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The Status of the Wild Camel in China

In 1874 the famous Russian explorer Nickolai Przewalsky first identified the wild camel (*Camelus ferus*) as being different in many respects to the domestic Bactrian camel (*Camelus bactrianus*). He took the skins and bones of two wild camels back with him to St Petersburg, where his discovery was treated with skepticism by Russian scientists. In recent years it has been proved through genetic testing that the wild camel is not only substantially different from the domestic Bactrian camel, but is indeed a separate species (see Burger this volume). Przewalsky was right.

This paper introduces wild camel distribution in China and factors that threaten them, and it puts forward methods to protect the wild camel in China against these threats.

HISTORY

The wild camel is a remarkable animal. Like all camels it has an outstanding immune system and its milk contains a high percentage of insulin (Wernery et al 2006, Al-Numair et al. 2010).

However, it is in China that its remarkable properties have been shown by its ability to drink salt water, which a domestic Bactrian camel cannot tolerate, and its ability to survive in two of the harshest environments in the world; the Desert of Lop and the Gashun Gobi. These two deserts were for centuries crossed by the Middle Silk Road and caravans of domestic Bactrian camels criss-crossed the roads from east to west and west to east taking with them the riches of China and returning with the wealth of Europe. This gave rise to the suggestion that the wild camel was just a Silk Road runaway – a feral camel.

In more recent years, China conducted atmospheric nuclear tests over parts of the former Middle Silk Road, yet the truly remarkable wild camel appears to have survived these tests without any damage to its reproductive system.

Two hundred years ago the habitat of the wild camel extended into the grassland steppes of Mongolia and the great plains of Kazakhstan. But today, due to pressures mainly from man, the wild camel has retreated into the wildest and harshest environments, which seem unlikely to be able to sustain any life whatsoever, let alone a mammal as large as the wild camel.

It has always been a timid and elusive creature, retreating at the approach of man and fearful of any close contact. The renowned Swedish explorer Sven Hedin (1889) only noted the presence of the wild camel infrequently and his references to it in his numerous books on travels through its Chinese habitat are extremely rare. He did, however, shoot two wild camels, and by taking careful measurements of their skulls he concluded that the shape of the head was different from the domestic camel. This is verified by the Mongolian word for the wild camel, *havtagai*, which translates as “flat head” and acknowledges a difference in skull shape from that of the domestic Bactrian. Another notable difference is the size of the two humps. They are much smaller and, as Hedin correctly observed, more widely spaced. Even in captivity and with access to high quality food, the humps remain small and do not flop to the side as is sometimes the case of the domestic Bactrian camel when the animal has been in a stressful situation or is deprived of adequate grazing (see picture 2 of Pamela Burger’s article in this volume which shows a “flat head” next to its domestic Bactrian relative with the distinguishable features.

THE DISTRIBUTION OF THE WILD CAMEL IN CHINA

Currently, wild camels survive only in four separate areas in the world. Three of these habitats are located in the Xinjiang Uygur Autonomous Region of China: 1) the Gashun Gobi Desert in the northern part of the Lop Nur lake region, 2) the Arjin Mountains south of Lop Nur Lake region, 3) the Taklamakan Desert to the west of the Desert of Lop, including the southern Tarim River basin. The fourth area, in part outside China in Mongolia, is located in the China-Mongolia border region, including the Outer Altai Gobi Desert in the south-western part of Mongolia.[1] The wild camel sometimes migrates across the international border from Mongolia into Gansu Province and Inner Mongolia. For the purposes of this paper, the fourth area is described as the Outer Altai Gobi Desert. All these four wild camel habitats are located in the extremely arid area of Central Asia and are characterized by varied landforms with low hills and sparse vegetation. The soil comprises brown desert soil, grey-brown desert soil and aeolian soil. The actual number of wild camels is a matter of intense debate. Estimated numbers range from less than 730 (Hare 1996) to 890 (Yuan Guoying, Zhang Li, Yuan Lei 1999) in the mid- and late 1990s in China. By 2011 it was fresh estimates suggested that there are approximately 600 wild camels in China and approximately 450 in Mongolia – a world-wide population of roughly 1000. A substantial number of these wild camels live in a Chinese nature reserve.

THE XINJIANG LOP NUR WILD CAMEL NATIONAL NATURE RESERVE

In 2000, the Xinjiang government set up the Arjin – Lop Nur Wild Camel Nature Reserve which gave protection to the prime habitat of the wild camel in the Gashun Gobi and the Arjin Mountain areas – numbers one and two of the last four areas mentioned above where wild camels live today. This largest of the three Chinese reserves comprises 78,000 sq km and was upgraded to national level in 2003 and renamed the Xinjiang Lop Nur Wild Camel National Nature Reserve (LNWCNR).

The LNWCNR is located in the north-west of China in Xingjiang Uygur Autonomous Region. As mentioned, the LNWCNR is the main habitat of the critically endangered wild camel in China and it is one of the driest areas in the world, popularly known as "Lop Nur". In the centre of this area is a feature which viewed from space looks like a large ear, but is in fact the dried-up lake-bed of Lop Lake. The LNWCNR not only protects the critically endangered wild camel, but also protects one of the driest and most ecologically fragile desert eco-systems in China. The reserve is divided into buffer and core zones depending on (1) the concentration of wild camels and (2) areas which have been identified as prime wild camel habitat where people cannot enter. The latter are classed as core areas. Areas where the wild camel is an infrequent visitor are classified as buffer.

WILD CAMEL RESEARCH

Prior to 2010 the Xinjiang Environmental Protection Bureau, where the LNWCNR Reserve Management Office is situated, organized a number of expeditions into the LNWCNR to survey the wild camel. Eleven field surveys were undertaken and 58 herds with 318 individual camels were observed over this period.

In detail, the camels sighted in the course of these eleven surveys between 2003 and 2009 are: In 2003, a total of five groups and 38 individuals in two areas near the southern boundary of the reserve were sighted. In 2005, five groups and 55 individuals were observed in the Arjin valley, namely Bashkagung, Xiagou valley and Kum Su Spring. In 2006, two groups and six individuals were sighted at Biquan Spring and Pargang Tagh. In 2007, five wild camels were observed south of Lop Nur Lake and one camel in the Arjin Mountains. In 2008, a total of 161

[1] For a discussion of the Mongolian habitat of the wild camel see the article by Yadamsuren, Dulamtseren and Reading in this volume.

wild camels were found in three areas: the north-eastern mountains of the Lop Nur Desert, south of the Aqike valley and north of the Arjin Mountains, with the biggest group totaling 30 wild camels. In 2009, 52 wild camels were observed south of Lop Nur Lake and along an abandoned road in the northern Arjin Mountains.

Based on these eleven surveys, it has been concluded that the population of wild camels is relatively stable, neither increasing nor decreasing to a large degree. Due to the vast size of the reserve and the fact that it is surrounded by a restricted military area to the west, accurate data is extremely difficult to obtain and aerial surveys are not possible. But there has certainly not been a dramatic decrease over the last ten years.

THREATS TO THE SURVIVAL OF WILD CAMELS

Threats to the survival of the wild camel population in the LNWCNR include hunting or poaching, predation, habitat degradation, hybridization and mining.

Illegal Hunting and Poaching

Illegal hunting was popular from the 1950s to the 1970s and was mainly conducted by local communities for food and sport. During the 1980s private guns, including those held by herdsmen, were confiscated because of internal security problems in China. However, it has been observed that some armed enforcement officers – including policemen – still engage in illegal hunting.

In the northern Arjin Mountains, cases of poached wildlife including wild camels have been reported in recent years. Specific evidence of this has been recorded on the surveys made by LNWCNR staff in 1996, 2005 and 2008. In addition, there is the problem of legal and illegal miners killing wild camels for food when they approach their mining sites. In addition, survey parties have found homemade land mines positioned near wild camel water points to kill the wild camel for food.

Wolf Predation

A few wild camels, especially calves up to two years old, have been killed by wolves in the Arjin Mountains. Wolf predation on wildlife is part of a natural ecological balance. As long as the wolf population is not too high, it should not be necessary to control them. In the LNWCNR the habitats of wild camels and wolves overlap only in the northern Arjin Mountains. However, since this is the area with the largest concentration of wild camels, wolf predation could become a more serious problem if wolf numbers dramatically increase. Since the government stopped herdsmen carrying firearms in the 1980s, wolf numbers appear to be increasing in the Arjin Mountain area and the situation is being closely monitored by the LNWCNR head office.

Desertification and Grazing Competition with Domestic Bactrian Camels

LNWCNR's grazing land in general has been reduced dramatically over the last ten years due to loss of vegetation because of increased desertification. For example, there is no vegetation at all near the northern boundary of the LNWCNR. In the northern sector, grazing competition with domestic Bactrian camels is not a great problem because there are hardly any domestic camels in the area. In the southern and south-eastern sectors of the LNWCNR, however, the biggest impact on grazing occurs near the northern escarpment of the Arjin Mountains. Nearly 200 domestic Bactrian camels from Aksai in Gansu Province have been herded deep into valleys of these mountains and have been grazed near the Lapeiquan fresh-water spring, which is in the buffer zone of the LNWCNR.

Grazing of domestic livestock causes degradation of vegetation and results in competition for food. In addition, domestic camel grazing may cause unwanted hybridization between the wild camel and the domestic Bactrian camel, as discussed below.

In the past, an increase in domestic livestock grazing was responsible for a decrease in the population of wild camels in the south-eastern Gashun Gobi and Arjin Mountains. However, due to a rapid degradation of the vegetation caused by overgrazing, the pasture condition in these areas is now too depleted for domestic livestock other than domestic Bactrian camels. Numbers of domestic Bactrian camels were very high in the past, but in recent years they have dropped dramatically as there is little economic value in raising domestic camels today and domestic camel usage has been replaced by motor vehicles. Considering the huge distribution area of the wild camel, grazing activity on a small scale does not present too great a threat. However, with the increasing degradation of the vegetation, the threat in the eastern Arjin Mountain area and the south-eastern Gashun Gobi remains, even though domestic Bactrian camel numbers have fallen.

HYBRIDIZATION

Hybridization of wild camels and domestic Bactrian camels is a threat. If herdsmen release domestic Bactrian camels into the desert to graze without supervision, hybridization and thus a dilution of the wild camels' unique gene pool will occur. Mating only takes place during December, January and February, when the wild bull comes into musth. Another risk is that domestic Bactrian camels can carry infectious diseases, such as Q-fever, into the wild camel herd. If this happens it can be disastrous for wild camel populations, which in some cases have little immunity to domestic camel diseases.

OTHER HUMAN ACTIVITIES

Mining is the biggest legal and illegal human activity in the LNWCNR. Several years ago, approximately 2000 people went into or through the LNWCNR every year. Some of these were legal miners in the buffer zone mining iron-ore. Others were illegal miners in search of gold or using fresh-water springs to extract gold from rock by the highly toxic use of potassium cyanide. On the southern boundary, which is bordered by the Arjin Mountains with numerous valleys and culverts, it is extremely difficult to detect illegal miners if they operate in this rugged and sparsely populated terrain.

However, today, more and more of the mining activities are receiving government permission. South of the Tikar LNWCNR checkpoint in the north-east of the reserve, legal iron-ore mining activities have increased considerably in recent years. The volume of legal motor traffic going into the reserve can build up extremely quickly. In addition, gold mining is developing in the Gashun Gobi, north of the Aqike valley, which is a very important core area for the wild camel habitat. These activities affect wild camels considerably in what Sven Hedin has called "the heartland of the wild camel".

Other activities, such as tourism, do not occur frequently and car rallying, which did occur in the past, has now been stopped. There is some tourism from the western city of Keurla to Lou Lan ancient city, which is located to the west of the LNWCNR near the western boundary of the Gashun Gobi. There is also some tourism in the Gashun Gobi from the city of Dunhuang in the east of the LNWCNR.

REMEDIAL MEASURES FOR WILD CAMEL PROTECTION

Some effective measures have successfully been carried out but further activities are necessary to secure the survival of the last remaining wild camels.

The wild camel is the eighth most critically endangered large mammal in the world according to the Zoological Society of London (ZSL). Many organizations and individuals have given all kinds of help in order to protect the species from extinction. In 1997 John Hare established the Wild Camel Protection Foundation (WCPF), a UK registered charity with the sole aim of protecting the critically endangered wild camel. This has helped the Xinjiang government to

establish the LNWCNR, raised funds for wild camel protection, organized workshops and training programs for Chinese and Mongolian scientists and established a wild camel breeding centre in Mongolia. The Zoological Society of London (ZSL) has also contributed greatly to wild camel protection by awarding fellowships for Chinese and Mongolian scientists and jointly organizing workshops. The Chinese government has established wild camel reserves and given great support both at provincial and national levels. In addition, there are many other institutions and individuals who have given help to protect the wild camel either practically or by making substantial donations to wild camel protection.

Now the most important issue is to strengthen the environmental monitoring in the LNWCNR under the already existing Regulations of the People's Republic of China Nature Reserves Law and the Xinjiang Nature Reserve Management Regulations. Strengthening law enforcement and patrolling inspection in the LNWCNR can only be put into effect by an increase in personnel and finance.

Next it is necessary to strengthen the collaboration between the three different reserves in China, that is, 1) the Xinjiang Lop Nur Wild Camel National Nature Reserve (LNWCNR) with 78,000 sq. km, 2) the Gansu Annanba Wild Camel Nature Reserve with 3,300 sq. km, and 3) the Gansu Dunhuang Xihu Nature Reserve of about 6,600 sq. km.

It is recommended that these three nature reserves, which have contiguous borders, are linked together administratively, so that an exchange of information and the organization of joint operations are conducted to prevent illegal access to all three reserves from the outside. Public education activities to increase community awareness of biodiversity conservation among people of all ages and nationalities would be a further necessity. Finally, it is important to secure the genetic purity of wild camels by tightly controlling domestic Bactrian camels' grazing in areas where the wild camel is given protection.

CONCLUSIONS

At present, the LNWCNR is one of the last major wild camel habitats in the world. The number of wild camels in this and the two other contiguous reserves is estimated at approximately 600, with the possibility, as a 2011 survey has shown, of a further 50 wild camels in the Taklamakan Desert to the north of the end of the Keriya river. If the LNWCNR is not given enhanced protection in its competition with intensified economic development, then more than half of the wild camels in the world will eventually disappear. Despite the negative impacts, the LNWCNR staff is working hard to fulfill their mission to protect wild camels. The strengthening of the management of protected areas, enhanced inter-reserve cooperation and the protection of wild camels as outlined above are therefore top priorities.

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