DISTRIBUTION AND CONSERVATION THREATS OF BHUTAN TAKIN

Wangchuck Centennial National Park
Department of Forests and Park Services
2016

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Report by
Wangchuck Centennial National Park
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Foreword

Wangchuck Centennial National Park covering an area of 4914 km2 in the north-central region of the country extends from cool broadleaf forest to alpine meadows, spanning an altitude range over 2500m to above 500m. The park is home to rich floral and faunal diversity comprising over 693 species of vascular plants, 43 mammals, 250 bird species and more than 156 species of butterflies. Among the mammal species, we have some iconic species which require adequate studies and research for conservation and protection.

The presence of Bhutan Takin (Budorcas whitei) was recorded in the park, the detail field study and research to get detail information had been long overdue. Therefore, this first field report with one time data collection is limited in scope to WCNP; however, it will be the baseline information on distribution and conservation threats.

This report is published with intention to share information not only to conservationists, but also to general to get overview of Takin conservation in WCNP and the country at large. I believe in strong coordination and partnership between general public, particularly people residing inside protected areas and the protected area management in getting better results from conservation programs.

With outmost sincerity and pleasure I am looking forward that this report will provide some information and guidance for further, planning and implementation of conservation program related to Takin. I further, assure that more detailed studies on the ecology, habitat use and migratory routes of Takin in WCNP will be carried out hereafter.

(Tshering Dhendup)
Chief Forestry Officer

Acknowledgement

The management of Wangchuck Centennial National Park would like to heartily thank Bhutan Trust Fund for Environmental Conservation (HANAS) for generous financial support in conducting this field study. The efforts and commitments of staff working with three range offices under WCNP during the field data collection has played vital role in success of this study. The management appreciates and recognizes the effort of all and would like sincerely thank everyone for their hard work and commitments.

The contribution and support from all the section heads and staff stationed at park headquarter were remarkable and management would like to thank all for their support and valuable contributions. The management would like to specifically acknowledge IDMS and CDEES section heads for their efforts in coordination of the study from planning, data and compilation of this study report.

Lastly our sincere thanks go to all the respondents and local residents who assisted our field staff during the survey, your support and cooperation has meant a lot in successful completion of this field study.

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1. Introduction

Bhutan's forest is a home to so many flora and fauna diversity owing to its varied forest types and this is further backed by the article 5 of the constitution of the country which states to maintain 60% of its geographical area in forest cover for all times to come. Environmental Conservation is one of the pillars of GNH; country's development philosophy. As a developing country, conservation of environment and floral and faunal diversity is given priority over other development activities. Since the inception of developmental plans in the country, protection of forest and wildlife was considered a priority by our farsighted leaders and implemented several programs in protection and conservation of natural resources and wildlife. Establishment of national parks, wildlife sanctuaries and strict nature reserves in the country to protect important wildlife and plant species has played significant role in environment conservation front. Bhutan is known for rich biodiversity and received several internationals awards for its conservation affords. Over the years government has established ten protected areas and biological corridors connecting the protected areas. Among the ten protected areas Wangchuck Centennial National Parks (WCNP) is the largest and most recently established national park.

The Wangchuck Centennial National Park was established in 2008 and covers an area of 4914 sq. km. in north central region of the country and has recorded a number of wild animals, plants and birds. The biodiversity survey conducted during the establishment and formulation of management plan has recorded the presence of several iconic wildlife species including Tiger (Panthera tigris), Snow Leopard (Panthera uncia), Tibetan Wolf (Canis lupus), Asiatic Black Bear (Ursus thibetanus), Red Panda (Ailurus fulgens) and Bhutan Takin (Budorcas whitei). The presence of iconic wildlife species reflects the

richness of biodiversity and habitat types through varying forest types and altitudinal range from 2500 m.a.s.l. to more than 5000 m.a.s.l.

The biodiversity survey reported the presence of Bhutan Takin in WCNP, however, proper habitat and locations of the animals are important for the management to target interventions and protect this flagship species. Over the years no specific programs were implemented to properly record the presence and the conservation threats to the species. Knowledge of park residence about the iconic wildlife species might play equal role of park in protection and conservation, therefore, understanding local knowledge and filling the information and knowledge gaps are crucial for local people to take part in conservation.

The provision to conduct field study on big mammals within WCNP was included in the program through financial support from HANAS project (Enhance park biodiversity database for informed decision). WCNP has already carried out research on other species with the aim of achieving goals on the conservation of wildlife and to keep records of reliable data for future reference. WCNP lack information on Bhutan Takin, mainly on the places and habitat type and conservations threats within the park, in light of this it was decided to conduct field survey on the distribution, habitat type and conservation threats of Bhutan Takin. It is aimed at aiding the management in decision making and planning future activities; protection of the species and habitats.

2. Literature review

The Bhutan Takin Budorcas taxicolor whitei, fall under Order: Artiodactyla, Family: Bovidae, Subfamily: Caprinae, Genus: Budorcas, Species: taxicolor and the subspecies: whitei(Sharma et al. 2015). According to Neas and Hoffmann (1987), as stated in (Wangchuk et al. 2015)the Takin (Budorcas taxicolor) are of four subspecies: Mishmi Takin (B. t. taxicolor), Bhutan Takin (B. t. whitei), Shichuan Takin (B. t. tibetana) and Shaanxi or Golden Takin (B. t. bedfordi) which are listed as rare and vulnerable. However, four subspecies are now considered as a full species (Sangay et al. 2016).

The four species of Budorcas taxicolor area threatened bovid native to the temperate and subtropical forests in eastern Asia and are primarily distributed in Bhutan, China, northeastern India, and northern Myanmar (Sangay et al. 2016). The Golden Takin B. bedfordi and the Sichuan Takin B. tibetana are both confined to China. Budorcas bedfordi is distributed along southern Shaanxi while B. tibetana is distributed southerly from the Sichuan-Gansu provincial border to the border with Yunnan Province. The Mishmi Takin B. taxicolor ranges from southeast Tibet to the north-western Yunnan in China, with the central part of its range occurring in Arunachal Pradesh and northern Myanmar and the Bhutan Takin B. whitei is mostly found in Bhutan. (Sharma et al. 2015)

As per Wangchuk (1999) in BhutanBudorcas whiteiis distributed in the upper catchments of the Pho Chhu, Mo Chhu, Mangde Chhu and Kuri chhu rivers and most of these catchment areas fall under Wangchuck Centennial National Park, the largest protected area in the country. The Highest elevation at which the Takin is reported in Bhutan is 4200m.a.s.l and they move to higher elevation in summer to feed on grassy and shrubby patches near the tree line or alpine meadows, and

in winter to mixed bamboo-rhododendron thickets at lower elevations, or even lower to evergreen forests (Sharma et al. 2015). From the study conducted by Wangchuk et al (2015), has identified six vegetation types, namely Alpine meadow, Alpine scrub, Birch forest, Fir forest, Juniper forest and Willow shrub as major habitats.

In Bhutan the Bhutan Takin is listed under Schedule I of Forest and Nature Conservation Rules (Wangchuk et al. 2015) and on international front Takins are listed as vulnerable in IUCN Red list of threatened species (Sangay et al. 2016). According to Sharma et al. (2015), the migratory routes and habitats of this animal are expected to undergo fragmentation and degradation. Takin are also vulnerable to natural predators like tigers, leopards, wild dogs and black bears, both in Bhutan and other countries. Besides, natural predators (Wangchuk et al. 2015) categorized grazing competition from domestic animals and habitat and migratory routes fragmentations as conservation threats.

3. Methods

One workshop among the field staff was conducted as first step for the survey for choice of species and gather field knowledge requirement from field staff. From the workshop it was consented to focus on study of Bhutan Takin, which is found in the park, but lack adequate information on its distribution, habitat use and conservation threats. The topic for the study was phrased as Distribution, habitat type and conservation threats of Bhutan Takin in WCNP during the workshop.

Upon finalization of the topic for the proposed survey, the objectives were deliberated and commonly consented objectives as stated above. The methodologies were deliberated for identification of potential habitat areas and field survey. The survey mainly focused on preparation of potential habitat map, field data collection for presence of Bhutan Takin and questionnaire interview with park residents. The methodologies used for this survey are as elaborated here under specific topics and the simple analysis of data was done using SPSS 16.

3.1 Potential habitat

For preparation of potential habitat of Bhutan Takin in Wangchuck Centennial National Park, elevation and land use types were considered as two major parameters.The distribution range of Bhutan Takin extends from elevation 1500 to 4500 m.a.s.l and away from human settlement(Sharma et al. 2015). Taking the elevation range, the digital elevation model of WCNP was extracted from digital elevation model (DEM)of Bhutan and reclassified as required. The secondary data on land use and settlements were used from national data and further clipped and extracted to suit and ease the process.

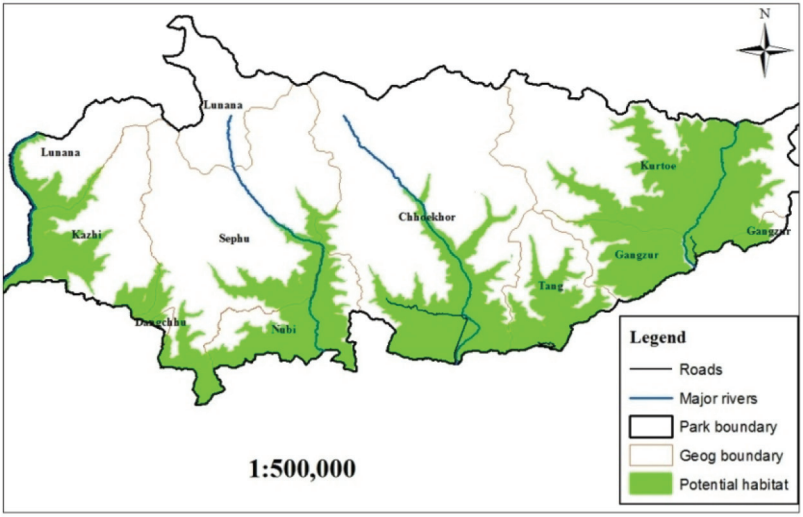


Figure 4: Respondent's knowledge on Takin

After reclassification elevation to 1500m to 4500 meters, the agricultural land and human settlement areas falling within that altitude range was excluded and the potential habitat map in WCNP was prepared (Figure.1).

The potential habitat covers an area of 1579.40 square kilometers which is roughly 32% ofthe park. Western and Eastern range has maximum potential habitat with 566.28km2 and 586.52 km2 respectively and Central range has 426.60 km2.

3.2 Field survey

The field data collection on evidences was finalized to be conducted in 4x4km grid. The grid was overlaid on potential habitat, which sums up to 133 grids to cover whole potential area. Based on field experiences, limited financial resources and man power, it was decided to conduct survey through sampling. The sampling intensity of 30% was taken as the minimum requirement(Mills et al. 2013). For the survey 17 grids in central range, 13 grids in eastern range and 10 grids in western range was selected which makes up to 40 grids spread across the Takin

potential habitat areas (Figure 2). The selection of grid was mainly based on the field experience and the past evidence of Takin presence and further the accessibility issues. For the data collection from the identified grids, transect length of 2000 meters was taken within the grid and circular plot of 10m radius at an interval of 500m to record the evidences and vegetation types(Singh, 2005). Further, any evidences along transects were recorded to capture every possible evidences outside plots and the plots layout along the transect as in figure 3.

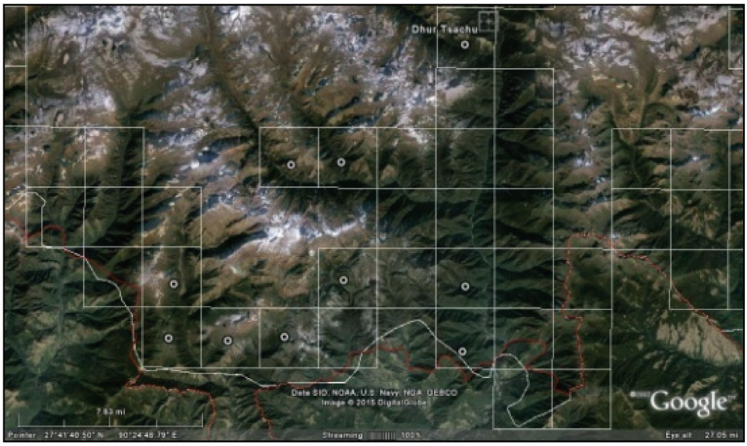


Figure 2: Random selection of grids for field data collection

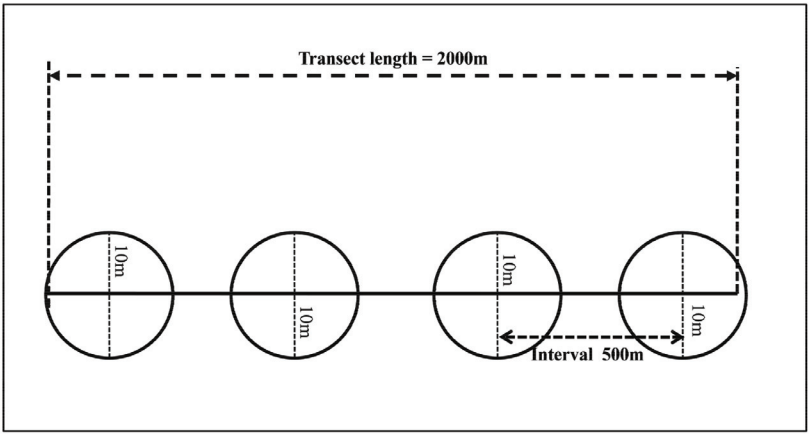


Figure 3: Plot layout along transects

3.3 Questionnaire survey

To capture local knowledge and experience to add on the field data and understand perception of park residents on the presence and status of Takin in WCNP, set of questionnaire was developed.

The questionnaire was administered randomly to the people residing nearby or inside potential habitat of Bhutan Takin. In total 64 people were interviewed from four geogs and the number of respondents was based on the settlements residing within or in vicinity of potential habitat areas in each geog. In the Chhokhor geog, Bumthang the questionnaire was administered to 35 respondents, nine respondents in Kurtoed geog, Lhuentse, 18 respondents under Sephu geog, Wangdue Phodrang and two respondents from Nubi geog, Trongsa Dzongkhag.

4. Result and discussion

4.1 General perception of park residence

The total of 64 people from four geogs was interviewed during the survey to get general information and people's knowledge and perception on the conservation of Bhutan Takin. Majority of the respondents were aware of presence of Takin in their region and its significance in the country. More than 96% (n= 64) of respondents from four geogs knew Takin and its importance in the country and only two respondents from Kurtoed geog were unaware of Bhutan Takin as represented in figure 4. This reveals that the majority of park residents are fully aware of the national animal; however, there is need for the management to create awareness to selected areas to educate local residents.

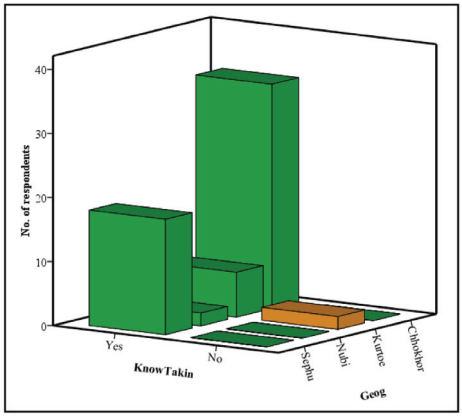


Figure 4: Respondent's knowledge on Takin

4.2 Population trend

Takin are poorly studied and there are no reliable estimates of their global population size and approximate global population is 7,000 to 12,000 across the range of four species; while the best estimate of the Bhutan Takin population size in Bhutan is 500–700 animals (Sharma et al. 2015). Wangchuck Centennial National Park covers most of the areas in north-central part of the country and those areas host most of the Takin migratory routes and habitats.

The conservation interventions targeted to specific species or ecosystem could be while defined if adequate information is available.

To gather the perception of park resident's on the population trend of Bhutan Takin, respondents were asked whether the population is increasing, decreasing or remaining stable in their locality.

Based on the information from respondents on population trend, it indicates that the population is on increasing trend with 40.62 percent of the respondents stating increase and 21.88 percent indicated the stable population. While 31.25 percent of the respondents really did not bother on population trend and did not have idea where as 6.25 percent of the respondents claimed that there is declining trend population in last five years (fig. 5).

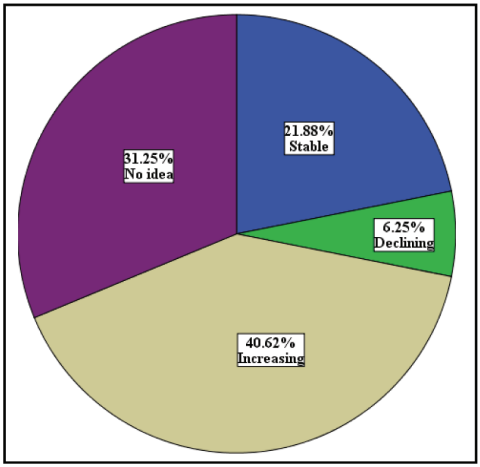


Figure 5: People's perception on population trend

Though understanding population dynamics and trend of animals in different locations within the park is crucial for strategic conservation, this particular survey resultsonly represent the perception of people and does not necessarily reveal actual scenario, however, as local people has fare knowledge on area adjacent to their settlements. During the field survey one group of Takin (11 individuals) was sighted by the team in Situzampa area, Sephu at an elevation of 4673 m.a.s.l in the month of June, however, in most cases during this survey the presence was recorded through indirect signs. Detailed survey on the population, summary and winter habitats used and migratory routes within the park may be prioritized as most of studies conducted in the past report

the presence but does not report areas of winter and summer residence in WCNP.

4.3 Distribution and habitat types

The Takin is generally restricted to specific habitats throughout its distribution range and occurs in three separate areas in the west-centralregion of China and along the eastern Himalaya (Sharma et al. 2015). The Bhutan Takin is restricted to the uppercatchments of the Pho Chhu, Mo Chhu, Mangdi Chhu and Kuri Chu which are part of Jigme Dorji National Park (JDNP) and Wangchuck Centennial National Park. WCNP represents one of the best examples of the middle Himalayan ecosystems and contains several ecological biomes ranging from temperate broadleaf forest to dry permanent snow and ice. It can be divided into temperate, sub-alpine alpine zones with six different habitat types (DoFPS, 2015).

The habitat of Takin ranged from 1500m to 4500m (Sharma et al. 2015), however, Sangay et al (2015) reported the habitat range from 700m to as high as 5,550m in JDNP. The Takin is a socially aggregating generalist herbivore that migrates to sub-tropical forests in winter to alpine regions in summer. In the winter Takin migrate to lower altitude in broadleaf forest and in summer in alpine areas.

The compilation of data on presence of Takin based on the evidences show the presence in Melo chuga, Situzompa, Tshachhu gom, Kikhorthang, and Thamchey areas in the Western Range. Western Range covers Sephu, Kazhi and Dangchu geogs under Wangdue Phodrang, Lunana of Gasa and upper part of Nubi geog of Trongsa dzongkhag. A group of Takin was sighted in Situzompa area at an altitude of 4717m in alpine scree. Out of 52 plots in 13 grids the evidences were encountered seven plots only. The survey could not be conducted in Mangdiphu area due to accessibility problem as it was already summer. Mangdiphu is known to be habitat of Takin and there were encounter and pictures captured in the previous year during the field visit of staff (fig. 6).

a. Takin Captured in Mangdiphu (**Trongsa**) area in 2015

b.Takin Captured in Pasamlung (Lhuentsi) area, 2014

Figure 6: Takin captured in Camera trap in Mangdiphu and Pasamlung area

In the Central which cover Chhokhor and Tang geogs of Bumthang dzongkhag, evidences were mostly encountered in Kuphu, Murthi, Lungula, Bumchen, Jangsa nipa, Kerab, and Tang top areas mostly in Fir forest, mixed conifer forest and alpine meadows. The evidences were encountered in 14 plots out of 68 plots spread across 17 grids. Eastern Range located at Dungkar, Lhuentse covering Kurtoed geog and part of Gangzur geog has recorded only three sites, namely, Ney Tshachhu where team sighted 3 animals at 3012m in cool broadleaf forest Yonten Kuenjung area. Total of 40 plots were surveyed in 10 grids and evidences were found in three plots in two locations. The distribution of Takin within WCNP based on the evidences collected during the survey is shown in figure 7.

Figure 7: Google image showing points of Takin evidences

The evidences of Takin were recorded from different forest types and majority was recorded in Fir forest (33.33%) followed by Mixed conifer (29.17%), Meadows (16.67%), Cool broadleaf forest (12.50%) and rivers and scree with 4.17% each (fig.8). The survey was conducted in summer which is time for Takin to migrate to higher altitudes. The time of the survey might have attributed to presence of evidences in lower elevation as Takin is seasonal migratory animal. Generally Takin dwell mostly in cool broadleaf forest during winter and in alpine meadows during summer (Sangay et al. 2015)

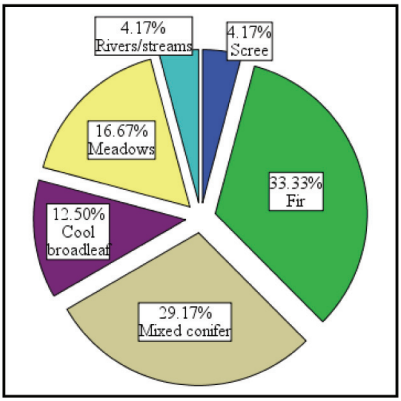


Figure 8: Percent of evidences recorded in different forest types

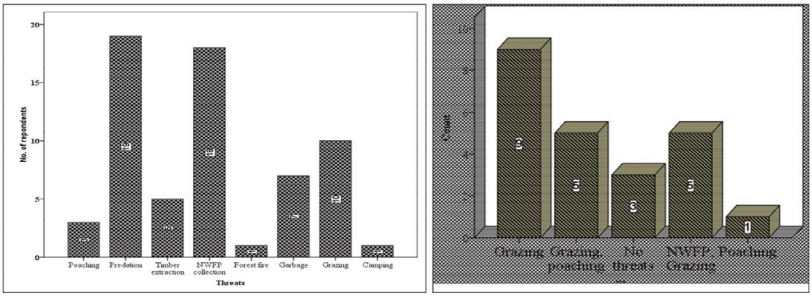
4.4 Conservation threats

Across the Takin range areas habitat loss and disturbance, hunting, and grazing competition are considered common threats in conservation (Wang et al. 1997). Similarly, in Bhutan, grazing competition and disease transmission from domestic livestock, habitat loss, and disruption of migration routes are posing threat (Tshewang R. Wangchuk, 2015). Sangay (2015) reported loss of habitat, disruption of migratory routes and defragmentation of winter habitats due to construction of developmental infrastructure as conservation threats in JDNP.

To get comprehensive list of threats within WCNP data collection was carried out in questionnaire and field data collection from the plots. Survey focused on threat categories like NWFP collection, predation, timber collection, poaching, and forest fire, garbage, camping and grazing.

In general, data from social questionnaire revealed that the predation

by natural prey and NWFP collection followed by grazing competition with domestic animals are major threats to Takin. Similarly data collected from field during the survey along the transect show that grazing, particularly grazing competition and collection of NWFP are threats mostly in alpine areas. The grazing competition may be attributed to Yak grazing in summer habitats as well as migration routes during winter as reported in study carried out by Wangchuk et al. (2015). Figure 9 show the graphic representation of threats from perception of park residence and the evidences collected from field.

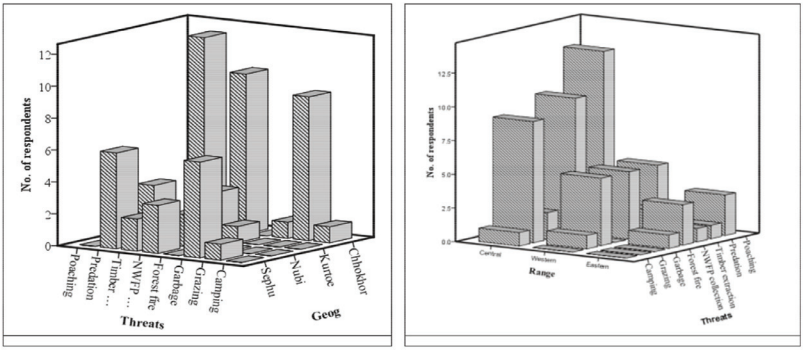


a. Threat assessment based on respondents perception

b. Threat assessment based on field data

Figure 9: Threat assessment based on field data and respondents perception

Assessment of threats in perspective of geogs, majority of the respondents from Chhokhor geog viewed predation as major one followed by NWFP collection and grazing competition, while respondents from Sephu geog also identified predation as main followed by garbage. The garbage might be a cause of concern in these two geogs as hundreds of people move in Takin habitats during summer for collection of Cordyceps sinensis and have most commonly used trekking routes. On other hand Nubi and Kurtoed geogs considers predation and garbage as potential threats (fig. 10a)



a. Threat assessment based on respondents perception

b. Threat assessment based on field data

Figure 10: Threat assessment based on individual geogs and Range

The assessment of threats at range level based on the data collected during survey indicates similar across three range jurisdiction. In the Eastern range few evidences of predation and forest fire were recorded along transect, while evidences of grazing, garbage, NWFP collection and predation were recorded. In the Central range grazing, garbage, NWFP collection and predation were recorded during the survey (fig. 10 b).

The conservation threats indicated are based on the data collected during the survey which was conducted one time during summer do not really qualify as major and immediate threats to conservation of Bhutan Takin in the jurisdiction of WCNP, however, some mitigation measures depending on the severity of threats in different locations may be advisable.

5. Conclusion

The presence of Bhutan Takin (Budorcas taxiclor whitei) was recorded during the biodiversity survey conducted prior to formulation of Conservation management Plan of WCNP and included as one of the iconic mammal species found in WCNP. Over the time specific studies or survey on this particular mammal was not carried out to confirm the localities, its habitat and migratory routes in the park. This particular survey aimed at understanding basic information on the presence, perception of park residents and some conservation threats to guide the management in implementation of conservation programs in coming years has gathered good amount of information about Bhutan Takin.

Most of the respondents during the survey were well aware of the presence of Takin in their localities and its importance. However, few respondents were unaware of its presence and significance in conservation, which indicates that if awareness programs related to Takin conservation within the park are to be conducted it may be more focused on those villages or geogs.

The presence of Takin in Dhur Tshachhu area, Melo chuga, Situzompa, Kingkhor and Thamchey in Western Range; Kuphu, Kerab, Murthi areas in Central Range and Ney Tshachhu and Yonten kuenjung in Eastern Range was confirmed based on the evidences recorded during this survey. Considering the importance of conserving this IUCN Red listed and vulnerable mammal, management intervention in those areas may be prioritized and implemented in coming years.

Though conservations threats are not severe in present situation in WCNP, the report indicated potential threats that are on rise or would have impact on conservation in long run. Alpine meadows are important summer habitats for Takin, but, waste accumulation

in alpine areas is becoming a concern across protected areas in the north as many people enter during summer for collection Cordyceps sinensis. Grazing competition was reported as threat in several studies and it also appeared to be one of threats in two range jurisdictions in this survey. Proper waste management regimes in the alpine areas along with advocacy and awareness programs to general public on waste management may be crucial to reduce the impact on habitats. Regulated grazing in identified grazing grounds of Takin may be a blissful solution.

Detail field study and research in coming years may be conducted to gather concrete information on the summer and winter residence and migration routes with WCNP; this will provide clear direction on the need of management interventions based on the location habitat types and conservation threats.

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