

CAT

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news





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Original contributions and short notes about wild cats are welcome

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Common leopard and snow leopard co-existence in Sanjiangyuan, Qinghai, China

The snow leopard *Panthera uncia*, classified as Vulnerable by the IUCN, is distributed across the mountainous areas of 12 countries in South and Central Asia. The common leopard *Panthera pardus*, also classified as Vulnerable by the IUCN, has the widest geographic distribution among all wild cats and inhabits many countries of Africa and Asia. The common leopard is much bigger than the snow leopard. Sightings of both species in the same location have recently been reported from the Autonomous Region of Tibet and Sichuan, China. We conducted a camera trap survey to verify the presence of these large carnivores using camera traps in Niandu and Yunta villages of Qinghai province, China. In both areas camera trap stations captured both species, identifying seven adult snow leopard and four adult common leopard individuals. Our study provides the first photographic evidence of common leopard presence in Qinghai province and confirms the co-existence of snow leopards and common leopards in the Sanjiangyuan National Nature Reserve. A more detailed study will be conducted to investigate the distribution and interaction of the two species along Tongtianhe and Zhaqu rivers, Qinghai province, in order to enhance efforts for their long-term conservation.

The snow leopard, classified as Vulnerable by the IUCN (McCarthy et al. 2017), is distributed across the mountainous areas of 12 countries in South and Central Asia (Jackson et al. 2014). China holds the largest proportion of the snow leopard's global distribution range. The species is found across Xinjiang Autonomous Region, Tibet Autonomous Region, and Qinghai, Gansu, Inner Mongolia and Sichuan provinces (McCarthy et al.

2017). The slightly larger common leopard, classified as Vulnerable by the IUCN (Stein et al. 2016), has the widest geographic distribution of all wild cats and is found in many countries of Africa and Asia (Jacobson et al. 2016). Historically, the common leopard was found throughout China, with exception of the arid Gobi Desert and at elevations above 4000 m in mountainous regions of western China (Laguardia 2015). At present, the spe-

cies is thought to mainly occur in 19 provinces of south-west and north China (Bao et al. 2009, Laguardia 2015).

On the basis of the IUCN distribution maps, the snow leopard's range in China overlaps with the one of the common leopard in a few areas of south-eastern Tibet Autonomous Region and western Qinghai-Tibetan plateau (IUCN spatial data, version 5.2; Fig. 1). However, to date objective evidence of co-existence of the two species remains scarce. Two camera trap studies have formally documented their presence in the same location, one in Luolong County, east of Tibet Autonomous Region (Guo et al. 2016), the other in Shiqu and Kangding Counties, Sichuan Province (Felidchina 2016). We provide evidence of the co-existence of the two species in Qinghai Province, which until now has only been indicated through limited interview data (Laguardia 2015).

Methods

We conducted snow leopard camera trapping surveys across two areas of Sanjiangyuan National Nature Reserve, Qinghai Province, namely Yunta Village and Niandu Village. The camera trap surveys were conducted as a part of the community-based monitoring programme, with the involvement of 21 herders from Yunta and 34 herders from Niandu. A total of 58 camera trap stations were set up, 16 across a 400 km² area in Yunta and 42 across a 575 km² area of Niandu. At each station one camera trap was installed. The camera traps were left active in both sites for 200 days between November 2015 and 2016, except during the caterpillar fungus *Cordyceps sinensis* season (May-July). Capture incidences were reviewed independently by two separate observers and the coat pattern was used to identify individual snow leopards and common leopards. The spot pattern of the face was used to identify snow leopard individuals. The tail spot patterns were used to identify common leopard individuals (Fig. 2 & 3). We also report individual capture rates which are defined as 1) consecutive photographs of different individual snow or common leopards; 2) consecutive photographs of individual snow or common leopards taken more than 30 minutes apart 3) non-consecutive photographs of individual leopards (O'Brien et al. 2003).

Results

Both snow leopards and common leopards were captured in the two areas. In Niandu,

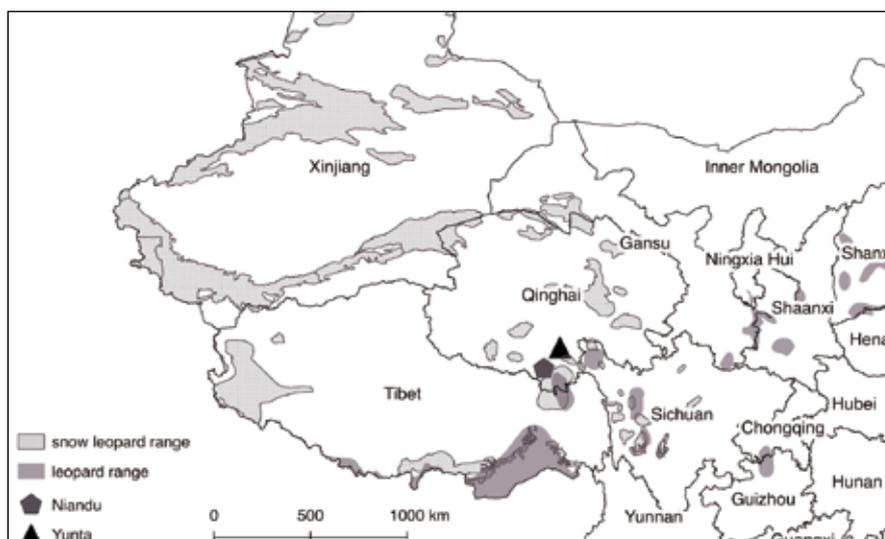


Fig. 1. Two study areas of our investigation and the IUCN predicted distribution of snow leopards and common leopards in China (The IUCN Red List of Threatened Species, Metadata: Digital Distribution Maps on The IUCN Red List of Threatened Species™ Version 5.2. Snow leopard and common leopard downloadable from <http://maps.iucnredlist.org/map.html?id=22732>, <http://maps.iucnredlist.org/map.html?id=15954>).

two camera trap stations captured both species, identifying five adult snow leopard and three adult common leopard individuals (Table 1). One adult female common leopard and one cub were captured on the same occasion (21 November 2016), confirming that the common leopard population is breeding. One camera trap station in Yunta captured both species, including two snow leopard individuals and one common leopard. In both survey areas, we found both species at elevations above 4,000 m. Camera trap locations were within 1 km distance to either of the two major rivers, Zhaqu (the upper reach of the Mekong River) or Tongtianhe (the upper reach of Yangtze River). Locations were characterised by cypress *Juniperus tibetica* forests and rugged red sandstone. The snow leopard was captured in areas with lime-stone habitat and the common leopard in red sandstone habitat. The camera locations in both areas captured possible prey species, including white-lipped deer *Cervus albirostris*, blue sheep *Pseudois nayaur* and musk deer *Moschus chrysogaster*. In Niandu, local livestock herders reported

that snow leopards and common leopards had co-existed for at least fifty years.

Discussion

Our survey provided the first photo-capture evidence of common leopards in Qinghai Province, and confirmed the co-existence of snow leopards and common leopards in a small part of Sanjiangyuan National Nature Reserve. Additional information is needed to assess the distribution of both species in Sanjiangyuan National Nature Reserve. It is important to further investigate their co-existence given the potential for competitive interaction between these species, which might lead to negative outcomes, especially for the smaller and less adaptable snow leopard. This is possibly crucial in the context of climate change, as the common leopard may shift to higher altitudes following the rising tree line (Lovari et al. 2013a). It is however possible that the two species may co-exist through different habitat use to avoid interspecific aggression (Lovari et al. 2013b), with the snow leopard preferring areas characterised by little vegetation, and

the common leopard preferring areas with higher density of cypress forest. This was suggested by the vertical distribution of the two species in Sagarmatha (Mt. Everest) National Park, Nepal, with the snow leopard preferring open shrub land and alpine meadows, while the common leopard preferring lower lying forests (Lovari et al. 2013b). We plan to undertake a detailed study on the distribution and interaction of the two species along the Tongtianhe and Zhaqu rivers, in order to facilitate their long-term conservation.

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Fig. 2. Snow leopard individual identification. A, B and C are photos of different individuals from one camera trap station. Identification is based on the distinct spot patterns of the face (Photos Shan Shui Conservation Center).

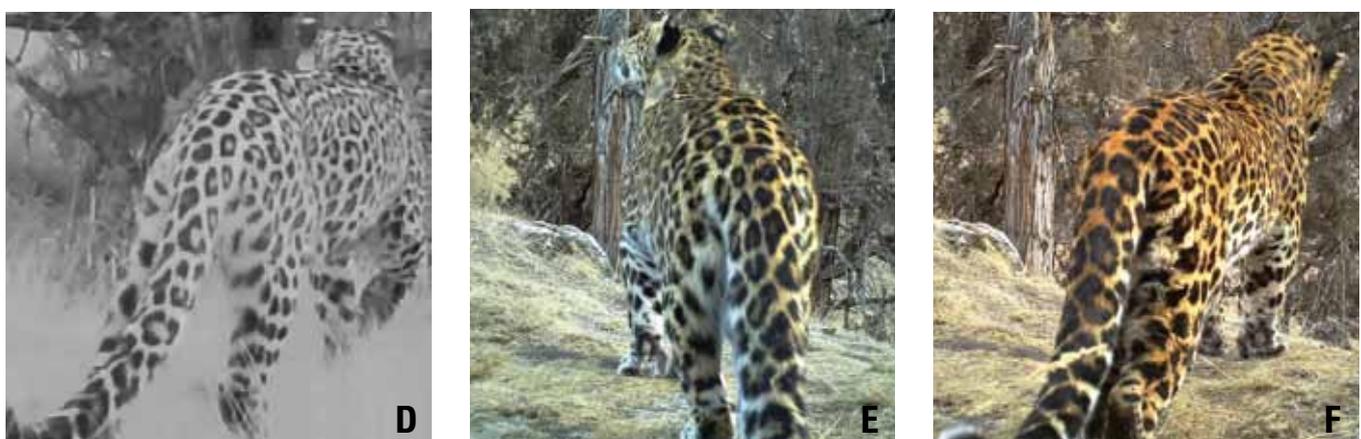


Fig. 3. Common leopard individual identification. D and E are photos of the same individual from one camera trap station. F is a different individual from the same camera trap station. Identification is based on the distinct spot patterns of the tail (Photos Shan Shui Conservation Center).

Table 1. Detailed information on occurrence of common leopard CL and snow leopard SL captured in Niandu and Yunta Village.

Site	Elevation	Species	Independent captures	Adult individuals captured
Yunta	4167m	SL	6	2
		CL	2	1
Niandu	4045m	SL	11	3
		CL	5	2
	4119m	SL	5	2
		CL	2	1

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