



Mining and Snow leopard Conservation: Tost-Tosonbumba Mountains of Gurvantes Soum, South Gobi, Mongolia



Snow Leopard
Conservation Fund



Snow
Leopard
Trust

Snow Leopard Trust



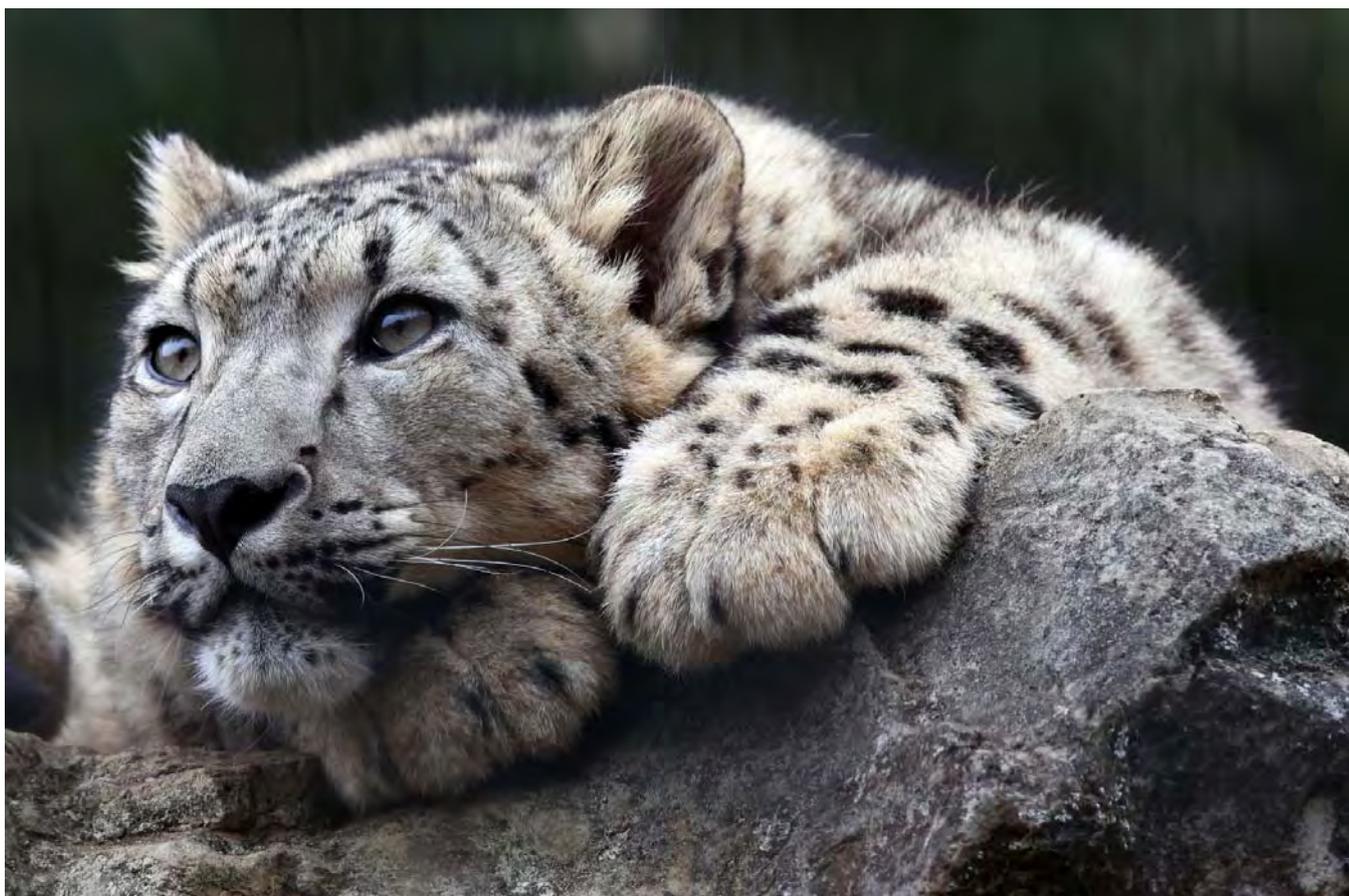
Panthera

Abstract

The Tost-Tosonbumba Mountains of South Gobi represent one of the most impressive habitats for the endangered snow leopard *Panthera uncia*, supporting amongst the highest population density of this rare cat reported so far from across its global range. A prestigious multi-institutional international research collaboration was initiated in Tost-Tosonbumba in 2008 with the establishment of a state of the art research station. Yet, lying outside any protected area, this important snow leopard population and its habitat face direct and urgent threats due to mining. Initiation of mining in the region would (i) severely impact an important snow leopard population and destroy much of its habitat, (ii) compromise the possibility of genetic exchange of snow leopards over a much larger landscape (iii) lay to waste ten years of effort with local communities that have involved improving livelihoods and seeking their co-operation in snow leopard conservation, and (iv) squander the opportunity for Mongolia to continue a prestigious, one of a kind, long-term international collaborative program on snow leopard research. It is critical that mining licenses in snow leopard habitats of the region be immediately revoked, and the local communities be supported in their efforts to develop Tost-Tosonbumba Mountains into a local protected area.



The issue



The endangered snow leopard *Panthera uncia*, one of Mongolia's – and indeed the entire world's – natural treasures faces serious problems for its continued survival. Today, mining threatens one of the highest density snow leopard populations known anywhere in the world: the one inhabiting the Tost-Tosonbumba Mountains of South Gobi. Initiation of mining in snow leopard habitat of Tost-Tosonbumba will reverse the impressive gains the country has made in the conservation of this species of global conservation concern. This report describes this urgent threat, and emphasizes the need for the Government and the mining industry to join hands with conservationists and local communities to develop Tost-Tosonbumba Mountains into a local protected area for snow leopards and associated biodiversity.

The snow leopard

The snow leopard is a magnificent predator in one of the last, great wilderness regions on earth – the spectacular mountain ranges of Central Asia. Yet, the species faces threats that are pushing it to extinction, including poaching, habitat loss, and retribution killing by herders. The cat is listed as Endangered on the World Conservation Union (IUCN) Red List of Threatened Species. Additionally, it is listed in Appendix 1 of CITES. Current estimates suggest that as few as 3,500 snow leopards may exist in the wild and their continued existence is precarious. Conserving the snow leopard is further complicated by the fact that sizeable and important populations of the species occur outside Protected Areas, and survive in a habitat that is also used by pastoral and agro-pastoral communities.

Snow leopard conservation extends beyond the context of saving just one species: protecting snow leopards affords protection to other predators and prey species (many of which are likewise threatened or endangered), and to their habitat and the biodiversity associated with it. Additionally, managing and monitoring all aspects of biodiversity is difficult and hence managers tend to concentrate on focal species such as the snow leopard that can guide conservation efforts for the area.

The entire global conservation community is deeply concerned about the survival of the snow leopard. International organizations such as the Snow Leopard Trust (www.snowleopard.org), and global alliances such as the Snow Leopard Network (www.snowleopardnetwork.org) have been established with the sole purpose of ensuring the continued survival of this magnificent cat. Most national governments in the snow leopard's range have accorded this species with the highest level of protection under their respective laws.



Fig. 1 Snow leopard is one of the world's most elusive cats.

Snow leopard in Mongolia

After China, Mongolia is amongst the most important snow leopard range states with estimates ranging from 800-1700 individuals, which is 25% of their total wild population on earth. Within Mongolia, South Gobi, Central Transaltai and Northern Altai are believed to be the most important regions for the snow leopard. The species is accorded very high protection under Mongolian law: hunting is strictly prohibited, and possessing or trading snow leopard parts is illegal.



Fig. 2 Global snow leopard distribution.



Fig. 3 Snow leopard in South Gobi, Mongolia.

South Gobi

South Gobi is amongst the most important regions for snow leopards in Mongolia. It is the largest but least populated *aimag* (state) in Mongolia, with a human population density of only 0.3 people per km² and a relatively high density of snow leopards (McCarthy, 2000).

The Gurvantes *Soum* of South Gobi has a total human population of 3,400 with a livestock population of 90,700 (including camels, horses, sheep and goats). The area receives an average annual precipitation of only 130 mm a year. During summer, temperatures reach 38°C whereas in the winter, temperatures drop to -35°C.

The Tost-Tosobumba Mountains (100°36'E, 43°11'N, Fig. 4) of South Gobi represent a very important habitat for the snow leopard. The Tost and Tosonbumba Mountains are within 25 km of the Gobi Gurvansaikhan (Three Beauties) National Park. Although not legally protected for conservation, snow leopard population thrives in the region. In addition, the area supports a diverse range of large mammals including Siberian ibex (*Capra sibirica*) and argali (*Ovis ammon*), the former presumably being the primary prey of snow leopards in this region because of their greater abundance. Carnivores other than the snow leopard are grey wolf (*Canis lupus*), lynx (*Lynx lynx*), red fox (*Vulpes vulpes*) and Corsac fox (*Vulpes corsac*).

Small mammals found in the region include the South Gobi jerboa (*Allactaga nataliae*), Siberian jerboa (*Allactaga sibirica*), Northern three-toed jerboa (*Dipus sagitta*), Dwarf fat-tailed jerboa (*Pygeretmus pumilio*), Royle's mountain vole (*Alticola argentatus*),



Fig. 4 Location of Tost Mountains within Mongolia.

Great gerbil (*Rhombomys opimus*), Daurian pika (*Ochotona daurica*), Pallas pika (*Ochotona pallasi*), Tolai hare (*Lepus tolai*), Long-eared hedgehog (*Erinaceus auritus*), Alaschan souslik or ground squirrel (*Citellus alaschanicus*) and Long-tailed hamster (*Cricetulus longicaudatus*). Important avian predators include the Golden eagle (*Aquila chrysaetos*), the Lammergeier (*Gypaetus barbatus*) and the Saker falcon (*Falco cherrug*).

Tost and Tosonbumba Mountains are not only important for snow leopard and biodiversity conservation, but are also home to 233 herder families with a total livestock holding of approximately 40,000 animals, comprised of goats, sheep, camels and horses. The Snow Leopard Conservation Fund (SLCF) and Snow Leopard Trust (SLT) have a long term collaboration for snow leopard conservation and have been working since 2000 in the area. Two community based conservation programs are active here, involving 72 families. The programs focus on providing sustainable cash income for herder households who live in snow leopard habitat and in return herder groups and communities commit not to killing snow leopard and their prey in the area. One of the programs called Snow Leopard Enterprises has been active in the area for almost 10 years, offering income



Fig. 5 Ibex are the primary prey species in South Gobi.



Fig. 6 Argali are less abundant but important prey species.

generation opportunities for herders while enhancing their capacity to process their livestock raw materials. Handicrafts are produced and sold in the USA and Mongolia. From this program nationwide, herders make about 30 million tugriks annually. In Gurvantes alone, herders have earned a total of 19,698,650 Tugriks in the last 10 years. This program has the attention of hundreds of conservation organizations and foundations internationally, including more than 65 Zoological Parks throughout Europe and the US for its success in increasing the livelihoods of herders while conserving snow leopard and their habitat.

In addition, a community based livestock insurance program has been initiated with local herders beginning in 2009. This program allows villagers to manage their own insurance funding in order to compensate participants for animals lost to predation by wolf or snow leopards.

Both programs have a positive response from herders, give herders a direct voice in how the programs are managed, and focus on increasing the livelihoods of local people while protecting snow leopards and biodiversity. Years of collaborative effort are creating a positive atmosphere and attitude for long-term conservation of the snow leopard in the Tost-Tosonbumba Mountains. In fact, the local communities themselves have recently come forward and expressed a keen interest to set up a local protected area in the region.



Fig. 7 The local communities largely rely upon livestock for livelihood.

International snow leopard research program in Tost-Tosonbumba, South Gobi

A thorough understanding of the species' ecology, behaviour and habitat requirements is needed to design and implement effective conservation programs, and this information can only be gained through sound scientific investigation. Snow leopards are highly cryptic and occupy remote inaccessible habitats. Despite studies dating back to the early 1980s in other parts of Central Asia, most questions regarding the basic life history of snow leopards have remained unanswered. No information exists on basic population parameters such as birth and mortality rates, cub survival, or dispersal rates for snow leopards in the wild. Although two long-term studies of snow leopards using VHF radio collars were undertaken in Nepal (1980s) and Mongolia (1990s), logistical and technological constraints made the findings of both studies equivocal. Thus, essential knowledge on habitat use, home-range size, activity patterns, and daily or seasonal movements was deficient and sometimes conflicting.

In a unique international initiative, several Mongolian and International organizations recently joined hands to start the first ever comprehensive research program on snow leopards in Mongolia (Table 1). After surveying and gathering information on several potential sites, the Tost-Tosonbumba Mountains were chosen to locate this initiative, due to the high density of snow leopards and the conservation importance of this site, even though it was located outside any protected area.

The Ministry of Nature and Environment, Government of Mongolia, partnered in this

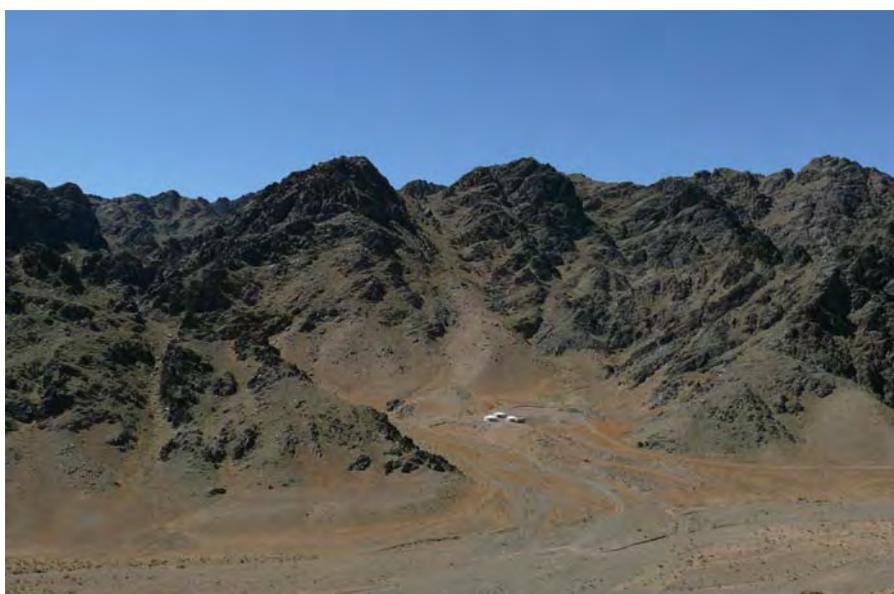


Fig. 8 Snow leopard habitat in South Gobi.



initiative. A research station with state of the art research equipment was established in 2008 in the Tost Mountains (43.1767°N & 100.602°E, Fig. 9), near the *bag* centre about 35 km west of Gurvantes town. As the first long-term study of snow leopards, their prey and habitat the study is expected to last at least 15 years; a first of its kind ever attempted on the snow leopard. In the past two years, scientists, volunteers and students from 8 countries have visited the research centre and assisted in different aspects of research data collection. A Mongolian student is completing her M.Sc. thesis based on work undertaken under the auspices of this program and a second Mongolian student has just initiated her M.Sc. work. A Swedish Ph.D. student is currently conducting his fieldwork. The research has associated with over 18 institutions from six countries. Eight snow leopards have been collared so far using state of the art GPS collars equipped with satellite phone communication for the purpose of understanding their ecology. These collars have provided useful preliminary information about the home ranges, habitat use and dispersal.

In 2008 and 2009, extensive camera trapping was conducted in the Tost and Tosonbumba Mountains using automatic infrared cameras to obtain snow leopard population estimates. Breeding females with cubs have been observed in the photos, in addition to several adult males. We estimate that between 9 and 16 adult snow leopards and at least 6 cubs call this

Table. 1 Current collaborators, donors and supporters of the long-term snow leopard research program in Tost-Tosonbumba Mountains, South Gobi, Mongolia..

Partners

Snow Leopard Trust (USA)
 Panthera (USA)
 Snow Leopard Conservation Fund (Mongolia)
 Mongolian Ministry of Nature, Environment and Tourism (Mongolia)
 Mongolian Academy of Sciences (Mongolia)
 Mongolian State University of Agriculture (Mongolia)

Donors:

Felidae Conservation Fund (USA)
 Kolmarden Zoo (Sweden)
 David Shepherd Wildlife Foundation (UK)
 Association of Zoos and Aquariums (USA)
 Cat Life and Research Foundation (USA)
 Columbus Zoo (USA)

Associated Institutes:

American Natural History Museum (USA)
 Grimsö Wildlife Research Station (Sweden)
 Swedish University of Agricultural Sciences (Sweden)
 Laboratoire d'Ecologie Alpine (France)
 University of Veterinary Medicine - Vienna (Austria)
 Woodland Park Zoo (USA)
 Cheyenne Mountain Zoo (USA)
 Zoo Doue (France)

area home, making it **one of the most productive and densely populated sites in all of the species' 12- country range, despite the absence of a legal protected area status.**

As part of the ongoing research program in 2010, collaring of up to 10 snow leopards is proposed. Camera trapping exercise will be repeated along with site occupancy surveys to refine the methodology of the latter for cost effective monitoring of snow leopard populations across large landscapes. Habitat surveys will be done in landscapes with dominant human and wildlife use to understand the resource use and overlap between herders and wildlife. A separate study is also planned to investigate the socio-economic and cultural factors influencing the trapping of wolves in the region, which occasionally injure or kill snow leopards accidentally. The program is expected to grow considerably with several other international and national institutions (such as the National University of Mongolia) expected to join hands shortly.

The preliminary results from radio-collaring studies reveal that territorial males have home ranges of at least 250-300 km² and their movements interface with the human settlements in the area (Fig. 10). It is worth noting that all of the collared snow leopards have shown tendencies to make expeditions out of their territories, ranging up to as many as 40-50 km, making it important to have a large secure buffer areas even outside their core home ranges.



Fig. 9 Locations of Base camp, Gurvantes and the Tost Baag Centre.

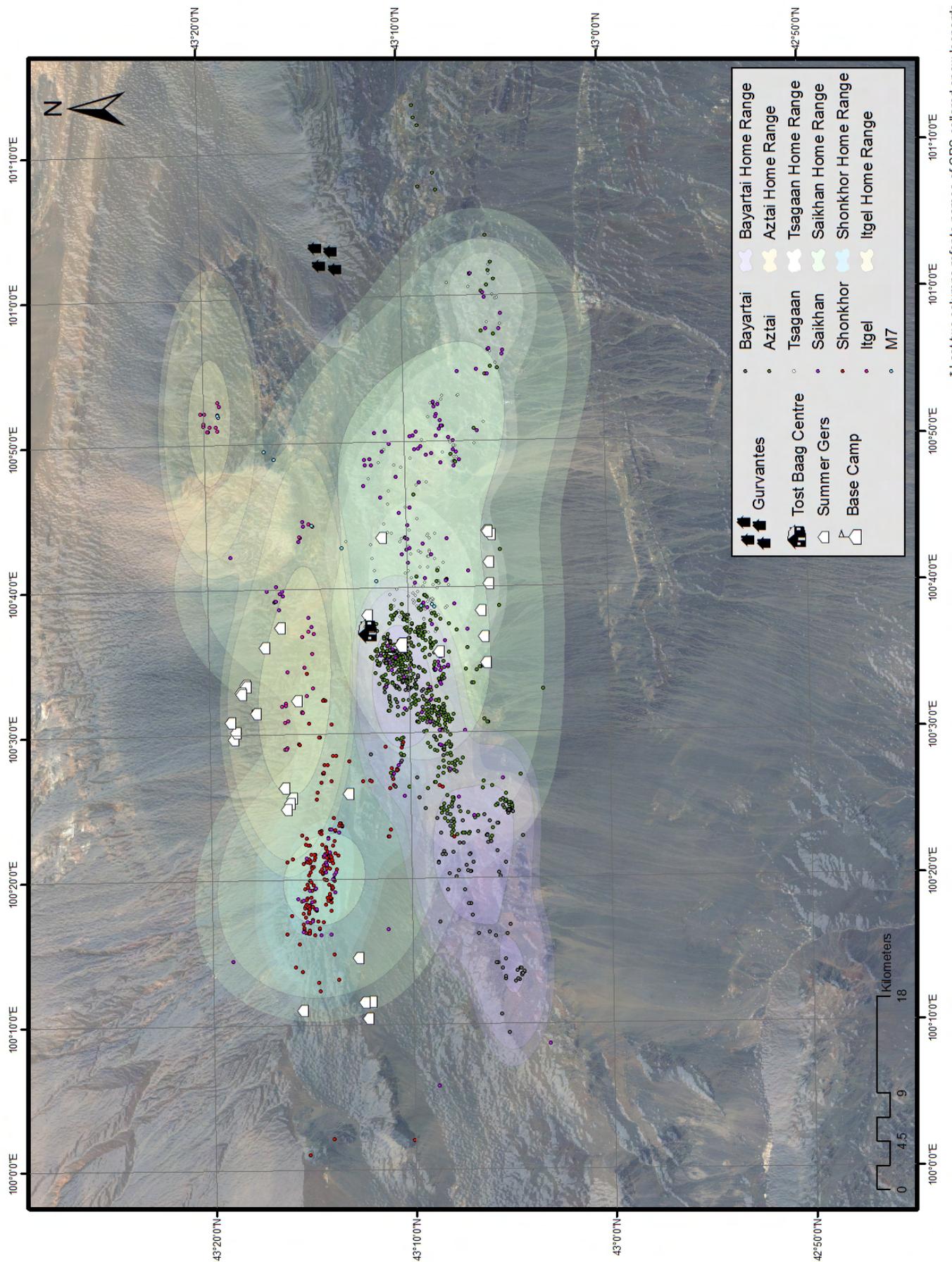


Fig. 10 Preliminary home-ranges of 7 out of 8 collared snow leopards in South Gobi.

Mining and snow leopards

Mongolia is rich in mineral deposits, particularly copper, gold, coal, molybdenum, fluorspar, uranium, tin, and tungsten. Mining already accounts for a large part of foreign direct investment and government revenues in Mongolia. Mining has the potential to bring enormous benefits to the country, increasing its potential for development and improving the livelihoods of citizens, through better infrastructure, social services, educational opportunities and employment. If properly managed, environmental protection benefits can be achieved by minimizing negative consequences on natural ecosystems, landscapes and traditions of Mongolia.

At the same time, however, mining has the potential to cause large scale environmental damage, pollution and disturbances to local peoples' grazing and land use needs, and to wildlife, causing losses in habitat and threatening the already fragile desert ecosystems. Open pit mines, blasting, large vehicle



Fig. 11 One of the landscapes where mining lease have been issued in the Tost Mountains..

movements, railroads, water use and increases in human populations needed for workers, are all potential threats to wildlife and desert ecosystem stability. Local herder families who have been using the area for many generations will be potentially overwhelmed and stressed due to negative social pressures that come with large-scale human migration to the area. In many areas, herders are particularly worried about losing their traditional pasture to mining interests.

Mining in South Gobi Aimag and Gurvantes Soum

The Gobi region is distinguished by the fact that it is home to large mineral deposits as Tavan Tolgoi, Naryn Sukhait, Oyu Tolgoi and Tsagaan Suvarga which are earmarked as important strategic deposits.

As of October 2009, South Gobi province accounted for 12% (560) of the total licenses (4521) that have been issued so far, according to the Cadastral department of Geology and Mining at the Mineral Resources Authority. This distinguishes the province as having the most licenses issued for mining. Out of 560 licenses in South Gobi, Gurvantes *Soum* holds 92 licenses or 16% of total licenses in South Gobi.

A map depicting current licenses as of March 2010 was obtained from the Cadastral department of Geology and Mining at the Mineral Resources Authority (Fig 12). According to the information 92 licenses have been issued in Gurvantes *Soum* to 52 companies. This shows that almost all land other than Gobi Gurvan Saikhan National park in Gurvantes falls under current mining licenses. However, as shown in the map below, the majority of the current licenses have been issued for exploration.

Mining and snow leopards

As mentioned earlier, the Tost-Tosonbumba Mountains represent a very important site for snow leopard conservation and a prestigious international collaborative program involving the MNE, SLT, Panthera and several other institutions has been started here (Table 1). The region harbours a high density of snow leopards, and the local community is very supportive of snow leopard conservation.

Falling outside the boundaries of any protected area, most of the Tost-Tosonbumba region has been given under exploring licenses for mining. This poses a very urgent and serious threat to the globally important population of the endangered snow leopard inhabiting this area. Also under threat is the entire biodiversity of the region, the local way of life, and the spirit of co-operation that local communities have shown for snow leopard protection.

In Fig.13 we have overlaid the map of snow leopard occupancy with the mining license map of Gurbantes. As is clear from the map, mining poses an immediate and direct threat to the snow leopard and its habitat. It not only interferes with the good snow leopard habitats, but also poses threat to the snow leopards over a much larger landscape by potentially compromising dispersal and genetic exchange.

Initiation of mining activities in the Tost-Tosonbumba region would therefore (i) severely impact an

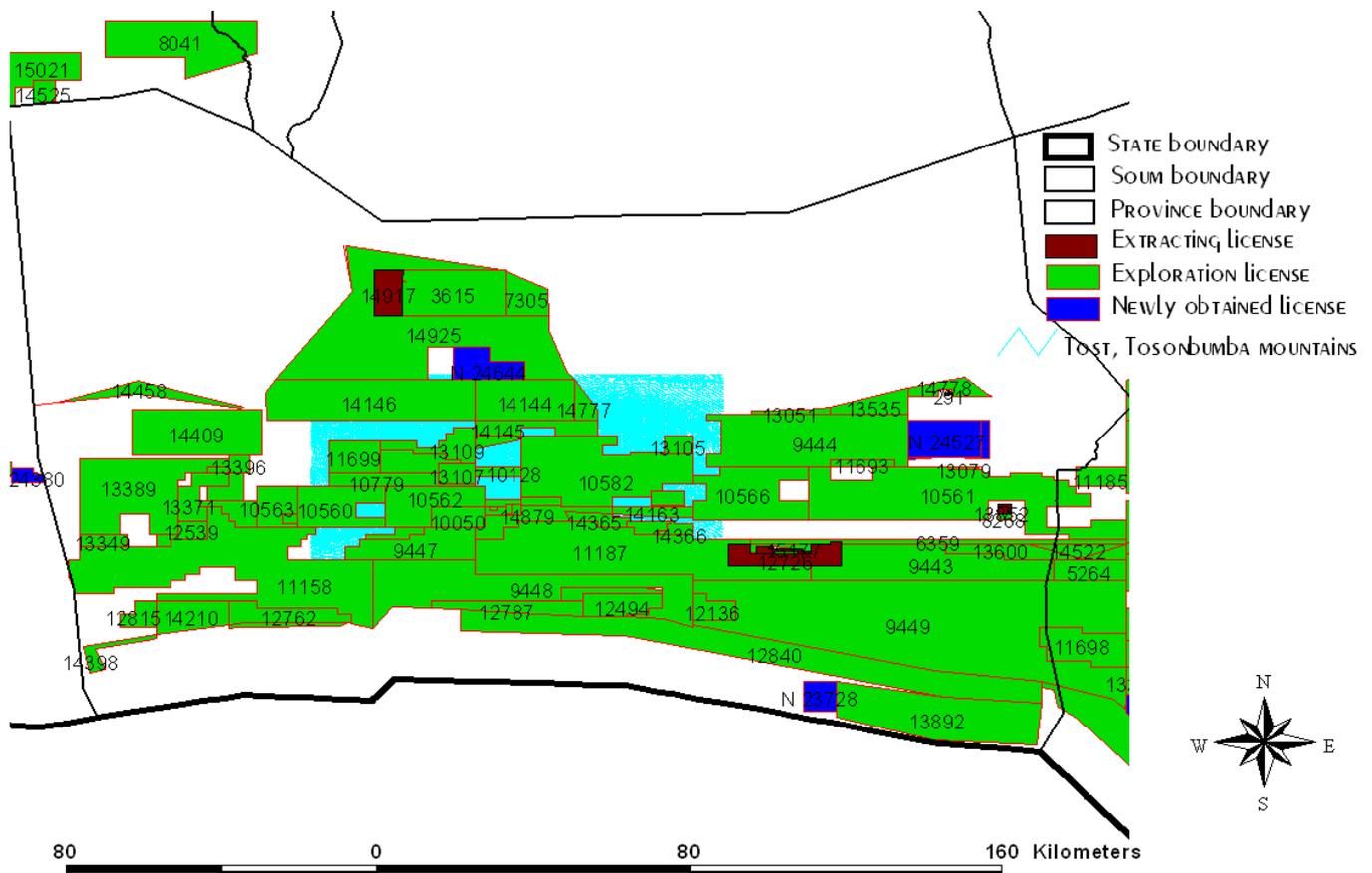


Fig. 12 Map of mining licenses in and around South Gobi for exploration and extraction.

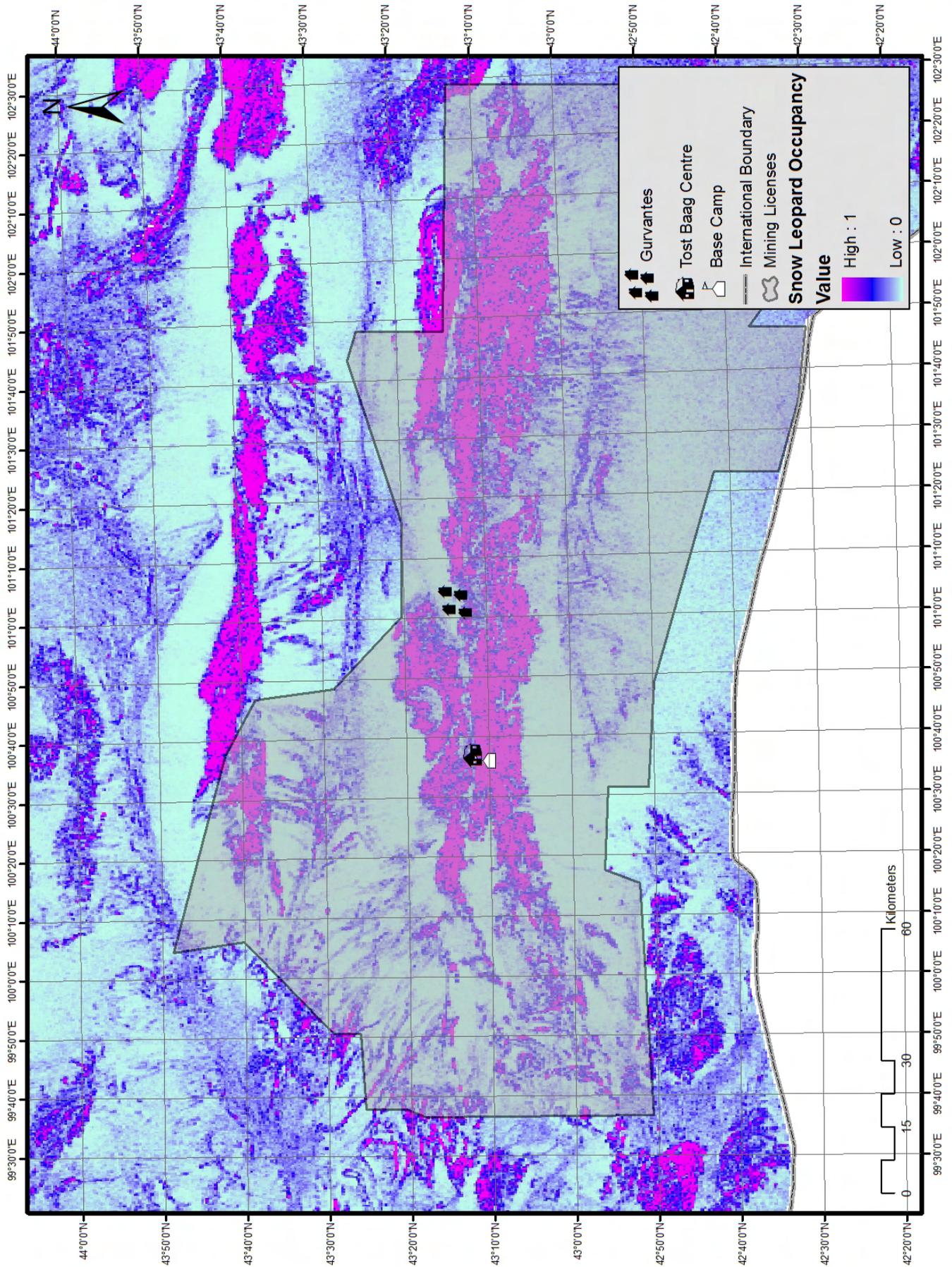


Fig. 13 Map depicting areas with high snow leopard occupancy (based on surveys conducted in 2008) overlaid on that of the mining licenses.

important snow leopard population and destroy much of its habitat, (ii) compromise the possibility of genetic exchange of snow leopards over a much larger landscape (iii) lay to waste ten years of effort with local communities that have involved improving livelihoods and seeking their co-operation in snow leopard conservation, and (iv) squander the opportunity for Mongolia to continue a prestigious, one of a kind, long-term international collaborative program on snow leopard research.

Creating a strong, well-informed mining strategy integrated with a strong, sustainable environmental protection plan are necessary to enhance the long-term economic opportunities from mining, tourism, livestock production and other future endeavors.

Over the shorter term, it is extremely critical to undertake the following steps:

Revoke the mining licenses in the Tost-Tosonbumba Mountains and an appropriate buffer around it. Since most of the current licenses are exploratory, and there are no active mines, this will not compromise any major financial investments.

Assist local communities and the local government in setting up a local protected area.

Encourage participation of mining companies active in Gurvantes *Soum* in supporting the protected area and conservation efforts in Tost-Tosonbumba.

