

## Red Pandas (*Ailurus fulgens*) at risk: how tribal hunting fuels poaching and threatens survival

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### Abstract

Hunting represents a significant threat to wildlife conservation efforts. Arunachal Pradesh is inhabited by various tribes that pursue hunting activities due to their cultural and traditional importance, which is also upheld by legal protections. However, understanding hunting practices remains limited, presenting considerable challenges to conservation initiatives. Aside from the targeted species, these hunting methods occasionally result in the unintended capture of threatened species. This report delineates an incident involving a red panda that was likely inadvertently ensnared in one of the traps established by local hunters within the Dibang Wildlife Sanctuary in Arunachal Pradesh. The local community is barred from hunting red pandas due to their endangered status; therefore, such actions may be classified as poaching. This case and its implications for the endangered red panda population are examined herein.

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Hunting presents a significant threat to wildlife worldwide (Bennett et al., 2002; Milner-Gulland et al., 2003). Indigenous tribal communities residing in proximity to forests predominantly rely on wildlife for sustenance, trade, cultural rituals, and income (Robinson and Redford, 1991; Fa et al., 1995). Each tribal group employs specific hunting practices influenced by their cultural backgrounds and the native wildlife available. However, data regarding these hunting practices is scarce, and even less is understood about the Indigenous hunting methods in India (Aiyadurai et al., 2010). Despite India's strict wildlife protection laws, tribal communities, particularly in Northeastern India, possess unique cultural identities, and their rights, including hunting, are safeguarded by governmental regulations (Bhatt and Pandit, 2019). Consequently, hunting is common in Northeastern India (Datta, 2007). Hunting is culturally significant and prevalent in Arunachal Pradesh, an important state in Northeast India, contributing to the decline in wildlife populations (Hilaluddin and Ghose, 2005; Mishra et al., 2006).

Arunachal Pradesh is a crucial biodiversity hotspot (Myers et al., 2000) and is home to 26 indigenous tribes comprising 110 sub-tribes, each characterized by distinct cultures and traditions (Aiyadurai et al., 2010; Bhatt and Pandit, 2019). A limited number of studies indicate that local tribes in Arunachal Pradesh engage in the hunting of 33 endangered and threatened mammalian species (Aiyadurai et al., 2010). Therefore, understanding the cultural foundations of these tribes' hunting practices and their profound connection to tradition is essential for promoting wildlife conservation efforts, particularly for species at the brink of extinction. Among these threatened species is the endangered red panda, *Ailurus fulgens*, which is hunted by the local tribes in Arunachal Pradesh (Aiyadurai et al., 2010).

The red panda is a rare and elusive species native to the Eastern Himalayas, with a distribution that spans Nepal, Bhutan, India, China, and Myanmar (Glatston and Roberts, 1988; Pradhan et al., 2001; Choudhury, 2001). They primarily inhabit the Sikkim and Darjeeling hills of India, with fragmented populations reported in

Arunachal Pradesh and Meghalaya (Pradhan et al., 2001; Choudhury, 2001). Only a limited number of individuals inhabit three zoological parks in India (Khan et al., 2022). The subspecies *Ailurus fulgens fulgens* is predominantly located in India and certain regions of China, whereas *Ailurus fulgens styani* is exclusively found in the Himalayas of China (Reid et al., 1991). Recent research suggests that these taxa may eventually be recognized as distinct species (Hu et al., 2020; Dalui et al., 2021), although the scientific community has yet to reach a consensus regarding this taxonomic revision.

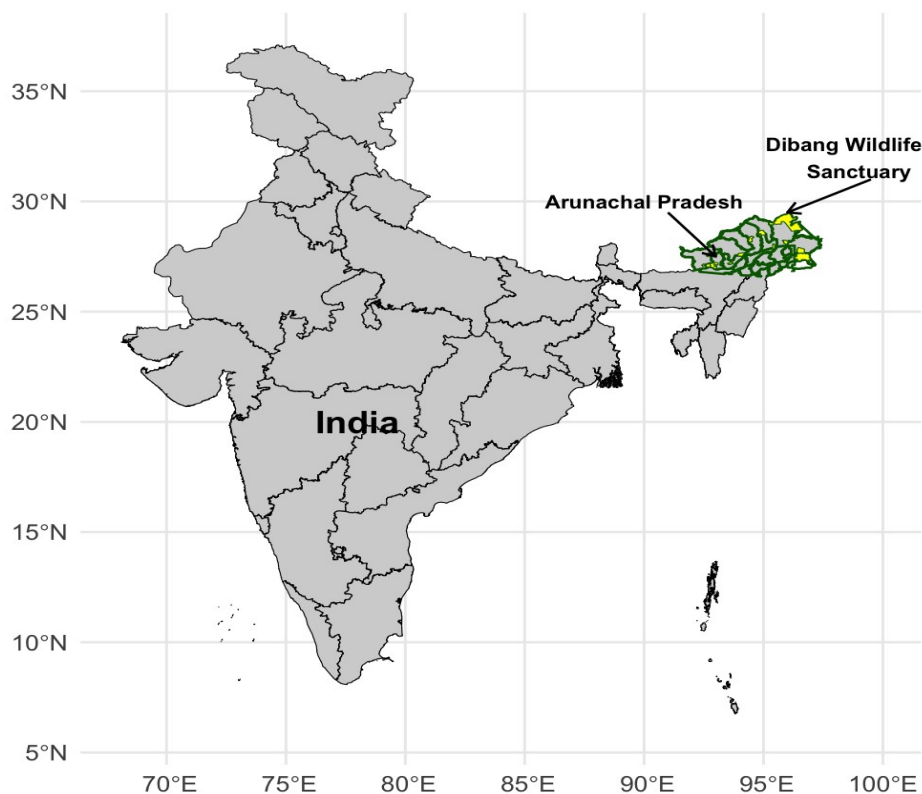
Estimations propose that Arunachal Pradesh contains the most extensive geographic distribution of the red panda (Choudhury, 2001). Nevertheless, the population encounters significant threats primarily resulting from poaching and habitat degradation (Choudhury, 2001; Glatston et al., 2015). Although red pandas are not explicitly targeted for hunting, as such actions are prohibited under the Indian Wildlife Protection Act of 1972, they are occasionally captured inadvertently when traps are set for other species (Choudhury, 2001). This study highlights a potential case of such incidental capture, wherein a red panda became ensnared in a trap established by local tribal members—a clear indication of unintentional yet evident poaching activity. Additionally, we investigate the ramifications of tribal hunting practices on the survival of endangered species, particularly the red panda.

Dibang Wildlife Sanctuary is situated at coordinates 29.047°N and 95.79°E, covering an expansive area of 4,149 km<sup>2</sup> (refer to Fig. 1) in Arunachal Pradesh,

India. In addition to the red panda, the sanctuary harbors a variety of elusive and rare species, including the red goral (*Naemorhedus baileyi*), the Mishmi takin (*Budorcas taxicolor t.*), the Bengal tiger (*Panthera tigris tigris*), the Asiatic black bear (*Ursus thibetanus*), Sclater's monal (*Lophophorus sclateri*), and Blyth's tragopan (*Tragopan blythii*). Arunachal Pradesh is recognized as part of the Indo-Myanmar biodiversity hotspot and holds significant importance as a global ecoregion (Olson and Dinerstein, 1998). The state is home to 26 Indigenous communities, with the Idu Mishmi tribe serving as the local inhabitants of the Dibang Valley. For this community, hunting represents not only a vital source of sustenance but is also deeply embedded within their cultural practices (Aiyadurai, 2011).

During our wildlife survey, we investigated established forest trails (Pradhan et al., 2001) to identify indirect indicators of red pandas and document any opportunistic sightings. A map of the study area was prepared utilizing the corresponding shape files and employing the packages “sf” (Pebesma and Bivand, 2023) and “ggplot2” (Wickham, 2016) within the R software version 3.4.2 (R Core Team, 2023).

During our concise survey, we were unable to document any indirect indicators of red panda presence; however, we unexpectedly discovered a deceased red panda on the forest floor within the Anini range of the sanctuary. Following a thorough examination of the deceased specimen, we identified a significant indication of a neck injury (Fig. 2).



**Figure 1:** Dibang Wildlife Sanctuary, located in Arunachal Pradesh, India.



**Figure 2:** A red panda showing signs of neck injury at Dibang Wildlife Sanctuary, India.

Although the cause of the red panda's death remains uncertain, we propose three potential explanations:

1. The red panda may have fallen from a tree, sustaining injuries that led to its demise.
2. A predator might have attacked the red panda, resulting in injuries that ultimately caused its death.
3. There may have been an incident of accidental hunting and opportunistic poaching.

The deceased specimen indicates that red pandas inhabit the Dibang Wildlife Sanctuary and underscores the concern for their conservation. Although the precise cause of death for this individual remains undetermined, a thorough investigation into several potential explanations for the circumstances has been conducted. It is plausible that the animal fell from the adjacent trees, as red pandas are recognized as arboreal mammals. However, during observations of captive individuals, the corresponding author noted several incidents of falls from trees. The individual in question, a female, exhibited a documented history of epilepsy. Regrettably, our understanding of diseases affecting the wild population of red pandas is limited (Dhami et al., 2021; Karki et al., 2021). An alternative explanation for the incident could involve a mating conflict. Notably, red pandas typically lead solitary lives, except during the breeding season (Pilgrim and Biddle, 2013). Given that the incident occurred in January, coinciding with their breeding period from December to January (Zhang et al., 2011), it is feasible that the occurrence resulted from a mating dispute. Additionally, the red panda may have fallen victim to a predator, which could have led to its injury and eventual death. However, this scenario appears unlikely, as a predator typically would not leave the body in such a condition. Among all the aforementioned possibilities, one additional credible explanation could pertain to hunting by local tribes. Discussions with residents revealed that animal snares

might significantly contribute to the mortality of red pandas. The tribes of Arunachal are culturally rich and reside adjacent to the forest, relying on it for their livelihoods. They are afforded rights and privileges under the laws of the Government of India, including the right to hunt (Bhatt and Pandit, 2019). Hunters employ traditional trapping methods that necessitate considerable time and a comprehensive understanding of wildlife (Aiyadurai et al., 2010). Nevertheless, there is limited information regarding the hunting practices of the tribes in the Dibang Valley. A local hunter reported that snares are positioned within the forest for several days prior to retrieval, during which time the captured animals are collected. Notably, although these snares are intended for specific species, non-target animals may inadvertently become ensnared and subsequently hunted. The local community is prohibited from hunting red pandas; therefore, any such incidents may be classified as poaching, even if unintentional. The study by Aiyadurai et al. (2010) indicated that hunters often did not disclose certain species they hunted, likely due to recall limitations. However, researchers observed trophies of various species not mentioned by the hunters during their visits to local residences and forest departments, including red pandas (Aiyadurai et al., 2010). Furthermore, Choudhary (2001) documented the sale of red panda pelts and hats made of their fur in Arunachal Pradesh, suggesting that, albeit infrequent, there exist significant occurrences of red pandas being unintentionally captured and utilized for trophies and gifts. These findings raise critical concerns regarding the survival of red pandas in their natural habitat, especially given the current threats to their already declining population (Glatston et al., 2015). A comprehensive study is warranted in the region of Arunachal Pradesh to investigate various hunting practices and their impact on local wildlife, particularly regarding endangered species such as the red panda. The red panda is classified as an endangered mammal and represents a solitary member of its taxonomic family. This species faces significant threats primarily due to poaching and habitat degradation, as noted by Choudhury (2001). Such circumstances indicate a pressing need for enhanced conservation efforts within its distribution range across the Indian subcontinent. Arunachal Pradesh, noted for its rich biodiversity, necessitates focused attention from the conservation community concerning the red panda and other threatened species. The present article verifies the existence of red pandas, reports an incident of possible accidental hunting and poaching, and calls upon the scientific community to investigate hunting practices and the types of animal traps employed within the distribution range of red pandas.

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## Author contributions

MG: Fieldwork, writing the draft; ASK: Concept, supervision, writing and editing the draft.

## Conflict of interest

The authors declare that there are no conflicting issues related to this short communication.

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