

Census of Red Panda (*Ailurus fulgens*) at Singalila National Park and its surrounding area, Darjeeling, West Bengal, India

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Introduction

Red Panda is a unique carnivore that has adapted to the herbivore mode of life and is resident of Himalayan and Hengduan mountain ranges (Roberts & Gittleman 1984, Glatston 1994, Wei. *et.al.* 1999, Choudhury 2001). Red Panda is one of the flagship species in worldwide conservation. Like its phylogenetic position the status of Red Panda in the wild has also been a matter of great discussion and speculation for over a long period (Glatston 1994). But recently IUCN has reassessed the global status of the Red Panda and placed it under the Vulnerable category and they presume that the global number of Red Panda across its range – spanning from Nepal to Sichuan provinces of China through India (Sikkim, West Bengal (Darjeeling district), Arunachal Pradesh and Meghalaya), Bhutan and Myanmar, could number to <10,000 (Wang *et.al.*, 2008) In India too, though Red Panda is included under the Schedule I of Indian Wildlife (Protection) Act 1972, very little is known about its status in the wild. Anthropogenic activities and associated global climate change are threatening the biodiversity in the Himalayas and have led to the extinction of many species of flora and fauna. Rapid growth and expanding human population which depends on the forest for livestock grazing, timber extraction, food, fodder, fertilizer, fuel-wood are the cause for the erosion of the Himalayan forest and decrease in the number of Red Panda.

Study Area

The Singalila National Park lies within the latitude of 27°13' 15" N and 22°1'46" N latitude and 83°01'91" to 38°7'54"E longitude. The National Park is situated in the extreme North-Western boundary of Darjeeling District, West Bengal. The National Park ranges between 2400 m to 3650 m in altitude above MSL in the eastern part of

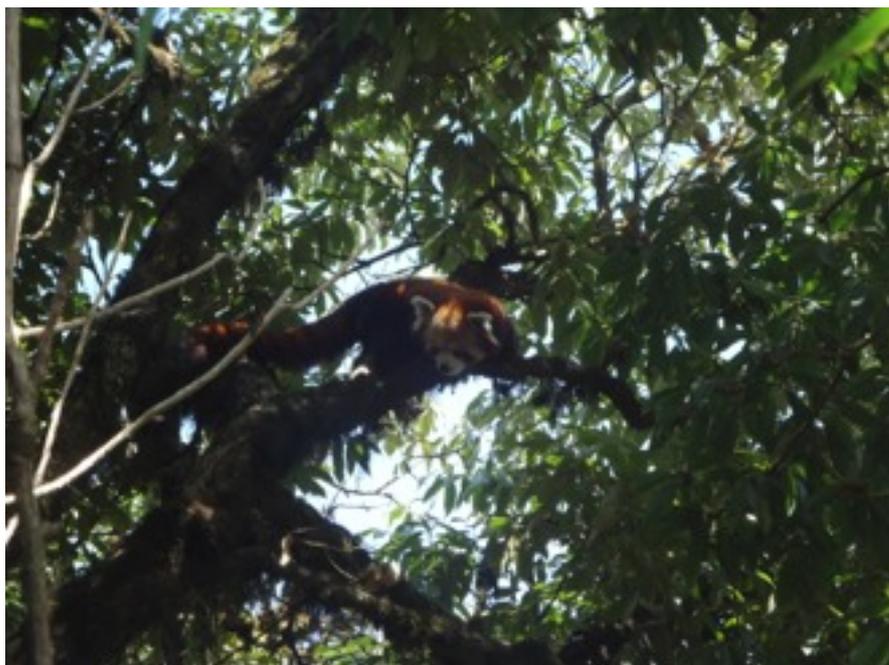


Fig 1. Red Panda in Singalila National Park

the Great Himalayan Range, at the border of Nepal, West Bengal and Sikkim. Eastern side of the Singalila Range is the valley of the Teesta river, the Western (Nepal) side is the valley of the Tamur river, one of the tributaries of the Kosi river. The physiography of the flora of both, the eastern and western side of the Singalila Range is alike. Its situation is unique, where various phytogeographical

and zoogeographical zones meet. It has sub alpine anthropogenic grasslands that merge higher and higher up to the snowline beyond Singalila peak (Sikkim). Its temperate forests are contiguous

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with subtropical and tropical forests of Tonglu, Ghoomsimana, Senchal. Temperate zone of the National Park has mean temperature in summer between 7°C to 17°C and in winters between 1°C to 10°C. In sub-alpine zone the mean summer temperature is under 7°C and in winter below 1°C. The winter is extremely cold and extends from November to March. The hottest season is between April and June, just before the onset of monsoon. At 3300 m altitude and above there is regular incidence of snowfall during winters. Mean annual rainfall is 350 cm and average humidity ranges from 83 to 96%.



Fig 3. Scat sample of Red Panda

Methods

Preliminary survey of the National Park was conducted in two phases to establish presence/ absence of the red panda in different blocks of the park. A questionnaire survey was conducted on a set Performa for direct sighting, signs like faecal pellets and reports of any anthropogenic threats among villagers, camp staff, guides, tourist, drivers, forest officials and researchers. For field surveys pre-existing tracks and trails within the forest at various altitudinal zones were used and red panda evidences were searched in the forest. It was not possible to

establish transects (Burnham *et al.* 1980) due to the rugged terrain and also because of the presence of dense bamboo undergrowth in the study area. Among these, other than direct sighting, pellets gave best indication of red panda's occurrence in the study habitat and this was used to estimate the relative abundance of the animal in the area (Pradhan *et al.*, 2001). Whenever a pellet group in the field were encountered, the state of the pellet group, substrate of defecation, number of fresh pellets, the details of the trees used for defecation, water source

and pellets of other animals in the surrounding area were recorded. Fresh pellet of red panda were collected from the site and the GPS reading were taken.

Result

The survey which was conducted put the total count of Red Pandas at **27** from Singalila National Park. 505 scat samples of Red pandas were collected and sent for genetic analysis to Centre for Cellular and Molecular Biology (CCMB) Hyderabad and Zoological Survey of India (ZSI) Kolkata for population estimation, sex



Fig 4. Red Panda habitat

identification and genetic diversity of *Ailurus fulgens*. The census also recorded the presence of different high altitude faunal diversity like Wild boar, Barking deer, Flying squirrel (*Ratufa bicolor gigantea*), Yellow Throated Marten (*Martes flavigula*), Himalayan Goral (*Naemorhedus goral*), Himalayan Serow (*Tupaia glis*), Asiatic black bear (*Ursus thibetanus*), Satyr Tragopan (*Tragopan satyra*), Kalij Pheasant (*Lophura leucomelanos*), warblers, tit (*Parus* sp), Magpie, Black Throated Thrush (*Turdus ruficollis atrogularis*), Sparrow. Himalayan crow, etc. Scats of different animals were collected from different beats and compartments to identify the parasites prevalent in wild animals. Floral diversity of the Park included *Cardamine* sp, *Cyanodon* sp, *Pentanax* sp, *Rhododendron* sp, *Michelia* sp, *Ilex* sp, *Astible rivularis*, *Polygonum* sp, *Senecio* sp, *Eurya* sp, *Arundnaria* sp, *Gnaphalium* sp, *Debgressia* sp, *Phytolacca* sp, *Vaccinum* sp. etc. (Table 3).

Table 1, 4 show the details of the direct sighting of the Red Panda, other sighted animal, plants species preferred by Red panda

Table: 1 Beat wise sightings of Red Panda at Singalila National Park

Beat	Compartment	Age	Total No.
Gairibans	Rithu-3	Adult	2
Relling	Relling -6	Adult	1
Kankibong	Kankibong-2	Adult	1
Kankibong	Kankibong -1	Adult	1
Singalila South Range / Gairibans/	Rithu- 1	Adult	4
Rammam/ Sabarkrum -4	Sabarkrum -4	Adult	5
Kankibong	Kankibong -I	Adult	1
Kankibong	Kankibong - II	Adult	3
Kankibong	Kankibong II	Adult	3
Rimbick	North Rimbick -3	Adult	3
Rammam	Rammam - 4,5 & 6	Adult	3

Table: 2 Altitude wise sightings of Red Panda at Singalila National Park

Altitude (m)	No of species	Percentage (%)
Below 2800	1	3.7
2801 to 2900	3	11.11
2901 to 3000	12	44.44
3001 to 3100	6	22.22
3101 to 3200	5	18.51

within the vicinity of the Red Panda habitat.

Discussion

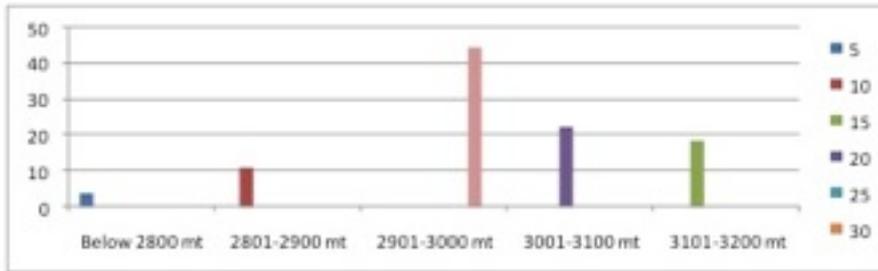
During the survey Red Pandas were sighted between the altitudinal level below 2800 meter to 3200 meter represented by the

broad-leaf deciduous forest where the dominant tree species are *Sorbus cuspidata*, *Rhododendron griffithianum*, *Vitex heterophylla*, *Schefflera impressa*, *Quercus pachyphylla*, *Zanthoxylum* sp, *Castonopsis tribuloides*, *Daphne cannabina*, *Symplocos theifolia*,

Table 3: Plant preferred by Red Panda and its utility

SN	Name of the species	Local Name	Family	Uses
1	<i>Rhododendron griffithianum</i>	Chimmal	Ericaceae	Red Panda sighted, Substrate for defecation
2	<i>Quercus pachyphylla</i>	Banta	Fagaceae	Red Panda sighted, Substrate for defecation
3	<i>Castonopsis tribuloides</i>	Musre Katus	Fagaceae	Red Panda sighted
4	<i>Schefflera impressa</i>	Bhalu Chinday	Araliaceae	Red Panda Sighted, Substrate for defecation
5	<i>Abies spectabilis</i>	Silver fir	Coniferae	Red Panda sighted
6	<i>Zanthoxylum</i> sp	Lekh Timbur	Rutaceae	Red Panda sighted, Substrate for defecation
7	<i>Brassaioopsis</i> sp	Phutta	Araliaceae	Red Panda sighted, Edible, Substrate for defecation
8	<i>Acer campbelli</i>	Kapasi	Araliaceae	Red Panda sighted
9	<i>Sorbus cuspidata</i>	Tenga	Rosaceae	Edible, Substrate for defecation
10	<i>Magnolia</i> sp	Ghoga Chap	Magnoliaceae	Red Panda sighted, Substrate for defecation
11	<i>Vitex heterophylla</i>	Pach Pathay	Verbenaceae	Red Panda sighted, Substrate for defecation
12	<i>Tsuga brunoniana</i>	Hemlok	Coniferae	Substrate for defecation
13	<i>Rhododendron</i> sp	Gurash	Ericaceae	Red Panda sighted, Substrate for defecation
14	<i>Symplocos theifolia</i>	Kholma	Symplocaceae	Red Panda sighted
15	<i>Rhododendron falconeri</i>	Kurlingo	Ericaceae	-
16	<i>Eurya acuminata</i>	Jhinghani	Theaceae	Red Panda sighted
17	<i>Ilex</i> sp	Lisha	Aquifoliaceae	Red Panda sighted , Substrate for defecation
18	<i>Daphne cannabina</i>	Lokti	Thymeliceae	Substrate for defecation
19	<i>Wightia speciosissima</i>	Bahuana	Scrophulariaceae	Substrate for defecation
20	<i>Betula utilis</i>	Bhujapat	Betulaceae	Red Panda sighted
21	<i>Abies densa</i>	Gobra	Coniferae	Substrate for defecation
22	<i>Tsuga brunoniana</i>	Tingray	Coniferae	Substrate for defecation
23	<i>Castonopsis hystrix</i>	Katus		Substrate for defecation
24	<i>Taxus baccata</i>	Dhengre salla	Coniferae	Substrate for defecation
25	<i>Arundinaria maling</i>	Malingo	Polygonaceae	Red Panda sighted Edible

Fig 5: Presence of Red Panda on the basis of altitude



Magnolia sp, *Tsuga brunoniana*, *Rhododendron sp.*, *Taxus baccata*, etc. During the study it was also found that the Red Panda used trees, logs, rocks and ground as substrate for defecation which has also been reported by Pradhan *et.al.* 2001.

They live mostly on trees but substrate differs by seasons. Direct sighting and scat samples were found close to water sources, greater canopy forest, fruiting vegetation and little disturbance area. Study conducted by Pradhan *et.al.* (2001) noted that Red Panda uses rock and ground frequently during breeding months which was evident from the following study

conducted. Bamboo being an essential diet component of Red Panda, its occupancy and abundance of scat sample was high in thick bamboo under cover. The faunal diversity of the national park also revealed scheduled high altitude species that shares a similar habitat with the Red Pandas. The yellow throated marten sighted during the study is considered to be the natural predator of the Red Panda. The study also indentified several pockets in the protected area that are viable for the Red Panda population and no immediate threats were identified.

Table 4: Other Animals

Beat	Compartment	Species
Gairibans	Rithu 3,4,5,8	Barking deer (<i>Muntiacus muntjak vaginalis</i>) Kalij pheasant (<i>Lophura leucomelanos</i>) Magpie (<i>Urocissa flavirostris</i>) Partridge (<i>Arborophila torqueola</i>) Asiatic black bear (<i>Ursus thibetanus</i>) Scarlet minivet (<i>Pericrocotus flammeus</i>) Wild boar (<i>Sus scrofa</i>)
Gairibash	South Rimbick 7	Eurasian Jay (<i>Garrulus glandarius</i>) Barking deer (<i>Muntiacus muntjak vaginalis</i>) Red Jungle fowl (<i>Gallus gallus</i>) Magpie (<i>Urocissa flavirostris</i>)
Sandakphu	Sandakphu 4,5	Kalij (<i>Lophura leucomelanos</i>) Satyr Tragopan (<i>Tragopan satyra</i>)
Ramam	Siri 1 -5	Magpie (<i>Urocissa flavirostris</i>) Barking deer (<i>Muntiacus muntjak vaginalis</i>) Blue whistling thrush (<i>Zoothera mollissima</i>)
Sandakphu	9-10	Magpie (<i>Urocissa flavirostris</i>) Eurasian Jay (<i>Garrulus glandarius</i>)
Ramam	Sabarkum 4,5,6,7,8,10,11, 12	Himalayan Goral (<i>Naemorhedus goral</i>) Jungle cat (<i>Felis chaus affinis</i>) Yellow throated marten (<i>Martes flavigula</i>) Magpie (<i>Urocissa flavirostris</i>) (A breeding place of wild boar was also sighted)
Gorkhay	Phalut 1,5,6,7, 10, 12	Tit (<i>Parus sp</i>) Magpie (<i>Urocissa flavirostris</i>) Jungle cat (<i>Felis chaus affinis</i>) Himalayan Goral (<i>Naemorhedus goral</i>) Yellow throated marten (<i>Martes flavigula</i>) Blue whistling thrush (<i>Zoothera mollissima</i>)
North Rimbick	NR 3	Stripped throated Yuhina (<i>Yuhina flavicollis</i>) Common leopard (<i>Panthera pardus</i>)

Conclusion

The study at The National Park concerning the population ecology of the Red Panda has given significant inputs concerning Red Panda status, habitat and habitat use. Since Red Panda is an indicator species, the findings of the following study thus indicates that Singalila National Park is a suitable habitat not only for the species itself but also for other high altitude Himalayan fauna. This study though has given an indication of the presence of Red Panda in the National Park yet, a confirmed number of the species, sex identification and genetic diversity shall be known in details from the scat samples being analysed at Centre for Cellular and Molecular Biology, Hyderabad. Datas from both the field and the laboratory findings shall be beneficial in drawing out managerial outcomes of the Park thus ensuring a suitable habitat for the already vulnerable species.

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