

Project Update: May 2015

The blue sheep survey for the winter season in the central part of Jigme Dorji National Park, Bhutan is complete and the findings are presented as following.

In a 60-day field survey, a total of 1,635 blue sheep belonging to 43 groups (or herds) were sighted by the first observer. The second observer counted 1,643 individuals belonging to the same number of groups. The mean group size of blue sheep was 38.12 ($SE \pm 4.28$). There was a very high variability of group size, ranging from two to 120 (Fig. 1). Using the abundance estimation method employed by Forsyth and Hickling (1997) for double-observer regime, the total number of blue sheep in the study area was estimated at 1,762 ($SE \pm 199$). This estimate was found to be highly reliable with the detection probability of 93% each by both the observers (Table 1).

Table 1. Abundance estimates for blue sheep in central part of Jigme Dorji National Park, 2015 using the double observer survey method.

Variable	Value
B	40
S_1	3
S_2	3
G	46
Var(G)	0.25
μ	38
Var(μ)	18
N	1762
Var(N)	39511
SE (N)	199
SE (μ)	4.28
p1	0.93
p2	0.93

Using the snow leopard to blue sheep ratio of 1:98-143 by Jackson (1996), 11-17 snow leopards could be sustained in the study area. This estimate is closer to the estimated snow leopard abundance of 13-17 determined by Thinley *et al.* (2015) in the same area. During the survey period, i.e. on 29/12/14, three snow leopards were sighted at Zego, which is situated in a prime blue sheep area. The sighting of three snow leopards indicates growing population of snow leopard.

The density of blue sheep in the study was estimated at 2.96 individuals per km^2 which is based on the total area of habitat available for blue sheep.

Using the observations of the first observer (i.e., the author), only 1,524 of 1635 blue sheep were categorised according to sex and age group (Fig. 2; Table 2). 111 individuals of blue sheep could not be identified due to observations at long distance, ambiguous identification features and very shy nature of the species.

Table 2. Population structure of blue sheep in Lingzhi Park Range of Jigme Dorji National Park during winter season.

	Sex and age class	Number of individuals observed	Percent of individuals observed
Young	Lamb	266	17.45
	Yearling	305	20.01
Female	Female	478	31.36
Male	Young Male	117	7.68
	Medium Male	109	7.15
	Big Male	249	16.34
	Total	n=1524	100.00%

The number of observations indicated that habitat utilization did not differ much with respect to type of vegetation coverage ($H(3) = 2.505, p = 0.286$). Although there was no significant difference in the habitat utilizations, slightly higher sightings were recorded in alpine grasslands between 3500 to 5000 m.

The detail report on winter population abundance, structure and habitat use of blue sheep in central part of Jigme Dorji National Park, Bhutan will be published soon for public access.



Figure 1. An adult male and female accompanied by lamb.



Figure 2. The largest group size ($n = 120$) of blue sheep sighted just above treeline at Boeza.

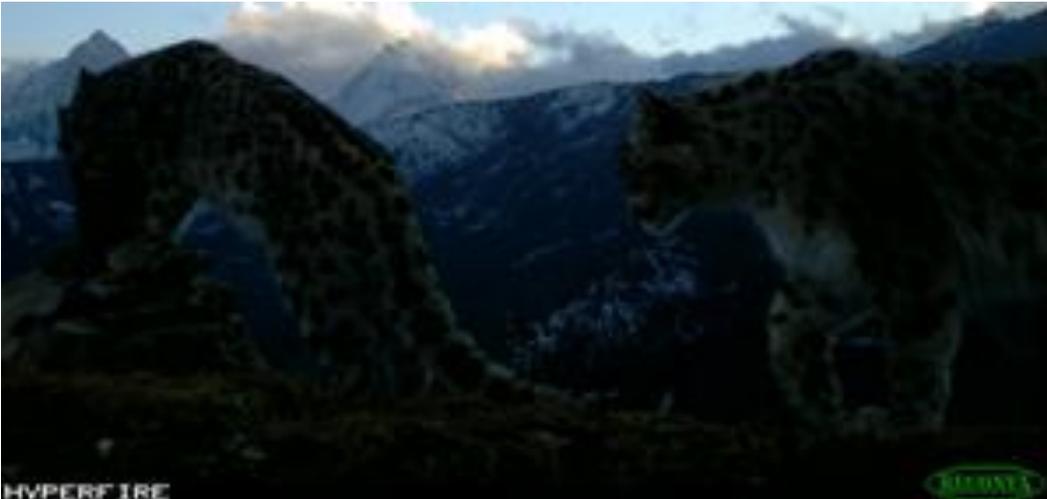


Figure 3. Two snow leopards captured in a camera-trap stationed at Shasila in the study area, which is the prime habitat of blue sheep. *Photo credit: Lingshi Park Range (LiPRO), 2012.*