

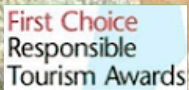


EXPEDITION REPORT

Expedition dates: 29 June – 22 August 2009

Report published: November 2010

Mountain ghosts: snow leopards and other animals in the mountains of the Altai Republic, Central Asia.



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Germany



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**Mountain ghosts: snow leopards and other animals in
the mountains of the Altai Republic, Central Asia.**

**Expedition dates:
29 June – 22 August 2008**

**Report published:
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**Authors:
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of the National Academy of Sciences of Ukraine**

**Matthias Hammer (editor)
Biosphere Expeditions**

Abstract

This study was part of an expedition to the Altai mountains in the Kosh Agach region of the Altai Republic, run by Biosphere Expeditions from 29 June to 22 August 2009. The aim was to continue a survey of snow leopard (*Uncia uncia*) in this area, as well as surveying the snow leopard's primary prey species, argali (*Ovis ammon*) and Siberian ibex (*Capra sibirica*), together with secondary prey species. Using the Snow Leopard Information Management System (SLIMS) developed by the International Snow Leopard Trust (ISLT), presence/absence surveys (SLIMS form 1) of snow leopard and prey species were conducted throughout the study period across the entire survey area. In 2009 surveys were extended to areas away from the Talduair massif site (core area) to the valleys and surrounding ridges of the Karaghem mountain pass. Interviews with local, semi-nomadic herders also formed an important part of the research procedure. The expedition also collected data for extended mammal, bird and plant inventories. Fresh signs of snow leopard presence recorded this year are an indication that the core area once again has been visited and used. The developing relationship between the predator and prey species seems to be very fragile, so any decline (perhaps even slight) in the prey species may drive the snow leopard out of the core area. In addition, human disturbance is considered to be a severe threat. Yet the study area still retains its importance as a habitat for snow leopard and as a corridor for snow leopard dispersal. The survey area urgently needs protection, but involving the local community and raising public awareness is vital if conservation initiatives are to succeed. Today work on establishing four additional nature parks in the Republic of Tuva and the Sailugem Nature Reserve in the Republic of Altai, which will protect the biggest Russian population of the snow leopard is in progress.

Резюме

Данное исследование проводилось в рамках экспедиции в Кош-Агачском районе Республики Алтай РФ, организованная природоохранным агентством «Biosphere Expeditions» в период с 29 июня по 22 августа 2009 г. Целью работы было изучение наличия снежного барса в данном регионе, а также учет животных, являющихся основной его добычей, среди которых, наряду с другими видами животных, следует отметить аргали и сибирского горного козла. Параллельно проводили инвентаризацию птиц, млекопитающих и высших растений. С помощью Системы Учета Информации о Снежном Барсе (SLIMS), разработанной Международным Обществом Опеки Снежного Барса (ISLT), исследование наличия (форма 1 SLIMS) снежного барса и его видов-жертв, проводилось на протяжении всего периода работы на всей территории, включенной в зону деятельности экспедиции (приблизительно 200 кв. км). В этом году исследовали также окрестности Карагемского перевала. Интервью местных скотоводов также стало важной частью исследования, что фиксировалось в разработанной для этой цели анкете. в 2009 г. обнаружены (на снежнике) отпечатки лап зверя. Предполагается, что снежный барс потенциально может проникать на территорию горного массива Талдуаир с массивов, расположенных севернее. Колебания численности поголовья главных потенциальных жертв не способствует появлению тут снежного барса, но можно предположить, что главенствующее негативное влияние на снежного барса оказывают антропогенные факторы. Вместе с тем имеется положительный потенциал для присутствия здесь снежного барса, чему способствует рельеф, растительность, слабая посещаемость высокогорий скотоводами, пребывание потенциальных жертв (прежде всего, аргали, но его численность стремительно падает, и горного козла). Район исследования крайне нуждается в защите, однако, вовлечение в работу местного населения (в т.ч. проведение разъяснительной кампании) является необходимым условием для того, чтобы инициативы по созданию биосферного заповедника или национального парка могли быть реализованы.

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Please note: Each expedition report is written as a stand-alone document that can be read without having to refer back to previous reports. As such, much of this section, which remains valid and relevant, is a repetition from previous reports, copied here to provide the reader with an uninterrupted flow of argument and rationale.

1. Expedition Review

Matthias Hammer
Biosphere Expeditions

1.1. Background

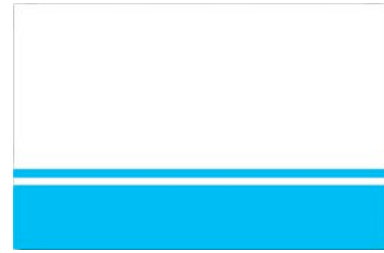
Biosphere Expeditions runs wildlife conservation research expeditions to all corners of the Earth. Projects are not tours, photographic safaris or excursions, but genuine research expeditions placing ordinary people with no research experience alongside scientists who are at the forefront of conservation work. Expeditions are open to all and there are no special skills (biological or otherwise) required to join. Expedition team members are people from all walks of life and of all ages, looking for an adventure with a conscience and a sense of purpose. More information about Biosphere Expeditions and its research expeditions can be found at www.biosphere-expeditions.org.

This expedition report deals with an expedition to the Altai Republic from 29 June – 22 August 2009. This expedition conducted a survey of snow leopards as well as their prey species such as the argali (a mountain sheep with large ram horns and close relative of the Marco Polo sheep) and the Siberian ibex (a relative of the Alpine Steinbock). The expedition also surveyed other animals such as marmots, birds and other small mammals. The area is an important but unprotected corridor of snow leopard movement between Mongolia and Russia and next to nothing is known about these movements and snow leopard numbers. Data collected by this expedition will be crucial in the fight for wild snow leopard survival.

The Altai Republic sits in the very centre of central Asia between China, Mongolia, Kazakhstan, Russia and the Tuva Republic. In it, the Altai mountains rise from 350 to 4500 m and are one of the most beautiful, pristine and remote parts of the world. They were added to the list of natural World Heritage Sites in 1998 as an area of outstanding biodiversity of global importance and they provide the habitat for a number of endangered species including the snow leopard and manul (a small cat predator). It is, however, also one of the poorest regions of the former Soviet Union whose collapse has increased pressures on exploitation of natural resources and deprived local scientists of precious funds for biodiversity conservation.

Little is known about the status and distribution of the globally endangered snow leopard in the area and its interaction with prey animals such as the argali and Altai ibex, and its reliance on smaller prey such as marmots, ground squirrels and game birds. Biosphere Expeditions will provide vital data on these issues, which can then be used in the formulation of management and protection plans.

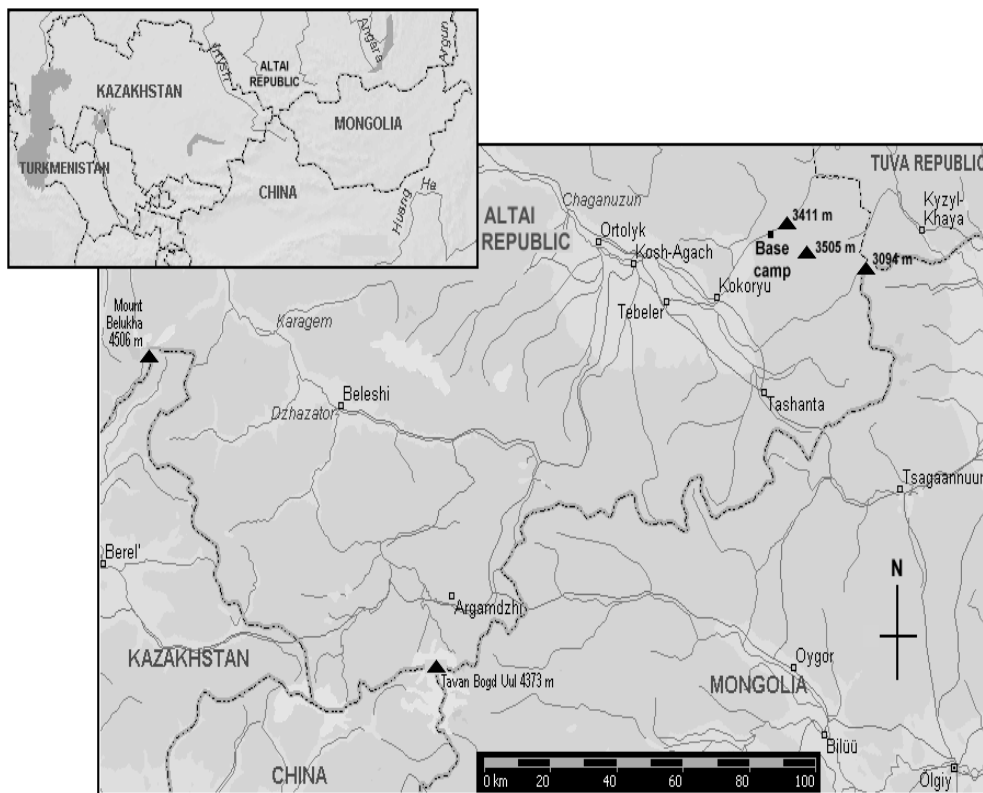
1.2. Research Area



Flag and location of the Altai and study site.

An overview of Biosphere Expeditions' research sites, assembly points, base camp and office locations is at [Google Maps](#).

The Altai mountains are one of the most beautiful, pristine and remote parts of the world, stretching across the very centre of central Asia between China, Mongolia, Kazakhstan and Russia, and standing at the junction of several natural zones and cultures. Few foreigners get to this corner of the world. Those that do, see a variety of stunning high mountain landscapes and immense spaces of open steppe framed by snow covered peaks. Belukha, the region's highest mountain at 4506 m, rises just west of the research area and other mountain peaks, such as Tapduair (3505 m) and Sajlugem (3411 m), overshadow base camp.



Map showing the Altai region and location of base camp.

The mountains are divided by several river valleys and there is a great variety of landscapes. There are hollows with semi-desert landscapes, Alpine peaks, narrow river canyons and broad valleys, highland tundra and deep natural limestone gorges, open steppes, permanent snow and glaciers and tracts of forest, as well as 7000 lakes, wild rivers and waterfalls. Forests of larch, cedar, spruce and pine (but very few deciduous trees) cover more than a half of the mountain territory. Base camp itself is set amidst larch forest at the foot of Tapduair mountain and overlooking an area of open steppe.

Many threatened animal and plant species, many of them endemic, are present in the area with a recent count showing at least 73 mammal species, 300 bird species, 44 fish species, 7 reptile species, a large number of invertebrates, and 1270 plant species.

The Altai Republic is very sparsely populated, with just about 200,000 people, 53,000 of whom live in the main city of Gorno-Altajsk. About 60% are Russians, 30% are native Altai people, and 5% are Kazakhs. The Altai, a Turkic-speaking people, are mostly village dwellers, but a few are still semi nomadic, moving with their herds to different pastures, following the seasons and living in yurts in summer. Even today some settled families keep their yurts in their gardens as an extra room or kitchen for summer use. In the more remote areas the horse is still the main means of transport and the yurt the main type of residence.

The history of the Altai is that of a semi nomadic horseback culture entwined in the power struggles of Central Asia between Mongolian and Turkic tribes. In 1756 the Altai became part of the Russian empire and in 1905-1907 they were involved in the revolution, which ended in the establishment of Soviet power in 1917. During the era of the Soviet Union, the Altai people were integrated into the union as an autonomous district (oblast) and most of its semi nomadic people were collectivised.

With the end of the Soviet Union, the oblast was transformed into a republic in 1991, adopting the name Altai Republic in 1992. As a semi-independent member of the Russian Federation, the Altai Republic established its current constitution and state symbols, such as its flag and coat of arms, in 1997. Official languages of the Altai Republic are equal Russian and Altaian. More information on the Altai is at www.altai-republic.com.

1.3. Dates

The expedition ran over a period of six weeks divided into three two-week slots, each composed of a team of international research assistants, guides, support personnel and an expedition leader. Expedition slot dates were

29 June - 11 July | 13 - 25 July | 27 July - 8 August | 10 - 22 August 2009.

1.4. Local Conditions & Support

Expedition base

The expedition team was based in a mountain tent camp of single and double dome, mess and kitchen as well as shower and toilet tents at approximately 2200 m altitude and 60 km from the nearest human habitation. All meals were prepared by the expedition cook.

Field communications

There was no mobile or landline telephone connection at base. Instead the expedition used an Iridium satellite telephone with internet connection. This did not work well and will be replaced by an Inmarsat BGAN system in 2010. Courtesy of Motorola hand-held radio were used for communication. These worked well when within range.

Transport & vehicles

Team members made their own way to the Novosibirsk assembly point. From there onwards and back to the assembly point all transport and vehicles were provided for the expedition team, for expedition support and emergency evacuations. Courtesy of Land Rover, and their local dealers Avtoland of Novosibirsk and Ekaterinburg, the expedition had the use of three Defenders and one Discovery.

Team members wishing to drive the Land Rovers had to be older than 21, have a full clean driving licence and a new style EU or equivalent credit card sized driving licence document. Off-road driving and safety training was part of the expedition.

Medical support & insurance

The expedition leader was a trained first aider, and the expedition carried a comprehensive medical kit. Further medical support was provided by a small district hospital in the town of Kosh Agach (60 km from the camp) and a large hospital in Gorno Altaisk (500 km from camp). There was also a helicopter rescue service. All team members were required to be in possession of adequate travel insurance covering emergency medical evacuation and repatriation. Emergency evacuation procedures were in place.

There was one minor medical incident of a team member sick and confined to camp for one day.

1.5. Expedition Scientist

Volodymyr Tytar was born in 1951 and his Master's Degree in Biology is from Kiev State University. At that time he first experienced the Altai mountains and wrote a paper on the ecology of the brown bear in the Altai. He then pursued a career as an invertebrate zoologist before shifting towards large mammals and management planning for nature conservation. He has worked with Biosphere Expeditions on wolves, vipers and jerboas on the Ukraine Black Sea coast and has been involved in surveying and conservation measures all his professional life.

1.6. Expedition Leader

Andrew Stronach was born in Scotland, studied Engineering and then flew aircraft for the Royal Air Force before working in wildlife. Surveys of wild plants, birds and marine mammals led him into anti-wildlife crime work that has become his passion and taken him all over Britain and Cyprus. He has taken part in expeditions to Belize, Honduras and Sulawesi, surveying coral reefs and rainforest. Due to a rare allergy to offices, Andrew is almost always found outdoors, whether it is working in the highlands of Scotland, trekking in some remote national park on one of his many foreign travels or dangling from a rope on a rock face.

1.7. Expedition Team

The expedition team was recruited by Biosphere Expeditions and consisted of a mixture of all ages, nationalities and backgrounds. They were (with country of residence):

29 June - 11 July

Robert Burton (UK), Steve Cunningham (UK), Ernst Novotny (Austria), Toby Perring (UK), Peter Pilbeam (UK), Patricia Scheer (France), Guenter Schurz (Germany), Isabella Van Damme (UK), Heike Vornhagen (Ireland), David Warnock (UK).

13 - 25 July

Dorothee Alps-Luetje (Germany), Barbara Bentlage (Germany), Robert Burton (UK), Thorsten Fischer (Germany), Joerg Giere (Germany), Martin Haslam (UK), Annie Johns (Australia), Claire Shapiro (UK), Sonja Stange (Germany), Herwig Stecher (Austria), Simon Verdon (Australia), Sonja Wolken (Germany).

27 July - 8 August

Juergen Benger (Germany), Mike Bishop (UK), Lisa Forsyth (UK), Martin Furtwengler (Germany), Jacqueline Houlder (UK), Georgina McDonald (UK), Patricia Sheehy Skeffington (Ireland), Ulrike Sigl (Germany), Laura Tedstone (UK), Arno (Peter) Ternes (Germany), Nicola Woodward (UK).

10 - 22 August

Thorsten Fuchs (Germany), Verena Jucker (Switzerland), Axel Keller (Switzerland), Solveig Puttrich (Germany), Melanie Sagasser (Germany), Rachel Veerman (Ireland).
Throughout the expedition

Timofei Klimov (translator and all round fixer), Marina Permyakova (translator), Roman Rolin & Oleg (mountain guides), Nina Taranova (cook and our Russian mother who looked after us so well with wonderful food), and camp helpers Uri, Anton, Emil & Sergej.

1.8. Expedition Budget

Each team member paid towards expedition costs a contribution of £1390 per two week slot. The contribution covered accommodation and meals, supervision and induction, a permit to access and work in the area, all maps and special non-personal equipment, all transport from and to the team assembly point. It did not cover excess luggage charges, travel insurance, personal expenses like telephone bills, souvenirs, etc., as well as visa and other travel expenses to and from the assembly point (e.g. international flights). Details on how these contributions were spent are given below.

Income	£
Expedition contributions	55,526
 Expenditure	
Base camp and food includes all meals, base camp equipment	3,734
Transport includes fuel, vehicle maintenance	3,781
Equipment and hardware includes research materials, research gear	1,265
Biosphere Expeditions staff includes salaries, travel and expenses to Novosibirsk	5,172
Local staff includes salaries, travel and expenses, Biosphere Expedition tips, gifts	7,057
Administration includes bribes, registration fees, sundries, etc	1,745
Logistics & co-ordination Payment to Sibalp	8,294
Team recruitment Altai as estimated % of PR costs for Biosphere Expeditions	7,433
 Income – Expenditure	 17,045
 Total percentage spent directly on project	 69%

1.9. Acknowledgements

This study was conducted by Biosphere Expeditions which runs wildlife conservation expeditions all over the globe. Without our expedition team members, who are listed above and who provided an expedition contribution and gave up their spare time to work as research assistants, none of this research would have been possible. The support team and staff, also mentioned above, were central to making it all work on the ground. Thank you to all of you and the ones we have not managed to mention by name (you know who you are) for making it all come true. Biosphere Expeditions would also like to thank the Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine, WWF Russia, the Snow Leopard Conservancy, the Siberian Environmental Centre, the Foundation of Sustainable Altai, the Altai Project, the Altai national government, as well as local authorities, communities, museums & schools. Land Rover, Swarovski Optik and Motorola also support this expedition. The support of all these is gratefully acknowledged.

1.10. Further Information & Enquiries

More background information on Biosphere Expeditions in general and on this expedition in particular including pictures, diary excerpts and a copy of this report can be found on the Biosphere Expeditions website www.biosphere-expeditions.org.

Enquires should be addressed to Biosphere Expeditions at the address given below.

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2. Snow Leopard & Prey Survey

Volodymyr Tytar

I.I Schmalhausen Institute of Zoology of the National Academy of Sciences of Ukraine

2.1. Introduction

The estimated population of snow leopards (*Uncia uncia*) in the wild today is between 3000 and 7000 animals (unpublished manuscripts and Sunquist & Sunquist 2002: also see www.snowleopardnetwork.org). This is the same estimate as for tigers, but whilst tigers have received a lot of publicity and there is wide public awareness of their precarious status, the same can not be said for the snow leopard. They are still one of the least known big cats. Hardly a surprising fact when one considers their elusive nature and the remote and difficult habitats they occupy in the mountainous regions of central Asia. Their geographical range spans twelve countries, many of which are politically unstable and all of which have sensitive borders. The snow leopard is classified as an endangered species (Category I) by the IUCN and is disappearing from many parts of its formerly vast range.

After China, which it borders, Russia has the second largest potential snow leopard habitat and together with Mongolia and other post-Soviet republics, it accounts for much of snow leopard habitat.

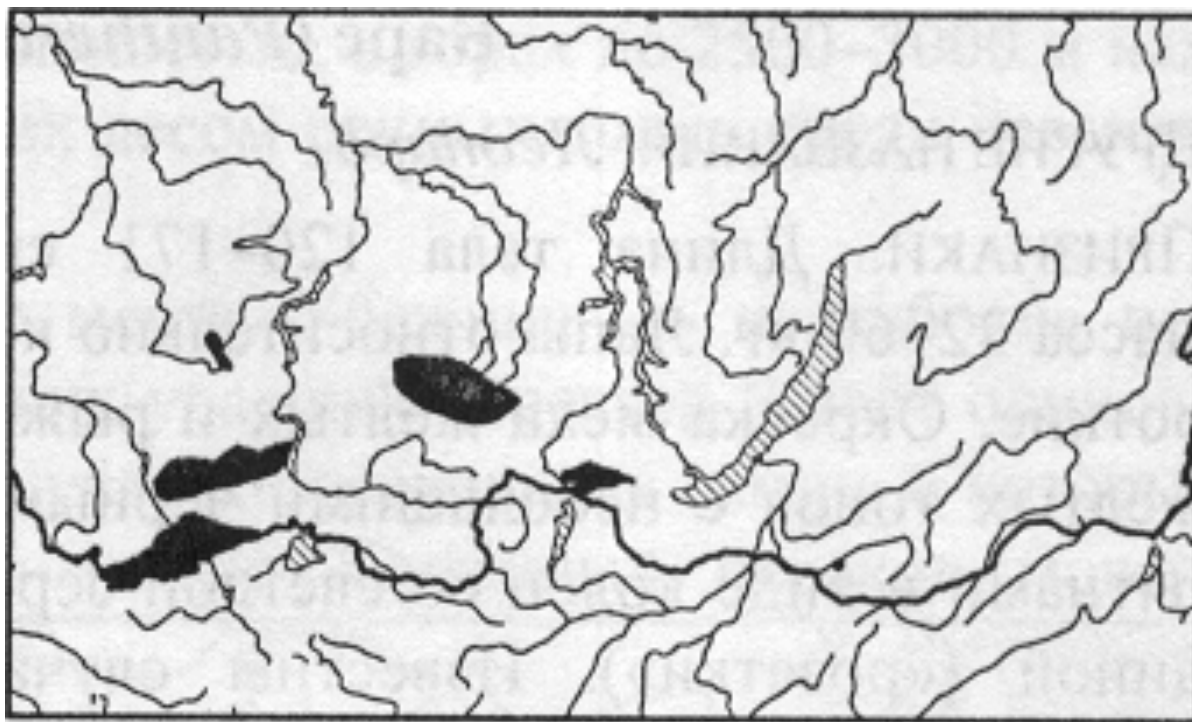


Figure 2.1a. Distribution of the snow leopard in Russia (from Павлинов И.Я. и др., 2002)

The amount of suitable snow leopard habitat in Russia totals about 131,000 square km (Koshkarev 1994) with snow leopards being reported from the Altai and Sayan ranges bordering Mongolia. Smirnov et al. (1990) estimate about 80 snow leopards reside in southern Siberia, including those animals that wander into Mongolian territory. Sopin (1977), cited in Fox (1989) estimates 0.75 to 1.5 snow leopards per 100 sq km in parts of the Altai mountains giving a total population of about 40 (Jackson & Hunter 1996).

Rodney Jackson's four year study (Jackson 1996) of radio-collared snow leopards in Nepal provided most of what is known about the species today, but while Nepal contains prime snow leopard habitat and has the highest percentage of protected area (26.7%) after Bhutan (57.4%), it also only accounts for a small proportion of snow leopard range (0.9%). It took another 10 years for a comparable study to be undertaken in a different habitat (Schaller et al. 1994). This study employed radio-collared animals (VHP & satellite transmitter radio-collars) and took place in the Mongolian part of the Altai Mountains, to the north of the Great Gobi National Park. Although a stronghold of snow leopards in Mongolia, prey densities were found to be relatively low and probably representative of much of the snow leopard's range in central Asia (McCarthy et al. 2005). Results from this study have also revealed much larger snow leopard home ranges than previously recorded.

However, studies involving radio-collared snow leopards are difficult, time-consuming and expensive. Conducting surveys using the Snow Leopard Information Management System (SLIMS), on the other hand, is a more practical way of assessing snow leopard status and distribution in much of the snow leopard's range. Following this protocol ensures standard procedures are used and enables data gathered across any part of the snow leopard's range to make a valuable contribution to the International Snow Leopard Trust's (ISLT) database and so help further knowledge and conservation efforts. The expedition therefore followed SLIMS methodology.

2.2. Research Area & Timing of Survey

The area surveyed by Biosphere Expeditions is chosen for several reasons including: (1) the area before was poorly surveyed for snow leopard; previous expeditions to the area since 2003 suggest the fragility of the area for sustaining a viable snow leopard population and its temporary status as a snow leopard habitat, however more evidence is needed before coming to a final conclusion; (2) a map study suggests that the area may be an important corridor for snow leopard dispersal to and from Mongolia; (3) the habitat is diverse in biological terms, supporting a range of prey species and other carnivores; (4) the area lacks proper protection and is threatened by a proposed road to the Tyva Republic and a proposed gas pipeline. However, there is a potential here for establishing a protected area that would favour wildlife and accommodate local residents.

Two main clusters of study sites are distinguishable. One study site (Talduair area) totals approximately 200 square km (in a square roughly between 50.10°N, 89.20°E and 49.85°N, 89.48°E) and is delineated by geographical features – rivers, in particular Buguzun and Bar-Burghazy, and a number of mountain ranges. The other site focuses on an area of the Northern and Southern Chuya mountain ranges centered around the Karaghem mountain pass (49.97°N, 87.77°E); a few surveys were carried out in the Sailughem range down south near the Mongolian border (approximately 49.5°N, 88.5°E). See fig.2.2.1. and 2.2.2.

As per SLIMS suggestions, the survey routes followed river valleys and landform edges wherever possible. Research was focused on the core area as it included the most important habitat for snow leopard and prey, and suffered from the lowest levels of human disturbance. The survey sites were accessed by Land Rover (or on foot if near base camp). All surveys were conducted on foot.

Base camp (49.99°N, 89.23°E) was situated in a valley, at the entrance to the core area, below the mountain of Kunduyak (3399 m) in the Talduir massif. It afforded the necessary shelter and fresh water source from Kunduyak stream needed by the expedition.

In 2009, as in the previous year, surveys were extended to areas out of the initial Talduir site to those indicated above. One of the reasons for selecting these areas was the digital modeling exercise (see below), which indicated the places as favorable (in terms of bioclimatic parameters) for the snow leopard.

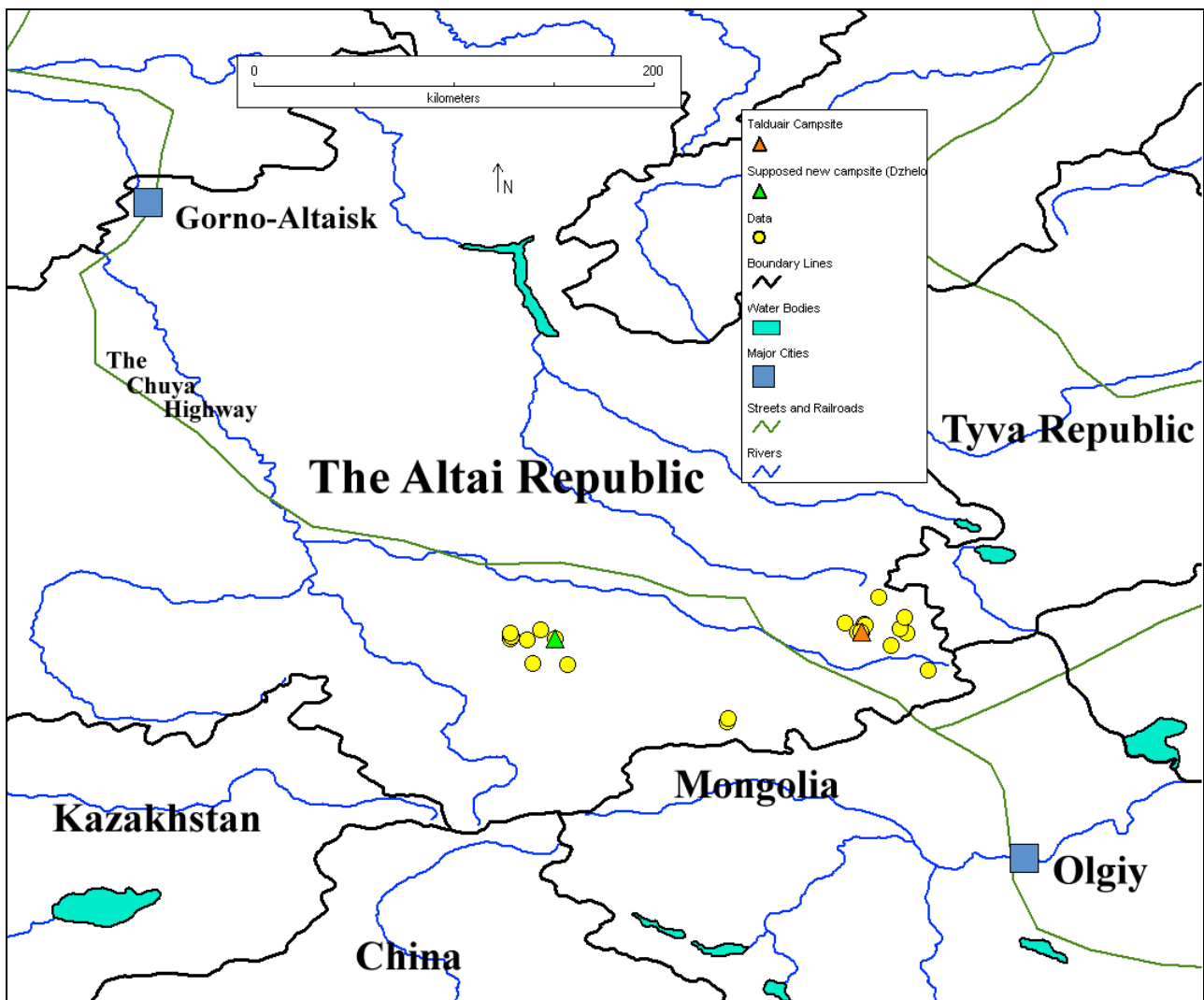


Figure 2.2a. Distribution of survey sites in 2009 (map composed in *DIVA-GIS*).

Snow leopard surveys are best undertaken when weather permits travel within the proposed survey area, when animals are most actively marking and when sign is most long-lived. These conditions rarely coincide, so trade-offs have to be made between logistical factors and biological ones. In this study, logistics and team recruitment by and large determined the survey period.

On the one hand, summer is a difficult time to find snow leopard sign: marking activity is low, human disturbance is high and livestock grazing can soon obliterate sign. Suitability of tracking substrate is also poor (tracking is much easier in snow). Weather conditions also tend to be unpredictable and contribute to sign erosion and eradication. Rain erodes sign rapidly. On the other hand, however, recruiting an expedition for a summer expedition is much more realistic, logistics are not nearly as prohibitive as in winter and, most importantly for this study, human presence can be a valuable source of information, especially in the absence of other baseline data. Summer is also the optimum time for accumulation of sign and availability of "relic" sign (i.e. old sign that is not washed away or otherwise destroyed or removed).

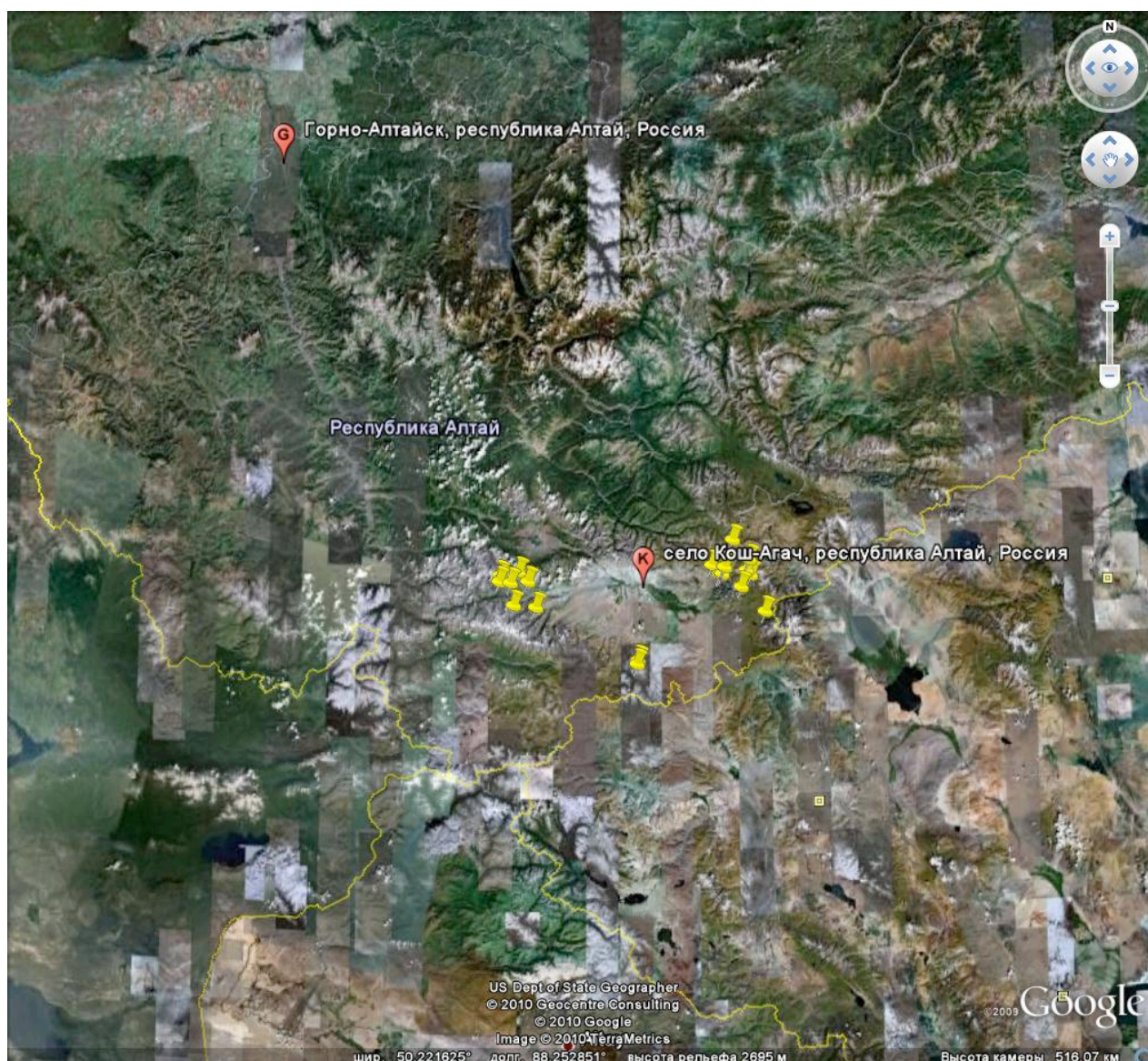


Figure 2.2c. Distribution of survey sites in 2009 (map composed in *Google Earth*). Yellow pins – survey areas, G – Gorno-Altaysk, K – Kosh-Agach.

2.3. Methods

2.3.1. Snow leopard presence-absence survey

Presence-absence surveys of snow leopard and prey (SLIMS Form 1, see appendix 1) were conducted throughout the survey area. Designed for ease of use, presence-absence surveys are a scientifically valid approach to determine the general status of snow leopards in broad geographical areas. The surveys rely on the presence of snow leopard sign at strategic search locations. Data analyses use survey block summaries to draw conclusions on: (1) the presence-absence of snow leopards and prey species; (2) major threats; (3) management recommendations.

These are qualitative methods that lead to personal judgments supported by physical evidence documented in the survey forms. Unlike relative abundance surveys, there is no statistical basis for the conclusions. When snow leopard sign is absent, the analyst must rely on all other information on the data forms to reach a judgment. Prey species, habitat and local interview data may point to the presence of snow leopards, even though no sign was found during the survey.

The analyst uses the survey data to support qualitative judgments on snow leopards, prey species, threats and management recommendations for the survey area. The survey forms are the critical analytical unit and are stored for future reference.

Snow leopard presence can be detected by sign, i.e. pugmarks (tracks) (PUG), scrapes (SC), faeces (scat) (FE), urination (UR) and rock scent spray (RC). These signs tend to be left in relatively predictable places. For example, scrapes tend to be left at the base of cliffs, beside large boulders, on knolls and promontories, at bends in trails, or along other well-defined landform edges (Schaller 1977; Koshkarev 1984; Mallon 1988; Schaller et al. 1987; Jackson & Ahlborn 1988; Fox 1989). These factors are important when deciding where to survey.

2.3.2. Prey base survey

Surveying prey base is another, essential component of the present SLIMS presence/absence survey. Argali and ibex are the main prey species. Their range closely parallels that of snow leopard. Siberian red deer (*Cervus elaphus maral*), roe deer (*Capreolus capreolus*) and wild boar (*Sus scrofa*) are also taken by snow leopard in Russia (Jackson & Hunter 1996).

Prey species were surveyed by recording sign and by observation. Prey sign included tracks, faeces, hair/wool, and carcasses/bones. Prey species were divided into 'primary' (ibex and argali) and 'secondary' (maral, marmot, pika, hare and game birds). The same search sites were used for snow leopard and for prey.

2.3.3. Interviews

The social and economic crises of the 1990s in Russia (and now the current GFC) strongly influenced the intensity and character of how the environment is used, which had a dual effect on the snow leopard. On one hand, due to a decreased number of livestock and related pressure on natural pastures, population numbers of major prey species, Siberian ibex and argali, have grown. On the other hand, due to the fact that the living standards of the locals have declined, its pressure on biological resources has also increased. People who have lost their jobs have intensified their use of hunting grounds, including the introduction of poaching techniques highly dangerous for the snow leopard.

Grazing livestock in the highlands is part of traditional land use that directly affects the snow leopard, and herders, many of whom are hunters too, form the part of the human population that is present in the snow leopard habitats and encounters the animals most often. The expedition found it instructive to interview these people to find out about their attitudes to and sightings of snow leopards and other wildlife. These interviews were conducted in Russian and translated to the team members as they happened. Their job was to make sure that all topics in a formalised questionnaire (see appendix 2) were covered and all questions were asked as far as possible. Datasheets were discussed in the evening with scientific staff as part of the filling in datasheet activity.

2.3.4. Additional surveys

Evidence of other carnivores sharing snow leopard habitat was also recorded as part of the SLIMS survey.

In the end an attempt is made to build a predictive model of the distribution of the snow leopard in the Altai based on ecological niche modeling and using Biosphere Expedition records together with published data summarized in the Red Data Book of the Republic of the Altai. *DIVA-GIS* software (<http://www.diva-gis.org>) was applied to process georeferenced primary occurrence data for the species, in combination with digital maps representing environmental parameters (namely, altitude and 19 bioclimatic parameters). The simplest *BIOCLIM* model (Nix, 1986) was chosen, which itself involves tallying species' occurrences in categories for each environmental dimension, trimming the extreme 5% of the distribution along each ecological dimension, and taking the niche as the conjunction of the trimmed ranges to produce a decision rule.

2.4. Results

2.4.1. Snow leopard presence/absence survey

From 2 July and up to 19 August 2009, 34 snow leopard presence-absence surveys were carried out. The average length of one survey route was about 10 km, and an average of 7.37 ± 0.5 hours was needed for making an inspection. Elevations ranged from approximately just below 2000 m (in the Buguzun floodplain) to above 3600 m (mountains surrounding the Karaghem Glade). The dominant landscape surveyed in the area consisted of narrow valleys (NVAL), broken terrain (BTER), and steeply (SROL) and wide valleys (WVAL) met, respectively, in 35, 35, 5 and 5% of the cases; other landforms included grass plateau, ridges, rock falls, glacial lake areas, and woodland consisting of Siberian larch and sporadic pine stands.

Snow leopard sign searched for during this study included: pugmarks (tracks), scrapes, faeces (scat), urination, rock scent spray and direct observation.

Tracks (pugmarks): These are more easily found in sandy rather than gravelly places, but sandy areas were only present at lower elevations, away from preferred snow leopard terrain. Most of the area surveyed was unsuitable for tracking (scree, boulders, vegetation, etc), so any conclusions are fairly dubious.

However, the winter of 2009 was very snowy and large patches of snow were still present in the early summer. Special attention was drawn to such places and in one of the valleys of the Talduair massif a fairly clear track (PUG) left behind by one snow leopard was detected at 48.80814°N, 89.54433°E, 3143 m. The animal was apparently following a herd of argali.

Scrapes: These can be found in sandy sites (short-lived) and gravel (more long-lived). Unfortunately suitable substrates were not present in most of the survey area favoured by snow leopard, where the majority of substrate was vegetation and broken terrain. Potentially suitable substrate was subject to livestock grazing. Rainfall and occasional snowfall throughout much of the survey period also reduced the possibility of finding scrapes.

No scrapes possibly belonging to the snow leopard were encountered.

Faeces: Faeces can be long-lived in areas with little rainfall and minimal insect activity - the survey area was subject to high rainfall and intense insect activity. Grasshoppers, for instance, were found at all but the highest elevations and were voracious consumers of faecal, plant and other matter. Faeces can be deposited solitarily or with other scats of varying ages (Jackson & Hunter 1996). Faeces are most often found in association with scrapes.

One definite sample of faeces (FE) belonging to snow leopard was discovered this year in the vicinity of the Karaghem glade at 49.97816°N, 87.65698°E, 2733 m. The sample was rather old and contained bony remnants of a game bird.

Urination: Urine can be deposited on scrape piles and is commonly deposited along regular paths or trails.

No definite signs of urination were found during the survey period. Lack of trails and difficulty in finding scrapes were a contributing factor.

Scent spray: snow leopards spray-mark the faces of upright or overhanging boulders and the base of cliffs. Some sites are periodically revisited and re-sprayed (mainly along trails). The majority of spray sites will have one or more scrapes within a distance of a few meters.

No scent-spray was found during a survey conducted this year.

Claw rakes: These are occasionally left on a rock face, log or upright tree trunk.

No claw rakes were found during the survey period.

Direct observation: One unconfirmed observation (OBS) of a snow leopard occurred during an overnight stop to the Karaghem glade: 49.95775°N, 87.69802°E.

2.4.2. Threats to snow leopard presence

In the course of the presence-absence survey an account was taken of human-induced factors considered to be threatening to snow leopard presence in the area. Grazing activities turn out to be common and widespread and were recorded in 22 out of the 34 accomplished snow leopard presence-absence surveys (65%) and are in most cases are confined to foothills and valley floor. More grazing occurs obviously in the Dzhelo area (just down on the eastern side of the Karaghem Mountain Pass), where several herders' summer stations are in place and dogs are kept in plenty, however here, as elsewhere, most of human impact occurs at lower altitudes (extending downstream the Dzhelo River and occupying areas in the adjoining Taldura Valley).

In general, the grazing pressure in the area continues to remain fairly stable and considerably reduced, compared to communist times. Many areas suitable for grazing (as, for instance, along the Tekelyu River or down on the western side of the Karaghem Mountain Pass) have been abandoned by herders, which are no longer subsidized by the Government. Today these areas are considered to be 'empty', not meaning, of course, that in the near future they can once again be used by the herders (or, for example, as hunting grounds or enclosures for keeping maral).

Occasional horse droppings, car tracks found in higher places indicate sporadic human presence all over the area. Other signs of human presence and disturbance included findings of bullet cases, hides, campfires and various rubbish left behind by visitors, fresh collection of firewood has been recorded as well.

In 2007 it was very disappointing to find tracks of quad bikes in the fairly remote potential corridor area (north of the Talduair area along the Tekelu River, 49.9°N, 89.43°E); this year quad bikes have been recorded in areas of the Karaghem glade and the Taldura valley. This surely is a bad sign, has nothing in common with the local traditional land use and may become an additional factor of disturbance for wildlife.

Short-term disturbance is created by harvesters coming in for pine cones, mushrooms, wild onions, moss used for insulation etc.

2.4.3. Prey base survey

Signs of prey species in both presence/absence and relative abundance surveys were fairly abundant and widespread as far as they usually are met in a much greater variety of terrain.

In 2009 argali were recorded in 13 surveys out of 34 (38.2%). Signs of argali included faeces, hoof prints, pieces of wool, skulls and horns, resting depressions ('beds'). Individual animals were spotted in places between altitudes of 2379 and 2920 m.

In 2009 Siberian ibex were recorded in 26 surveys out of 34 (76.5%). These included records of faeces, hoof prints, 'beds', skulls, tufts of hair. Animals were seen between altitudes of 2792 and 3245 m.

In pooled samples elevations for both argali and ibex records overlap and vary around the medium of 2800 m. Signs indicating the altitudes at which the animals are met, highlight the area as a potential habitat for the snow leopard.

Evidence from surveys and interviews indicates that the numbers of animals using the survey area are perhaps relatively low and are subjected to fluctuations from year to year. It is quite difficult to give any statistical interpretation of these estimates (solely based on the number of records originating, particularly this year, from various differing areas).

Fig. 2.4.3.1 presents the records of the potential prey species. About less than a third (28%) are records of the 'primary' prey species, argali and Siberian ibex. Game birds (Altai snowcock, grouse etc.), northern pika, mountain hare and the grey or Altai marmot make up together 56% of the records. There are fewer records (grouped in the category 'other') of roe deer, wild boar and the Arctic ground squirrel. Newcomers to this category are elk and musk deer recorded in the vicinity of the Karaghem glade.

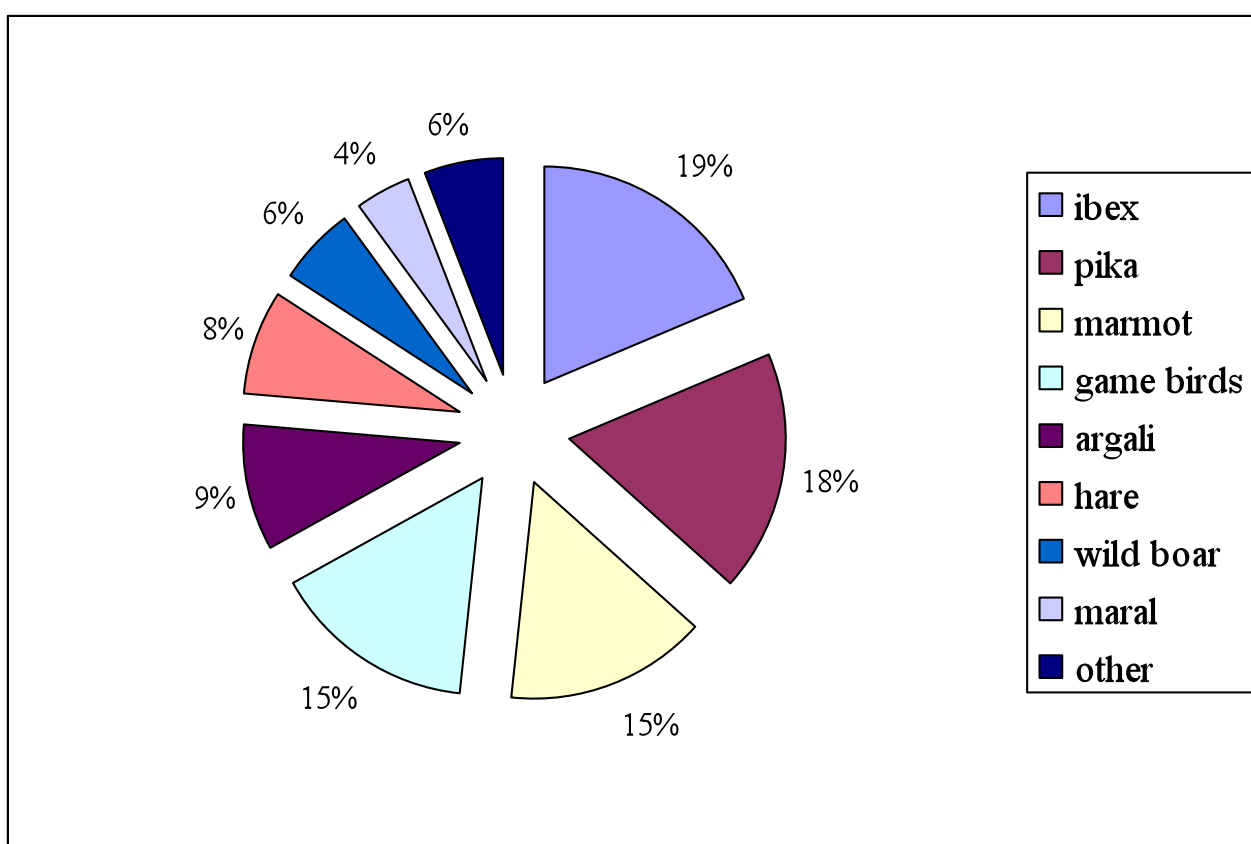


Figure 2.4.3a. Records of potential prey species.

2.4.4. Interviews

Seven interviews of people were taken in the field, almost all of men (only once a couple was involved), aged between 30 and 50, most being local residents settled in the Kosh-Agach District (Kosh-Agach itself, Tebeler, Zhana-Aul etc.), but spending most of the summer with their herds out in the mountains. One person presented himself as a forester/warden (from Kokoria), another was a technician from Gorno-Altai.

All the herders keep livestock: sheep (numbers belonging to one owner fluctuate between 100 and 500), goats (100-250), cows (30-150), horses (from few up to 7), sarlyks (yaks) are kept as well. In fact, sometimes a considerable portion of the livestock belongs to other people such as for instance, teachers, policemen etc. for whom the herder for a fee keeps the animals in the field. In general, the shepherds were fairly vague (or reluctant?) in their statements on the exact number of livestock under their supervision.

The overall feeling towards the snow leopard and other wildlife was diverse: 'strongly dislike' (nobody), 'indifferent' (1), 'like' (2), and 'strongly like' (2, including both one herder and the technician). One person failed to answer.

On the question about the presence of the snow leopard, 3 replied that this was a 'good thing', 2 were 'indifferent', nobody said this was a 'bad thing'. In one case the 'good thing' was associated with potential income from the snow leopard, perhaps by poaching.

Four locals have seen a snow leopard in the wild between 2008 and summer of 2009, in one case the female was followed by 2 cubs. This, if true, is of course encouraging information.

The question 'how many snow leopards do you think live in the region' was a puzzle to the interviewees: nobody could say anything definite.

Four people were explicitly knowledgeable that the snow leopard is protected in Russia.

Responses to questions related to the impact of the snow leopard on wildlife, particularly 'primary' and 'secondary' prey species, attacks on humans and domestic livestock depredation were distributed as per Table 2.4.4a below.

Table 2.4.4a. Questions related to the impact of the snow leopard on wildlife.

Questions related to the impact of the snow leopard on wildlife	Strongly disagree	Disagree	Neutral	Agree	Strongly agree
Snow leopards have a considerable impact on large game (argali, ibex, etc.)	1	-	3	1	-
Snow leopards have a considerable impact on small game (marmots, ground squirrels, etc.)	-	-	2	-	1
Snow leopards reduce populations of argali and ibex to unacceptable levels.	-	-	2	1	-
Snow leopard attacks on humans are more frequent in regions where snow leopards live in close proximity to humans.	-	-	2	-	-
In regions where snow leopards live in close proximity to livestock, they feed primarily on domestic animals.	1	1	2	-	-
We already have enough snow leopards in the region	-	-	1	-	-
Total	2	1	12	2	1

Most of the interviewees responded (if responding at all) to the questions related to the impact of the snow leopard on wildlife in a neutral manner (it could be they just do not know).

On the question concerning the attraction of more tourists to the region because of snow leopards, nothing was explicitly said. In general, people in the area are not against tourists from outside, provided they are respectful of the environment, but one of the interviewees was opposed to the idea of having more tourists, saying it was a 'bad thing'.

Unfortunately, as the nation becomes richer (after the economic crisis in the 1990s) more people are coming to the region and displaying an aggressive attitude towards the use of the natural resources of the area, attempting to privatize at any cost areas for their selfish economic needs and hardly respecting traditions such as for instance, hunting rules established by consensus between the local residents and kept in force for many years. This winter (2009) has seen a very worrying example of this as allegations of poaching by a hunting expedition aboard a Mi-171 helicopter has received wide coverage even in the government-friendly media outlets (see <http://www.themoscowtimes.com/article/1010/42/376853.htm>).

A remedy to this intrusion could be the establishment here of a protected area, preferably a national park or a biosphere reserve. However, people to whom we spoke do not think the whole area should be protected and do not seem to realise the threat that encroaching civilization could bring to the area. So far the herders and people in the steppe have managed to prevent privatisation of the land and are trying their best to resist poachers from the big cities (the source, perhaps, of having more tourists being considered a 'bad thing').

2.4.5. Additional surveys

Evidence of other carnivores sharing snow leopard habitat was also recorded. These were wolf, fox and manul. Wolf sign were found at various elevations (up to 2726 m) in 3 surveys (8.8%).

Wolf is the only predator currently preying on domestic livestock in the area, perhaps the brown bear as well. Unfortunately, eradication measures for the wolf include poisoning and the use of traps, a potential hazard for the snow leopard as well.

No video camera trapping was carried by the expedition in 2009. Previously possible locations were identified and tested, but without success. Indeed, the chances of remote video capture (particularly if only one camera is in use) of snow leopard are slim until a trail or 'relic' scrape is found.

2.5. Conclusions

On an expedition such as this, covering a large area of remote, rough and broken terrain, it is difficult to find signs of snow leopard and 'primary' prey species, especially during the summer absence of prolonged, continuous snow cover. Ungulates and carnivores favour higher ground and are more dispersed during this season and snow leopard sign is harder to find.

The first expedition in 2003 indicated that snow leopard was present in the area surveyed. This, together with evidence from local people, confirmed the importance of the study area as a habitat for snow leopard and as a corridor for snow leopard dispersal between Russia and Mongolia. The repeated surveys of the expeditions have also shown that the habitat in the Talduair massif is sufficiently varied and capable of sustaining a healthy prey base for the snow leopard. In 2003 sign of snow leopard was found in the core area of the Talduair massif implying a resident animal and/or or more than one snow leopard in the research area. However, in the following years no other sign was found, besides fairly old (perhaps a few months) scat samples presumably belonging to the species, showing that snow leopards may have left the area or were visiting it on an occasional basis.

Fresh signs of snow leopard presence recorded this year are an indication that the core area once again has been visited and used. The developing relationship between the predator and prey species seems to be very fragile, so any decline (perhaps even slight) in the prey species may drive the snow leopard out of the core area. Indeed, poaching and disturbance may be the main factors for driving animals out of the site.

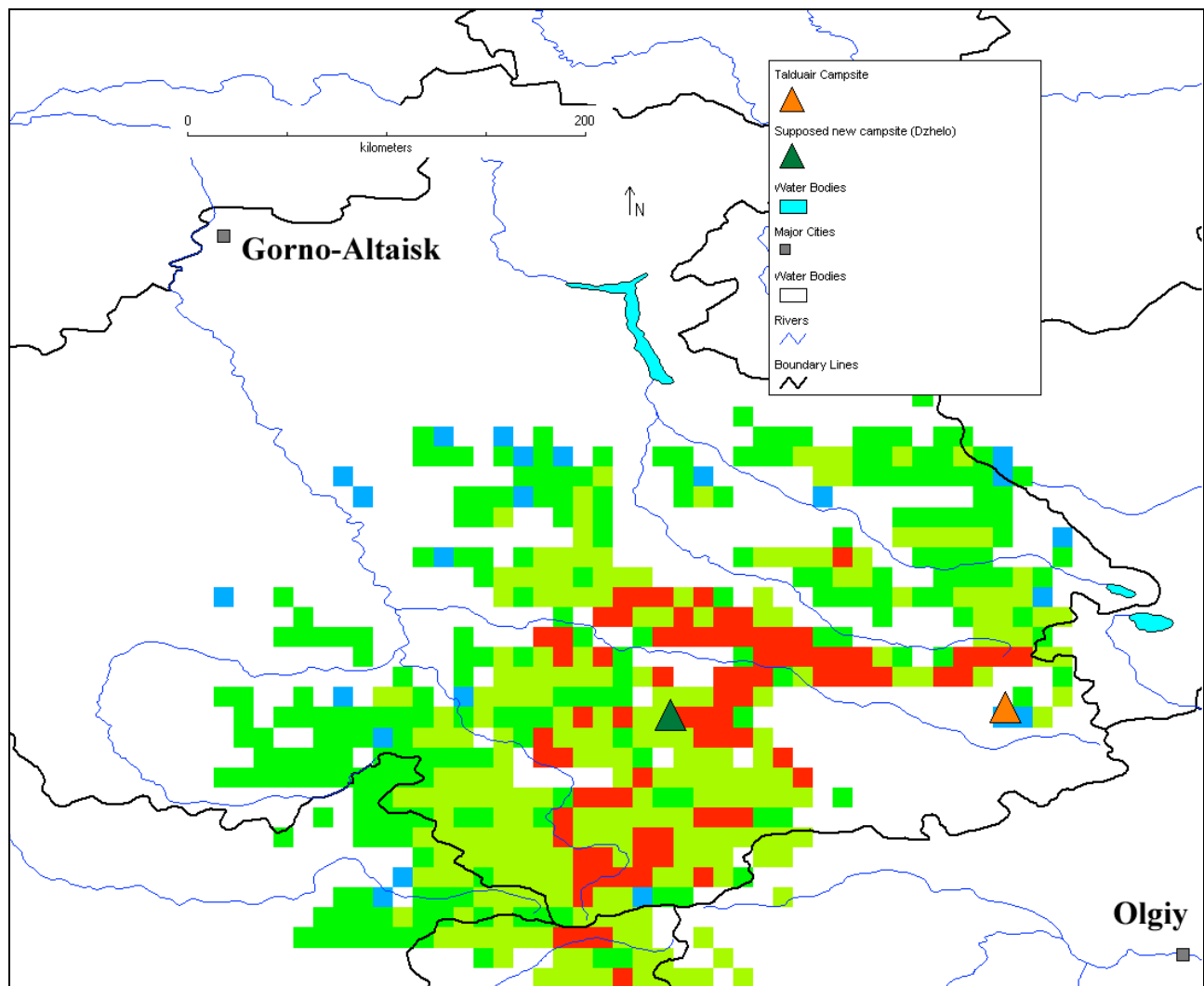


Figure 2.5a. Digital distribution model of the snow leopard in the Republic of Altai (and some adjacent areas); areas within the red-coloured cells present the most favourable ('excellent') combination of ecological conditions required by the species, blue – the least favourable (composed in *DIVA-GIS*).

Interviewed people have seen snow leopards (adults and cubs) and/or signs of their activity within the Talduair massif and in the surrounding area. Sightings have decreased significantly since 1998, although, according to the locals, animals still do occur in the proximity of the Tapduair area (for instance, mountains Chornaya, Tabajoc, surroundings of Arzhan-Buguzun). Snow leopard predation of domestic livestock occurred in the past, but there are no records of any incidents after 1993. The evidence from interviews suggests the study area once held a healthy, breeding snow leopard population, which is now in steep decline. We hypothesize that the main cause for this is increased poaching of snow leopard and ungulates (particularly argali) exacerbated by seriously diminished facilities to combat these problems.

The corridor area located to the north beyond the Buguzun-Karagai-Tekelu boundary seems to be of vital importance for animals recolonizing the Talduair Massif. The relationship between these two areas resembles 'continent' and 'island' relationships in biogeography (MacArthur & Wilson 1967), a notion arising from the digital modeling exercise (Fig. 2.5a). Indeed, mountain ranges located north of the Tapduair massif together with the Kurayskiy range form an extensive cluster of 'excellent' habitat area (coloured in red) interconnected with similar areas in the Chuya ranges favoring snow leopard presence to where the expedition will move in 2010.

Overgrazing by livestock and erosion caused by vehicles is also a problem, particularly at lower altitudes. Improved anti-poaching control together with a temporary ban on hunting could have an immediate impact on halting the decline of prey species and, by inference, snow leopards. All the surveyed areas, particularly the Talduair Massif, urgently need proper protection. Involving the local community and helping them to benefit as well as wildlife is vital for any conservation initiative to succeed.

Fig. 2.5b depicts Biosphere Expeditions locations and survey efforts in the context of the developing network of protected areas in the Republic of Altai. Most of these plans are still on paper and NGOs such as the Siberian Environmental Center (www.sibecocenter.ru), the Gebler Ecological Society, etc. are involved in a campaign to have these parks declared. Recent efforts have focused upon the establishment of the Sailughem National Park, an important area for snow leopard conservation and the site of much of Biosphere Expeditions' research work. Initial plans were to have the park in two locations (see 3.18 in Fig. 2.5b), including a cluster "Argut" (in patch 3.13 of Fig. 2.5b). In total the area of the national park would be about 117,000 hectares. Up to now the Russian government has adopted a resolution (№ 241-p, 27.02.2010) on declaring the area protected, but matters have gone no further and as yet there is no national park on the ground. Biosphere Expeditions will continue to provide these expedition reports and other data to campaigning organisations in order to aid efforts of extending the network of protected areas in the Altai Republic.

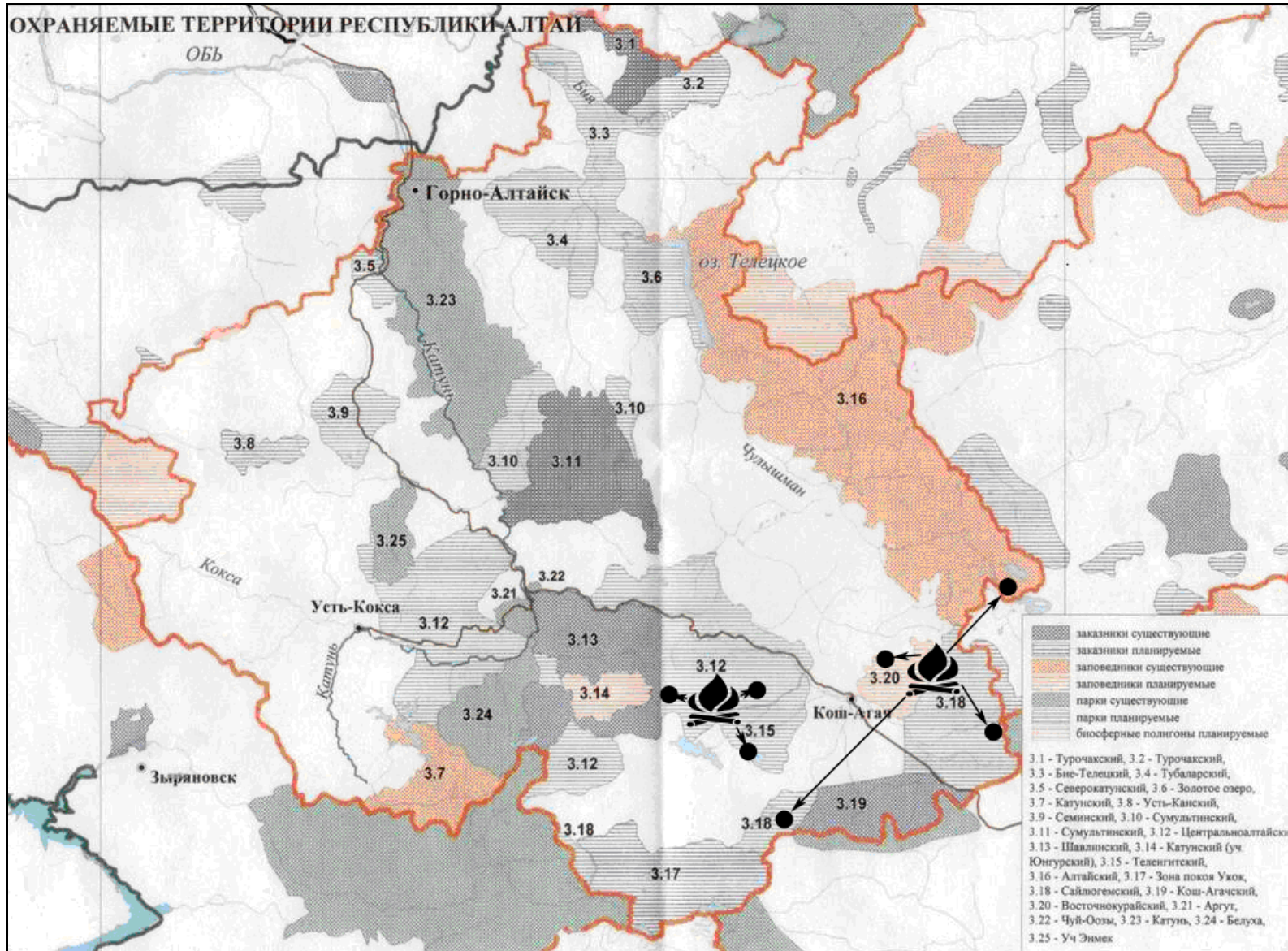


Figure 2.5b. Biosphere Expeditions base (log fire icons) and major field camp locations (large black dots) mapped in relation to the present and planned network of protected areas in the Republic of Altai (source map www.altai.ru/tourist/gorny/ecolog/zapoved/).

Existing protected areas

- 3.16 - Altai Nature Reserve
- 3.17 - Ukok Quiet Zone
- 3.19 - Kosh-Agach Wildlife Sanctuary.

Planned protected areas

- 3.12 - Central Altai National Park
- 3.15 - Telengit National Park
- 3.18 - Sailughem National Park
- 3.20 - Eastern Kurai Nature (or Biosphere) Reserve

In summary:

- Results from SLIMS data sheets confirm the fragility of surveyed areas for sustaining a viable snow leopard.
- The major threats facing the snow leopard and prey population within the study areas seems to be poaching, habitat degradation caused by grazing pressure, human disturbance and proposed development, land privatization. If development goes ahead it will exacerbate the poaching problem and cause further damage to an already fragile ecosystem.

2.6. Summary & Management Recommendations

Management recommendations are in line with the Strategy for Conservation of the Snow Leopard in the Russian Federation (2002) and include the following:

- III.1. *Safeguarding the range structure* – conduct further research in the study areas, including the Talduair Massif and adjacent corridor area, and extend the survey to areas (as indicated by the ecological niche modeling) in the Chuya ranges.
- III.3. *Measures for conservation of major prey species and control over potential competitors* – an immediate temporary ban on hunting any of the larger prey species. Ibex and argali numbers are not high enough locally (though these seem to be increasing, particularly of the ibex) to support hunting pressure and it is almost impossible to regulate what is shot once a licence is issued.
- III.5. *Solutions to the conflict between snow leopards and local herders* – improve the economic situation of local people in return for participation in wildlife monitoring and help with anti-poaching. In fact, interviews have shown that locals in their majority have no hostile feelings to the snow leopard, so it might be reasonable for this purpose using the combination of ecotourism and marketing products made by herders.
- V. *Raising public awareness of snow leopard conservation* – further investigation and consultation with herders are needed, so they would reach an understanding of the snow leopard as a ‘flagship’ species not only for nature conservationists, but a species benefiting them as well. More attention has to be drawn to realizing the threat that encroaching civilization is bringing to the area and to the understanding of protected areas concept as a tool for withstanding against privatization of land by non-residents and maintaining sustainable nature resource use in the traditional fashion.

· As numbered in the Strategy for Conservation of the snow leopard in the Russian Federation of Anon (2002).

2.7. Outlook & Future Expedition Work

Further research is needed to monitor snow leopard and prey population trends in the survey area. Presence-absence surveys will be repeated in the following years and relative-abundance surveys will also be undertaken in the most suitable habitat areas as pointed out in the digital modelling. For this purpose the expedition base camp will be moved to a place in the Chuya ranges (Dzhelo). Finding a trail and/or relic scrape(s) is still a high priority. If either of these can be found, remote camera-trapping will be included as a survey tool. Collecting scat for DNA analysis must continue to play an important part in the research; for this purpose search should be continued for an appropriate grant for processing the scat samples in a laboratory. Liaising with local people will continue to play a key part in the research. Continued dialogue with herders is very important, not only to find out what has happened in between expedition periods but to involve them more fully in the research and explore possibilities of benefiting the local community.

2.8. Заключение

С 2 июля по 19 августа 2009 г. проведено обследование на наличие снежного барса в районе горного массива Талдуаир, хребта Сайлюгем, Северо- и Южно-Чуйского хребтов (преимущественно в районе Карагемского перевала) и оценка подходящих для вида местообитаний. Вели поиск отпечатков лап, поскребов, экскрементов, мочи и мочевых меток. Исследования прошлых лет года дали основания считать, что в районе обитает по крайней мере одна особь. Находка лишь одного образца экскремента в 2004 году дало повод предположить, что вид покинул район горного массива Талдуаир или только временно ее посещает. Сделанные в 2005 г. находки отпечатков лап и мочевых меток указывают на возвращение в район снежного барса, что может быть связано с некоторым увеличением численности его потенциальных жертв, в первую очередь горного козла, но отсутствие подобных следов в 2006 г. (все находки были сделаны в другом районе – на СЗ от основного района исследований) позволяет предположить, что возрастающее негативное влияние оказывает беспокойство со стороны людей. В 2007 г. найдены лишь старые следы и экскременты, а предположительное снижение поголовья главных потенциальных жертв не способствует появлению тут снежного барса. В 2008 г. вообще не обнаружено каких-либо следов пребывания снежного барса, но в 2009 г. вновь обнаружены (на снежнике) отпечатки лап зверя.

Предполагается, что снежный барс потенциально может проникать на территорию горного массива Талдуаир с массивов, расположенных севернее линии, образуемой реками Бугузун-Карагай-Текелю, и входящими с состав своеобразного миграционного коридора. Подобное предположение укрепляется полевыми наблюдениями и компьютерным моделированием экологической ниши снежного барса, выполненным с помощью ГИС-технологии. Отдельные признаки пребывания барса отмечены в районе Карагемского перевала. Предполагается, что в 2010 году сюда будет перенесен базовый лагерь экспедиции.

Оценка подходящих для вида местообитаний, расположенных на высотах в среднем 3000 м н.у.м., показала, что имеется определенный потенциал для присутствия снежного барса, чему способствует рельеф, слабая посещаемость мест скотоводами (хотя в расположенных ниже угодьях выпасание домашних животных является обычной практикой), признаки пребывания потенциальных жертв (прежде всего, сибирского горного козла и аргали, относительная численность которого, однако, стремительно падает).

Вместе с тем, имеются признаки незаконной охоты на основных потенциальных жертв снежного барса, и снижение их численности может привести к полному исчезновению вида на рассматриваемой территории. Вместе с тем, хотя относительная численность аргали снижается (предполагается, что за последние пять лет она снизилась примерно в три раза), относительная численность козла за этот период испытывала как падения, так и подъемы, но это, по-видимому, никак не отразилось на количестве регистраций хищника. Тем не менее необходимо ввести запрет и/ или строгий контроль на отстрел диких копытных и придание району Талдуаир природоохранного статуса. Кроме того, улучшение благосостояния местного населения и экологическое просвещение могут стать составными элементами комплексной природоохранной программы, целью которой станет сохранение такого флагманского для всей экосистемы вида как снежного барса.

2.9. References

Anon. (2002) Strategy for Conservation of the Snow Leopard in the Russian Federation (2002) WWF, Moscow, 30 pp. (In Russian and English).

Fox, J.L. (1989) A review of the status and ecology of the snow leopard (*Panthera uncia*). International Snow Leopard Trust.

Jackson, R.M. (1996) Home range, movements and habitat use of snow leopard (*Uncia uncia*) in Nepal. PhD dissertation. University of London.

Jackson, R.M., G. Ahlbom (1988) Observations on the ecology of snow leopard in west Nepal. In: Proceedings of the 5th International snow leopard symposium, ed. H. Freeman, 65-87. Bombay: International Snow Leopard Trust and Wildlife Institute of India.

Jackson, R., D. Hunter (1996) Snow Leopard Survey and Conservation Handbook, 2nd edition. International Snow Leopard Trust, Seattle, WA.

Koshkarev, E.P. (1984) Characteristics of snow leopard (*Uncia uncia*) movements in the Tien Shan. International Pedigree Book of Snow Leopards 4: 15-21.

Koshkarev, E.P. (1994) Evaluation of the presence of snow leopard and ibex in southern Siberia. In: J. Fox and Du Jizeng, eds.: Proceedings of the Seventh International Snow Leopard Symposium, Xining, China, International Snow Leopard Trust, Seattle, WA.

Mallon, D.P. (1988) A further report on the snow leopard in Ladakh. In: Proceedings of the 5th International snow leopard symposium, ed. H. Freeman, 89-97. Bombay: International Snow Leopard Trust and Wildlife Institute of India.

MacArthur, R.H., E.O. Wilson (1967) The Theory of Island Biogeography. Princeton University Press. Princeton, New Jersey.

McCarthy, T.M., T. Fuller, B. Munkhtsog (2005) Movements and activities of snow leopards in southwestern Mongolia. *Biological Conservation* 124: 527-537.

Nix, H.A. (1986) A biogeographic analysis of Australian elapid snakes, p.4-15. In: Bureau of Flora and Fauna [ED.]. *Atlas of Australian elapid snakes*. Canberra, Australia.

Schaller, G.B. (1977) *Mountain Monarchs*. The University of Chicago Press.

Schaller, G.B., Li Hong, Lu Hua, Ren Junrang, Qui Mingjiang and Wang Haibin (1987) Status of large mammals in the Taxkorgan Reserve, Xinjiang, China. *Biological Conservation* 42: 53-71.

Schaller, G.B., J. Tserendeleg, G. Amarsana (1994) Observations on snow leopards in Mongolia. In: J. Fox and Du Jizeng, eds.: *Proceedings of the Seventh International Snow Leopard Symposium*, Xining, China, International Snow Leopard Trust, Seattle, WA.

Smirnov, M.N., G. Sokolov, A. Zyryanov (1990) The Snow Leopard (*Uncia uncia* Schreber 1776) in Siberia. *Int. Ped. Book of snow leopards* 6: 9-15.

Sunquist M., F. Sunquist (2002) *Wild Cats of the World*. The University of Chicago Press.

Павлинов И.Я., Круской С.В., Варшавский А.А., Борисенко А.В. Подотряд Feliformia. Род ирбисы // Наземные звери России. Справочник-определитель. Москва, 2002. С.111-112, 118-119.

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3. Bird Survey

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3.1. Introduction

It is often asserted that birds are convenient indicators of biodiversity, at least at larger scales and that they are useful for monitoring environmental change (as discussed by Furness & Greenwood 1993). One reason is that birds have long been popular with naturalists, amateur and professional, and consequently their systematics and distributions are better known than any other comparable group of animals.

A measure of the species diversity is a meaningful complementary result from a wildlife count survey. It allows managers to document the ecosystem health with reference to similar ecogeographical areas and to evaluate the biological potential of an area managed with objectives of natural resources exploitation. Under a monitoring scheme, regular information on community composition and species assemblage, combined together with a special focus on target species (harvested or flagship species, such as, for instance, the snow leopard), provides greater sensitivity to evaluate ecosystem responses to development of anthropogenic activities or to changes in management strategies (Kremen, Merenlender & Murphy 1994). Comprehensive ecological monitoring is therefore a crucial source of information to integrate both conservation and management objectives.

3.2. Methods

The abundance of birds and the diversity of their communities are difficult things to measure. The acquisition of quantitative data presents many problems, yet such data are becoming more necessary, for example in allocating categories of threat to the rarer species (Mace & Stuart 1994, Sisk et al. 1994, Bennun & Njoroge 1996).

For the purpose of measuring and comparing bird diversity, there are two broad groups of methods: those which generate a species list, perhaps with an approximation of abundance, and those which generate a species list with a quantifiable measure of abundance (for details see Bibby et al. 1992) [Russian version published in 2000]. For birds, abundance is enormously difficult to measure with any precision. A key problem is the difference between observed and real abundance. Various methods can yield data on distributions as well as abundance, but they differ considerably in the amount and types of data they produce in relation to the effort put into them. All quantitative methods are relatively time-consuming and cost-effectiveness is thus important. Using a combined measure of abundance and diversity is a widespread practice in bird surveys.

Typically, a survey consists of set of counts. The mean score for each species is regarded as an index of its abundance. Bibby et al. (2000) proposed a simple approach, in which abundance is indexed by the simple proportion of the counts in a survey in which a species is encountered. It is obvious that the commoner the species, the more likely it is to be recorded with higher frequency. For example, out of the total of 763 records of species being encountered during the surveys, 41 (or 5.4%) belong to the black-eared kite, one of the most common birds in the study area. On the contrary, rare species recorded only once account only for about 0.13%. The same can be assessed by using the number of surveys in which a particular species was encountered.

In general, the time horizon of the expedition survey and available logistics constrained our choice to presence-absence methodologies and those which could yield useable data in one day's sampling per transect.

The census methods we employed consisted of different transect counts (car day and foot counts). The overwhelming majority of censuses were based on direct sightings. Animals detected were identified either by the naked eye or with binoculars. For the analysis car day counts and foot counts are pooled.

Sampling units (i.e. transects) were spread over the whole study area and covered all habitat types. This network did allow for a relatively fair proportional coverage of habitat units, so we consider it to provide a representative sample of the area for a reliable estimate of bird diversity. The time to complete a transect took between 4 and 10 hours and varied around an average of 7.5 hours. The number of routes was used in our analysis as a measure of the sampling effort (as far as more than one route could be accomplished in one day, say by two separate teams). A total of 43 survey routes were accomplished between the 1 June and 20 August.

Records were entered into a datasheet after each survey in the evening of the same day.

Data analysis

The simplest and least controversial estimate of diversity is the number of species (S , species richness) in a defined area, such as a particular habitat (Magurran 1988). The total species richness of a site can only be approximated by exhaustive data collection. Even then, 'new' species can be added after thousands of hours in the field. However, species richness can be extrapolated in various ways from the numbers actually recorded.

Diversity was estimated by the Shannon index (entropy, H'), which takes into account the number of individuals (or its analogue) as well as number of taxa:

$$H' = - \sum n_i/n \ln (n_i/n),$$

where n is the total number of individuals and n_i is number of individuals of taxon i . This index varies from 0 for communities with only a single taxon to high values for communities with many taxa, each with few individuals. The variance of H' ($Var H'$) can be used as a measure of statistical error, however the significance of differences in diversity between samples was preferably determined by using the Shannon diversity t -test (Hammer et al. 2008).

Of course, it is only big differences in species richness, which are likely to be useful as indicators of conservation value. However, when considering conservation priorities, species richness should, wherever possible, be combined with other measures, such as the presence of rare or restricted range species (see, for example, Usher 1986). For the local avifauna, abundance categories have been asserted using a five-point logarithmic scale (Pesenko 1982).

3.3. Results

The methods used resulted in a presence-absence data set consisting of 763 records (appendix 3). A total of 116 species (subspecies) were recorded (belonging to 13 orders and 33 families). In 70 additional cases (9.2%), species were not identified (most of these were redstarts, *Phoenicurus* (15 cases), or pipits, *Anthus* (7 cases), occasional raptors, etc. or there are doubts on how reliable the identification was, particularly if only feathers were found.

The following analyses of bird diversity were made:

3.3.1. Species richness & diversity.

The overall diversity of the avifauna (assessed by the Shannon index, H') comprised 4.173. The Shannon diversity t -test once again has detected differences in diversity between samples collected in consecutive years (4.337 in 2008) ($t=2.95$, $p<0.05$). However, this drop most likely is associated with the specific selection of sites visited by the team in 2009, apparently less diverse than in the previous year.

A qualitative analysis of species diversity done by taxonomic unit (bird order and family) shows that just above a half of the species (61 out of 116, or 52.6%) are represented, as one could expect, by passerines (table 3.3a). In terms of species numbers, passerines are followed (exactly as in previous years) in approximately equal proportions by raptors (families *Accipitridae* and *Falconidae*) and waders (predominantly *Charadriidae*), composing respectively 15.5% and 12.9% of the local bird fauna.

In general the distribution of species amongst the major bird orders remains stable as evidenced by the Chi-square statistical tests (p well above the 0.05 threshold) (see table 3.3b).

Table 3.3a. Summary of species in each taxonomic unit (bird order and family).

Order	No. of species	Family	No. of species
Passeriformes	61	Turdidae	14
		Corvidae	8
		Fringillidae	8
		Motacillidae	8
		Prunellidae	4
		Sylviidae	4
		Hirundinidae	3
		Passeridae	3
		Alaudidae	2
		Laniidae	2
		Paridae	2
		Cinclidae	1
		Emberizidae	1
		Muscicapidae	1
Falconiformes	18	Accipitridae	14
		Falconidae	4
Charadriiformes	15	Charadriidae	9
		Laridae	3
		Scolopacidae	2
		Sternidae	1
Anseriformes	8	Anatidae	8
Galliformes	3	Phasianidae	1
		Tetraonidae	2
Ciconiiformes	2	Ardeidae	1
		Ciconiidae	1
Gruiformes	2	Gruidae	1
		Rallidae	1
Podicipitiformes	2	Podicipitidae	2
Columbiformes	1	Columbidae	1
Coraciiformes	1	Upupidae	1
Cuculiformes	1	Cuculidae	1
Gaviformes	1	Gaviidae	1
Pelecaniformes	1	Phalacrocoracidae	1
Total: orders 13		Total: families 33	Total: species (subspecies) 116

Table 3.3b. Distribution of species amongst the major bird orders for survey years 2008-2009.

Orders	2008	2009
Passeriformes	60	61
Falconiformes	21	18
Charadriiformes	15	15
Other (pooled)	30	22
Chi-square _{2008/2009} = 1.058, <i>d.f.</i> = 3, <i>p</i> = 0.79		

Local and regional rarity

Different methods have been proposed for defining abundance classes. Following Pesenko (1982), we use the logarithmic approach in which the upper boundary for each abundance class is defined as: $N^{a/k}$, ($a=1, 2, \dots, k$), so the upper boundary for the rarest category in a series of five abundance classes ($k=5$) will be set at $43^{0.2} = 2.1$, or approximately 2. In such a way the uniques (species that occur in only one sample) and duplicates (species known from two samples) fall into one abundance class, and in our case they comprise together 45.7% of all the recorded species. Boundaries for the remaining four abundance classes (2 to 5) are presented in Table 3.3c.

Table 3.3c. Summary of abundances of recorded bird species (2008-2009)

Abundance classes						
1 (rare)		2 (few)	3 (moderate)	4 (common)	5 (abundant)	
Data 2008						
1-2 records		3-4 records	5-8 records	9-16 records	17-31 records	
uniques: 40 (31.7%) duplicates: 14 (11.1%)	Total: 54 (42.8%)	23 (18.3%)	23 (18.3%)	16 (12.7%)	10 (7.9%)	
Data 2009						
1-2 records		3-5 records	6-10 records	11-20 records	21-43 records	
uniques: 43 (37.1%) duplicates: 10 (8.6%)	Total: 53 (45.7%)	21 (18.1%)	17 (14.7%)	18 (15.5%)	7 (6.0%)	
Chi-square _{2008/2009} = 1.23, d.f. = 4; p = 0.87						

Amongst the most frequently encountered birds ('abundant' category) are the black-eared kite, steppe eagle *(III), considered in the Red Data Book of the Altai Republic as *Aquila rapax nipalensis*, red-billed chough, white (or pied) wagtail, Isabelline wheatear, Northern wheatear and grey wagtail.

Next in abundance ('common') are the horned skylark, long-legged buzzard, sand martin, bluethroat, Demoiselle crane *(III), hoopoe, twite, common kestrel, common sandpiper, rock ptarmigan, water pipit, ruddy shelduck, black-billed magpie, carrion crow, common redshank, Altai snowcock *(III), common stonechat and Eurasian skylark.

Moderate records have been made of the barn swallow, citrine wagtail, common tern, Guldenstad's redstart (= white-winged redstart), dark-throated thrush, house martin, upland buzzard *(III), bearded vulture *(I), rufous-tailed rock thrush, tufted duck, Siberian accentor, yellow-billed chough, common cuckoo, greenish warbler, herring gull, rufous-backed redstart, Saker falcon *(III).

Fewer records were made of the common rosefinch, dipper, golden eagle *(ii), spotted nutcracker, Altai accentor, chiffchaff, cinereous vulture *(i), coot, great-crested grebe, hill pigeon, lapwing, Mongolian finch *(ii), willow grouse, black redstart, black stork *(ii), little ringed plover, Northern goshawk, pochard, slavian grebe, willow tit, Eurasian sparrowhawk.

Ten species marked with an asterisk are listed in the Red Data Book of the Altai Republic (I-IV stand for their assigned nature conservation status¹). In 2008 there were 13 such species.

Amongst the rarest species 13 are listed in the Red Data Book of the Altai Republic: Imperial eagle *(II), lesser kestrel *(i), red-breasted merganser *(iii), solitary snipe *(ii), black-throated diver *(ii), black-tailed godwit *(iii), great cormorant *(ii), grey heron *(iii), white-winged scoter *(iii), booted eagle *(i), greater sand plover *(ii), brant's mountain finch *(iii), whooper swan *(iii).

Together 23 species out of 67 (or about a third) listed in the Red Data Book of the Altai Republic have been spotted by the expedition team during the survey. In 2008 there were 25 such species.

The Chi-square tests shows that variations in the figures concerning the distribution of bird species between the abundance classes observed between the consecutive survey years (table 3.3c) are statistically insignificant (p above the critical value of 0.05).

¹ I – globally threatened, II – declining species, III – rare, IV – species at the edge of its home range and/or poorly known.

3.4. Conclusions / Заключение

1. A repeated bird species inventory in the Talduair area and areas around the Karaghem mountain pass of the Altai Republic undertaken by Biosphere Expeditions between the 1 July and 20 August 2009, involving a total sampling effort of 43 survey routes (763 records), yielded 116 species belonging to 13 orders and 33 families; in 70 additional records, species were not identified or there were doubts on their identification.

2. An analysis of species diversity done by taxonomic unit (bird order and family) shows that the majority of species belong to passerine families. As in previous years, carnivores continue to make up a high-ranking diet guild, indicating a rich source of secondary production in the area capable of maintaining an array of raptor species and specialised scavengers.

3. 53 (or 45.7%) of the recorded species can be considered rare; 13 of them are listed in the Red Data Book of the Altai Republic.

4. 63 species belong to other abundance categories, ranging from “few” to “abundant”; 10 of them are listed in the Red Data Book of the Altai Republic. A pleasing fact may be considered the presence (even amongst birds the abundance of which has been categorized as “abundant” or “common”) of such flagship species as the steppe eagle, or the Demoiselle crane.

1. В районе горного массива Талдуair и вокруг Карагемского перевала в Республике Алтай РФ с 1 июля по 20 августа 2009 г. проводили очередную инвентаризацию фауны птиц и учет их численности. Работа велась силами четырех команд волонтеров, участников экспедиции, в среднем по 12 человек в каждой. Общее количество маршрутов, потраченных на наблюдения, составило 43 (сумма наблюдений составила 763). В итоге обнаружено 116 видов птиц (принадлежащих к 13 отрядам и 33 семействам); в 70 случаях нужны дополнительные данные для надежного определения птиц.

2. Анализ таксономического разнообразия птиц показывает, что большинство видов принадлежит к Воробьиным. Хищные птицы продолжают составлять существенную по численности видов группу, что указывает на достаточные ресурсы вторичной продукции, способные содержать многих хищников и падальщиков.

3. 53 (или 45.7%) зарегистрированных здесь видов птиц можно считать редкими; 13 из них занесены в Красную книгу Республики Алтай.

4. 63 вида принадлежат к другим категориям встречаемости (от «мало» до «очень много»); 10 из них числятся в Красной книге Республики Алтай. Радует тот факт, что среди них (даже принадлежащих к категориям «много» и «обычные») встречаются такие «знаковые» для природоохраны виды как степной орел и красавка.

5. Comparisons between inventories of 2008/2009 seem to confirm no significant environmental change in the study area and the validity of the approaches we have chosen for biodiversity assessment based on bird species richness, especially in terms of replicability.

5. Сравнение результатов учетов 2008/2009 гг. указывает на относительную стабильность окружающей среды в исследованном районе, а также обоснованность методов, используемых для оценки биоразнообразия через структурные особенности орнитофауны, особенно в аспекте получения стабильных повторных результатов.

3.5. References

Bennun, L., Njoroge, P. (eds) (1996) Birds to Watch in East Africa: a Preliminary Red Data List. National Museums of Kenya, Nairobi.

Bibby, C.J., Burgess, N.D., Hill, D.A. (1992) Bird Census Techniques. Academic Press, London.

Bibby, C.J., Burgess, N.D., Hill, D.A., Mustoe H. (2000) Bird Census Techniques. 2nd edition. Academic Press, London.

Furness, R.W., Greenwood, J.J.D. (eds) (1993) Birds as Monitors of Environmental Change. Chapman & Hall, London.

Hammer O, D.A.T. Harper, P.D. Ryan. (2008) PAST - PAlaeontological STatistics, ver. 1.81. April 25, 2008. (<http://folk.uio.no/ohammer/past>).

Kremen, C., Merenlender, A.M., Murphy, D.D. (1994) Ecological monitoring: a vital need for integrated conservation and development programs in the tropics. *Conservation Biology* 8: 388–397.

Mace, G., Stuart, S. (1994) Draft IUCN Red List categories. *Species* 21–22, 13–24.

Magurran, A.E. (1988) Ecological Diversity and its Measurement. Croom Helm, London.

Pesenko Yu.A. (1982) Principles and methods for a quantified analysis in faunistic studies. Moscow: *Nauka*, 288 pp. (*In Russian*),

Sisk, T.D., Launer, A.E., Switky, K.R., Ehrlich, P.R. (1994) Identifying extinction threats. *BioScience* 44: 592–604.

Usher, M.B. (Ed.) (1986) Wildlife Conservation Evaluation. Chapman & Hall, London.

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4. Mammal Survey

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4.1. Introduction

Mammal species have long been far less popular than birds with naturalists, amateur and professional, and consequently their taxonomy and distributions are poorer known.

The basic objectives and methods used for the mammal inventory are much the same as for the bird inventory. Methods we employed consisted of different transect counts (car day and foot counts). The censuses were based on both direct sightings (encounters) and signs (tracks, faeces, bones, etc.). Animals detected were identified either by the naked eye or using binoculars, signs were associated with particular species using relevant field guides (Bang & Dahlstrøm 2001, Dolejš 1987, Rukovskiy 1984, etc.). For the analysis, car day counts and foot counts were pooled. The sampling effort totaled 31 routes (accomplished between 2 July and 20 August). Records were entered into a datasheet after each survey in the evening of the same day.

4.2. Results

The methods used resulted in a presence-absence dataset (appendix 4). A total of 28 species were recorded (belonging to 5 orders and 12 families). In some cases (particularly *Microtinae* – 11 cases), it was difficult to identify the animals to the species level.

The overall diversity of the mammal fauna (assessed by the Shannon index, H') comprised 2.865. The Shannon diversity t -test detected no significant differences in diversity between inventories performed in 2008 and 2009 ($t_{2008/2009}=0.49$, $p=0.62$), meaning the quantitative structure of the mammal fauna in the area is most likely to be in a steady condition. However, the qualitative similarity between these inventories, assessed by the Jaccard measure, is fairly low and reaches the level of 45.8% of the species' composition (due, perhaps, to spending more research efforts in and around the Karaghem mountain pass area).

The fairly large proportion of Carnivora (39.2%) (Table 4.2a) may be an indication of the complexity of the local community structure and diverse food webs, leading to a corresponding pattern of trophic diversity.

Table 4.2a. Summary of mammal species in each taxonomic unit

Order	No. of species	Family	No. of species
Carnivora	11	Mustelidae	5
		Canidae	3
		Felidae	2
		Ursidae	1
Artiodactyla	6	Cervidae	3
		Bovidae	2
		Suidae	1
Rodentia	6	Sciuridae	4
		Cricetidae	2
Lagomorpha	4	Leporidae	2
		Ochotonidae	2
Insectivora	1	Talpidae	1
Total: 5		Total: 12	Total: 28

Local and regional rarity

We follow Pesenko (1982) in distinguishing the abundance classes using the logarithmic approach in which the upper boundary for each abundance class is defined as: $N^{a/k}$, ($a=1, 2, \dots, k$), so the upper boundary for the rarest category in a series of five abundance classes ($k=5$) will be set at $31^{0.2}$, which is approximately 2. In such a way the uniques (species that occur in only one sample) and duplicates (species known from two samples) fall into one abundance class, and in our case they comprise together 24% of all the recorded species. Boundaries for the remaining four abundance classes (2 to 5) are presented in Table 4.2b. In general, the distribution of mammal species between the abundance classes observed between the consecutive survey years is fairly similar (p well above 0.05).

Amongst the most abundant mammal species are the Arctic ground squirrel, grey or Altai marmot, Siberian ibex, Northern pika.

Next in abundance (common) are the Arctic or mountain hare, red fox, wild boar, Argali sheep*(I), Daurian pika.

According to Sobanskiy (1988), the wild boar appeared in the Altai Republic in the 1960s and today has colonised most of country. This year repeated records have been made by the Biosphere Expeditions team of animals (mostly characteristic “diggings”) found fairly high up in the mountains, between 2364 and 2703 m (average of 2503 m). Perhaps the growing population of wild boar could serve as an additional food resource for the snow leopard.

Table 4.2b. Summary of abundances of recorded mammal species (including unidentified taxa).

Abundance classes				
1 (rare)	2 (few)	3 (moderate)	4 (common)	5 (abundant)
Data 2008				
1-2 records	3-4 records	5-8 records	9-15 records	16-32 records
uniques: 9 (29%) duplicates: 2 (6.5%)	Total: 11 (35.5%) 5 (16.1%)	6 (19.4%)	3 (9.7%)	6 (19.4%)
Data 2009				
1-2 records	3-4 records	5-8 records	9-16 records	17-31 records
uniques: 9 (32.1%) duplicates: 2 (7.1%)	Total: 11 (39.2%) 4 (14.3%)	4 (14.3%)	5 (17.9%)	4 (14.3%)
Chi-square _{2008/2009} = 0.32, d.f. = 2*; p = 0.85				

*as far as some of the scores in the abundance classes are less than 5 neighbouring 2 and 3, 4 and 5 classes have been pooled into two; consequently the degrees of freedom (*d.f.*) is reduced to 2 (i.e., number of classes minus 1)

Moderate records were made of the Maral deer, Siberian chipmunk, wolf, roe deer.

Fewer records were made of the brown bear, large-eared or Altai vole, snow leopard *(I), stoat.

Two species marked above with an asterisk are listed in the Red Data Book of the Altai Republic (I-II stand for their assigned nature conservation status).

Eleven of the mammal species recorded this year are considered rare. Identified species in this category are Corsac or steppe fox, elk, badger, Evermann's or steppe polecat, manul*(II), Northern red squirrel, Russian dwarf hamster, Siberian or Altai mole, stone marten, Tolai hare, wolverine.

Elk, badger and the stone marten were recorded by the Biosphere Expeditions team for the first time. An outstanding record was the discovery of a badger family (one adult and three young) far above the treeline in an open montane habitat (49°56.450'N, 89°19.910'E, 2674 m). Another rare and interesting feature were Siberian or Altai mole mounds found at altitudes of 2344 and 2516 m.

Alltogether three mammal species out of 19 (or about 16%) listed in the Red Data Book of the Altai Republic were spotted or their sign recorded by the expedition team during the survey.

4.3. Conclusions/ Заключение

1. A total of 28 species of mammals were recorded (belonging to 5 orders and 12 families).

2. A fairly large proportion of Carnivora species (39.2%) may be an indication of the complexity of the local community structure and diverse food webs.

3. Uniques and duplicates comprise together a noticeable portion of the fauna (39.2%).

4. Potential mammal prey species of the snow leopard (Siberian ibex, Argali sheep, grey or Altai marmot, Arctic or mountain hare, Northern pika, Arctic ground squirrel, maral deer) are either relatively abundant or common in the area. The growing population of wild boar could serve as an additional food resource for the snow leopard.

5. An encouraging fact is the finding of snow leopard sign. Another felid species, the manul, since 2004 has shifted down to the "fewer" category, but this year has appeared in the category of rare species and the population seems to be in a steady decline.

6. Three mammal species out of 19 listed in the Red Data Book of the Altai Republic were spotted (or records of sign made) by the expedition team during the 2009 survey.

1. Отмечено наличие в исследованном районе 28 видов млекопитающих (принадлежащих к 5 отрядам, 12 семействам).

2. Относительно большая доля видов отряда Хищные (39.2%) может быть показателем сложности структуры местной экосистемы и разнообразия пищевых цепей.

3. Виды, которые наблюдались один или два раза, составляют примерно 39.2% фауны.

4. Потенциальные жертвы снежного барса (горный козел, аргали, серый сурок, заяц-беляк, алтайская пищуха, длиннохвостый суслик, марал) относительно многочисленны и обычны в исследованном районе. Растущая популяция дикого кабана может послужить дополнительным источником питания для снежного барса.

5. Найдены следы снежного барса в отчетном году, что является обнадеживающим фактом. Положение другого представителя семейства кошек, манула, вызывает тревогу. Этот вид продолжает редко встречаться.

6. В 2009 г. отмечено наличие 3 из 19 видов млекопитающих, внесенных в Красную книгу республики Алтай.

4.4. References

Bang P., Dahlstrøm P. Animal tracks and signs. Oxford University Press, Inc., New York, 2001. 264 pp.

Dolejš K. Tracks of mammals and birds. Moscow, "Agropromizdat", 1987. 224 pp. (Russian translation from Czech).

Red Data Book of the Altai Republic (<http://www.gasu.ru/virt/rb/content.html>) .

Rukovskiy N.N. The Tracker. Moscow, "Fizkultura i sport", 1984. 119 pp. (In Russian).

Sobanskiy H.H. Game animals of the Gorniy Altai.- Novosibirsk: Nauka, 1988.- 159 pp. (In Russian).

BIOSPHERE EXPEDITIONS

Datasheet: Altai

SLIMS form 1: snow leopard presence/absence survey: snow leopard

Observer names		Date		Survey Block Number	
Summary of snow leopard sign observed in this survey block					
Column 1 Search site number	Column 2 Type and amount of sign	Column 3 Search effort (km ² and time)	Column 4 Dominant landscape		
This is the number of the search SITE <u>within</u> the survey BLOCK. You should be given this number before you set out. If not, ask. <u>Fill in one sheet for each search site.</u>	A simple list for each discrete sign. Take GPS reading for each sign and note approximate age (new or old) into your notebook. On completing the search, total the number of each type of sign and enter below. If no sign is found enter 0 below. Sign types: PUG = pugmark (track). SC = scrape. FE = scat or feces. UR = urination. RC = rock scent spray. Age of sign: OLD = old or very old sign (> 1 month). FRE = fresh or very fresh sign (1 day to 1 month).	Note the approximate size of the area searched and the time it took to do this. Remember to note down your search start and end time!	Note the dominant landscape at each search site. PLA = plain. GROL = gently rolling (low hills and valleys without distinct ridgelines). SROL = steeply rolling (steep or very steep slopes of more than 30 m). BTER = broken terrain (land surface broken by irregular slopes, cliffs, rocky outcrops, gullies). WVAL = wide valley (wide, level floor more than 1 km wide). NVAL = narrow valley (steep sides with floor less than 1 km wide). GORG = gorge (extremely steep-sided and deep valley with cliffs and bluffs along its edges). OTH = other (describe).		
	PUG				
	SC				
	FE				
	UR				
	RC				
Threats to snow leopard					
Comments					

SLIMS form 1: snow leopard presence/absence survey: prey species

Information on prey species is obtained in two ways: Interviews with locals and noting all species observed or their sign. Because animals may be disturbed while searching for snow leopard sign, a separate morning or afternoon should be devoted to searching for prey animals. If at all possible the same groups should search for snow leopard sign *within the same search site* and then for prey species and use this one form to record results for both searches. From prominent ridges or hill tops, but well-hidden from view, scope the area with binoculars. When using the same search site, be aware that prey species use less rugged terrain such as a wide valley or gently rolling hill slopes.

Observer names		Date		Survey Block Number	
Summary of prey species and their sign observed in this survey block					
Column 1 Prey species	Column 2 Type and amount of sign	Column 3 Relative abundance	Column 4 Threats		
Ibex, Argali, Red deer, Musk deer, Wild boar, Marmot, Pika, Hare, Rabbits, Game birds (including Altai snowcock).	Kinds of evidence are INT = interview (describe). OBS = observation by researchers (describe numbers, behaviour etc). SIG = sign (describe what kind of sign and deductions made from sign).	Record, for example, the number of herds seen at the search site or the number of days a particular species or sign was seen. Also note your observations and opinion on whether the prey species populations are low, average or high and give reasons.	Is there evidence of poaching? If so, how widespread is it, who is involved and where are products sold? Also record information on livestock that may be competing with prey species. If possible, interview locals to learn how much predation there is on prey species and livestock (but exercise caution when asking questions and interpreting responses).		
Comments					



DATASHEET: RECORDING INTERVIEWS

ALTAI

You will be visiting local people to find out about their attitudes to and sightings of snow leopards and other wildlife. These interviews will be conducted in Russian and translated to you as they happen. It is your job to make sure that all topics on this sheet are covered and all questions asked as far as possible.

However, interviews will be conducted in a very informal, “chatty” way as formal interviews with datasheets tend to result in inaccurate information. This is because as soon as an interviewee sees a formal datasheet and is asked questions in a very rigid way, he or she is likely to become tense and will attempt to second-guess what answers the interviewer would like to hear, rather than give his or her true opinion. This effect can be avoided by having a very informal chat which nevertheless covers all the topics.

Guidelines

1. Be relaxed, friendly, chatty.
2. Take pictures only after asking for permission and then only a few.
3. Keep the datasheet out of sight as much as possible.
4. You can glance at the datasheet or record the questions in your notebook beforehand to make sure they are all covered. If necessary, prompt the interviewer to make sure this is done.
5. Immediately after the interview and out of sight of the interviewee, discuss the datasheet and record the answers, using your judgment.
6. Discuss the datasheet in the evening with scientific staff as part of the filling in datasheet activity and make changes as necessary.

INTERVIEW CONDUCTED BY:

DATE OF INTERVIEW:

PERSONAL INFORMATION ABOUT THE INTERVIEWEE

Sex:

Age:

Place of residence (name of community):

Place of birth (region):

Occupation:

If you are a livestock owner/raiser, what kind of animals do you have?

Sheep

Goats

Cows

Horses

Other

INFORMATION ABOUT SNOW LEOPARDS AND OTHER WILDLIFE

Which of the following statements best describes your feeling towards snow leopards?

Strongly dislike
Like

Dislike
Strongly like

Indifferent

The presence of snow leopards for you is

- A good thing
- A bad thing
- You are indifferent

Have you ever seen a snow leopard?

- No
- Yes, when _____ and where _____

How many snow leopards do you think live in the region?

_____ number

Are snow leopards protected in Russia?

- Yes
- No
- Don't know

	Strongly disagree	Disagree	Neutral	Agree	Strongly disagree
snow leopards have a considerable impact on large game (argali, ibex, etc.)	1	2	3	4	5
snow leopards have a considerable impact on small game (marmots, susliks, etc.)	1	2	3	4	5
snow leopards reduce populations of argali and ibex to unacceptable levels.	1	2	3	4	5
snow leopard attacks on humans are more frequent in regions where snow leopards live in close proximity to humans.	1	2	3	4	5
In regions where snow leopards live in close proximity to livestock, they feed primarily on domestic animals.	1	2	3	4	5
We already have enough snow leopards in the region.	1	2	3	4	5

If snow leopards attracted more tourists to the region, this would be

- A good thing
- A bad thing
- You are indifferent

Comments (record any other useful/interesting information here)

Appendix 3: Bird species recorded by Biosphere Expeditions in the Altai (2009). Names and classification following Cramp, S and Simmons, K E L (eds.) (2004), BWPI: Birds of the Western Palearctic interactive (DVD-ROM). BirdGuides Ltd, Sheffield.

English name	Scientific name	Русское название	Nature conservation status in the Red Data Book of the Altai Republic. Природоохранный статус в Красной книге Республики Алтай
Alpine accentor	<i>Prunella collaris</i>	альпийская завирушка	
Altai accentor	<i>Prunella himalayana</i>	гималайская завирушка	
Altai snowcock	<i>Tetraogallus altaicus</i>	алтайский улар	III
Arctic warbler	<i>Phylloscopus borealis</i>	пеночка-таловка	
Asian rosy finch	<i>Leucosticte arctoa</i>	сибирский вьюрок	
Barn swallow	<i>Hirundo rustica</i>	деревенская ласточка	
Bearded vulture	<i>Gypaetus barbatus</i>	бородач	I
Black redstart	<i>Phoenicurus ochruros</i>	горихвостка-чернушка	
Black stork	<i>Ciconia nigra</i>	черный аист	II
Black-billed magpie	<i>Pica pica</i>	сорока	
Black-eared kite	<i>Milvus lineatus</i>	черный коршун	
Black-headed gull	<i>Larus ridibundus</i>	озерная чайка	
Black-tailed godwit	<i>Limosa limosa</i>	большой веретенник	III
Black-throated diver	<i>Gavia arctica</i>	чернозобая гагара	II
Bluethroat	<i>Luscinia svecica</i>	варакушка	
Booted eagle	<i>Aquila pennata</i>	орел-карлик	I
Brant's mountain finch	<i>Leucosticte brandti</i>	жемчужный вьюрок	III
Brown accentor	<i>Prunella fulvescens</i>	бледная завирушка	
Brown-headed gull	<i>Larus brunnicephalus</i>	буроголовая чайка	
Carrion crow	<i>Corvus corone</i>	черная ворона	
Chiffchaff	<i>Phylloscopus collybita</i>	пеночка-теньковка	
Cinereous vulture	<i>Aegypius monachus</i>	черный гриф	III
Citrine wagtail	<i>Motacilla citreola</i>	желтоголовая трясогузка	
Common buzzard	<i>Buteo buteo</i>	канюк	
Common cuckoo	<i>Cuculus canorus</i>	кукушка	
Common kestrel	<i>Falco tinnunculus</i>	обыкновенная пустельга	
Common redshank	<i>Tringa totanus</i>	травник	
Common redstart	<i>Phoenicurus phoenicurus</i>	обыкновенная горихвостка	
Common rosefinch	<i>Carpodacus erythrinus</i>	обыкновенная чечевица	
Common sandpiper	<i>Actitis hypoleucos</i>	перевозчик	
Common stonechat	<i>Saxicola torquata</i>	черноголовый чекан	
Common tern	<i>Sterna hirundo</i>	обыкновенная крачка	
Coot	<i>Fulica atra</i>	лысуха	
Dark-throated thrush	<i>Turdus ruficollis</i>	темнозобый дрозд	
Demoiselle crane	<i>Anthropoides virgo</i>	красавка	III
Desert lesser whitethroat	<i>Sylvia curruca minula</i>	малая белогорлая славка	
Desert wheatear	<i>Oenanthe deserti</i>	пустынная каменка	
Dipper	<i>Cinclus cinclus</i>	оляпка	
Eurasian jackdaw	<i>Corvus monedula</i>	обыкновенная галка	
Eurasian skylark	<i>Alauda arvensis</i>	полевой жаворонок	
Eurasian sparrowhawk	<i>Accipiter nisus</i>	перепелятник	
Eurasian tree sparrow	<i>Passer montanus</i>	полевой воробей	
Eyebrowed thrush	<i>Turdus obscurus</i>	оливковый дрозд	
Gold finch	<i>Carduelis carduelis</i>	щегол	

English name	Scientific name	Русское название	Nature conservation status in the Red Data Book of the Altai Republic. Природоохранный статус в Красной книге Республики Алтай
Golden eagle	<i>Aquila chrysaetos</i>	беркут	II
Great cormorant	<i>Phalacrocorax carbo</i>	большой баклан	II
Great tit	<i>Parus major</i>	большая синица	
Great-crested grebe	<i>Podiceps cristatus</i>	большая поганка	
Greater sand plover	<i>Charadrius leschenaultii</i>	толстоклювый зуек	II
Greenish warbler	<i>Phylloscopus trochiloides</i>	зеленая пеночка	
Grey heron	<i>Ardea cinerea</i>	серая цапля	III
Grey wagtail	<i>Motacilla cinerea</i>	горная трясогузка	
Guldenstadt's redstart	<i>Phoenicurus erythrogaster</i>	краснобрюхая горихвостка	
Herring gull	<i>Larus argentatus</i>	серебристая чайка	
Hill pigeon	<i>Columba rupestris</i>	скальный голубь	
Himalayan vulture	<i>Gyps himalayensis</i>	кумай	
Hoopoe	<i>Upupa epops</i>	удод	
Horned skylark	<i>Eremophila alpestris</i>	рогатый жаворонок	
House martin	<i>Delichon urbicum</i>	городская ласточка	
House sparrow	<i>Passer domesticus</i>	домовый воробей	
Imperial eagle	<i>Aquila heliaca</i>	могильник	II
Isabelline wheatear	<i>Oenanthe isabellina</i>	каменка-плясунья	
Lapwing	<i>Vanellus vanellus</i>	чибис	
Lesser kestrel	<i>Falco naumanni</i>	степная пустельга	I
Little ringed plover	<i>Charadrius dubius</i>	малый зуек	
Long-legged buzzard	<i>Buteo rufinus</i>	курганник	
Mallard	<i>Anas platyrhynchos</i>	кряква	
Merlin	<i>Falco columbarius</i>	дербник	
Mistle thrush	<i>Turdus viscivorus</i>	деряба	
Mongolian finch	<i>Bucanetes mongolicus</i>	монгольский снегирь	II
Northern goshawk	<i>Accipiter gentilis</i>	тетеревятник	
Northern wheatear	<i>Oenanthe oenanthe</i>	обыкновенная каменка	
Oriental plover	<i>Charadrius veredus</i>	восточный зуек	
Pallas's reed bunting	<i>Emberiza pallasii</i>	полярная овсянка	
Pintail	<i>Anas acuta</i>	шилохвость	
Pochard	<i>Aythya ferina</i>	красноголовый нырок	
Raven	<i>Corvus corax</i>	обыкновенный ворон	
Red breasted merganser	<i>Mergus serrator</i>	длинноносый крохаль	III
Red crossbill	<i>Loxia curvirostra</i>	обыкновенный клёст	
Red-backed shrike	<i>Lanius collurio</i>	обыкновенный жулан	
Red-billed chough	<i>Pyrrhocorax pyrrhocorax</i>	клушица	
Richard's pipit	<i>Anthus richardi</i>	степной конек	
Rock ptarmigan	<i>Lagopus mutus</i>	тундряная куропатка	
Rock sparrow	<i>Petronia petronia</i>	каменный воробей	
Rook	<i>Corvus frugilegus</i>	грач	
Ruddy shelduck	<i>Tadorna ferruginea</i>	огарь	
Rufous-backed redstart	<i>Phoenicurus erythronotus</i>	красноспинная горихвостка	
Rufous-tailed rock thrush	<i>Monticola saxatilis</i>	пестрый каменный дрозд	
Rufous-tailed shrike	<i>Lanius isabellinus</i>	буланный сорокопут	
Saker falcon	<i>Falco cherrug</i>	балобан	III

English name	Scientific name	Русское название	Nature conservation status in the Red Data Book of the Altai Republic. Природоохранный статус в Красной книге Республики Алтай
Sand martin	<i>Riparia riparia</i>	береговушка	
Siberian accentor	<i>Prunella montanella</i>	сибирская завирушка	
Siberian stonechat	<i>Saxicola maurus</i>	сибирский черноголовый чекан	
Slavonian grebe	<i>Podiceps auritus</i>	красношейная поганка	
Snow finch	<i>Montifringilla nivalis</i>	снежный вьюрок	
Solitary snipe	<i>Gallinago solitaria</i>	горный дупель	III
Spotted flycatcher	<i>Muscicapa striata</i>	серая мухоловка	
Spotted nutcracker	<i>Nucifraga caryocatactes</i>	кедровка	
Steppe eagle	<i>Aquila nipalensis</i>	восточный степной орел	I
Tawny eagle	<i>Aquila rapax</i>	степной орел	
Tawny pipit	<i>Anthus campestris</i>	полевой конек	
Temminck's stint	<i>Calidris temminckii</i>	белохвостый песочник	
Tree pipit	<i>Anthus trivialis</i>	лесной конек	
Tufted duck	<i>Aythya fuligula</i>	хохлатая чернеть	
Twite	<i>Acanthis flavirostris</i>	горная чечетка	
Upland buzzard	<i>Buteo hemilasius</i>	мохноногий курганник	III
Water pipit	<i>Anthus spinoletta</i>	горный конек	
White (pied) wagtail	<i>Motacilla alba</i>	белая трясогузка	
White (pied) wagtail_personata	<i>Motacilla personata</i>	маскированная трясогузка	
White-winged scoter	<i>Melanitta deglandi</i>	горбоносый турпан	III
Whooper swan	<i>Cygnus cygnus</i>	лебедь-кликун	III
Willow grouse	<i>Lagopus lagopus</i>	белая куропатка	
Willow tit	<i>Parus montanus</i>	буроголовая гаичка	
Wood sandpiper	<i>Tringa glareola</i>	фифи	
Woodcock	<i>Scolopax rusticola</i>	вальдшнеп	
Yellow-billed chough	<i>Pyrrhocorax graculus</i>	альпийская галка	

Appendix 4: Mammal species recorded by Biosphere Expeditions in the Altai (2009).

English name	Scientific name	Русское название	Nature conservation status in the Red Data Book of the Altai Republic. Природоохранный статус в Красной книге Республики Алтай
Arctic ground squirrel	<i>Citellus undulatus</i>	длиннохвостый суслик	
Arctic or Mountain hare	<i>Lepus timidus</i>	заяц-беляк	
Argali sheep	<i>Ovis ammon</i>	горный баран, аргали	I
Badger	<i>Meles meles</i>	барсук	
Brown bear	<i>Ursus arctos</i>	бурый медведь	
Corsac or Steppe fox	<i>Vulpes corsac</i>	корсак	
Daurian pika	<i>Ochotona daurica</i>	даурская пищуха	
Elk	<i>Alces alces</i>	лось	
Evermann's or Steppe Polecat	<i>Mustela eversmanni</i>	степной хорь	
Grey or Altai marmot	<i>Marmota baibacina</i>	серый, или алтайский, сурок	
Large-eared or Altai vole	<i>Alticola macrotus</i>	большеухая горная полевка	
Manul	<i>Felis manul</i>	манул	II
Maral deer	<i>Cervus elaphus</i>	марал	
Northern pika	<i>Ochotona alpina</i>	алтайская пищуха	
Northern red squirrel	<i>Sciurus vulgaris</i>	обыкновенная белка	
Red fox	<i>Vulpes vulpes</i>	обыкновенная лисица	
Roe-deer	<i>Capreolus capreolus</i>	косуля	
Russian dwarf hamster	<i>Phodopus sungorus</i>	джунгарский хомячок	
Siberian chipmunk	<i>Eutamias sibiricus</i>	бурундук	
Siberian ibex	<i>Capra sibirica</i>	сибирский горный козел	
Siberian or Altai mole	<i>Talpa altaica</i>	сибирский крот	
Snow leopard	<i>Uncia uncia</i>	снежный барс, ирбис	I
Stoat	<i>Mustela erminea</i>	горностай	
Stone marten	<i>Martes foina</i>	каменная куница	
Tolai hare	<i>Lepus tolai</i>	заяц-толай	
Wild boar	<i>Sus scrofa</i>	дикий кабан	
Wolf	<i>Canis lupus</i>	волк	
Wolverine	<i>Gulo gulo</i>	росомаха	

Appendix 5: Expedition leader diary by Andy Stronach.

23 June

This is the first diary entry for the 2009 Biosphere Expedition to the golden mountains of Altai in search of snow leopard.

Having travelled from my home in Scotland, I went to the Biosphere Expeditions HQ in Norwich, England, for a briefing and to collect some equipment. Amongst the equipment are two Gerber folding shovels. Although the Russians managed to put a man in space some years ago, they have still not succeeded in the tricky area of shovel design and the sturdiest ones I have been able to find in Russia are barely able to cope with soft blanchmange, never mind the abundant rocky ground we have to deal with – hence the funny shaped bulges in my now rather heavy bag.

I'm looking forward very much to meeting you all and getting lots of work done surveying new areas. Please make sure you've got all the equipment on the list. You will not need good waterproofs often (for example). The weather is generally great, however, you will need good waterproofs occasionally to prevent getting soaked, hypothermic and ill. Prepare properly, swat up on the latest expedition report (www.biosphere-expeditions.org/reports) and then we will all have great adventures together in the golden mountains.

My next diary entry should come from Novosibirsk. I am off on a flight in a few hours. See you there soon :)

Andrew Stronach
Expedition Leader

23 June - London to Moscow

Flew to Domodedovo where the transfer was straightforward; if you come through this airport, note that you will have to go through passport control first, collect your hold luggage and then go to departures. My flight to Novosibirsk left from area D, if you are missing any equipment, there is a shop here called 'Expeditions', coloured orange that does sell some stuff that may be useful – gloves, socks, cutlery, mammoth tusk carvings, you know, just the usual. However, please look on this as an emergency back-up and do get all your things before you leave.

24 June – Moscow to Novosibirsk

All the way, the sky never really got dark and there was always an orange glow to the north right throughout the night. Sunrise coincided exactly with the start of our descent and I wondered if I would get two sunrises in one day, but that didn't really happen; OK I know I was being greedy :)

Sergey, boss of Sibalp, our local logistics partner, drove me from the airport to hotel Sibir. At the airport I noticed signs for a bus from the airport into Novosibirsk that stops right outside hotel Sibir; 60 rubles rather than around 700 rubles for a taxi. If you do take the bus, it takes around 20 min to get to the only river, the Ob, which is massive. After crossing the Ob the bus goes through a tunnel and after another 200 m, turns left at traffic lights. After the turn, the hotel Sibir is 50 m further on and the bus has its first stop there.

After meeting Valentina, our translator, we went to get a SIM card for my phone; the number is +7-913-9899053 if calling from outside Russia. If inside Russia, you have to add an 8 (not a 0) at the beginning, so it becomes 8913-9899053. Please only call this number in emergencies and note that most of the time I will not be in mobile phone coverage, so do not expect a quick response.

Next stop was the Land Rover dealer where I received three lovely Land Rover Defenders and one lovely Land Rover Discovery; these vehicles have CD players, but no CDs, so please feel free to bring a selection for the two-day drive to base camp :)

Later, I met a couple of local journalists who interviewed me so they can write articles in local periodicals.

25 June - Novosibirsk

Gave a press conference at Land Rover today. Land Rover are kind enough to lend the expedition four vehicles every year; this year it is three Defenders and one Discovery and without this generosity, the expedition would simply be far too expensive to run. In return for this generosity, we take as good care of the vehicles possible, so that when they are sold after the expedition, Land Rover get a good price for them. That alone is a good reason to drive carefully, but as well as that, road surfaces are a bit unpredictable and local drivers are very unpredictable. In all other aspects of the expedition, I aim to get you very involved in the decision making process; in driving matters, I will be dictatorial.

For reasons of safety, I will need you to drive as per Biosphere Expeditions rules so that we can all stay safe and so that we can spend our time, not fixing vehicles, but looking for snow leopards and Siberian ibex and argali and wolverine and Siberian chipmunk and golden eagle and steppe eagle and Altai falcon and manul and wolves and demoiselle cranes and gentians and geranium and..... :-)

26 June - Novosibirsk

I spent the day doing a whole variety of different things in preparation for the expedition such as printing and binding the latest Altai expedition report (which by now you have of course all studied ;) and printing datasheets for recording our sightings. Filled up the vehicles with diesel and prepared them. I spent rather a lot of time in phone shops trying to get my nice new complicated phone data services enabled, whatever that means. I am hoping to be able to send regular diary entries from near base camp with his new phone; we'll see – don't hold your breath!

I arranged a meeting with the Programme Coordinator for the Siberian Environmental Centre to see if we can support each others' work. It's great to work with local NGO's and pass them the data we have collected so they can get the most possible from it.

We will be leaving Novosibirsk 07:50 on Monday 29 June heading for Altai (don't panic Rob, I've not forgotten about you!). However, it would be great to meet you all the night before – Sunday 28th June in the reception area of Hotel Sibir at 19.30. We can have a quick chat about plans for Monday and if you would like, we can go out for dinner together so we can start to get to know each other. See you there slot 1!

27 June - Novosibirsk

Met with Anna and Ilya from the Siberian Environmental Centre and discussed how we could support each other's work. There are three main areas of interest. 1. Mining of mineral deposits and the associated destruction and pollution of land used by protected species as well as increased disturbance and poaching. We will look out for mining activities whenever we are out surveying. 2. Manul or Palla's cat. This cat is even more rare than snow leopard and is being studied by Anna, so we will ask locals about them as well as snow leopard when we visit yurts. 3. Raptors. Sibecocentre are particularly interested in raptors that are globally threatened or critically endangered and have a project to conserve them and study their taxonomy by DNA analysis of cells from discarded feathers. The data we routinely collect will be of use to them, as will feathers we find. It's great to be able to help these passionate scientists with only tiny additions to what we do in our normal snow leopard work anyway :)

28 June - Novosibirsk

Happy birthday to me, happy birthday to me. Happy birthday to Novosibirsk, happy birthday to Novosibirsk.

Well, Novosibirsk reached the grand old age of 150 today, I on the other hand only look that old :)

I went shopping with Nina (our cook) to a market. There were many articulated lorries, many from Kazakhstan and Uzbekistan. All were lined up very close together with their rear doors open, with their cargo of fruit and vegetables piled high, it was hard to know there were lorries there at all! There were melons, cabbages, apples, apricots, tomatoes, cucumbers and plums. All were mouth-watering and fresh as can be. In the evening, I met the slot 1 team members in the Sibir lobby and after a briefing for the next day, we had dinner and a little celebratory Altai vodka to mark the start of the expedition. On leaving the restaurant, the fireworks display I had arranged for the team started; it was fantastic, rainbows of fire reflected in the new sparkly glass clad skyscrapers around us - magnificent! Someone suggested that the fireworks display was not for them, but for Novosibirsk 's birthday! That's gratitude for you! :)

29 June - Novosibirsk to Oost Cema

Up at 07.00, packed the Land Rovers, had an enormous breakfast and then set off for the golden mountains of Altai :) The road was busy, the local drivers were a bit crazy and the police were out in force.....

Most of the journey was over flat arable ground with wildflower-filled roadside verges, but as soon as we crossed the border into Altai, hills and then mountains appeared.

We spent the night just outside Oost Cema at a beautiful spot by a small river. We had lovely new wooden chalets, complete with en-suite hot showers! Until a few years ago, only the biggest of cities had any kind of plumbing at all, never mind hot showers!

30 June - Oost Cema to base camp

Having left the playground of the Katun river valley that is crowded with people from Novosibirsk, the road to base camp was much quieter. We reached Kosh Agach at 16:00 where we took full advantage of the facilities of civilization and filled ourselves with ice cream :) Leaving the asphalt road behind, we passed the last village of Kokaria and crossed the steppe to base camp. Due to a wet spring, the steppe was green rather than brown and parched like last year; it's looking good for wildflowers this year. Got to base camp on the edge of the steppe, in a beautiful larch forest, under picture postcard snow capped mountains where we moved our stuff into our tents and settled in; it's great to be home.

1 July – Training

It was quite cold at night and our tents were covered with frost in the morning. Ernst got the expedition off to a great start by spotting a group of three Siberian ibex on the mountain by base camp. These animals were difficult to see; Ernst will be a great asset to the expedition! After breakfast in the mess tent, dodging the drops of melting frost as they fell when the sun rose, we started the training. Risk assessment first, science with Volodya and then off-road driving. Toby managed the steep hill descent much more quickly than anyone else; maybe we'll use a lower gear next time eh! Rob had fun with the failed hill climbs, getting lots of practice in so he's the expert there!

2 July - First survey day

Along with Isabella, Heike, Gunter, Ernst and Pete, I surveyed a valley near base camp. It was stunning, filled with great swathes of wildflowers in purple, vivid blue, yellow and orange. Spring has been late in Siberia this year and there were many hollows where the grass was dead as the snow had just melted; but in the pools of dead brown grass, beautiful pristine blue gentians had sprung, the vanguard of bountiful life in the short Siberian summer for that little patch of ground. But it was not the flowers that were the highlight for me. In the previous six years of the expedition, there has been only two sightings of snakes of any kind - vipers, by the end of the day, we had seen five! Fantastic! We have now re-named that survey route 'Viper Valley' :)

3 July - Travel to Tapduair

After breakfast we loaded up the Land Rovers with tents, food, firewood and field guides and headed off to Tapduair on the far side of our mountain range. It was difficult to find somewhere decent to stop for lunch, so in the end we had to settle for a hill top with 360 degree views of snow and ice clad mountains in Mongolia, silky steppe, Himalayan Vultures cruising by, lakes with ruddy shelduck, flowers all around and the most wonderful scent of oils from the herbs of the mountain.

After lunch I took over driving and as we had plenty of time I decided to demonstrate how to use the winch to recover a vehicle stuck in soft ground; that went very well.....

When we had set up camp and had dinner, we sat round the fire sang jolly songs and told jokes - Gunter was without a doubt the winner here and all through the night, uncontrollable laughter could be heard from Volodya's tent as he remembered the tale about Timbuktu..... :)

4 July – Tapduair

A big day on a big mountain got off to a fantastic start when David, Toby, Isabella, Steve, Volodia and I saw three badgers; at 2700 m, this was an unusually high record, as well as being the first record for the expedition; wonderful animals.

After scanning a cliff, I spotted a big stick nest with a small white fluffy thing in it. I scrambled up to it to find a young eagle chick; probably golden or possibly imperial, with all sorts of food remains such as ptarmigan, chough, grouse and ground squirrel: this was a restaurant with an amazing view!

At the head of the valley that Isabella, Steve and I had climbed, Isabella spotted a Siberian ibex, silhouetted against the snow. After scouring the surrounding area, we counted over 50 ibex, the biggest group by far ever seen by the expedition and a fantastic find as ibex are the main prey of the snow leopard.

Meantime, David, Toby and Volodia were doing just as well, with a sighting of 23 argali, again important for the snow leopard.

5 July - Bird lakes

After the exertions of Tapduair we had a more relaxed day today. After a long drive across the steppe and a crossing of the Bugazon river that focused our drivers' concentration, we arrived at a small lake. Being wet, there were lots of mosquitoes around :(so we doused ourselves in citronella before setting off. There were lots of beautiful birds, including citrene wagtails with pristine bright yellow heads and Demosielle cranes that were displaying to each other, jumping up into the air on their long elegant legs; wonderful.

After the lake, three of us went to see a man about a horse, Marat is the man and we have hired horses from him before. Biosphere Expeditions has been approached by a man who wants to join the expedition next year. Having found out a bit about him and what he has done, he is clearly not disabled, though he does have only one leg; I discussed with Marat the possibility of providing a horse for him so he too can help with the expedition. Meanwhile, Patricia, Heike and Steve had a gallop around the steppe, with varying degrees of horsemanship..... :)

6 July - Sailugem and glacial lake

Today, Patricia, David and I headed up Sailugem mountain whilst everyone else surveyed a nearby valley and glacial lake. My team started off in a beautiful larch and flower filled valley and almost straight away, we found fresh tracks, less than a day old, of an adult ibex that had come down the valley. We followed the tracks for about 1 km and then we found tracks of a young ibex along with those of the adult; but why was there no sign of the youngster further down the valley? We soon found the answer in a patch of soft mud; fresh tracks of wolf, the same age as the ibex tracks and it had been running. We followed the tracks of the three animals further up the valley, it looked like the chase had lasted for at least half a km.

Tracking does not always paint so clear a picture though; we also found a track from a big deer of some kind, or perhaps it was a pigmy hippo or maybe a tapir.... :)

At the head of the valley, we climbed up a rocky ridge and then a scree slope, a steep scree slope, a steep, loose, scree slope, a long steep loose scree slope..... Apparently I should apply for copyright for the phrase 'nearly there'..... :)

7 July - Travel to Kundictikul

Today, we made the long drive to Kundictikul by the Mongolian border. All our drivers did a fine job, negotiating rivers, boulder fields, steep slopes and soft ground. However, the only bridge on the way was too much of an obstacle with a gap of 4 m on the far side and a landing, a metre below onto boulders. We debated the merits of taking a good run at it to clear the boulders, Evil Knievel style, but we didn't have the spangly costumes, so decided against it and found somewhere else to ford the river instead.

After a final tortuous bit of driving, we arrived at Naran Gol river and lake where we set up camp, under the Chicachova mountains that marked the Mongolian border and that would be our aim tomorrow.

8 July - Chicachova mountains

Today we split up into three teams; with me were Patricia, Heike and Rob. We crossed the river by camp in the Discovery and then started our adventure for the day. Up one slope to a ridge, down the other side to a second river, a bit of acrobatics to cross and then we started on the mountain that was our objective. On the way up, we saw an Altai accentor, a rare bird only found in Altai, that was carrying grass to an almost complete nest. Leaving the scree slope, we scrambled up a rocky ridge - much less tiring and also more productive. We found fresh tracks of ibex as well as dust baths that Altai snowcock had used to clean themselves. Lunch was at the top of a cliff where we could look across the valley to see Toby, Peter, David and Volodia walking up the next ridge. The head of the valley below us was spectacular, with dramatic cliffs, a glacial lake and massive snow cornices. There were many ledges on the steep slopes and cliffs that would be favoured by snow leopard; we spent much time methodically scanning them all with binoculars and telescope, but did not see the elusive mountain ghost. We walked as far as a saddle just under the snowy summit where animals are most likely to cross between valleys and hence leave sign of their passing and we found old resting depressions, probably from ibex, but, discretion being the better part of valour, we left the steep snowy summit for another day.

On the way down we checked out an old nest, possibly of a vulture and looked for the nest of an Altai falcon we had seen earlier; we didn't find the nest, but we did surprise each other when we got within 3 m of the falcon before it flew off from the ground squirrel it was eating - wow!

9 July - Return to base camp

Our campfire from the night before was still smouldering as we had breakfast, we packed and then set off. We had driven all of 300 m when we were met by a team of five border guards in tactical formation, ready to stop us whether we wanted to stop or not; I decided we should stop :) I gave them our papers, which they checked along with our passports and once they were satisfied all was in order, they were very friendly and wished us good luck. Now you all know why we are so insistent about you sending in your paperwork!

On the way, we stopped at a couple of yurts to ask about snow leopard and other wildlife. Aidby was very friendly and helpful, telling us about a snow leopard he had seen, as well as an even more rare species, the manul or Palla's Cat. We left the yurt full of tea, Kazak bread and rhubarb jam and with a bag of cheese created specially to break your teeth!

Our route home took us through the valley of antiquities, so we stopped to see the burial tombs, standing stones, stone circles and a tree with a long-legged buzzard nest complete with two chicks - wonderful. A little further on, we stopped at a crag that had a steppe eagle nest with two chicks, then a crag with many petroglyphs and an upland buzzard nest with two chicks. We were all getting a bit overloaded with wonders by this point :)

Our final evening together at base camp was lovely as we shared tales of adventures past and planned over a vodka or two.

Many thanks to all the team members from slot 1; we successfully completed a lot of great survey work, thank you.

Now, Volodia our scientist will travel back to Novosibirsk with slot 1 team members and then meet slot 2 team members at 19:30 on Sunday, 12 July in the reception area of Hotel Sibir. For any team members arriving Monday 13 July, the expedition will depart from the front of Hotel Sibir at 8.00 sharp. If you should need to contact Volodia, his phone number is +79134540878. Note: this number is for emergency purposes only.

I look forward to meeting everyone on slot 2 at base camp Tuesday evening - your home in the mountains awaits you :)

14 July - Slot 2 arrives at base camp :-)

More driving and driving on the second day of driving from Novosibirsk to base camp, some loved it (Dorothy!) others got a bit fed up with it. Finally arrived at base camp at about 18:30 for dinner from Nina and wonderful hot showers from Amile.

15 July - Training day

After breakfast, we did the introductory talk and health and safety briefing. Next, Volodia did the science talk; snow leopards, survey methodology, how our data is used and how it fits into global snow leopard conservation. Navigation, use of maps, compass and GPS was next and after lunch, I did the off road driving course whilst Volodia took the non-drivers for a walk in the woods. Annie was the raptor pellet finding champion and Volodia was excited by the shrew jaw bones therein – ah well, it takes all sorts! For everyone else of a more normal disposition however, the highlight was seeing a fox cub playing in the sun – wonderful. Meanwhile, on the off road driving course, all was uneventful, which is just the way I like it. Everyone did well, negotiating steep slopes up and down, boulder fields and rivers with calm competence.

16 July - First survey day Mount Chornie (Black Mountain) and the Bailukem Lakes

All our newly qualified off-road drivers did a fine job of negotiating the difficult conditions, the Bugazon river on the way being quite high and near the limits, but we crossed it competently.

On arriving at Mt Chornie, we split into 2 groups, one, led by Volodia headed up the mountain, the other with me, headed round the mountain to a valley we had never surveyed before, that led to the border with the Tuvan Republic. All of 5 min after we left the mountaineers, the rain started, but being hardy mountain types, Volodia's team.....immediately abandoned their task and retreated to the comfort of the Land Rovers :-). Meantime, my group made our way up the valley, stopping every so often to scan the mountainside looking for animals. At the end of the `track` we stopped, had lunch and then headed up the valley. The crag to the northwest that marked the boundary with the next region in Altai was high and impressive. There were many ledges and some caves which we peered into hopefully with our binoculars, but we didn't see anything peering back at us. The valley floor was filled with many wild flowers and under what was now a deep blue sky, it was beautiful. We saw no signs that humans had been in the valley; no tracks, no domestic animals etc. but also, there were no signs of ibex or argali, a bit unusual. However, there is always something special to be seen, and the find of the day was made by Sonya who found a very rare viviparous lizard with a lovely orange stomach.

The drive back along the valley was punctuated with frequent stops to take photos of the fields of wild flowers, in the early evening light and under the blue sky it was impossible to fail to make a stunning image.

17 July - Start of horseback expedition and overnight trip.

Last year I tried to reach an area of mountains north of Kosh Agach as we had had reports of snow leopard from there and the area looked great on the map. Volodia's computer modelling exercise too, had also highlighted the area as a 'red zone' which is very favourable for snow leopard. I tried to drive there from the east, but the road was appalling and I could not get close. Next, I tried accessing the area from the west along a road marked on my map; when I got there, there were 15 foot high trees growing on the track. The only practical way to access the area is by horse. I arranged the hire of horses from Marat, a local herder/hunter and along with him, Claire, Arkady (Marat's helper) and myself headed off for four days to make an initial survey of the area and to see if further surveys would be practical.

We crossed the steppe, passed high red cliffs, went through a narrow rocky valley and into a flower filled valley with great swathes of edelweiss. At the top of a pass, Marat stopped and sprinkled the big rocky cairn with some fresh cow's milk for good luck on our journey. We passed small lakes with tufted ducks and Slavonian grebes in a wide green valley. A gentle descent in the next valley led us through the most beautiful woods I have ever seen. The trees were mostly Siberian larch, with a few pines, or cedar as they are known locally and they were quite widely spaced, leaving plenty of space and light for the most amazing woodland flowers. One area would be dominated with the blues of monk's hood and complimented with oranges of daisies, then the hue would subtly change to the blues of geranium, or of bluebells, but always, dazzling colour, delicacy and lush abundant life all around. For a long time, I have wanted to visit the world famous valley of flowers in India as it is supposed to be spectacular; now, I suspect it may be a bit of a let down for me.

We passed through an area of burnt forest, perhaps the result of a lightning strike, before arriving at our camp site by the side of a river. This was the most perfect of camp sites in a lush little flower filled meadow, surrounded by larch, fairy tale perfect!

Meanwhile, Volodia and the rest of the team set off for a 3 day expedition to the Tekelu river valley, driving up the river itself to get to a camp site.

18 July - Into the heart of the mountains.

After breakfast, we packed, loaded up the horses and set off. Yesterday, we had crossed a few rivers that I thought were pretty exciting, but nothing compared with the river crossing that started our day as we left camp..... As we headed up the valley, the trees thinned then disappeared, leaving us in a wide green valley with massive sheer cliffs to the west that I scoured for eagle eyries, unsuccessfully, and to the east, small crags on top of a high ridge. A small side valley led up into the heart of the mountains and it was here we were to leave Marat and the horses and continue on foot. At the foot of the valley, there was a small wooden hut where two herders lived and tended their flock of 300 sheep and goats. Whilst talking to them, on the ground, I noticed the skeletal hand of a bear, shot by the herders in protecting their animals. Claire and I left Marat and Arkady talking and drinking tea with the herders and headed off uphill. A small stream gully was still filled with ice from the winter and had been sculpted into sinuous curves. There was a small glacial lake, then a second larger turquoise one. The head of the valley was split by a rocky ridge with rocky corries left and right; it was up the ridge that we made our ascent. On the way up I saw a clubmoss, not actually a moss, but a primitive non-flowering plant; this was the first clubmoss I remember seeing in Altai and looked very similar to a species I know from Scotland, though it did have subtle differences. After a long slog up the rocks, we reached the summit plateau at 3333 m. The blue skies of the morning had gone and the clouds all around created spectacular lighting for the views out over the Kosh Agach steppe to the south west and the mountains and valleys all around. We started our descent down the other side of the mountain to our rendezvous with Marat down a narrow rocky ridge. We had barely set off when the weather suddenly changed and it started to hail, heavily. Only a few minutes later, we found tracks in the snow, unlike any I had seen before. I quickly took some photos before they filled with the hail; you could clearly see the paw prints, the length of the legs and the marks of the body, this was the trail of a manul or Pallas' cat, even more rare than the snow leopard and a fantastic find for the expedition. By now the weather had deteriorated even more, thunder and lightning had started. I could hear buzzing and my eyelashes were standing on end, a clear sign of serious electrical activity, this was no longer a safe place to be; we now hold the Altaian speed record for getting off a ridge. On the way down, the hail piled up, covering the ground, except for clumps of yellow flowers showing through, an unusual and beautiful sight. We arrived at 'ozyera adin' or the first lake to find Marat and Arkady sheltering in their tent, whilst a white-winged scoter, a bird not previously recorded by the expedition, flew past.

Meanwhile, in the Tekelu river valley, the rest of the team split into two survey teams, one headed up high onto a mountain whilst the other surveyed a mountain valley. The mountain group had a hard day, leaving at nine in the morning and only getting back at six, having endured rain and snow. Down in the valley, Thorsten in the other group made the find of the expedition; argali tracks with those of a snow leopard following behind! It has been a long time since we have found sign of snow leopard, so it was excellent to get this data. :-)

19 July - Glacial lakes

We had camped by the first lake in our valley, however there were four glacial lakes further up the valley; it was these we went to survey this day. The first glacial lake was interesting; where the water flowed into the lake, there was a rock field, but all the rocks were orientated to have their flat sides up and all at the same level, the result was an amazingly smooth flat surface that you could have driven an ordinary saloon car over, very strange. Around this area, the birds were wonderful, we saw a spectacularly red and pink rosefinch, new for the expedition, a white winged redstart and lots of Altai accentors – endemic to the area. The next lake was bounded on one side by a steep scree slope that disappeared straight into the depths of the lake – didn't look good for crossing at all and on the other side, by a steep slope, again plunging into the lake, but negotiated easily with a little scrambling. Glacial lake number three was up a hanging valley, so we passed it by, but on the way to the last lake, we started to find fresh sign of Siberian ibex and argali, both primary prey species of the snow leopard, as well as older sign in the form of two old ibex skulls. The final lake was as beautiful as the others and beyond, massive cliffs, at least 2000 feet high, was a very abrupt and spectacular end to the valley.

Whilst we had been surveying the glacial lakes, Marat had taken the horses further down the valley to where there was food for the horses, so we made our way there to join him. At the side of the river on the way, we made another great find, more Manul sign, this time faeces. Marat and our horses were at the other side of the river, so Arkady took a horse across to ferry us to the other side. Claire was first across, this was a good thing as when Arkady returned, we saw a viper at the water's edge which would have provoked a major incident had Claire been anywhere near it :)

Meanwhile, the rest of the team were having a day off work, starting with a long lie-in as it was pouring with rain. After a while the rain stopped, the sun came out and the team made their way back to base camp. In the afternoon, the team made a trip to some nearby petroglyphs and saw an upland buzzard nesting there with one big fat brown chick.

20 July - Return to base camp

We awoke to a misty wet morning. After breakfast, we crossed the river and headed down the valley through very spongy ground that the horses' hooves disappeared into with every step. We crossed the river near a small abandoned hut - that was interesting, deep water, big boulders, I was glad that was behind us. We traversed a meadow on the hillside, completely covered with yellow flowers, before descending to, yes, cross the river again. Marat checked all the horses and tightened their straps, not a good sign, then he got on his horse and headed for the river, and stopped. 'Nyet' he said, too much water. I was not about to disagree with the judgement of an expert, however, I did look for alternatives that might be acceptable to him. How about going back to the previous crossing and travelling down the other side of the river, 'nyet' the ground was far too soft and hazardous for the horses. I walked upstream and found somewhere that looked better than the other crossing. 'Maybe' said Marat, so I looked downstream for another option. I found a crossing that looked perfectly fine to me and on returning with Marat, he agreed, the only problem was how to get the horses to it! There were some fallen trees blocking the way as well as thick stands of willow, but after a bit of exercise with Marat's axe, we were there and then easily across the river. Another river lay across our track, but this was easily crossed too. Next, we made our way up a steep slope and from behind I heard a commotion, looking round I saw Claire on the ground – a small but clearly vital piece of tack had broken, dumping saddle, panniers and Claire onto the hillside. Fortunately, no damage was done.

The rain stopped, so we did too, making a fire for tea. I wrung out the water from my clothes and then dried them by the fire along with my toes; that felt good! The break from riding was great, but starting again was not so great! When we started to get near Marat's home, the horses realised where they were heading and quickened their already brisk pace; very fit horses!

At Marat's Isle, his home, we had more tea accompanied by bread and fresh cream – that tasted soooo good. The drive back to base camp was interesting as ever, especially when we saw a Demoiselle crane doing a broken wing distraction display, trying to lure us away from its chicks: wonderful, I've never seen that before.

Meanwhile, the rest of the team had been surveying a valley near base camp in heavy rain and were rewarded with a sighting of a maral deer; although we do sometimes find sign of these deer, sightings are extremely rare

21 July - Base camp to Sailugem National Park (proposed!)

After breakfast we loaded up the Land Rovers with tents and food and headed off for the proposed Sailugem National Park. Passing through Kosh Agach, Annie was amazed at the high fashion on display on the dusty streets of this harsh frontier town: high heeled stilettos, stockings and exposed mid-riffs mixing with rusty old Russian army lorries, log cabin houses and dirt roads.

After crossing the Kosh Agach steppe, we got to the Jezator checkpoint where our papers and passports were checked, this took a bit longer than normal as we had arrived at lunch time..... When underway again, we drove along a valley on the main road to Kazakhstan before heading east up a valley into the proposed Sailugem National Park. Though there was a track marked on the map, it was difficult to even see it on the ground. The way was rough, bumpy and at times boggy, but with Dorothy, Sonya and Thorsten driving we made good progress. Near the highest point of the valley and about 8 km from the Mongolian border, we set up camp. Woods marked on the map were either a cartographer's dream or the victim of a lumberjack's axe, but the views were fantastic with dramatic cliffs and snow fringed ridges to the west, rolling hills to the east and tantalizing Mongolia to the south; in the warm evening light they looked fantastic. After dinner we had a fantastic camp fire that warmed parts that even the Nescafe, condensed milk and vodka cocktails could not reach, and listened to what sounded like a cat calling (manul?) from a nearby gully.

22 July - Sailugem National Park survey.

We split into three survey teams, Sonya, Simon, Herwig, Joerg and I headed off west for an enormous walk up a 3400 m peak and horseshoe, whilst Barbara, Claire, Sonya, Thorsten and Rob surveyed a valley and Volodia headed for Mount Chornia (black mountain) with Dorothy, Annie, Martin and Marina. As my team climbed, we saw lots of sign of domestic animals, but mixed in were a few fresh tracks, only about a day old, of what looked like ibex. Then it started raining. It looked like it would be a passing shower, so we continued in the mist with our work; it was not a passing shower, however... We continued uphill, finding sign of ibex, but after about half an hour of horizontal rain and then hail, the novelty of it wore off and I decided we should head back, but taking a slightly different route to cover some new ground on the way. As we walked, we started to find resting depressions, usually difficult to attribute to a particular species, but these depressions had ibex faeces in them. Then Sonya suddenly pointed to something in front of us, further along the top of the cliff. We all looked round to see 11 ibex appear from the cliff face up onto the cliff-top. As soon as they appeared, they took flight and ran off down hill and away. We were all delighted at seeing the ibex so close, about 200 m away. Then more ibex appeared, 28 of them, including eight young; these too ran off downhill. We couldn't believe our luck. Then, an adult and two young appeared, I asked everyone to stay perfectly still as the three ibex started walking along the cliff directly towards us! They got closer and closer till when they were about 80 m away they disappeared from sight behind a fold in the ground. I got everyone to sit down, and then again stay perfectly still. The ibex did not appear. We stayed there motionless for what seemed like ages, had they fled, had they stopped? Then they re-appeared about 50 m from us, the adult stopped and looked directly at us, but we all stayed perfectly still and eventually it continued its track towards us. At about 30 m from us, the three ibex headed off down the cliff, still unaware of our presence - a fantastic experience and great data for the expedition. Back at camp, the other teams had returned too, so we dried off and had lunch. Later, when the weather improved and the sun came out; Volodia and Herwig investigated the gully from where we had heard cat-like calling the night before, while Rob, Simon, Sergii, Annie, Claire, Martin and I drove to some lakes to see what birds they held – tufted duck, Slavonian grebe, whooper swan and pintail.

23 July - Return to base camp

Sonya, Herwig and I drove the Land Rovers out of the valley, negotiating the boggy ground, Sonya doing a great job of finding the best way. We stopped at an isle (wooden hut) and had a chat with Misha, a herder. Misha was very friendly and chatted openly, telling us of the big herds of ibex and argali in the local area. Whilst he had not seen snow leopard, which he confirmed to be a holy animal, the man who tended the goats and sheep with him had, twice, on the mountain where we had seen ibex the day before. Misha gave us kefir - fermented cows milk and cheese - as we talked about changes in land ownership in Russia, school for his children and what it was like to live in the beautiful mountains with their chill winds.

Just before we re-joined the Kazakhstan / Altai international highway (!) we stopped at some Kurgin, burial tombs, and their standing stones. Further on, we stopped for lunch, just as we got onto the steppe, by some massive boulders that had some petroglyphs of ibex and other animals on them. After driving across the steppe, we had a short stop at Kosh Agach to stock up on essential supplies, in my case, ice-cream! We made good time and arrived at base camp around 16:00, so that after checking the Land Rovers for the long drive back to Novosibirsk and filling in the last datasheets, we were free to relax and enjoy the warm sun. A good time was had by all on the last evening, eating cake and consuming the essential supplies before we went to bed as it started to snow :-)

24 July - Base camp to Mikhailovo

After a team photo with the newly snow dusted mountains in the background, we were off; most sad to leave, others looking forward to a soft bed. We were all looking forward to a big lunch at the Chui Oozi restaurant, however, it was closed, so we had to continue to the café on top of the Chiki Taman pass.

25 July - Mikhailovo to Novosibirsk

An early start in the rain, stops at silver springs market, then the honey market where we sampled the worlds best pirozhkis - hot 'pies' filled with either potato, cabbage, meat or egg and onion and bliny - pancakes filled with fruit :-)

So, that's the end of slot 2, the weather was quite poor at times, but we still managed to get a lot of survey work completed. Thorsten's fantastic find of the snow leopard trail was the find of the expedition, but we'll see if we can outdo that during slot 3 or 4.

For those of you about to join slot 3, I will be in the reception area of Hotel Sibir on Sunday evening at 19:30 where I'll do a very short briefing for the travel to base camp and then we can all go out for dinner if you wish. Please bring your passport and immigration card as we will need to copy some details for the registration process in Altai. Please note that my posh new phone is no longer working, so, I've reverted to using my old but reliable phone +7 913 454 0878. Please only use this number for emergencies and if I'm in the field, replies may take a considerable time.

I'm looking forward to meeting all slot 3 team members.

27 July - Novosibirsk to Michelovo

On the long road, the police were making their presence felt. We had a lovely lunch of pirozhkis and blennies at the honey market and sampled some of the hundreds of varieties of honey on sale.

28 July - Michelovo to base

Set off at 08:00 and enjoyed the quiet roads, beautiful scenery and lovely weather. Got all the drivers driving both the Discovery and the Defenders, so everyone is comfortable with them before starting the off-road driving tomorrow, all good. Crossed first the Seminsky pass and then the Cheki Taman pass that is the boundary of a sub bio-geographical zone. The vegetation was lush and green before, whilst more stunted and adapted for arid conditions after the pass. Likewise before the pass, most people were of European appearance, whilst after it, most had Mongolian features. We stopped at the confluence of the Katun and Chuya rivers where it is traditional to visit for good luck on your journey; pretty much guaranteed to see a snow leopard now then I guess :-)

29 July - Training day at base camp

We started the day with navigation – use of map and compass, GPS etc., then the health and safety briefing. Later, Volodia explained what we were aiming to do, how to carry out the surveys, what our data will be used for and how it will fit into global snow leopard conservation. After a lunch of wild mushrooms expertly cooked by Nina, Volodia took the non-drivers for a walk in the woods looking for animal sign; Georgina found a lovely raptor breast feather as well as sign of wolf and boar. Meanwhile, I did the off-road driving. We had some people who had never driven off-road before and others who do so every day for work; everyone did well and we are now ready to get stuck into the survey work. Laura and Nicola saw three ibex from base camp, it's been a while since we've seen any there.

30 July - Travel to Kara Gyem

After breakfast we loaded up the Land Rovers with tents, a mountain of food and most importantly, Nina to cook it for us; we then headed off towards Kara Gyem in the Aktru Mountains. Kara Gyem is a remote valley that is very difficult to reach, there is a road marked on the map, but last year, on heading for the valley, we found that the 'road' was extremely difficult, with many deep river crossings and boulder fields. Finally, the 'road' had been removed due to erosion, leaving an impassable cliff, or alternately a tortuous off road section through the forest over steep wet slopes, through narrow gaps between the trees and over inconveniently located boulders. Last year we walked the difficult section through the forest and got a glimpse of Shangri la beyond, this year I wanted to drive further, so we could survey the area properly.....

Having stopped at Kosh Agach for diesel and other supplies, we crossed the steppe, heading south west to Byelter, then along the beautiful Taldura river valley, before breaking out, up its steep sides and heading west. Nicola in the lead Land Rover doing some great driving up the steep loose slopes. As we ascended, the views opened up and became more spectacular with every corner we turned. There were high mountain valleys with scattered Siberian larch trees, old and knarled from the excesses of the climate, then there were high peaks with slopes of broken shale, rich in the colours of the lichens that covered them, then there were even higher peaks, dressed in snow-filled gullies and icy blue glaciers. The high point of our drive was a pass at almost 3000 m with views way out over the Kosh Agach steppe and the mountains of Mongolia to the east and down the Kara Gyem valley to the west, with mountains up to almost 4000 m diving down very steeply to the river below that lay ahead of us and which we had to follow. A patch of snow about 40 m wide lay across the track in front of us.

Jenya and Yana, our friends from Novosibirsk in their Land Rover with two winches :-) had joined us for the trip and tried to cross the snow first. The snow was soft, heavy and deep and after some digging, pushing and a bit of winching we went for plan B, avoiding the snow and driving round it. As we descended, the 'road' at the bottom of the narrow rocky valley got steadily worse and we had to cross the river eight times as it steadily grew in size. All the crossings were serious; I drove the lead Land Rover whilst Martin and Uli drove the second and third ones, doing a great job of negotiating all the obstacles.

On the way, I noticed the fresh tracks of a quad bike heading for Kara Gyem, only a day old. It is unfortunate that not only wildlife conservationists, but also hunters can access the very few remaining areas that are difficult to get to and that hold a great wealth of wildlife.

Finding a rare lovely camp site in the narrow valley and with limited daylight left, I decided we would stop for the night. We got the tents up and sorted out and settled in amongst the larch and cliffs. Only a little later, Nicola came racing back into camp in a great state of excitement; she had seen a big whitish animal gracefully running down a gully between cliffs, it was long and low with a long tail; everything that she described about it fitted with snow leopard. Nicola had watched film of snow leopard before the expedition and this animal moved just like she had seen in the film. We considered other animals, ibex, juvenile ibex that are light in colour, manul, fox, lynx; nothing else fitted. However, the sighting had been at a considerable distance so it was not possible to be absolutely certain it was a snow leopard, just pretty sure :-)

31 July - Kara Gyem first survey

The last bit of the journey to Kara Gyem included the tortuous section through the forest where the 'road' had been removed by the river. First, there was a very tight corner between two big rocks, with only just enough room to pass. Next was a steep section with very loose ground; momentum took us up the first half and we then towed each other up the last bit. Next was a short steep section of wet grass with a big rock in the middle. Then it was down the other side, a narrow gully filled with boulders a very tight corner at the bottom by a precipitous drop to the river below. With care, good marshalling excellent driving from Martin and Uli and a bit of time, we got all the Land Rovers past and onto a decent track beyond :-) After about 4 km, we arrived at Kara Gyem meadow, wow! The whole meadow was a sea of yellow euphorbia flowers with islands of deep purplish blue delphiniums, incredible. We set up camp at the edge of the meadow amongst the Siberian larch and Siberian pine trees; the view out of our tents, across the meadow, up the braided river and to the glacier clad mountains beyond was that of paradise. After lunch we split into two groups, Volodia surveyed back along the valley where we had come from and found his favourite – a viviparous lizard, whilst I went with Laura, Nicky, Uli, Jurgen, Mike and Sergii up the valley. There was a road marked on the map, but there was no sign of it on the ground so we went for option B. The braided river consisted of small shallow channels and some not so shallow channels, all spread out over most of the glacial valley floor and conveniently with an even hard bottom of smooth pebbles – with a little care, great for driving up. We drove 4 km up the river to where a stream joined it, here we started our survey. As soon as we got out of the Land Rover, I noticed big fresh animal tracks in the silt.

Unusually, the tracks which were from a cloven hoofed animal also showed clear impressions from dew claws, these were elk tracks, an animal never recorded by the expedition before - an excellent start to the survey. We headed up the very steep slope by the stream and found a huge amount of sign from maral deer, Siberian ibex, Argali as well as elk, this was an area extremely rich in wildlife. Nicola spotted a Siberian chipmunk, barely 15 m from us. In the tops of the Siberian pine trees, locally known as cedar, pronounced 'keder', were big purple pine cones containing delicious pine nuts; it was not only us who valued the nuts though, the nutcracker or 'kedrovka' flew from pine to pine making its distinctive call as it searched them out. We ascended to the top of the main slope and had fantastic views up to an impregnable castellated mountain with rock towers a thousand feet high above and the beautiful valley and our Land Rover almost directly below us.

1 August - Kara Gyem High in the mountains

After breakfast, we all set off together to survey a mountain. We drove up the river for a couple of km to our start point where we started walking uphill through thick larch forest. There had been a big forest fire there perhaps 20 years ago so that between the well spaced old burnt trunks, there were lots of closely packed young larch trees. The sky was blue and it was warm, but all the trees and other vegetation was laden with water from earlier rain; those at the front (me!) got soaked brushing off all the water walking through, but it didn't matter in the lovely weather. As with our survey yesterday, we immediately started to find lots of fresh sign of large mammals; maral, elk, ibex, argali, lots of bear, wolverine and best of all and a great find for the expedition, some old scat that is probably snow leopard. The hill was very steep and unrelenting, it was lunchtime only shortly after getting above the tree line to the hanging valley above Kara Gyem valley and our camp, but the views were, again, fantastic. A little further up the hanging valley, Volodia & co headed back for camp whilst Laura, Nicola and I continued on up to the top of the mountain. The vegetation thinned out till only slabs of shale covered the ground as we crunched our way up. Patches of snow directed our route and then we were at the top and I instantly had a new favourite view.

The upper reaches of Kara Gyem valley way below held Kara Gyem forest that terminated with a massive cliff, waterfalls, hanging glaciers and then massive snow and ice covered mountains. In the evening light, the scene changed mood every few seconds, the three of us stood there watching a show for the gods, stunning. A 4 km long cliff on the north side of the mountain dropped straight down about 1000 m to another secluded and tantalizing valley; it was on top of this cliff top plateau we spent the night in our bivvy bags. We were extremely lucky with the weather; not a breath of wind, dry and clear – perfect. And both Laura and myself saw a meteorite, the most spectacular one either of us had seen. Burning for a long time, the meteorite was like a giant firework, full of colours and energy, a great end to the day.

2 August - Kara Gyem last survey day

Woke to an amazing sunrise that was so wonderful I felt I couldn't do it justice with my camera, so instead, I went back to sleep. Woke up again at the far more civilized hour of 9 :-) and had tinned peas for breakfast that tasted just great. Given the amount of sign we had seen of animals at lower altitudes, I was surprised by the lack of it on the mountain top, I said 'I'm surprised that we haven't seen any sign of ibex here, oh look there's some ibex!' From my bivvy bag, I sat and watched a group of 14 ibex as I ate my tinned peas; it's a hard life :-) Then Nicola spotted a second group of 17 ibex; which group to watch, decisions, decisions.

We set off to survey the summit plateau, plodding through some thigh deep snow which was hard going, but we did find tracks of a wolf that had likewise been plodding through thigh deep snow. Eventually, we decided that the time had come to start the descent back to the Land Rover at the bottom of the mountain :-) From the plateau, we headed down the rocky then vegetated hanging valley. We stopped at the end of the hanging valley and scanned the forest below for animals, but saw none, I wondered how long we would have to wait to see a bear, considering all the fresh bear sign we had seen in the forest the day before and Nicola (being greedy having already seen a snow leopard) said she would really like to see a bear. Continuing down towards the tree line, I spotted movement, a large animal about 150 m away. I told Laura and Nicola and we stopped and watched. From the bushes emerged a massive adult bear. To my horror, both Laura and Nicola shrieked in excitement and delight. I shared the excitement and delight, but didn't care to share it with the bear that was racing around the hillside like a rather nimble battle tank. Brown bears are not supposed to be aggressive towards humans, but I didn't really want to test that, preferring to remain undetected by the bear. Fortunately, the bear did not hear us and we made a detour around it back to the Land Rover.

3 August - Kara Gyem to base camp

Breakfast at 07.00, packed up and set off back towards base camp. One of the Land Rovers had developed a fault, probably due to dirt in the fuel, so that it lost power, only managing to idle; this was not the sort of place you wanted this sort of fault, however, if we let the car sit with its engine off for a while, you could get around 20 seconds of power; I used the 20 seconds to negotiate serious obstacles like rivers whilst otherwise, Martin towed me. The now slick driving team negotiated the difficult off road section through the forest with great skill and professionalism, getting through in good time. After perhaps an hour of interesting towing, the fault in my Land Rover disappeared and the vehicle then worked perfectly again; perhaps dirt in the fuel had been drawn through the engine? Back in the Taldura river valley, we stopped for a late lunch by some petroglyphs, but no-one could summon up the energy to climb the hill to look at them. Through Byelter with its Olympic stadium :-) across the steppe, Kosh Agach, then back to base camp for a fantastic hot shower courtesy of Amile, dinner and bed. Good to be home.

4 August - Arzhan Buguzun Spa

Arzhan Buguzun Spa is a very popular place for people to visit. Doctors prescribe stays at the spa to treat various conditions. The variety of people who can be found there is great both in terms of where they reside as well as their socio-economic group. The people at the spa have lots of free time and little to do, ideal for us to carry out interviews. We met a man from the capital of Altai, Gorno Altaisk who visits the spa every year. It was heartening that as soon as we met, he started telling us about how important it was to look after the site and the land of Altai in general and that Altians considered the land and its wildlife to be holy.

On the way back to base camp, we stopped at a few yurts, but no-one was in. Eventually, we found a yurt with some men working outside with their goats. Boris, his Russian name, or Mahbat, his Altaian name was very friendly and helped us as much as he could, telling us about argali in nearby hills, however, he had never seen snow leopard.

5 August - Buguzon River headwaters survey

Took three Land Rovers to the headwaters of the Buguzon river where we split into two groups, Nicky, Uli, Jurgen, Arno and I headed up a ridge, whilst Volodia took everyone else up a valley. Just a few minutes after setting off, Jurgen spotted a group of 5 argali heading up the hill and over the horizon, they were all adults and all had massive spiral horns that must have weighed a ton. This was our first sighting of these impressive and rare, red data book listed animals this year. On the way up the ridge, we found lots of sign of argali in particular and also ibex. There were lots of fresh tracks and many resting depressions including ones that the Argali had used the night before. On reaching the ridge top, the views opened out so that we could see the mountain range around base camp, the Chichova mountain range on the order with Mongolia and the hills of the Tuvan Republic to the north west.

At the top of our mountain, we stopped for lunch just under the top of a cliff to shelter us from the chilly wind. It was clear and sunny and with my Swarovski telescope, I could scan the mountains for miles around looking for animals. Eventually I found a group of 22 ibex about 4 km away, it was great watching them butting heads. We descended the far side of our mountain a little and I spotted the five argali we had seen earlier that day, they were relaxing on a patch of snow, cooling themselves just like I've seen red deer in Scotland in the summer.

6 August - Steppe lakes bird survey

After breakfast, we headed off across the steppe to a group of small lakes to survey them for birds. On the way, we had to stop every few minutes as a succession of different birds appeared before us; horned lark, long-legged buzzard, cinereous vulture, lammergeyer, red-billed croucher, demoiselle crane, etc. etc. etc. At the lakes, we doused ourselves in insect repellent and set off. There were lots of tufted duck with young, a well as pochard. There were grey heron and ruddy shelduck whilst waders included redshank, wood sandpiper and Temminck's stint. Nearby the lakes, we found a group of 19 Bactrian camels; these animals used to be domesticated, but since the fall of the Soviet Union, they have been abandoned and are now feral, roaming free and apparently behaving like the very few remaining wild animals.

We visited Marat, our friendly local horseman, but unfortunately, he was not in, so we continued to Kokoria to get some supplies for Nina as well as ice cream or two :-). On the way back to base camp, I, along with Nicky, Georgina, Uli and Mike checked a steppe eagle nest and found that it had one very large steppe eagle chick in it, almost ready to fledge. We collected feathers from the eyrie for the Siberian Environmental Centre for their DNA study of the raptor populations in the area.

Back to base camp, showered and got dressed for dinner and then we all headed off to Campii's yurt, a 20min drive from camp. We had arranged to eat with Campii who had cooked a lamb for us. Stewed lamb is the national dish of Altai, so that was what we had – except for the veggies amongst us we had potatoes and mushrooms that Nina had prepared and taken along with us. I have been reliably informed that the lamb was absolutely delicious and there was certainly enough of it, mountains of it in fact. We paid Campii and went back to camp, it's good to put a little cash into the local economy without distorting things.

Back at camp, the festivities of our last night were not over, as Nina produced a lovely cake which we ate as we chatted and shared a drink or two. A wonderful last day.

7 August - Base Camp to Michelovo

After breakfast, I went with Laura, Trish, Lisa and Jurgen to check another steppe eagle's nest, as they were a little miffed at having missed out on seeing one yesterday. Even better, this eyrie had two chicks in it, again almost fully grown and almost ready to fledge; a fantastic sight and more data for the Siberian Environmental Centre.

After group photos and fond farewells we set off, a last ice cream at our favourite ice cream shop in Kosh Agach and off along the M52.

At Michelovo, the girls were first into the banya (sauna), apparently it was still warming up, so they had to wait a bit and were given some magazines to read, car magazines. So there they were discussing the merits of various off road cars in the banya, all that was missing was a few pints of Stella :-)

8 August - Michelovo to Novosibirsk

The loooooong drive back to Novosibirsk.....

So, that brings to an end the third slot of this year's expedition. We succeeded in getting to and surveying the Kara Gyem area that has eluded us in the past and we found there a real little paradise. Much other excellent surveying with excellent finds was completed, so very successful overall. Thanks to you all for all the hard work and the laughs; I had a great time, hope you come back :-)

Slot 4; I'm looking forward to meeting you all and getting stuck into the work. I will be in the reception area of the Hotel Sibir at 1930 Sunday 09 August, I'll quickly brief you on the plans for getting to base camp, please bring your passports and immigration cards. We can then go or dinner somewhere if you would like that. Departure will be 08.00 Monday morning from the Hotel Sibir.

10 August - Novosibirsk to Michelovo

Some confident driving from Axel along with light traffic got us to Gorno Altaisk immigration office in good time. Speedy processing of our documents got us finished there in record time too so that we arrived at Michelovo with time to relax and explore a little. After dinner, we had a banya (sauna); wow, that was hot! Cooled off in the river for about 15 min and was still hot when I came out! Shared a wonderful, enormous, sweet melon and then danced the night away, Axel doing his Saturday night fever thing :-)

11 August - Michelovo to base

Long wait for a not too great breakfast :- (Long drive to a lovely big lunch :-) Short wait at Aktash for our paperwork allowing us to go to all sorts of lovely places :-) Very rare (red data book), very long necked bird (black stork) seen on the way :-) Very glad that's the last time I have to do that very long drive to an from Novosibirsk and will be very glad when we get home to base camp :-)

12 August - Training day

When the sun rose over the mountain to the east of base camp, our tents, wet with dew steamed like a sauna; a precursor to the beautiful hot day ahead. After breakfast, we did the risk assessment and then the navigation training using sun, maps, compass and GPS. Volodia, our scientist then briefed everyone on why we are doing the expedition, how we do it – the survey methodology, and what we do with the information when the expedition has ended – primarily how it fits into global snow leopard conservation, but also the other uses our data is put to. In the afternoon, Volodia went for a training walk with Rachel and Solveigh, finding sign of eight different mammals and seeing a beautiful Siberian chipmunk.

Meanwhile, I did the off-road driving training with Melanie, Verena, Axel and Thorsten; this went very well as we safely negotiated steep hills, up and down, boulder fields and rivers. With the training successfully completed, we are now ready to get stuck into the survey work.

13 August - Move to Akkol Valley

Loaded up the Land Rovers with tents and food for five days and set off. Our current and only base camp has served us well over the years, but now, having surveyed that area thoroughly; it is time to move base camp. Having done a few exploratory trips to the Taldura river valley area, we will look for a new base camp in that area; the first place we will check and that we are heading for today, is the Akkol valley. Our route took us through Kokoria, Kosh Agach, the Kosh Agach steppe, Belter and then up the Akkol valley. On the map, the valley looked remote and difficult to get to, which usually equates with healthy wild animal populations, however on arrival, we found a good track, not only to the valley, but all the way up it, excepting the last 6 km. On the way there were two lakes and very unusually for Altai, there was lots of sand around the lakes and up much of the valley. The valley sides were very steep, on the east especially where there was an almost unbroken cliff along the entire valley. We stopped where a stream flowed down the western valley side in a sheltered spot surrounded by dwarf willow and birch with a few scattered Siberian larch; with the cliffs as a backdrop the scene was spectacular. Having set up camp, we explored the local area with its waterfall and gorge. I scanned the eastern cliff and found a Lammergeier vulture nest, the first one I have ever seen and a great find as the bird is a red data book listed species for Altai.

14 August - Survey of Akkol Valley

Volodia with Solveigh, Rachel and Melanie headed west uphill to a lake whilst I along with Verena, Marina, Axel and Thorsten set off in the Land Rovers up to the head of the valley and Safeski glacier, Altai's second largest. We left camp, got round the corner, past a patch of mud where we explored the limits of the Land Rovers traction..... , drove another few hundred metres before having to stop. We walked up the steep sided valley that had a braided river on the flat valley floor whilst small hanging glaciers clung to the slopes above us. We saw one disused eagle nest and there were remarkably few raptors in the valley. There were a few ground squirrels around, but this was really the domain of the pika, a relative of the hare. These animals were everywhere, darting around with mouths full of vegetation that they dry and then store for the winter ahead. We even saw two albinos, complete with red eyes, I've never seen anything albino in Altai before.

As we neared the glacier, the pleasant walk along the river turned into an assault course over boulder fields, but the views of the glacier and jagged peaks above that we had were well worth the effort in getting there. Unfortunately, even right at the head of the valley, there was sign of intense grazing from domesticated animals such as sheep and goats and there was no sign of ibex, argali, deer and certainly not snow leopard. Then, out of the clear blue sky, started to fall, snow! There was a cloud above one of the mountains and the snow must have blown from it but it was odd seeing the snowflakes against the blue sky. On the way back, we collected armfuls of wood for a fire; this was an excellent idea. After sunset, it got cold, but the fire was hot, we all sat round it filling in the datasheets and talking about meteorites – it's a long story..... :-)

15 August - Move to Jyelo valley forest

Woke in the morning to a winter wonderland. Our tents and everything around were covered with about 4 cm of snow; just enough for a good snowball fight :-) After breakfast we packed everything up and set off, along with hikers from Moscow who had been in the mountains for 20 days. On the way, I noticed the petroglyph of an ibex by the road, we stopped and explored further; we didn't find so many more in the short time we were there, but we did find one slab of rock that had around 15 large and unusual petroglyphs of fox, ibex, possibly elk, possibly oxen and other ones that were too weird to identify at all. At Belter we dropped off the hikers and Nina got a few supplies; this was apparently a big event for the locals and Verena got lots of attention from a very enthusiastic lady who spoke a few words of German. Leaving the excitement of Belter behind, we headed up the Taldura river valley where we saw a group of about 25 bactrian camels foraging by the river. We got to a beautiful camp site by a larch forest with big patches of purple flowers all around; this might be our new base camp for next year.....

16 August - Survey day

We awoke to tents stiff with ice, but soon it melted as the sun rose in a deep blue cloudless sky. We split into two groups today, Melanie, Marina and Volodia headed up the Jyelo river valley to the Bejerdu glacier, whilst Verena, Rachel, Axel, Thorsten and I headed up a mountain to the north of camp. A narrow stream gully at the start of our climb had larch trees in it and there were many birds flitting around including brown accentors and a finch that I cannot find in our field guides, so identification will have to wait till I get home :-) Though our mountain was over 3000 m high, the terrain was not generally rocky; mostly gently and steeply rolling slopes covered with grasses, sedges and wildflowers. Apart from one mountain hare, which was great to see racing off, there were no wild mammals, but there was sign of heavy grazing by domesticated animals such as sheep, goats and sarlik (a cow, yak cross). Near the top of the mountain, we came across a big drift of snow, surviving from last winter and even better, it came complete with three Altai snowcock; big birds that made the most surreal out of place call I have ever heard as the flew off. Altai snowcock are very rare birds only found in the Altai mountain area and this was the first sighting we had had this year.

The views all around us were picture postcard. To the west, big snow and glacier covered mountains disappeared off to the horizon in a tantalizing, unbroken sea of peaks and to the south, the great length of Taldura river valley flanked by steep snowy slopes and ending in the mighty Taldura glacier, the biggest in Altai.

After lunch, we headed down a gully to the west and near the bottom; I had a new experience. Everyone just sat down, scattered around the hillside, then, without any discussion or planning, we lay down and had a snooze for a wee while; a spontaneous siesta! We continued downhill and from behind the hill, two adult lammergeier vultures appeared, and they were low. I've seen lammergeier before, but seeing them flying so close was amazing, they were massive. We watched them circle around us for a bit, wondered about lying down and playing dead to get an even closer look at them, but then they were gone. The walk back to camp along the Jyelo river was beautiful, with scattered Siberian larch and juniper bushes. The evening was cold, but the camp fire was hot and we watched stars and sputniks for a while before heading for bed.

17 August - Taldura valley

We drove up the Taldura river valley today. The valley was as beautiful as it was long and it took us over three hours to drive up it. There was some hay making lower in the valley, all cut by hand with scythe – hard work. As we went further up the valley, the track ended and we had to drive up the river bed, Thorsten and Axel negotiating the rocks and water well. We had lunch near the end of the terminal moraine with fine views of the glacier above us. After lunch we walked further up the valley and Rachel spotted an ibex half way up a mountain on the far side of the valley, just before it disappeared out of sight; fantastic to see that these animals, one of the main prey species of the snow leopard is in the area. As we neared the foot of the glacier, snow started to fall and it was time to head back for camp, so reluctantly we headed back to the cars. As Nina had joined us for the day, Amile had prepared dinner for us and had a great big pot of excellent soup waiting for us on our return; a great end to a great day.

18 August - Return to base camp

We had breakfast and packed up camp in the most beautiful morning. Ephemeral frost on the red and orange leaves of autumn glistened in the sun for a few minutes, and then was gone forever. We headed back to base camp via the scenic route..... To the west of the Chagan Uzun river, between Belter and Chagan Uzun village, are mountains that we have never explored before, so we drove through the middle of them by way of a quick reconnaissance to see if they were suitable for snow leopard and hence future survey work. The whole area was very heavily grazed and unsuitable for snow leopard, but on talking to a herder called Karan, we were told that there were ibex as well as argali in the area; Volodia instantly conjured up plans for a winter expedition to survey these animals :-). The landscape was very different from the craggy mountains we have become accustomed to in Altai, the mountains here were gentle and rolling with few rocky outcrops. As we neared Chagan Uzun, any bits of exposed ground glowed in the bright colours of the mineral rich land that is in places mined here for polymetallic ores.

We arrived back at base camp very tired and ready for a shower and bed, however, our work for the day was not done. The stream by base camp where we get our water had completely dried up, so I had to drive to another river and fill barrels with water from there. When we did eventually get our long dreamt of showers, they were sooo good :-)

19 August - Survey of Kojalu

This was quite simply a perfect day, surveying a wonderful mountain with a great team of people. The weather was warm and sunny. The views from the top went on for ever and we could see most of the part of Altai we had surveyed over the years; the Chichova mountains on the border with Mongolia, Cornie, Black Mountain near the border with Tuva, the Kurai ridge, across the Kosh Agach steppe to the proposed Silugem National Park, Irbestu – Snow Leopard valley and the wonderful snow covered Chuya mountain range. At our lunch stop, across the valley, on a very steep craggy slope, I saw three ibex – a long way off but great to see. Later, on descending the mountain, we saw a second group of ibex, this time eleven animals, only the second time I have seen two groups in one day. Then, Thorsten spotted another group of three ibex, probably the same group we had seen earlier in the day. Then..... Sergii spotted a single ibex; fantastic. The return to base camp along the valley was a little rough, but our welcome anything but. Marina and Melanie greeted us with slices of fresh melon that Rachel had bought, whilst Amile offered us a small glass of vodka; it's a hard life :-)

20 August 09 - Last day at base camp 2009

Rachel and Melanie went for a walk in the woods by base camp and found all manner of wonders including a wolf skull. Thorsten and Amile went hunting mushrooms and came back with a huge bag full that Thorsten prepared for dinner. Verena, Axel and Volodia drove to Kokoria and came back with a blanket full of ice-creams and yes, they won first prize in the foraging competition. Meantime, I checked and packed up all our equipment for the end of the expedition :-). A group of four little young stoats were exploring around Nina's kitchen tent, it was wonderful to see these inquisitive little animals racing around. Nina produced a fantastic cake for dinner and we shared a drink or two, with great company, into the evening.

21 August - Base Camp to Michelovo

Packed everything up and filled the Land Rovers with bags and boxes, the roof racks got the tables and benches. Left base camp for the last time, had one last ice-cream at Kosh Agach and started the long drive back to Novosibirsk.

22 August - Michelove to Novosibirsk

Drove the now all too familiar flat, straight road back to Novosibirsk for the last time to end Biosphere Expeditions' 2009 expedition to the Golden Mountains of Altai.

Many thanks to all team members for all the help and hard work. A very successful year; after 2008 where we found no sign of snow leopard, the sign we found this year and especially Nicky's sighting were fantastic. During slot 1 we finally made it back to the Chichova mountains on the Mongolia border after years of trying to get permission, that was quite an adventure. Slot 2 horse riding mini-expedition revealed a new area rich in wildlife and the slot 3 trip to Kara Gyem was paradise with many fantastic animal sightings. We have been looking for a new base camp for a couple of years and due to the work done during slot 4, I think we may have one (to be confirmed!), so that is excellent too.

Thanks again to everyone, we couldn't do this without your hard work and determination, I had a ball :-)

Andrew Stronach
Expedition Leader