Red Panda (*Ailurus fulgens*) on the Verge of Extinction: Threat and Conservation

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ABSTRACT

The red panda is a charismatic animal that acts as an icon to attract and encourage the public in support of conservation action. Forest fragmentation, habitat degradation, forest resource collection, cattle grazing, and increasing visitor number in protected areas are the prime threat to the red panda population. Confiscation of red panda pelts in different countries shows an increase in illegal trade in recent years. Various research articles, conference reports, chapters and books, management plans, and thesis on red panda were referred for the study. This study aimed to understand the threat to a red panda in the wild habitat and highlights the requirement of conservation initiatives. Collaborative study on red panda population, prey-predator density, habitat, food availability, floral diversity and, threat assessment in the entire habitat can contribute immensely in framing and formulation conservation strategies for long-term management of the species and maintaining the viable population in the wild.

Introduction

The red panda (*Ailurus fulgens*) also known as a lesser panda is an endangered living fossil (Kumar, 2016) residing in the Himalayan and Hengduan mountain ranges (Bista, 2019). Its habitat ranges from western Nepal to Sichuan Province in China through Sikkim, West Bengal, Arunachal Pradesh, Meghalaya, Bhutan, and some northern parts of Myanmar (Dorji, 2011; Panthi, 2019) within the altitude of 1500 m and 4800 m (Choudhury, 2001). Anthropogenic activities are a crucial threat to biodiversity and are causing the decline in the red panda population across the distribution range (Jha, 2011; Dorji, 2012; Kandel, 2015; Acharya, 2018). Weather condition, increase in the human population, prey and predator density and food availability affect the population and habitat of the animals (Winne, 2004; James *et al.*, 2006; Zhang, 2011). In the last three generations, the red panda population has declined by 50% (Kappelhof, 2020) and IUCN has placed red panda under the endangered category (Glatston, 2015). It is presumed that the in-situ population of the red panda across its range could be 14,500 to 15,000 individuals (Xu, 2018). Various studies on red pandas have been published to date but comparatively less information is available on the threat throughout the range. Therefore, the proper understanding of the threat is essential for the conservation and management of the wild population. The effort has been made in this paper to highlight some major threats recorded throughout the distribution range of red panda.

Methodology

Systematic reviews of the literature related to red panda were carried out during the study. Various

published and unpublished research articles, conference reports, chapters and books, management plans, and thesis on red panda were referred for the study. Articles were searched in databases like Web of Science, Scopus, and Google Scholar using keywords red panda, conservation, habitat, threat, hunting, poaching, anthropogenic impact, and trade. Publications related to the red panda in the Bhutan, China, India, Myanmar, and Nepal were focused mainly during the study and were arranged accordingly. After the collection of articles they were analyzed on the basis of country, region, state, year of publication, and the subject focusing threat and conservation of red panda.

Results

Increasing pressure on land has resulted in rapid changes in natural habitat. The dependence of the local human populace harms the protected areas and the surrounding. Natural disaster like landslide, heavy snow, bamboo flowering, heavy rainfall, forest fire, invasive species and disease outbreak are other major causes for decline in red panda population. Country-wise threats have been discussed to present the past and the present disturbances that have led to a population decline of red panda in entire distribution range.

Bhutan

A study conducted by Dorjee (2012) mentions that the expanding road in Bhutan is one of the major causes for the loss of wilderness in the country. More than 50% increase in the road network within the year 2002 to 2008 has provided the opportunity for the development in the core red panda habitat resulting in deforestation and damage of bamboo understory. Population depending on forest product and demand for timber and fuel wood is affecting the red panda habitat. Cattle grazing, looping, and trampling have caused significant habitat degradation in the country (Dorji, 2011; Dorji 2012). Bamboo is the main diet of red panda but 42% of the household of Bhutan uses bamboo for the domestic purpose (Dorji, 2011). Therefore, the bamboo collection is one of the major threats to the red panda in Bhutan. The tourism industry is rapidly growing in Bhutan and is directly proportional to habitat degradation. An increase in number of tourist flow increases the demand of forest resources for infrastructure development, firewood, etc. During the

questionnaire survey, Dorji (2012) found red panda being attacked by dogs. Apart from predation dog carries canine distemper which is fatal to the red panda. Dhendup (2020) has recorded seven disturbances in Jigme Dorji National Park, Bhutan i.e. four natural that includes dried or death bamboo, presence of predator, landslide, and fallen logs and three anthropogenic disturbances- plant disturbance, livestock and infrastructure development. Badola (2020) stated that from July 2010 to July 2019 incidents of illegal trade and poaching of red panda were not recorded in Bhutan.

China

In China red panda population has decreased by 40% within 50 years due to habitat loss, increasing anthropogenic pressure, and poaching (Zhang, 2009). Deforestation is a fundamental threat in China for red panda survival. Hunting and poaching are other prime threat for a major decline in the red panda population. Red panda skins and fur are worn by the bridegroom in the wedding ceremonies of one of the local indigenous peoples of Yunnan Province. Wei (1999) reported that red panda has disappeared from some parts of Sichuan, Tibet, and Yunnan of China. It has also extinct from Gansu, Guizhou, Qinghai, and Shaanxi provinces of China. The trade of live red pandas to zoos were formerly very prevalent. 141 live red panda was exported from China between the year 1985 to 1992 (Wei, 1999). Survey conducted by TRAFFIC in April and May in the year 2017 in China found red panda product sold in a shop in Yulong Snow Mountain in Lijiang, Yunnan Province. Along with traditional cloths, pelt hats were available for the visitors for photography and also for purchase. In Sichuan, Shaanxi, Jiangsu, Liaoning and Yunnan Provinces law enforcement agencies made 13 seizure that were involved with red panda during 2005 to 2017. During the seizure 35 live and 07 dead red panda were confiscated in the area (Xu, 2018). However, legislation has probably limited this practice in more recent years. Habitat fragmentation is another factor for decline in red panda population and decrease of the genetic diversity causing inbreeding depression of the red panda.

India

Srivastava (2010) found numbers of red panda skin in the Mandla area of Arunachal Pradesh. During the questionnaire survey conducted by TRAFFIC in

Arunachal Pradesh, old pelts were recorded in Anjaw, Menchuka, and Rouliang area. Respondent further reported the knowledge of poaching of six red pandas in the past 10-15 years in Anjaw District (Badola, 2020) but currently, no targeted poaching is recorded in the area. In Arunachal Pradesh and Meghalaya, the hill tribes practice jhum, a form of shifting slash-and-burn cultivation that destroys large tracts of forest. Forest fire is also a serious problem for red panda habitat degradation. In western Arunachal Pradesh fire caused extensive damage to bamboo brakes in the year 1999 (Choudhury, 2001). Major causes for the red panda habitat destruction are commercial logging, firewood collection, land use pattern, cattle grazing, monoculture forest plantation, etc. (Choudhury, 2001). No hunting and poaching are reported from Sikkim and West Bengal in India. In Sikkim number of tourists visiting the state is increasing rapidly (Mahapatra, 1998), and their requirement for wood for both cooking and heating has accelerated habitat loss. In Singalila National Park, West Bengal exploitation of wildlife occurred prior to 1992 before it was declared as National Park in the year 1992. The park was closed for cattle grazing and the cattle station was removed from the area. But the rapid increase in the human population in the surrounding area and dependence on the forest are the threat to the red panda habitat (Pradhan, 2001).

Myanmar

A study conducted in the year 2003 in Hkakaborazi National Park and Hponkanrazi Wildlife Sanctuary, found the indirect evidences of red panda (Wei, 2014). In the year 2010, two red pandas were sighted on the oak tree in Hkakaborazi National Park. It is worthwhile to mention that during the Gibbon survey red panda were recorded on camera trap in Emaw Bum in the year 2011. Glastston (2015) stated that since 1999-2000 in the Emaw Bum region in Myanmar more than 5,000 sq km were commercially logged resulting in habitat loss of red panda. New roads were constructed between the China border and the May Hka river which provides access to the core red panda habitat and facilitates hunters. Poaching and hunting are other major threats to red pandas in Myanmar. New roads were constructed between the China border and the May Hka river which provides access to the core red panda habitat and facilitates hunters. She further stated that in the early 1990s, in Myanmar red pandas were captured and were traded to various zoos by China motivating locals to catch the red panda from the wild.

Nepal

The possible red panda habitat in Nepal is assessed to be 2652 km^2 which is very less compared to the previous estimation of around 20,400 km^2. 70 % of the suitable red panda habitat in Nepal is outside the protected area where the conservation initiatives are comparatively poor (Bista, 2017). Red panda habitat is threatened by deforestation, habitat degradation, rise in human population, and forest fire. Bamboo is the main forest resource of the local resident and is harvested for domestic as well as commercial purposes causing a threat to the existence of red panda (William, 2004). Panthi (2012) found more than 53% of red panda habitats overlapping with human disturbances and cattle grazing. A study conducted by Yonzon (1991) stated that the red panda is facing a high mortality rate in Nepal. Predation of two adult and one cub red panda by leopard and four deaths related to anthropogenic activities were also reported by him in Nepal. Changes in land use pattern, global climate change, and associated threats affect the red panda population and survival (Kandel, 2015). In Nepal from 2008 to 2015, 56 cases of red panda trafficking were reported (MoFSC, 2016). A study conducted by Bista (2020) reported 121 pelts were seized during the year 2008 to 2018 in Nepal. He further stated that a local poacher was caught and was later sent to jail in eastern Nepal. In the year 2016, one red panda was rescued by local people in Panchthar District of Nepal. Red panda poaching and illegal trade have increased in Nepal resulting red panda as one of the top five poached animals in Nepal (Dangol, 2015, Bista, 2020).

Discussion

The red panda is an ecological indicator (Dorji, 2011; Roka, 2020) that is used to measure the condition of the environment, to provide an early warning signal of the change in vegetation, ecology, or to diagnose the cause of an environmental problem. It acts as an icon or symbol for conservation of a defined habitat. But the red panda population in wild is decreasing rapidly in recent years. This study has point out that most of the inhabitants in the vicinity of red panda habitat are dependent on the forest resources for the

firewood, cattle fodder, timber, etc. Socio economic condition of the local should be given more emphasis and should be improved. Cattle grazing must be restricted in the red panda habitat and alternative sustainable livelihood can be provided to mitigate threats. Educational awareness about the species, its conservation and its role in ecosystem should be depicted and disseminated amongst stakeholder and local. Housing dogs nearby the red panda habitat should be discouraged. Developmental work should be sustainable, balanced and eco-friendly. Trans-boundary collective research can contribute immensely in management of species. All the red panda corridors should be identified and focus should be made to restore the vegetation in the area and should be considered as the protected areas. Tourist being one of the major source of income for the hotels and guest house in the area, use of cooking gas and kerosene instead of firewood for cooking should be encouraged. Proper record keeping and counseling of tourist entering in the protected areas should be mandatory and number of tourist flow should be minimized. Community participation in the conservation activities, capacity building of the frontline staff and vaccination of the dogs in the surrounding area of the red panda habitat should be followed routinely (Glatston, 2015). Through this study we also found that there is no proper data on the population of the red panda in the wild. Collaborative study on population, prey predator density, habitat, food availability, floral diversity and the threat assessment in the entire red panda pocket can contribute immensely in framing and formulation conservation strategies in broader aspects. Therefore proper conservation of the species results in the long term conservation of biodiversity of the region.

Acknowledgement

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