Uncovering the presence and conservation needs of the elusive red Panda (*Ailurus fulgens*) in Namdapha National Park, Arunachal Pradesh, Northeast India

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Abstract

The red panda, or lesser panda (*Ailurus fulgens)*, is an endangered species recognized as one of the world's flagship species. A scientific survey was conducted from July 2018 to December 2022, utilizing the camera trap technique in high-altitude, unexplored areas of Namdapha National Park in Eastern Arunachal Pradesh, India. Historically, Namdapha lies within the eastern limit of the red panda's natural range in India. The species is known to inhabit temperate forests with bamboo understory conditions that exist in parts of Namdapha at elevations around 2,000–4,000 meters. Earlier records (1980s–1990s) from the Zemithang, Dapha Bum, and Deban areas suggested a possible presence, but confirmation was sparse due to remoteness and limited survey effort. The study confirmed the presence of red pandas in the park. The park's Daphabum Forest Range, which includes the East Himalayan moist temperate forest, recorded seven sightings of red pandas in three camera traps installed above 3000 meters above sea level. The predominance of sightings during daylight hours indicates the species exhibits primarily diurnal activity patterns. Fewer anthropogenic disturbances, such as evidence of hunting and medicinal plant collection, were observed in the red panda's habitat within the park. The distribution and population status of red pandas in the park may thus be thoroughly investigated in the future to prepare a conservation and population management action plan for the species based on the present study. A conservation action plan for the red panda in Namdapha National Park requires an integrated approach that combines scientific research, community engagement, habitat protection, and policy support.

Keywords: Red Panda, Mammals, Status, Distribution, Camera trap, Namdapha National Park

Introduction

The Red panda or lesser panda *(Ailurus fulgens)* (F. Cuvier, 1825) is an endangered species recognized as one of the flagship species worldwide. Red panda is mainly confined in its distribution in eastern Himalaya biodiversity hotspot with its adjacent areas in northeast India, Bhutan, Nepal, northern Myanmar, western Sichuan and Yunnan Provinces of China (Reid et al., 1991; Yonzon et al., 1991; Choudhury, 2001; Williams 2003; Zaw et al., 2008; Dorji et al., 2011). The red panda has two subspecies, *Ailurus fulgens fulgens* and *Ailurus fulgens styani*. Subspecies *A.f. fulgens* is widely distributed in the Himalayan range starting from Nepal through northeast India, Bhutan and China (Bahuguna et al., 1998; Pradhan et al., 2001; Choudhury, 2001; Zhang et al., 2009; Dorji et al., 2011; Bista et al., 2017) while *A. f. styani*is is found in a limited area of the Hengduan mountains in Sichuan and the East Nujiang River in Yunnan Province of China and northern Myanmar and the Salween (Nu Jiang) river probably separates the two subspecies of the red panda (Wei et al., 1999; Zaw et al., 2008)

The habitats of Red panda is mostly associated with temperate climates in deciduous and coniferous forests which includes montane and subalpine temperate forest, subtropical and tropical bamboo mixed-thicket understories forestalong with seasonal deciduous hardwoods, mixed forest of fir and rhododendrons (Roberts & Gittleman, 1984; Choudhury, 2001; Dorji et al., 2011; Bashir et al., 2019). The red panda has been reported to be found above the timber line in dwarf bamboo thickets (Zaw et al., 2008). The red panda inhabits the slopes of the Himalayas at heights of between 1,500 m and 4,800 amsl (Choudhury, 2001). Red panda is basically a herbivore and mainly feeds on bamboo, with supplements of fruits, roots, mushrooms, acorns, and lichens, although it may occasionally feed on small prey insects, grubs and bird eggs (Reid et al., 1991; Pradhan et al., 2001; Zhang et al., 2009; Panthi et al., 2012).

In northeast India, the red panda has its restricted distribution in the states of northern West Bengal (Bahuguna et al., 1998; Pradhan et al., 2001; Pradhan, 1999), Sikkim (Sathyakumar et al., 2011; Bashir et al., 2019), Arunachal Pradesh (Srivastava and Dutta, 2010; Dorjee et al., 2014; Chakraborty et al., 2015) and with an isolated population in Meghalaya (Choudhury, 1997). According to Choudhury (2001), the extent of occurrence of the red panda in northeast India is about 170,000 sq. km; although its area of occupancy within this may only be about 25,000 sq km. and projected the population status is projected to be about 5000-6000 individuals. The status of the red panda in northeast India is likely threatened, as much of its distribution range is under

unprotected areas, which are highly degraded and disturbed by various anthropogenic activities (Choudhury, 2001; Kumar, 2010). Among the northeast Indian states, Arunachal Pradesh accounted for the highest distribution range of red pandas with a potential habitat of 23000 sq. km. occupying most likely the largest population in India (Choudhury, 2001). IUCN Red Data Book enlisted the species under the Endangered (A1acd, C2a) category and placed it in Appendix I of CITES. It has been placed under Schedule I of the Indian Wildlife (Protection) Act, 1972 (amended in 2022).

Few preliminary efforts have been made so far to explore the distributional status of red panda in Northeast India, particularly in northern West Bengal, Sikkim and Western Arunachal Pradesh (Pradhan, 1999; Choudhury, 2001; Chakraborty et al., 2015). Apart from these studies, a few intermittent records of red panda occurrence are reported by several researchers based on observation of skins found with local people in the states(Athreya & Johnsingh, 1995; Athreya et al., 1997; Choudhury, 1997; Kumar, 2010). Till the present study, red panda presence was only confirmed through direct sighting, mainly from Tawang and West Kameng districts of Western Arunachal Pradesh (Srivastava & Dutta, 2010; Chakraborty et al., 2015). Although the presence of red panda in Namdapha National Park (NNP) was reported based on secondary evidence collected in discussion with local inhabitants (Datta et al., 2008; Choudhury, 2001), however, so far, no confirmed report of the presence of red panda from Namdapha National Park (NNP) has been made.
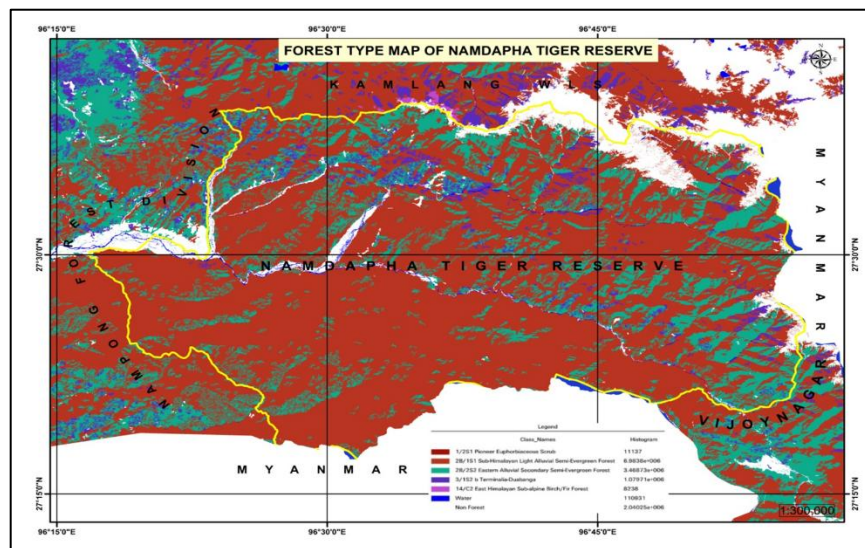
Also, owing to the inhospitable and dense vegetation of the Namdapha, the direct sighting of many mammalian species, including the red panda is nearly impossible as the species is believed to favour habitats with altitudinal variation from 1500 m to 4800 amsl (Choudhury, 2001) with frequent distribution between 2800 and 3600 amsl (Yonzon et al.,1991; Pradhan et al., 2001). However, the increased use of camera traps over the years has led to the discovery of rare and elusive animals in known areas where there were no direct sighting records. Accordingly, the use of camera traps has provided the first photographic records of many elusive animals in areas where direct sighting was not possible (Karanth,1995; Kelly et al., 2008; Rowcliffe et al., 2008; Taylor et al., 2014; Bashir et al., 2019). Considering the vast area, rough terrain, limited accessibility and rugged nature of the NNP (70% of the park is still unexplored) and the extreme shyness and crepuscular nature of the red pandas jointly make direct sighting of the species difficult.

Thus, an intensive study was conducted in the unexplored high altitude areas of the parkunder the monitoring programme of large carnivore (Tiger) and other elusive mammalian diversity concerning red pandato find out the presence of species in the park with some scientific record by using camera traps based on recent finding of tiger from high altitude area (3630 amsl) in Mishmi hills, Eastern Arunachal Pradesh (Adhikarimayum & Gopi, 2018).

Material and methods

Study area

Namdapha National Park (NNP), which enjoys the dual conservation value such as Namdapha Tiger Reserve (NTR), is one of the oldest protected areas of the state and lies within the Indo-Myanmar global biodiversity hotspot (Myers et al., 2003). The Park covers 1985 sq. km area of Changlang district of the state with an altitudinal variation ranging from 200-4,571 m asl. and is located between 27°15'30" to 27°39'40" N latitude and 96°15'02" to 96°58'33" E longitude near the international border with Myanmar. The altitudinal range of the park provides a wide variety of forest types, starting from lowland tropical rainforest to temperate broadleaf and mixed forest with patches of thicket bamboo understory forest. The geographic, climatic, vegetation, etc. about the NNP can be found in Parimal et al. (2015) and Nath et al. (2005). WWF (2011) has identified eight types of vegetation, which accounted for 200 plant species (Nath et al., 2005) with dominated by Dipterocarp forest. This floral diversity provides habitats for 137 mammals, 505 birds, 73 reptiles, 34 amphibians, 75 fishes, 312 butterflies and moths, more than 500 insects and other invertebrates, 10 earthworms and 5 leeches (WWF, 2011), including several endemic, threatened and rare species.

Figure 1. Map of study area (Namdapha National Park)

The five-year field survey was conducted using the camera trap (Cuddeback Attack camera) method between 2018 and 2022. A total of 103 cameras were deployed across various altitudinal ranges in a standard grid size of 2x2 km, specifically designed to monitor the presence of tigers, co-predators, and other elusive mammals. All the camera traps were installed along animal trails in the potential habitats of carnivores and other elusive species, such as the red panda, from 400 to 4000 amsl altitude. Out of the 103 camera traps placed for monitoring tigers in various areas of the park, 9 cameras were deployed at high altitudes above 3000 amsl. in the Daphabum range of the park, which had remained completely unexplored until the present study. All camera traps were set to operate continuously, 24 hours a day, for a minimum duration of 60 days during the survey period in Namdapha National Park (NNP). A minimum interval of 30 minutes was maintained between two consecutive capture events to avoid repeated recordings of the same individual. Approximately 345 trap nights were used to capture 7 red pandas. Following the completion of the field survey, images were manually checked for the recorded species.

Results

The first photographic evidence of the red panda (*Ailurus fulgens*) in this region (Fig. 2a, b, e, f & g). Seven individuals were captured by camera traps installed at elevations above 3,000 amsl in the Daphabum range of the park. The red pandas were recorded at altitudes ranging from 3,145 m to 3,712 amsl details on each record are provided in Table 1. The Relative Abundance Index (RAI) is approximately 2.03 captures per 100 trap nights, which gives an idea of how frequently red pandas were detected relative to the effort. The red pandas were documented in diverse microhabitats, including snow-covered areas, bamboo-dominated forests, and the forest floor. The habitat was primarily temperate forest dominated by rhododendron and bamboo species such as *Phyllostachys* sp., *Chimonobambusa* sp., and Tsuga sp. Although the sex of the individuals could not be determined from the camera trap images, the body size and morphology suggest they may be adult males.

Camera traps also recorded the presence of potential natural predators in the same locations, including the Asiatic wild dog (*Cuon alpinus*) and the Asian golden cat (*Catopuma temminckii*) (Fig. 3a & 3b). Other sympatric mammals documented include the orange-bellied Himalayan squirrel (*Dremomys lokriah*), Himalayan palm civet (*Paguma larvata*), and the Mishmi takin (*Budorcas taxicolor*) (Fig. 2c, 2d, & 2e).

Figure 2a to 2g. Red Panda recorded in different habitats and Red Panda captured in a camera trap at the Daphabum range of the NNP
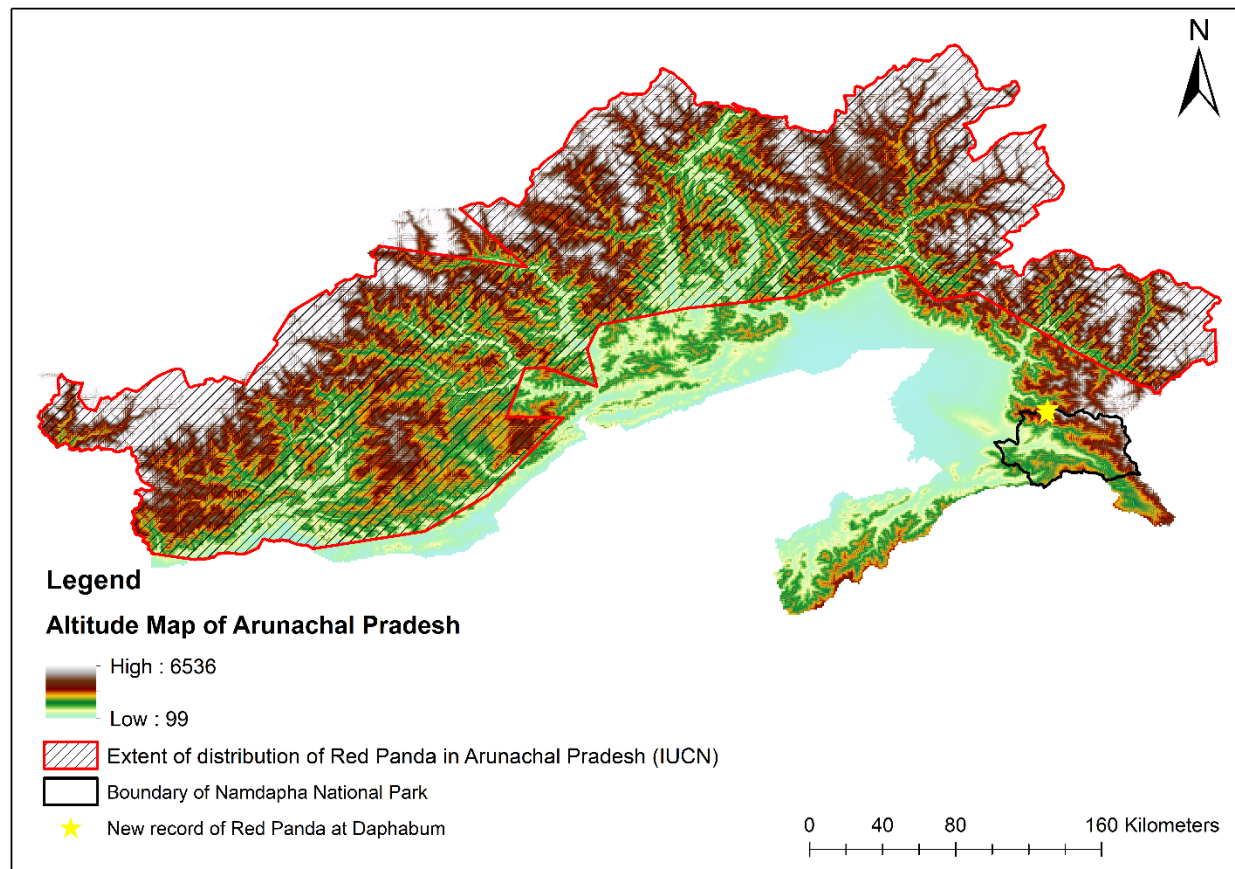

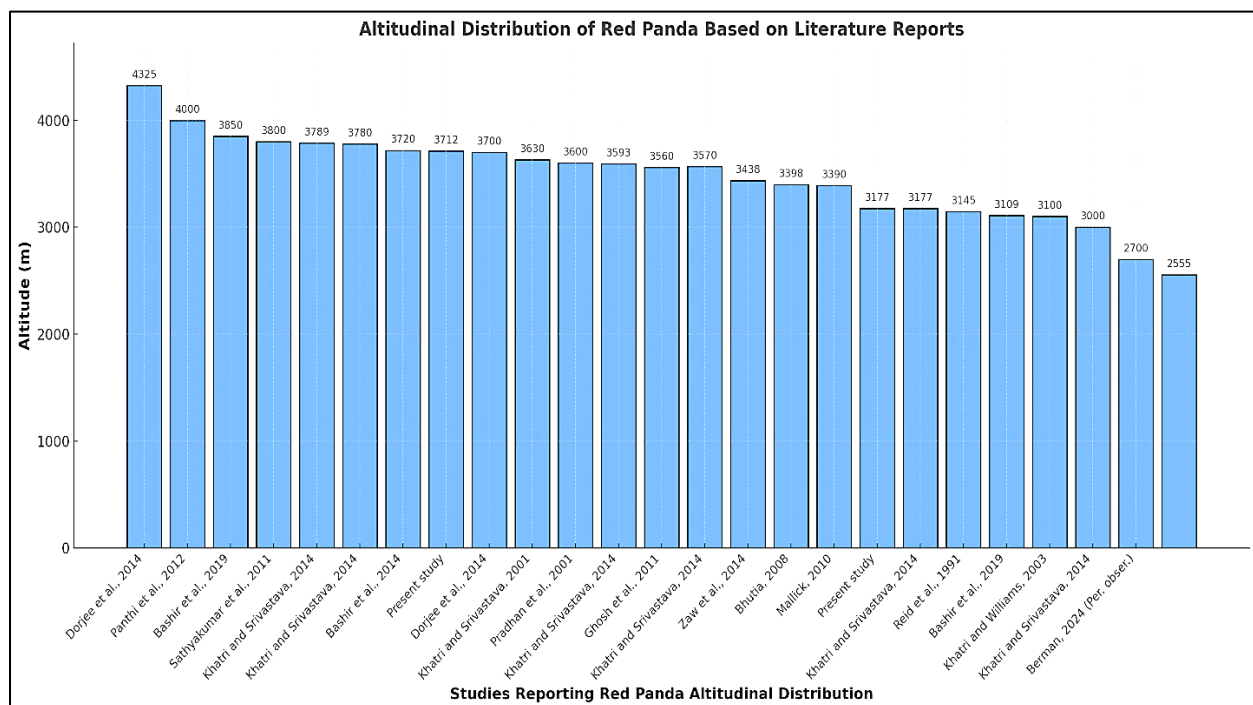**Figure 3a & 3b.** The Asiatic wild dog and the Asian golden cat.

Discussion

The first-time detection of red pandas in Namdapha National Park expands the known distribution range of this endangered species in northeastern India (Fig. 4). The altitudinal range (3,145–3,712 amsl) recorded in this study aligns with previous findings from across the red panda's global range. For example, Dorji et al. (2011) reported their occurrence between 2,110–4,389 m asl, with most sightings between 2,400–3,700 amsl. Similarly, studies in Sikkim have documented red panda distributions from 2,700 to 3,850 amsl (Khatiwara & Srivastava, 2014; Basir et al., 2019). These data affirm that red pandas strongly prefer a narrow elevational band typically associated with cool temperate climates and specific vegetation types (Fig. 5). The red panda sightings were concentrated in forest habitats dominated by rhododendron and bamboo species, which are known to be crucial for the species' foraging and shelter. Such habitat preference has been consistently documented throughout their range (Reid et al., 1991; Sharma & Belant, 2009; Panthi et al., 2012; Bista et al., 2017). The observation of red pandas in snow-covered habitats during winter further reflects their adaptability to high-elevation conditions. The inability to determine the sex of the individuals limits demographic insights, although body morphology hints at adult males. The co-occurrence of known predators like Cuon alpinus and Catopuma temminckii presents potential predation pressure, which, along with habitat specificity, could influence red panda population dynamics in the region. This study provides critical baseline data on red panda presence in NNP and highlights the ecological importance of the Daphabum range for their conservation. Further long-term monitoring and habitat assessment are recommended to understand population trends and potential threats, enabling informed conservation strategies. Crafting a conservation action plan for the Red Panda in Namdapha National Park requires an integrated approach that combines scientific research, community engagement, habitat protection, and policy support.

Figure 4. Distribution Map of Red Panda in Namdapha National Park.

Figure 5. Altitudinal distribution records of the red panda across its global distribution

Conclusion

The present study provides the first photographic evidence of the red panda (Ailurus fulgens) from high-altitude, previously unexplored areas of Namdapha National Park (NNP), specifically at an elevation of 3,145 meters above sea level in the Mishmi Hill range, located within the Indo-Myanmar Biodiversity Hotspot. This finding highlights the ecological significance of the region and underscores the need for further detailed investigations into the distribution and status of the red panda in NNP. Understanding the spatio-temporal distribution of rare and threatened species is a cornerstone of both theoretical ecology and applied conservation biology. Such insights are essential for informing in situ and ex situ conservation strategies, and for the formulation of sustainable management plans (Brotons et al., 2004; Carricondo-Sanchez et al., 2016; Engler et al., 2004). A thorough knowledge of species distribution patterns is particularly vital for conservation practitioners and policymakers aiming to design and implement effective biodiversity conservation policies. In light of these findings, the study recommends comprehensive assessments of mammalian diversity, with a special focus on unexplored and under-surveyed areas within the park. Such assessments are critical for the development of targeted conservation and management action plans for both the park and its constituent species.

Acknowledgement

References

Adhikarimayum, A.S., & Gopi, G.V. (2018). First photographic record of tiger presence at higher elevations of the Mishmi Hills in the Eastern Himalayan Biodiversity Hotspot, Arunachal Pradesh, India. Journal of Threatened Taxa 10(13), 12833-12836.

Athreya, V.R., & Johnsingh, A.J.T. (1995). Survey of the clouded leopard (*Neofelis nebulosa*) in Northeast India. Unpublished report. Wildlife Institute of India, Dehradun.

Athreya, R.M., Captain, A.S. & Athreya, V.R. (1997). A faunal survey of Namdapha Tiger Reserve, Arunachal Pradesh, India. Unpublished report.

Bahuguna, C.C., Dhaundyal,S., Vyas, P.& Singhal. N. (1998). Red panda in Darjeeling at Singalila National Park and adjoining forest: a status report. Small Carnivore Conservation 19: 11–12,

Bashir T., Bhattacharya, T., Poudyal, K. & Sathyakumar, S. (2019). First camera trap record of Red Panda *Ailurus fulgens* (Cuvier, 1825) (Mammalia: Carnivora: Ailuridae) from Khangchendzonga, Sikkim, India. Journal of Threatened Taxa 11 (8): 14056-14061. https://doi.org/10.11609/jott.4626.11.8.14056-14061

Bista, D., Shrestha, S., Sherpa, P., Thapa,G.J., Kokh, M., Lama,S.T., Khanal, K., Thapaand, A. & Jnawali, S.R. (2017). Distribution and habitat use of Red Panda in the Chitwan-Annapurna landscape of Nepal. PLoS ONE 12(10): e0178797. https://doi.org/10.1371/journal.pone.0178797

Brotons, L., Thuiller, W., Araújo, M.B. & Hirzel, A.H. (2004). Presence-absence versus presence-only modelling methods for predicting bird habitat suitability. Ecography, 27: 437–448.

Carricondo-Sanchez, D., Samelius, G., Odden, M., and Willebrand, T. 2016. Spatial and temporal variation in the distribution and abundance of red foxes in the tundra and taiga of northern Sweden. European Journal of Wildlife Research, 62: 211–218. https://doi.org/10.1007/s10344-016-0995-z.

Chakraborty, R., Nahmo, L.T., Dutta, P.K., Srivastava,T., Mazumdar, K. & Dorji, D. (2015). Status, abundance, and habitat associations of the red panda (*Ailurus fulgens*) in Pangchen Valley, Arunachal Pradesh, India. Mammalia, 79(1):25-32. https://doi.org/10.1515/mammalia-2013-0105.

Choudhury, A. (1997). Red Panda Ailurus fulgens F. Cuvier in the North East with an important record from Garo Hills. Journal of Bombay Natural History Society, 94: 145–147.

Choudhury, A. (2001). An overview of the status and conservation of the red panda Ailurus fulgens in India, with reference to its global status. Oryx, 35(3): 250-259. https://doi.org/10.1046/j.1365-3008.2001.00181.x

Datta, A., Naniwadekar, R. & Anand, M.O. (2008). Occurrence and conservation status of small carnivores in two protected areas in Arunachal Pradesh, north-east India. Small Carnivore Conservation, 39: 1–10.

Dorjee, D., Chakraborty, R. & Dutta, P.K. (2014). A note on the high elevation distribution record of Red Panda *Ailurus fulgens* (Mammalia: Carnivora: Ailuridae) in Tawang District, Arunachal Pradesh, India. Journal of Threatened Taxa 6(9): 6290-6292. https://doi.org/10.11609/JoTT.o3492.6290-2

Dorji, S., Vernes, K. & Rajanathan, R. (2011). Habitat correlates of the red panda in the temperate forests of Bhutan. PLoS One 6: e26483. https://doi.org/10.1371/ journal. pone.0026483

Engler, R., Guisan, A., and Rechsteiner, L. 2004. An improved approach for predicting the distribution of rare and endangered species from occurrence and pseudo-absence data. Journal of Applied Ecology, 41:263-274. https://doi.org/10.1111/j.0021-8901.2004.00881.x.

Karanth, K.U. (1995). Estimating tiger Panthera tigris populations from camera-trap data using capture-recapture models. Biological conservation, 71(3), 333-338.

Kelly, M.J.& Holub, E.L. (2008). Camera trapping of carnivores: trap success among camera types and across species, and habitat selection by species, on Salt Pond Mountain, Giles County, Virginia. Northeastern naturalist 15(2): 249-263.

Khatiwara, S., & Srivastava,T. (2014). Red Panda *Ailurus fulgens* and other small carnivores in Kyongnosla Alpine Sanctuary, East Sikkim, India. Small Carnivore Conservation 50: 35–38.

Kumar, A. (2010). Preliminary survey of distribution, population status and anthropogenic threats to the red panda (*Ailurus fulgens*) in Arunachal Pradesh, India. LifeLine*s*110: 8-9.

Myers, N. (2003). Biodiversity hotspots revisited. Bioscience, 53 (10): 916-917.

Nath, P.C., Arunachalam, A., Khan, M.L., Arunachalam, K. & Barbhuiya, A.R. (2005). Vegetation analysis and tree population structure of tropical wet evergreen forests in and around Namdapha National Park, northeast India. Biodiversity and Conservation, 14(9): 2109-2135. https://doi.org/10.1007/s10531-004-4361-1

Panthi, S., Aryal, A., Raubenheimer, D. Lord, J. & Adhikari, B. (2012). Summer diet and distribution of the red panda (*Ailurus fulgens*) in Dhorpatan Hunting Reserve, Nepal. Zoological Studies, 51: 701–709.

Pradhan, S. (1999). Observation of the red panda, Ailurus fulgens in the Singhalila National Park, Darjeeling, India. Small Carnivore Conservation. IUCN/SSC Mustelid, Viverrid & Procyonid Specialist Group, Vol. 21, pp. 6-8

Pradhan, S., Saha,G.K. & Khan, A. (2001). Ecology of the red panda Ailurus fulgens in the Singhalila National Park, Darjeeling, India. Biological Conservation 98:11-18. https://doi.org/10.1016/S0006-3207(00)00079-3

Ray, P.C., Kumar, A., Devi, A., Krishna, M.C., Khan, M.L. & Brockelman, W.Y. (2015). Habitat characteristics and their effects on the density of groups of western hoolock gibbon (*Hoolock hoolock*) in Namdapha National Park, Arunachal Pradesh, India. International Journal of Primatology, 36(3), 445-459. https://doi.org/10.1007/s10764-015-9834-4

Reid, D.G., Jinchu, H. & Yan, H. (1991). Ecology of red panda *Ailurus fulgens* in Wolong Reserve, Journal of Zoological Society of London, 225: 347-364 https://doi.org/10.1111/j.1469-7998.1991.tb03821.x

Roberts, M.S. & Gittleman, J.L. (1984). *Ailurusfulgens*. *Mammalian Species* 222: 1–8. https://doi.org/10.2307/3503840

Rowcliffe, J.M. & Carbone, C. (2008). Surveys using camera traps: are we looking to a brighter future?.Animal Conservation, 11(3): 185-186.

Sathyakumar, S., Bashir,T. Bhattacharya, T. & Poudyal, K. (2011). Assessing mammal distribution and abundance in intricate eastern Himalayan habitats of Khangchendzonga, Sikkim, India. Mammalia, 75(3): 257–268. https://doi.org/ 10.1515/mamm.2011.023

Sharma, H.P. & Belant, J.L. (2009). Distribution and observations of red pandas Ailurus fulgens in Dhorpatan Hunting Reserve, Nepal. Small Carnivore Conservation 40: 33–35.

Srivastava, T. & Dutta, P.K. (2010). Western Arunachal Pradesh offering prime home to the endangered Red Panda. Current Science 99(2): 155–156.

Taylor, B.D., Goldingay, R.L. & Lindsay, J.M. (2014). Horizontal or vertical? Camera trap orientations and recording modes for detecting potoroos, bandicoots and pademelons. Australian Mammalogy, 36(1), 60-66. https://doi.org/10.1071/AM13012

Wei, F., Feng, W.Z.J., Wang, Z.W. & Hu, J.C. (1999). Current distribution, status and conservation of wild red pandas *Ailurus fulgens* in China. Biological Conservation 89: 285–291.https://doi.org/10.1016/S0006-3207(98)00156-6

Williams, B.H. (2003). Red panda in eastern Nepal: how do they fit into ecoregional conservation of the eastern Himalaya? Conservation Biology in Asia 16: 236–250.

WWF. (2011). To develop a Protected Area Management Information System in Arunachal Pradesh using Remote sensing and GIS Technology. Management Plan. WWF-MoEF-NNRMS Research Project

Yonzon, P., Jones,R. & Jefferson, F. (1991). Geographic information systems for assessing habitat and estimating the population of red pandas in Langtang National Park, Nepal. Ambio 20: 285–288.

Zaw, T., Htun, S., Po, S., Maung, M., Lynam, A.J., Latt, K.T. & Duckworth, J.W. (2008). Status and distribution of small carnivores in Myanmar. Small Carnivore Conservation 38: 2–28.

Zhang, Z.J., Hu, J.C., Yang, J.D., Li, M. & Wei, F.W. (2009). Food habits and space-use of Red Pandas Ailurus fulgens in the Fengtongzhai Nature Reserve, China: food effects and behavioral responses. Acta Theriologica, 54(3): 225–234. https://doi.org/10.4098/j.at.0001-7051.017.2008.

Table 1. Detailed survey records of the red panda in Namdapha National Park, Arunachal Pradesh

Camera ID	Location	Altitude (amsl)	Time& date of the Rad panda captured in the camera trap		Forest types	Presence of threats around the captured location
			Time	Date		
DBM4B	27°38'55.90"N 96°31'44.80"E	3174 m	07:43 AM	27/12/2018	**East Himalayan moist temperate Forests (12/C -3)** *Chimnobambusae* sp. and *Rhododendron* sp. Habitat.	Human disturbances in the form of hunting and medicinal plant collection
DBM4B	27°38'55.90"N 96°31'44.80"E	3174 m	12:54 AM	28/01/2019	**East Himalayan moist temperate Forests (12/C -3)** *Chimnobambusae* sp. and *Rhododendron* sp. Habitat.	Human disturbances in the form of hunting and medicinal plant collection
CAM 115	27°39'32.50"N 96°33'55.00"E	3462 m	01:13 PM	22/02/2021	**East Himalayan moist temperate Forests (12/C -3)** *Small bamboo sp.* on mountain ridge with randomly scattered *Pinus sp.* in between.	Human disturbances in the form of hunting and medicinal plant collection
16D NTR	27°38'23.38"N 96°39'54.33"E	3750 m	10:26 AM	05/08/2021	**East Himalayan moist temperate Forests (12/C -3)** No *bamboo sp.* found at this elevation. No snow this season. The mountain ridge with many different herbs, as seen in pictures.	Human disturbances in the form of hunting and medicinal plant collection
CAM 115	27°39'32.50"N 96°33'55.00"E	3462 m	10:46 AM	15/03/2022	**East Himalayan moist temperate Forests (12/C -3)** *Small bamboo sp.* on mountain ridge with randomly scattered *Pinus sp.* in between.	Human disturbances in the form of hunting and medicinal plant collection
CAM 115	27°39'32.50"N 96°33'55.00"E	3462 m	11:21 AM	15/03/2022	**East Himalayan moist temperate Forests (12/C -3)** *Small bamboo sp.* on mountain ridge with randomly scattered *Pinus sp.* in between.	Human disturbances in the form of hunting and medicinal plant collection
16C NTR	27°38'23.38"N 96°39'54.33"E	3750 m	10:31 AM	01/07/2022	**East Himalayan moist temperate Forests (12/C -3)** No *bamboo sp.* found at this elevation. No snow this season. The mountain ridge with many different herbs, as seen in pictures.	Human disturbances in the form of hunting and medicinal plant collection