

RUT SEASON SURVEY REPORT
**HIMALAYAN IBEX
& BLUE SHEEP**
IN GILGIT-BALTISTAN
2024-25



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& BLUE SHEEP (*Pseudois nayaur*)**
IN GILGIT-BALTISTAN, PAKISTAN

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HIMALAYAN IBEX (*Capra sibirica*)
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REPORT SUMMARY

Over time, humans became more dependent on wild animals than domesticated ones, which, in some cases, led to their extinction. The wild ungulates of Gilgit-Baltistan were not spared from this fate and were on the verge of extinction when the concept of trophy hunting was introduced.

The trophy hunting program was well accepted and embraced by local communities, as it initially involved them as owners rather than relying on existing game reserves and sanctuaries, where decisions were made by the government and all proceeds went to the government.



Plate 1. Himalayan ibex common ungulate.



Plate 2. Himalayan ibex in its habitat.

GB using the standard Double Observer Survey Method (DOSM) from 15th December 2024 – 31st January 2025.

Survey results indicated that 7,294 Himalayan ibex and 1,785 blue sheep are present across in Community-Controlled Hunting Areas of GB. DOSM capture-recapture analysis revealed that, at a 95% confidence interval, the estimated population of Himalayan ibex is between 6,710 and 7,811, while the estimated population of blue sheep is between 1,155 and 2,389.

Of the Himalayan ibex population, 37.93% comprises males, 34.52% females, 16.36 young, and 11.17 yearlings. Among the males, 27.93% are trophy-sized animals. Similarly, 47.67% of the total blue sheep population consists of males, 29.97% females, 14.62 young, and 8.62 yearlings. Among the males, 22.32% are trophy-sized animals.

Now, the trophy hunting program of Gilgit-Baltistan (GB) has become a global example, as communities not only receive millions of Pakistani Rupees (PKRs), but the population of wild ungulates and other wildlife species has also increased. Experts have also applauded the GB program for being the only one that conducts multi-partner annual surveys of wild ungulates and issues quotas only after those surveys are completed.

For the trophy hunting season of 2025-26, the prerequisite wild ungulate surveys were conducted in 63 Community-Controlled Hunting Areas (CCHAs) across

Using the standard method of harvesting 2% of the total population, the department can authorize the harvest of 146 Himalayan ibex and 36 blue sheep. If it adopts the 25% threshold of trophy-sized animals instead, they can permit the harvest of 193 Himalayan ibex and 48 blue sheep.



Plate 3. Blue sheep herd in Gojal Subdivision

1. INTRODUCTION

Gilgit-Baltistan (GB), a landlocked region in the north of Pakistan, was for centuries known only to Silk Road traders engaged in the silk trade. The landlocked nature of GB kept it isolated from many modern-day amenities, but this isolation helped preserve its unique ecosystem for generations.

The towering peaks of GB have provided refuge and thriving habitats for many wildlife species, including the snow leopard (*Panthera uncia*), markhor (*Capra falconeri falconeri*), Himalayan ibex (*Capra sibirica*), blue sheep (*Pseudois nayaur*), Himalayan brown bear (*Ursus arctos isabellinus*), and Asiatic black bear (*Ursus thibetanus*) (Ali *et al.*, 2021).



Plate 4. Gilgit-Baltistan landscape.

The centuries-old dynamics of Gilgit-Baltistan (GB) began to change after 1960 with the construction of the Karakoram Highway, which not only provided new opportunities for the region's inhabitants but also attracted visitors and introduced automatic firearms. Both outsiders and locals took advantage of this situation to poach wildlife rampantly, driving many species to the verge of extinction, particularly wild ungulates, which they especially targeted for their Halal meat and elegant horns (Rasool, 1990).

The trophy hunting program was introduced to help conserve the remaining populations of wild ungulates and other wildlife. The concept was highly appealing, as it assured local communities that 80% of the hunting fees would be given to them a lucrative offer for an animal that was previously hunted only by a few poachers for its meat (Haidar *et al.*, 2015; Shackleton, 2001).

The commitment of the communities is evident, with around 63 Community-Controlled Hunting Areas now established, and many more in the planning stages. The trophy hunting program in Gilgit-Baltistan currently offers three species: the Himalayan ibex, blue sheep, and markhor. A fourth species, the Ladakh urial, is under consideration to be included as a trophy animal.

1.1 Blue Sheep

The blue sheep (*Pseudois nayaur*) (Figure 1), commonly known as the Bharal, is an intermediate species that exhibits characteristics of both sheep and goats. Morphologically, it resembles a sheep, but its behavior and habitat preferences are more similar to those of a goat (Schaller, 1977).

Blue sheep are dimorphic, with males having larger horns and body sizes than females. Males can weigh up to 75 kg, while females may reach up to 45 kg (Schaller, 1977). The species is classified as "Least Concern" on the IUCN Red List (Harris, 2014), however, in Pakistan, it is listed as "Endangered" (Sheikh & Molur, 2004).



Plate 5. A herd of Blue sheep in its habitat.

The blue sheep occurs in Nepal, Bhutan, China, and Pakistan. In Pakistan, it is endemic to the Gojal subdivision of Hunza district (Figure 2 A & B).





Figure 1. Demographic categories of *Pseudois nayaur* adopted from (Castello, 2016)

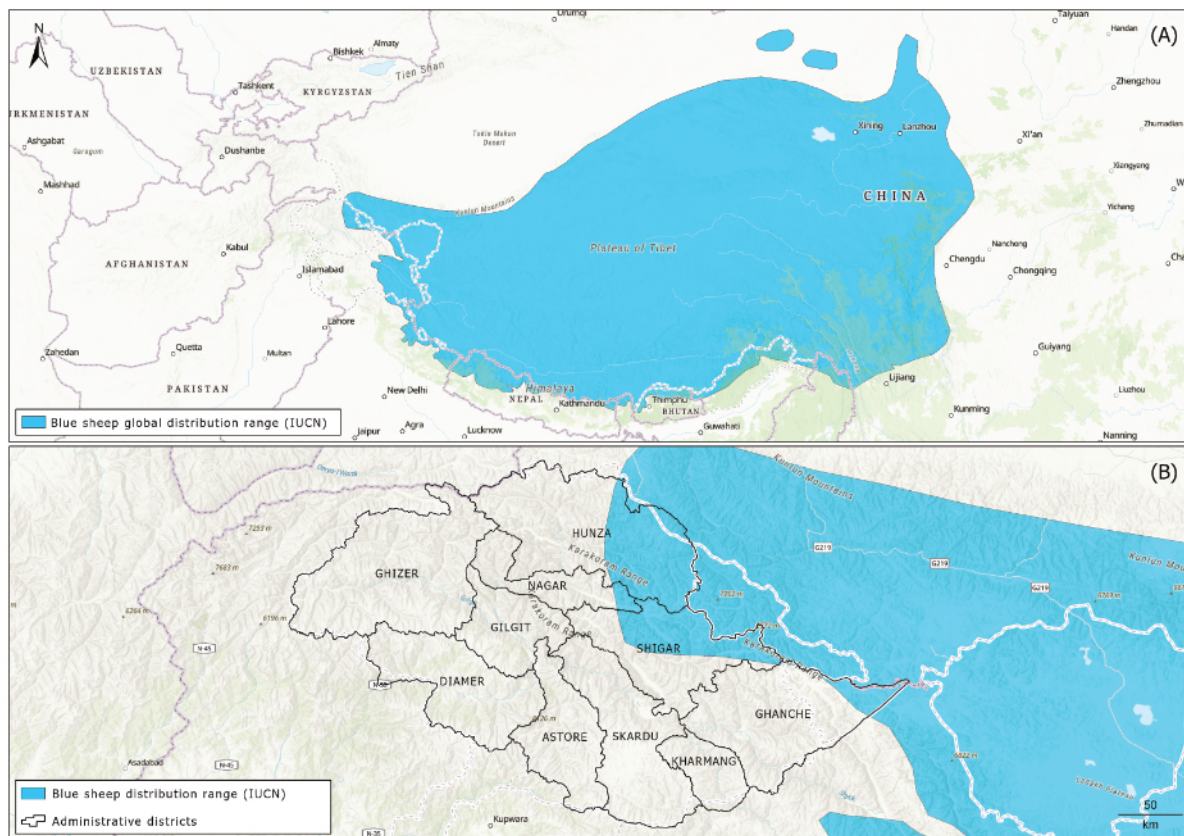


Figure 2. (A) Global distribution and (B) distribution in Gilgit-Baltistan of blue sheep.

1.2 Himalayan Ibex

Himalayan ibex (*Capra sibirica*) (Figure 3), commonly known as the Siberian ibex in Central Asia, Russia, Mongolia, and China, the Asiatic ibex in India, and the Himalayan ibex in Pakistan (Reading et al., 2020).

The Himalayan ibex occurs in 12 countries within the snow leopard range (Figure 4 A & B). It is a highly dimorphic species, with males being heavily built compared to others in the genus *Capra*. Males possess large, elegant, backward-curving horns, and their body weight can reach up to 130 kg (about 286.6 lb), while females typically weigh up to 60 kg (Schaller, 1977). The Himalayan ibex is listed as 'Vulnerable' on the IUCN Red List (Reading et al., 2020) and as 'Least Concern' in Pakistan (Sheikh & Molur, 2004).



Figure 3. Morphology of *Capra sibirica* adopted from (Castello, 2016)

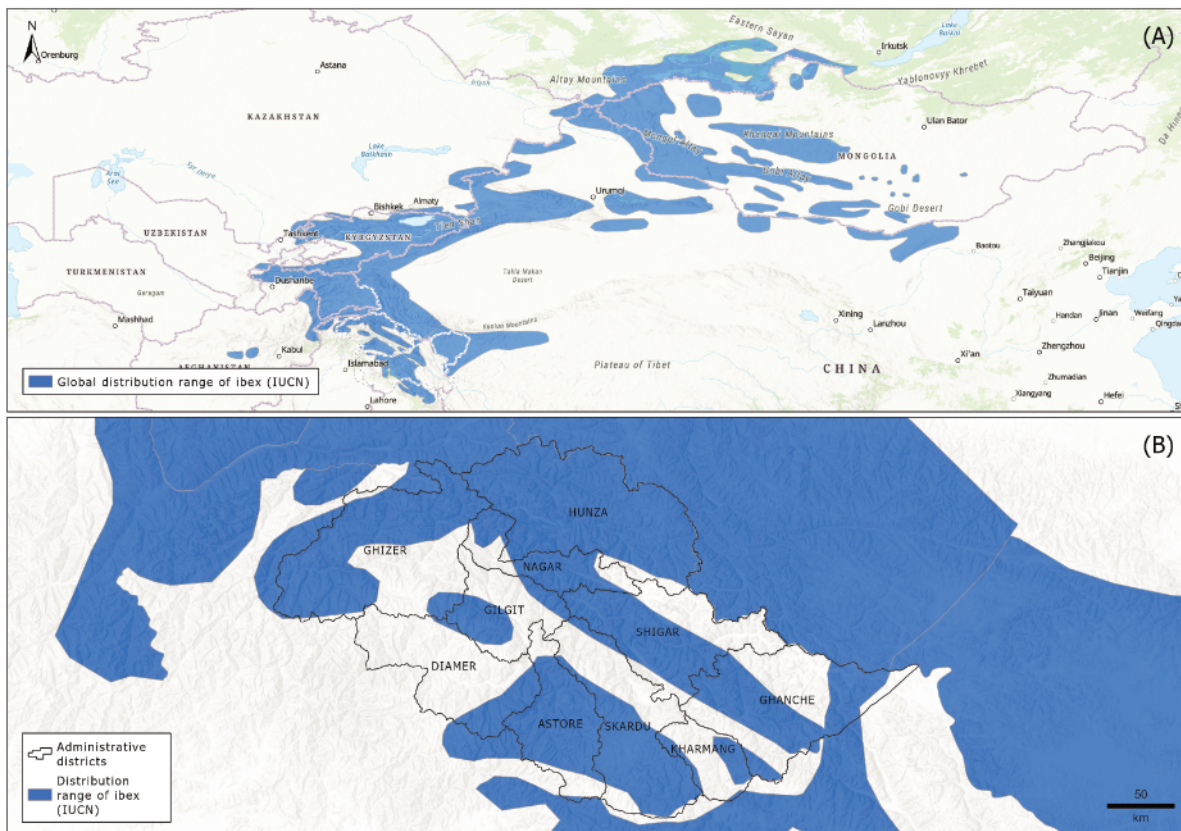


Figure 4. Distribution of Himalayan ibex (A) Global distribution (B) distribution in Gilgit-Baltistan.

1.3 Objectives of Study

Gilgit-Baltistan has emerged as a globally recognized destination for game hunting, primarily due to its unique status as a trophy hunting reserve that offers three highly sought-after species: the Himalayan ibex, Astor markhor, and blue sheep. The trophy hunting program has evolved into a significant industry that benefits both individuals and local communities. Since 80% of trophy fees are allocated to the communities, the Parks & Wildlife Department conducts annual rut surveys to ensure that hunting quotas are based on the most recent population estimates of wild ungulates and to evaluate the effectiveness of ongoing conservation interventions (Singh & Milner-Gulland, 2011). Therefore, this survey was undertaken with the following objectives:

1. To document the current distribution of Himalayan ibex and blue sheep in Gilgit-Baltistan.
2. To estimate the number of trophy-sized animals available for the 2025–2026 trophy hunting season.
3. To apply Bayesian statistical methods to predict the estimated population of blue sheep and Himalayan ibex in Gilgit-Baltistan.
4. To document annual changes in the population trends of Himalayan ibex and blue sheep to inform optimal management strategies for their long-term conservation.



2. MATERIAL AND METHODS

2.1 Pre-Survey Training Sessions

As the annual wild ungulate surveys require a substantial number of surveyors, it is essential to ensure that all participants receive proper training prior to fieldwork. Each surveyor is trained in identifying wild ungulates by sex and age classes, including adult males, females, juveniles, yearlings, and trophy-sized individuals. In addition, to ensure data accuracy and consistency, surveyors are also trained in the use of Global Positioning System (GPS) devices, binoculars, spotting scopes, and, most importantly, in completing the field data collection form (Annexure I). These training sessions were facilitated by Dr. Hussain Ali, Senior Regional Program Manager at the Snow Leopard Foundation (SLF) (Figure 5).



Figure 5. Lecture session of pre-survey training.

2.2 Study Area

The survey was conducted in 63 Community-Controlled Hunting Areas (CCHA) and potential valleys for its future notification as CCHAs across Gilgit-Baltistan (Figure 6) from 15th December 2024 – 31st January 2025.

2.3 Double Observer Method

The Double Observer Method (DOM), grounded in the principles of mark-recapture, was employed in this study. Originally developed to estimate detection probabilities in aerial wildlife surveys (Caughley, 1977), the method was later refined by Magnusson *et al.* (1978) to account for

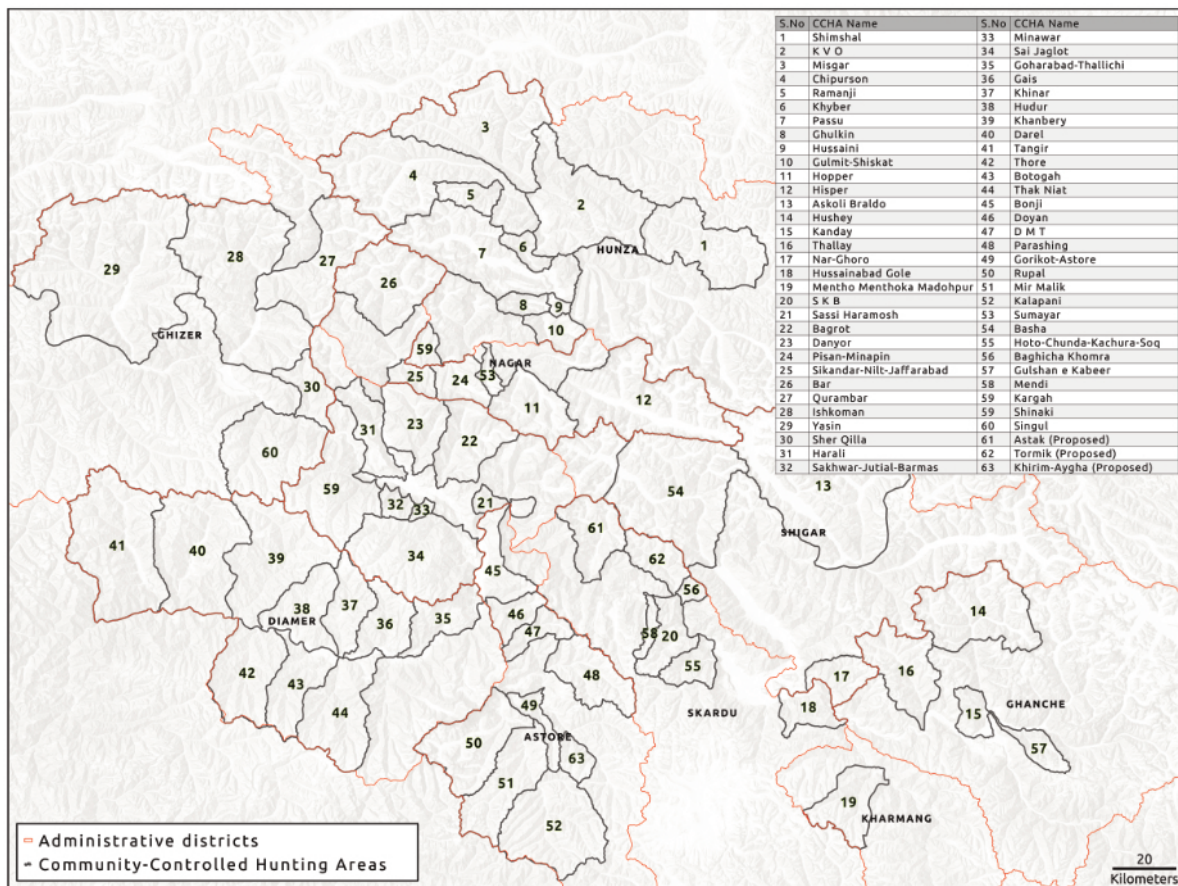


Figure 6. Community-Controlled Hunting Areas.

differences in detection rates between observers. Forsyth and Hickling (1997) were the first to apply the DOM to ground-based surveys, using it to estimate populations of Himalayan Thar in New Zealand.

The DOM involves two observers independently scanning and counting animals, either simultaneously from different vantage points or sequentially over time. Surveys are conducted within blocks that do not exceed the typical daily movement range of the target species or surveyors. These blocks are delineated using prominent physical features such as rivers or high ridgelines—that limit animal movement between blocks.

2.4 Delineation of Survey Blocks

Survey maps were created by subdividing each Community Controlled Hunting Area (CCHA) into smaller blocks ranging from 25 to 40 km² using ArcGIS Pro version 3.5.1 (Esri, Redlands, California, USA).

2.5 Scanning for Animals

Mountain ungulates are typically crepuscular in nature (Roberts, 1997; Schaller, 1977, 1980), so observations were conducted during dawn and dusk hours. Scanning was aided by spotting scopes (Swarovski 30×70) and binoculars (Nikon 10×50). When a herd was sighted, relevant information such as group size, type, demographic composition, location, and elevation was recorded on a standardized field data sheet. A Global Positioning System (GPS) device (e.g.,

Garmin 64S, 66S, or 66ST) was used to mark the observer's position, while the herd's location was noted and later delineated on the survey map.

2.6 Demographic Classification

The Capture-Recapture method can be accurately applied to wild ungulates only if the species is sexually dimorphic and individuals can be identified based on age classes (Suryawanshi *et al.*, 2012). Herds were classified using the demographic categories proposed by Schaller (1977), as outlined in (Table 1). The composition of each herd—female herds (females with young), male herds (males only), and mixed herds (males, females, and young)—was recorded to help distinguish between repeated and single captures. Additionally, the number of trophy-sized animals were recorded separately.

Table 1. Demographic classification proposed by Schaller (1977) for mountain ungulates.

Female Classification	Kids Classification		Males Classification				
Female < 2	Young < 1	Yearlings > 1 < 2	Class I (2 ^{1/2}) years	Class II (3 ^{1/2}) years	Class III (4 ^{1/2}) years	Class IV (5 ^{1/2}) years	Trophy Size

2.7 Topography of Herd Locations

To distinguish between herds observed by both observers, habitat features such as snow, bare rock, glacier, rangeland, shrubs, mixed forest, and slope orientation (north, south, east, or west)—were recorded. The behavior of the herd at the time of sighting (e.g., feeding, walking, running, or resting) was also documented to ensure that the animals remain visible long enough for accurate counting.

2.8 Post Survey Discussion

The total number of Himalayan ibex and blue sheep groups was estimated using a two-survey mark-recapture approach implemented in the “BBRecapture” package, which operates within a Bayesian framework in the R statistical programming environment (Fegatelli & Tardella, 2013) version 4.4.3, R Core Team, 2025.

Group size was analyzed following the methodology of (Ahmad *et al.*, 2022; Khanyari *et al.*, 2021; Suryawanshi *et al.*, 2012). Age-sex composition and sighting locations were used to determine whether each group was observed by one or both observers. Groups observed by both observers were coded as “11,” those seen only by the first observer as “10,” and those seen only by the second team as “01”.

The detections of the two observers were separately modelled using the “mt” model. To estimate the number of ibex and blue sheep groups ($\hat{G}$) in the study areas, using the “BBRecap” function with a uniform prior for each species. The “mt” model was selected because detection probabilities were expected to vary between the two observers (Suryawanshi *et al.*, 2012). The model was run for 10,000 MCMC iterations with a burn-in of 1,000 (Fegatelli & Tardella, 2013).



The "mt" model estimated detection probabilities for observers one and two across the survey occasions. To calculate the total population size (Nest) for each ungulate species, we multiplied the estimated number of groups ($\hat{G}$) by the estimated mean group size (μ). Confidence intervals for population estimates were derived by generating a distribution of mean group sizes through 10,000 resampling iterations with replacement.

This distribution was then combined with 10,000 random draws of estimated group numbers ($\hat{G}$), weighted by their posterior probabilities, to produce a distribution of total population estimates. The median of this distribution was taken as the estimated population (Nest), with the 2.5th and 97.5th percentiles serving as the 95% confidence intervals.

To estimate the 95% confidence intervals for the proportion of individuals in different age-sex classes (adult male, adult female, and young), we performed 10,000 bootstrap iterations using the herd as the sampling unit. Median values were reported as the estimates, and the 2.5th and 97.5th percentiles were used to define the confidence intervals.

Population densities were calculated by dividing the estimated abundance by the total surveyed area. This area was determined by summing the sizes of all survey blocks, which were delineated based on visible regions within each block using ArcGIS Pro version 3.5.1 by the survey team after fieldwork was completed.



Plate 6.A surveyor is scanning for Himalayan ibex during the survey.

3.RESULTS

3.1 Population of Himalayan Ibex

Using the Double Observer Survey Method, a total of 7,294 Himalayan ibex were counted in 57 CCHAs across Gilgit-Baltistan. The estimated population, predicted by the model at a 95% confidence interval (CI), is expected to range from 6,710 to 7,811. The ibex population is distributed across 323 herds (Figure 7) in Gilgit-Baltistan, with an average herd size of 22.58 and a range of 2 to 109 individuals per herd (Table 2). The largest ibex population is found in the district of Hunza, followed by Ghanche and Skardu (Table 3 and Figure 8), inhabiting different elevations ranging from 1,500 to 4,742 meters (Figure 9).

Table 2.Summary of Statistical Analysis for Himalayan ibex and Blue sheep.

Statistics	Himalayan ibex	Blue sheep
Number of CCHAs Surveyed	57	02
Detection Probability of Observer ONE	0.99	0.93
Detection Probability of Observer TWO	0.99	0.93
Observer ONE total	7,294	1,785
Groups Only Sighted by Observer ONE	0	9
Observer TWO total	7,294	1,785
Groups Only Sighted by Observer TWO	0	0
Groups Sighted by Both Observers	323	15
Total groups	323	15
Mean group size	22.58	119
Median group size	18	120
Group range	2 - 109	8 - 327
Counted population	7,294	1,785
Estimated population at +95% confidence interval	6,710 – 7,811	1,155 – 2,389
Percentage of male	37.93	47.67
Percentage of trophy hunting males within males	27.93	22.32
Percentage of mature males within males	19.72	26.33
Percentage of female	34.52	29.07
Percentage of young	16.36	14.62
Percentage of yearlings	11.17	8.62
Ratio (Male: Female)	1.10:1	1.63:1
Ratio (Female: Young)	2.11:1	1.98:1
Ratio (Young: Yearlings)	1.46:1	1.69:1
Ratio (Female: mature male)	1.74:1	1.10:1



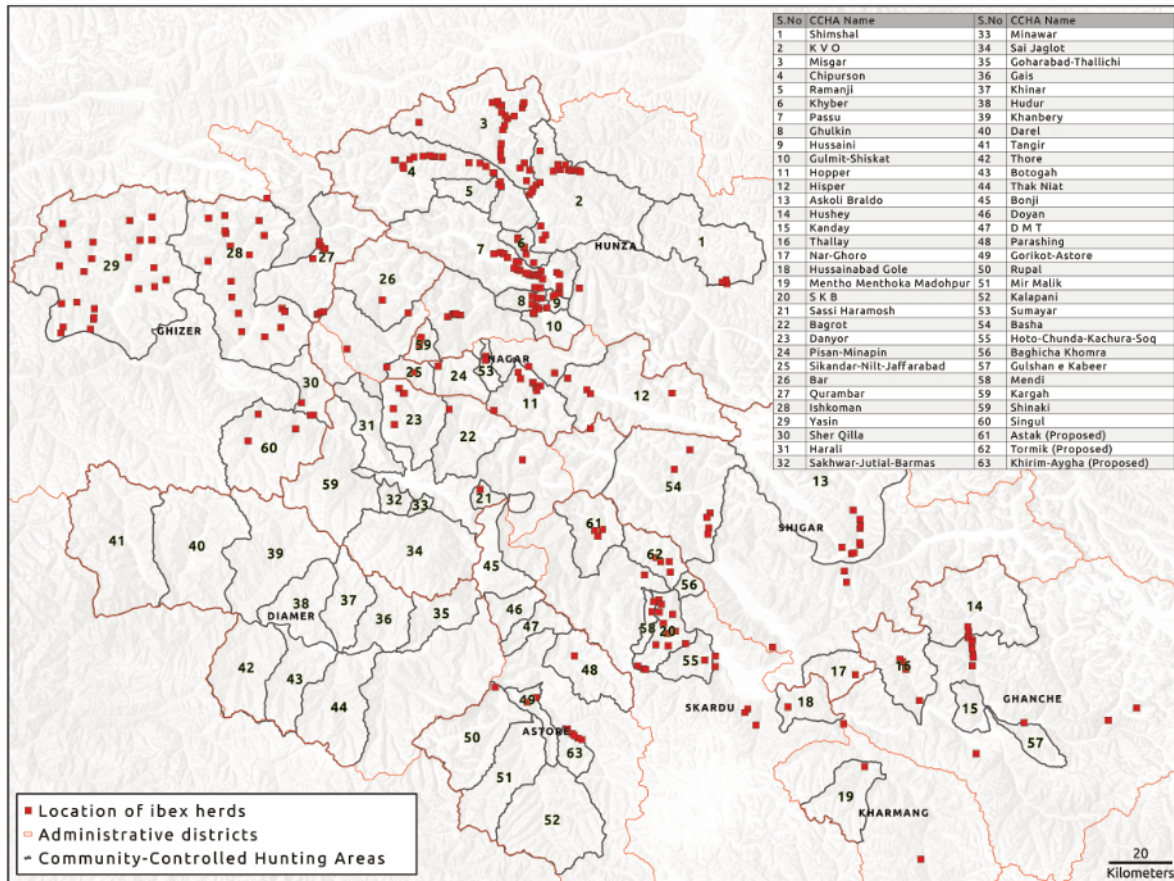


Figure 7. Location of Ibex herds across different CCHAs in Gilgit-Baltistan.



Plate 7. A herd of trophy sized Himalayan ibex.

Table 3. Population structure of Himalayan ibex in different CCHAs of ten districts.

District	CCHA	Female	Young	Yearling	Class 1	Class 2	Class 3	Class 4	Trophy	Total
Astore	Gorikot	14	12	11	2	1	0	9	5	54
	Khirim-Aygha	31	13	5	6	3	0	6	8	72
	Parishing	8	4	6	2	3	0	3	2	28
	Rupal	30	38	20	4	5	4	7	14	122
	District Total	83	67	42	14	12	4	25	29	276
Ghanche	Gulshan-e-Kabeer	79	21	13	8	12	11	13	23	180
	Hushey	144	97	88	10	15	14	25	69	462
	Khanday	58	49	31	2	6	3	10	27	186
	Thallay (Pro)	43	25	12	3	8	4	7	12	114
	District Total	324	192	144	23	41	32	55	131	942
Ghizer	Ishkoman	82	36	16	19	20	17	14	20	224
	Qurumbar	114	49	30	34	27	17	20	28	319
	Sher Qilla	6	2	1	5	0	2	1	0	17
	Singul	3	3	0	3	0	3	1	0	13
	Yaseen	37	13	20	23	24	5	2	8	132
	District Total	242	103	67	84	71	44	38	56	705
Gilgit	Bagrote	83	17	32	14	16	16	14	6	198
	Danyore	32	16	8	3	7	0	0	10	76
	Rahim Abad	5	3	4	0	0	0	0	4	16
	Sharote	4	3	0	3	2	1	0	0	13
	District Total	124	39	44	20	25	17	14	20	303
Hunza	Chipurson	114	61	32	11	18	20	24	14	294
	Ghulkin	53	25	20	15	18	22	24	18	195
	Gulmit	84	31	20	14	13	11	10	13	196
	Hussaini	62	38	13	14	11	14	20	26	198
	Khyber	89	43	27	16	19	16	22	17	249
	KVO	165	100	54	42	22	37	66	59	545
	Misgar	184	106	51	40	23	45	57	62	568
	Passu	181	70	31	13	27	31	52	41	446
	Raminji	66	36	14	9	7	8	8	10	158
	Shimshal	60	19	21	17	12	9	38	22	198
	Shinaki	8	6	2	1	1	5	11	10	44
	District Total	1,066	535	285	192	171	218	332	292	3,091



Himalayan ibex and blue sheep

in Gilgit-Baltistan, Pakistan

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District	CCHA	Female	Young	Yearling	Class 1	Class 2	Class 3	Class 4	Trophy	Total
Nagar	Bar	3	4	3	2	1	1	5	3	22
	Hisper	49	21	10	2	11	22	45	35	195
	Hopper	62	25	8	6	29	36	55	40	261
	Pisan-Manapin	2	0	0	0	2	1	2	1	8
	Sikanderabad-Jaffarabad-Nilt	3	0	2	1	1	2	3	2	14
	Sumayar	13	5	0	2	1	5	13	9	48
	District Total	132	55	23	13	45	67	123	90	548
Karmang	Girakh-Baghicha-Harghosil (Proposed)	7	4	2	3	3	2	2	5	28
	Hamzigond-Gavis-Kindrik (Proposed)	16	8	1	3	3	2	2	9	44
	Mantho-Manthokha-Madhupur	5	3	3	1	1	2	1	2	18
	District total	28	15	6	7	7	6	5	16	90
Shigar	Asqoli-Biafo-Dumurdo-Laskam	55	22	25	4	8	12	14	19	159
	Basha	149	31	57	18	20	14	12	22	323
	Niali (Proposed)	9	4	2	2	1	1	1	5	25
	District total	213	57	84	24	29	27	27	46	507
Skardu	Astak (Proposed)	12	2	8	3	4	3	4	2	38
	Baghicha-Khumra (Proposed)	27	13	10	11	14	4	6	10	95
	Basho	62	22	33	8	11	1	4	7	148
	Burgaye (Proposed)	6	3	1	0	1	0	2	3	16
	Hoto-Kachura-Chunda Soq	39	17	13	3	4	7	10	24	117
	Hussainabad Gole	2	1	1	1	1	1	0	0	7
	Mendi	17	10	5	2	4	1	2	7	48
	Nar Ghoru	11	2	2	2	2	2	2	3	26
	Sadpara (Proposed)	6	2	2	0	0	0	0	0	10
	Sermik (Proposed)	3	1	2	1	1	1	1	0	10
	SKB	96	47	36	6	15	1	8	29	238
	Tormik (Proposed)	25	11	7	5	8	7	8	8	79
	District total	306	131	120	42	65	28	47	93	832
GB	Grand Total	2,518	1,194	815	419	466	443	666	773	7,294



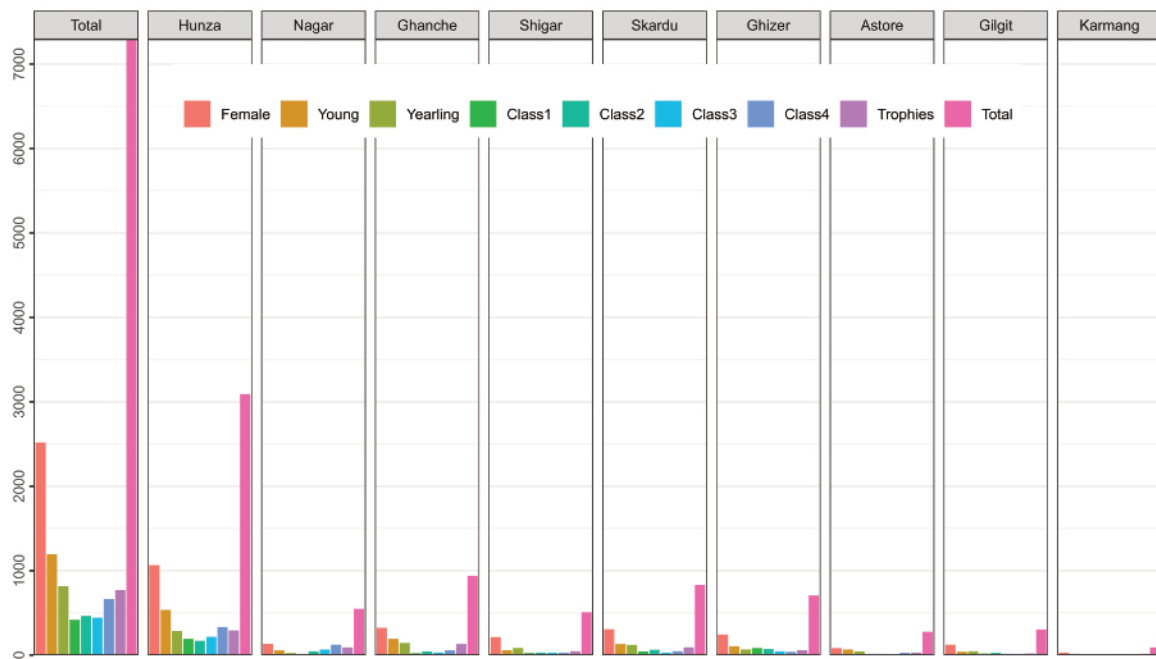


Figure 8. Population structure of Himalayan ibex in different CCHAs of ten districts.

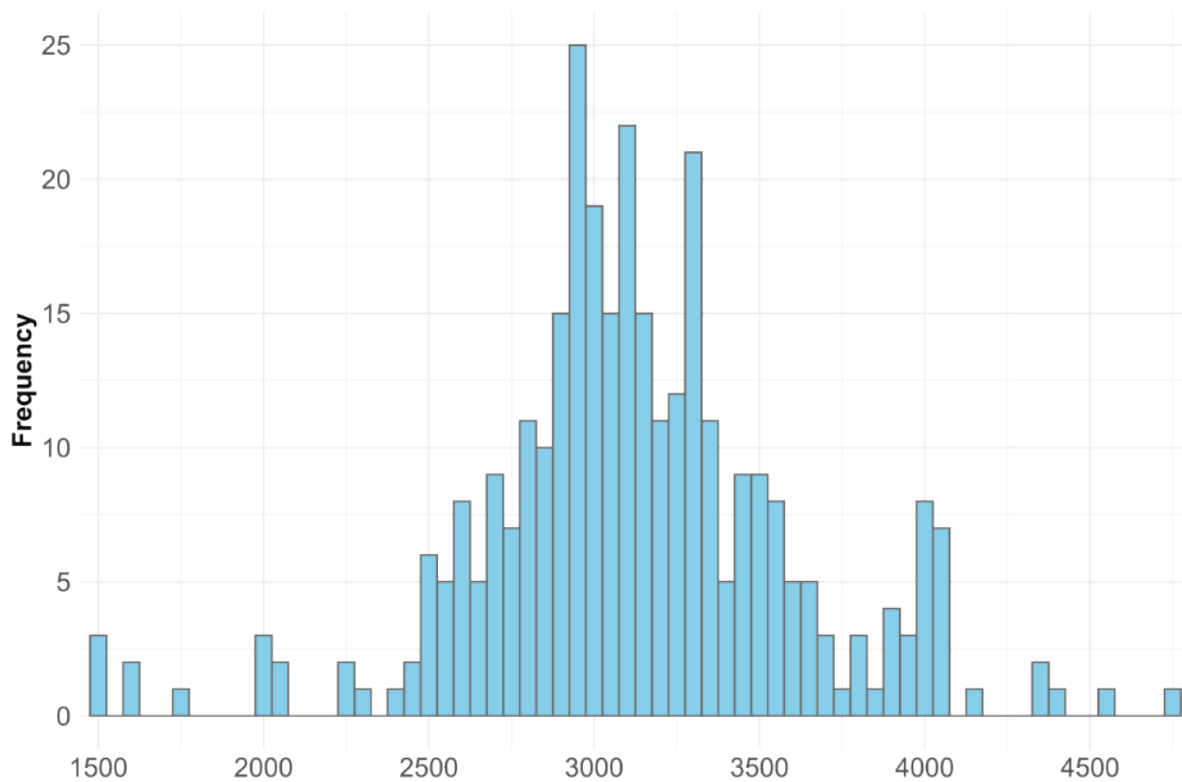


Figure 9. Elevational distribution of Himalayan ibex across different CCHAs.

3.2 Population of Blue Sheep

During the survey of blue sheep in two CCHAs, a total of 1,785 individuals were counted (Table 4 and Figure 10). The Bayesian statistical model predicted, with 95% confidence intervals, that the population of blue sheep might range between 1,155 and 2,389 (Table 2). The blue sheep were observed in 15 herds (Figure 11), with an average herd size of 119. In Shimshal CCHA, 1,692 blue sheep were counted, while in Sockterabad, 93 were recorded. These herds were sighted at varying elevations, ranging from 3,134 to 4,367 meters (Figure 12).

Table 4. Population structure of Blue sheep in different CCHAs.

District	CCHA	Female	Young	Yearling	Class 1	Class 2	Class 3	Class 4	Trophy	Total
Hunza	Shimshal	490	247	146	202	98	58	268	183	1,692
	Sockterabad	29	14	8	8	7	8	12	7	93
	District Total	519	261	152	210	105	66	280	190	1,785

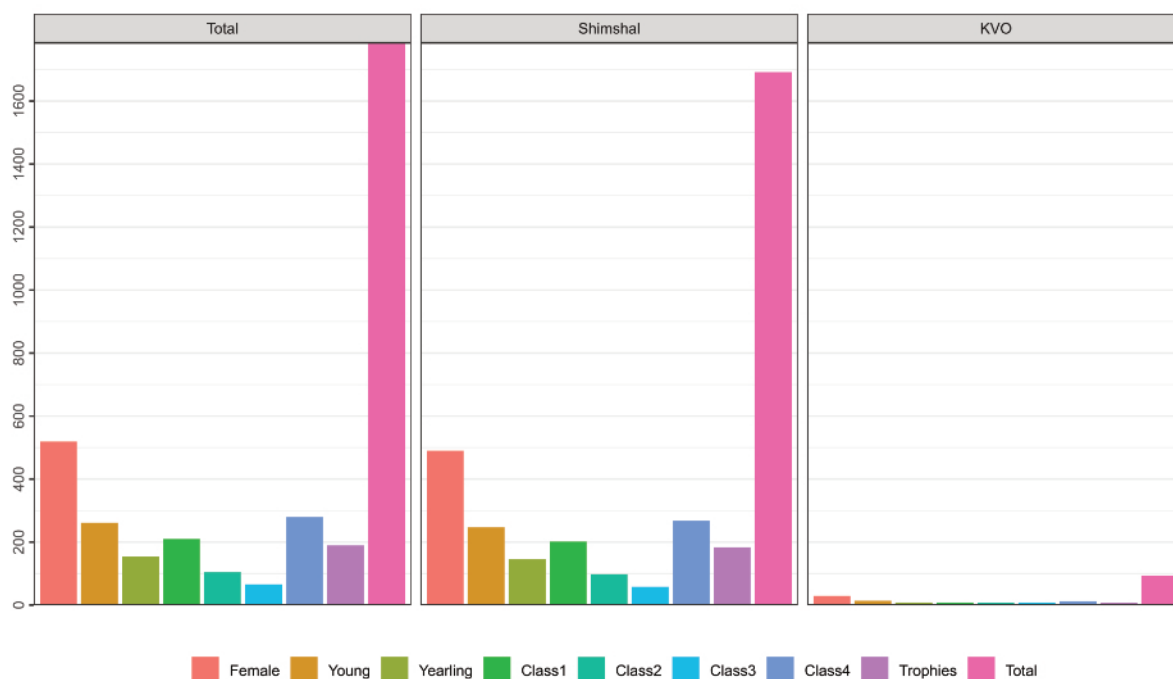


Figure 10. Population structure of blue sheep in two CCHAs.



Plate 8. Blue sheep herd in Gojal Valley, district Hunza.

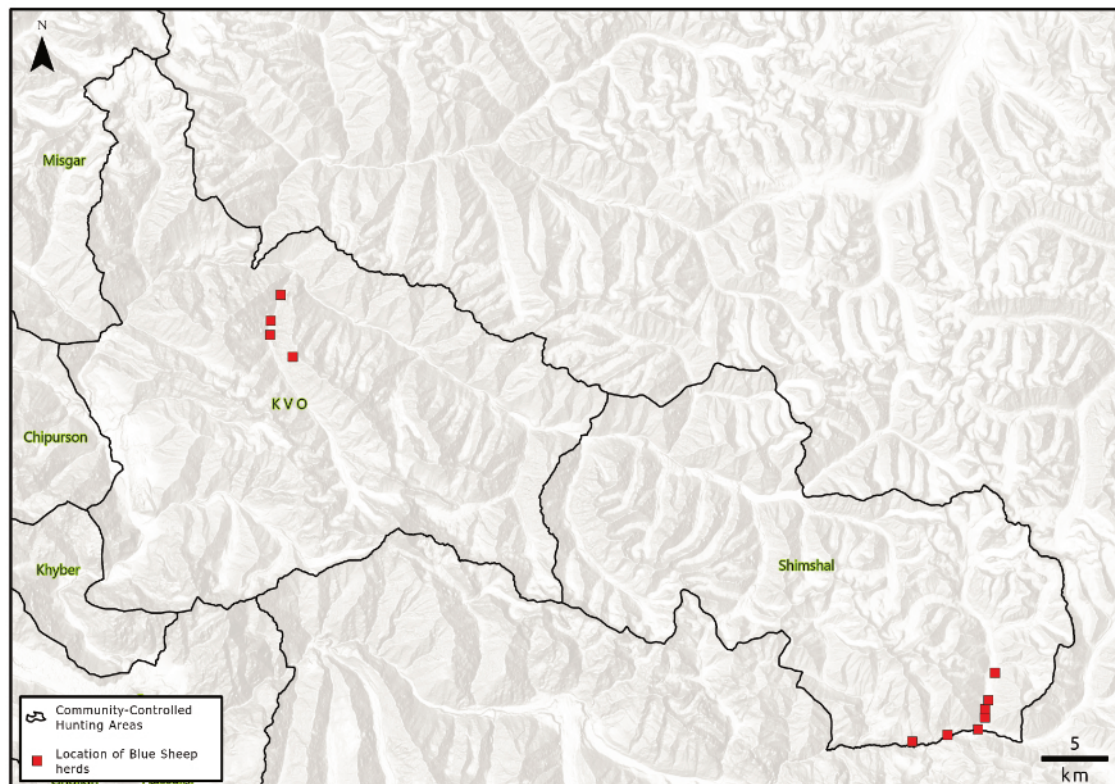


Figure 11. Location of Blue sheep herds in two CCHAs of district Hunza.

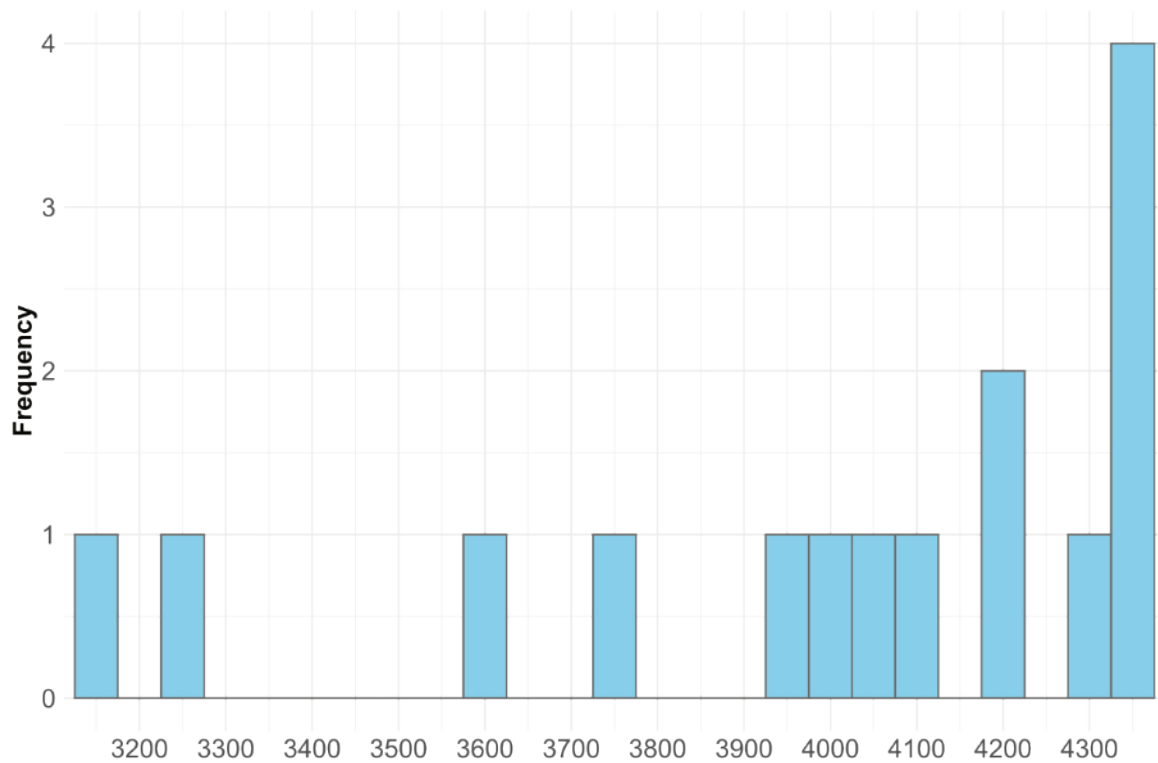


Figure 12. Elevational distribution of blue sheep across different CCHAs.

3.2 Population Density

3.2.1 Population Density of Himalayan Ibex

This study observed varying animal densities per square kilometer, ranging from 0.018 to 5.55. The highest density of ibex was recorded in Hussaini CCHA, where it reached 5.55 animals/km² (Figures 13 and 14).

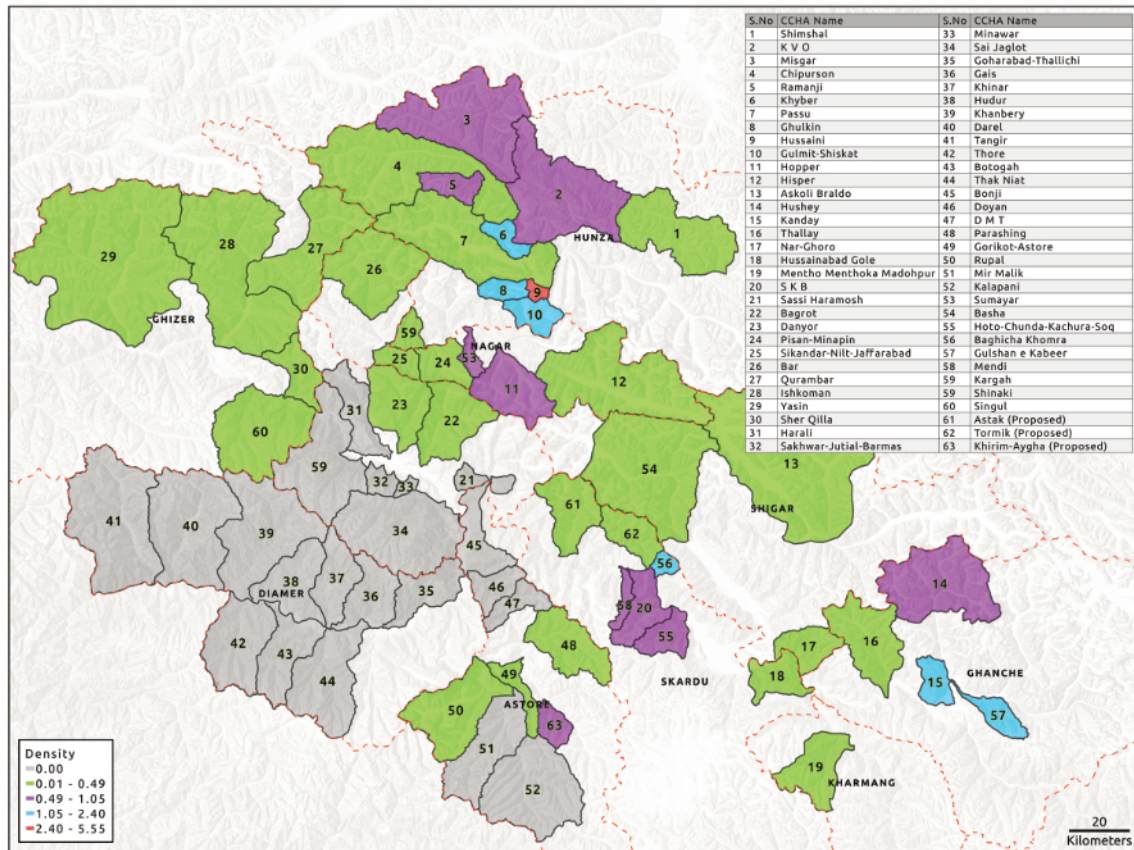


Figure 13. Population density of Himalayan ibex in different CCHAs.

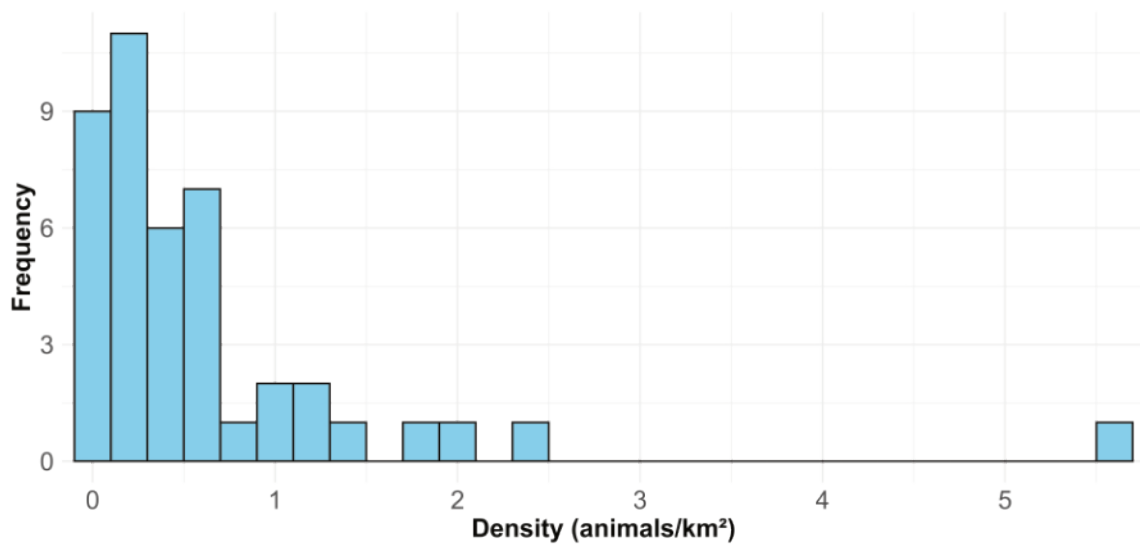


Figure 14. Histogram of density of ibex/km² in different CCHAs.

3.3.2 Population Density of Blue Sheep

The blue sheep density ranged from 1.10 to 2.55 animals per km², with the highest density (2.55 animals/km²) recorded in the Shimshal CCHA compared to Sockterabad, KVO, CCHA (Figure 15).

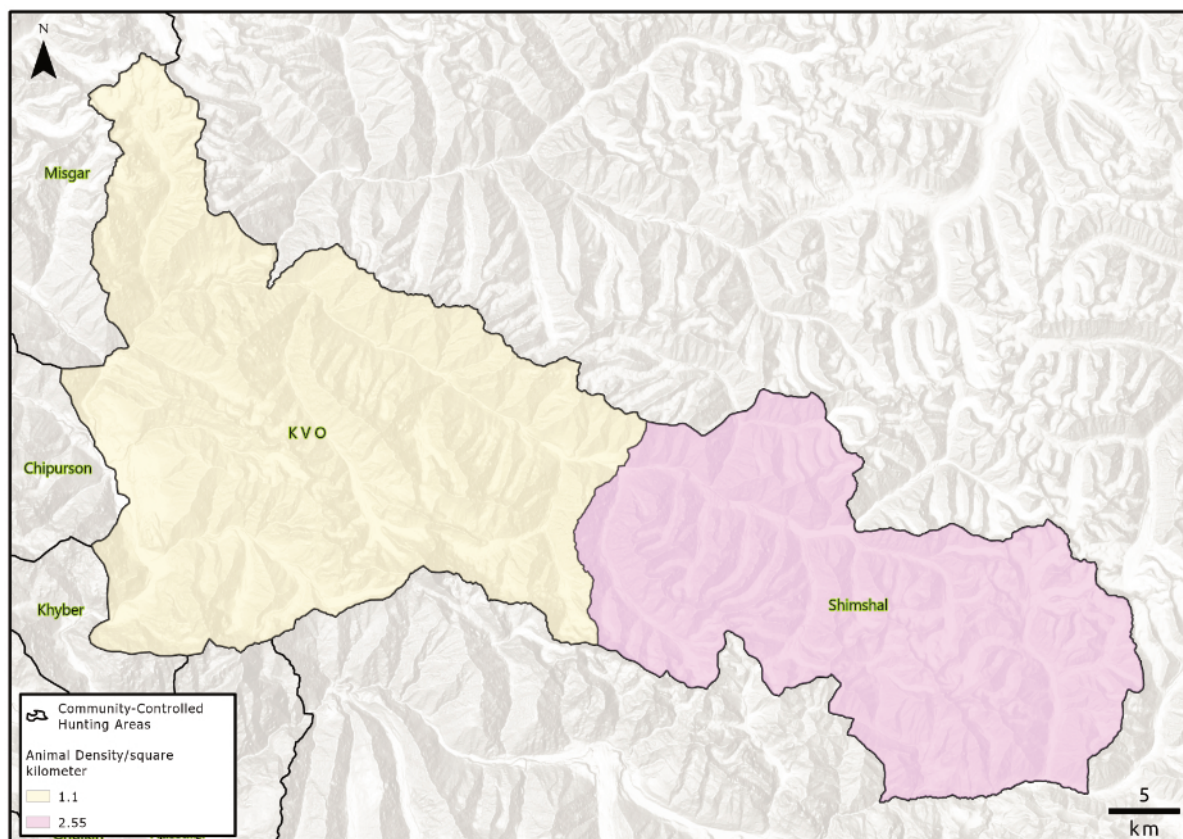


Figure 15. Population density of blue sheep in two CCHAs of district Hunza.

3.4 Population Trend

3.4.1 Population Trend of Himalayan Ibex

In this survey, the population of Himalayan ibex was the largest recorded since 2020. This year, 1,710 ibexes were added to the total population of Himalayan ibex in Gilgit-Baltistan (Figure 16). Changes were also recorded in the demographic structure of the Himalayan ibex population for the years 2023 and 2024 (Figure 17).

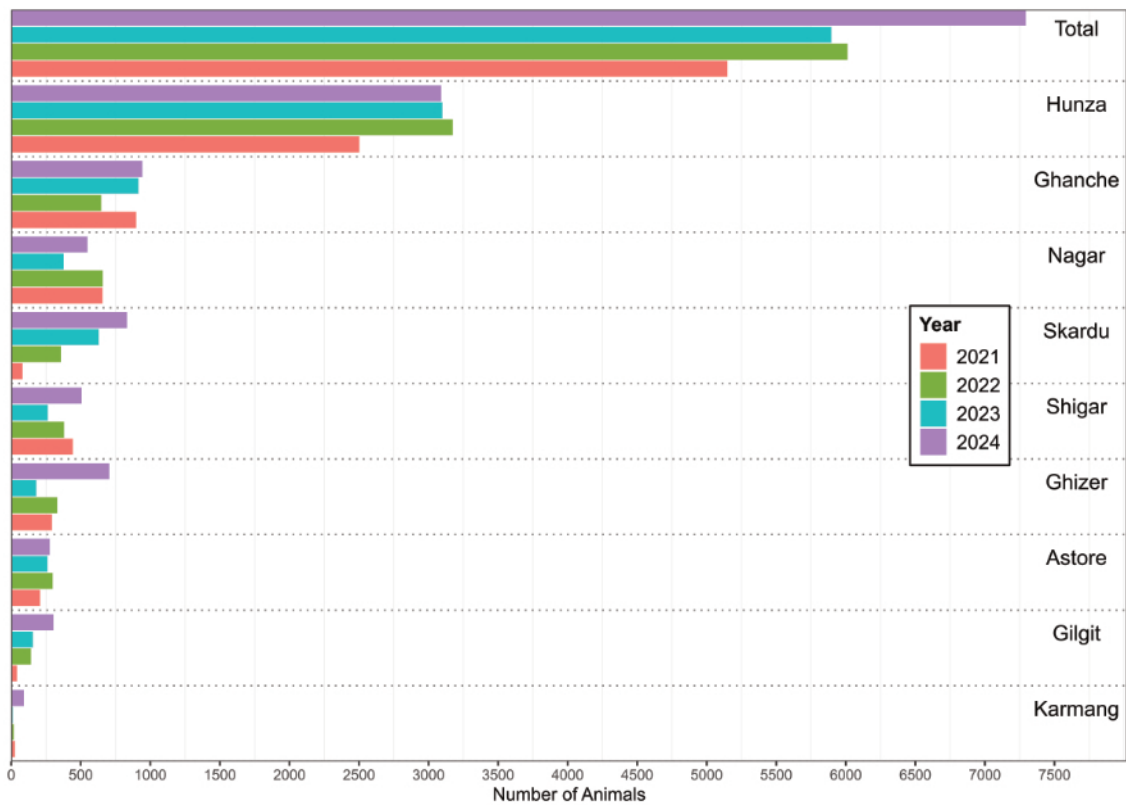


Figure 16. Trends in the population of the Himalayan ibex over four years.

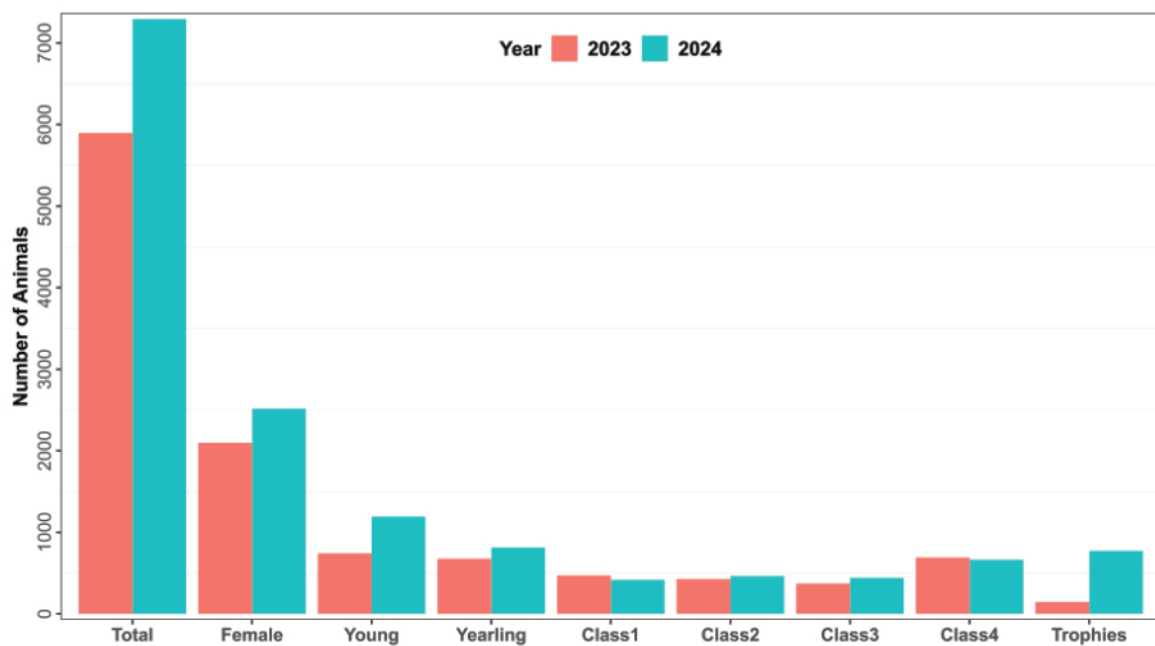


Figure 17. Changes in the demographic structure of ibex in 2023 and 2024.

3.4.2 Population Trend of Blue Sheep

This year, the highest population of blue sheep since 2022 was recorded (Figure 18), with an increase of approximately 463 individuals compared to the previous year (Figure 19).

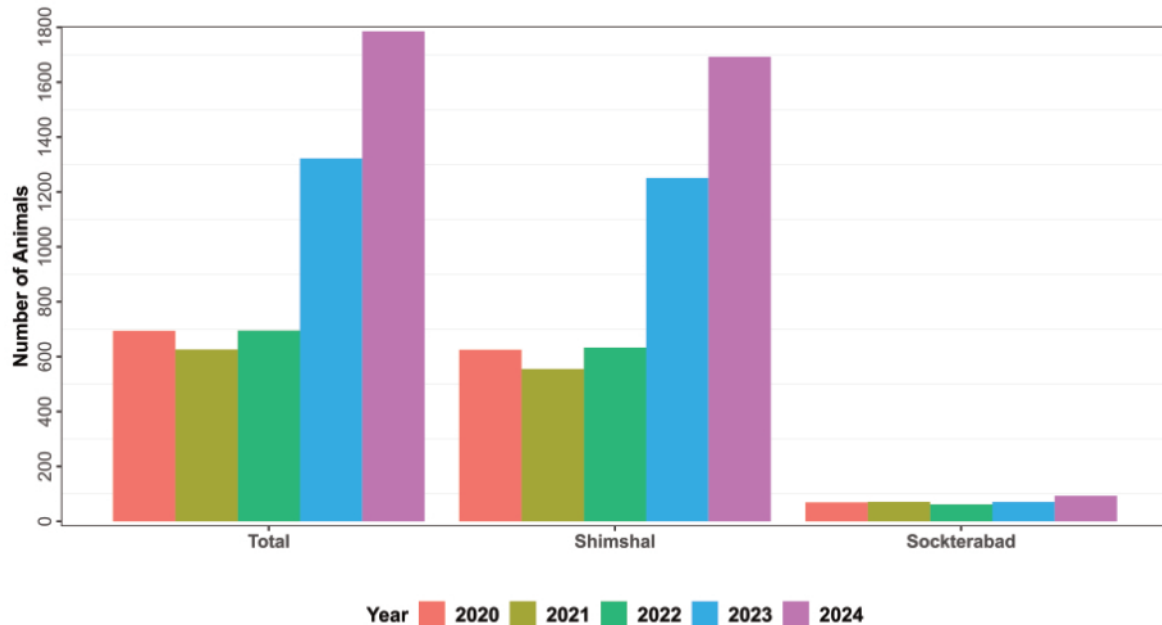


Figure 18. Trends in the population of the Blue Sheep over four years.

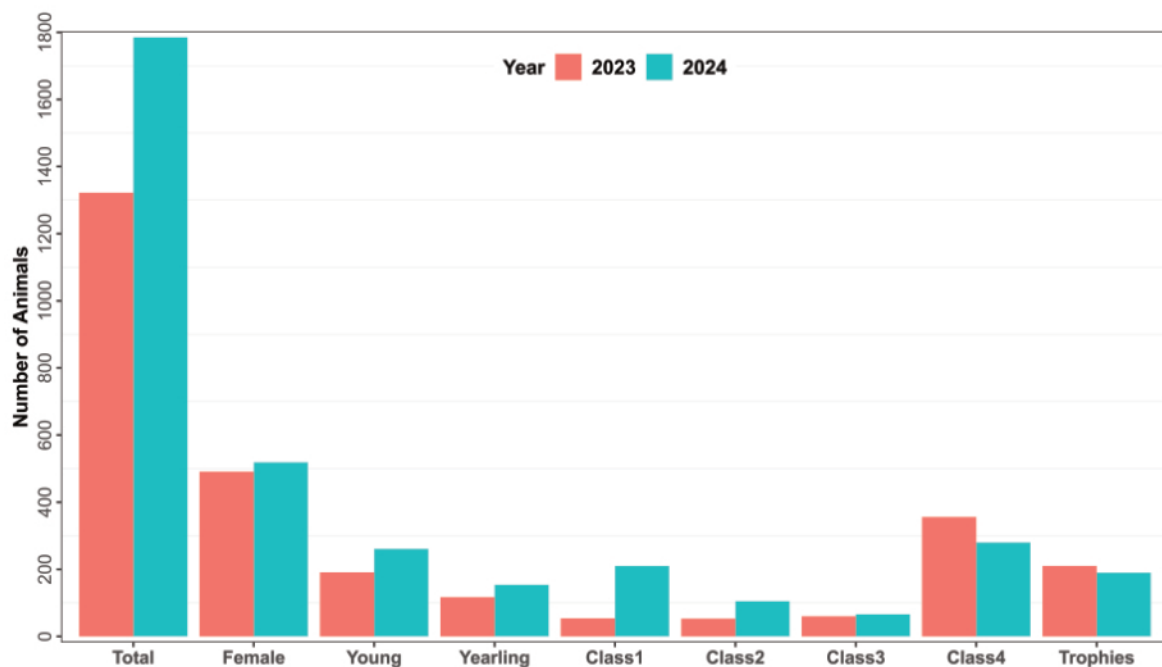


Figure 19. Changes in the demographic structure of the blue sheep in 2023 and 2024.

3.5 Number of Harvestable Animals for Year 2025-26

Based on the rule of harvesting 2% of the total population (i.e., 1,785 blue sheep), 36 trophy-sized animals can be harvested. However, if the rule allowing the harvest of 25% of trophy animals (190) is applied, then 48 blue sheep may be harvested during the 2025–2026 season.

Similarly, applying the 2% rule to the total Himalayan ibex population (i.e., 7,294) allows for the harvest of 146 trophy-sized animals. If the 25% trophy animal rule (773 individuals) is used instead, then 193 Himalayan ibexes may be harvested during the 2025–2026 trophy hunting season.



Plate 9. Blue sheep in their habitat.

4. DISCUSSION

Annual wildlife surveys are an important yearly event for most Wildlife and Parks Departments globally, helping them devise better management plans, allocate hunting or surplus quotas for the following year, and assess the effectiveness of conservation interventions or the benefits that local communities receive from wildlife conservation (Singh & Milner-Gulland, 2011).



Plate10. Golden marmot, an alpine species.

The Parks & Wildlife Department, Gilgit-Baltistan, has been conducting annual surveys for many years. Since 2020, it has been one of the few departments to publish annual survey reports based on robust fieldwork and statistical methods (Ali *et al.*, 2022).

These surveys are considered very important due to the growing global interest in Gilgit-Baltistan's trophy hunting program and the heavy dependence of local communities on natural resources (Mishra *et al.*, 2016).

These surveys are considered very important due to the growing global

interest in Gilgit-Baltistan's trophy hunting program and the heavy dependence of local communities on natural resources (Mishra *et al.*, 2016).

Using the Double Observer Survey Method, a total of 7,294 Himalayan ibexes were counted. This survey reports an increase of 1,710 in the total population of Himalayan ibex (Ali *et al.*, 2024). The current increase reflects not only a rise in the population compared to last year's survey in Community-Controlled Hunting Areas (CCHAs), but also the addition of approximately six new CCHAs this year, bringing the total to more than 63 than the 57 surveyed in the 2023–24 survey (Ali *et al.*, 2024). During the blue sheep survey, a total of 1,785 blue sheep were counted in the Shimshal and Sockterabad CCHAs an increase of approximately 430 from the 1,355 reported in the 2023–24 survey. (Ali *et al.*, 2022).

The estimated population of Himalayan ibex, at a 95% confidence interval, ranged from 6,710 to 7,811, while for blue sheep it ranged from 1,155 to 2,389. The observed male-to-female ratio for ibex was 1.10:1, and for blue sheep, it was 1.63:1. This ratio, especially in the Himalayan ibex population, is significantly lower than the ideal male-to-female ratio of 1:6 suggested by experts (Adhikari *et al.*, 2021; Zaman *et al.*, 2019).

Based on the standard method of harvesting 2% of the total population, 146 Himalayan ibex and 36 blue sheep can be harvested. Alternatively, if a 25% threshold of trophy-sized animals is used, 193 Himalayan ibex and 48 blue sheep can be harvested. This year, the number of ibex trophies has increased by 36 and blue sheep trophies by 10 under the 2% total population rule. Under the 25% trophy-sized threshold, ibex trophies have increased by 89, while blue sheep trophies have decreased by 4 (Ali *et al.*, 2024).

5. RECOMMENDATIONS

1. Annual surveys should continue using the double observer method, as over half of the Parks & Wildlife Department staff are now trained in its implementation.
2. The standardized data collection format developed for the double observer method is widely recognized by all stakeholders and should be adopted by all organizations to ensure uniform data collection.
3. Surveys are time- and season-sensitive. For instance, the rutting season for blue sheep and Himalayan ibex begins after the end of November, coinciding with the onset of snowfall. To complete surveys before snowfall, the Parks & Wildlife Department should procure additional GPS units, cameras, spotting scopes, and binoculars to deploy the maximum number of survey teams.
4. Game watchers should receive regular training in the latest survey techniques and equipment to ensure accurate and consistent data collection each year.
5. Trophy allocations should follow IUCN guidelines, which were agreed upon with local communities at the inception of the trophy hunting program specifically, those based on census data and population assessments.
6. All collected data should be entered into a centralized database and made publicly accessible to promote transparency and data sharing.
7. Resurveys covering at least five percent of the survey area should be conducted to validate the reliability of the data.
8. GPS tracks of survey nullahs and routes should be a mandatory requirement for processing field staff allowance payments.
9. A professional photographer should be included in survey teams to document the survey process, wildlife, and wild ungulates.



Plate 11. Himalayan ibex male and a young.

6. REFERENCES

- Adhikari, L., Khan, B., Joshi, S., Ruijun, L., Ali, G., Shah, G. M., Ismail, M., Bano, K., Ali, R., Khan, G., Pasakhala, B., & Ali, A. (2021). Community-based trophy hunting programs secure biodiversity and livelihoods: Learnings from Asia's high mountain communities and landscapes. *Environmental Challenges*, 4.
- Ahmad, S., Ali, H., Asif, M., Khan, T., Din, N., Rehman, E. U., Hameed, S., Din, J. U., & Nawaz, M. A. (2022). Spatial density pattern of Himalayan Ibex (*Capra sibirica*) in Pakistan. *Global Ecology and Conservation*, 39.
- Ali, H., Ali, M., & Abbas, S. (2024). Rut Season Survey Report 2023-2024: Himalayan ibex & blue sheep in Gilgit-Baltistan.
- Ali, H., Din, J. U., Bosso, L., Hameed, S., Kabir, M., Younas, M., & Nawaz, M. A. (2021). Expanding or shrinking? range shifts in wild ungulates under climate change in Pamir-Karakoram Mountains, Pakistan. *PLoS ONE*, 16(2).
- Ali, H., Din, N., & Haider, J. (2022). Rut Season Survey Report 2021-2022: Himalayan ibex & blue sheep in Gilgit-Baltistan.
- Caughley, G. (1977). Analysis of vertebrate populations. In *Analysis of vertebrate populations*. John Wiley and Sons.
- Fegatelli, D. A., & Tardella, L. (2013). Improved inference on capture recapture models with behavioral effects. *Statistical Methods and Applications*, 22(1), 45–66. <https://doi.org/10.1007/s10260-012-0221-4>
- Forsyth, D. M., & Hickling, G. J. (1997). An improved technique for indexing abundance of Himalayan thar. *New Zealand Journal of Ecology*, 21(1), 97–101. <http://www.jstor.org/stable/24054529>
- Haidar, A., Malik, A., Shafi, M., Khan, H., Shah, M., Khan, M., Ali, H., & Shafi, M. M. (2015). Socio-economic benefits of community-based trophy hunting programs. *Environmental Economics*, 6(1), 9–17. https://businessperspectives.org/images/pdf/applications/publishing/templates/article/assets/6400/ee_2015_01_Ali.pdf
- Harris, R. B. (2014). *Pseudois nayaur*. The IUCN Red List of Threatened Species.
- Khanyari, M., Zhumabai Uulu, K., Luecke, S., Mishra, C., & Suryawanshi, K. R. (2021). Understanding population baselines: Status of mountain ungulate populations in the Central Tien Shan Mountains, Kyrgyzstan. *Mammalia*, 85(1), 16–23. <https://doi.org/10.1515/mammalia-2020-0005>
- Magnusson, W. E., Caughley, G. J., & Grigg, G. C. (1978). A Double-Survey Estimate of Population Size from Incomplete Counts. *The Journal of Wildlife Management*, 42(1), 174–176.
- Mishra, C., Bhatnagar, Y. V., & Suryawanshi, K. R. (2016). Species Richness and Size Distribution of Large Herbivores in the Himalaya. In F. S. Ahrestani & M. Sankaran (Eds.), *The Ecology of Large Herbivores in South and Southeast Asia* (pp. 89–97). Springer Netherlands.
- Rasool, G. (1990). Population status of wildlife in Khunjerab National Park (Pakistan). *Tiger Paper*, 14(4), 25–28.
- Reading, R., Michel, S., Suryawanshi, K., & Bhatnagar, Y. V. (2020). *Capra sibirica*. The IUCN Red List of Threatened Species.



- Roberts, T. J. (1997). *The Mammals of Pakistan*. Oxford University Press.
- Schaller, G. B. (1977). *Mountain monarchs. Wild sheep and goats of the Himalaya*. University of Chicago Press.
- Schaller, G. B. (1980). *Stones of Silence Journeys in the Himalaya*. The Viking Press.
- Shackleton, D. M. (2001). A Review of Community-Based Trophy Hunting Programs in Pakistan. In Mountain Areas Conservancy Project. Mountain Areas Conservancy Project.
- Sheikh, K. M., & Molur, S. (2004). Status and red list of Pakistan's mammals, based on conservation assessment and management plan for mammals. In IUCN, Pakistan (Vol. 344). IUCN-Pakistan.
- Singh, N. J., & Milner-Gulland, E. J. (2011). Monitoring ungulates in Central Asia: Current constraints and future potential. *Oryx*, 45(1), 38–49.
- Suryawanshi, K., Bhatnagar, Y., & Mishra, C. (2012). Standardizing the double-observer survey method for estimating mountain ungulate prey of the endangered snow leopard. *Oecologia*, 169(3), 581–590.
- Zaman, S., Chaudary, J. A., Abbas, S., Ghaznavi, M., Essa, M., & Ali, A. (2019). Safeguarding Biodiversity Conservation through Sustainable Use in Gilgit-Baltistan: Guidelines for Streamlining the Community-Based Sustainable Trophy Hunting Programmed in Gilgit-Baltistan.





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