

REPORT

**Study of Presence or Absence of Red Panda
in Api Nampa Conservation Area
Darchula**



Photo source: Dr. M.K. Chalise

Submitted to:
Government of Nepal
Ministry of Forests and Soil Conservation
Department of National Parks and Wildlife Conservation
Api Nampa Conservation Area
Darchula

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Summary

Government of Nepal has been felt conservation need of important wild flora and fauna of northern part in the Darchula district, declared Api Nampa Conservation Area (ANCA) to include western ecosystem in the protected area network. Twenty one Village Development Committees are included within ANCA occupying 1903 sq.km. These village development committees are: Byash, Rapla, Sunsera, Dhaulakot, Huti, Pipalchauri, Hikila, Dhari, Bramhadev, Chapari, Katai, Khandeswori, Ghusa, Sitaula, Guljar, Iyarkot, Latinath, Sipti, Sheri, Khar, Tapoban.

Api Nampa Conservation Area has been creating baseline survey on plants, wildlife and NTFP. This study is formulated to know the status of red panda in the potential habitats in Api Nampa Conservation Area. Temperate and sub alpine forest region of Byans, Rapla, Sunsera, Hikila, Iyerkot, Sitaula, Ghusha and Khandeswori was explored elevation ranging from 1400m to 4300m for presence or absence of red panda. Field study was conducted during January to March 2012. Different methods were used and pellets were collected but not found fresh. Cold weather limited the duration of field visits. Local herders, older people, NTFP collectors and jungle goers were consulted. Opinion survey was conducted from them.

Habitats are found fragmented, over grazing pressures, frequent fire and work force enter for collection of NTFP and poaching are attributed to decline red panda population not only ANCA but also in red panda range countries of Asia.

Red panda is a small animal. Its size varies from 560 to 625mm long. Tail of red panda seems beautiful. However, beautiful tail jeopardizes its life. The face is predominantly white with reddish-brown "tear" marks under the eyes. There are two sub-species of red panda worldwide. These are: *Ailurus fulgens fulgens* and *Ailurus fulgens styani* (Wei *et al.*, 1999). Red panda lives in trees. About 86% of its resting sites are on trees, mostly *Abies spectabilis* in summer and Junipers, *Betula utilis*, *Rhododendron* and *Acer spectabilis* trees in winter (Yonzon and Hunter, 1989, Glatston (1994).

The observation of Red Panda was not possible. Some droppings were doubtfully collected. However the data of presence were kept as the local peoples' aspiration and evidences recorded might be useful for future long term study. Therefore, a record up to 9-10 panda was enlisted for Rapla and Siddhinath forests in the Api Nampa Conservation Area.

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1. Background and Purpose

Red panda (*Ailurus fulgens fulgens*) is found in Nepal. It is commonly referred to as "Habre" in Nepali. It is called "Hoptanga" in the Bhotia language, It is known as "Sagaicha" and "Thanwor" in Magar (Kham) and Nigale Bagh in Darchula (Field survey, 2011).

Distribution of Red panda is large: throughout the Himalayan Mountains between 2,200 and 4,800m in elevation, Red panda is found in the Eastern Himalayas eco-region. It extends from Eastern Nepal through Sikkim, Bhutan, Arunachal Pradesh in India, up to the high mountains of Burma and in Sichuan and Yunnan of Western China (Chakraborty, 1999) cited in Panthi 2009). Red panda lives in the temperate forest that has good bamboo (*Arundinaria spp*) understory (Yonzon, 2000) and are associated with the occurrence of temperate forest with birch, fir, bamboo thickets etc characterized by the presence of mixed deciduous and coniferous forest (Chakraborty, 1999).

In Nepal, red panda are distributed within a narrow elevation range between 2500 and 4200m in the northern part of the country including Api Namp Conservation Area, Darchula. Red panda is confirmed to occur in the following protected areas ; Kangchenjungha Conservation Area, Makalu Barun National Park, Sagarmatha National Park, Langtang National Park, Annapurna Conservation Area, Dhorpatan Hunting Reserve and Rara National Park (Yonzon *et al.*, 1997).

Covering the area of 1,903 km² in Darchula district of far western region of Nepal, the Government of Nepal declared Api-Nampa Conservation Area. The topography extended around altitude of 539m to 7132 m (Api Himal) above the sea level. Land use of the area consists of forest 30%, grazing land 23%, barren land 23%, Shrub land 6%, cultivated land 5%, snow glacier 2%, rocks 2%, other 10%. The vegetation pattern shows that it consists of Subtropical forests (Hill Sal forest), Temperate forests (fir, Hemlock, Oak, Junipers), Lower and upper sub alpine forest (pine, oak, rhododendron), Lower and upper alpine (Juniper, rhododendron grazing and sруб land).

The major wildlife species consists of snow leopard, musk deer, clouded leopard, red panda, goral, himalayan black bear, blue sheep, himalayan tahr, wolf, wild boar, etc. The avifauna includes Daphne (*Lophophorus impejanus*), Munal (*Crimson spp*), Snow Chock, Blood

pheasant, Red billed chough, and Yellow-billed chough etc. Endangered plants recorded as Jatamansi, Yarshagomba, Panchaule, Kutki, Sugandhwal, Talis patra, Lauth Salla and so on.

Baseline data of important and protected wildlife species are essential for the better management and conservation of them. Tying up the objectives of the Api Nampa Conservation Area, study on species has been started in order to generate baseline information. Blue sheep census was conducted in ANCA. A check list of medicinal plant found in ANCA is prepared. Bird survey was conducted. For the present status survey, it is included three species of mammals: Red Panda, Musk deer and Himalayan Tahr. The available literature shows the musk deer and Himalayan tahr needed a monitoring schedule while the presence or absence of Red Panda was confirmed. It was complimented by the social survey within the human community near the probable and suitable habitats of the area.

2. Rationale of the study

Red panda is shy animal listed under the “Endangered” species in National Red Data Book in threat category (BPP, 1995), CITIES list I (Chapagai & Dhakal, 2002) and protected wildlife by National Parks and Wildlife Conservation Act, 1973 of Nepal. Although, the red panda is native species to Asia, but population continues to decline due to habitat fragmentation, poaching, competition and habitat overlap with livestock (Panthi, 2009). The conservation of red panda is therefore a global concern. Grazing and habitat fragmentation are the most significant threat to the red pandas habitat in Nepal (Fox *et al.*, 1996; Karki, 1999; Thapa, 2007; Yonzon, 1989), however detailed information on population declines and interactions with ecological parameters is lacking in Nepal. People in the Himalayas have hunted red panda for commercial purposes since the early 1970’s. Very few studies have been conducted in Nepal on this species (Panthi, 2009; Paudel, 2009; Sharma and Belant 2007). But there is no any study on red panda was performed in the Far Western part of Nepal. Api Nampa Conservation Area initiated this study about red panda to access presence or absence in potential habitats in temperate zone.

3. Objective of the Study

To know the current status of Red Panda in the ANCA by conducting presence and absence study in potential habitats.

4. Study Area

Api Nampa Conservation Area is located in the Far Western Development Region of Nepal in Darchula district. Realizing the conservation need of unique flora and fauna of northern part in the Darchula district, taking an objective to conduct social development programs and contribute in reducing poverty of this region, promote study/research on wild species, Government of Nepal has declared Api Nampa Conservation Area. A five year management plan is also approved and has been operated in order to systematize its programme.

Twenty one Village Development Committees are included within ANCA. These are: Byash, Rapla, Sunsera, Dhaulakot, Huti, Pipalchauri, Hikila, Dhari, Bramhadev, Chapari, Katai, Khandeswori, Ghusa, Sitaula, Guljar, Iyarkot, Latinath, Sipti, Sheri, Khar, Tapoban (Fig 1).

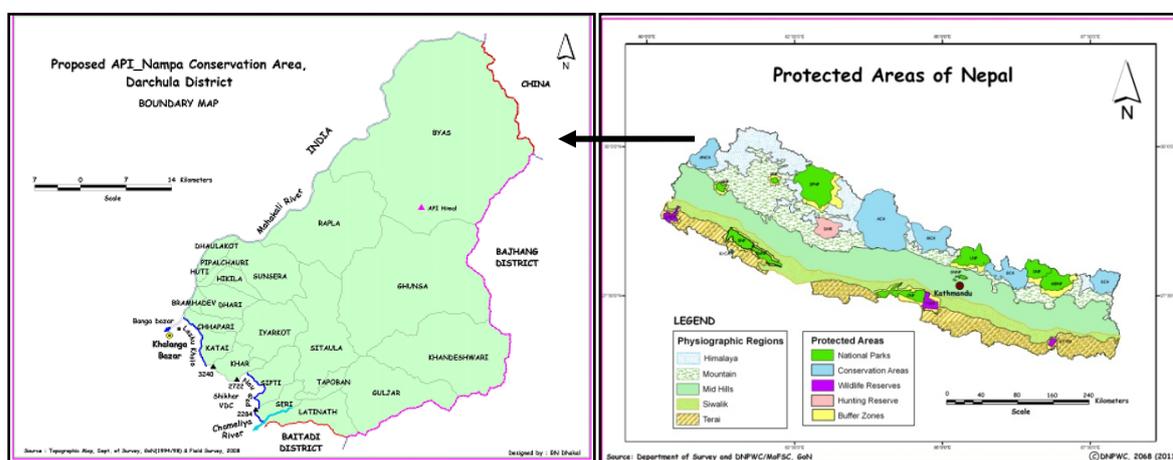


Fig 1 Location of Api Nampa Conservation area in Nepal.

The ANCA has been creating baseline of wildlife, plants and NTFP. Creating base line data of wild species is essential. Therefore, initiative on base line information is focused. The Government of Nepal has allocated budget to conduct survey, census and monitoring of wild animals in this Fiscal Year.

The study team visited Byans, Rapla, Sunsera, Hikila, Iyarkot, Sitaula, Ghusha and Khandeswori village development committee elevation ranging from 1400m to 4300m. The study area represents high altitude temperate and sub alpine zone. Habitats are suitable for red panda. Tree species occurring are fir, oak, coniferous, Betula, rhododendron, chimal with thickets of malingo. The area is used by grazing livestock and highly disturbed due to movement of local people and others who roam in the jungle for NTFP collection. Only winter

remains less visited due to fall of snow. During dry season this region gets frequent fire which is important threat to red panda.

5. Red Panda

The size of red panda vary from 560 to 625mm long, with a tail marked with approximately 12 alternating red and buff rings that is not prehensile. The face is predominantly white with reddish-brown "tear" marks under the eyes. There are two sub-species of red panda worldwide. These are: *Ailurus fulgens fulgens* and *Ailurus fulgens styani* (Wei *et al.*, 1999). Red panda lives in trees. About 86% of its resting sites are on trees, mostly *Abies spectabilies* in summer and Junipers, *Betula utilis*, *Rhododendron* and *Acer spectabilis* trees in winter (Yonzon and Hunter, 1989). Glatston (1994) and Roberts and Gittleman (1984), highlight that these animals are found in habitats with temperatures between 10 to 25°C, and average annual rainfall of 350cm. Red panda are crepuscular in nature, and are more active at dusk and dawn.

They are usually sedentary but may travel a linear distance of 1.75 km (Yonzon & Hunter, 1989). They migrate vertically, in winter moving upwards to get sunlight and in summer season downwards towards the dense forest to escape from the high intensity of the sun light (Panthi, 2009). It is more active during January to mid March because of its breeding season. The birth occurs during the monsoon in the months of June to August. Mating occurs during winter, usually between early January and mid-March (Pradhan *et al.*, 1999). Its gestation period is between 120 to 160 days. Home range size varies between 1.02 to 9.62 sq. km. Male home ranges tend to overlap. Red panda activity changes throughout the year based on the temperature, feeding regimes, and the presence of young. The normally solitary *A. fulgens* are most active at dusk, dawn and during the night.

The Red panda, *Ailurus fulgens* (Cuvier, 1825) is one of the threatened and endangered carnivore mammal species. It inhabits the temperate forest with bamboo from Nepal through India, Bhutan, Myanmar and China. The red panda is a habitat specific that prefers mostly subtropical and alpine forest between 1,500 and 4,800 m. In Nepal, the Red Pandas are patchily distributed from east to west, in temperate and sub-alpine area. Presence of the Red Panda has been suggested in Khangchenjunga Conservation Area, Makalu Barun National Park, Sagarmatha National Park, Langtang National Park, Manaslu Conservation Area, Annapurna conservation area, Dhorpatan Hunting Reserve and Rara National Park. It has been also reported from community-managed and National Forest of Jamuna and Mabu VDCs

respectively of Ilam in eastern Nepal (Williams, 2004). It is an unusual member of carnivore feeding on bamboo leaves. It is legally protected by Government of Nepal under section 10 of the National Parks and Wildlife Conservation Act, 2029 (1973), and enlisted under “endangered” category of IUCN red data list and in Appendix I under CITES.

The Red Panda (*Ailurus fulgens*) is distributed to the Himalayan foot-hill regions of Nepal. It is an indicator of the overall health of the Himalayan forest, associated with its upper layer of bamboos especially *Maling* and *Arundonaria* species which is the least-represented ecosystem in Nepal’s protected area network. Protecting the red panda is important to the preservation of Nepal’s natural heritage and global biodiversity because it is the only species of its kind in the world surviving in the remote Tibetan cultural sites such as Langtang and other Himalayan slopes. Human population, tourist flow causes increasing land use and forest fragmentation and Red Pandas are facing pressure for the survival. Some parts of LNP is assigned as red panda conservation area by DNPWC however, scientific research is yet to perform. Government also decided to prepare a Red Panda Conservation Action Plan for Langtang National Park (LNP), Nepal (2008-2013). Unless a comprehensive study of the population status and existing threats is conducted, no reasonable management recommendation and conservation action plan can be established. The red panda scientific study was conducted during 80s (Shrestha, 1988 Yonzon, 1989) and thereafter only some preliminary observation are in record (Karki, 1999, Chalise 2008). Though with government status, it does not have latest info on its ecology and behavior. The proposed comprehensive project study will concentrate on assessment of the Red Panda in the Langtang National Park including population surveys, analysis of socio-ecological factors and site-specific conservation measures and development of community outreach/participation programs. Thus project findings will contribute the concern authorities of Nepal in formulating effective management plans for the conservation of Red Panda.

6. Survey methods

The ultimate objective of the baseline survey /studies of mammals were to prepare the reliable database and information regarding the current status of mammals. Basically four following methods were intended to apply for this study that will cover the investigation of animals.

6.1 Field Methodology used

For this study, scat (droppings) and paw print survey were conducted to determine the presence or absence of panda. If animal sign was observed then measurement were taken and defecation time estimated. The fresh pellets areas were searched for live animal. Different observing points and trail were selected to observe the red panda in different topographic area. Altitudinal transect walk is used to cross the probable panda habitat. Through this method indirect and direct observation of red panda paw print or scats or live animal would be possible. The scats are useful to speculate the age group (Williams 2004).

6.2 Opinion Survey

The information about red panda was obtained from local regular forest goers, opinion leaders and older citizen of surrounding villages by a preset questionnaire.

6.3 Observation

After identifying the appropriate areas with the help of villagers where red pandas are most likely to occur, a survey was conducted by establishing transects of horizontal line in the same elevation across the forest. Approximately 100 meters of hiking along the vertical line other transects were laid.

The details of the methodology applied in the field were as follows.

a) Transect walk: Field surveys was followed by line transect and point count methods (Bibby et al. 1992). The line transects were laid randomly, one in each major habitats of the forest with closed canopy, open canopy, degraded and grassland areas near the forest edge. Also point counts were conducted along the line transects of each habitat on different days. Points were of maximum 50m radius; at least 100m apart from each other to avoid overlap and counts or observation was done 5minute duration. In each habitat, more than 3 point count surveys were carried out. All the counts were carried out early morning, during the first three hours after sunrise as counts need to be carried out at the time of highest animal movements (Chalise 2009, Sutherland, 1996). Opportunistic observations (ad libitum sampling) were added to the list so as not to miss any species during the survey period.

Animals were identified using books (Shrestha 1997; Chalise 2008) while walking for identification of potential habitat for the species.

b) Scan Sampling: 10 minutes scan sampling were performed (as described in Chalise, 2003, 2009) to find out observed wild animals species diversity and population. It was repeated several times in each day observation with shifting of the observation site in an hour interval. It was also performed in each important and significant site of proposed area.

c) Ad libitum sampling: A continuous recording of the data during the forest walk were performed; whenever any new information perceived (Altmann, 1974; Chalise, 2009).

d) Indirect evidences collection: The sign of Pug marks / Foot prints of animals, Droppings and marking in the trees, Nests, Holes and burrows, Cry, Smell or odor; Leftover food items; Trampling of plants; etc were recorded wherever possible. All those noticeable evidence of the field were recorded by camera and GPS too. The indirect evidences were supported by the local people information generated by the questionnaire survey or interviews (Altmann, 1974; Sutherland, 1996).

7. Results

Altogether 15 different wild mammals were recorded by direct observation and basically supported by local people opinion. The presence of tiger was doubtful as the area belongs to the temperate ecological zone and prey numbers are scarce to meet the demand of a real tiger (*Panthera tigris*). However, researcher is pretty sure that common leopard must be the species that local is commonly called as tiger in higher elevation. The presence of red panda also seems doubtful even though locals were very much sure (they also call it Nigale Bagh). Because their evidence of droppings reflects that those must be civet and marten species. There is one species that could not be identified was kept in local dialects, Dhayin. They seem small mammals by the descriptions of locals.

Among the recorded animals four species is protected by National Parks and Wildlife Conservation Act, 2029 while two species has status as Endangered and two species ranked Vulnerable by IUCN listing. The local abundance and status is presented in tabular form (Tab 1). The Himalayan tahr is abundant and in large number animal of the project area while common animals are Barking deer, Wild boar, Blue sheep, Ghoral, Jackal, Porcupine and Monkeys. The local respondent and key informants showed that those animals interacting with

agriculture field and are frequently seen by local people. Monkey and wild boar occasionally enter in the crop field and aggravate conflict each year.

Table. 1 The wild animals as recorded by the opinion poll survey.

SN	Common Name	Scientific Name	Local status	GoN	IUCN
1.	Barking Deer	<i>Muntiacua muntjak</i>	Common		LC
2.	Blue Sheep	<i>Pseudois nayaur</i>	Common		LC
3.	Clouded Leopard	<i>Neofelis nebulosa</i>	Scarce	P	VU
4.	Ghoral	<i>Nemorhdeus goral</i>	Common		NT
5.	Himalayan Bear	<i>Ursus thibetanus</i>	Scarce		VU
6	Himalayan tahr	<i>Hemitragus jamlahicus</i>	Abundant		LC
6.	Jackal	<i>Canis aureus</i>	Common		LC
7.	Monkey	Primate species	Common		NT
8.	Musk deer	<i>Moschus chrysogaster</i>	Scarce	P	NT
9.	Otter	<i>Lutra lutra</i>	Few		NT
10.	Porcupine	<i>Hystrix indica</i>	Common		LC
11.	Red Panda	<i>Ailurus fulgens</i>	Scarce	P	EN
12.	Wild Boar	<i>Sus scrofa</i>	Common		LC
13.	Serow	<i>Capricornis sumatransis</i>	Scarce		LC
14.	Danphe	<i>Lophoferus impejanus</i>	Common	P	

8. Presence of Red Panda in ANCA

The observation of Red Panda was not possible. Some droppings were doubtfully collected but the size and shape did not match as of previous eastern samples (Chalise, 2009) (Fig 2).



Fig 2 Droppings of Red Panda as indirect evidences

However the data of presence were kept as the local peoples' aspiration and evidences recorded might be useful for future long term study. Therefore, a record up to 9-10 pandas were enlisted for Rapla and Siddhinath forests in the Api Nampa Conservation Area (Fig 3).

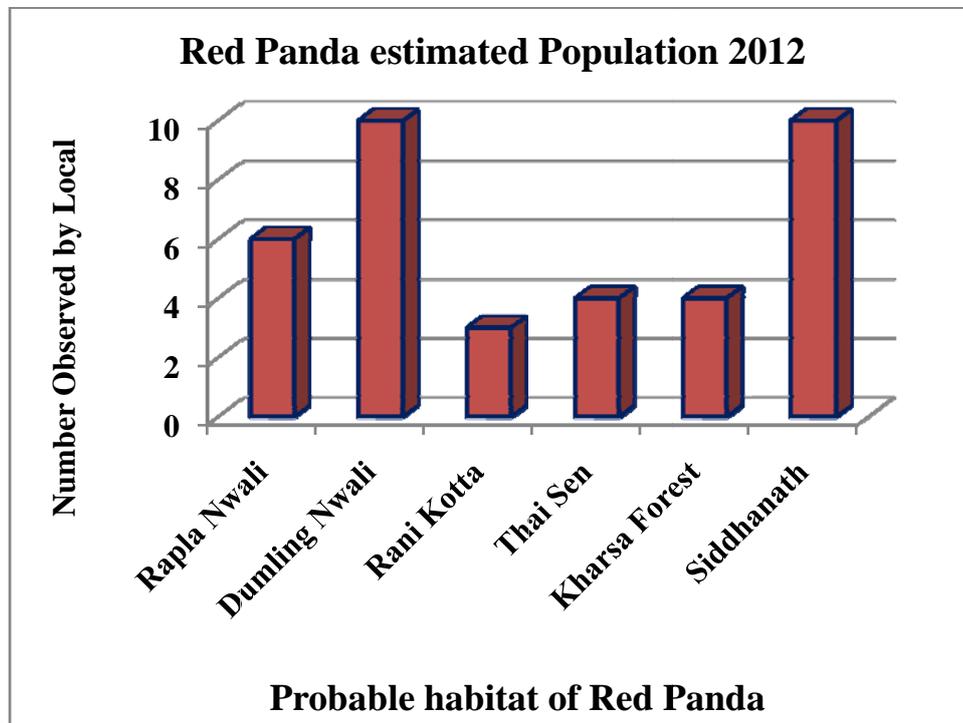


Fig. 3 Local observation of Red Panda in different forest area.

9. Limitation

The weather was very cold, hazy and cloudy which donot allow team to work long time in higher elevation. The Red Pandas were not much active during study period January and February. The binocular team used was not so good in condition. The panda's droppings were very old which made difficult to identification. Financial constraint was also a barrier to conduct long period study.

10.Recommendations

Census of Red Panda if conducted during April-May or August-September gives better result. Poaching seems alarming that causes a drastic decline of red pandas. It seems the trade is for fur mainly. The remaining population of Himalayan red panda should be stopped with the help of local people. Conservation awareness activities should be widely performed. Regular monitoring should be done to keep information updated and take proper management decision.

References

- Altmann, J. (1974). Observational study of behavior: sampling methods. *Behaviour*, 49: 227-265.
- Aryal, A. 2009. Habitat Ecology of Himalayan Serow (*Capricornis sumatraensis* ssp. *thar*) in Annapurna Conservation Area of Nepal. *Tiger Paper/FAO*. 36(4): 12-20
- Aryal, A., D. Raubenheimer, S. Subedi, B. Kattel. 2010c. Spatial Habitat Overlap & Habitat Preference of Himalayan Musk deer '*Moschus chrysogaster*' in Sagarmatha (Mt. Everest) National Park, Nepal. *Current Research Journal of Biological Sciences* 2(3):217-225.
- Aryal, A., S. Gastaur, S. Menzel, T.B. Chhetri. & J. Hopkins. 2010 a. Estimation of blue sheep population parameters in the Dhorpatan Hunting Reserve, Nepal. *International Journal of Biodiversity and Conservation* 2(3): 051-056
- Aryal, A., S. Sathyakumar & B. Kreigenhofer. 2010b. Opportunistic animal's diet depend on prey availability: spring dietary composition of the red fox (*Vulpes vulpes*) in the Dhorpatan Hunting Reserve, Nepal. *Journal of Ecology and the Natural Environment* 2(4): 59-63
- Bibby, C.J., N.D. Burgess & D.A. Hall (1992). *Bird Census Techniques*: Academic press, London, New York, San Deigo, Boston, 248pp.
- Chakraborty, T. 1999. Himalayan Heritage: The Endangered Red Panda in Himalayan Paryavaran: *The Journal of Environmental Protection Society* Vol 6: 129-132. WWF India
- Chalise, M. K. (2003). Assamese Monkeys (*Macaca assamensis*) in Nepal. *Primate Conservation*. No. 19: 99-107. The Journal of the IUCN/SSC Primate Specialist Group, Conservation International, USA.
- Chalise, M. K. (2008). *Nepalka Samrakshit Banyajantu, (Nepal's Protected Wildlife) in Nepali*. Shajha Prakashan, (A Corporate publishing house) Lalitpur Kathmandu Nepal, page 116+12.
- Chalise M K. (2009). Observation of Red panda (*Ailurus fulgens*) in Choyatar, Ilam, East Nepal. *Journal of Natural History Museum, TU, Kathmandu*, Vol. 24: 97-103.
- Gittleman, J. 1993. *Carnivore Behavior, Ecology and Evolution*. Cornell University Press.
- Hall, L. S., P. R. Krausman, and M. L. Morrison. 1997. The habitat concept and a plea for standard terminology. *Wildlife Society Bulletin* 25:173-182.
- Karki, J. B. 1999, A study on Red Panda Habitat at Cholangpati area of Langtang National Park. Department of National Park and Wildlife Conservation. Nepal
- Mahato N.K. 2003. Status of Red Panda, *Ailurus fulgens* (Cuvier, 1825) in the Kanchenjunga Conservation Area, Nepal- A project Paper Submitted in Partial Fulfillment of the Requirement for the Degree of Bachelor of science (in Forestry).

- Panthi, S. 2010. Status and Distribution Of *Canis lupus* (Grey Wolf) in Dhorpatan Hunting Reserve. DHR office, Baglung, Nepal.
- Panthi, S. 2009. Status Of *Ailurus fulgens* (Red Panda) in Dhorpatan Hunting Reserve. DHR office, Baglung, Nepal.
- Paudel, K.N. (2009). Status and distribution of Red Panda (*Ailurus fulgens*) in Manang District, Nepal. B.Sc. project paper submitted to Tribhuvan University, Institute of Forestry, Pokhara Campus, Pokhara.
- Sharma H.P. & Belant, J.L. 2009. Distribution and observation of Red Panda (*Ailurus fulgens fulgens*) in Dhorpatan Hunting Reserve, Nepal. *Small carnivore conservation* vol.40 33-35
- Shrestha, M. 1988. Vegetation Study of Red Panda in Langtang National Park, Central Nepal. Central Department of Zoology. Kirtipur Campus, Tribhuvan University.
- Shrestha, R. & Ale, S. B. (Eds.), 2001. Species diversity of Modi Khola Watershed. National Annapurna Conservation of Manang District, Nepal”
- Shrestha, S.M. 1993. Comparison of Different sampling Techniques in Forest Inventory in Southern Nepal .M.Sc. Thesis, University of Joensuu, Finland
- Shrestha, T.K. (1997). Mammals of Nepal with reference to those of India, Bangladesh, Bhutan and Pakistan. Published by Bimala Shrestha, Kathmandu, pp. 371.
- Sutherland, W. (1996). *Ecological census techniques: A handbook*. Cambridge UK: Cambridge University Press.
- Thapa, B.B. 2007. Dhorpatan Sikar Aararksha ko Parichaya. DHR office Baglung, Nepal.
- Williams, Brian H. (2004). The status of the red panda in Jamuna and Mabu villages of eastern Nepal. A Master of Science Thesis. The Faculty of the Department of Environmental Studies San José State University, USA.
- Yonzon, P. B. 1989. Ecology and conservation of the red panda in the Nepal-Himalayas. Ph.D. dissertation., University of Maine. 169 p.
- Yonzon, P., Jones. R., & Fox, J. 1991. Geographic Information Systems for assessing Habitat & Estimating population of red pandas in Langtang National Park, Nepal. *Ambio*. 20 (7) 285-288.
- Yonzon, P., Yonzon, P., Chaudhary, C., Vaidya, V., 1997. Status of the Red panda in the Himalaya. *Resources Nepal*. Kathmandu.
- Yonzon, P.B. & Hunter, M. L. 1989. *Ecological Study of the Red Panda in the Nepal-Himalayas*. SPB Academic Publishing. The Hague, the Netherlands.