



# Caprinae



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## Editorial

Despite guidelines provided in our Action Plan, trophy hunting is clearly in need of careful controls in some areas, especially where threatened taxa are involved. Recently there have been problems surrounding the planned disbursement of funds that will be generated from hunting markhor in Pakistan. In another instance, described in the lead article of this issue, trophy hunting quotas for argali in the south-eastern Pamir increased sharply in 1996, following the decision to allow importation of argali trophies from Tadjikistan into the USA. Although Caprinae continue to face other problems, the article does present some good news in some areas.

Despite what should be obvious, it seems that it cannot be over-emphasised that for any form of hunting to take place, there must be a clear management plan that includes a sustainable harvest quota based on adequate biological population data. There must also be a transparent process for the allocation and distribution of generated funds to local people and to conservation of the taxa being exploited.

Pressure must be placed where necessary to halt abuses of trophy hunting, especially

hunting involving threatened taxa. Such practices are undefendable. Of all of the Central Asian states in the CIS, only Kazakhstan returns some of the money generated from trophy hunting to Caprinae conservation.

The Smithsonian Institute was recently under the scrutiny of the US press when it applied for an import permit for a Kara Tau argali (*Ovis ammon nigrimontana*). The specimen was donated to the Institute by a hunter, but because of its endangered status cannot be imported into the U.S.A. The same hunter had also made a \$20 million donation to the Institute.

Following one of the Action Plan's general recommendations, a Taxonomy Working Group is currently being established, and plans are being made to hold a workshop in May 2000. At the time of writing, the potential venue is Ankara, Turkey. The goal of the Taxonomy Group and that of the workshop, is not only to encourage and co-ordinate taxonomic revision of Caprinae, but also to help "sort out" the taxonomy for conservation purposes. We will keep you informed of future developments.

In this issue is a new (trial) column devoted to publishing abstracts of graduate student theses. The purpose is to bring exposure of a student's work to a wider audience and to keep ourselves informed of the latest work. Obviously, we can only consider work on Caprinae, their habitat and predators.

Just a reminder - 1999 is the SSC's 50<sup>th</sup> anniversary.

As always, please keep those articles coming in - without them we won't have a newsletter.

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## The status of some wild sheep populations in the CIS (former USSR) and the impact of trophy hunting

### Surveys

In 1997, we surveyed wild sheep populations exploited for trophy hunting in Kazakhstan and Kyrgyzstan. Our research was financed by the Russian Office of WWF (TRAFFIC). Similar studies were planned in the Pamir as well, however, the Ministry for Nature Conservation of Tadjikistan denied us permission.

We surveyed Transcasian or Ustyurt ural (*Ovis vignei arkal*) and Kazakhstan argali (*O. a. collium*) in Kazakhstan. A researcher with the Kazakh Zoological Institute, R.Zh. Baidavletov, participated in the latter survey. Pamir argali or Marco Polo Sheep (*O. a. polii*) was studied in Kyrgyzstan.

### Transcasian ural

Transcasian ural inhabits mainly the precipices of the Ustyurt plateau, as well as the coastal cliffs and low mountains along the eastern shore of the Caspian Sea, in western Kazakhstan and north-western Turkmenistan. Its total numbers are estimated to range from 6,000-7,000 (Weinberg *et al.* 1997) and have remained stable in recent years. In the second half of April, we obtained data on numbers and population structure in the Karagiye Depression and the table-mountains of North Aktau in the central and northern parts of the Mangyshlak Peninsula. A total of 130 ural were counted in Karagiye and 869 in North Aktau. The first population has declined because of its proximity to the city of Aktau (50 km) and because of

intensive livestock grazing. In contrast, the second population has increased slightly since 1990. We estimated the total number of urial in the North Aktau mountains at ca. 1,000 animals. Population density was estimated to be around 2.5 animals/km<sup>2</sup>, calculated for an area that included the plain between separate mountains, and flat mountain-tops. The population structure was worse in Karagiye, where the lamb:female ratio was 40.1:100, the yearling:female ratio 15.4:100, and class III and IV rams comprised only 6.1% and class I and II males 11.0% respectively. The overall male:female ratio was only 38:100. The corresponding figures for North Aktau were 44.8:100, 23, 0:100, 6.2% and 23.8%, and 68:100 respectively. On the Ustyurt plateau, where no trophy hunting occurs, males made up 32%, and the mature ones 10%, of the population, according to earlier observations. It must be noted that the parturition season was not completely finished in North Aktau, so the lamb:female ratio may eventually have been a little higher. As to the population sex structure, the figures given in this report may not be completely representative because they were obtained in spring, summer or early fall. Most dimorphic caprins, and *Ovis* in particular, are notorious for ecological and often spatial segregation between adult males and females outside the rut.

Trophy hunting has been carried out in North Aktau since 1990, and a total of 47 rams have been taken, 30 in 1992 and 1993. Despite the break in 1994, the mean age of 8 rams shot in 1996 was only 6.5 years, and the average horn length was 10 cm shorter than those taken in 1993. Poorer quality trophies seem to be caused not only by overharvesting but also by the severe winter of 1993-94 when many wild ungulates (including urials) died.

#### **Kazakhstan argali**

Kazakhstan argali inhabits central Kazakhstan (Kazakh Melkosopochnik), the Chinghiztau mountains, Tarbagatai, Saur and adjoining Chinese territory. It lives in low mountains composed of granite and quartzite. Females are found mainly in the granite ranges and males in the latter. Males migrate considerable distances in late autumn before the rut, while females move mostly in spring and summer, concentrating in birthing and nursery sites. Aerial counts in November 1991, covering most of Kazakh Melkosopochnik, defined total numbers at

9,717 and mean densities 0.6 animals/km<sup>2</sup> (Baidavletov and Auezov 1995). Highest densities (1.5-2.8/km<sup>2</sup>) were found in the mountains in the north-eastern part of Karaganda Oblast. Numbers and densities decline in south-western and southern directions.

In the early 1990s, total numbers of Kazakhstan argali were about 13,500, including 6,500 in Karaganda Oblast where trophy hunting occurs. Analysis of the count data indicates an increase in numbers at the beginning of the 1990s (including areas with trophy hunts), but a decline was already evident by 1994-95, and numbers decreased 2-3 times in certain areas by 1997. There are several causes for the decline. Most possibly, trophy hunting is one of them. Also, the pressure upon pastures in argali habitat has not diminished, despite abrupt and large decreases in livestock numbers. This is because domestic sheep and cattle are now being kept on the ranges year round, while formerly those pastures were used only in winter. Fires are another threat that devastate vast areas in spring and summer almost every year. Poaching is also frequent (Kalmykov 1995) due to accessibility of argali habitat and a quite high human population density. Wolves are very abundant. In 20 days, we counted 500 argalis and 36 wolves (20 adults and yearlings, and 16 cubs). A reduction in livestock numbers could increase predation upon argalis which represent the main wild ungulates in Kazakh Melkosopochnik.

Our data collected in July in the "northern" population (Edrei, Arkalyk and Myrzhyk mountains) showed that females outnumbered males, and the lamb:female ratio was about 80:100. In the "southern" population (Koshubai and Konyr-Temirshi mountains), the sex ration was close to unity, and lamb:female ratio was around 60:100. Mature males of class III and IV were more numerous than younger classes, and there were very few yearlings. These results suggest low reproduction rates and/or high lamb mortality in previous years. In the opinion of Kazakh zoologists (Bekenov and Baidavletov 1995) and also partly ours, this age structure may be due to trophy hunts carried out during the rut, which destroy the hierarchical system, scatter rutting groups and, of course eliminate the best sires. Around 60% of the trophy hunts take place in October and

November, 24% in August and September, and the rest in December through March. Hunting occurs in Edrei, Myrzhyk, Koshubai and Kinyr-Temirshi mountains. Between 4 and 19 males are taken annually, and 75 were shot over the period 1990 to 1996. More than half of the trophies taken in the first years had horn lengths greater than 120 cm, but since 1994, only 1/3 of the trophies exceeded this value. Continued selective elimination of the largest rams may damage the general status of populations and the simultaneous shooting of 13-19 prime breeding males is probably too great for comparatively small local populations. For example, taking 19 rams in 1992 caused a significant decline in the number of trophies above 130 cm length in subsequent hunts. Such trophies became more frequent only after 1995 when merely 5 rams were shot. However, these data indicate that the damage done by over-hunting may not yet be critical. The rams simply may not have had time to grow up and the trophies were probably younger aged animals than the ones taken before 1992. Weakening of hunting pressure in 1995, may have given rams the chance to grow and dimensions of trophies increased. However, these questions require further study.

Kazakhstan is the only Central Asian state in the CIS where part of the income from trophy hunts is spent on research, population counts and protection. In 1993-95, 0.7 - 5.3%, 6.5 - 7.2%, and 12.3 - 33.3% of the income were spent on the 3 named activities, respectively (Kalmykov 1995). Hunted animals are measured, weighed and aged, and the stage of moult is noted and parasites are collected. Reproduction, mortality and other aspects of the animal's ecology are studied in the field.

#### **Pamir argali**

In Kyrgyzstan, Pamir argali occurs in the southern part of the country, along the Chinese border. Numbers of this argali subspecies in this State could have been around 6,000-7,000 in the first half of the 1990s. The Kokshaaltau range harbours most of the animals, the Aksai River basin alone has some 4,000 animals in an area of 1,800 km<sup>2</sup>. At the end of August and beginning of September, we surveyed the upper part of Kurumduk River valley of Aksai River basin in Kokshaaltau range.

This area was previously surveyed in the summer of 1993 (Fedosenko *et al.* 1995). In 1993, 565 argalis were counted on 226 km<sup>2</sup> (2.5/km<sup>2</sup>). In 1997, the valley harboured 861 animals (3.8/km<sup>2</sup>). The increase could be partly caused by marmot trappers, operating primarily in lower sections of the valleys. Their activities made animals move upstream. Trapping season lasts from about 10 August to 10 September. Nevertheless, there may be an actual rise of argali numbers, because local residents informed us that, in the last years, argalis showed up in places where nobody has seen them during the previous decade. Livestock herds had shrunk drastically since beginning of the 1990s. In fact, Kokshaaltau range had almost no domestic sheep or cattle in places that we visited and pastures were re-establishing. In 1993, male:female ratio was 105.4:100, III and IV class males made 13.9%, I and II class ones made 24.3% of all animals, lamb:female ratio was 42.5:100 and yearling:female ratio was 27.5:100. In 1997, the respective figures were 96.1:100, 19.5%, 10.6%, 80.1:100 and 39.0:100. Percentage of mature males is rather high for a population exploited for trophy hunting since 1990. However, our data indicate that this percentage was much lower (5% of 298 counted argalis) and that females significantly outnumbered males in smaller neighbouring Kok-kiya, and more distant Sary-Imek valleys, while lamb:female and yearling:female ratios were close to those in Kurumduk. Thus, it looks as if there was some concentration of adult males in Kurumduk, maybe caused by activities of marmot trappers. A higher reproduction rate may be due to better weather conditions during the last few years (mild winters, and warm springs and summers without snowfalls, as reported by local people). Asiatic ibex (*Capra [ibex] sibirica*), inhabiting the same area, displayed similar increase of kid:female ratio compared to 1993.

A total of 110-115 argali rams were shot in Kokshaaltau range (12-31 annually) over a period of 1990-96. During the last years, no more than 17 rams were taken annually. Hunting took place mainly in Kurumduk and Uzengigush valleys, usually in September and October, before the rut. Killed animals were not weighed, measured or aged. The horns from Kyrgyzstan are smaller than those from the Pamir.

Judging from our survey, Kurumduk population does not currently suffer from

trophy hunting, but it is necessary to spend part of the income from trophy hunts on argali protection, annual counts and monitoring the age and sexual structures of exploited populations.

Finally, we present data on Pamir argali in the Pamir (Tadjikistan) and Altai argali (*O. a. ammon*) in south-eastern Altai (Russia) obtained by K. Fedosenko in November 1995 and September 1996, respectively. Pamir argali inhabits the Eastern Pamir where its numbers were estimated at 10,000 - 12,000 at the beginning of the 1990s (Odinashoyev *et al.* 1990). About 60-65% of these animals occur behind the barbed-wire fence, running along the border with China. The total length of this fence is about 250 km and its distance from the border is between 5-30 km. Wild animals feel less human disturbance behind the fence, because the border regime limits admittance of unauthorised persons and livestock.

The survey was conducted in the south-eastern Pamir and counted a total of 1,137 argalis over an area of 2,000 km<sup>2</sup>. Of these, 905 were found in the southern half of the area near the Afghan border, and only 232 occurred in the northern half, closer to the road from Murgab to Khorog, in the vicinity of the town of Akbura. Later, after snowfalls, argalis started moving to the latter region. Towards the rut, the proportion of adult males increased there. Of 878 aged and sexed argalis, 32.9% were males, 46.5% females (both including yearlings), and 20.6% were lambs. Class III and IV rams comprised 8%, while younger ones represented 25% of the population.

Poaching has increased in the Pamir since the start of the civil war in 1992, when refugees resulted in a doubling of the human population. Many owned military firearms and used them for hunting wild ungulates as well as for trading with local people. Trophy hunting began in 1987. Each year, between 9 and 24 argali rams were taken between 1987-89, 20-25 from 1990-92, and 15-17 between 1993-95. However, starting in 1996, the annual quota rose sharply to 30 and more, following the decision to allow importation of argali trophies from Tadjikistan into the USA. The number of hunting companies also increased from 3 to 5. Hunts occur mainly outside the rut, in October, November and March. Our data

does not allow us to evaluate the impact of trophy hunting upon argali population in the south-eastern Pamir.

In Russia, small populations of Altai argali survive in southern Altai and Tuva, along the Mongolian border. The upper Chagan-Burghazy River (Sailyugem Range in Altai) harbours the largest population. Here some 100 to 200 animals occupied a narrow strip of land along the border in places called Sarzhenaty and Bayan-Chagan in 1988. By 1996, their numbers rose to around 300. Argali have expanded their range to the right bank of Karasu River where they have not been reported before. The strip of land occupied by this population has widened up to 15-17 km. Growth of the population is most probably due to a significant decline in livestock herds. Pastures used by domestic sheep and goats are being gradually occupied by argali. Despite these changes, protection of wild sheep is far from satisfactory. The territory of Kosh-Agach Sanctuary, where the mentioned population and some other smaller ones occur, is now totally unprotected because the Altai Committee for Nature Conservation that runs the sanctuary has no money for employing even a single warden. Poaching, especially by border guards, is happening more and more frequently. Shepherds, wintering with domestic yaks (*Bos mutus grunniens*) in argali habitat also hunt these wild sheep.

### Summary

We conclude that Transcaspian urial numbers appear to be stable and may even be increasing slightly due to decreases in livestock and regeneration of pastures. However, urial populations of North Aktau sometimes suffer from excessive trophy hunting. Clearly, no more than 10 rams can be taken annually from this population without it causing detrimental effects.

Numbers of Kazakhstan argali have been diminishing recently in central Kazakhstan. The causes are thought to be frequent fires, probably increases in predation and poaching, and perhaps trophy hunting especially when it occurs during the rut. It should also be added, that Kazakhstan argali habitat is clearly the most readily accessible of all those described in this report.

The status of Pamir argali in the Pamir is unclear. The impact of trophy hunting is not yet known, but hunting quotas have risen sharply to accommodate growing demands. Trophy hunting takes place in any area accessible to a 4-wheel-drive vehicle. Poaching has also probably increased in the Pamir. Marco Polo Sheep populations in Kyrgyzstan are stable or may even be expanding, because of overall decline in livestock numbers. Until now, they have not suffered from trophy hunting.

Despite an increase in poaching, numbers of Altai argali may be slowly recovering thanks to a reduction in livestock herds.

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## Status and management needs of a Balkan chamois population in the Rodopi Mountains

### Introduction

Greek chamois populations have been recognized to belong to the Balkan subspecies (*Rupicapra rupicapra balcanica*). They can be found in 11 mountain ranges: Giona, Vardoussia, Timphi, Smolikas, Zigos, Trigia, Ligos, Olympos, Grammos and Western Rodopi (Karandinos 1992, Adamakopoulos *et al.* 1997, Adamakopoulos - Matsoukas 1992, Papaioannou 1991, Hatzirvassanis 1991, Hatzissarantos and Kannelis 1962, Sfougaris *et al.* in prepar.). The chamois are forming populations, mainly small, approximately 15-50 individuals (Karandinos 1992) or even up to 100 individuals (Hatzirvassanis 1991), some of which are completely isolated. The chamois have already disappeared from the Varnous mountain and Parnassos mountain (Hatzirvassanis 1991). In Varnous mountain, probably seasonally, some individuals come from the Peristeri mountain (former Yugoslavia). The same is true for Nemertsika mountain, where some individuals move in from Albania (Papaioannou 1991). It is estimated that the total population of chamois in Greece does not exceed 500 individuals and is constantly decreasing (Hatzirvassanis 1991).

### Chamois of the Rodopi Mountains (Frakto Virgin Forest)

The Frakto Virgin Forest, which is located in Rodopi mountain range, Northeastern Greece has been declared as a "preserved nature monument", provides habitat for one of the largest chamois populations in Greece. This population has been estimated at 65-75 individuals (Giannakopoulos and Goumas, in prep.).

They use an area ranging from 900-1900m above sea level (a.s.l.) and their preferred habitat is mainly valleys with steppe slopes partially or totally forested by spruce, fir, scotch pine, beech and oak. A big part of this population is moving during winter outside the boundaries of the Virgin Forest and the surrounding Game Reserve (Giannakopoulos and Goumas, in prepar.).

### A New Population and its Habitat Description

In February 1998, a population of 15-25 individuals, not referred to before, have been located approximately 20 km from the Frakto Virgin Forest, in an area called Lepida Forest, 15 km out of Dipotama village. These animals probably do not communicate with the closest population in the Frakto Virgin Forest.

Animals in the Lepida Forest use a valley with an altitude ranging from 700-1000 m a.s.l., covered by oak except for the higher parts covered by beech. They occupy a range of about 1500 ha where slopes range from 60-95% incline. The valley's bedrock is granite and limestone, while the Kaba Rema gorge which crosses the area, ends at the Arkoudorema River (Xanthi Prefecture).

The fauna of the wider area includes the following species: Brown bear (*Ursus arctos*), red deer (*Cervus elaphus*), roe deer (*Capreolus capreolus*), wild boar (*Sus scrofa*), wolf (*Canis lupus*), wild cat (*Felis silvestris*), golden eagle (*Aquila chrysaetos*), capercaillie (*Tetrao urogallus*), hazel grouse (*Bonasa bonasia*).

### Legal Status

The valley is a state area but does not fall in any category of "protected areas".

### Human Activities

In the area, poaching constitutes a great pressure on the chamois population, even though the species has been included in the "rare" category of the Red Data Book of the Threatened Vertebrates of Greece (Karandinos 1992) and its hunting is forbidden.

Logging is the main productive activity in the wider area and is facilitated by the opening of new roads. The construction phase, created a major disturbance for chamois, along with erosion problems. Such roads give access to poachers and result in chamois habitat fragmentation. Currently, a forest road above the valley already exists and construction of a new one crossing the valley is planned.

The logging activities constitute a disturbance mainly during the gestation and lactation periods, and in the early growing phase of the young.

Pastures inside the valley at elevation higher than 1000m a.s.l. are grazed from spring to autumn by approximately 1200 cattle and 500 goats. Probably the grazing

of domestic animals is an antagonistic factor to chamois.

Among the above human activities, the most serious threats for the survival of this population are roads opening inside the valley and poaching.

### Management Recommendations

The survival of this chamois population is considered to be highly important. Thus some measures must be completed in order to protect the species including:

1. Avoid forest road opening through the valley area since it will cause disturbance to the chamois population and facilitate poaching.
2. The entire area of 1500 ha must be declared at least as a Permanent Game Reserve or be included in the European "Natura 2000" network of protected areas. The following reduction in wood production would not be too important since the area is not very productive.
3. The existing forest road must be closed and access allowed only under special circumstances.
4. Prohibition of grazing domestic animals in the valley outside the chamois habitat would be very beneficial. However, for economic wellbeing of the local people, it is suggested that only goat grazing be banned because it is considered a more direct competition with the chamois.
5. The protection of the area, which is under Forest Service responsibility, must be intensified through more effective guarding.
6. Authorities should educate people, especially those living in the area, about the importance of this chamois population.
7. All Greek chamois populations are isolated and close to the minimum viable population level, and its habitat is deteriorating. It is urgent a field study be conducted and protective measures be completed.

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## Conservation News

### Tunisia

#### Barbary sheep

There is good news about the Libyan Barbary Sheep (*Ammotragus lervia fassini*) from southern Tunisia. As noted in the IUCN Caprinae Action Plan, I had hoped that they still occurred south of Tatahouine in the mountains near Remada (de Smet 1997). Their occurrence has now been confirmed by officials of the Tunisian Forest Service (anti poaching brigade) in Djebel Nekrif - El Angar.

Moreover, a new nature reserve called Oued Dekouk has been created by the Tunisian government in 1995. It is 6000

ha, totally fenced, and contains canyons with some suitable habitat for Barbary sheep. They keep 7 Libyan Barbary sheep in enclosures 4 of which (2 males & 2 females) came from the Bou Hdema breeding stock and 3 animals (2 males, 1 female) from the Governor's private collection. One more male is kept in captivity in the Sidi Toui National Park 80 km to the NE.

Both Sidi Toui National Park and Oued Dekouk Nature Reserve are part of the *Oryx dammah* reintroduction program being carried out with support of the Bonn Convention (CMS). This means that they will receive substantial international support, and that the local managers will be trained in reintroduction techniques. So, in a few years, we might expect the Libyan Barbary sheep to be the next species to be reintroduced in these protected areas in southern Tunisia.

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### Pakistan

**Himalayan Ibex** - WWF continues to collaborate with the Northern Areas Directorate of Wildlife, IUCN and the conservation committees that have been formed by some of the alpine villagers, to conduct annual surveys. The number of hunting permits approved by the Government has now been extended from 5 to 12 for 1998/99. WWF has facilitated the sale of one licence to a US hunter on behalf of the Bar Valley Community. Attempts are being made to get the different institutions to allow collation of all the information associated with the surveys geo-referenced and entered into a GIS here at WWF.

**Marco Polo sheep** - the Chinese have completely fenced off the col at the summit of the Khunjerab Pass. The fence will definitely stop any ungulate

movement through the col in the summer. It is about 2 m high and it is uncertain how quickly it would drift over in the winter to allow argali to negotiate it.

**Chiltan markhor/Wild Goats** - WWF-Pakistan has just completed a detailed management plan for Hazarganji-Chiltan National Park in Balochistan. This is the last known refuge for *Capra aegagrus chiltanensis* and the plan focuses principally on conservation measures for the species. There are 2 years of reasonably good census data that were generated specifically for the plan. Part of the management proposals include establishment of a breeding nucleus elsewhere in Balochistan. Recently a dead, apparently poached, mature male (11 obvious growth checks on his horns) was found. The horns were massive being 92 cm along the curve from base to tip and about 30 cm around the base. This specimen certainly looked more like a markhor than a wild goat.

Provision has also been made for the possible reintroduction of **Afghan urial** that once occurred in Hazarganji-Chiltan National Park, according to anecdotal evidence.

**Punjab urial** - The survey conducted last year was inadequate in coverage due to political wrangling that kept it out of the Kalabagh Region. Only 4 other sub-populations were located and the total population estimate outside the Kalabagh region was a maximum of 200-250 urial. There are plans for a WWF-sponsored census of the entire Punjab urial population. We also hope to collect DNA samples from captive animals and from trophies. This new survey will also attempt to determine what happened in the Lehri area at the eastern limit of the Salt range where an unspecified number of urial are reported to have been 'accidentally' released into the wild. All of this work will be thoroughly geo-referenced in a GIS being developed for this project.

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## IUCN

As of March 1999, Dr. Maritta Koch-Weser is the new Director General of IUCN. Dr. Koch-Weser is a social scientist who has worked at the World Bank.

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## Urial now considered an Argali

So it's an argali, Severtsov's urial or Kyzylkum sheep (*Ovis orientalis [vignei] severtzovi*) is now considered an argali (*Ovis ammon severtzovi*). This change is based on the discovery that its karyotype number is  $2n=56$  (Lyapunova *et al.* 1997, Bunch *et al.* 1998: see **Recent Publications**). Sheep with  $2n=54$  are considered to be urial and those with  $2n=56$ , argali. Unfortunately, this sheep is still endangered (EN A2cde, C2b - 1996 IUCN Red List).

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## Abstracts

### Polymorphisme des séquences d'ADN mitochondrial dans le genre *Capra*. Application à la conservation du Bouquetin des Pyrénées (*C. pyrenaica pyrenaica*).

The reintroduction project of the Spanish wild goat (*Capra pyrenaica*) in the French side of the Pyrenees raises questions about systematics. The systematics of the species *Capra pyrenaica* and of the genus *Capra* are based on morphological criteria. Four sub-species have been defined in the iberic species, the pyrenean population belongs to the subspecies *C. p. pyrenaica*. However, the morphological characters are plastic and these systematics are questioned. So, in order to test the taxonomic status of the Spanish species within the genus *Capra* and the status of the Pyrenean population within the Spanish species, we made phylogenetic inferences with sequences of mitochondrial DNA (mtDNA). Fragments of the mtDNA central region and of the cytochrome b gene were analysed. *Capra* species samples were provided by collecting bones in museums and in the field. Phylogenetic inferences are congruent with the hypothesis of a domestication event in the fertile crescent

from wild *aegagrus* populations and with the definition of two clades in the Caucasus, one in the eastern, the other in the western part of the Caucasus. The ibex group (the Alpine, the Siberian, the Nubian and Abyssinian wild goats) is not monophyletic. That questions the use, in this case, of morphological characters to infer the phylogeny. The haplotypes of the Spanish and Alpine populations are monophyletic. Moreover, the mean genetic distance between Pyrenean and other Spanish haplotypes is similar to the mean genetic distance between Spanish and Alpine haplotypes. The Pyrenean population can be then considered as a conservation unit. Nevertheless, since there are few individuals in the Pyrennees, we recommend reinforcing this population with individuals from the most diverse Spanish population or from several Spanish populations.

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## CONFERENCE ANNOUNCEMENT

**IUCN/SSC Caprinae Specialist Group Workshop on Caprinae Taxonomy**  
Ankara, Turkey  
May 8-10, 2000 (*Tentative*)

### Goals of the workshop:

- Provide an update on the current status of taxonomy of mountain ungulates
- Identify knowledge gaps, particularly those most relevant to conservation
- Provide a forum to exchange ideas and establish collaboration
- Help co-ordinate future research and conservation efforts
- For those taxa for which a consensus exists, produce a guide to the identification of the world's mountain ungulates

From the 1997 IUCN Caprinae Action Plan:

### 12.2.2 Taxonomy and Genetic Diversity

It is clear from the preceding sections of this Plan, that a total revision of the entire subfamily is necessary if long-term Caprinae conservation is to be effected. Not only is there biological justification

for this task, but as Geist (1992) observed, a taxonomy has major implications for conservation legislation. The immediate benefits of a revised Caprinae taxonomy include: a) improved CITES identification sheets to aid law enforcement officials in their task of controlling the illegal trade in taxa, b) clarification of biological and legal aspects for conservation laws, and c) an advance in our understanding of the phylogenetic relationships within the subfamily Caprinae.

However, it should also be borne in mind that most conservation actions do not necessarily require a formal taxonomy, especially where management units can be defined by other criteria (see Cronin 1993:345).

Recommended actions and implementation:

### 1) Taxonomy Working Group.

Establish a Taxonomy Working Group within the IUCN/SSC Caprinae Specialist Group. This will require additional members to the Specialist Group (see below) with responsibilities to: 1.1) organise an international workshop on Caprinae evolution and taxonomy; and 1.2) revise the taxonomy of the Caprinae. To be useful, a revision of Caprinae taxonomy will require a multi-disciplinary, integrated approach involving DNA analysis, internal and external morphology, behaviour, zoogeography, palaeontology, and evolutionary history (Awise 1989; Cronin 1993; O'Brien and Mayr 1991; Ryder 1986). It will also require large sample sizes if it is to be a valuable revision (Cronin 1993). A revision would be most effectively achieved if a Taxonomy Working Group of the Caprinae Specialist Group is established with scientists from around the world representing disciplines that directly bear on taxonomic criteria. This action requires additional new members to the IUCN/SSC Caprinae Specialist Group. The working group's task would be to work co-operatively towards the goal of publishing a revised taxonomy of the subfamily, either in a single or a series of scientific reports. The working group should also seek input from outside the scientific community, from hunting organisations and government agencies.

The Taxonomy Working Group needs to meet quickly to organise its philosophy/approach and to determine a division of labour. Its first tasks must be to establish guidelines and criteria, and decide

the division of taxa among members. This may be best achieved through an international workshop on Caprinae evolution and taxonomy aimed at developing a recommended program for resolving taxonomic uncertainties pertaining to wild Caprinae populations.

### 2) Conservation of Maximum Genetic Diversity.

While it is clear that Caprinae taxonomy is problematic, taxonomic confusion must not be allowed to prevent or delay conservation. Our aim is maintenance of maximum genetic variation, not merely conservation of "taxa" per se. With this in mind, it will not be sufficient to preserve just 1 or 2 "representative" populations of a given taxon, or even 1 or 2 populations within a country. We must ensure that a taxon's broad geographic distribution is well represented through our conservation actions. Only in this will we effectively maintain as current levels of potential genetic variability along with the supporting habitats.

Taxonomy is an area where regional co-operation can be vital. International co-operation and concerted action can ensure not only that adequate samples are available, but that the necessary wide geographic (genetic) representation is preserved. The alternative, to let countries address their own Caprin conservation issues in isolation, will most probably lead to an unsatisfactory, piece-meal solution that fails to address the real conservation issues.

#### 12.2.3 Maintaining Genetic Integrity

At least 3 issues are involved. First, for some Caprinae, threats to genetic integrity exist because non-indigenous taxa, often closely related, have been introduced into their range. Examples include, Alpine chamois introduced into Chartreuse chamois range in France, and into Balkan chamois range in the former Yugoslavia; European mouflon into chamois range in France and Italy; and Barbary sheep into some desert bighorn ranges in the USA. The dangers arise from hybridisation, increased competition, or both. If hybridisation occurs, even between subspecies, unique gene pools that were adapted to local conditions are lost. Second, wild species are sometimes used for cross breeding in an effort to develop better adapted breeds of domestic

livestock (e.g., domestic goat x Nubian ibex in Israel - Rattner *et al.* 1985; domestic goat x Asiatic ibex and markhor in Pakistan - Rasool and Hussain 1993). If successful, such crosses can only threaten the genetic integrity of the wild taxon. Last, are cases where "re-introductions" have been made without using animals of the appropriate taxon (e.g. muskox from Greenland into Alaska, Alpine chamois into several European countries).

#### Tentative list of topics:

Invited and contributed presentations on topics such as:

- Evolutionary/fossil history of Caprinae
- Why caprin taxonomy is important for conservation
- What are the problems involved in using taxonomy for conservation
- *Ovis* taxonomy: where are we at?
- *Capra*, *Ammotragus* and *Hemitragus*: where are we at?
- Rupicaprin taxonomy: where are we at?
- Hunters' view of caprin taxonomy, and how it may (or may not) differ from scientific taxonomy

To be followed by, or intermixed with, either plenary workshops or small working groups on the following topics:

- Molecular Vs morphological taxonomy: can we agree on anything?
- Appropriate and inappropriate taxonomic characters
- What are the most important and urgent taxonomic problems of Caprinae that affect their conservation?
- World-wide co-ordination of sample and data collection
- Production of a standardized sampling protocol useful for trained and untrained field people
- Production of a guidebook with pictures and drawings of the world's Caprinae, useful for field identification, customs officials and management and enforcement agencies
- Revision of taxonomic categories used for trophy evaluation of Caprinae
- Co-ordination of funding strategies and of graduate student and field personnel training strategies

Provisional organizing committee:

- Marco Festa-Bianchet - Université de Sherbrooke, Canada
- David Shackleton - University of British Columbia, Canada

- Cal Bilgin - Middle East Technical University, Turkey
- Ayut Kence - Middle East Technical University, Turkey
- Gordon Luikart - CNRS Grenoble, France
- Sandro Lovari - Università di Siena, Italy
- John Wehausen - White Mountain Research Station, USA

The web address for the workshop is:  
<http://callisto.si.usherb.ca:8080/caprinae/iucnwork.htm>

You can also contact Marco directly if you do not have web access:

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## Recent Publications

### Journal Articles

- Bleich, V.C. 1999. Mountain sheep and coyotes: patterns of predator evasion in a mountain ungulate. *Journal of Mammalogy* 80:283-289.
- Bunch, T.D., Voronsov, N.N., Lyapunova, E.A. and R.S. Hoffmann. 1998. Chromosome number of Severtzov's sheep (*Ovis ammon severtzovi*): G-banded karyotype comparisons within *Ovis*. *Journal of Heredity* 89:266-268.
- Cassinello, J. 1998. *Ammotragus lervia*: a review on systematics, biology, ecology and distribution. *Annals of Zoology Fennici* 35:149-162.
- Grimm, U. 1998. Conservation and use of wildlife in southern Tanzania. *Animal Research and Development* 48:7-18.
- Luikart, G. & J-M. Cornuet. 1998. Empirical evaluation of a test for identifying recently bottlenecked populations from allele frequency data. *Conservation Biology* 12:228-237.
- Luikart, G., Sherwin, W.B., Steele, B.M. & F.W. Allendorf. 1998. Usefulness of genetic molecular markers for detecting population bottlenecks via monitoring genetic change. *Molecular Ecology* 7:963-974.
- Lyapunova, E.A., Bunch, T.B., Voronsov, N.N. and R.S. Hoffmann. 1997. Chromosome sets and the taxonomy of Severtzov's wild sheep (*Ovis ammon*

*severtzovi*). *Russian Journal of Zoology* 1:387-396

- Mishra, C. and A.J.T. Johnsingh. 1998. Population and conservation status of the Nilgiri tahr *Hemitragus hylocrius* in Anamalai Hills, south India. *Biological Conservation* 86:199-206.
- Rubin, E.S., Boyce, W.M., Jorgensen, M.C., Torres, S.G., Hayes, C.L., O'Brien, C.S., and D.A. Jessop. 1998. Distribution and abundance of bighorn sheep in the Peninsular Ranges, California. *Wildlife Society Bulletin* 26:539-551.
- Schwartz, M.K., Tallmon, D.A. & G. Luikart. 1998. Review of DNA-based census and effective population size estimators. *Animal Conservation* 1:293-299.

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 Web: <http://www.iucn.org>

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### Caprinae News

Dr. D. Shackleton, Editor  
 Wildlife Research Group, Agroecology  
 Faculty of Agricultural Sciences  
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 Vancouver, BC, Canada, V6T 1Z4

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## Notice to Contributors

Submissions of articles, including **research reports, conservation news, recent publications, etc., on wild or feral Caprinae**, are always 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.

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## Acknowledgements

- Faculty of Agricultural Sciences, UBC.
- Lavona Liggins

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## Next Issue

Articles in the next issue will include:

- Punjab arial

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## Editorial Note

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

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## Next Issue

Articles in the next issue will include:  
 - Status of Markhor in Pakistan

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## Errata

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