Study on the status of snow leopard (*Panthera uncia*) in the Mount Qilian Nature Reserve, China

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Background

China contains most of the snow leopard's global range, yet our understanding of the species' distribution and status within the country remains incomplete. As part of a national initiative to develop a conservation plan for this iconic predator, we rapidly assessed for the first time the snow leopard population size (and that of its main prey species) in Mount Qilian Nature Reserve (MQNR; 26,530 km^2) . The presence of the species in the western edge of Mount Qilian had been reported by Schaller et al. (1998), but no details were provided.

Methods

Three transects were surveyed on foot, recording snow leopard signs and visual observations of prey species in March 2011 (Fig. 1). Additionally, ten infrared camera traps were set up along the line transects. We estimated snow leopard density based on: (a) encounter rate of snow leopard signs according to McCarthy and Chapron (2003), (b) individual identification from camera trapping photos (total individuals/survey area) and (c) prey biomass (according to Carbone and Gittleman; 2002).

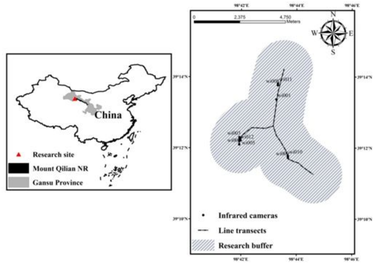

Fig. 1 . Location of study site within China, and map of the survey area (32.6 km^2, calculated as the transect buffer area with width equal to the maximum distance of sighted ungulates using 10*42 binoculars)

Fig 2. Snow leopard photos: A) three individuals in one picture; B) & C) the same individual were identified by their pelage patterns.

Results

- The mean encounter rate of snow leopard signs along the transects was 5.98 signs/km (Table 1).
- Nine snow leopard photos were collected and individual identification attempted using pelage patterns (Fig. 2), but this was not possible with some images. The minimum leopard population in the study area was three (max. 7).
- We sighted 35 groups of blue sheep (*Pseudois nayaur*), with a mean group size of 12.8 (7.7-17.9, CI=95%). The estimated density was 4.3 (1.4-13.4, CI=95%) sheep per km^2. Applying the Carbone and Gittlemann (2002) formula, we estimated a snow leopard density of 3.9/100 km^2 (in Table 2).

Table 1. Snow leopard signs survey

No	Transects length (km)	Pugmark	Scrape	Faeces	Hair
1	2.3	15	4	0	1
2	3.5	3	2	2	1
3	3.1	9	10	2	1

Table 2. Estimated snow leopard density (cats/100 km^2) in Mount Qilian Nature Reserve using three different methods.

	cats/100 km^2
occurrences of snow leopard signs	2-10
Individual identification from camera trap photos	9.2
Extrapolation from available prey biomass	3.9

Conclusion

While recognizing the preliminary nature of our results, it is apparent that MQNR is home to a considerable snow leopard population, relative to reports from other protected areas e.g. Tumor Peak NR in Xinjiang Province (0.5-2.7/km^2, Ma et al. 2006) and Mount Hengduan in Qinghai-Tibet Plateau (0.9-1.4/km^2, Peng 2009). The importance of MQNR for snow leopards should be recognized nationally and a conservation action plan developed for the area.

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