**Conserving the elusive Pallas cat and other carnivores of the Mongolian steppes**

James Murdoch[1] and Richard Reading[2]

[1] Wildlife Conservation Research Unit, University of Oxford, United Kingdom
[2] Department of Conservation Biology, Denver Zoological Foundation, USA

The grassland steppes of central Asia represent one of the largest, intact ecosystems in the world. Extending from Eastern Europe in a broad band through northern China, the grasslands cross over 8000 km and rival the great Serengeti Plains of Africa in magnitude and breadth. In Mongolia, the grassland steppes border the gravely terrain of the Gobi Desert, considered one of the world's largest and most pristine desert ecosystems. The margin of these two great ecosystems harbours a unique group of plants and animals – a mix of desert and grassland species all living together. One such species is the highly elusive, rarely studied, and globally threatened Pallas' cat (*Otocolobus manul*).

Often referred to as 'manul' by local Mongolians, the Pallas' cat is small cat species uniquely adapted to the harsh conditions of northern Asia. Although many aspects of Pallas' cat biology are largely unknown, early studies by Russian scientists indicate that they are active only at night and feed on a specialized diet of gerbils and jerboas. They are also known to use rock crevices and small caves as dens to avoid extreme temperatures and larger predators like wolves, steppe eagles and other birds of prey. During winter months, when temperatures often fall below -40° C, some accounts also indicate that Pallas' cats migrate in small groups over large distances – a characteristic highly unusual for a larger carnivore. Sergei Ognev (1886-1951), famed Russian taxonomist, in his extensive accounts of steppe wildlife noted that "like the corsac fox, the manul migrates from Mongolia northward and into Russia in whole families during some winters".

Sadly, in many areas, this unique carnivore faces extinction due to a myriad of threats. Globally listed as *Near Threatened* by the IUCN (www.iucn.org) and ranked as a CITES (www.cites.org) Appendix II species, Pallas cat populations are declining. The extent of the decline remains unknown, and must be understood quickly to prevent localized extinctions throughout its range. In Mongolia, work by the Denver Zoo's Mongolia Program identified key threats the species in 2003. The most severe threat identified is from widespread over-hunting and illegal poaching. Pallas cats are hunting across Mongolia for their fur and body parts that are sold mainly to the medicinal markets of eastern Asia. More disturbingly, live Pallas cats are sought for the pet trade in some international markets. The situation for Pallas cats is exacerbated by a lack of protective measures and law enforcement outside of regions zoned as 'strictly protected areas'. Pallas cats are also threatened from diseases that are spread from domestic dogs and cats, and from poisoning efforts that target voles and other rodents of the steppes.

The threats of hunting and poaching, disease, and poisoning are not unique to the Pallas cat. They affect all other carnivore species that live in the steppes, such as the corsac fox (*Vulpes corsac*), red fox (*Vulpes vulpes*), Eurasian badger (*Meles meles*), and wolf (*Canis lupus*). As these threats intensify, the consequences to steppe ecosystems may be drastic and irreversible. In-field conservation efforts are needed to protect carnivores and the

ecosystems they inhabit not only in Mongolia, but across the grassland and desert steppes of Asia.

In 2004, the Denver Zoo Conservation Biology Department responded to this need and launched the Mongolia Carnivore Project. The project is the first of its kind in northern Asia and is designed to provide direct *in situ* conservation to steppe carnivores. The main objectives of the project are to 1) understand the fundamental biology of the Pallas cat and other carnivores, 2) evaluate the magnitude of threats facing these species in Mongolia, and 3) use this information to develop a carnivore conservation program in the steppes.

Understanding the fundamental biology of each animal will provide much-needed information for developing realistic and effective conservation strategies. For example, it will help us evaluate biological factors, like habitat and prey resources, that are relied upon by each species and important to survival. Understanding the threats to each species will also allow us to identify the impacts and root causes of each threat. The project will use this information to develop and implement conservation measures for carnivores and steppe ecosystems.

In September 2004, we began intensive field study efforts at the Ikh Nartiin Chuluun Nature Reserve, located in the East Gobi province of Mongolia (Figures 1 & 2). The reserve is situated at the junction of grassland and desert steppe ecosystems and harbours populations of Pallas cats, corsac and red foxes, badgers, and other carnivores. To date, we have radio-collared several animals of each species that we now track periodically. In fact, our project was the first to ever radio collar a corsac fox in history, and we are among the first to tag wild Pallas' cats for study. The information we obtain from radio tracking allows us to determine the ranging behaviour of each species – that is how much space and habitat they require. It also provides information on when each species is active and how different species interact with one another.

We collect scats (feces) and analyze them to understand the diet of each carnivore species and how food preferences changes each season. In addition, our diet analysis also involves surveying the abundance of small mammals that include gerbils, jerboas, hamsters, pikas and hares. In October 2004, our surveys uncovered an unknown jerboa species that may be new to science. Our small mammal research is particularly important for understanding how populations respond to predation by carnivores. This will help us develop alternatives to rodent poisoning efforts in the steppes.

Our conservation efforts are in their early stages and will be launched later this year. Our approach to carnivore conservation is interdisciplinary and will involve interviewing local herders, documented the impacts of hunting inside and outside of protected areas, assaying disease exposure among carnivores, training local Mongolians in wildlife management, and providing educational opportunities for young Mongolian scientists.

The project is run by the Denver Zoo Department of Conservation Biology (http://www.denverzoo.org/conservation/conservation.htm) in collaboration with the Wildlife Conservation Research Unit (www.wildcru.org) at the University of Oxford and

the Mongolian Academy of Sciences. For more information on the project, its objectives, study area, and personnel, please visit our website at:
http://www.wildcru.org/links/mongolia/mongolia.htm

**Photograph 1:** Pallas' cat (*Otocolobus manul*) in a rock den in the Ikh Nartiin Chuluun Nature Reserve, Dornogov, Mongolia. Photo: © Richard P. Reading.

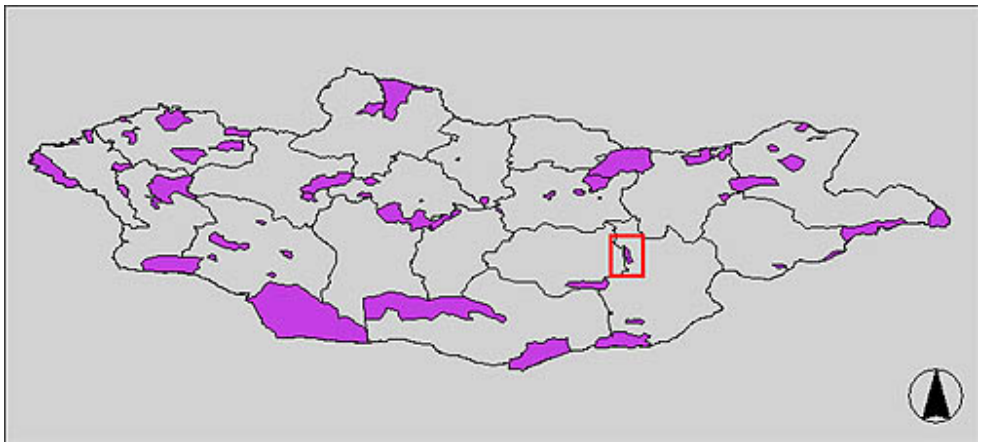

**Figure 1.** Map of Mongolia showing aimag (province) boundaries and protected areas (colored purple). Our study site in the Ikh Nartiin Chuluun Nature Reserve is outlined in red.

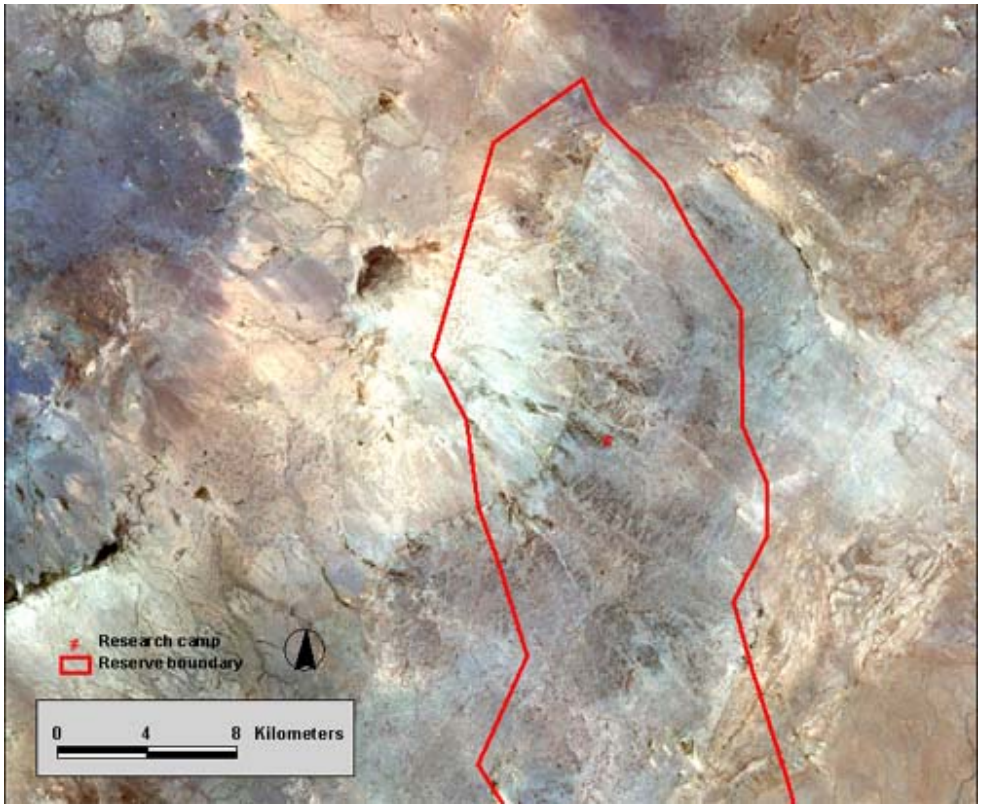


**Figure 2.** Satellite image of our study site in the Ikh Nartiin Chuluun Nature Reserve. The reserve boundary is outlined in red and the location of our research camp is indicated with a red circle.

**Source**: The Zoo Review of the Denver Zoological Foundation (Denver, Colorado, USA), 2005