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Wildlife and local community investigation in trans-boundary area between China-Mongolia borders

Yang Weikang, Xu Wenxuan, Xia Canjun, Liu Wei & Gao Xingyi

Abstract

During June 2008, and August and December 2010, we investigated both the status of wildlife and local human communities in the great Gobi trans-boundary area between China and Mongolia. We surveyed Baytik Mountain (called Baitag Bogdt on the Mongolian side of the border)(44°59' - 45°21'N, 90°30' - 90°53'E), which is located in the West of Great Gobi B strict protected area (GGB) and connected with Dzungarian Gobi. The Kazakh shepherds still maintain their nomadic life here in Baytik Mountains. The region was divided into summer, winter and transitional pasture, and most of the livestock were goats and sheep. We also surveyed Haftik Mountain, which is connected to GGB. The region is used as winter pasture by Kazakh shepherds, which belong to Mori and Qitai counties. They drive their livestock over several months to reach the region and spend here the winter time, and leaving the region to go back to south in spring year by year. By interview with local shepherds, we got information that the population number of khulan and Goitered gazelle decreased sharply since the building of the enclosure in Baytik Mountain region. Ibex is numerous and we counted totally 64 ibexes (14 herds) in one afternoon in one valley on the mountain ridge, which is less than 20 km long. In Haftik Mountain range, we counted 50 Goitered gazelle (12 herds), 45 ibexes (12 herds), 15 argali sheep (2 herds) and over 54 khulans (6 herds) in one week by car. Totally we investigated 15 Kazakh families in Baytik Mountain area. The local people in Baytik Mountain Pasture belong to Xinjiang Production and Construction Corps (XPCC). Since 2003, the government has built a lot of enclosures in this area to protect and improve the grassland ecosystem. These enclosures work as a constant trap for ungulates and are a source of mortality for a lot of them. Since 1995, fences have been built along the Chinese-Mongolian border. The khulans inside the border zone are obviously a migrating population, and they cross the border through the foothills of the mountain ridge, where fences were not built over rugged terrain. Apparently these corridors are used for migrations. It is obvious that the border fences stopped the regularly migration of khulans. Usually, the schools, clinics, markets and the veterinary services were concentrated in some big settlements in Baytik Mountain Pasture. Basically, all children of the local Kazakh people get bilingual (Chinese and Kazakh language) education at school. The local shepherds have to face the following difficulties: (1) Sustained growth of population in the face of limited pasture; (2) people were encouraged by the government to begin a sedentary living, but they haven't any necessary basic knowledge of farming and cultivation of agricultural land; (3) infrastructure for the education of the children is absent and there are not enough teachers in shepherds settlement; (4) people's income is based only on lambs-sale and cannot afford the daily life expenses. This exclusive income source also makes their ability to fight against calamities very weak.

Key words: wildlife, community, Great Gobi, shepherds, living conditions, natural conservation

Overview of survey area

The area is located in northeastern Xinjiang, China. It involves Baytik Mountain, little Haftik mountain, big Haftik Mountain, Huhondelay Mountain and their alluvial fan. The total area is around 11700 km². The mountains are part of the Altai Mts., and they are the ecotone zone between

boreal forest-steppe and central Asian desert. The highest peak of Baytik Mountain is 3290 m, the average altitude is 1600 m. The eastern part of the area comprises little and big Haftik Mountains with an average altitude from 1200 m to 1900 m. The altitude of alluvial fan is 500 m to 1300 m. The annual precipitation of the western part of the area is 100 ~ 200 mm, relatively higher than the eastern part (50 - 100 mm). The average temperature in January is between -12.5 °C and -15 °C, and 18 °C - 23 °C in July. There is no perennial river in the survey area, only intermittent rivers and streams could be seen, springs are the major water source in this area (GAO et al. 2002).

The vegetation zones of Baytik Mt. can be divided into 5 types: desert, desert grassland, mountain shrub steppe, alpine steppe and alpine meadow (LOU 1995), while the little and big Haftik Mountain show only 2 vegetation zones: desert and desert grassland. There are some small areas of coniferous forest (fig. 1) in the west slope of Baytik Mt. (GAO et al. 2002). The desert is mainly located in the foot hills of the mountains and the alluvial fans. The dominant species of plants in this area include: *Ephedra przewalskii*, *Anabasis brevifolia*, *Ceratoides latens*, *Zygophyllum xanthoxylon*, *Reaumuria soongorica*, *Haloxylon ammodendron*, *Nitraria sphaerocarpha*, and *Convolvulus tragacanthoides*.

Dominated by the small shrubs and bunch grasses, the desert grassland is mainly located at the belt with an altitude between 1400 m and 1800 m. The constructive species and dominant species are *Stipa capillata*, *Stipa glareosa*, *Stipa gobica*, *Festuca sulcata*, *Artemisia gracilescens*, *Salsola laricifolia*, *Kaschgaria komarovii*, *Ephedra innermedia*, *Anabasis brevifolia*, *Caragana microphylla*, *Spiraea hypericifolia* etc.

Mountain shrub- steppe plant communities are found at a belt with an altitude between 1800 m and 2100 m. The community structure can be divided into 2 layers: shrub layer and herb layer. The dominant species of the shrub layer are *Spiraea hypericifolia*, *Anabasis brevifolia* etc; the dominate species of the herb layer are *Stipa capillata*, *Festuca sulcata* etc.

The alpine grassland mainly located at the belt with the altitude between 2100 m and 3000 m. The dominant species are *Stipa capillata*, *Festuca sulcata*, *Artemisia frigida*, *Ajania fruticulosa*, *Oxytropis spec.*, *Astragalus spec.*

The alpine meadow is situated on the top of the mountain with an altitude higher than 3000 m and the dominant species are cold-resistance plants, such as *Kobresia bellardii* and *Kobresia capillifolia* and others.

This area was the last habitat of the Wild horse (*Equus ferus przewalskii*) and Saiga (*Saiga tatarica*) in China, and is located between two important nature reserves: Kalamaili Nature Reserve (China) and Great Gobi B (Mongolia). Some rare species live in this area, such as argali (*Ovis ammon*), Sibirian ibex (*Capra sibirica*), khulan (*Equus hemionus hemionus*), Goitered gazelle (*Gazella subgutturosa*) etc. (GAO 2002).

The Kazakh people still maintain their nomadic life and divide this area into summer pasture, winter pasture and transitional pasture; most of their livestock are goats and sheep. Local people in Baytik Mountain Pasture belong to Xinjiang Production and Construction Corps (XPCC). There are schools, clinics, market and veterinary service in the settlements.

Materials and Methods

There were 10 people in our investigation team, including 9 from the research staff of the Xinjiang Institute of Ecology and Geography, Chinese Academy of Sciences; and one guide (Kazakh) from local Forestry Police Station. We choose the hidden valley to set our camp. Two cars were used for this investigation: one pick-up was used for the logistics and a Toyota land cruiser was used for daily surveys.



Fig. 1: The coniferous forest in Baytik Mountains.

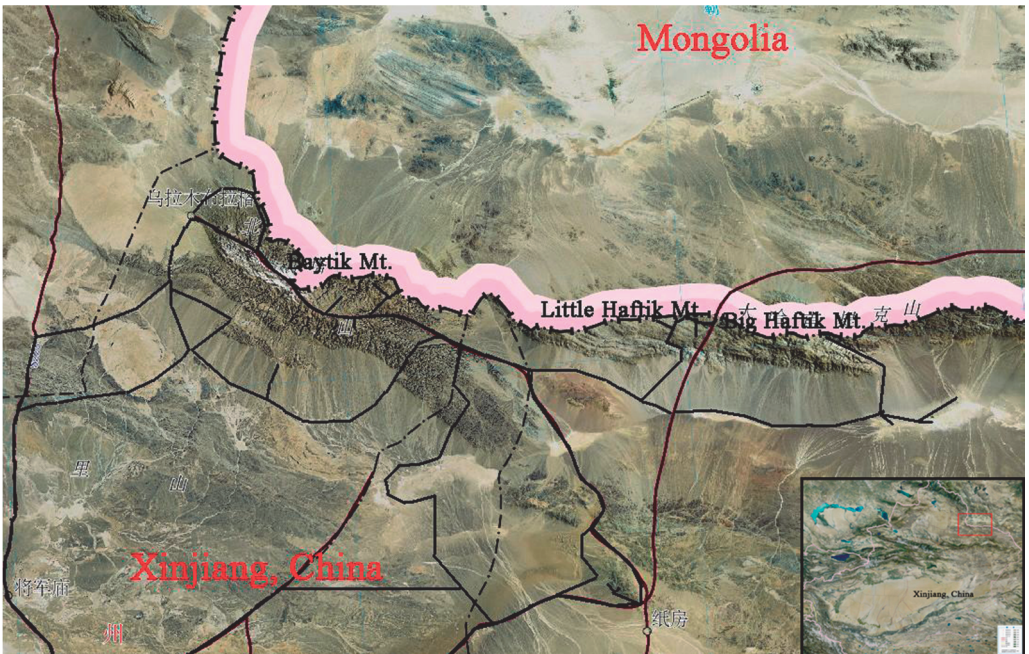


Fig. 2: Survey tracts in the observation area (black lines showed the survey routes).

The point transect method was used to record the species and their number by driving the car with low speed (max. 30 km/h). Some transects were gone by foot, because no horses were available. All observed animals were counted and their location recorded together with their distance from the car. The top of the Baytik Mt. was relatively flat, and used as summer pasture by local Kazakh people. So the major task in Baytik Mt. was the community survey by interviewing local people. The interviews include asks on distribution and living conditions of wild animals, the effect of human activities (such as enclosure) on the wild animals, nationalities, populations, social and economic conditions etc.

Table 1: Wildlife record in 2008

species	date	time	coordinates	area	n	remarks
Khulan	04.07.08	12:46	N44°58.472' E91°39.239'	Haftik Mt.	1	af, d
			N44°58.472' E91°39.239'		1	af, d
		13:01	N44°57.978' E91°42.094'		21	af, d
		20:30	N45°00.350' E91°50.288'		3	v, ws
	05.07.08	18:38	N45°02.266' E91°48.915'		2	v, dg
		19:07	N45°02.430' E91°50.678'		2	v, dg
	06.07.08	7:40	N45°02.457' E91°46.255'		1	v, dg
		9:22	N45°03.821' E91°46.973'		1	v, dg
	07.07.08	6:00	N45°00.350' E91°50.288'		2	v, ws
		19:09	N44°59.400' E92°27.120'		3	v, dg
Goitered gazelle	03.07.08	13:23	N45°08.08' E90°38.96'	Baytik Mt.	3	af, dg
		21:05	N44°53.267' E91°08.252'	Haftik Mt.	2	af, d
			N44°53.267' E91°08.252'		14	af, d
	05.07.08	7:55	N44°58.856' E91°51.279'		6	af, d
		10:36	N44°50.749' E92°08.411'		1	af, d
		10:44	N44°50.68' E92°10.407'		2	af, d
Argali	06.07.08	18:34	N45°04.787' E91°50.895'		Haftik Mt.	3
Ibex	04.07.08	20:30	N45°00.350' E91°50.268'	Haftik Mt.	1	mr, dg
	05.06.08	19:34	N45°02.691' E91°51.470'		1	mr, dg
		20:51	N45°02.303' E91°51.663'		2	mr, dg
	06.07.08	10:11	N45°03.609' E91°52.136'		1	mr, dg
		10:42	N45°04.316' E91°57.294'		6	mr, dg
		19:00	N45°03.886' E91°58.169'		1	mr, dg
			N45°03.886' E91°58.169'		1	mr, dg
		20:41	N45°04.531' E91°55.135'		2	mr, dg
		21:22	N45°00.777' E91°49.463'		1	mr, dg
	07.07.08	20:03	N45°06.000' E92°24.700'		1	mr, dg

f = alluvial fan
v = valley

d = desert
ws = water spring

dg = desert grassland

mr = mountain ridge

Results

Wildlife in Baytik Mountain

In Baytik Mt., the mountain shrub grassland, alpine steppe and alpine meadow were used as summer pasture by the local Kazakh herdsman. Most of their livestock were goats and sheep, the grazing disturbance is very strong. Wild mammals such as argali, Siberian ibex, khulan, Goitered gazelle, snow leopard and wolf are distributed here and in the desert in its fringe region (GAO 2002). During survey we did not find any argali, snow leopard, or wolf. However, local Kazakh people insisted that these species are living here. XU et al. (2007) believe that snow leopards are distributed in Baytik Mt. according to the traces they found.

In totally, we have interviewed 15 Kazakh families in Baytik Mt. area, and got information that the population number of Khulan and Goitered gazelle decreased sharply since the building of enclosures. In addition, the snow storm in winter 2009 also killed a lot of wildlife. During our transect survey, only ibex was found in the eastern part of Baytik Mt., which was used as winter pasture by local people. We counted there 64 ibexes (14 herds) just in one valley (< 20 km long) on the mountain ridge during August 2010 (table 2).

Discussion

Goitered gazelle (*Gazella subgutturosa*)

The Goitered gazelle (*Gazella subgutturosa*) is the most common ungulate species in the survey area. Chinese scientists have distinguished four subspecies of Goitered gazelle and all of them are found in Xinjiang: *G. s. sairensis* in Junggar basin, Tacheng basin and its adjacent areas; *G. s. hillieriana* in eastern Xinjiang and its neighbouring areas; *G. s. yarkandensis* in Tarim basin and Turpan; and *G. s. reginae* in Kunlun and Arjin Mountains (GAO et al. 1996, JIANG 1998). During the early 1990s, the population density of *G. s. sairensis* in the Junggar basin was 0.71 ± 0.17 individuals/km² (GAO et al. 1996); in the mid-1990s, the density had increased to 0.80 ± 0.24 individuals/km² (GAO et al. 1997).

Since 2003 the government has built a lot of enclosures in this area to protect the grassland from overgrazing. These enclosures were constructed with good intentions, and produced a very bad result. The large enclosures are divided into many smaller ones with barbed wire on the top of the fences. With a limited number of gates, these enclosures are like labyrinths, and severely limit the freedom of movement of wild ungulates, threaten their migrations to pastures, breeding areas, and water sources, and prevent the ungulates from escaping their natural enemies. This human infringement can result in habitat fragmentation and divide the ungulates' distribution range into many small isolated island habitats. In turn, this can have strong influences on the large and middle-sized mammals' extinction.

These enclosures worked as a constant trap for gazelles, and as a result, the gazelle population decreased considerably since 2003; and the snowstorm in winter 2009 was another hard blow to the gazelle population. We found a drastic decrease in gazelle numbers in this area. During the survey in Haftik Mountain, we see the dead body of young argali that was trapped by the border fence. This shows that the border fence can be a threat for wild ungulates.

Khulan (*Equus hemionus hemionus*)

Khulan (*Equus hemionus hemionus*) has been listed as rare in the Chinese Red Data Book of endangered animals, and classified as a Category I of protected species. *E. hemionus* has also been included in the Appendix I of CITES and listed as endangered by IUCN. Early reports documented that the population number of the Asian wild ass in China was not more than 2,000 individuals (GAO & GU 1989).

Later information affirmed that the distribution area of the khulan in the Kalamaili Nature Reserve (KNR) was 2,300 km², with a mean density of 1.2 ± 0.49 individuals/km². The size of the population ranged from 1,633 to 3,887 individuals (XU et al. 1997).

Table 2: Wildlife recorded in 2010

species	date	time	coordinates	area	no.	remarks		
Khulan	02.11.10	9:28	N45°02.234' E91°48.828'	Haftik Mt.	13	v, dg		
	02.11.10	11:38	N45°02.472' E91°46.282'		>30	sb, dg		
	03.11.10	9:37	N45°02.534' E91°51.036'		2	v, dg		
		12:11	N45°00.348' E91°50.265'		1			
	04.11.10	9:39	N45°00.386' E91°50.040'		7	v, dg		
Goitered gazelle	01.11.10	17:09	N45°01.282' E91°26.117'	Haftik Mt.	4	af, d		
		17:20	N44°58.960' E91°34.176'		4	af, d		
		17:24	N44°59.002' E91°35.402'		3	af, d		
		17:34	N44°56.845' E91°46.991'		4	af, d		
		17:36	N44°56.308' E91°49.228'		10	af, d		
	03.11.10	16:35	N44°49.412' E92°25.810'		4	af, d		
		16:37	N44°49.469' E92°26.321'		2	af, d		
		16:45	N44°50.257' E92°32.492'		2	af, d		
	05.11.10	13:52	N44°32.082' E91°35.984'		5	af, d		
	Argali	02.11.10	11:47		N45°02.062' E91°45.185'	Haftik Mt.	5	sb, dg
		03.11.10	9:52		N45°00.446' E91°49.619'		10	mr, d
Ibex	20.08.10	11:45	N45°09.645' E91°07.675'	Baytik Mt.	2	mr, dg		
		13:08	N45°07.926' E91°06.886'		7	mr, dg		
		19:48	N45°07.368' E91°07.757'		5	mr, dg		
		20:02	N45°07.370' E91°07.758'		4	mr, dg		
		20:09	N45°07.133' E91°08.372'		1	mr, dg		
		20:12	N45°06.991' E91°08.635'		2	mr, dg		
		20:14	N45°06.779' E91°09.145'		3	mr, dg		
		20:45	N45°06.839' E91°08.990'		3	mr, dg		
		20:51	N45°07.428' E91°07.696'		1	mr, dg		
		21:01	N45°07.502' E91°07.599'		8	mr, dg		
		21:02	N45°07.528' E91°07.561'		9	mr, dg		
	21:02	N45°07.528' E91°07.561'	12	ms, d				
	21.08.10	10:27	N45°05.909' E91°11.613'	4	mr, d			
	02.11.10	11:47	N45°02.062' E91°45.185'	Haftik Mt.	4	sb, dg		
		13:40	N45°01.908' E91°49.133'		13	ms, d		
		15:55	N45°02.441' E91°49.821'		2	mr, d		
		16:08	N45°02.529' E91°50.982'		1	mr, d		
	03.11.10	9:21	N45°01.325' E91°49.334'	2	mr, d			
		15:58	N45°02.511' E91°49.567'	3	mr, d			
		16:32	N45°02.881' E92°03.485'	1	mr, d			
		17:55	N45°02.510' E91°49.564'	1	mr, d			
		18:06	N45°01.346' E91°49.349'	2	mr, d			
10:04		N45°00.775' E91°51.370'	2	mr, d				
10:35		N45°00.496' E91°48.178'	2	mr, d				
	11:10	N45°00.240' E91°47.915'	12	mr, d				

Aberrations in table 2: af = alluvial fan, ap = alluvial plane, d = desert, dg = desert grassland, ms = mountain slope, mr = mountain ridge, sb = small basin, v = valley, ws = water spring.

Since the 1980s, the population number of Wild ass in China has almost doubled, and the number of khulan in the KNR is 3,300 - 5,300 individuals at present (CHU et al. 2009). Some researchers consider that the khulan population of the KNR migrates seasonally from Mongolia (PANTEL et al. 2006, in MOEHLMAN et al. 2010), but we don't agree. Since 1995 border fences were built along the Chinese-Mongolian border, and there is no information on the migration of khulan between the KNR and the Great Gobi (Mongolia) since this year.



Fig. 3: Because there is no fence on the slope animals migrate there and their trails can be seen clearly.

In addition, many highways and roads have been built in recent years. They have closed all possible routes for such migrations, and make the KNR khulans to an isolated population. But the khulans in the border zone are obviously migrating, and they cross the border through the foothills of the mountain ridge, where fences were not built over rugged terrain. Apparently these corridors are used for migrations (fig. 3). But the number of khulans migrating across the border is still unknown because any zoological investigations of this region are absent up today.

All khulans we found by the surveys in 2008 and 2010 were located in Haftik Mt. and its alluvial fan. By the survey 1998, 108 individuals (17 herds) were found in this area (GAO et al. 2002), while there was only 37 individuals (10 herds) recorded in 2008, and over 54 individuals (6 herds) 2010. We can not calculate the density of khulans in this area really, because we didn't get enough data. But we used the same route as in 1998, so we are sure, that the population of khulan in this area declined compared with 12 years ago. In the survey of 1998 and 2008, most khulans were found grazing on the alluvial fan of the south fringe of the mountain. But in 2010 no khulans were observed on the alluvial plain. All animals were sighted in the open valley or small basin of Haftik

Mt. Because we surveyed the area in winter time, we assume that the weather conditions on the alluvial plain with strong wind and coldness are too hard for the khulans and so they prefer the valleys between the mountains. Conservation biology is concerned with population decline and scarcity, and is a central focus of much public concern (KREBS 2008). We hope further study can be carried out in the near future and we can get some foundation supporting this work.

Ibex (*Capra sibirica*)

The ibex was classified as a Category I state protected species, listed as endangered (EN) in the China Red Data Book, Least Concern in IUCN red list (READING & SHANK 2008). It is still not certain that Siberian Ibex (*Capra sibirica*) is distinct from other ibex species. Some authors use the name *Capra [ibex] sibirica* (SHACKLETON 1997), although WILSON & REEDER (1993) regarded it as a separate species, following GEPTNER et al. (1961). At present, four subspecies are recognized: *C. s. hagenbecki* in the Mongolian Gobi, *C. s. sibirica* in Altai Mountains, *C. s. alaiana* in the TianShan range, and *C. s. sakeen* in Pamir, Hindu Kush, and Karakorum (FEDOSENKO & BLANK 2001). So the ibex in the central and eastern TianShan Mts. belongs to the subspecies *C. s. alaiana*, and according to FEDOSENKO & BLANK (2001), *C. s. hagenbecki* is located in the Mongolian Gobi and *C. s. sibirica* in the Altai Mountains. Because Baytik and Haftik Mountains are situated in the Gobi area between the Altai and TianShan Mts., today nobody knows exactly which subspecies of ibex is living in this area. SHACKLETON (1997) estimated that the total number of ibexes in the TianShan Mts. is about 40,000 - 50,000 individuals. According to recent investigations, it is common to see ibex groups of several to dozens of individuals all over their range. The number of ibexes is considerably larger than that of Argalis (GAO et al. 2011).

In the eastern part of Baytik Mts. we visited the valley Sentasi (18 km long) three times, and found 64 ibexes. This was the first observation of the ibex in this part of Baytik Mt. During the survey in 1998 in the Haftik Mts. only 7 individuals (2 herds) were found (GAO et al. 2002), and 17 individuals (10 herds) were recorded in 2008, and 45 individuals (12 herds) were counted in 2010.

Baytik and Haftik Mts. are located at the border between China and Mongolia. The management in this area is more restricted. Relatively less human interferences to wildlife compared with other regions take place. So we advise the government to establish a nature reserve in this region to protect its unique landscape and its mountain ungulates.

Argali (*Ovis ammon*)

Argali is classified as Category II state protected species, listed as Near Threatened in the IUCN red list and endangered (EN) in the Chinese Red Data Book. GAO et al. (2002) considered argali of Baytik and Haftik Mts. as *O. a. darwini*, while according to FEDOSENKO & BLANK (2005) it should be *O. a. ammon*. Recent genetic studies (TSERENBATAA et al. 2004) revealed that these two subspecies represent the same subspecies. Recent data from some local hunting teams showed that the argali density in Xinjiang had an obvious growth, and large herds of over 100 individuals can be seen in some areas (GAO et al. 2011).

As a famous game animal, the status and population of *O. a. ammon* attracts a lot of attention. No argali sheep was counted in 1998, only rotten skulls were found. In the survey 2008, was found only one herd (2 females, 1 lamb) at the Mongolian side of the border in the Haftik Mts. area. This result makes us worried for the future of the Argali population in this region. We didn't find any argali in Baytik Mts. in 2010, according to the high pressure of livestock grazing on the top of the mountain and the peripheral steeps of the mountain crest. May be that not any argali is living in Baytik Mt. But in November 2010 in Haftik Mts. two groups with 15 individuals were observed. It means that argali in these mountains aren't extinct. But the population size is small.

Advice

Importance of this area

This area borders on the Great Gobi protected area in Mongolia in the North, the Buergen Beaver Nature Reserve in the Northwest, the Kalamaili Mountain Nature Reserve in the West, and the Qitai Desert Grassland Reserve in the South. The specific Gobi ecosystem and endemic biodiversity are the main natural biological resources in this area. That gives this region a very high and important ecological value. Many rare species can be found here, such as khulan, Goitered gazelle, argali sheep, Siberian ibex, snow leopard, Houbara Bustard, Altai Snowcock (*Tetraogallus altaicus*). However, there is no nature reserve in this region at present time. So we suggest that the government should create a new nature reserve for the protection of this area with its special landscape and rich biodiversity. We suggest that a comprehensive scientific survey should be done on both sides of the Chinese-Mongolian border, composed of scientists from different academic sectors, to investigate and provide an assessment of the biodiversity resources of the region and to find out the population number of Khulan in the border area between China and Mongolia.

Some suggestions about fences

The fence on the border affects in an extremely negative way the wild life across the boundary; during the survey in Haftik Mountain, we saw one argali sheep that was trapped by a fence. The fence can be a big threat to argali, ibex, even khulan. There was no fence on the slope of the mountain ridge, so animals can pass (fig. 3) the border there. We propose to the relevant governmental departments and conservation authorities to open some gates as migration passages between China and Mongolia for the wild animals, after the herdsmen have left the area.

Grassland enclosures were built for the restoration of the vegetation. The use of these enclosures was based on an Australian method for fenced pastures for livestock. Australia and Xinjiang have very different climates and ecological demands that aren't comparable. So, setting up the Australian-style enclosure in the Gobi area is really not appropriate. We suggest that some solutions should be done to protect the wild animals. First, research the migration route of wild animals in this area; leave some places as corridors for migration and water resources. Second, reduce the fence height and remove the barbed wire. Third, open the fence doors/gates after the herdsmen and their livestock have left the region. Fourth, stop building new enclosure in this area.

Suggestions on hunting ground

Another way for solving the conflict between local people and wildlife is the trophy hunting. In 2006, the Chinese State Forest Administration wanted to auction hunting licenses for wild animals to foreigners, but in the face of strong disagreement from the public and media, these plans were stalled at that time. Trophy hunting could be a good way to stimulate local economies, but the problem is that the local communities do not get the benefit. The income from trophy hunting should be used by local communities, but instead it is used to buy new cars or computers for government officers. In Xinjiang are many hunting areas, mainly for hunting Argali and Ibex. For example, 5 argali sheep sacrificed for trophy hunters can earn about 800,000 RMB (table 3), and if 500,000 of that could be used by the local people, they would be very happy and no longer herd their sheep. The argali would become their sheep.

"The only justification for trophy hunting is that it should benefit conservation and benefit local communities." (George B. Schaller). At 07.-08.07.2010 an international symposium on Wildlife Protection and Trophy Hunting was held in Urumqi, hosted by the Xinjiang Institute of Ecology and Geography, CAS. In this meeting, many officers and scientists expressed their opinions on trophy hunting. The relationship between hunting and wildlife protection was discussed. Pakistan has successfully established community-managed trophy hunting programs, community conservation committees, community conservation funds to pay guards, and other initiatives that promote active local involvement in conservation. According to the experience gained in Pakistan, we suggest that:

1. a method must be found to distribute the money (generated by trophy hunting) directly to community committees rather than through several layers of government;
2. trophy hunting issues should be open and accountable to the public; and
3. strict management of the process, because trophy hunting can have a serious and detrimental impact on wildlife if improperly managed.

Table 3: Prices charged to foreign hunters for trophy species in western China 2005 (HARRIS 2008), prices are constant since the mid-1990s

species	location	price (US Dollar)
Argali	Gansu, Qinghai	21500
		19500 ¹
	Xinjiang, Except Pamirs	26400
	Xinjiang, Pamirs (Marco Polo)	29000
Blue sheep	Gansu, Qinghai	7900
		6900 ²
		5900 ³
		2500 ⁴
Ibex	Xinjiang	4900
White-lipped deer	Gansu, Qinghai	14400
		13400 ¹
Red deer	Qinghai, Gansu	4500
		3500 ¹
Tibetan Gazelle	Gansu, Qinghai	1500 ⁴
Goitered gazelle	Gansu, Qinghai	1500 ⁴

¹ = per hunter if > one hunt together, ² = per hunter if two hunt together,

³ = per hunter if > two hunt together, ⁴ = if added to another blue sheep or argali.

Local community

Compared with most areas of China, the living conditions of Kazakh people in Baytik Mountain are relatively bad. In 2007, the Chinese average life span was 71 years (men) and 74 years (women); during our interviews, most people in the Baytik Mountain area do not think their life expectancy will be more than 70 years. So we suggest the government should improve the social security welfare system, the retirement age should adjust with the local people's life span, rather than the same standard through the country. Because living conditions are tough in this area, the people in Baytik Mountain region hope to retire earlier. The social security costs are too high according to the so low income of local people, so many of them stop payment for social security. We suggest the fee for social security should adjust with the per capita income of local people.

Now, the recent "sedentary living policy" implemented by the government agrees with desires of many herdsman. This is a good way to solve the conflict between human and wildlife. But local Kazakh worried about their future. They don't know how to farm the land after giving up their nomadic life. Actual they have some problems such as the high charges. The local people can not enjoy the preferential polices, local government affairs is not so open and accountable to them. So the government should reassure these worries. The local people should be tax free during the beginning years, trained how to farm the land, and long time technique support must be provided.

In Baytik Mt., because of the hard living conditions, most local people suffer from hypertension and arthritis when they just about 50 years old. Their life span is around 65 - 68, apparently under the countywide average level. We suggest that the government should invest more money for medical treatment facilities; and improving of the medical level of the hospitals and professional skills of the doctors.

Even the government and local people must pay great emphasis on education. But the generation faces a new problem: most young men just graduated from high school have difficulties to find jobs in the city, so they come back and herd the sheep like their parents. Only some lucky ones go out of Baytik Mountain, and don't like coming back here again. We suggest the government to pay more attention to the infrastructure in remote areas such as Baytik Mountain, to improve the living conditions.

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