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Saiga News

summer 2007: issue 5

Providing a six-language forum for exchange of ideas and information about saiga conservation and ecology

Contents

The Saiga Conservation Alliance

The SCA is developing fast. We have appointed a Steering Committee and have an agreed Constitution, a new web page and a bank account. Please see our web page at www.saiga-conservation.com for details.

A new saiga calf. Photo by E.J. Milner-Gulland

Because of their demonstrated commitment to saiga conservation and their geographical spread, we have appointed the Editors of *Saiga News* as the first SCA Steering Committee. The Steering Committee will be meeting in Tashkent in September to discuss the strategic plan of the SCA, and the potential for setting up SCA filials at the national or regional level.

We are now in the position to start recruiting members. As a supporter of *Saiga News*, we invite you to join us as a founder member of the SCA. In order to join, just send an e-mail or letter to Elena Bykova, SCA Secretary (esip@tkt.uz) with a short message to confirm your acceptance of this invitation. There is no membership fee, although donations towards the running costs of the SCA will be gratefully received.

By becoming a member you confirm that you support the mission of the SCA:
We are committed to restoring the saiga antelope to its position as the flagship species of the Central Asian and pre-Caspian steppes, reflecting the species' cultural and economic value to local people and its fundamental role in the steppe ecosystem. We work collaboratively, and freely share our expertise and enthusiasm for saigas. We disseminate our work widely - to those working for saiga conservation, the public throughout the world, governments and the wider conservation community.

Members can be individuals or institutions. We will acknowledge all members on our Membership List and will provide networking opportunities for them, for example through a message board.

We hope that members will also apply to have their conservation activities affiliated to the SCA. Affiliated conservation projects will be able to use the SCA logo and will be given a page on the SCA website to advertise their project free of charge, as well as space in the *Saiga News* projects round-up section.

SCA team studies saiga calves in Ustyurt. Photo by Jean-Francois Lagrot

Children at the Arshan Children's Home, Elista, wearing SCA badges after pledging to support the SCA's mission. Photo by E.J. Milner-Gulland

We will also target our fund-raising efforts and small grants competitions towards affiliated projects. There are full details about the roles and responsibilities of members and the administrative structures of the SCA in our Constitution, which you can view on our website, or obtain in hard copy on request from any member of the Steering Committee.

The SCA will only succeed with the support of its members. We hope that you will accept this invitation to join us, and that together we can build a strong foundation for saiga conservation!

E.J. Milner-Gulland (Chair of Steering Committee), e.j.milner-gulland@imperial.ac.uk

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WWF

All contributions are welcome, in any of our six languages. Please send them to esip@tkt.uz, saigaconservationalliance@yahoo.co.uk or to one of the editors. We publish twice a year.

This publication is available online at www.saiga-conservation.com, http://saigak.biodiversity.ru/publications.html, www.iccs.org.uk/saiganews.htm and http://www.wildlifewarden.net/wcs/mini/Saiga-Chinese.pdf , as a pdf, or in hard copy on request in Chinese, English, Kazakh, Mongolian, Russian and Uzbek.

Updates

INTERNATIONAL AND REGIONAL

The prospects for international cooperation in captive breeding of saiga antelopes

In late 2006, the director of the Centre for Wild Animals of the Republic of Kalmykia (CWA), Yuri Arylov, and leading scientific associate of the Institute of Ecology and Evolution of the Russian Academy of Sciences, Anna Lushchekina, made a unique two-week trip to the USA, organized by the Consortium of Centres for the Conservation of Wild Animals.*

This travel was made possible by the desire of the American specialists to participate in saiga conservation and their interest in the CWA's seven-year experience in successful saiga breeding. Our hosts were interested in the results of scientific studies carried out at the Centre (such as calf feeding and rearing methods, non-invasive methods for monitoring the animals' physiological status, sperm cryobanking and experiments on the rehabilitation of native pasture)

The visit provided an excellent opportunity to observe husbandry procedures at the Scientific Research Center of the National Zoological Park of the Smithsonian Institute (Virginia), the Wild Animals Park and San Diego Zoological Park (California), the White Oak Center (Florida) and The Wilds Center (Ohio). An agreement was reached on carrying out joint studies on artificial insemination and eventual transplantation of saiga embryos. In Russia, there is expertise in this technique for domestic animals at the Institute of Genetics (St. Petersburg) and the Institute of Animal Husbandry (Moscow). We also plan to involve teachers and students at the Kalmyk State University (KSU) in the project. One of the study sites will be the mini-farm of the Agriculture Faculty of KSU.

It is gratifying to realize that our American colleagues acknowledge the contribution of our scientists to the conservation of this vanishing steppe antelope. They are ready to help us to conserve the saiga and have presented the Centre for Wild Animals with highly effective anthelminthics, antibiotics and a rifle for animal immobilization .

In autumn 2007, we expect a return a visit of the US specialists to our republic. A round table on the conservation of the saiga and environmental protection in general will be organized during the visit, as well as meetings with students and schoolchildren, videos, a workshop and other activities

Ivan Minkov, Main Department "The Center for Wild Animals of the Republic of Kalmykia"

Yu. Arylov and workers at the Research Center of the National Zoological Park of the Smithsonian Institute, Virginia (left); Yu. Arylov is feeding a giraffe at the Whiter Oak Center (right). Photo by Anna Lushchekina

*Five North American conservation facilities have joined together in a consortium called the Conservation Centers for Species Survival (CCSS). The San Diego Zoo of Escondido, California; the Fossil Rim Wildlife Center of Glen Rose, Texas; the Wilds of Cumberland, Ohio; the White Oak Conservation Center of Yulee, Florida, and the Smithsonian's Conservation and Research Center of Front Royal, Virginia; all have excellent resources in terms of space, scientific research and breeding, management and recovery of endangered species. The consortium was formed to allow the group to cooperatively apply their unique resources for the survival of threatened species with special needs. The CCSS has identified a number of priority tax that could benefit from their resources. The saiga antelope is one of these species.

The CCSS institutions are very interested in providing their expertise to help support the saiga programs at the Centre in Kalmykia and in situ. The group is currently developing plans for a short training workshop at the Center, and hopes to find more opportunities to work together in the future.

Dan Beetem, The Wilds, djbeetem@yahoo.com

PhD student from Kalmykia awarded a grant from the Sidney Byers Trust

On 6 April 2007, the Wildlife Conservation Network (WCN) announced the winners of the 2007 Sidney Byers Scholarships, which was awarded to young scientists from Africa, Asia, Eastern Europe and South America, who work on the conservation of endangered species. The candidates were nominated by WCN partner organizations. Nadezhda Arylova, who had been nominated by the Saiga Conservation Alliance, was one of seven winners. She studies saiga reproduction in Kalmykia and is studying at the Institute of Ecology and Evolution of the Russian Academy of Sciences. We are pleased to congratulate Nadezhda on this award.

For more details, please follow the link http://www.iccs.org.uk/papers/ScholarshipWinnersPressRelease2007.pdf.

New generation in Gansu Wuwei Wildlife Breeding and Research Centre

In May 2007, a new generation of saigas was born at the Gansu Wildlife Breeding and Research Centre, comprising 4 females and 7 males. The total number of saigas at the Centre is now approaching 50, the highest for 20 years. However, the Centre is now concerned about the sex ratio. 60% of adults are males, and 63% of the newborns are also males. There have been several incidents in which males have injured or even killed females, or each other, using their horns when chasing or fighting. It is interesting to note that the male/female ratio has remained high for the past several years.

The Centre is planning to set up a sub-enclosure in order to separate out some of the males. This may reduce injuries to females. But, the Centre has no experience in how to separate animals without injury. They would welcome information, suggestions or help from those with experience. For more information contact Aili Kang at ygling@online.sh.cn.

Turning the pages of the book of saiga life

Izvestiya Kalmykii, 21 March 2007

"Preserve the saiga as our living heritage" and "Do you know all about me?" are the titles of booklets published by the Centre for Wild Animals of the Republic of Kalmykia (CWA). The first booklet provides insights into the life of this rare animal, conservation issues, anthropogenic effects on its population and how the CWA was founded. These editions open "pages" in the centuries-old life of this indigenous inhabitant of the vast wormwood steppes. In addition, a poster "Cow Breeding and Calf Rotation for the protection of the saiga in Kalmykia" was published, under the DEFRA-funded SEPS project.

Ustyurt children draw saigas

An art competition for schoolchildren on the theme of saiga conservation was held in two remote villages of Karakalpakstan (Uzbekistan) in April-May 2007. The Saiga Conservation Alliance was the initiator of this competition and WCN provided the financial support.

The competition was held in three schools situated in the villages of Karakalpakia and Jaslyk, Kungrad district, with two categories – a picture and an embroidered work. Both children and teachers participated in the contest with enthusiasm, making original and skillful artworks. The most interesting works will be exhibited at the annual Wildlife Conservation Expo hosted by WCN in California, USA, in October this year. The teachers and schoolchildren then took the initiative in conducting remarkable class dedicated to the saiga (see below for more details).

For more information contact Elena Bykova and Alexander Esipov at esip@tkt.uz.

Judging the saiga drawing competition, school #26, Karakalpakiya village (left); Prize-giving for the saiga embroidery competition, school #56, Karakalpakiya village (right). Photo by Elena Bykova & Alexander Esipov

Saigas from Vozrozhdenie Island

During an expedition organized by Russian oil-and-gas company Lukoil* jointly with "Gosbiokontrol" of the State Committee for nature protection of Republic of Uzbekistan in May 2007, an investigation of the former Vozrozhdenie Island (nowadays a peninsula) located in the Aral Sea (Uzbekistan) was carried out. Vozrozhdenie Island was a closed area during Soviet times, so very little was known about its biodiversity, although saigas were known to be present on the island. An isolated group of adult saigas was found on the peninsula, numbering 50 animals. Calves were not observed. Some carcasses from natural mortality were observed. Nowadays the peninsula is practically not visited by people and consequently the saigas living here are not under poaching pressure. It is necessary to carry out a more detailed investigation of this saiga group. For more information contact Artur Nurijanov, nuridjanov@mail.ru , or esip@tkt.uz.

**Lukoil, as part of a consortium of investors, began carrying out seismic prospecting on the Ustyurt plateau in spring 2007.*

Many horns confiscated in the Primorsky province

On 18 January 2007, motorway patrol officers of the Horolsky District Department of Internal Affairs confiscated a truck loaded with three tiger skins, 283 bear legs, 581 saiga horns and bags filled with tiger bones and legs. This was the largest haul of animal parts confiscated in the Far East of Russia in the last 10 years, WWF noted. The criminals were arrested and and a prison term is expected. For more details please follow the link http://www.wwf.de/presse/details/news/grausiger_fund/89/cHash/c22385d79f/ and http://subscribe.ru/archive/home.pets.bcatsproject/200701/18171703.html.

Saiga poachers imprisoned in Kalmykia

In March 2007, Yashkul district court of the Republic of Kalmykia sentenced two residents of Yustinsky district, Kalmykia, who were found guilty of illegally hunting saiga. The damage caused to the state was assessed at 48,000 rubles ($1,700). They were both imprisoned for one and a half years with one year's probation. More details are at http://www.regnum.ru/news/803911.html.

Chinese citizen expelled from Kazakhstan for an attempted smuggling of saiga horns

A Chinese citizen was found guilty in Karaganda (Kazakhstan) of attempting to smuggle 200 kg of saiga horns, INTERFAX agency reports. The criminal was fined and expelled from Kazakhstan. According to information provided by the Territorial Administration of Forestry and Game Ranches of the Republic of Kazakhstan, the smuggler, who had come to Karaganda on a visitor visa, bought the saiga horns from unidentified persons and stored them in a rented flat. The official price of saiga horns in China is reportedly about $200 per kg. According to the laws of the Republic of Kazakhstan, people suspected of killing and smuggling saigas can be tried in both the civil and criminal courts.
More details are at http://www.interfax.ru/r/B/politics/2.html?id_issue=11656506.

Horns for sale in a Chinese medicine store. Photo by Matthias Rossbach

Taiwan police confiscated saiga antelope horns in illegal markets

From Taiwan Environmental Information Centre, May 1st, 2007

Recently, customs officials and the police in Taiwai confiscated 680 horns of saiga antelope, weighing 100 kg, and with a black market value of 5 million RMB ($650,000). The unit price is up to 50-75 thousand RMB ($6,500-9,000).

The investigation and confiscation is part of an action plan by the Executive Yuan of Taiwan. It is in an effort to step up the crack-down on smuggling of agricultural, fishery, livestock and wild animal product and wines.

The local customs officials and police officers detected those horns during their regular patrol. They sent them to the Mushan Zoo and Wildlife Conservation Association Asia section because they felt that they were different from African antelope horns. The Association identified the horns as being from saigas.

Saigas in the news

Russia: *Izvestiya Kalmykii* [The News of Kalmykia]. 26 May 2007

The Saigas return

The growing international concern towards the saiga remains high on the agenda. This unique animal is still on the brink of extinction practically throughout its entire range. However, protection of the saiga has been improving from year to year. Currently, a tendency of population growth is being observed. Deputy Director for Science of the State Nature Biosphere Reserve Chernye Zemli, Boris Ubushaev, has shared this news with Izvestiya Kalmykii.

Due to a warm winter, the calving started earlier than usual – on 28 April, and had already finished by May 9. Preliminary data suggest that about 14,000 females gave birth to calves. Two kilometres away from us, 1500 females gave birth in the Tengutinsky Republican reserve. In previous years, we had only 7000-9000 calves. This implies that currently the population is on the increase and the situation is becoming stable. This is the result of joint work carried out by a number of agencies whose activities are aimed at the conservation of the saiga in Russia. We are united by the Darwin Initiative programme of the British Government. This international project on the conservation of the saiga in Kalmykia was initiated in 2003, coordinated by E.J. Milner-Gulland, of Imperial College London. The nature reserve Chernye Zemli, the Committee for Natural Resources of the Republic of Kalmykia, the Department for Rosselkhoznadzor [Russian Agricultural Inspection] for the Republic of Kalmykia, the Centre for Wild Animals, the Kalmyk Institute of Humanitarian Studies of Russian Academy of Sciences, Dharma-Center, Yashkul High School, and the Elista Children's House are all involved in the implementation of the project in Kalmykia.

Work with local people is a prime consideration for the project participants, because poaching remains the main cause of saiga declines, together with other factors such as climatic conditions and predation. As part of the project, students from Yashkul' and Komsomolsk High Schools have conducted sociological surveys in their own districts to find out about the livelihoods of rural residents, their attitudes towards the problem of saiga antelopes and opinions on how to improve saiga protection. The survey of public opinion gave the work two directions: the improvement of the capacity of nature reserves to oppose poaching and assistance for local residents to improve their living standards.

Representatives of the Darwin Initiative project visited Kalmykia for nine days. The coordinator of the project, E.J. Milner-Gulland, was accompanied by exchange participants who were concerned about the status of the saiga. Everybody had a specific mission during this trip. Some were solving organizational questions, while others were familiarizing themselves with nature. However, everybody was able to communicate with our schoolchildren in Elista, Komsomolsk and Yashkul. The visitors were delighted to see how seriously and responsibly the schoolchildren considered this problem. Rosa Baik was filming a documentary, which highlights not only the problem of saiga antelopes, but also the history, culture, customs and way of life of the Kalmyk people. "I live in Wales. I have long been interested in wildlife. I have made several wildlife films. In the UK, this film will highlight the problems of saiga conservation." Alison, Eleanor's mother, came along with her. "I am a painter. Therefore, my goal is to reflect all that I see here on canvas. I have always been interested in nature, ecology and landscapes. I have already made many sketches. When I return home, I will paint real pictures, which will help people to form their opinion about Kalmykia. We want to tell the whole world about these remarkable animals and the danger they are currently facing. There are no saiga antelopes in the UK, but we do have other animals, which are also endangered. This is what unites us." This unity of the international community has already started yielding positive results.

Lyudmila Sarangova

Articles

INTAS project draws to a successful close

E.J. Milner-Gulland

Imperial College London, e.j.milner-gulland@imperial.ac.uk

The three-year project "Reproductive Ecology of the Critically Endangered Saiga Antelope", funded by INTAS, came to a close at the end of March 2007. This project involved teams from the UK, Norway, Russia, Uzbekistan and Kazakhstan (Imperial College London, University of Oslo, Institute of Ecology and Evolution, Centre for Wild Animals of the Republic of Kalmykia, the Institutes of Zoology of Kazakhstan and Uzbekistan, and the Kazakhstan National Agricultural University).

Our study aimed to monitor saiga reproductive behaviour in two populations - Kalmykia (Russia), which is relatively well protected and Ustiurt (a transboundary population shared between Kazakhstan and Uzbekistan), which is suffering from heavy poaching. The comparison between the two populations allowed us to evaluate the effects of selective harvesting on the reproductive ecology of the species, and make recommendations for future management. The second component of the project concerned building capacity for robust saiga conservation and management in the range states. We have developed a non-invasive method of monitoring pregnancy, based on hormonal analysis of faecal samples, to replace the previous method based on culling. We have also developed a robust method for monitoring saiga births, rutting and herd size and structure, which has been standardised over the three participating range states, allowing comparability in the datasets generated from long-term monitoring. We have used models to improve our understanding of the accuracy and precision of current aerial survey techniques for population counts. Finally we have contributed to the conservation and management of saigas in the three range states by training young scientists and setting up a network for information dissemination and communication between scientists and conservationists.

Saiga calves at the Chernye Zemli Biosphere Reserve, Kalmykia, May 2004. Photo by Nils Bunnefeld

Our project has had a substantial impact on saiga conservation and scientific research, both within the FSU and internationally. We have been approached for scientific advice by several international conventions and NGOs, and many journalists, students and private individuals. Our work has featured in local, national and international TV programmes, films and newspapers. The impact of our research on saiga management has been to ensure that a consistent methodology for collecting data on saiga ecology is used in all three of the saiga's main range states. We have instituted long-term monitoring in Kalmykia and Uzbekistan, and contributed to the improvement of existing monitoring in Kazakhstan. Our successful trial of non-invasive methods for monitoring pregnancy in saigas will be of interest both for saiga managers and managers of other species. We were also instrumental in engaging with the governments of each range state, through the provision of advice from in-country team members, as well as at the international level through the CMS MOU meeting in 2006, to which our INTAS team was asked to contribute as scientific experts. Finally, we have had a strong capacity-building impact, particularly through the support of young scientists G. Erdnenov, N. Arylova and A. Voznesenskaya in Russia and D. Golovtsov in Uzbekistan. We are particularly proud to announce that our young scientist Nadezhda Arylova has recently won a Sidney Byers Scholarship to support her further PhD studies.

CSCWAK young scientist Nadezhda Arylova analysing blood samples for monitoring pregnancy status. Photo by Anna Lushchekina

Many publications have come out of our project already, and there are several more in the pipeline. Some have appeared already in Saiga News, including in this issue. Some others are listed below.

The following are available online in English at www.iccs.org.uk:

- *Kuhl, A., Mysterud, A., Erdnenov, G.I., Lushchekina, A.A., Grachev, Iu. A., Bekenov, A.B., Milner-Gulland, E.J.* (2007) The 'big spenders' of the steppe: sex-specific maternal allocation and twinning in the saiga antelope. Proceedings of the Royal Society B 274, 1293-1299.
- *Dierks, J.* (ed) (2006) The wonder of the Kazakhstan steppe. Schoolbook for children, Kazakhstan.

The following are available online in Russian at http://ecoclub.nsu.ru/books/Stepbull.htm:

- *Arylov, Iu.A., Voznessenskaya, V.V., Lushchekina, A.A., Medzhidov, R.A., Milner-Gulland, E.J., Ubushaev, B.S.* (2006) International projects for the study and conservation of the saiga antelope in Kalmykia. Stepnoi Bulletin, N 21-22, 11-13.
- *Bykova E.A., Esipov A.V., Efimov A.Yu., Golovtsov D.E.* (2006) Saiga in Uzbekistan – the current status and reasons of population decline. Steppe bulletin, N 21-22, 2006, 17-20.
- *Grachev, Iu.A., Bekenov, A.B.* (2006). Status of the population and perspectives for the conservation of the saiga in Kazakhstan. Steppe Bulletin, N 21-22, 15-17.

We plan to continue the work started in the INTAS project through further research, with a particular focus on understanding the drivers of saiga movement and investigating the potential of participatory monitoring as a tool for saiga conservation and management. Unfortunately, after 12 years of continuous support for saiga research through difficult times, INTAS will not be funding any further studies, because the European Union has ceased funding this organisation. However we are confident that the strong network which we have created during this last project will enable us to continue our very productive collaborations with new funding sources.

Saiga reproduction in Ustyurt

Yury A. Grachev, Amankul B. Bekenov
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Republic of Kazakhstan, Almaty, terio@nursat.kz

This research was carried out in the Kazakhstan part of Ustyurt, in 2004-2006. In 2004, calving started on 14 May, and between 14 and 26 May, we recorded in total 595 calves. The weight of calves aged 0.5 to 2 days was 3100-3850 g and the body length was 510-600 mm (n=9); on day 3, these values reached 3950-4600 g and 600-660 mm (n=4). The differences in sizes between males and females was insignificant. Of 13 calves, seven males and six females were recorded. The females gave birth mainly to one calf rather than two. Hence, of 133 encounters, in 87 (65%) we recorded one calf and in 46 (35%), two calves. On average, 1.34 calves were born per calving female. The fecundity of the population has therefore decreased; in previous years, 1.5 calves were born per female (including those who did not give birth). Currently, the precise number of non-calving females is impossible to establish. The approximate ratio of "calves to females" is possible to evaluate by using observations from the last two days of the birth period, when when we can be certain that calves were near their mothers, because the animals had already started migrating from the breeding grounds northwards. In this period, we recorded 334 calves and 578 females, i.e. 0.57 calves per female. This ratio appears to be close to the real ratio, as calf-less females were also observed.

A newborn saiga in Ustyurt plateau, Kazakhstan. Photo by Marcus Fry

In May 2005, the largest saiga aggregation was recorded near the Kosbulak salty marshland ("sors"), situated ca. 70 km to the north of the Uzbekistan boundary. Several thousand females had concentrated there, in an area of 100-150 sq. km. The area was a slightly rugged plain lying to the north-west of the Kosbulak sors, vegetated by saltworts, wormwood, grasses and sparse saxaul shrubs. The first calves were presumably born on 12 May, as on 14 May we were already encountering several two-day old calves. The last newborn calves were recorded on 19 May. The peak of birth occurred on 14-17 May.

Most of the calves from which we were able to take measurements were 2 days or older. Of 13 calves aged 6-12 hours, the weight of the males (n=8) was 2700-3400g (average 3087g) and females (n=5) 2800-3350g (average 3070g); the difference was insignificant.

Of 177 encounters, one calf was recorded 126 times (71.2%); two calves, 50 times (28.2%); and three calves once (0.6%). On average, there were 1.29 calves per calving female. The density of newborn calves varied from 18 to 35 per sq. km. On 20 and 21 May, some calves were with their mothers. In one group, we recorded 131 females with 32 calves; in the other, 22 females with 11 calves.

During calving, weather conditions were good; no deaths of newborn calves were recorded due to low temperatures or cold rains, which happens in some years. However, we found nine saiga calves killed by wolves. It is noteworthy that only a few deaths of saiga calves have been recorded over many years of study. The remnants of one saiga calf were recorded near the nest of a steppe eagle.

Yury Grachev maps saiga observations. Photo by Jean-Francois Lagrot

A few saigas were also recorded calving near Asmantai sors (70 km westwards), as well as near the River Emba in the Mount Kantorkol area, further to the west.

No mass calving aggregations were found in 2006, in part due to rain to the north-west of the Terenkuduk former weather station, where we had hoped to find the breeding grounds. On 21 May, we found the remains of a female with one fetus at a late stage of development. On 22 May, we recorded a female with one calf to the north of Lake Shoshkakol. A group of five females and seven calves was recorded at the Buzachi peninsula in June. Summarizing these patchy data, we can calculate that were 1.28 calves per calving female.

Thus, saiga birth dates have not changed compared to the long-term average; large-scale calving is usually recorded in the period 10th-20th May. The fecundity has dropped, which is confirmed by the reduction in the number of calves per female – from 1.50 in 1990s to 1.28-1.34 currently. Previously, about 75% of females had twins, and 25% had only one calf. Currently, the situation is the reverse – only 28% of females have twins. The main reason for the drop in fecundity is the reduction in the number of reproductive males, which results in an increase in the number of females who don't conceive. The reduction in the twinning rate may be connected to a change in population structure, in particular an increase in the proportion of young females, who are less fecund.

This study was carried out with the support of INTAS project 3579.

Phylogeography of the Saiga

Marina V. Kholodova

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Until now, the level of genetic diversity in the saiga, in whose history periods of sharp habitat reduction and declines in numbers have been recorded (Bannikov et al., 1961; Baryshnikov et al., 1998), remains a mystery; nor is the degree of relatedness between different populations of the saiga known. Besides, the question of the status and origin of the Mongolian saiga is not clear as yet. To study the species' phylogeographic structure and assess its genetic diversity, an analysis was carried out of polymorphism in a hypervariable fragment of the D-loop of mitochondrial DNA (mtDNA) for specimens (n=93) collected from various saiga populations. 52 haplotypes were described. 36.6% of specimens had unique haplotypes. Overall, the species has haplotype (H=0.98) and nucleotide (π=3.7%) diversity slightly higher than the average for ruminants. Significant differences between individual haplotypes, a large number of variable sites and transversions of mutations all suggest a long history of formation of the modern polymorphism of saiga mtDNA and confirm the hypothesis of the ancient history of this species as a single evolutionary line (Baryshnikov et al., 1998)

Genetic diversity varies significantly between saiga populations. The highest genetic variability was found in the Ustyurt and Betpakdala populations, while the lowest values (3-5x lower) were recorded in the Mongolian saiga. The preservation of relatively high levels of genetic diversity in the nominate subspecies, *Saiga t. tatarica*, despite periods of population decline, appears to be connected with the species' high reproductive rate. An analysis of the phylogenetic relationship between the European and Kazakhstan populations, as well as between different subspecies of the saiga, suggests a general and relatively recent separation of all modern saigas from a single highly polymorphic ancestor population. An assessment of the inter-population genetic distance shows the highest genetic isolation of the Mongolian population from all other populations and a lack of true differences between the Ustyurt and Betpakdala populations (Fig. 1). Thus, despite the geographic isolation and different migratory routes of individual Kazakhstan populations (Fadeev, Sludsky, 1982; Bekenov, Grachev, 1998), our findings clearly indicate their close relationship.

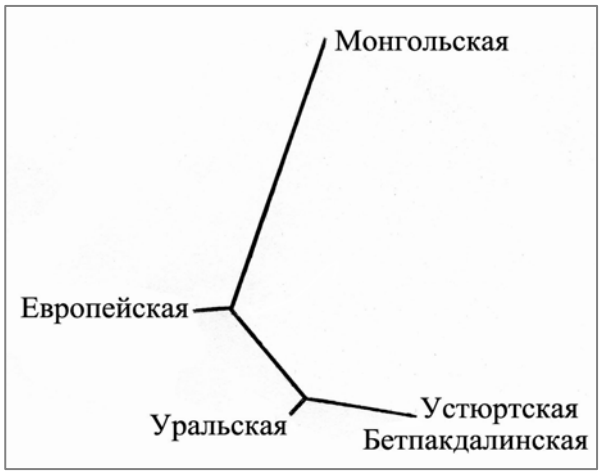
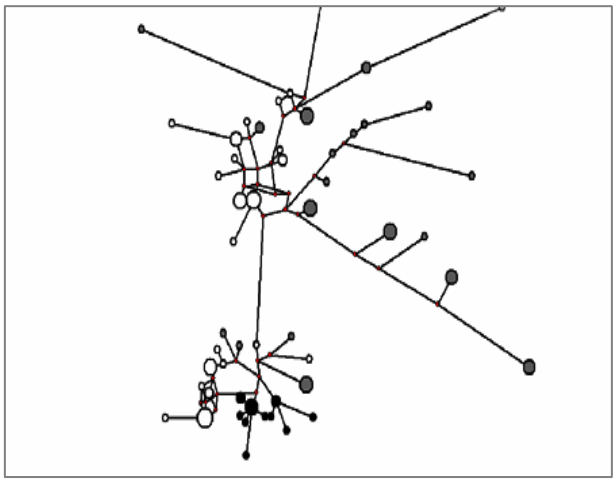


Fig.1. Genetic distances between populations of Saiga tatarica based on the weighed genetic distance, Net distance).

Despite their clear genetic relationship with the Kazakhstan population, European saigas showed no haplotypes identical to those of Kazakhstan's saiga, while haplotypes common to all saigas were recorded in all three of Kazakhstan's populations. The River Volga appears to play a significant role as a barrier between the right-bank (European) and left-bank (Kazakhstan) saiga populations. Although saigas have occasionally moved from one bank of the River Volga to the other (usually in periods of winter food shortage; Bannikov et al., 1961), their effect on genetic exchange between populations, at least through the maternal line, is insignificant. Anthropogenic factors play an increasingly important role in the isolation of individual populations of *S. t. tatarica.* The presence of man-made obstacles hindering movement between populations was recorded in Kazakhstan as early as the 1980s-90s (Bekenov et al., 1998). Taking into account the sharp decline in saiga numbers in all populations in the late 20th and early 21st centuries, both geographical and genetic isolation will only increase.



Molecular-genetic data suggest that Kazakhstan's saigas are the closest to the ancestor form. Haplotypes of saigas from Kazakhstan are highly variability, and in the phylogenetic tree (Fig. 2), most of them occupy basal locations. The analysis of mtDNA polymorphisms allows us to suggest that the main Holocene centre of saiga distribution within its modern range is central Kazakhstan. The Mongolian saiga, *S. t. mongolica*, characterized by the lowest genetic variability, represents a group separated from a single ancestor population, which has existed in isolation at low numbers for a long time. This finding fits well with the morphological traits of the Mongolian subspecies, which is distinguished from other saiga by smaller size and a number of infantile traits of its anatomy.

This study was partly funded by INTAS project 97-11197, the Russian Foundation for Basic Research and the Zoological Society of San Diego. Further detail is in Kholodova et al (2006), *Oryx*, which can be found at www.iccs.org.uk.

Fig. 2. The median net of haplotypes of the saiga from different populations. Designations of haplotypes: white circles, European saiga; grey, Kazakhstan; black, Mongolian. The diameter of circles is proportional to the number of specimens with this haplotype. The arrow shows the direction from the possible ancestor (the homologous fragment of mtDNA of Kobus kob was used the external group).

Saiga protection in the Stepnoi Reserve, Astrakhan Province

Anatoly V. Khludnev

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The south-western part of the Astrakhan province, in the north-western Caspian region, has a unique feather-grass steppe ecosysem. This area is little affected by human activities, and contains rare mammal, bird and plant species such as the Steppe Eagle, the Long-legged Buzzard, the Demoiselle Crane, the Little Bustard and the Saiga. A catastrophic decline in saiga numbers in the 1990s and the desire of activists to preserve this animal and other species inspired the initiation of work towards the establishment of a nature reserve. This initiative was successful and eventually supported by the governor of Astrakhan province, A.P. Guzhvin, who issued decree No 120 of 5 April 2000 approving of the establishment of the Stepnoi Reserve with an area of 87.000 ha in Liman district, Astrakhan province. The main goals of this reserve are the eradication of poaching; prevention of disturbance to saigas; preventive and educational work with the local population; ensuring compliance with the rules; and facilitation of research.

The reserve has a staff of 10. The inspectors have four vehicles equipped with radios and night vision devices, two Kawasaki and Yamaha sport motorcycles, arms, navigational equipment and binoculars, field equipment and cameras. The inspectors receive regular training on legal documentation etc., and are examined on the safe use of arms and equipment.

Inspectors on patrol in the steppe. Photo by Anatoly Khludnev

V. Kalmykov – a poacher's nightmare. Photo by Anatoly Khludnev

From the very first days of the reserve's existence, round-the-clock observation teams were set up using two vehicles, which gave rapid positive results. The rangers detained all those poachers who continued to use the area. All poaching by motorbike was stopped as soon as we obtained two power speedway motorcycles. Saiga protection is carried out by various methods; vehicle surveys throughout the area; ambushes on possible poaching routes; watches of well-used crossroads and round-the-clock check-points

Through work with shepherds we obtain useful information saigas and any changes taking place in the protected area. Farmers whose cattle are being stolen cooperate directly with us and very frequently inform us on mobile phones about suspicious motorcyclists, enabling us to take appropriate measures. However, the poachers, who are very well equipped with mobile phones, also alert one another about the presence of rangers or inspectors from the Hunt Administration of the Republic of Kalmykia. Therefore, the rangers have to move secretly to the observation points and use night vision devices.

Inspectors who are not on patrol duties visit classes in local schools, libraries and colleges, and show video films that they themselves have shot. Every quarter, we publish articles about the situation in the reserve. In June 2006, correspondents from the Russian TV channel STS made a film based on our videos, which was shown on Astrakhan TV and was a great success. Articles about the saiga have been published in several Astrakhan newspapers. In February 2007, a team from the Astrakhan television and radio company Lotos made two short documentaries about the the inspectors' saiga protection and wolf control work in the reserve. Both induced a significant public response. A large article about the reserve and its staff was published in the newspaper Komsomolets Kaspiya on 14 February 2007.

The reserve inspectors help researchers and students of Russian and foreign higher educational institutions to carry out their studies.

For three years, the inspectors have been monitoring of saigas in the reserve by filing trip reports. All data collected by us and others are transferred to a general saiga monitoring database, which enables saiga distributions to be mapped. Thus, we are abel to trace seasonal and annual changes in saiga numbers in the surveyed area.

Owing to our close cooperation with the Centre for Wild Animals of the Republic of Kalmykia, the "Chernye Zemli" Biosphere Reserve and the Russian Committee for UNESCO/MAB, the workers of the Stepnoi Sanctuary have become involved in scientific research and cooperation with various Russian and international organizations. Thus, we have become full participants in a number of saiga research and conservation projects under the supervision of Dr. Anna Lushchekina and Professor Yury Arylov. The work carried out by the staff of the Stepnoi Sanctuary on saiga protection and our initiative in working with local residents has enabled us to obtain support from international nature conservation organizations such as IFAW, PTES, INTAS and the Darwin Initiative. Taking this opportunity, on behalf of all the staff of the Stepnoi Sanctuary, I would like to express my sincere gratitude to all those who help us to conserve a unique animal such as the saiga.

Our findings show that the decline in the number of the saiga has stopped, being replaced by a slight increase. Thus, the current number of saigas in the northwestern Caspian region is up to about 20,000 individuals, including 1000 mature males. We hope that our work will contribute to the conservation of the saiga for future generations.

A Memorable Trip through Saiga country

Stacey Iverson

Wildlife Conservation Network, USA, stacey@wildnet.org

Stacey Iverson, Program Manager for Wildlife Conservation Network (WCN) and her husband, Keith (Kip) Iverson, WCN computer/technology volunteer, spent two weeks in April and May visiting the projects of the Saiga Conservation Alliance in Uzbekistan and Kalmykia, Russia.

Armed with a Russian phrase book and a good digital camera, Kip and I set out for our Central Asian adventure. We have lived in and traveled to Africa and South America, but this was our first experience in Central Asia.

We were warmly greeted by Alexander Esipov and Elena Bykova in Tashkent. We piled into the Lata jeep and the journey began along the ancient Silk Road. We were soon joined by Dmitry Golovtsov and Gairat Saidov, both zoology students working for the Alliance. They proved to be very patient caretakers of an old but sturdy off-road van that they drove during the trip, and very dedicated young scientists.

Our ultimate destination was the region of Karakalpakstan on the western border of Uzbekistan, the ancient migratory route of the saiga herds. Sadly, the saiga no longer breeds in this region because of pressure from poachers. Herds of saigas come here only during winter migration. The land and sky stretch on for miles while the wind moves through the short grass without a sound. It is a place for reflection and time out from the hectic pace of our lives. I wished for more time here, to learn more about the travelers who for centuries followed this route by horseback, camel or on foot, and to imagine the wildlife that used to live here.

The road to this great steppe was long, but we broke up the time with frequent stops for photos. Roadside attractions included fields of lively red poppies, the indigenous rodents and birds foraging for insects and plants, flocks of sheep of all colors and shapes, huge gentle camels grazing, and the occasional donkeys and horses. Meals on the road were always interesting and delicious, and certainly part of the adventure.

Along the road, we stopped for the night in Samarkand, Bukhara and Nukus. Each city had its own unique charms, including spectacular mosques covered with blue and white handmade mosaic tiles. The stories of these mosques are a fascinating account of centuries of exotic cultures and ancient civilizations. In each city, we enjoyed the warm hospitality and comfort at the local Bed & Breakfast. A highlight of breakfast in Bukhara was a delicious jam made from roses, which are grown throughout the country.

A roadside encounter with some camels in Uzbekistan - love from the locals! Photo by Keith Iverson

On our fourth day in Uzbekistan we arrived at the home of Misha and Damish, local residents of the village of Karakalpakia. Misha was formerly a saiga hunter, but has recently become a “Saiga Friend” and advocate for the protection of wildlife. We also visited the secondary school in the village to help choose the finalists of the saiga art contest. We were impressed with the talented artists among the school kids and were honored to be a part of this important lesson in saiga conservation for local children.

On the road again to our final night in Uzbekistan. Our destination was the Beleuly ruins on the Ustyurt Plateau. The ruins are from an ancient hotel that stood along the Silk Road. Not so long ago saiga births took place here. Near the ruins was a small lake and all around was the endless expanse of the steppe. Distances are distorted in this flat landscape and the sense of being totally alone was intense. I could have stayed there a long time.

We said goodbye to Elena and Alexander and flew to Moscow to meet Anna Lushchekina. Our mission for this part of the trip was to meet the saiga team in Russia and visit the Saiga Breeding Centre in Kalmykia.

Our first night was spent at the home of Anatoly and Nadezhda Khludnev, the Director of the Stepnoi Sanctuary. Once again, warm hospitality welcomed us to this country.

The next day we drove to the Stepnoi Sanctuary. The open steppe habitat is the perfect environment for rodents and their avian predators - hawks, eagles and falcons. The most exciting moments were seeing wild saiga running free on the steppe, perfectly adapted to this flat open landscape. We met several of the men from the anti-poaching unit and learned more about the tough work that they must do in this vast sanctuary. In less than 7 years, they have almost eliminated poaching from this region, thus protecting one of the most vibrant and important breeding areas for saigas and other endemic wildlife.

Our final stop of the trip was the impressive Saiga Breeding Centre in the heart of Kalmykia. Professor Yury Arylov is the director of the centre and has worked hard to create a first-class facility with very few resources. Approximately 40 saigas occupy the large enclosures, and can be viewed by guests from a raised platform. The saigas are well cared for but human contact is kept to a minimum so that they remain semi-wild. In every aspect of this facility, there is a sense of goodwill and compassion for humans and animals. The visitor centre is still taking shape, but currently houses a wonderful collection of art from local school children and educational displays that describe local culture and the intertwined lives of people and the saiga.

This trip was a unique and memorable experience. We will always remember the warmth and generosity of our hosts and the vision of wild saiga running free in the Stepnoi Sanctuary. As the program manager for Saiga Conservation Alliance with WCN, I am now able to share my knowledge and experience of the saiga with others, and look forward to a long and successful partnership with Elena and the Saiga Conservation Alliance.

Yuri Arylov, director of the Sagia Breeding Centre in Kalymikia, Russia, presents Keith and Stacey with two woven wall hangings hand made in the region. Photo by Anna Luschekina

Project round-up

Involvement of local residents in projects on saiga conservation in Uzbekistan

Poaching is the major cause of the decline of saiga populations in Uzbekistan, as in other range states. Saiga horns and meat are used by local residents for sale or personal use. The most active poaching period is October-February, coinciding with saiga migration into Uzbekistan. The incentives to poach are low incomes, unemployment, and lack of control of illegal hunting. The sustained demand for saiga meat and horns and lack of understanding of the situation has been a fertile field for flourishing poaching activities. In January 2007, two projects were launched on the conservation of the saiga through the improvement of the educational levels of local people and their involvement in the management of this species

Interview with saiga friend in Jaslyk village. Photo by Elena Bykova

Schoolgirls embroider a saiga, school #56, Karakalpakia village. Photo by Alexander Esipov

1. Establishment of local associations for saiga management

The project is carried out by the Institute of Zoology of the Uzbekistan Academy of Sciences and Fauna & Flora International (FFI), with financial support from British American Tobacco. The project is directed at involving local people in saiga monitoring. Monitoring groups include former and current hunters. Two groups have now been set up, in Jaslyk and Karakalpakia villages, and have received training in scientific monitoring. From October 2006 to March 2007, information was amassed on saiga ecology, including migration timing, numbers, distribution, herd size, population structure and behaviour. Data collection forms have been developed based on the monitoring protocols developed by the INTAS project researching the reproductive ecology of the saiga (see article above). We also have a goal of raising awareness about conservation and sustainable use of the saiga, for which we have held discussions with local residents and carried out joint actions along with national nature conservation agencies.

2. Awareness raising and involvement of local communities in saiga conservation

This project is carried out by the Saiga Conservation Alliance with the financial support of the WCN, Sidney Byers Trust, and donations. It is also aimed at raising awareness and establishment of a stable network for saiga conservation. Our actions are first and foremost directed at working with the local residents of Jaslyk, Karakalpakia and Kubla-Ustyurt villages, situated in saiga range areas, who are directly involved in the use of saiga meat and horns. We are carrying out an educational programme with schoolchildren and students (see above), supporting a school folk crafts club, publishing information booklets and posters, and working with local volunteers as assistants, future protectors and friends of the saiga.

By raising the awareness and interest of the local population in the issues of saiga conservation, we are laying the basis for the long-term conservation of biodiversity in the Ustyurt region in general.

Another important component of the WCN project is the development of the Saiga Conservation Alliance through the support of *Saiga News* and holding an SCA Steering Committee meeting in Tashkent in September this year. For further information please contact Elena Bykova and Alexander Esipov, esip@tkt.uz

The SCA is monitoring progress of the MOU on Saiga Conservation

In Issue 4 we carried an article announcing the coming into force of the MOU on Saiga Conservation and the ratification of a Medium Term Work Programme (MTWP) for action over the next 5 years. The next meeting of the MOU signatories will take place in two years.

The CMS has commissioned *Saiga News* to help them to support the implementation of the MWTP, through sharing information about any activities that are contributing towards the fulfillment of the MWTP, and through compiling a database of projects and saiga experts. In support of this, we will from now on include a short section in *Saiga News* on progress towards the goal of the MWTP, written by the Editorial team.

We ask all subscribers to let us know about any relevant activities that they are carrying out, and to give us the contact details of anyone who should be on the database of experts. All contributors to *Saiga News* will be requested to provide a short explanation of how the work reported in their article contributes to the MTWP. Our final report to CMS will form an important part of their documentation of the success that range states have had in fulfilling their obligations under the MTWP, and so we would like to ensure that all activities are noted, so that those carrying them out can get appropriate recognition for their efforts.

Report on progress towards the CMS MOU in the period September 2006-June 2007

Section 1. Implementation

Internationally, the publication of *Saiga News* by the Saiga Conservation Alliance has been supported in this period by INTAS, the Darwin Initiative and the Wildlife Conservation Network. The Convention on Migratory Species is supporting the collation of information about progress towards MTWP implementation through a 2-year grant to Imperial College London, starting on 1st July 2007 (action 1.5).

In Uzbekistan, a Coordinating committee for implementation of the MoU has been set up within the framework of the MTWP; a working program of urgent measures aimed at the conservation of saiga antelopes for the period of 2006 to 2010 was outlined (actions 1.2, 1.3).

In Kazakhstan, in compliance with the order of the head of the Kazakhstan Prime Minister's office No 7-64/002-565 of 20 February 2007, the Institute of Zoology and the Committee for Forestry and Game Ranching of the Ministry of Agriculture initiated the development of the second stage of the programme for the conservation and rehabilitation of rare and vanishing wild ungulates and saiga antelopes for the period of 2008 to 2010 (action 1.2)

Section 2. Anti-poaching

No major increase in funding for anti-poaching patrols over that already in place has been reported in any range state.

In Russia, a small grant from IFAW is reported to have been received by the Stepnoi Sanctuary, to support the monitoring and protection of the saiga in the Stepnoi Sanctuary by improving the capacity of the inspectors, including logistical support (action 2.2) and training (action 2.4). Two poachers were arrested and prosecuted in Kalmykia in March 2007, and there have been interceptions of smuggled horns in Russia, Taiwan and Kazakhstan (action 2.3; see articles above).

In Mongolia, a ranger refresher training course was held in September 2006 (WWF-Mongolia, see *Saiga News* issue 4; action 2.4).

Section 3. Sustainable use and trade

Internationally, in June 2007, the saiga antelope was discussed at the meeting of the CITES Animals Committee, and an update on the situation was given by the CITES secretariat, including the results of an trade survey in consumer and producer countries conducted by TRAFFIC and the Wildlife Conservation Society. See: http://www.cites.org/eng/cop/14/doc/E14-56.pdf (action 3.6).

Section 4. Human factors

In addition to existing projects, the following new actions have taken place in the period:
In Uzbekistan, new projects have begun on participatory monitoring and setting up a "Saiga Friends" network, carried out by the SCA and Institute of Zoology, and funded by FFI/BAT and WCN (see above; actions 4.2 and 4.3).
In Kalmykia, a survey of attitudes to saiga conservation and the effectiveness of conservation projects was carried out in Oct-Nov 2006 by the Centre for Ecological Projects and Imperial College London, funded by the Darwin Initiative (action 4.2). A project funded by the Association of Religions in Society and led by the Dharma Centre, Kalmykia, is involving religious groups in saiga conservation (action 4.3).
In Kazakhstan, FFI initiated a second phase of its small grants programme in Bosoi, Ustiurt, in October 2006 (action 4.1; see *SN* issue 4).

Section 5. Awareness

In addition to existing projects, the following new actions have taken place in the period:
In Mongolia, WWF-Mongolia organised a children's art competition in October 2006 (see *Saiga News* issue 4; action 5.2).
In Uzbekistan, awareness-raising has been carried out through art competitions, supporting a craft club and production of publicity materials (see articles above; action 5.2).
In Kazakhstan, a 15-minute saiga cartoon was shown in October 2007, supported by NABU (see *Saiga News* issue 4; action 5.2). There has been some press coverage of saiga issues (e.g. *SN Issue 4*, action 5.1).
In Kalmykia, saiga conservation has been featured in the local press on a number of occasions (action 5.1), a children's art competition has taken place (May 2007) and a number of new sets of publicity materials have been distributed by members of the SCA, supported by a number of grants including from the Darwin Initiative and DEFRA's Small Ecological Project Scheme (action 5.2).
Internationally, the Saiga Conservation Alliance is launching a new website at www.saiga-conservation.com in June 2007, and continues to expand the *Saiga News* mailing list (actions 5.3 and 5.4).

Section 6. Mapping distributions

In Kazakhstan, the Association for the Conservation of the Biodiversity of Kazakhstan has appointed a new GIS officer, Stefan Zucker, with the responsibility of collating data on saiga distributions and ecology, funded by the German government (actions 6.1 and 6.3).
In Kalmykia, a computer database of saiga distributions, herd size and structures in the Chernye Zemli Biosphere Reserve and Stepnoi Sanctuary from 2003 onwards has been collated, funded initially by INTAS (action 6.1).
In Mongolia, several saigas were satellite-collared in August 2006 by the Wildlife Conservation Society and Mongolian Academy of Sciences (see *SN* issue 4; action 6.2).

Section 7. Protected areas

No new progress to report in this area. In Kazakhstan, the Altyn-Dala Conservation Project continues to be active in planning and other activities (action 7.1).

Section 8. Monitoring

In Kazakhstan, aerial censuses of all three saiga populations were carried out in April-May 2007 (action 8.1). An evaluation of the aerial survey monitoring procedures with recommendations for future developments was carried out by independent consultants in April 2007 on the request of the Committee for Forestry and Game Ranching, and financially supported by Frankfurt Zoological Society (action 8.3).
In Kalmykia, monitoring of saiga demography, calving, herd size and structure and distribution has continued to be carried out as in previous years (actions 8.1, 8.2, 8.7; see articles above).
In Uzbekistan, a pilot participatory monitoring programme has been set up (see articles above; action 8.6).
In Mongolia, a saiga population count was carried out in January 2007, suggesting a population size of at least 2000 individuals (action 8.1).

Section 9. Captive breeding

The Centre for Wild Animals of the Republic of Kalmykia has been active in transferring its expertise to other, more newly established, captive breeding centres in Russia (in Rostov and Astrakhan provinces and Moscow Zoo). Several calves were taken from the Stepnoi Sanctuary in May 2007 in order to improve the captive breeding stock in these breeding centres (actions 9.3, 9.7).

Sections 10-14. Population-specific measures

North-west Precaspian: Work on actions 10.2-10.4 (monitoring and conservation activities) has continued (see articles above and in *SN 4*).
Ural: No known progress to report against any of these actions.
Ustiurt: The pilot-scale public engagement projects have continued in Kazakhstan and Uzbekistan (12.4). There has been work with law enforcement authorities in Uzbekistan (12.8) and attempts have been made to engage with infrastructural developers (12.9).
Betpak-dala: ACBP has engaged a GIS officer with responsibility for saiga data collation, and saiga conservation is being fully considered in the planning process of the Altyn-Dala Conservation Project (13.1). Funding for anti-poaching patrols has continued (13.2).
Mongolia: Inadequate information available to assess progress, although small-scale initiatives have been started by a number of organisations on action points 14.1-14.5.

Compilation of the progress report

The full text of the MTWP, for cross-referencing with this report, can be found at http://www.cms.int/species/saiga/1st_saiga_range_states_meeting.htm. If any new activities in fulfilment of the MTWP, which occurred during the reporting period Sept 06-June 07, have not been included in this round-up, please send us details and we will include them in the next round-up. We can't include activites that we have not been informed about. If you want to know more about any activity reported here, contact either the author of the Saiga News article which expands on the activity or the editorial team member for the country in question.

Review of recent saiga publications

Publications in Russian

Voznesenskaya, V.V., *Arylova, N.Yu.*, *Arylov, Yu.N.*, *Khludnev, A.V.*, *Lushchekina, A.A.* (2007) The methodology of the sampling of saiga faeces in field conditions for the analysis of the content of steroid hormones or their metabolites in them. Moscow.
Resulting from the implementation of an international project INTAS №03-51-3579, methodical guidelines on the sampling of saiga faeces in field conditions for a further hormonal analysis were published in Russian. These guidelines will be extremely useful for specialists working in field conditions, studying the reproductive status and conservation of the saiga. These methodical guidelines are available electronically on request by email rusmabcom@gmail.com or in printed form by post.

Klevezal, G.A. (2007) Principles and methods of age determination of mammals. Moscow: KMK Sci. Press Ltd., 283 p.
In the book the reader will find the main methods of age determination of mammals enabling the estimation of the age of an animal with the necessary precision using the most simple appropriate method. Special attention is paid to aging living animals. The book includes specific data on using different methods for aging more than one hundred species of the mammals. A special section is devoted to determination of saiga age.

Kholodova, M.V. (2006) The use of modern and ancient DNA for the study of the ecosystem dynamic. The dynamics of modern ecosystems in Holocene. Proceedings of the Russian scientific conference, Moscow, p. 261-266.
The author shows that fossil specimens are of great importance for the study of evolutionary processes in populations and ecosystems, including saiga antelopes, because of the potential for DNA extraction using novel methods. For further details see: http://www.sevin.ru/news/holocene-ecosystems-2006.pdf

Bekenov, A.B., Meldebekov, A.M., Grachev, Yu.A. (2007) A strategy for the conservation of the saiga in Kazakhstan. Proceedings of the international scientific conference "Biological diversity of Asian steppes", 3-4 April 2007, Kazakhstan, Kostanai. p. 16-17.
An analysis is carried out of the current status of the saiga in Kazakhstan; the causes of the decline of saiga populations are revealed and recommendations given for their protection and recovery. Contact: Yu.A. Grachev, A.B. Bekenov: terio@nursat.kz

Grachev, Yu.A. (2007) The saiga in the desert-steppe ecosystems of Kazakhstan. Proceedings of the international scientific conference "Biological diversity of Asian steppes", 3-4 April 2007, Kazakhstan, Kostanai, p. 40-42.
The author notes that the saiga has been an inhabitant of open arid lands both in previous centuries and nowadays. The best conditions for this species are a combination of the remaining desert, semi-desert and steppe ecosystems within its range. Contact: Yu.A. Grachev: terio@nursat.kz

A selection of materials on the study and conservation of the saiga in different parts of its range was published in the "Stepnoi Bulleten" [Steppe Bulletin] (##21-22, autumn-winter). This special section also provides information on international projects and the role of the international community for the conservation of this species. A review is presented of the First International Meeting of the signatories to the Memorandum of understanding concerning the conservation and sustainable use of the saiga, in Almaty, Kazakhstan, in September 2006.
Milner-Gulland, E.J., Lushchekina, A.A., Bekenov, A.B., Arylov, Yu.N. Using saiga antelope conservation to improve rural livelihoods (p. 10-11).
Arylov, Yu.N,. Voznesenskaya, V.V., Lushchekina, A.A., Medjidov, R.A., Milner-Gulland, E.J., Ubushaev, B.S. International projects on research and conservation of the saiga in Kalmykia (p.11-14).
Grachev, Yu.A., Bekenov, A.B. The state of populations and prospects for the conservation of the saiga in Kazakhstan (p.15-17).
Bykova, E.A., Esipov, A.V., Efimov, A.Yu., Golovtsov, D.E. The saiga in Uzbekistan – the current status and causes of the population decline (p.17-20).
Mallon, D. The saiga antelope in the international context – the events of the last three years and prospects (p. 20-22).
Mallon, D. A meeting in Almaty – an important step towards the conservation of the saiga (p. 22-23). The electronic version of the publication is available at http://ecoclub.nsu.ru/books/Step-21-22/index.htm and http://saigak.biodiversity.ru/publications.html.

The proceedings of the fifth international scientific-practical conference "The problems of conservation and sustainable use of biodiversity in the Caspian region and adjoining regions", 7-8 December 2006, Elista, Elista: KalmSU, 2006, 204 pp.
Of interest are works on the reproductive biology and behavior of the European saiga:
Kokshunova, L.E. On the rut of the European saiga against the background of low numbers of mature males in natural environments (p.40-43).
Kokshunova, L.E. The behavior of first-year males in a mixed sex-age group (p. 43-45).

The proceedings of the international meeting "Mammalian fauna in Russia and adjoining territories" (VIII Congress of Mammalogical Society), 31 January-2 February 2007, Moscow. Moscow, 2007, 581 pp. A number of articles are dedicated to the study and conservation of the saiga. Abstracts will soon be available at: http://www.sevin.ru/menues1/index_rus.html
Arylova, N.Yu., Lushchekina, A.A., Voznesenskaya, V.V. Non-invasive monitoring of the reproductive status of the saiga as an alternative nature conservation technology (p. 22).
Bukreeva, O.M. On the status of the saiga population in the north-western Caspian region (p. 61).
Esipov, A.V., Bykova, E.A., Efimov, A.Yu., Golovtsov, D.E. The state of the Ustyurt saiga population in Uzbekistan based the 2004-2006 winter field censuses (p. 148).
Larionov K.O., Nikonova O.A. Comparative foraging of saiga and sheep (p. 250).
Pereladova, O.B., Lukarevsky, V.V., Marmazinskaya, N.V., Baidavletov, R.Zh., Sidorenko, E.V., Ukrainsky, V.V., Grachev, Yu.A. The importance of special protection measures in the conservation and rehabilitation of ungulate populations (the results of seven years of realization of WWF projects) (p. 380).
Pereladova, O.B. The experience of the analysis of the state of poluations and distribution of ungulates in Central Asia for the analysis of the system of strictly protected natural areas and the development of land use (based on the materials of the project "Econet-Central Asia) (p. 381).
Sidorov, S.V., Bukreeva, O.M. The status of the saiga population in north-western Caspian region, its development and use (p. 452).

Publications in English

Morgan, E.R., Medley, G.F., Torgerson, P.R., Shaikenov, B., and Milner-Gulland, E.J. (2007) Parasite transmission in a declining migratory saiga antelope population in Kazakhstan Ecological Modelling 200, 511-520.
A transmission model was devised for trichostrongylid nematodes of saiga antelopes and domestic sheep in Kazakhstan. The framework extends previous models by including seasonal migration of saigas, contact with separate populations of sheep, and climate-driven stochasticity in herbage biomass and in the development, survival and migration onto herbage of free-living larvae. The model was parameterised for the contrasting life histories of Marshallagia, Haemonchus and Nematodirus, three important parasites of saigas and sheep in the region, and was successful at predicting broad qualitative patterns of infection dynamics in sheep and saigas. Parasite transmission between saigas and sheep was predicted to be most important for Marshallagia (from sheep to saigas in the south in winter, and onward transmission to sheep in the north in summer) and Haemonchus (from sheep in the north in summer via saigas to sheep further south in autumn). Model predictions for winter transmission of Marshallagia infection in saigas were consistent with field data, which showed that saigas culled before they have grazed the winter range carry lower burdens of this parasite than older animals. The model provides a mechanistic explanation for its predictions, which will assist hypothesis formation, and further the epidemiological basis of efforts to control parasite transmission between wildlife and livestock in both directions. A similar modelling approach could prove useful in other situations where detailed mechanistic models of parasite transmission are inappropriate in the face of parameter uncertainty and spatio-temporal variation in climate and host density. This is likely to include the majority of wildlife-parasite systems. Contact: Eric Morgan, eric.morgan@bristol.ac.uk

Kuhl, A., Mysterud, A., Erdnenov, G.I., Lushchekina, A.A., Grachev, Iu. A., Bekenov, A.B., Milner-Gulland, E.J. (2007) The 'big spenders' of the steppe: sex-specific maternal allocation and twinning in the saiga antelope. Proceedings of the Royal Society B 274, 1293-1299.
In polygynous mammals, males generally benefit more from extra allocation of maternal resources than females. However, limitations to sex-specific allocation are usually ignored. We propose the "allocation constraint" hypothesis, whereby maternal resource allocation is more likely to follow life history predictions in same sex litters than in mixed sex litters, due to limitations in prenatal resource targeting. Consequently for polygynous species, males in mixed litters are likely to receive sub-optimal maternal investment, which may have a negative effect on lifetime reproductive success. We test this hypothesis for the saiga antelope, a highly polygynous species with the highest level of maternal effort reported amongst ungulates. At such high reproductive output levels, the limitations on additional investment in males are likely to be particularly acute. However, we demonstrate high levels of sexual dimorphism both in late-stage foetuses and newborn calves, including within the same litter. Male twins with a brother tended to be heavier than those with a sister. This may be due to allocation constraints or differences in maternal quality. We conclude that an explicit focus on potential constraints can enhance progress in the field of sex-specific maternal allocation in polytocous species. Contact: Aline Kuhl, aline.kuhl@imperial.ac.uk

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