ZSL
LET'S WORK FOR WILDLIFE

EDGE

EVOLUTIONARILLY DISTINCT & GLOBALLY ENDANGERED

Survival Blueprint

Red Panda, *Ailurus fulgens*

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Suggested citation:

Chakraborty, M., Ramesh, K. & Das, J. (2021) Conservation of Endangered Red Panda in Sikkim: A survival blueprint. Wildlife Institute of India & ZSL EDGE of Existence Programme. Pp. 17.

1. STATUS REVIEW

1.1 Taxonomy:

The Red Panda was first classified as *Ailurus fulgens* in 1825 by French zoologist F.G. Cuvier. It is the sole representative of the monotypic family *Ailuridae*. The two known (sub) species are placed to the eastern and north-eastern Himalayan subalpine conifer forests and the eastern Himalayan broadleaf forest eco-regions, respectively. The separation of Red Panda into two species – the Himalayan Red Panda (A. fulgens) and the Chinese Red Panda (A. styani) – based on differences in morphology and biogeography has been proposed (Groves, 2011), with additional genetic evidence (Hu et al., 2020).

The classification of Red Panda is as follows:

Kingdom: Animalia
Phylum: Chordata
Class: Mammalia (Linnaeus, 1758) – mammals
Order: Carnivora (Bowdich, 1821) – carnivores
Family: Ailuridae (Gray, 1843)
Genus: Ailurus (F. G. Cuvier, 1825)
Species: *Ailurus fulgens (*F. G. Cuvier, 1825*)*
Common name: Himalayan Red Panda.
Local Name: Habre, Pundekundo (Nepali), Hopdunga (Bhutia)

Figure 1. An adult *Ailurus fulgens* was seen for the first time in LachungReserve Forest (North Sikkim, Non-PA) (A), and a fresh pug mark was sighted in Barsey Rhododendron Sanctuary (West Sikkim, PA) during post-monsoon survey in 2019-20 (B)

1.2 Distribution and population status:

The distribution of the red panda is not continuous but rather discrete throughout this range (Roberts and Gittleman, 1984). The global range of the species includes India, Nepal, Bhutan, Myanmar, and Southern China (Choudhury 2001). The Westernmost limit of the species is Mugu district (western Nepal) and the easternmost limit is Minshan Mountains and upper mean valley of Sichuan province, South-central China mostly restricted to temperate mixed coniferous, broadleaved forests and Sub-alpine forests of Eastern Himalayas except for sub-tropical forest ranges in Meghalaya, India (Chaudhury, 2001). These two distinct species of red panda are found in isolated pockets of China and India. They are biogeographically separated by the Nu Jiang river in China (Choudhury, 2001) and the Siang river in Arunachal Pradesh, India (Joshi et al. 2021). Towards west, *Ailurus fulgens fulgens* occurs in Bhutan, Nepal, India, Northern Myanmar and China (Southern Tibet and western Yunnan) and Ailurus fulgens styani occurs in the east, in south-central China (Sichuan and Yunnan) (Choudhury, 2001), and recently this species has marked its range in the Dibang Valley of eastern Arunachal Pradesh, India (Joshi et al. 2021). In India, it is found in Sikkim, West Bengal (Darjeeling district), Arunachal Pradesh and Meghalaya. Although its range is known, no population estimates or abundance studies have been performed across its distribution range due to various limitations within the species and its rugged landscape, andits population trend graph is undoubtedly still unknown and frequently declining. It is categorized as 'Endangered' species by IUCN Red List of Threatened Taxa.

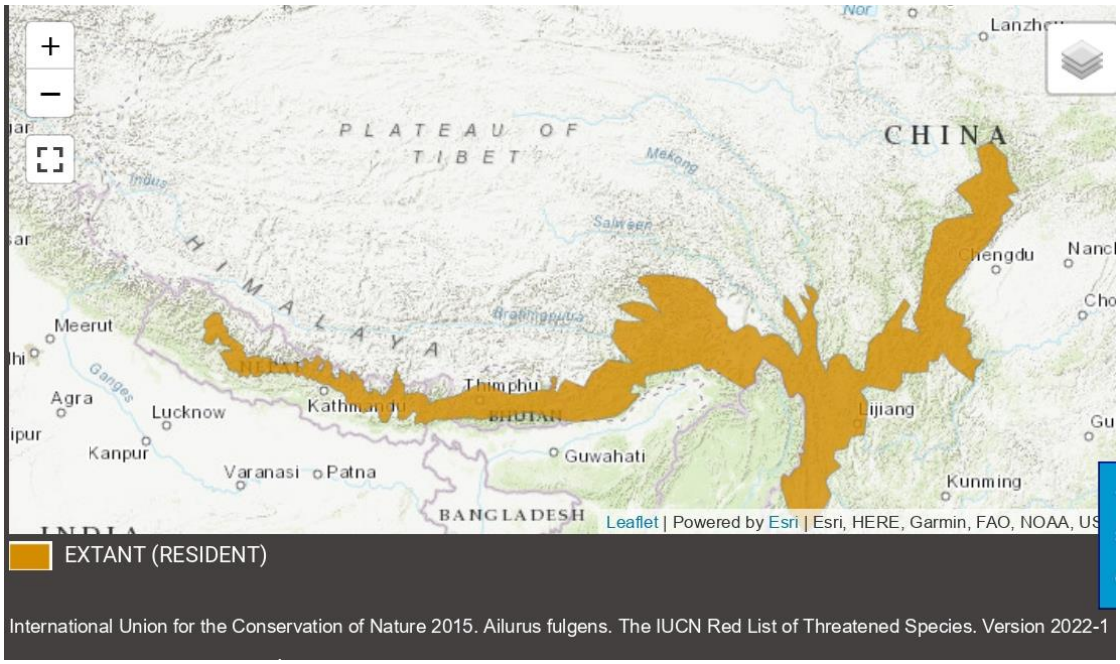

Figure 2: Map showing the global distribution of *Ailurus fulgens* (IUCN, Version 2022)

1.2.1 Global distribution:

Country	Population estimate (plus references)	Distribution	Population trend (plus references)
India	Between 5000 and 6000 individuals (Glatston et al., 2015)	Red Panda is reported from three states in India namely, Sikkim, Arunachal Pradesh and West Bengal. Although it has also been reported in the state of Meghalaya, from Balapakram and Nokrek National Park in Garo hills area (Choudhury, 1997), it has however not been confirmed from there in recent times	Population is declining throughout its distribution range (Choudhury 2001).
China	Around 6000–7000 individuals (Glatston et al., 2015).	The original range included western Sichuan and Yunnan, south-eastern Tibet, southern Qinghai, Shannxi and Gansu, northern Guizhou province (Allen, 1938; Expedition of Rare Animal in Gansu, 1976; Expedition of Rare Animal in Sichuan, 1977; Hu and Wang, 1984; Feng et al., 1986; Gao, 1987; Kunming Institute of Zoology, 1989; Northwest Plateau Institute of Biology, 1989). However, its present range retreated sharply so that it now is confined to Sichuan,Yunnan and Tibet.	Rapid population declines have been reported for the species in China (40% decline over the last 50 years) (Wei and Zhang 2011)
Nepal	317–582 individuals (Glatston et al., 2015)	Red Panda's distribution has been confirmed from 24 districts of the country, while 12 additional districts have been identified to have potential Red Panda habitat when a Population and Habitat Viability Assessment (PHVA) was undertaken (Jnawali et al., 2012)	The overall population in the country is declining, Population of Red Pandas is estimated at 237 to 1061 in Nepal (RPN, https://thehimalayantimes.com/opinion/conserve-red-panda)
Bhutan	No estimation has been undertaken	It is distributed in 13 districts (Haa, Thimphu, Paro, Punakha, Wangdiphodrang, Gasa, Trongsa, Zhemgang, Bumthang, Mongar, Lhuntse, Trashigang, and Trashiyangtse) (Glatston et al., 2015)	Very little is known about the status of the Red Panda in Bhutan. It continuous to decline in number (Dorji et al., 2012)

Northern Myanmar	No estimation has been undertaken	Red Pandas occur in the Northern Forest Complex, which is the largest tract of forest in the country covering about 12,000 square miles (31,000 square kilometres). This complex comprises of Hponkanrazi Wildlife Sanctuary, Hkakaborazi National Park, Bumphabum Wildlife Sanctuary and the largest tiger reserve in the world, the Hukaung Valley Tiger Reserve. (https://news.mongabay.com/2014/11/saving-myanmars-red-pandas-by-protecting-land-educating-people/)	Very less information is available

1.2.2 Local distribution:

Country	Region / province	Site	Level of Protection	Population size	Reference(s)	Notes
India	Sikkim	Covering 7 sites Khangchendzonga National Park,Barsey Rhododendron Sanctuary, Shingba Rhododendron Sanctuary, Kyongnosla Alpine Sanctuary, FambongLho Wildlife Sanctuary, Pangolakha Wildlife Sanctuary, Maenam Wildlife Sanctuary	Protected	As per an estimate the population of Red Panda in Sikkim was estimated to be around 225–370, distributed over 650 sq. km of suitable forest area. Another estimate, however puts the population in Sikkim at 250–300 individuals	Ziegler et al., 2010, Jnawali, 2012 WWF	
India	Sikkim	Lachung,Lachen,Tung, Naga(North); Yali,Tumin (East) Labdang,Bhareng, Sindrabong(west) Sada(South)	Non-Protected	Population size is unknown		Distribution study has been initiated by EDGE Fellow

India	West Bengal (Northern)	Singalila National Park and Neora Valley National Park	Protected	Estimated 55–60 individuals	Roka and Jha 2014 Mallick 2010	
India	Arunachal Pradesh	Red Pandas have been reported from 11 districts of the state viz;Changlang, Dibang Valley, East Kameng, East Siang, Lohit, Lower Subansiri, Upper Siang, Upper Subansiri, West Kameng, West Siang, and Tawang	Protected and community forest both		Choudhury 2001	

1.3 Protection status:

Red panda (*Ailurus fulgens*) is currently listed as 'Endangered' category of the IUCN Red List of threatened species, and has been listed under the Schedule - I of Indian Wildlife (Protection) Act, 1972, which is the highest protection level for a species in the country.Although the species is found in 5 countries, it has different protection status in different countries.Except for Nepal, Bhutan and China, other countries have not developed or prepared any action plans for red pandas.A 5-year Red Panda Conservation Action Plan (2018–2023) has been developed so far only by Nepal and Bhutan (Government of Nepal, Ministry of Forests and Environment, Department of Forests and Park Services, Ministry of Agriculture and Forests, Bhutan). Most of the studies and previous research works for conservation have been conducted in China followed by Nepal, Bhutan and India. Little information is available on the security status from Myanmar.Many NGOs, government agencies and independent researchers in India have proposed state-level conservation management plans for red panda in Arunachal Pradesh, Sikkim, West Bengal based on advanced habitat analysis and stakeholder consultation enhancing capacity to train forest officials for regular monitoring reducing firewood or timber extraction through community participation and recognizing conservation areas or community-led red panda habitats. But still, it is in the process.

1.4 Ecology, behaviour and habitat requirements:

Red Panda (*Ailurus fulgens*) is one of the earth's living fossils, and its ancestor can be traced back to tens of millions of years ago with a wide distribution across Eurasia (Mayr., 1986).Thus, the Red Panda has no close living relatives and they are the only sole surviving species - a specialized offshoot existing till the glacial period in Eastern Himalayan ranges. However, some new information came recently in Evolutionary Biology 'Genomic evidence for two phylogenetic species and long-term population bottlenecks in Red Pandas' and they have concluded that there are two different species of Red Pandas existing now. The Himalayan Red Panda (*Ailurus fulgens fulgens*), resident of the Eastern Himalayan forest (Nepal, Bhutan and India's states Sikkim, West Bengal and Arunachal Pradesh) and Chinese Red Panda (*Ailurus fulgens styani*), lives in the mountain region of Northern Yunan province, China.It occupies specialized habitat and has been proposed as an indicator species for monitoring the integrity of Eastern Broadleaf and Conifer eco-region (William, 2003). The distribution of Red Panda is disjunct and its elevation range spans from 1500 to 4800 meter above mean sea level (Choudhury et.al., 2001).

However, some researchers suggest that the species may range between 2200 m and 4000m (Roberts and Gittleman 1984). Red Panda undergoes seasonal migration, going up during summer and coming down during winter, dwelling in the temperate and sub-tropical forest of the Eastern Himalaya in which their preferred habitat are typically characterized by the presence of mixed deciduous and coniferous forests with a bamboo thick understory and higher density of fallen logs and tree stumps at ground level, high density tree, rhododendron shrubs in the mid storey and site that are close to the water sources (Roberts and Gittleman, 1984; Chakraborty, 1999; Pradhan et.al., 2001b; Ghose et.al.,2011). Studies have also indicated that vegetation characteristics and habitats close to water sources are strong predictors of habitat use (Ahlering et al., 2010; Bista et al., 2019; Pradhan, Saha, & Khan, 2001; Wei, Feng, Wang, & Hu, 2000; Yonzon& Hunter, 1991; Zhang, Hu, Han, & Wei, 2011; Zhou et al., 2013). However, habitat requirements for the Red Panda vary across different landscapes.Red Panda is about 100 cm in length with its body being about 60 cm and tail about 40 cm long. Adult Red Panda in the wild weigh 4 kg while in captivity; they weigh 4-5 kg (Roberts and Gittleman, 1984).They have large round heads and short snouts with large, pointed ears. They have long, thick bushy tails that have red and white alternating rings. Red Panda is slow, timid and arboreal and they use its sharp curved claws to climb trees. It descends from trees facing downwards by gripping the tree bark with its hind feet. They are more active during the day than the night and are primarily crepuscular. They show higher activity during the spring, summer, autumn than winter (Zhang et.al, 2011). They are mostly seen sleeping in the tree hollows and branches (William, 2004). They curl up with their head tucked under the hind leg while sleeping and resting (Chakraborty, 1999). Red Panda has glandular sac in its anal region secreting the scent to mark its territory (Mahato, 2004). They are known to be habitat specialist maintaining a small home range varies between 1.38 sq.km.(Yonzon et.al 1991, Zhang et.al 2011) and3.78 sq.km.Home range often varies depending on different conditions availability of forest cover, density of roads, disturbance factors that select its activity pattern annually or seasonally (Bista et. al. 2021). The males have larger home range than females. Red Panda feed large amount of food due to the presence of less calorie found in the leaves of bamboo and repeatedly use same spots for defecation.Red Pandas are solitary animals except while mating. They breed once a year (Glatson et al., 2015). Mating occurs in early winter usually between early January and mid of March and giving birth in summer but mainly in June (Roberts and Gittleman, 1984; Mahato 2004; Glatson et al., 2015). The young ones become sexually matured mature at 18 months and female can give birth for the first time after two years of her birth (Mahato, 2004; Glatson et al., 2015). Litters usually can have up to four cubs.

1.5 Threat analysis:

Threat	**Description of how this threat impacts the species**	**Intensity of threat** *(low, medium, high, critical or unknown)*	**IUCN threat category**
Habitat loss/ forest fragmentation	Habitat loss and fragmentation are interrelated. As Red Panda is essentially arboreal in nature, forest-dwellers species, one of the main conservation concerns, deforestation, relates directly to this species. Almost 50% of the Red Panda's roosting/nesting trees have been damaged due to several causes (WWF). Rapid human population growth in the Eastern Himalayas is causing deforestation, degradation and fragmentation of the Red Panda habitat. Habitat is being fragmented by many developmental projects including roads, railway, hydro-projects, electric transmission lines, human settlement, agricultural conversion and anthropogenic forest fires etc. unsustainable use of forest by-products like timber, fuel wood, fodder, non-timber forest product (NTFP) and bamboo is depleting forest resources and reducing the forest quality. Deforestation is a problem confronting the Red Panda through most of its range, Sikkim as well. The loss of forest has a still greater influence on the Red Pandas population than other species, since deforestation can also lead to the loss of bamboo, Red Panda's staple diet; loss of large trees, Red Panda's roosting/nesting place.	Critical	1 Residential & commercial development 1.2 Commercial & industrial areas 1.3 Tourism & recreation areas 4 Transportation & service corridors 4.1 Roads & railroads 5. Biological resource use 5.3 Logging & wood harvesting 6 Human intrusions &disturbance 6.1 Recreational activities 6.2 War, civil unrest & military exercises 6.3 Work & other activities 10 Geological events 10.3 Avalanches/landslides 11 Climate change & severe weather 11.1 Habitat shifting &alteration
Pressure on forest resource	Mainly the rural people are mostly dependent on the forest products. There is continuous procurement of Timber/Non-timber forest products from the Red Panda forest by the village people. Mostly they extract edible plants, bamboo, medicinal and fodder plants and tree logs/stumps The extraction of forest products is one of the threats to Red Panda as it disturbs its habitat (Choudhury, 2001).	High	5. Biological resource use 5.3 Logging & wood harvesting

Feral Dogs	Feral dog is the predominant threat to the Red Panda. The killing of Red Panda by dog has been reported in several times by number of authors (Dorji et al., 2012; Ghose and Dutta, 2011). The large number of dog are kept by Army personal and herders (to deter the predator), which kill the Red Panda. The dogs are also thought to be carriers of canine distemper infection, which is fatal to Red Panda. Coming to the field observations, Eastern and Northern sites of Sikkim (Kyongnosla AS, Pangolakha WLS, Lachung, and Lachen) are very affected by the free ranging domestic dogs, it also threaten for Red Pandas and other wildlife. There are many reports of stray dogs killing Red Pandas in Nepal, Bhutan and India (Bista&Paudel, 2014; Dorji et al., 2012; Williams, Dahal, &Subedi, 2011).	High	12 Other options 12.1 Other threat
Unplanned developmental activities	Unplanned developmental activities in the Eastern Himalaya, which hold extensive potential Red Panda habitat, have lead to habitat destruction. The construction of large dam, bridge, road network, industries and mining activities has adverse impacts on Red Panda and its habitat. The growing population size in this region has enforced severe pressure on the forest. In Arunachal Pradesh and Sikkim, the construction of road has affected large areas of the forest (Choudhury, 2001). The road construction involves huge scale felling of trees. The destruction of forest might effects the movement of largely arboreal mammals like Red Panda (Choudhury, 2001). In addition to this, it also fragments the forest into small patches causing inbreeding depression.	Low	1 Residential & commercial development 1.2 Commercial & industrial areas
Unsustainable tourism	As Sikkim being the well-known tourist place, there has been huge increase in tourist between 2006 and 2010 (including both local and foreign tourist) where the visiting of tourist in the state rose annually from 4,39,992 to 7,20,768 (Rizal and Ashokan, 2013) which indirectly increases the requirement of firewood both for cooking and heating that further leads to habitat loss. Tourism activities in most	Low	1.3 Tourism & recreation areas

	regions of Eastern Himalayas are indirectly accelerates the threats to Red Panda and its habitat (Choudhury, 2001; Ghose and Dutta, 2011; Dorji et al., 2012).		
Dearth of awareness	Weak law enforcement, a dearth of the management plan, low Red Panda awareness and lack of research interest are also pressing problem till the date. Being a Sikkim's state animal, approx 30% people (both local and tourists) are still unaware of Red Panda.	Medium	12 Other options 12.1 Other threat
Unwanted poaching/ Accidental killing	Poaching and illegal trade for pelts have been identified as important threats to the red panda, although their intensity varies across different countries (Badola, Fernandes, Marak, &Pilia, 2020; Bista, Baxter, & Murray, 2020; Xu & Guan, 2018). In recent days, hunting is not a major threat to Red panda but un-intentional killing by poachers may occur in the snares kept for other animals like Musk Deer, Goral, Pheasants, Asiatic Black Bear etc because they share common habitat (Dorji et al., 2012; Ghose et al., 2011).	Low	5. Biological resource use 5.1 Hunting & collecting terrestrial animals 5.1.1 Intentional use (species being assessed is the target) 5.1.2 Unintentional effects (species being assessed is not the target)
Livestock grazing and establishment of cattle sheds	Livestock grazing within the potential habitat has been reported to adversely affect the Red panda presence in respective countries (Dorji et al., 2012; Sharma et al., 2014). In Sikkim, livestock grazing within protected land has been prohibited since a long back. Main concern is in non protected areas, but still it is very minimal as compared to other states/countries. The establishment of cattle sheds in the middle of the forest can be a major obstacle that leads to the fragmentation of different forest parts and the loss of red panda habitat.In addition to grazing or trampling;collection of timber, fodder and malingo (bamboo) are also threats to red panda habitat (Thapa et. al. 2013)	Medium	2.3 Livestock farming & ranching 2.3.1 Nomadic grazing 2.3.2 Small-holder grazing, ranching or farming

1.6 Stakeholder analysis:

Country	**Stakeholder**	**Stakeholder's interest in the species' conservation**	**Current activities**	**Impact** *(positive, negative or both)*	**Intensity of impact** *(low, medium, high or critical)*
International	Zoological Society of London (ZSL), EDGE of Existence Programme, Wildlife Institute of India (WII), Conservation Leadership Programme (CLP)	Research and conservation Policy making	Support in terms of funding for the project and supervision of the project. Collaborations in research, international exposure for the species.	Positive because of the efforts to save the species and provides a global exposure for it.	High
Nepal	Red Panda Network (RPN), Government of Nepal Ministry of Forests and Environment	Community-based conservation	Committed to the conservation of wild red pandas and their habitat through the education and empowerment of local communities.	Positive due to safeguarding the red panda habitat through community participation	High
India	State Forest departments	Conservation and management	Supporting project activities, Provide permits along with logistical support.	Positive impact for species conservation and management through staff training, regular monitoring and strategic planning	High
India	Local NGOs work within the state	Conservation activities	Support project activities in local areas through monitoring, training and consultation levels	Both, Positive They make connections that help get new projects for the species on a regular basis Negative, if there are any conflict of interests	High
India	Other Government bodies (ZSI/ BSI)	Identification, reviews/suggestions, research	Help in animal/plant taxonomical identification,	Positive impact on species conservation through noble	Medium

			genetics/molecular studies	research and findings	
India	Field assistants	Field monitoring	Holds knowledge on the species and more likely to interact with the species.	Positive	Medium
India	Local Community	Community conservation	Engaging local communities in research and outreach activities to strengthen networks	Both The community plays an important role in conservation, always supporting initiatives but sometimes certain mindset change can have a negative effect on it	Critical
India	Advisors	Research and management	Supervise in all project related doubts	Positive	High

1.7 Context and background information that will affect the success of any conservation action for this species:

	Description	Barriers to conservation	Opportunities for conservation
Socio-cultural effects and cultural attitudes	Local communities' living in the periphery of Red Panda habitats mostly are economically poor and mostly depends on forest goods (Timber and NTFP both), and some of them are following their traditional approach. They primarily use woods that Red Panda uses for roosting/nesting/feeding purposes. Field observations made in some study sites have revealed extensive spatial overlap in forest resource usage between red panda and villagers. Their major source of income for livelihood is agriculture, rearing cattle. Hunting of wild animals for bush meat is common practice of tribal communities. However, Red Panda is not a target species for hunting. However it was reported that Red Pandas are still getting killed if caught in snares laid for other mammals. Most of the villages suggested that the "*Apotolo*" (the traditional headgear made of Red Panda fur) is no longer preferred or sought after.	Protection of specific plant species, alteration of resource usage, people understanding are major barriers to conservation of the species.	Possibilities of alternative livelihood opportunity for local communities, engaged as a 'Forest Guardian' to safeguard nearby forest. Train and employ them as a field assistant in several projects in this landscape.

Economic implications	Usually the livelihood of villagers is associated to forests and forest resources. They extract woods, medicinal plants, bamboos, fodder plants, fruits, vegetables etc.	If restriction is to be issues, somehow it may directly or indirectly effect on their economy.	The widespread poverty and lack of other income generating opportunities often make these people resort to over-exploitation of forest resources.
Existing conservation measures	There is no existing Red Panda conservation management plan as such.	The management and conservation strategies may affect the traditional rights of local people. Taking these concerns, the involvement of local people in formulation of effective management plan would be helpful in its implementation.	Develop a state-level management plan for Red Panda based on advanced habitat analysis and stakeholder consultation and ensure its implementation.
Administrative/political set-up	The administrative set-up is functional at different levels across the state in India. Any proposed project related to the species must have written permission signed by the Principal Chief Conservator of Forests and Chief Wildlife Warden (PCCF & CWW) of the state. Any project involving sample collection or handling of scheduled species requires written permission from the central authority, i.e. Ministry of Environment, Forests and Climate Change and then from the PCCF and CWW of the state(s). Later it is transferred to the concerned departmental officer (DFO) who is responsible for overseeing the implementation of various projects in their divisions.	Permit acquisition as well as decision-making processes at various levels of the administrative and political set-up usually require extremely long periods of time.	Active participation emphasizes positive attention to the species at the national level.Also, building rapport with officials and continuous communication helps implement action plans for the species.

Local expertise and interest	Govt organisations (FEWMD, SBB), Committee (EDC, JFMC) and NGOs (ZSL, WWF, ATREE), Sikkim University are acquainted about the significance the species through research, education and communication build up. However, people living near existing Red Panda Hotspots, most of them are aware of the species and its behaviour. Local guide, porters have very good knowledge and field experiences on Red Pandas. Frontline forest staffs are also aware of Red Pandas ecology, theytrackingskills, good detection power.	Local communities are not aware about the legal protectionstatusand importance of the species. Even though, many of them are not interested in conservation of Red Pandas.	Capacity building training like sensitisation programmes, hands on training programme, species monitoring skills for frontline forest staff and awareness programme for local communities will raise interest for the species.
Resources	Difficult terrains, ample funds, inaccessibility, lack of trained manpower are major constraints in red panda research.	Lack of resource, less availability leads to ruin of the research work.	Availability of these resources can help in understand more about species and their habitat.

2. ACTION PROGRAMME

Vision (30-50 years)	
Long-term conservation of endangered Red Panda (*Ailurus fulgens*) and its habitat in Eastern Himalayan Landscape	
Goal(s) (5-10 years)	
Augment the protection of the existing Red panda hotspots in Sikkim	
Objectives	**Prioritisation** *(low, medium, high or critical)*
1. Population of Red Panda in existing hotspots (PA's and Non-PA's), Sikkim are well managed	Critical
2. Species-habitat association in respective protected and non-protected sites	High
3. Existing habitat management by reducing threats and restoring habitats in respective hotspots	Critical
4. Create partnership with various stakeholders (Govt and non Govt) to protect Red Panda	High
5. Initiate transboundary collaboration with Nepal, Bhutan and India to initiate joint monitoring mechanism and developing transboundary policies	High
6. Raise public awareness and involve the local communities in the conservation of Red Panda	High

Activities	Country / region	Priority *(low, medium, high or critical)*	Associated costs (INR)	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Objective 1: Population status of Red Panda in existing hotspots (Protected and non-protected areas), Sikkim are well managed								
Population monitoring in selected red panda hotspots	India/Sikkim	Critical	500000/year	3 years	WII, ZSL, State Forest Department	Half-yearly Report, Annual Report	Permits, Manpower	Species management
Inaugurate captive breeding programme with Himalayan Zoological Park, Sikkim	India/Sikkim	Critical	5000000	10 years	WII, ZSL, State Forest Department, MOEFCC	Monthly monitoring Report, Day basis	Permits, Manpower, Funds	Species management
Threats control and measure in in-situ and ex-situ programme	India/Sikkim	Critical	200000/year	5 years	WII, ZSL, State Forest Department, Locals	Monthly Report	Permits, Approval from Local community	Species management
Objective 2: Species-habitat association in respective protected and non-protected sites								
Habitat assessment in protected and non-protected sites in distinctive seasons	India/Sikkim	High	300000/year	10 years	WII, ZSL, State Forest Department, Sikkim University, Local NGOs	Habitat Assessment Report, Half Yearly	Manpower, Inaccessibility	Knowledge Improvement
Mapping existing sites based on habitat suitability and species presence data	India/Sikkim	High	50000/year	Between 5 years	WII, ZSL, State Forest Department, Sikkim University, Local NGOs	Map, Half Yearly	Technical glitches, wrong detection	Knowledge Improvement

Activities	Country / region	Priority *(low, medium, high or critical)*	Associated costs (INR)	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Identify the nesting sites preferably the nesting tree	India/Sikkim	High	200000/year	5 years	WII, ZSL, State Forest Department, Sikkim University, Local NGOs	Half Yearly, Annual	Manpower, Inaccessibility	Knowledge Improvement
Objective 3: Existing habitat management by reducing threats and restoring habitats in respective hotspots								
Threats reduction: Alteration of forest products specially woods and bamboos	India/Sikkim	Critical	200000/year	5 years	WII, ZSL, State Forest Department	Half Yearly, Annual	Manpower, Inaccessibility	Habitat Management
Plantation of preferred trees by red panda and bamboos	India/Sikkim	Critical	1000000	5 years	WII, ZSL, State Forest Department, local NGO's	Restoration Report	Manpower, Inaccessibility	Habitat Management
Protect the Non-PA's by declaring community conservation forest	India/Sikkim	Critical	500000	5-10years	WII, ZSL, State Forest Department, local NGO's	PBR/Work Report	Conflict of Interest between stakeholders	Policy Making
Habitat management Protocol for PA's and Non-PA's	India/Sikkim	Critical	200000	5 years	WII, ZSL, State Forest Department, local NGO's	Management Protocol	Technical glitches, Conflict of Interest	Policy Making
Engage local youth for monitoring the species and its habitat	India/Sikkim	High	200000	5-10years	WII, ZSL Local community, students	Final Report	Local engagement, less interested people	Habitat Management

Activities	Country / region	Priority *(low, medium, high or critical)*	Associated costs (INR)	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Objective 4: Create partnership with various stakeholders (Govt and non Govt) to protect Red Panda								
Awareness and Sensitization workshop involving multiple stakeholders and line departments to share lessons and create best landscape level approaches	India/Sikkim	High	1500000	5 years	WII, ZSL, State Forest Department, WWF India, Students, Dzumsa/Panchayat/ Local committees	Final Report	Local engagement, less interested people, any climatic/environmental factors/disease outbreak	Species and habitat management
Establish a formal partnership between govt and non-govt organizations include a Memorandum of Understanding (MOU).	India/Sikkim	High	1000000	5-10years	WII, ZSL, State Forest Department, WWF India, other local NGOs	Final Report	Less interested Partners, Political issues, or any conflict of interests	Species and habitat management
Coordination, consultation, knowledge sharing and M&E workshop of ongoing project	India/Sikkim/West Bengal/ Arunachal Pradesh	High	1000000	5-10years	WII, ZSL, State Forest Department, WWF India, other local NGOs	Final Report	Less interested Partners, Political issues, or any conflict of interests	Species and habitat management
Develop a comprehensive landscape level conservation plan for red pandas include objectives, strategies, actions, monitoring and evaluation.	India/Sikkim/West Bengal/ Arunachal Pradesh	Critical	1000000	5-10years	WII, ZSL, State Forest Department, WWF India, other local NGOs	Management Protocol	Conflict of Interest between stakeholders, less supports, technical errors	Policy making

Activities	Country / region	Priority *(low, medium, high or critical)*	Associated costs (INR)	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Objective 5: Initiate trans-boundary collaboration with Nepal, Bhutan and India to initiate joint monitoring mechanism and developing trans-boundary policies								
Trans-boundary coordination consultation between Nepal, Bhutan and India for piloting joint monitoring in the trans-boundary landscape and exchange of best practices	India/Nepal/Bhutan	High	1500000	10years	State Forest Department (Country level), WWF India- Nepal-Bhutan, Red Panda Network, ZSL, WII, Experts	Final Report	Less interested Partners, Inter or Intra regional/country issues, or any conflict of interests	Species and habitat Species and habitat management
Development and distribution of cross-border information sharing protocol (module) integrating management protocols	India/Nepal/Bhutan	High	500000	10years	State Forest Department (Country level), WWF India- Nepal-Bhutan, Red Panda Network, ZSL, WII, Experts	Management Protocol	Conflict of Interest between stakeholders, less supports, technical errors	Policy making
Assessment and monitoring of trans-boundary corridors and evaluating areas based on prior results	India/Nepal/Bhutan	High	2000000/year	10years	State Forest Department (Country level), WWF India- Nepal-Bhutan, Red Panda Network, ZSL, WII, Experts	Habitat Assessment Report, Final Report	Manpower, Inaccessibility	Knowledge Improvement/Management

Activities	Country / region	Priority *(low, medium, high or critical)*	Associated costs (INR)	Time scale	Responsible stakeholders	Indicators	Risks	Activity type
Objective 6: Raise public awareness and involve the local communities in the conservation of Red Panda								
Capacity building programme forest staffs for long tern monitoring	India/Sikkim	High	500000/year	5 years	ZSL, local NGO's Local community, students	Event Report	Local engagement	Education Awareness
Form a Nature club for Red Pandas: raise the voice amongst students	India/Sikkim	High	500000/year	5 years	ZSL, local NGO's Local community, students	Event Report	Local engagement, less interested people	Education Awareness
Awareness programmes with Nature club members	India/Sikkim	High	500000/year	5 years	ZSL, local NGO's Local community, students	Event Report	Local engagement, less interested people	Education Awareness
Meeting with stakeholders	India/Sikkim	High	200000/year	5 years	ZSL, local NGO's Local community, students	Event Report	less interested people	Education Awareness
Inaugurate Red Panda Tourism/ Wildlife Tourism Model across Sikkim	India/Sikkim	High	1000000/year	5-10years	ZSL, local NGO's Local community, students	Training report	Local engagement, less interested people	Alternative livelihood
Celebration Red Panda day and Red Panda Fair with locals	India/Sikkim	High	100000/year	5 years	ZSL, local NGO's Local community, students	Event Report	Local engagement, less interested people	Education Awareness

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