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# news





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**For joining the Friends of the Cat Group please contact Christine Breitenmoser at [ch.breitenmoser@kora.ch](mailto:ch.breitenmoser@kora.ch)**

Original contributions and short notes about wild cats are welcome

**Send contributions and observations to [ch.breitenmoser@kora.ch](mailto:ch.breitenmoser@kora.ch).**

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**Editors:** Christine & Urs Breitenmoser  
Co-chairs IUCN/SSC  
Cat Specialist Group  
KORA, Thunstrasse 31, 3074 Muri,  
Switzerland  
Tel ++41(31) 951 90 20  
Fax ++41(31) 951 90 40  
<[urs.breitenmoser@ivv.unibe.ch](mailto:urs.breitenmoser@ivv.unibe.ch)>  
<[ch.breitenmoser@kora.ch](mailto:ch.breitenmoser@kora.ch)>

**Contributing Editor:** Peter Jackson  
29 Lake Close, London SW19 7EG  
United Kingdom  
Tel/Fax: ++44 (20) 89 47 01 59  
<[peterfr.jackson@virgin.net](mailto:peterfr.jackson@virgin.net)>

**Associate Editors:** Keith Richmond  
Brian Bertram  
Sultana Bashir

**Cover Photo:** Asiatic golden cat  
Photo S. Lyngdoh

ANNA BARASHKOVA<sup>1</sup> AND ILYA SMELANSKY<sup>1</sup>

# Pallas's cat in the Altai Republic, Russia

**Pallas's cat *Otocolobus manul* is a small wild cat occurring in Russia at the northern periphery of its global range. The results of Pallas's cat surveys conducted in the Altai Mountain area are presented in this paper. Before the 2000s, there was no special research undertaken on Pallas's cat population numbers and distribution in the Altai part of its range, except for the gathering of interview data in the late 1990s. This study carried out snow-tracking and obtained survey data on the species from 2006 to 2009 in the Altai Republic, one of the core habitats for Pallas's cat in Russia. Pallas's cat density reaches 1.20-2.18 individuals per 10 km<sup>2</sup> in the main Pallas's cat habitats. A total of 480-650 Pallas's cats were estimated to live within the Altai Republic. The areas of high conservation value for Pallas's cat are situated on the Sailughem and Kurai ridges. The main threats to the species are poaching and killing by dogs. It is necessary to estimate the threats from possible human activity, such as mining. It is presumed that educational work with local people will reduce deaths amongst Pallas's cats. The creation of new protected areas within the key habitat of Pallas's cat in the Altai Republic, including the enlargement of the recently created national park on Sailughem ridge, is very encouraging.**

The Pallas's cat is a rare small wild cat presently listed in the IUCN Red Data List as Near Threatened (Ross et al. 2008). Pallas's cat is listed as "a rare species on the periphery of its range" in the Red Data Book of the Russian Federation (Dronova 2001). On the northern edge of its geographic range in Russia, Pallas's cat is found along the borders with Mongolia and China mainly in the Altai, Tyva and Buryatia Republics and in Zabaikalsky Region. The southeastern part of the Altai Republic (Kosh-Agach District) is one of the

important areas for Pallas's cat in Russia as its population density here is relatively high (Heptner & Sludski 1992, Dronova 2001).

The Altai Mountains Ecoregion is included in the WWF Global 200 and contains The Golden Mountains of Altai UNESCO World Natural Heritage Site. Pallas's cat is listed in the regional Red Data Book of the Altai Republic as a species with declining numbers (Chassovskikh 2007). However, prior to 2000, no work was done on Pallas's cat in the Altai Mountains. Before being listed in the national

Red Data Book of Russia, Pallas's cat was hunted for its skin. At that time, the local game department was purported to conduct regular snow-tracking surveys to evaluate the cat's resources, whereas, in fact, the surveys were often on paper only and their results were not published. Only in the late 1990s did specialists from the Wildlife Agency (Moscow) conduct interviews. They estimated that the Pallas's cat population numbered between 200 and 300 animals (Dronova 2001). The present study aimed to obtain up-to-date data on Pallas's cat population numbers and distribution in the Altai Republic of Russia and to identify threats to the species in the area investigated.

## Study area

The study sites are situated in the Kosh-Agach District of the Altai Republic where Pallas's cat occurs in three relatively separate areas. The largest area includes the Chuia intermountain depression (Chuia Steppe) and surrounding mountain slopes (of the Kurai, Sailughem, South Chuisky, North Chuisky, Chikhachev's ridges and Talduair Massif). Two smaller and more remote areas are the Kurai intermountain depression (Kurai Steppe) and the Ukok Plateau (Fig. 1). The distribution of the Pallas's cat is clearly limited by snow depth as well as by prey density and availability. The main prey items are different species of pika (*Ochotona* sp.) (Heptner & Sludski 1992, Kiriliuk 1999).

The sites we investigated are the main areas where Pallas's cat is known in the Altai Mountains. All the sites are located at elevations between 1,800 m and 2,500 m. The slopes of the Kurai ridge differ from the site on the Sailughem ridge by having steeper slopes and deeper snow cover. On average, the Kurai ridge has less arid steppe vegetation than Sailughem ridge.

## Methods

Information on Pallas's cat numbers and distribution was collected by snow-tracking and conducting interviews from 2006 to 2009.

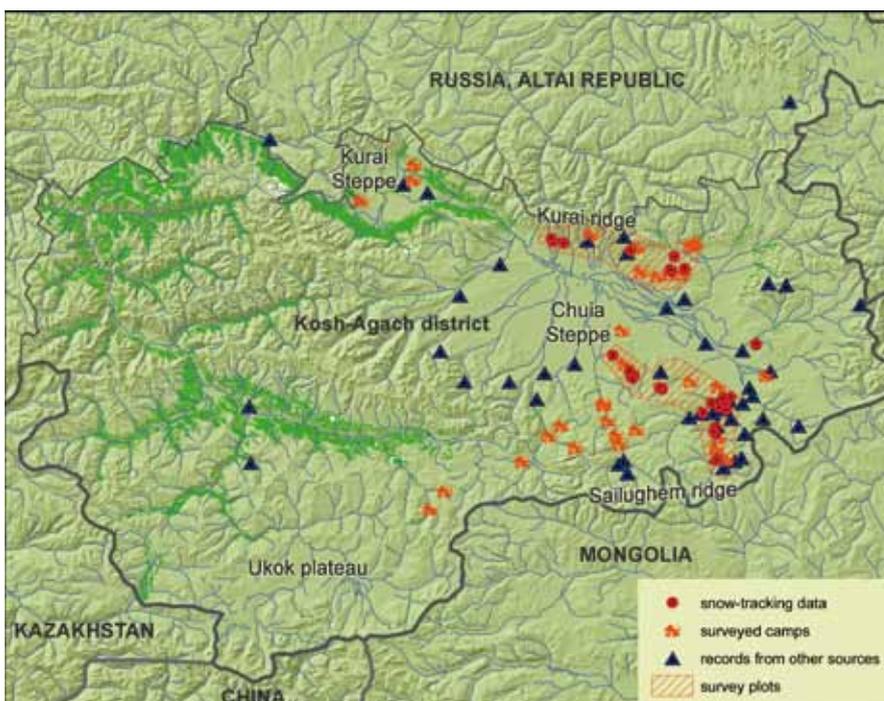
The snow-tracking we used is the standard method adopted by the State Wildlife Agency in Russia. Density estimation was calculated according to Formozov (1932) with correction factor by Malyshev & Pereleshin (Glushkov et al. 2007):

$$S = n / (L \times d)$$

where:  $S$  = density (individuals per 1 km<sup>2</sup>),

$n$  = number of tracks crossed,

$L$  = length (km) of route surveyed,



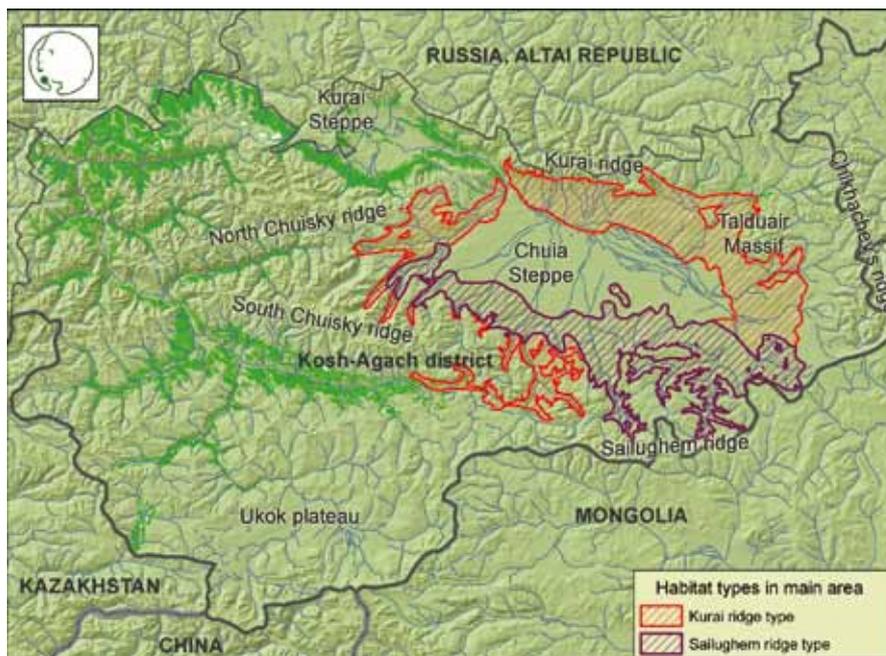
**Fig. 1.** Study site and survey results in the Russian Altai Republic.

$d$  = average distance (km) covered by individual per day.

As a rule, the value of  $d$  is specific for every species and habitat composition. It is taken from direct tracking of daily movement and for most game mammals in Russia was determined several decades ago. Only a few investigations have been made more recently for Pallas's cat (Kiriliuk 1988; our own data). According to these studies, we assume that Pallas's cat daily movement is approximately 1.5-2 km. This value was used for estimating the population density.

The total length of routes surveyed was approximately 210 km, this being travelled by 2-3 groups of fieldworkers. Two survey plots were identified in December 2006 and 2009: (1) the Sailughem ridge (Ulandryk River valley with tributaries and the Buraty River valley – total route length is 105.7 km); and (2) the Kurai ridge (southern slopes from Yanterek to Kokorya valley – total route length is 62.3 km). Other survey routes were put on the Chuia Steppe (32.3 km), and along the foot of the Talduair Massif (9.7 km) – a separate mountain massif to the southeast from the Kurai ridge. The survey routes traversed typical habitat of Pallas's cat (ie. screes, rocks, ravines and pika colonies at the foot of mountains), as well as less appropriate areas, in order to fully represent the habitat range. All Pallas's cat tracks encountered on the survey route were counted and their number was used for the calculation according to Formozov's formula (see above).

The interview data were obtained from 48 winter and summer livestock-herding camps during snow-tracking research and also during field trips in April and July 2009. Additional data on Pallas's cat occurrence was taken from our data base compiled from 2004 (results of interviewing hunters, rangers, tourists, students and other people who visited or worked in the area; a total of 17 respondents and 40 reports on Pallas's cat). Interview data were used for determining the boundaries of Pallas's cat distribution and for understanding actual threats to the species. The total area that Pallas's cat inhabits within the Altai Mountains was estimated using spatial analyses of remote sensing data (Landsat TM, ETM), a digital elevation model and a landscape map of the Altai region. Three main types of habitat were distinguished, namely: well-suited to Pallas's cat, moderately-suited and unsuited habitats. This habitat assessment was conducted based on the following assumptions: (1) snow



**Fig. 2.** Pallas's cat habitats in the main part of the species' range in the Altai Republic.

cover is a limiting factor – in suitable habitat the snow should not be deeper than 20 cm, or some patches should be free of snow all winter; (2) the spatial distribution of Pallas's cat in the area has an altitudinal limit of 2,600 m, probably because the permafrost line and steppe/tundra border occur at this height; (3) the landscape types under investigation are representative of the whole of the Pallas's cat's range in the Altai Republic. Data were treated using GIS methods (ie. Spatial Analyst, ArcView 3.2, ArcGIS 9.3, ESRI, USA).

## Results and discussion

### *Pallas's cat numbers and distribution*

No Pallas's cat tracks were crossed on the Chuia Steppe and on the basis of survey data

we assumed that Pallas's cats only occasionally disperse into this area. Thus we estimated Pallas's cat number only on two survey sites: (1) Sailughem ridge site and (2) Kurai ridge site united with the closely situated and similar Talduair Massif. On average, the density of Pallas's cat tracks was 1.86 tracks per 10 km. The figure for the Sailughem site was 1.4 times higher than for the Kurai site (2.08 and 1.53 tracks per 10 km, respectively). Taking into account that the daily distance moved by Pallas's cat is approximately 1.5-2 km (see above), the Pallas's cat population density in the Sailughem ridge was estimated as 1.63-2.18 individuals per 10 km<sup>2</sup> and in the Kurai ridge as 1.20-1.60 individuals per 10 km<sup>2</sup> (Table 1). Considering the pro-



**Fig. 3.** Pallas's cat in the Bar-Burgazy valley (Photo I. Rozhkov).



**Fig. 4.** Pallas's cat (Photo A. Barashkova).

portion of similar habitats in the main part of the Pallas's cat range (Fig. 2) in the Altai Mountains (Chuia Steppe and surrounding mountain slopes), it is estimated that the total population in this area of about 3,000 km<sup>2</sup> is 420-560 individuals. It is considered that no more than 10-20 Pallas's cats occur in the Kurai Steppe, while no more than 50-70 Pallas's cats are found on the Ukok Plateau. In total, therefore, the Pallas's cat population in the Russian part of Altai is estimated to be around 480-650 individuals.

Some differences in habitat use were found within the Sailughem ridge. Pallas's cat was found to occur here almost three times more often in valleys/ravines with steep slopes (ie. greater than 40 degrees) than in those

valleys with gentle slopes (ie. from 5 to 30 degrees). Pallas's cat was never found in flat steppe habitats (Naidenko et al. 2007). This finding, however, did not apply to the Kurai ridge. Most likely, this is because of the very deep snow experienced during 2009-2010 (up to 30-40 cm) when Pallas's cats probably moved to almost snowless, steep-sloped areas featuring outcrops, rocks and stones. Pallas's cat tracks were not recorded in relatively flat and snowy places, even if pika colonies were present.

#### *Information from the interviews*

Only four herders interviewed were completely unfamiliar with Pallas's cat. 35 out of 48 respondents reported that they had personally encountered Pallas's cats or their tracks. Usually, the area in which the encounter took place was the grazing area around the livestock-breeding camp that livestock can reach during their daily grazing. This can be up to 100 km<sup>2</sup>, but is more often 50-80 km<sup>2</sup>. In 11 (22.9%) of the interviews, Pallas's cats were not reported to occur in the vicinity of the camps, but in most cases these respondents explained that Pallas's cat can be found in other places nearby.

Our surveys show that the Pallas's cat is very rare in the Kurai Steppe. This is perhaps

because the Kurai Steppe represents the extreme northern edge of the species' range. The study suggests that Pallas's cat is not abundant here because of the deep snow cover and a lack of available prey. Snow depth was 20-30 cm in December 2009, and pika colonies in the area were few and small in size. The winter of 2009-2010, however, was definitely very snowy, so we cannot make a general conclusion. There is some evidence that Pallas's cats occur sporadically north of the Kurai Steppe, namely in the Lower Chuia valley near Chibit village and in the Ineghen valley. It is suggested that Pallas's cats only rarely disperse into this area and it is doubtful that a breeding population exists there. Additional data are necessary for a more accurate assertion.

Results from this study differ by a factor of almost 2 from the estimations of Dronova (2001) made for the Altai Republic from interview data obtained at the end of the 1990s. She estimated about 200-300 Pallas's cats in the Altai Republic. This difference probably comes from the methods used. The interview method is not accurate and cannot replace surveys in the field. At the same time, the study of so rare and secretive a carnivore as Pallas's cat should include additional methods, such as home range determination, etc. The authors are of the opinion that the Pallas's cat population size has been underestimated and that additional investigations are therefore needed to clarify its status.

#### *Threats to Pallas's cat*

In spite of a relatively high Pallas's cat density within the Altai Mountains, the species is still threatened in the area. About 25% of 52 respondents who gave instances of Pallas's cat deaths reported cats being killed by herders' dogs. Seven respondents reported that Pallas's cats were killed in traps set for hares *Lepus tolai*, marmots *Marmota baibacina*, red foxes *Vulpes vulpes* and corsacs *V. corsac*. Four respondents reported that they had killed the cats with their own hands. We know of one case of a Pallas's cat being killed by a vehicle. In two instances Pallas's cats were killed by dogs, and we once came across a carcass without skin lying close to a herder's camp; it may have been poached. Local residents have noted incidences of Pallas's cats being killed by steppe polecats *Mustela eversmanni*. We have not recorded any case of Pallas's cat being killed by either carnivore

**Table 1.** Density estimation for Pallas's cat based on snow-tracking data

Surveyed site	Area km <sup>2</sup>	Transect length km	Tracks /10 km	# individuals /10 km <sup>2</sup>
Sailughem ridge	450	105.7	2.08	1.63-2.18
Kurai ridge and Talduair Massif	385	72.0	1.53	1.20-1.60



**Fig. 5.** The Sailughem ridge (Photo I. Smelansky).

or raptor species in the Altai, although there is evidence that this is happening. Malkov (1979) reported a golden eagle *Aquila chrysaetos* attacking a Pallas's cat and, in 1999, the remains of Pallas's cats were found in eagle owl *Bubo bubo* and golden eagle nests in the Sayan Mountains (Tyva Republic; Karyakin, pers. comm.).

*Future conservation work*

This study's results suggest that Pallas's cat populations should be monitored in the Altai Republic on a regular basis. We recommend that conservation efforts be undertaken to reduce threats to Pallas's cats, such as trapping and direct killing. Other potential threats to Pallas's cats, such as habitat loss resulting from increased economic activity in the form of mining, recreation and the construction of hydropower plants, should be evaluated. Educational work with local people is a crucial activity for the success of Pallas's cat conservation (Fig. 7). We urge the creation of new protected areas in the key habitats of the Pallas's cat in the Altai Republic, including the enlargement of the recently-proclaimed national park in the Sailughem ridge.

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**Fig. 6.** The south slopes of Kurai ridge (Photo A.Barashkova).

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<sup>1</sup> NGO Siberian Environmental Center, P.O. Box 547, Novosibirsk 630090, Russia <manul-project@yandex.ru>



**Fig. 7.** Pallas's cat: children's art. Picture by Vladislav Turlunov (Grade 4 schoolboy, Kurai village, Altai Republic)