

Chapter 3

Mountain Ungulates in the Himalayan and Trans-Himalayan Protected Areas of India

J.S. Kathayat & V.B. Mathur

In all, 20 ungulate species belonging to four families *viz.*, *Cervidae*, *Moschidae*, *Bovidae* and *Equidae* occur in the Himalaya. Of these, three species, *viz.*, Sambar, Barking deer and Wild pig are widely distributed in the India and are not confined to the Himalayan region alone. The Himalayan ungulates are represented by 17 species and the members of the Sub Family Caprinae dominate (9 species). About 5,13,089 km² of India's geographical area is covered by the Himalayas and the hills of north-east India. There are about 75 Protected Areas (PAs) covering approximately 40,329.65 km² (7.86% of the region) in which the mountain ungulates occur. These include: 6 PAs in the Trans-Himalayan zone, 58 in the Himalayan zone, 3 in the Gangetic Plain, and 8 in North-East India. The Central Himalayan province (2C) has the highest percentage of PA coverage while the province of North-East Hills (9B) has the lowest PA coverage (Table 1).

1. Protected Area Coverage

a. PA Coverage in different Biogeographic Regions

An analysis of area covered under the PA network in each biogeographic zone (*i.e.*, area available for conservation of mountain ungulates and other species) reveals that the Eastern Himalaya (2D) has the highest (10,700.57 km²) coverage

while the North-East Hills has the lowest (1,249.69 km²). The area covered under the PA network in other provinces are as follows: 1A - Ladakh Mountains (9,775 km²), 2B - West Himalaya (6,028.48 km²), 1B - Tibetan Plateau (5,443 km²), 2A - North-West Himalaya (3,419.09 km²), 2C - Central Himalaya (2,071.82 km²) and in 7A - Upper Gangetic Plain (1,642 km²) (Table 2).

b. PA Size Distribution (for some selected species)

The mountain ungulate species found in various PAs and the potential areas available for each species are as follows: Himalayan ibex reported in 8 PAs (11,854.70 km²), Ladakh urial in 2 PAs (9,100 km²), Tibetan argali in 2 PAs (8,100 km²), Bharal in 17 PAs (17,540.76 km²), Tibetan wild ass in 1 PA (4,000 km²), Himalayan musk deer in 37 PAs (17,831.48 km²), Hangul in 5 PAs (1,178 km²), Himalayan tahr in 17 PAs (5,953.61 km²), Goral in 54 PAs (22,757.08 km²), Serow in 43 PAs (18,434.61 km²), Markhor in 1 PA (400 km²), Takin in 6 PAs (5,561.50 km²).

The mean PA size for PAs in Provinces 2A and 9B are low while it is higher for 1A and 1B (Table 3). Over 36% of these PAs are <100 km² and about 40% PAs are in the category of 101-500 km² (Figure 1) In



other words, 76% of PAs that afford protection to mountain ungulates are smaller in size. There is a need for large PAs to maintain viable populations of mountain ungulates for long-term conservation.

2. Ungulate Species Richness in Protected Areas

Goral seems to be the most common mountain ungulate in the Himalaya as it is reported from 54 PAs, while the Tibetan wild ass and Markhor are found only in one PA each. Information on the distribution of species such as Tibetan gazelle, Chiru and Wild yak is lacking.

The highest mountain ungulate species richness is in the biotic province North-west Himalaya (8 species) and the minimum species richness is in the biotic province Upper Gangetic Plain (1 species). The state of Jammu & Kashmir has the most number of mountain

ungulate species (10 species) while the states of Nagaland and Manipur have the least (1 species each).

Information on the PAs for the conservation of the mountain ungulates in the Himalaya and Trans-Himalaya is presented in Tables 1 to 3.

Authors' Note: The above analyses is based on the data available in the National Wildlife Database of the Wildlife Institute of India, provided by PA managers/states and has a some limitations viz., (1) Some species populations exist outside the PA network (2) The presence of a few species are yet to be confirmed from some PAs (3) The total area of the PA may not be the potential area for the mountain ungulate species as this includes perpetual snow covered areas and altitudinal range limits not used by the species. (4) A few PAs have the 'proposed' status *i.e.* they have not been gazetted.

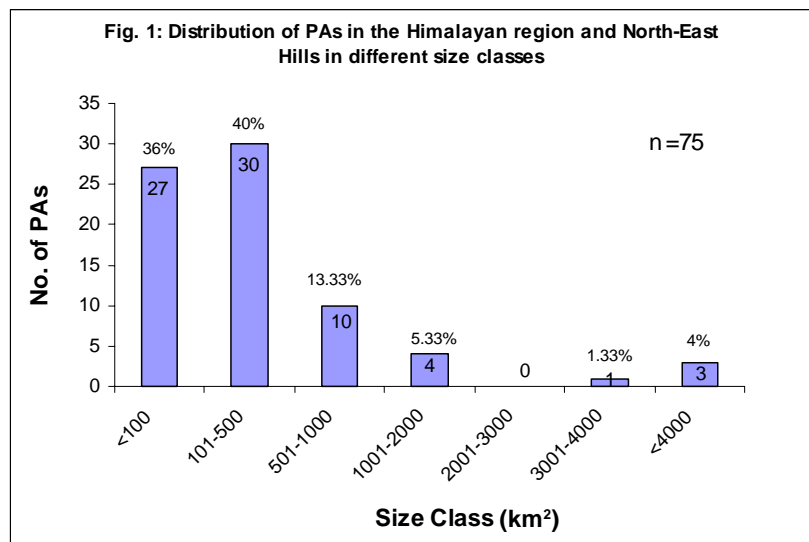


Table 1. Distribution of Mountain Ungulates in various Protected Areas in India

Biogeographic Zone	Biogeographic Province	State	Protected Area	Year of Establishment	Area (km ²)	Altitudinal Range (m)	Himalayan Musk deer	Hangul	Takin	Himalayan Tahr	Goral	Serow	Markhor	Himalayan Ibeex	Ladakh Urial	Tibetan Argali	Bharal	Tibetan Gazelle	Chiru	Tibetan Wild ass	Wild Yak				
1	1A	Jammu & Kashmir	Hemis NP	1981	4100	3140-5854	x	x	x	x	x	x	x	x	✓	✓	✓	✓	x	x	x	x			
			Karakoram WS	1987	5000	ca 2600-6500	x	x	x	x	x	x	x	x	x	✓	✓	?	?	x	x	x	x		
			Pin Valley NP	1987	675	3300-6632	x	x	x	x	x	x	x	x	x	✓	x	x	?	x	x	x	x		
			Changthang WS	1987	4000	ca 4200-6000	x	x	x	x	x	x	x	x	x	✓	✓	✓	✓	?	x	✓	x		
			Kibber WS	1992	1400	ca 4200-6000	x	x	x	x	x	x	x	x	x	✓	x	x	✓	x	x	x	x		
	1B	Sikkim	Shingba Rhododendron WS	1984	43	3048-4575	✓	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x	x		
			Baital-Thajwas WS	1987	210		x	?	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Dachigam NP	1981	141	1642-4289	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Gulmarg WS	1987	180	2400-4300	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Hirapora WS	1987	114.5	2557-4745	?	x	x	x	x	x	x	✓	?	x	x	x	x	x	x	x	x	x	
2	2A	Jammu & Kashmir	Kishtwar NP	1981	400	1700-4800	✓	✓	x	x	x	✓	✓	✓	x	x	x	✓	x	x	x	x	x		
			Lachipora WS	1987	93.5	1630-3300	✓	✓	x	x	x	x	✓	?	x	x	x	x	x	x	x	x	x	x	
			Overa WS	1981	32	2100-5425	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Overa-Aru WS	1987	425	2250-6000	✓	✓	✓	✓	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Trikuta WS	1981	31.73	450-600	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			City Forest NP	1992	9.07		x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Limber WS	1987	43.75		✓	x	x	x	x	x	x	x	?	x	x	x	x	x	x	x	x	x	
			Hokersar WS	1992	13.75	1584	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	
			Himachal Pradesh		Bandli WS	1962	41.32	762-2160	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x
					Gangul-Siahbehi WS	1962	108.85	1800-3919	✓	x	x	✓	x	x	✓	✓	x	x	x	x	x	x	x	x	x
Great Himalayan NP	1984	754.4			1500-5805	✓	x	x	✓	x	x	✓	✓	x	?	x	x	✓	x	x	x	x	x		
Kais WS	1954	14.19			2800-3680	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x	x		
Kalatop-Khajjair WS	1958	61			1185-2768	x	x	x	x	x	x	✓	✓	x	x	x	x	x	x	x	x	x	x		
Kanwar WS	1954	54	1800-4833	✓	x	x	✓	x	x	✓	✓	✓	x	x	x	x	?	x	x	x	x	x			
Khokhan WS	1954	14.05	1500-2787	x	x	x	x	x	✓	x	x	x	x	x	x	x	x	x	x	x	x	x			





Table 2 Protected Area coverage in the different Bio-geographic Provinces in the Himalaya

Province	Area of Province (km ²)	State	Name of PA	Area of PA (km ²)	Total Area of PAs (km ²)	% Coverage of PA Area	No. of Species
1A	109754	Jammu & Kashmir	Hemis NP	4100	9775	8.91	4
			Karakoram WS	5000			
			Pin Valley NP	675			
1B	75069	Himachal Pradesh	Changthang WS	4000	5443	7.25	4
			Kibber WS	1400			
			Shingba Rhododendron WS	43			
2A	69401	Jammu & Kashmir	Dachigam NP	141	3419.09	4.93	8
			Gulmarg WS	180			
			Hirapora WS	114.5			
			Kishtwar NP	400			
			Lachipora WS	93.5			
			Overa WS	32			
			Overa-Aru WS	425			
			Limber WS	43.75			
			Gangul-Siahbehi WS	108.85			
			Great Himalayan NP	754.4			
			Kalatop-Khajjair WS	61			
			Kanwar WS	54			
			Khokhan WS	14.05			
			Kugti WS	378.86			
			Lippa Asrang WS	30.89			
Rupi Bhaba WS	269						
		Himachal Pradesh	Sechu Tuan Nala WS	102.95			
			Tundah WS	64.22			
			Tirthan WS	61.12			
			Sainj WS	90			

2B	52072	Himachal Pradesh	Chail WS	108.54	6028.48	11.58	6
			Churdhar WS	56.15			
			Daraghathi WS	167			
			Darlaghat WS	140			
			Majathal WS	40			
			Sangla WS	650			
			Shimla Water Catchment WS	10.25			
			Talra WS	26			
			Askot Musk Deer WS	599.93			
			Binsar WS	45.59			
			Gangotri NP	1552			
			Govind NP	472.08			
			Govind Pashu Vihar WS	481			
			Kedarnath WS	957			
			Nanda Devi NP*	624.62			
			Valley of Flowers NP	87.5			
			Mussoorie WS	10.82			
2C	5457	Sikkim	Maenam WS	35.34	2071.82	37.97	6
			Khangchendzonga NP*	1784			
			Kyongnosla Alpine WS	31			
			Barsey Rhododendron WS	104			
			Senchal WS	38.88			
2D	83743	Arunachal Pradesh	Singalila WS	78.6	10700.57	12.78	5
			D'Ering WS	190			
			Dibang WS	4149			
			Eagle Nest WS	217			
			Itanagar WS	140.3			
			Kamlang WS	783			
			Mehao WS	281.5			
			Lado WS (proposed)	500			
			Mouling NP	483			





7A	12543	Uttaranchal	Namdapha NP	1807.82	1642	13.1	1
			Pakhui WS	861.95			
			Palin WS (proposed)	250			
			Sessa Orchid WS	100			
			Tale Valley WS	337			
			Tawang NP/WS (proposed)	300			
			Walong WS (proposed)	300			
			Rajaji NP	820			
			Corbett NP	520.82			
			Sonanadi WS	301.18			
9B	105050	Manipur Meghalaya Mizoram Nagaland	Yangoupokpi-Lokchao WS	184.8	1249.69	1.19	2
			Balphakram NP	220			
			Nokrek Ridge WS	47.48			
			Dampa WS	500			
			Murlen NP	200			
			Khawnglung WS	41			
			Phawngpui WS	50			
			Fakim WS	6.41			

*Some portions of these PAs fall in Zone 1BA/iso.

Table 3: Sizes of Protected Area in different Biogeographic Zones

Biogeographic Zone	Biogeographic Province	No. of PAs	Minimum size (km ²)	Maximum size (km ²)
1	1A	3	675	5000
	1B	3	43	4000
2	2A	20	30.89	754
	2B	17	26	1552
	2C	6	31	1784
	2D	15	100	4149
7	7A	3	301.18	820
	7B			
9	9A			
	9B	8	6.41	500