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Distribution update

Return of the wolf to the Nyesyang Valley, Manang District, Nepal

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Abstract

The presence and distribution of the wolf *Canis lupus* in the Nyesyang Valley, Manang District, Nepal were unknown until confirmed herein through camera traps. Anecdotal evidence suggested that the wolf was exterminated by herdsmen from the valley around 40-50 years ago, as retaliation for livestock depredation. The wolf's return was first confirmed by a camera trap photograph in March 2015. Subsequently, observations in the upper Khangsar valley in 2016 confirm successful reproduction of the wolf after its return; a pack of five individuals was observed. This evidence confirms successful re-colonization by wolves of their historic range in Manang. Interviews with herdsmen revealed losses of 11 yaks and three goats to wolves during the 18 months following their re-appearance up to the end of this field study. Herdsmen expressed negative attitudes towards wolves due to livestock depredation and the conflict seems likely to intensify in the future, which might lead to retribution killings and eventual local extinction of the wolf in the same way as occurred previously. Herdsmen-focused education programmes and livestock insurance schemes need to be implemented effectively to mitigate the human-wolf conflict and promote coexistence. Determination of the genetic lineage of these wolves along with a detailed ecological study is urgently required.

Introduction

The grey wolf *Canis lupus* was once one of the most widely distributed mammals in the world, but has become extinct in many areas of its range due to deliberate persecution provoked by livestock depredation and human fear (Mech and Boitani 2010). The wolf in Nepal is listed as 'Critically Endangered' in the National Red List Series of Species (Jnawali et al. 2011) and is protected by the National Park and Wildlife Conservation Act 1973 of the Government of Nepal (GoN 1973). An area of approximately 28,553km^2 is thought to include potential wolf habitats throughout the Nepalese Himalaya (Subba et al. 2016). However, wolves are distributed only in small pockets such as Humla (R.P. Lama, unpublished data), Upper Mustang (Chetri et al. 2016), Shey Phoksundo National Park, Kanchanjunga Conservation Area and Api Nampa Conservation Area (Subba et al. 2016), and Dhorpatan Hunting Reserve and Manaslu Conservation Area (Jnawali et al. 2011). The wolf is one of the most persecuted species in the Nepalese Himalaya, and suffers high mortality due to retaliatory killings by herdsmen over livestock depredation (Chetri et al. 2016; Subba 2012). Limited wolf studies in the Nepalese Himalaya (Subba et al. 2016) make the assessment and conservation of this species difficult.

Anecdotal evidence suggests that historically wolves were abundant in the Nepalese Himalaya. Information is lacking on the assessment of wolves' impact on local livelihoods due to depredations which resulted in large scale retribution killings. The wolf was eradicated from the Mt. Everest region with the killing of the last individual in the 1980s (Stevens 1993 as cited in Ale and Brown 2009). Similarly, in the Limi valley in Humla district, several pitfall traps were constructed to eradicate wolves from the area (R.P. Lama, unpublished data). Limited records suggest that wolves were wiped out from the Manang District through intensive killing during the late 1960s (R.P. Lama, unpublished data). Large-scale extermination of wolves was also

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practised in the past in the Dolpa (Subba et al. 2012) and upper Mustang regions of Nepal (G. Gurung, pers. comm.). However, in the last few decades the Government of Nepal has declared several new protected areas to improve habitat quality and conserve biological diversity. This effort has significantly contributed to the return of locally extinct species like the snow leopard *Panthera uncia* to Everest after four decades (Ale 2005), and the wolf to Everest (B. Shrestha, in press), Kanchenjunga conservation area (Subba et al. 2016) and Manang (R.P. Lama, unpublished data).

Apart from human-wolf conflicts, the debate on the phylogenetic identification of the wolf species in the Nepalese Himalaya is still ongoing. Recent studies in the Nepalese Himalaya suggest the presence of the Himalayan lineage wolf, *Canis lupus chanco* (Chetri et al. 2016), *Canis himalensis* (Subba 2012, Werhahn et al. 2017) and grey wolf *Canis lupus lupus* (Subba et al. 2016). In this paper, we present the first evidence of the return of the wolf to the Nyesyang Valley after more than four decades. We describe new locations and current distribution of this species in Nepal based on direct sightings and the first photographs and camera trap pictures ever taken in the Manang District of Nepal.

Methods

We conducted an opportunistic camera trapping survey in the Nyesyang Valley of Manang District during 2014-2016. Camera trapping was conducted in two phases with different objectives covering an area of approximately 150km^2. The first phase was conducted from December 2014 to May 2015 to study Pallas's cats *Otocolobus manul* and the second phase was from August 2015 to July 2016 to study snow leopards. A total of 36 camera trapping locations was covered in the first phase and 16 locations were covered in the second phase. We used Bushnell Trophy Cam HD trail cameras. The cameras were placed on ridgelines, at cliff bases and wildlife travel corridors where snow leopard signs were observed and expected to be used frequently.

The Nyesyang Valley is located in the rain shadow of the Annapurna Range (Oli 1991) covering an area of approximately 700km^2. The study area is covered mostly by coniferous and conifer-birch mixed forests at lower elevations and by grasslands mixed with scrubs at higher elevations. Scrubs are dominated by *Juniperus squamata* on gentle slopes, and *Caragana gerardiana, C. brevispina, Artimesia spp., Berberis angulosa, Rosa spp.* and *Ephedra gerardiana* on steeper, rocky slopes (Oli 1991).

The valley is very rich in carnivore diversity: snow leopard, red fox *Vulpes vulpes,* golden jackal *Canis aureus,* beech marten *Martes foina,* mountain weasel *Mustela altaica* (Oli 1991), Pallas's cat (Lama et al. 2016) and the recently photographed wolf. The blue sheep *Pseudois nayaur* is the main prey of the snow leopard along with the Himalayan musk deer *Muschus leucogaster* as a secondary prey. The small prey species include the large-eared pika *Ochotona macrotis* and Royle's pika *O. roylei* (R.P. Lama, unpublished data).

Results

The first wolf event was captured on 31 March 2015 in Pripche at 23:41h (Figure 1). It consisted of nine pictures of a single individual. The second wolf event, including one movie clip, was captured on 21 April 2015 in Kyarken at 02:14h. Five events (four movies and one picture) of a pair of wolves were captured in Angumi Lapche and another three movie events of a single individual were recorded in Kyarken and Shya Kang (Table 1; Figure 2). Pictures and movie clips often captured the same individuals, either single or in pairs. These records constitute the first ever camera trap evidence of the wolf in the whole Manang District. The wolf pack as well as individuals were also manually photographed on 2 September 2016 (16:21h) at the northern pasture of the Khangsar village (N28.70532, E83.93334; Figure 3). The pack was sighted and photographed at an elevation of 4,848m above sea level.

Figure 1. First camera trap picture of a wolf in Manang.

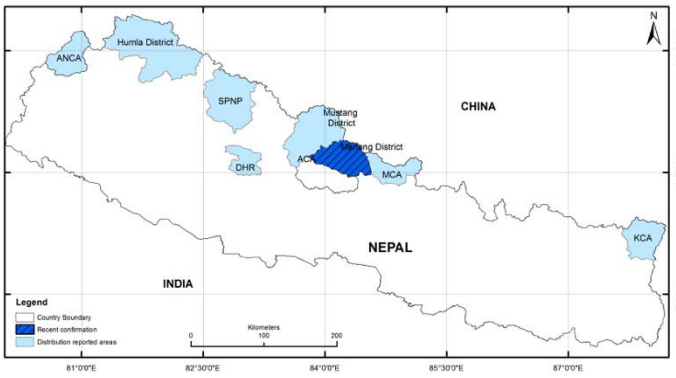

Figure 2. Distribution of wolf in Nepal (ANCA - Api Nampa Conservation Area, SPNP - Shey Phoksundo National Park, DHR - Dhor Patan Hunting Reserve, ACA - Annapurna Conservation Area, MCA - Manaslu Conservation Area, KCA - Kanchenjunga Conservation Area).

Figure 3. Photograph of a wolf taken by hand-held camera. © Tashi R. Ghale.

Table 1. Photographic evidence of wolf in the Manang District from camera trap captures.

Location Name	*Number of events based on location*	*Capture types*	*Capture date*	*Time stamp (hour/min./sec.)*	*Latitude/Longitude*	*Elevation (m. asl.)*	*Habitat types*
Pripche	1	Image	31-03-2015	23:41:08 - 23:41:29	N28.69466°/E84.00847°	4590	Meadow
Kyarken	2	Movie Movie	21-04-2015 23-04-2015	02:14:04 – 02:15:04 20:55:56 – 20:56:56	N28.40825°/E83.59272°	4340	Meadow
Angumi Lapche	5	Image Movie Movie Movie Movie	15-12-2015 03-02-016 09-03-2016 18-03-2016 15-04-2016	07:00:34 - 07:01:34 04:39:36 – 04:40:40 05:45:25 – 05:46:25 23:54:22 – 23:55:22 05:41:34 – 05:42:34	N28.41028°/E84.01776°	4644	Meadow
Shya Kang	2	Movie Movie	02-02-2016 02-02-2016	08:27:51 – 08:28:51 08:36:39 – 08:37:39	N28.68009°/E83.98475°	4232	Meadow

Livestock depredation and herders' attitudes towards wolves

We found a kill site of a mature male yak *Bos grunniens* aged 5-6 years (Figure 4). Apparently, the pack was feeding on this yak during the previous few days. This was not the first yak the wolf pack has hunted. We conducted informal interviews with 20 herdsmen in the Nyesyang Valley and gathered information about their attitudes to wolves and wolf depredation on livestock. Between 2015 and 2016, a total of 11 mature yaks (10 females and one male, out of 12 individuals attacked) and three goats were lost to wolves during the 18 months from March 2015 to August 2016. In the Nyesyang Valley, the current market price of livestock is approximately US$1,100 per male yak, US$800 per female yak and US$200 per goat. Based on these estimates, livestock losses to wolf depredation in Manang during these 18 months were worth US$9,700 spread over five households. Of the respondent herdsmen, 90% (n=18) identified wolves correctly and showed an extremely negative attitude towards them. Herdsmen believed that the wolf is the most problematic animal they have ever faced in the valley. This preliminary result shows that retaliatory killing of wolves can become a serious problem for the survival of recolonizing wolves in our study area. Thus, herdsmen-focused awareness campaigns and financial incentives such as a livestock compensation relief scheme are recommended to mitigate human-wolf conflict. Wolves need to be included in the livestock compensation relief scheme which currently includes only snow leopards and leopards *Panthera pardus*. Funds are provided by the Annapurna Conservation Area, Unit Conservation Office Manang through its Conservation Area Management Committees and snow leopard conservation subcommittees after the verification of the kills.

Figure 4. Yak killed by wolf pack. © Wang Lama

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References

Ale, S.B. and Brown, J.S. 2009. Prey behaviour leads to predator: a case study of the Himalayan tahr and the snow leopard in Sagarmatha (Mt. Everest) National Park, Nepal. *Israel Journal of Ecology and Evolution* 55: 315–327.

Chetri, M., Jhala, Y.V., Jnawali, S.R., Subedi, N., Dhakal, M. and Yumnam, B. 2016. Ancient Himalayan wolf (*Canis lupus chanco*) lineage in Upper Mustang of the Annapurna Conservation Area, Nepal. *ZooKeys* 582: 143–156.

GoN. 1973. National Parks and Wildlife Conservation Act, 1973. Government of Nepal, Kathmandu, Nepal.

Jnawali, S.R., Baral, H.S., Lee, S., Acharya, K.P., Upadhyay, G.P., Pandey, M., Shrestha, R., Joshi, D., Lamichhane, B.R., Griffiths, J., Khatiwada, A., Subedi, N. and Amin, R. 2011. *The Status of Nepal's Mammals: The national Red List Series*. Department of National Parks and Wildlife Conservation, Kathmandu, Nepal.

Lama, R.P., O'Connor, P., Andre, K., Ghale, T.R. and Regmi, G.R. 2016. Historical evidence of Pallas's cat in Nyesyang valley, Manang, Nepal. *CAT News* 63: 22-23.

Mech, L.D. and Boitani, L. (IUCN SSC Wolf Specialist Group). 2010. *Canis lupus*. The IUCN Red List of Threatened Species 2010: e.T3746A10049204.<http://dx.doi.org/10.2305/IUCN.UK.2010-4.RLTS.T3746A10049204.en> Accessed 23 April 2016.

Oli, M.K. 1991. *The ecology and conservation of the snow leopard (Panthera uncia) in the Annapurna Conservation Area, Nepal*. MPhil. University of Edinburgh, Edinburgh, UK.

Stevens, S.F. 1993. *Claiming the high ground: Shrepas, subsistence, and environmental change in the highest Himalaya*. Motilal Banarsi Dass, Delhi, India.

Subba, S.A., Shrestha, A.K., Thapa, K., Malla, S., Thapa, G.J., Shrestha, S., Subedi, S., Bhattarai, G.P. and Ottvall, R. 2016. Distribution of grey wolves *Canis lupus lupus* in the Nepalese Himalaya: implications for conservation management. *Oryx* 51: 403-406.

Subba, S.A. 2012. Assessing the genetic status, distribution, prey selection and conservation issues of Himalayan wolf (*Canis himalayensis*) in Trans-Himalayan Dolpa, Nepal. MSc. Lund University, Lund, Sweden.

Werhahn, G., Senn, H., Kaden, J., Joshi, J., Bhattarai, S., Kusi, N., Sillero-Zubiri C. and Macdonald, D.W. 2017. Phylogenetic evidence for the ancient Himalayan wolf: towards a clarification of its taxonomic status based on genetic sampling from western Nepal. *Royal Society Open Science*. DOI: 10.1098/rsos.170186.

Biographical sketch

Rinzin Phunjok Lama is an MSc student at the Georg-August University of Göttingen, Germany. His interest lies in the research and conservation of high-altitude mammals, specifically snow leopards, in the Himalayas.

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