TERMS OF REFERENCE

ASSESSMENT OF SNOW LEOPARD STATUS AND DISTRIBUTION IN WESTERN COMPLEX OF NEPAL

Introduction Background

1. Rationale

The endangered snow leopards are widely but patchily distributed throughout the sub-alpine and alpine ecosystems of the Himalayan mountain range (Nowell & Jackson, 1996). Compared to other large cats (e.g., tiger, lion), little conclusive information is available on the ecology, distribution and population status of the elusive snow leopards. Because of their cryptic nature, low population densities, large home ranges and inaccessible terrains, snow leopards are, by nature, difficult to monitor directly and indirectly. The abundance of snow leopard signs, such as scrapes and scent-sprays, is commonly used as an index of proxy snow leopard density (Jackson & Hunter, 1996). Sign indices as a measure of abundance, however, may be fraught with potential error and bias (Anderson, 2001). Based on sightings, reports, and anecdotal oral history snow leopard presence has been suggested in 12 mountain protected areas (HMGN 2005). Jackson estimated 350 to 500 cats across Nepal Himalaya in 27,432 sq. km potential habitat of snow leopards. However, this estimation is largely based on Habitat Suitability Index (HBI). Following this, the extent of the total potential snow leopard habitat in the Nepal Himalaya is estimated at about 13,000 km$^2$ based on habitat use analysis, (WWF Nepal 2009). The population estimate, based on linear relationships between genetic analysis and scrape encounter rates cross-verified by abundance of the prey base, in the Nepal Himalaya is 301-400 animals (WWF 2009). The population density ranges from 1.5 to 3.2 animals/100 sq. km in the different complexes However, this estimation is based on sign encounter rate, prey base abundance and limited genetic sampling. To overcome this limitation, an unbiased study for nationwide status update for snow leopards is required.

Recent advances in wildlife techniques, such as non-invasive genetic sampling (Karmacharya et al. 2011, Janecka et al., 2008; Janecka et al. 2011; Lovari et al., 2009; Wegge et al. 2012), offer possibilities for more reliable and rigorous studies on the abundance of snow leopards. Genetic analysis of fecal DNA showed promising potential index of the snow leopard abundance than other monitoring techniques. Thus, yet, we were able to update the status and distribution of snow leopards within two complexes out of three complexes. For example, the status and distribution of snow leopards in eastern complex (KCA, SNP, LNP and GCA) and Annapurna-Manaslu complex have been updated. However, there is a large extent of potential habitat of snow leopards in the western complex, possibly 2/3 of suitable habitat that requires updating urgently.

This project will assess status and distribution of snow leopards in the western part of Nepal using fecal DNA analysis. It requires substantial and highly likely snow
leopard scat samples from representative snow leopards habitat with an appropriate informative data to analyze noninvasive genetic study of the snow leopard. This project is designed to collect substantial putative snow leopard scat samples from different survey blocks of entire western complex which would be an accurate means to assess the abundance and distribution of snow leopards across the complex.

2. Objective

The objective of the consultancy is to assess the status and distribution of snow leopards in the western part of Nepal by collecting adequate snow leopards scat samples for fecal DNA analysis. The consultant will:

1. Collect adequate putative snow leopard’s scat samples from Darchula, Bajhang, Humla, Mugu and Dolpa of western complex of Nepal.
2. Identify major strengths, weaknesses, opportunities and threats for snow leopard conservation of western Nepal.

3. Study area

Western Complex

Dolpa- 2 sites (Phoksundo-Vijer- Saldang, Dho-Tinje- Tscharka)
Mugu- 1 site (Dolphu valley of Langu)
Humla- 2 sites (Limi-Mucchu and other parts)
Bajhang- 1 site (Dhuli)
Darchula- 1 site (Tinker-Sunsera)

Figure 1. Western complex with selected survey grids for scat collection sites (4*4 km.)
4. Methodology

The consultant will develop a detailed research methodology for the assessment including sampling method and design.

5. Expected output

1. Collection of adequate putative snow leopard scat samples with their accurate information
2. Identify major threats and opportunities for snow leopard conservation intervention

6. Deliverable

1. Collected scat samples with accurate data in the standard format
2. Photographs (with high resolution)
3. Final Assessment Report

7. Project Duration

2 months (spring season)