Caprinae

Newsletter of the IUCN/SSC Caprinae Specialist Group

October 2003

In this issue

Editorial

Due to my increased administrative commitments at UBC, this newsletter is not only long overdue but likely the only issue for 2003. However, it is a larger issue than normal, approximately equivalent to 2 regular ones.

More caprin surveys have been undertaken in, and a database for mammals is being developed for Central Asia. Also reported here, is an as yet undiagnosed disease that caused a die-off of blue sheep along the Tibet-Pakistan border.

Please remember to keep submitting articles for your newsletter.

David Shackleton
Editor

Wild sheep and goat surveys in Uzbekistan and Tajikistan in 2002

The principal aim of the surveys was to collect morphological data and samples for genetic analysis, but every opportunity was taken also to obtain population data on all available caprins. The surveys were part of the "Development of Morphological and DNA-based Standard Methods for Identifying Individuals and Tissues from Different Urial Subspecies Project", supported by WWF - Germany.

We visited Uzbekistan in May 2002. The trip was organized by Dr. Elena Kreuzberg-Mukhina and Alexander Esipov (both of Zoological Institute of Uzbek Academy of Sciences). Mr. A. Esipov also participated in field surveys. We visited 2 sites: Nuratau and Surkhan Nature Reserves (NR). The Nuratau NR occupies the northern slope in the central part of the Nuratau range which lies on the western-most spur of the Pamir-Alai Mountain System north of Samarkand and south of the salty Aidarkul lake (ca. 41^0N, $67^0$30'E). The Nuratau range is a low (up to 2169 m elevation), rather broken and sometimes precipitous, range. It is mostly steppe with several almond species, hawthorn and occasional maple and pistachio. There are agricultural stands of walnut and various fruit trees along the valley-bottoms. The Reserve has a small captive breeding group of Severtsov's or Kizil-Kum argali (*Ovis ammon severtzovi*) in an enclosure at the headquarters of the research section.

Our guide in the reserve was the head of research Dr. Natalia Beshko. Although we made only one survey following a route around the Hayat valley (above the headquarters of the research section of the NR) we nevertheless managed to count 193 Severtsov's or Kizil-Kum argali. The age-sex composition was: 59 males, 66 females, 17 yearlings (6 males and 11 females), and 52 lambs. There were 7 pairs of twins. The lamb:female ratio was 0.79, the yearling:female ratio was 0.26, and the male:female ratio 0.88. The lamb index is high, considering that the lambing period was not quite over during the survey, while the yearling index is rather low. The latter can be explained by the 2001 drought. By contrast, spring of 2002 was wet, and high and lush grass was everywhere in Uzbekistan, promising good lamb survival and a higher yearling index in 2003. The male:female ratio cannot be regarded as representative because data were collected outside the rutting season. I could not age most males because they were in one large group (48 animals) that was constantly moving; however there were some full-curl rams (class IV) among them. Average overall group size was 9.3 (n=26), while female group size was 8.0 (n=18). All animals were counted in the Hayat Valley, the neighbouring 2 valleys were empty, making any conclusions about population density pointless. The latest estimate of total argali numbers on the Nuratau range is ca. 2,000 animals, most of which are in the NR (N. Beshko, pers. comm.; Shakula, 2001). However, some very small populations may still survive on small mountains in the Kizil-Kum desert. N. Beshko saw Severtsov's sheep on Tamdytau massif, ca. 150 km to the west of Nuratau range in mid-1990s. While in Tajikistan, I was told that some Severtsov's sheep migrate to the north-western part of this country in winter from neighbouring ranges in Uzbekistan. Similar data were presented by G. N. Sapozhnikov (1976), but not substantiated later. I could not visit these areas, but they are quite far from Nuratau and separated by a wide and densely populated river valley, through which run the Tashkent–Samarkand highway and a railway. So, if there really are migratory Severtsov's sheep in north-western Tajikistan, they must come from ranges east of Nuratau. Unfortunately there are no data on Severtsov's sheep occurring on these ranges in Uzbekistan.

Recently, it had been clearly demonstrated that Severtsov's sheep is an argali, having 56 pairs of chromosomes (Shakula *et al*., 1994; Lyapunova *et al*., 1997). After seeing the animals and their skulls, lengthy discussions about the taxonomic position of Severtsov's sheep seems mysterious. It is an argali in everything but size. There are 2 main decisive taxonomic criteria settling the question absolutely: lachrymal pits and the male's neck ruff. Sparing detailed descriptions, lachrymal pits in urial are deep and well defined, as if having been pressed with a finger in clay or plasticine, but are shallow and vaguely expressed in argali. In winter pelage, males of all subspecies of urial above 3 years of age, have prominent throat ruffs growing in a stripe along the ventral side of the neck (except for the bib which is rather wide). In argyles, there is no bib, and the ruff, if present at all, is much shorter and spread over ventral and side surfaces of lower neck and chest, and blending with the surrounding pelage (except in cases when it has a contrasting coloration) (Geist, 1991). Skulls of Severtsov's sheep have shallow and inconspicuous argali-type lachrymal pits. Although it was spring, or even beginning of summer during our survey, males had not yet shed their winter coats, and showed definite argali-type ruffs. One more trait, maybe less important taxonomically is the shape of the horn curvature in 2-4 year old males. In Transcaspian, Kopetdagh, and Tajik urials, horn tips are always pointed inwards, towards the neck. Later, in the two former populations, they usually acquire homonym winding. In young argali males, horn tips are invariably pointed outwards. Young males of Severtsov's sheep have argali-type horn tips. In short, Severtsov's sheep is a dwarf argali and its distribution is very like that of another smaller form, the Karatau argali (*O. a. nigrimontana*). Both subspecies inhabit low westernmost spurs (surrounded by arid lowlands) of 2 great mountain systems, the Pamir-Alai (*severtzovi*) and the Tien Shan (*nigrimontana*). These distributions appear to be relicts. The difference between the 2 distributions is that *O. a. nigrimontana* is almost parapatric with another argali subspecies, *O. a. karelini*, especially in the winter, while *O. a. severtzovi* is separated from other argalis by at least 350 km.

Surkhan NR occupies eastern slope of the Kugitang range (ca. $37^0$50'N, $66^0$20'E) which is the westernmost spur of the Gissar Range. The Kugitang stretch south towards the Amu-Darya river, and are only 60-70 km long and up to 3,000 m high. The Tangi-Duval gorge cuts almost through across the northern part of the range and is the northern border of the Surkhan NR. The northern part of Kugitang, separated by this gorge, is called the Penjab or Panjob. A mountain pass separates it from the higher Baisuntau range that is connected with the Hissar range itself. The western (Turkmen) slope of Kugitang harbours a viable markhor (*Capra falconeri heptneri*) population of ca. 500 animals and a much smaller Tajik urial (*O. vignei bochariensis*) population, as shown by previous surveys (Weinberg et al., 1997; Lukarevsky, 2001). The situation on the eastern slope is much less clear. Urial seems almost extinct, while markhor are considerably more numerous. We could find no urials on the Uzbek side of Kugitang in May. All local hunters and guides said that animals have become almost singular and migratory, appearing in the foothills in late summer and leaving for Turkmenistan before spring, skirting the southern end of Kugitang on their way. On the whole, local poachers are much less interested in urial than in markhor. I did not see a single urial skin, head or horn in the villages, or on shrines in the southern part of the range.

We visited Tashli-Yurt valley in the northern part of the Kugitang, just south of the Tangi-Duval gorge and spotted 37 markhor: 2 fully adult males (= 1 curl and long ruffs) 7 young males, 9 females, 9 yearlings (4 males and 5 females), and 10 kids. Of 9 females, 3 were barren, and there were 4 pairs of twins. According to counts performed by NR wardens, there are some 180 markhor in the Reserve. Judging by the number of animals I saw in one valley, this estimate might be correct. The population density in that case is about 30 animals/1000 ha. Thus, markhor numbers on the Uzbek slope of the range are twice or even three times lower than those on the Turkmen slope. The Turkmen slope is much wider, not very steep and dissected by deep canyons, whereas the Uzbek slope is very steep (often cliff walls with some foothills below) and therefore several times narrower. It is a little wider in the northern part of the range, but on the whole, markhor habitat is at least 3 times smaller on the Uzbek side of the Kugitang, and more accessible. That no doubt explains why, despite the reserve, poaching is substantial in eastern Kugitang. As far as I could determine, there is no legal trophy hunting of Severtsov's argali, Tajik urial and markhor in Uzbekistan.

Unfortunately, it was not possible to visit the Babatagh range, the next big spur of the Gissar range to the east of the Kugitang, because it has been heavily mined in the 1990s and runs along the state border with Tajikistan. Local informants told me that markhor is already extinct in Babatagh, but urial is still present. According to local informants, and contrary to Ishunin (1972), there are no markhor on the southern slopes of Gissar range in Uzbekistan between Kugitang and Babatagh. In Baisuntau, reportedly only Asiatic ibex (*C. sibirica*) occurs, though some informants told me that the lower parts of this range adjoining Kugitang, used to harbour markhor. Thus, the Kugitang appears to be the only range in Turkmenistan and Uzbekistan which still have markhor.

Our visit to Tajikistan took place in late November and early December. It was organized by K. Kh. Kasirov (Ministry for Nature Conservation of Tajikistan). We began with surveys of lowland urial populations. According to local information, urial is widespread over south-western Tajikistan, but densities are very low, except in the Pyanj Karatau. [It should be noted that names like Karatau and Aktau are common throughout Turkic Central Asia, and mean respectively "Black Mountains" and "White Mountains".] We decided to visit 2 areas: the southern ends of Pyanj Karatau and Khozratisho ranges that reach the Pyanj river.

Unfortunately, though we had permits for the border-zone, we were not allowed to visit the southernmost part of Khozratisho Range ($37^0$30'N, $71^0$10'E, elevation up to 2,500 m) and the Dashti-Jum NR. However, we did visit the adjoining area and talked to people who knew the situation in and around the Reserve. The current estimates for urial provided by different informants were similar: up to 200 animals on some 5,000

ha of habitat. It is a small and compact population occurring in the eastern, more rolling part of the Reserve. Formerly, urial migrated seasonally along the range, but these are no longer evident due to drastic decrease in urial numbers. Reportedly, up to 150 animals could be seen in one day on a migratory route in the central part of the Khozratisho some 15-20 years ago. Besides the Dashti-Jum population, small urial herds are scattered throughout the range. The status of markhor is different. Estimates vary from 400 to 700 animals on ca. 20,000 ha. These figures are close or even exceed those from the late 1980s and beginning of the 1990s (Weinberg *et al*., 1997), but current estimates are highly likely to be too high. This is because informants told me that urial and markhor populations in the Reserve suffered heavy poaching by Afghanis who penetrated the Tajik territory in the mid-1990s, when the border was not properly guarded. One part of the end of the Khozratisho is the famous Kushvoriston cliff massif that literally overhangs Pyanj river. This massif is extremely precipitous, almost inaccessible and therefore practically unguarded. It is the main remaining markhor habitat in the Dashti-Jum NR.

As we could not visit Dashti-Jum NR, we went to the central part of the eastern slope of the Khozratisho, an isolated markhor habitat in the Sangauchun valley (ca. $38^0$15'N, $70^0$15'E) that reportedly had about 40 animals. During 2 days of survey, only 1 markhor female was seen. A survey to the precipices north of Dashti-Jum was also fruitless. Instead, there was clear evidence of constant disturbance and poaching everywhere. [It should be noted that as I understood, the name 'Dashti-Jum' was invented for the NR. Meanwhile, a big village near Sangauchun valley, more than 60 km north of the NR is called Dashti-Jum. This circumstance creates certain confusion. Locals usually do not use the name 'Dashti-Jum' for the NR.]

The third area populated by markhor, is the eastern slope on the southern end of the Darvaz range (car. 38^0N, $70^0$45'E), parallel to the Khozratisho. This population is estimated at below 200 animals. Reportedly, there still are also markhor on the western slope in the northern end of the range. Hunters and guides told me that there are some local micro-populations on the Vakhsh range and maybe elsewhere. On the whole, markhor distribution in Tajikistan appears very fragmented and confined to several comparatively small isolated areas; probably because markhor are sedentary, unlike urial. Almost all markhor sites have precipices in red, soft sandstone or in harder conglomerate containing not only sand but also pebbles. The Kushvoriston and eastern Darvaz, composed of hard rock, are exceptions to this.

The southern end of the Karatau range ($77^0$20'N, 69^0E) is formed by rather steep sandstone hills, up to 1,000 m high and covered by pistachio steppe, which end in precipices descending to the riverbank. It was formerly a sanctuary in Soviet times. About 8,000 ha of its territory were separated by barbed-wire and tangled wire fence which formed part of the border protection system of the Soviet Union. No people and livestock were admitted behind the fence and therefore it provided protection for urial and other wildlife (as happened almost everywhere along the southern borders of the USSR, e. g. in the Pamir and Tien-Shan). Urial had free access to the Pyanj river which is the only source of fresh water in the southern end of the range. However, there are some salty springs within the range. Wardens and guides told me that they estimated the population behind the fence at about 1,500 head in the 1980s. The fence was demolished in the 1990s and removed close to the river bank. There is now a 500-meter gap in that allows urials to reach the river. This area is now controlled and formally protected by a hunters' society. It is being used extensively for livestock pasturing, and pistachio trees are cut for firewood. In short, urial habitat is being destroyed rapidly. Poaching is also constant. Consequently, animals were very secretive, being active almost exclusively in the mornings and evenings, despite the rutting period. Local estimates of urial numbers are about 200 head on about 10,000 ha. These estimates could be correct. I saw only 46 animals in 4 days: 6 males about 5-6 years old (black ruff with grey streak, light saddle patch), 5 males 3-4 years old (black ruff, no saddle patch), 4 males 2 years old (black stripe along the throat or a very short ruff), 18 females, 1 yearling male, 2 yearling females, and 10 lambs. One very large male had no saddle patch at all. Of 11 males older than 3 years, 5 were roaming in search of females, the rest were accompanying females. The central, higher portion of the Pyanj Karatau that has fresh-water springs has also human settlements and therefore much lower urial population densities, according to our guides.

Trip to south-western Pamir was made to gather information on its almost unstudied urial population which has been mentioned by several authors (Nasonov 1923, Tsalkin 1951, both cited in Fedosenko 2002; Vorontsov *et al*. 1972). Even hunters in Khorog (administrative centre of the Pamir) did not know of these animals. Sapozhnikov (1976) measured horns and skulls of these sheep, but did not characterize the horn curvature. Somehow, this population remained unrecognized and was not included in USSR Red Data Books (1978; 1984), nor in other compilations. Twenty five years ago, numbers were estimated at 250 animals (A. Lailibekov, pers. comm.). During surveys in 2001, Pamir zoologists and game biologists counted only 65 urial, all in the Pyanj River valley between the Ishkashim settlement, and the confluence of the Vakhan-Darya and Pamir rivers (near $36^0$50'N, 72^0E; A. Lailibekov, pers. comm. and *in litt*.). This area also has Asiatic ibex, but practically no argali. In 4 days we saw no urials. Only above Udit village, were footprints that might belong to a few urial. Our survey, though short, revealed inaccuracies in surveys conducted in 2001. According to local information, animals were completely absent and never seen in places where they had been reportedly found in 2001. It is clear that the urial population in the south-western Pamir is small and has a very limited distribution, although reportedly, lone males may roam to the north of Pyanj River valley. In villages some 50 km from urial range, these animals are completely unknown to hunters, although old urial skulls and horns, among more numerous ibex remains, are present on shrines in or near several villages (e.g. Udit, Ptup, and Vitchkut). Only the latter shrine had 2 fresher urial skulls, left maybe 5-10 years ago. Locals have a specific name for urial (along with those for ibex and argali), meaning 'the little red', due to the rich colour of its pelage. Curvature of the horns does not testify definitely to the taxonomic status of the population. Older and more weather-beaten horn sheaths had

heteronym winding, but of the two fresher skulls one had sheaths curving in a single plane, while the other had a homonym winding. It is worth noting that I did not see a skull of a urial male older than 6 years, anywhere in Tajikistan.

In conclusion, it should be said that trophy hunting is carried out in all the described areas of Tajikistan, including nature reserves and sanctuaries. I was told, off the record, that 10 foreigners have hunted in the Pyanj Karatau in the last 3 years. In the Pamir, local hunters told me that hunting outfitters have already inquired about the possibilities of hunting Pamir urial as well. However, hard currency trophy hunting is evidently not a threat to urial or markhor populations in Tajikistan; ordinary local poaching and habitat destroying are really endangering the future of these species. The human population is growing rapidly in Tajikistan following the civil war, including in the mountain areas, where many refugees found refuge.

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Altai argali status and distribution in western Mongolia and the Altai-Sayan

The Altai subspecies of argali *Ovis ammon ammon* is the largest wild sheep in the world and occurs in the Altai mountains of Mongolia and adjacent regions of Russia, China and Kazakhstan (Geist, 1991; Shackleton, 1997; Amgalanbaatar and Reading, 2000). Although the Altai argali is one of the most sought after species of wild sheep by trophy hunters and commands high fees, its current population status remain poorly understood (Shackleton, 1997; Reading et al., 1999a). Argali populations were once more common throughout large tracts of the Altai (Figure 1). However, habitat disturbance and deterioration resulting from competition with domestic livestock and poaching appear to have contributed to population declines, habitat reduction and fragmentation and, in some cases, localized extirpation of Altai argali in Mongolia, China, Russia and Kazakhstan (Shackleton, 1997; Reading et al., 1997, 1999b; Amgalanbaatar and Reading, 2000; Fedosenko, 2000; Paltsyn, 2001).

Considerable controversy concerning the status of Altai argali exists. Accounts of declines in argali populations based on limited data or anecdotal information are known from as early as 1913 (Carruthers), but have become more common in recent years. Past surveys were conducted at irregular intervals and were based on a variety of questionable and inconsistent methodologies that make comparisons over time and between areas difficult, if not impossible (Reading et al., 1997, 1999b; Schuerholz, 2001). Contradictory survey findings, in conjunction with accounts of population declines, have often been dismissed by the Mongolian government and hunting companies, and obfuscate the status of argali populations in Mongolia (Luschekina and Fedosenko, 1994; Reading et al., 1998). Wild ungulates are known to undergo natural population fluctuations over time and quick recoveries of argali are documented in areas with favourable conditions (des Clers, 1985; Schuerholz, 2001). Furthermore, natural fluctuations may cause some population declines from which argali have the potential to recover (Shackleton, 1997; Schuerholz, 2001).

Prompted by national and international concern over the status of argali in Mongolia, in 2001, the Mongolian Academy of Sciences undertook the first nation-wide argali survey employing a standardized random sampling technique. Although potentially biased for reasons noted by Schuerholz (2001), the survey reported a significantly smaller argali population than any previous official national estimate (Institute of Biology, 2001). National survey findings support other reports (see Shackleton, 1997; Fedosenko, 1999; Working Group, 2000; Amgalanbaatar and Reading, 2000; Paltsyn and Spitsyn, 2002) that marked declines in argali populations have recently occurred across much of its range, that threats to argali

Figure 1. Current range and historic sightings of argali in Mongolia and the Altai-Sayan ecoregion. The southeastern boundary of Altai argali range is unclear due to uncertainty concerning the designation and differentiation of argali subspecies in Mongolia. Past encounters with argali are summarized by Kolosov (1938), Tsalkin (1951), Smirnov (1990), Luschekina & Fedosenko (1994).

conservation are increasing, and that appropriate steps toward better management and conservation are needed.

The Altai argali is now at high risk across its entire range in Mongolia due to dramatic declines or localized extirpations, highly fragmented habitat, and high and increasing densities of humans and domestic livestock (Shackleton, 1997; Amgalanbaatar and Reading, 2000). The total population of Altai argali in Mongolia is well below 3000 animals (Reading et al., 1999b). Similar conditions are documented for Altai argali in adjacent countries, with population declines or extirpations noted in the Ukok plateau, southern Altai, Mogun-Taiga, western Tannu-Ola, Sangilen highland, and the Sailugem and Chikhacheva ranges (Smirnov, 1990; Fedosenko, 1999; Paltsyn, 2001; Paltsyn and Spitsyn, 2002). Russia's Altai argali population decreased from approximately 1000 animals in the early 1970's to an estimated 600-650 animals by the late 1990's, while in Eastern Kazakhstan, no more than 100 remain (Fedosenko, 2000).

A number of protected areas have been established in western Mongolia and adjacent countries specifically for argali conservation (Figure 2); and proposals exist for the creation of trans-boundary biosphere reserves in the region (Badenkov, 2002). Yet, large portions of known argali distribution remain outside of the current network of protected areas (Shackleton, 1997; Reading et. al. 1999c), and a number of biologists have questioned if even existing protected areas can safeguard argali because the areas lack sufficient funding, resources, training and personnel to carry out basic management activities (Shackleton, 1997; Reading et al. 1999c; Amgalanbaatar and Reading, 2000; Schuerholz, 2001). Strictly protected areas or zapovedniks offer the highest level of protection of the three categories of protected areas shown in Figure 2; however, zapovedniks encompass only 10% of argali range in southern Siberia, and western Mongolia's strictly protected areas are regularly grazed by large herds of domestic livestock. Protected areas in this region are chronically understaffed and underfunded and little to no management activities for argali occur. Consequently, trespass grazing by domestic livestock in protected zones and poaching by local people are noted problems. Less frequently, wealthy hunters travelling by helicopter and jeep to illegally hunt argali have been documented in protected areas in Russia's Altai Republic; while, in western Mongolia, foreign trophy hunters have unknowingly been led into protected areas by their hunting guides (Paltsyn and Maroney, pers. obs.).

In an effort to compile information on argali in Mongolia and the Altai-Sayan, we created argali distribution and range maps using ESRI ArcGIS 8.1.2 software and digital 1:1,000,000 scaled maps of Central Asia (Figure 1 & 2). We defined range using past survey information from Smirnov (1990), Luschekina and Fedosenko (1994), Fedosenko (2000), and Paltsyn and Spitsyn (2002), and Altai argali elevation (2200-3800 m above sea level) and landscape (alpine steppe and tundra-steppe) preferences. We based distribution on data complied by the Mongolian Institute of Biology (2001), Fedosenko (2000), and our own field surveys. The southeastern boundary of Altai argali range remains unclear due to incomplete surveys and general uncertainty surrounding the designation and differentiation of argali subspecies (*O. a. ammon* and *O. a. darwini*) in the region (see Geist, 1991; Feng, 2000; Tserenbataa et al., 2000).

Acknowledging the need for regional and site-specific conservation and management plans for argali in western Mongolia and adjacent countries, we propose that future management and conservation strategies for Altai argali be focused within the Altai-Sayan. The Altai-Sayan ecoregion, as defined by Olson and Dinerstein (1998), encompasses much of recognized *O. a. ammon* distribution in western Mongolia and adjacent countries (Figure 2), and serves as a useful bioregion for

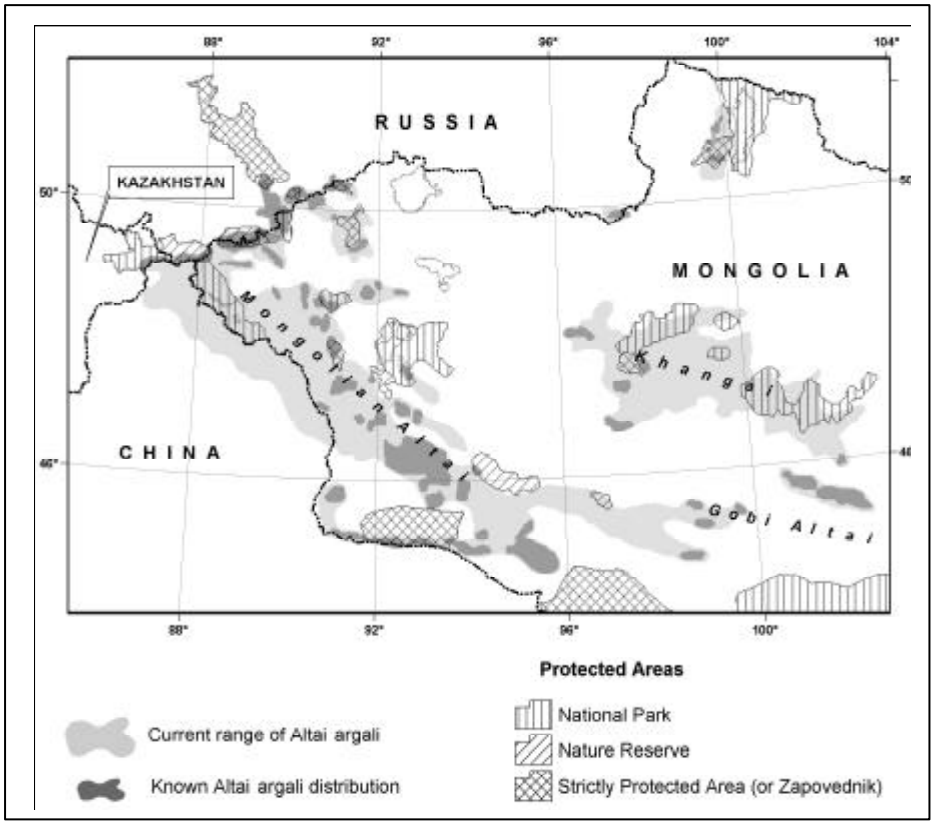

Figure 2 Protected area network and known range and distribution of Altai argali in western Mongolia and the Altai-Sayan as described by Fedosenko (2000), the Mongolian Institute of Biology (unpub. data, 2001), Maroney & Davarkhbayar (unpub. data, 2002), and Paltsyn & Spitsyn (2002). Argali distribution in the Chinese Altai remain approximate due to incomplete field surveys.

development of future conservation strategies to address threats common to all argali subspecies in the region, including forage competition with livestock, disturbance associated with people and livestock, habitat loss resulting from range deterioration, and poaching. Additionally, development of conservation plans for Altai argali may require alternative management strategies to address unique trans-boundary zones, larger human and domestic livestock populations, high cultural and ethnic diversity, and fragmented wildlife habitat characteristic of the Altai-Sayan ecoregion. International co-operation between Mongolia, Russia, China, and Kazakhstan will be an important and necessary component of successful management and conservation strategies for Altai argali and other endangered species in the Altai-Sayan.

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Conservation News

Blue sheep die-off in Khunjerab National Park, Pakistan

During April 2001, I visited Pakistan as a volunteer for the United States Fish and Wildlife Service. My brief was to assess the disease risks to wild Caprinae from interactions with domestic livestock. This study took me to the Kalabagh Reserve in the Salt range in Punjab, and to Dureji Estate, Torghar and Hazarganji-Chiltan National Park in Baluchistan. I also visited Shimshal Village near Khunjerab National Park in the Northern Areas, to investigate a Blue Sheep die-off.

At the beginning of December 1996, a Shimshali yak herder noticed that the Blue sheep, (*Pseudois nayaur)*, near the Chinese border at Sherlik, were suffering from an unrecognised disease. In July 2000, an American social geographer (Dr David Butz) visited Shimshal Village on the southern edge of the Khunjerab National Park (KNP) and was told that 'many blue sheep were dying at high altitudes of some unknown ailment'. Shimshali herdsmen reported seeing several hundred carcasses on some of the remoter high altitude meadows near Sherlik, during the early summer of 2000. They suspect that the disease originated two or three years ago among the larger Blue sheep population across the Shaksgam River in China and that it moved southwards towards the large domestic livestock settlement at Shimshal Pass. There has been local speculation that the disease in the Blue sheep population is associated with Chinese nuclear or chemical weapons testing carried out to the north of KNP.

While trekking at Chikkor, beyond the Khunjerab Pass at about 4000 m asl, Dr Butz managed to catch an afflicted Blue sheep, estimated to be about 4 years old. He described its condition as follows: "This animal retained strength in its hind legs but was unable to bear its weight on its front legs. Its front hooves were swinging loosely and the muscles and tendons on the lower leg joints appeared to have disintegrated. The skin and flesh from the muzzle, the chest and the forelegs was also disintegrating". Another trekker described having seen a Blue sheep with "large black protruding lesions on its muzzle". According to Dr Butz's Shimshali companions, this animal was exhibiting signs typical of many animals caught or found dead in the area. He saw two other partially decomposed sheep carcasses with similar signs, near the one he had caught.

The Shimshali say that both sexes and all age groups appear to be equally affected, and that the number and geographical distribution of the afflicted Blue sheep is increasing. The disease does not appear to be seasonal. Sympatric ibex (*Capra ibex*) and domestic sheep, goats and yaks do not yet appear to be affected.

The Shimshali herdsmen are naturally concerned that this mysterious and as yet undiagnosed disease will spread further south to infect their domestic sheep and goats that graze the lower meadows. They also wish to establish a Sustainable Use Hunting Programme for their Blue Sheep so that they can derive an income from them. Unfortunately until the cause of the Blue sheep disease has been determined and its probable effect on the population estimated, no hunting quota is likely to be granted.

A diagnosis of this mysterious disease requires the collection, satisfactory preservation and examination of suitable pathological specimens, preferably taken from a typically afflicted and still-living sheep. Since the nearest affected Blue sheep is estimated to be a 5-day trek at high altitude from Shimshal Village and even then the chance of finding and being

able to catch a sick sheep is relatively remote, the following plan is proposed.

A Wildlife Veterinarian should visit Shimshal Village in the near future and spend about a week training the Shimshali Vaccinator (of domestic livestock) to carry out a thorough post-mortem examination on a suitable diseased Blue sheep, either in the field or on one brought down alive to the village. The Vaccinator (or other suitable English–speaking Shimshali) would be fully equipped with suitable instruments, containers and preservation chemicals by the Wildlife Veterinarian.

The Shimshali herdsmen have indicated that, given 2 weeks warning, they could find and bring down a diseased Blue sheep to Shimshal Village. However, in case the disease is found to be infectious to domestic livestock, great care would have to taken to ensure that such an animal and those who handle it are completely isolated from domestic sheep and goats, and are efficiently disinfected.

Once the pathological specimens have been collected and preserved, they would be flown to Gilgit (by the Aga Khan Rural Support Programme helicopter) and thence to the National Agricultural Research Centre in Islamabad, where Dr Manzoor Hussain, Senior Scientific Officer, has agreed to examine them

The Mountain Areas Conservancy Project of IUCN-Pakistan, generously covered my travel and expenses to and from Gilgit. The Aga Khan Rural Support Project transported me by helicopter to and from Shimshal. I am grateful for this assistance.

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Mountain fauna in the Central-Asian: a database of threatened biodiversity

In 1999, the Imperial College (London) and the Uzbekistan Zoological Society (IUCN member), together with IUCN/Species Survival Commission, initiated a project (INTAS project 1483) on the "Correlates of the extinction risk of threatened biodiversity in Central Asia". The project was supported by the International Technical Assistance (INTAS) for the scientists from newly independent states (NIS), and brought together biodiversity specialists from 5 Central Asian and 3 European countries. Although the project is in its final stage, it provided the basis for developing a regional and international network for maintaining the Red books and Red Lists, and for the exchange of information on the problems of assessment and conservation of threatened species. During the project, a regional database on animal species was created, including more 160 vertebrates and 266 invertebrates with varying degrees of extinction risk. Among them, 55 vertebrate and ca. 150 invertebrate taxa are found within mountain areas. The database's information is used to assess the extinction risk of the species from Central Asian at national, regional and global levels. The study involved GIS mapping of historical and current ranges of the threatened species to explore trends of species survival, and to determine the main threats to the species populations and their habitats.

Assessment of the large mammals status in Central Asia was made from analysis of information from 5 Central Asian countries: Kazakhstan, Kyrgizstan, Tajikistan, Turkmenistan and Uzbekistan. This information was collected by different experts for the countries and is variable and not readily comparable. The large mammals provide good examples for highlighting differences between evaluations at a national, regional and, perhaps, at global levels. Preliminary assessment of the large mountain mammals (Tien Shan brown bear, Central Asian otter, North Persian leopard, striped hyena, Turkestan lynx, snow leopard, Turkmen wild goat, Tajik markhor, Transcaspian, Bukhara and Afghan urials, Altai, Kazakhstan, Severtsov's, Tien Shan, Karatau and Marco Polo's argali, and Menzbier's marmot) showed that all these species have different current statuses of threat depending on ecological parameters, biological features and taken conservation measures. Most of the large mammals survive generally within protected areas and in natural conserved zones (e.g. state borders), as well as through special conservation measures provided by local nature conservation authorities at national levels.

The analysis of the current status of threatened species and their main threats allowed us to identify "hot spots" of threatened biodiversity in Central Asian, and to predict future trends in distributions of these species. The analysis of the degree of human pressure on the distribution areas and the current level of their protection (through the existing network of the protected areas) allows us to determine the primary needs for biodiversity conservation in the region. The current coverage of protected areas within the mountains in the region is not sufficient for the effective protection and restoration of many species. Therefore, it will be necessary to develop a regional scheme for a protected areas network, similar to that applied at the Western Tien Shan trans-boundary project. In addition, it would be practical to develop the activity on the captive breeding of endangered species (e.g. markhor, Bukhara urial, Karatau argali) to allow their re-introduction into former ranges.

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Abstracts

Microsatellite DNA and recent statistical methods in wildlife conservation management: applications in Alpine ibex (*Capra ibex [ibex]*)

C. Maudet, C. Miller, B. Bassano, C. Breitenmoser-Würsten, D. Gauthier, G. Obexer-Ruff, J. Michallet, P. Taberlet & G. Luikart.

We evaluated the usefulness of microsatellites and recently developed statistical methods for the conservation management of fragmented and reintroduced populations, using the alpine ibex as a model species. First, we assessed the effects of past reintroduction

programs on genetic diversity and population differentiation considering different population sizes and histories. We show that genetic variability in ibex populations (H_e ~ 0.13) is among the lowest reported from microsatellites in mammal species, and that the Alpi Marittimi-Mercantour population has suffered from a severe genetic bottleneck associated with its reintroduction. Second, using a computer-simulation approach, we provide examples and rough guidelines for translocation programs concerning the number and origin of individuals for future reintroductions and for the reinforcement of populations with low genetic variability. Finally, we use the ibex microsatellite data to assess the usefulness of several statistical tests published for detecting population bottlenecks and for assigning individuals to their population of origin. This study illustrates that microsatellites allow: (i) the evaluation of alternative translocation scenarios by simulating different numbers and origins of "migrants", (ii) the identification of bottlenecked populations (especially using the Wilcoxon signed-ranks test), and (iii) the population assignment with a high certainty ($P < 0.001$) of nearly 100% of the individuals (or trophies or carcasses) from two distant populations (especially using STUCTURE or WHICHRUN software).

Published as cover page article in Molecular Ecology April/May 2002

Low genotyping error rates when analysing microsatellite DNA from wild ungulate faeces sampled in winter

C. Maudet, G. Luikart, D. Dubray, A. von Hardenberg & P. Taberlet.

We show that Alpine ibex (*Capra ibex*) and Corsican mouflon (*Ovis musimon*) faeces yield useful DNA for microsatellite analysis. However, we detected a higher genotyping error rates for spring faeces than for winter faeces. We quantified the genotyping error rate by repeatedly genotyping (100-200 per species and per season) four microsatellite loci. Respectively, 99 and 95% of mouflon and ibex genotyping repetitions provided a correct genotype using winter samples. Whereas spring samples provided only 52% and 59% correct genotypes. We recommend that before starting a project involving non-invasive sampling, researchers should conduct a pilot study to quantify genotyping error rates for each season, population and species to be studied.
Not for citation without Author permission. To be submitted to Molecular Ecology Notes

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DNA markers reveal the complexity of livestock domestication

Michael W. Bruford, Daniel G. Bradley and Gordon Luikart

A series of recent genetic studies has revealed the remarkably complex picture of domestication in both New World and Old World livestock. By comparing mitochondrial and nuclear DNA sequences of modern breeds with their potential wild and domestic ancestors, we have gained new insights into the timing and location of domestication events that produced the farm animals of today. The real surprise has been the high number of domestication events and the diverse locations in which they took place — factors which could radically change our approach to conserving livestock biodiversity resources in the future.
Nature Reviews, Genetics 4 (November 2003) 2-12

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Submissions of articles, including **research reports, conservation news, recent publications, etc., on wild or feral Caprinae**, are welcome from any professional biologist. A potential author does not have to be a member of the Caprinae Specialist Group. Please send submissions to the Editor, either by post or by e-mail attachment.

Acknowledgements

- Faculty of Agricultural Sciences, UBC.

CSG Web Site

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Editorial Note

Views expressed in the articles in this newsletter, do not necessarily reflect those of the Caprinae Specialist Group

First Circular

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INTERNATIONAL CONFERENCE

ON DESERT UNGULATE

BIOLOGY AND CONSERVATION

RIYADH, KINGDOM OF SAUDI ARABIA

ORGANISERS

National Commission for Wildlife Conservation and Development (NCWCD)

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Aims

- To gather together world specialists on desert ungulate biology and conservation to exchange ideas and discuss matters of management and conservation of desert ungulates
- To present and discuss Species Conservation Strategies for major species (especially Red data List species)

The Conference Programme will focus on the following topics:

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Ecophysiology

Behaviour

Pathology

Conservation management

Sustainable development

(Languages of the conference will be English and Arabic)

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