica, Bluethroat, Gorge-bleue à miroir, Варакушка

Monticola saxatilis, Common Rock Thrush, Merle de roches, Пёстрый каменный дрозд (data collected out of expedition)

Myophonus caeruleus, Blue whistling thrush, Arrenga siffleur, Синяя птица (on camera trap)

Oenanthe isabellina, Isabelline wheatear, Traquet Isabelle, Каменка-плясунья

Oenanthe oenanthe, Nothern wheatear, Traquet motteux, Обыкновенная каменка

Oenanthe pleschanka, Pied Wheatear, Traquet pie, Каменка-плешанка

Phoenicurus coeruleocephala, Blue capped redstart, Rougequeue à tête bleu, Седоголовая горихвостка

Phoenicurus erythrogastrus, White-winged Redstart, Rougequeue de Guldenstadt, Белокрылая горихвостка

Phoenicurus erythronotus, Eversmann's Redstart, Rouge-queue d'Eversmann, Красноспинная горихвостка

Phoenicurus ochruros, Black Redstart, Rougequeue noir, Черная горихвостка

➤ Phylloscopidae

Phylloscopus griseolus, Sulphur-bellied, Warbler, Pouillot griseolus, Индийская пеночка

➤ Sittidae

Sitta europaea, Eurasian Nuthatch, Sittelle torchepot, Обыкновенный поползень, ямщик

➤ Tichodromadidae

Tichodroma muraria, Wallcreeper, Tichodrome échelette, Стенолаз

➤ Troglodytidae

Troglodytes troglodytes, Winter Wren, Troglodyte mignon, Крапівник, подкорённый, орешек

➤ Aegithalidae

Leptopoeile sophiae, White-browed Tit-warbler, Pouillot de Sophie, Расписная синица

➤ Cinclidae

Cinclus cinclus, White-throated Dipper, Cincle plongeur, Оляпка

➤ Laniidae

Lanius isabellinus, Isabelline Shrike, Pie-grièche isabelle, Буланный жулан

Lanius phoenicuroides, Turkestan Shrike, Pie-grieche du Turkestan, Туркестанский жулан

➤ Monarchidae

Terpsiphona paradisi, Asia Paradise Flycatcher, Tchitrec de paradis (Moucherolle des Indes, Gobe-mouche de paradis), Раиская мухоловка

➤ Corvidae



Corvus corax, Common raven, Grand Corbeau, Ворон

Corvus cornix sharpie, Hooded Crow, Corneille mantelee, Серая ворона

Corvus frugileus, Rook, Corbeau freux, Грач

Corvus monedula soemmerringii, Eurasian Jackdaw, Choucas des tours, Гálка

Pica pica, Eurasian magpie, Pie bavarde, Сорока

Pyrhacorax graculus, Yellow-billed/Alpine chough, Chocards à bec jaune,

Альпийская галка

Pyrhacorax pyrrhacorax, Red-billed chough, Crave à bec rouge, Клушица

➤ **Sturnidae**

Pastor roseus* or *Sturnus roseus, Rosy starling, Martin roselin ou Etourneau roselin,

Розовый скворец

➤ **Passeridae**

Montifringilla nivalis, White-winged Snowfinch, Niverolle alpine, Снежный воробей

➤ **Fringillidae**

Bucanetes mongolicus, Mongolian Finch, Roselin de Mongolie, Монгольский

снегирь

Carpodacus erythrinus, Common Rosefinch, Roselin commun, Обыкновенная

чечевица

Carpodacus rubicilla severtzovi, Spotted Great Rosefinch, Grand roselin tachete,

Розовая чечевица

Leucosticte brandti, Brandt's Mountain Finch, Roselin de Brandt, гималайский

вьюрок

Leucosticte nemoricola altaica, Plain Mountain Finch, Roselin de Hogdson,

Гималайский вьюрок

Linaria flavirostris, Twite, Linotte à bec jaune, Горная чечётка

➤ **Emberizidae**

Emberiza buchanan, Grey-necked Bunting, Bruant à cou gris, Скалистая овсянка



Annexe 2: Complete list of mammals observed in Sarychat-Ertash reserve

You can find the complete list of all mammals observed in Sarychat-Ertash reserve since the beginning of our expeditions there.

- **Ursidae**
Ursus arctos isabellinus, Tian Shan brown bear, Ours brun isabelle, Тяньшанский бурый медведь
- **Canidae**
Canis lupus, Grey wolf, Loup gris, Волк
Vulpes vulpes, Red fox, Renard roux, Обыкновенная лисица
- **Mustelidae**
Martes foina, Beech marten, Fouine d'Europe, Каменная куница
Mustela altaica, Mountain weasel, Belette de l'Altaï, Солонгой
Mustela erminea, Stot, Hermine, Горноста́й
- **Felidae**
Lynx lynx isabellinus, Eurasian lynx, Lynx du Turkestan, Обыкновенная рысь
Otocolobus manul, Pallas' cat, Chat de Pallas, Манул
Panthera uncia, Snow Leopard, Panthère des neiges, Илбирс
- **Bovidae**
Ovis ammon, Argali, Mouflon, Архар
Capra sibirica, Siberian ibex, Bouquetin de Sibérie, Сибирский горный козёл
- **Suidae**
Sus scrofa, Wild boar, Sanglier, кабан
- **Leporidae**
Lepus tolai, Tolai hare, Lièvre de Tolai, Заяц-толай
- **Ochonidae**
Ochotona macrotis, Large-eared pika, Pika, Большой болотная пищуха
- **Sciuridae**
Marmota baibacina, Grey marmot, Marmotte grise, Серый сурок

Few bats were observed flying near Koilou camp, but we were not able to identify the species.

