WILDLIFE MANAGEMENT PLAN

Construction of Sinlekh Bungli Motor Road

Gangolihat Range

Pithoragarh Forest Division

Project Cost- Rs. 14.45 Lakh

Wildlife Management Plan

Project Name	- Construction of Sinlekh Bungli Motor Road
Proposed area	- 3.2 Ha
Range	- Gangolihat
Project Cost	- Rs. 570.90 Lakh
Wildlife Management Plan (minimum 2%)	- Rs. 14.45 Lakh

Introduction

Wildlife management is a science and art of maintaining/changing the characteristics and interactions of habitats, wild animal populations and activities of people in order to achieve specific goals of conservation. The Wildlife Science is of recent origin in India and scientific information base is developing slowly. Wildlife management in India is integral to mainstream forest management, yet, as a resource needing scientific management. Management of wild life is essentially multidisciplinary and the success of strategies lies in ensuring multidisciplinary inputs to the extent needed. Wildlife conservation aims to prevent the loss in the earth's by taking into consideration ecological principles such as carrying capacity, disturbance, succession and environmental conditions such as physiological geography, pedology and hydrology with the aim of balancing the needs of wildlife with the needs of people.

Pithoragarh

Pithoragarh district is the easternmost Himalayan district in the state of Uttarakhand, India. It is naturally landscaped with high Himalayan mountains, snow-capped peaks, passes, valleys, alpine meadows, forests,waterfalls, perennial rivers, glaciers, and springs. The flora and fauna of the area have rich ecological diversity.

The Pithoragarh town is located at a height of 1645 meters above sea level. The district lies between 29.4° to 30.3° North latitude and 80° to 81° East longitude along the eastern and southern part of the central Himalayas with Indo-Tibetan watershed divide in the north and the Kali Riverforming a continuous border with Nepal in the east. The Pithoragarh district is surrounded by the national boundaries of China and Nepal. Pithoragarh has one Wildlife Sanctuary i.e.Askot Wildlife Sanctuary having area around 600 sq. Kms. It is situated in Dharchula & Askot range.

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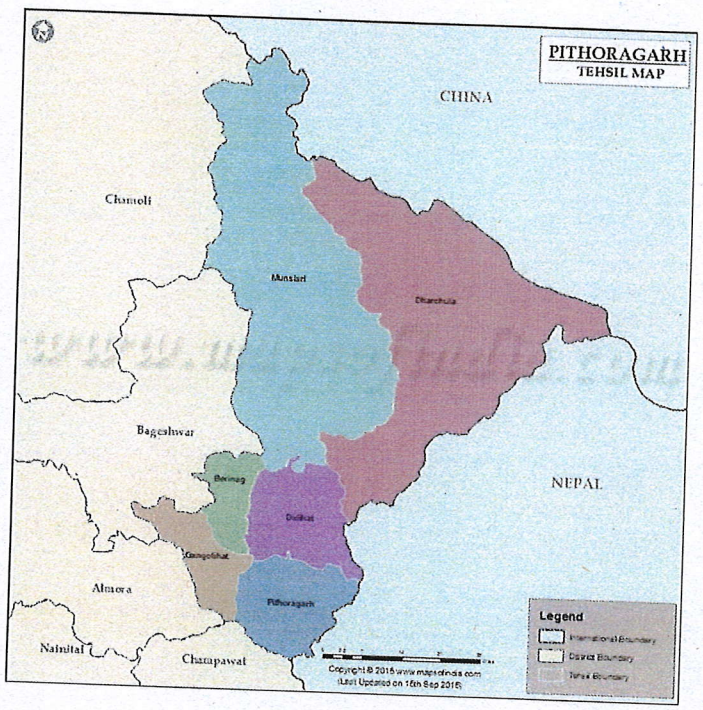

About Pithoragarh Forest Division

Pithoragarh Forest Division is the largest geographical division in Uttarakhand, covering an area of 7250 square kilometers. It is bounded by the Tibet region to the north and the Kali River, forming the international boundary with Nepal, to the east. To the south, it is delineated by the Saryu River and areas of Champawat and Civil Soyam Almora Division, while it shares its western boundary with the Bageshwar forest division and Nanda Devi National Park. The division comprises entirely hilly terrain, with altitudes ranging from 450 meters at Pancheswar, the confluence of the Saryu and Kali rivers, to 7431 meters at the Nanda Devi east peak.

The division was established in 2002 through the merger of the North Pithoragarh forest division and the Pithoragarh range of the former South Pithoragarh forest division. Its geographical coordinates lie between 79° 48' E and 81° 3' E longitude and 29° 27° N and 30° 48′ N latitude.

The area of reserved forest within the division covers 798.53 square kilometers, comprising 58 blocks and 492 compartments, with 50 chaks located within this area. The protected forests span 4602.97 square kilometers, including deemed forest (11.93 square kilometers), civil forest (417.83 square kilometers), van panchayat forest (2729.05 square kilometers), and unclassed lands (1444.51 square kilometers). Consequently, the total forest area amounts to 5401.50 square kilometers, representing 74.5% of the district/division's total area.

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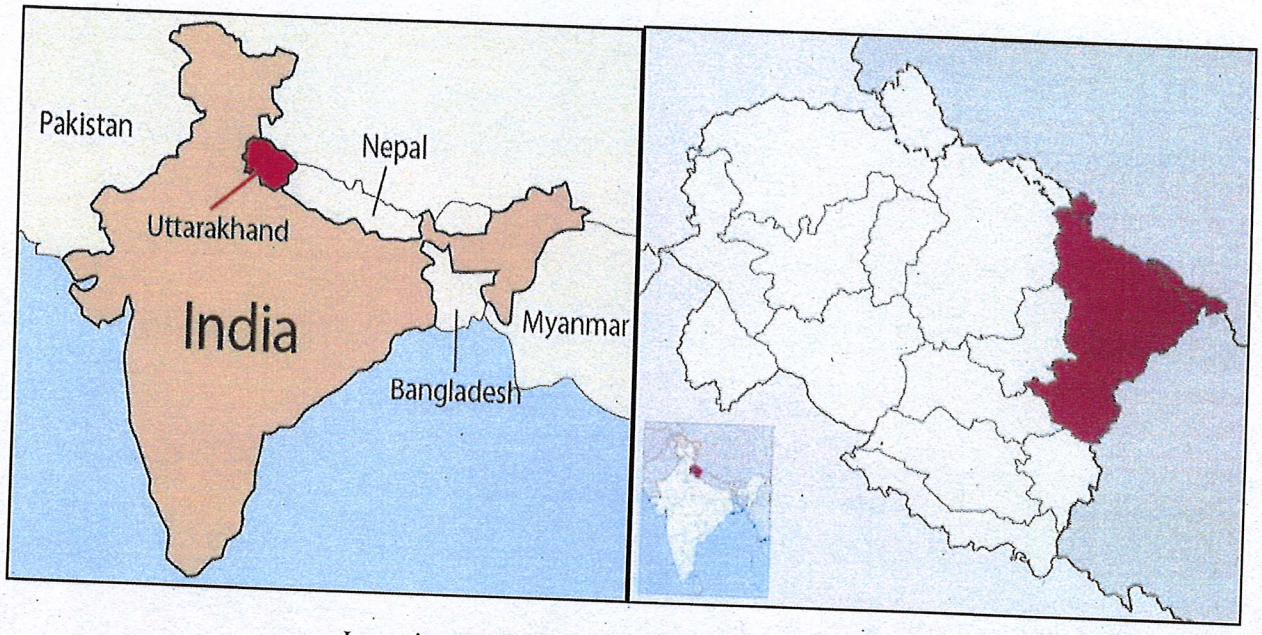
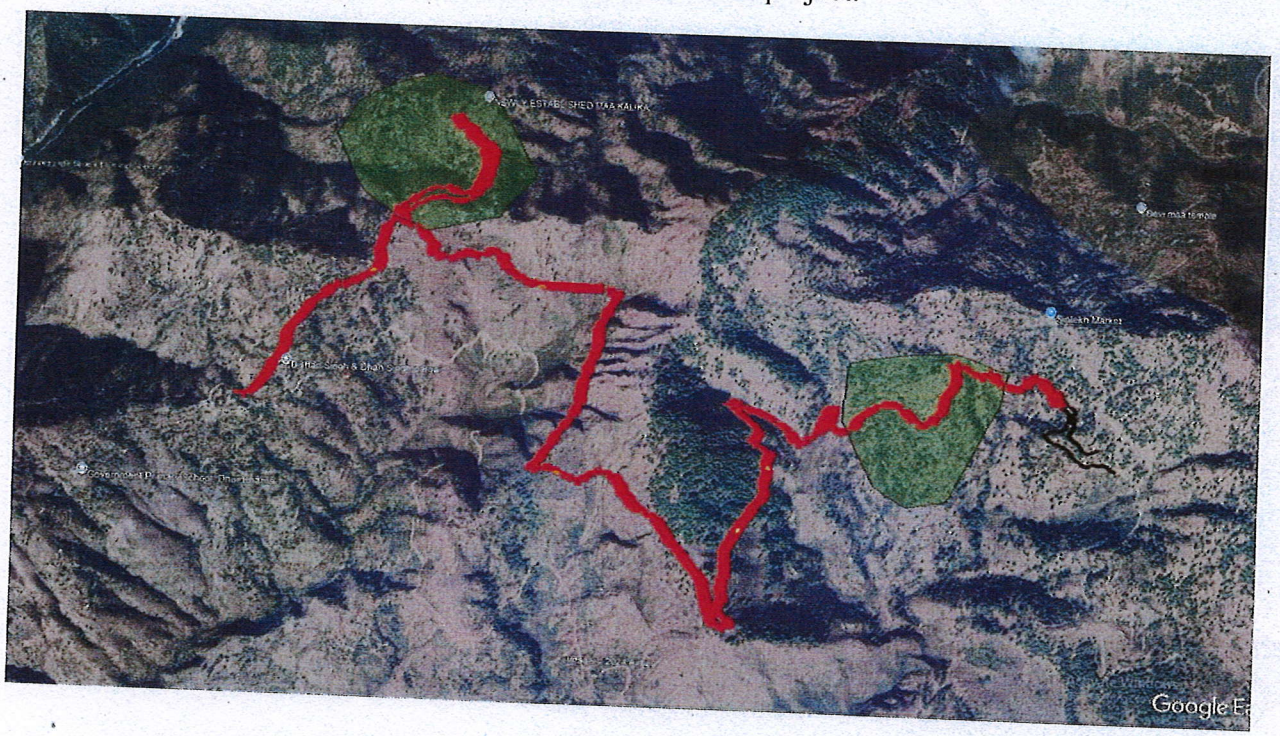


Location Map of Pithoragarh Forest Division

About the project

PWD Berinag has proposed a road with the name Construction of Sinlekh Bungli Motor Road in 3.2 ha forest area in Gangolihat range, Pithoragarh Forest Division. The proposed road length is about 7.55 km and it is passing through the Civil Forest, Van Panchayat & Nap land. About 250 viilagers of village Khatigaon & Bungli will get benefitted from this project.



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Wildlife diversity

The proposed project lies in the Gangolihat Range of Pithoragarh Forest Division. As per the wildlife population estimation carried out in 2016 wild animals like monkey (*Macacamulatta*), langur (*Presbytis entellus*), leopard (*Pantherapardus*), barking deer *(Muntiacusmuntjak),* wild boar *(Sus scrofacristatus)*were enumerated. The results of the estimation were as given in table below:

Species	Nos.
Leopard	275
Black Bear	286
Musk Deer	96

It is pertinent to mention that, unlike All India Tiger Estimation exercise which used intensive use of camera trapping in reserve forests and protected areas, no such method exists for estimation/counting of other animal species. Therefore, actual wildlife population is expected to be far higher than the result of 2016 wildlife estimation. Further, the forest affected in above project has presence of wild animals like Jungle Cat, Leopard Cat, hareand other reptiles. It is clear from data that proposed project area has rich wildlife population.

Human-wildlife conflict

Pithoragarh is primarily aninterior district which shares international border with Nepal & China. As per 2011 census only 18.9% population is urban and rest population lives in villages or rural areas. There are 1651 villages in Pithoragarh district. The villages in Pithoragarh are widely spread and are surrounded by forest in most cases. The people are dependent on forest for fodder, grazing, water, minor forest produce, timber in form of rights and concessions etc. Human Wildlife interaction and human wildlife conflict is frequent.The loss of crops, livestock and/or human life has huge social and economic costs and has negative effects on wildlife conservation efforts of the department. Human-wildlife conflict mostly manifests itself in form of human death/injury, livestock death, crop damage and property damage.

Range wise breakup of number of cases of human death and human injury since 2019:-

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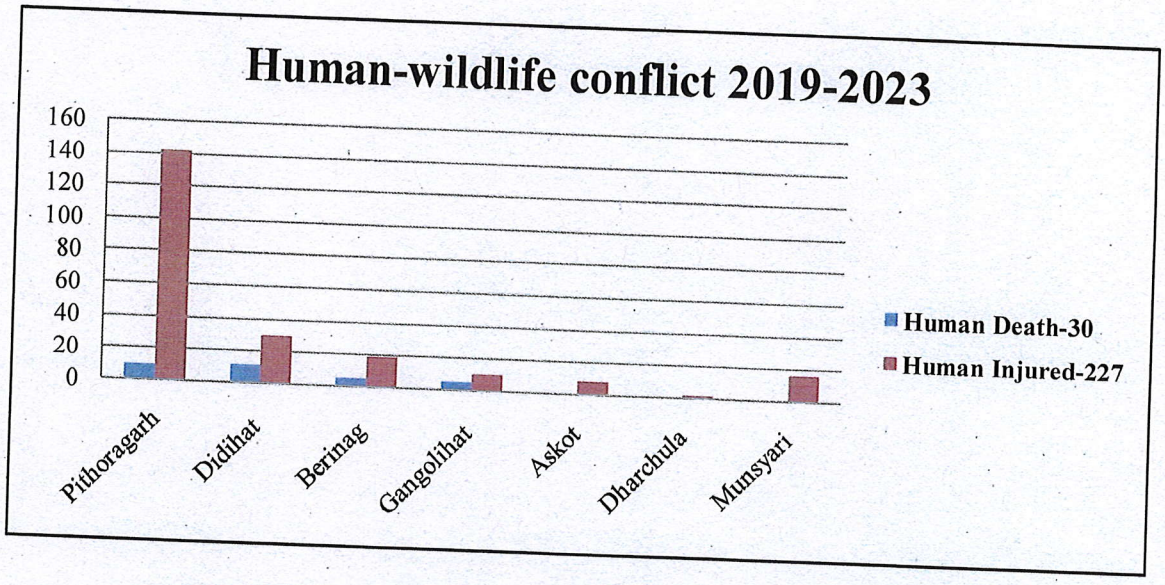

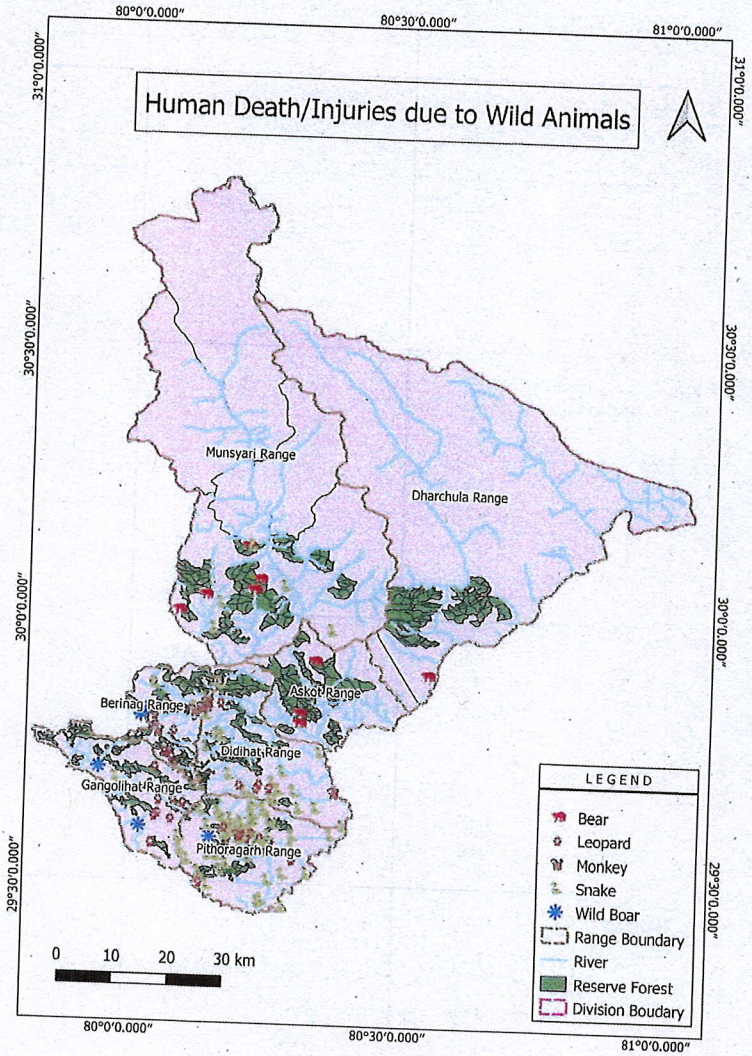

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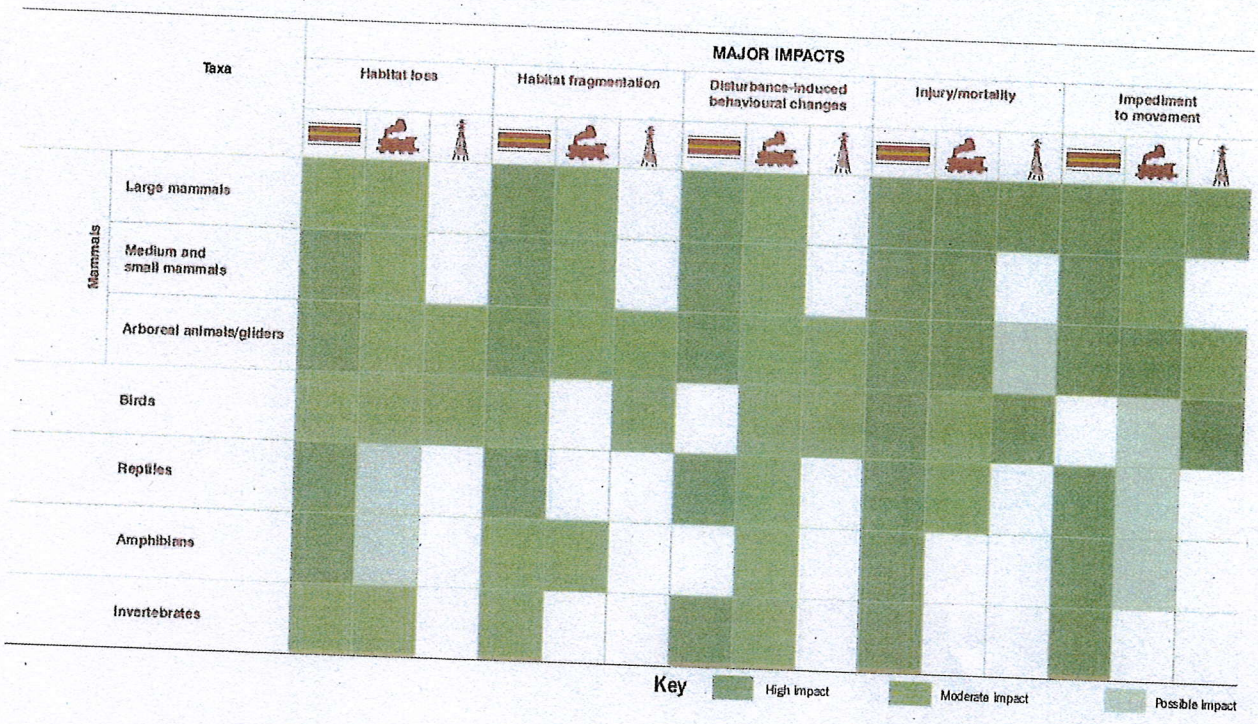
Impact of Chanaulitundi to okhalamamotor road on wildlife

The construction of Sinlekh Bungli Motor Road will invariably lead to increase in vehicular traffic and vehicle speed as mentioned by project proponent in the justification of the need of the present project. This would have direct impact of wild animals in form of increased wildlife accidents, habitat degradation during construction, obstruction to wildlife movement etc. Obstruction to wildlife movement leads to them venturing into human habitation which leads to increase in crop loss, livestock depredation, and human injury/casualty.



Ecological Impacts of Linear Infrastructure on Different Animal Groups

As per the report "**Eco friendly measures to mitigate impact of linear infrastructure on wildlife**" published by Wildlife Institute of India in collaboration with Ministry of Environment Forest and Climate Change,the impact of linear infrastructure on the wildlife is mentioned below-

1. Direct loss of habitat and fragmentation
2. Degradation of habitat quality
3. Noise induced psychological and behavioural change
4. Negative impact of headlight glare on wildlife
5. Road avoidance by wildlife
6. Injury and mortality of wildlife as well as human in road accidents
7. Barrier effect where wildlife stops crossing road altogether
8. Increased human animal conflict

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Proposed wildlife management intervention

The objective of this project is to minimize the impact of road construction on wildlife by habitat improvement, enhancement of protection for wildlife present in this area and to minimize the human wildlife conflict in and around the area. To achieve these objectives the following important interventions have been proposed: -

I. Habitat improvement

Habitat improvement is one of the important components of wildlife management. The prime objective is to improve the existing wildlife habitat by both eliminating the existing adverse conditions and by improving the existing conditions. Some of the interventions are as follows:-

- Remove unwanted species to enhance the ecological integrity of the landscape and planting/sowing of palatable grass.
- Develop and implement habitat restoration plans.
- Strengthen the overall resilience of the habitat to support diverse flora and fauna.

II. Wildlife protection

Wildlife protection is one of the basic components of wildlife management. Historically this landscape is very much sensitive for various types of wildlife poaching and trade. Many cases were registered in past years from this area. Proximity to international border also makes this region very sensitive and vulnerable for wildlife protection. This project addressesthese issues by various interventions. To enhance protection, regular short range and long range patrolling are very much essential. For patrolling in the region, proper patrolling kits for frontline staffs are very much essential, hence procurement of such kits has been provided. Improvement of basic facilities such as repairing of existing forest infrastructure and provision of solar lightings in nearby areas has been provided. Important component of public engagement and sensitisation of different stake holders is also envisaged. Installation of signages for regulation of speed, wildlife awareness along the road and nearby sensitive areas will also be taken up.

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III. Measures to alter human behaviour / Regulatory or prescriptive measures

i. Signage for regulation of speed at sensitive locations.

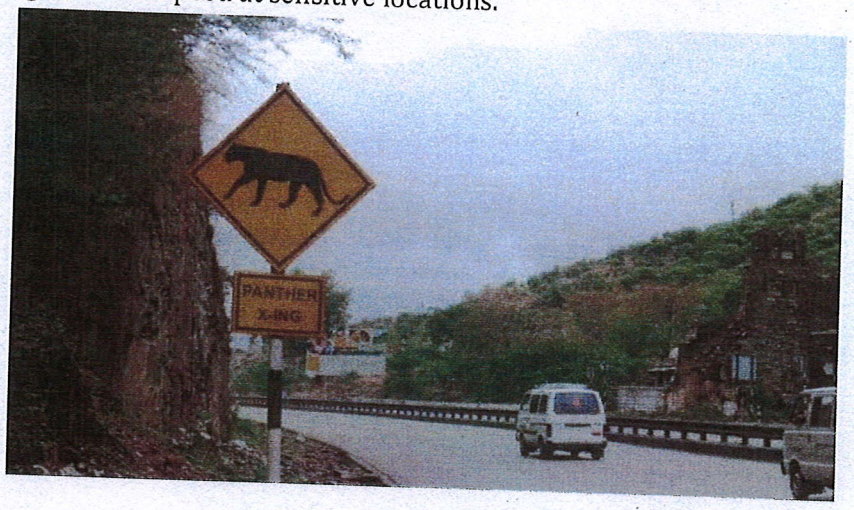

Figure 1 Sample Signboard 1

ii. Signage to stop feeding of wild animals especially langur / monkey on the road.

Figure 2 Sample signboard 2

iii. Signage to prevent accumulation of waste at sensitive locations along the road.

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IV. Measures to alter animal responses / on-site construction and habitat restoration

i. Provision of wildlife crossings

a. Retrofitting and enrichment of the existing culverts along the road.

Modified culverts (culverts with furniture)

Additional features such as walkways or planks should be installed on the interior walls of the underpass, to encourage small and medium-sized mammals to use culverts built on natural drainage sites.

Similarly, in pipe culverts, guard rails or wooden planks may be installed to facilitate movement of small mammals and reptiles through the culvert.

Furniture can and should be added to all types of crossing structures.

Source: Photograph from Clevenger and Huijser 2011.

Figure 3 Modified Culverts

Pipe culverts

These are typically round pipes of relatively small diameter (<1.5 m), made of smooth steel, corrugated metal, or concrete. Although their primary purpose is to convey water under roads or railways, a variety of wild animals has been observed using them as passageways: they are often used by small mammals, reptiles and amphibians. They have also been used as fish passages.

Design considerations:

- Single or multiple pipes should be placed at an appropriate spot.
- Native vegetation should be established on both sides of the culvert to provide cover.

Source: Photograph by Public works department, Government of the Netherlands.

Figure 4 Pipe Culvert

b. Construction of canopy bridge for monkey/langur crossings.

Canopy bridge

This is a rope, pole, rope or wooden ladder or walkway suspended above the road or railway, either from vertical poles or trees, and installed for tree-dwelling species.

Design considerations:

- The bridge should be located in areas having important populations of arboreal species with a high risk of mortality.
- Structures should be taut and wide enough for animals to walk on.
- Each end of the bridge should be connected to trees or bushes for cover.

A thin rope above the bridge can prevent predation of small arboreal mammals by birds.

Figure 5 Canopy bridge

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ii. Measure to reduce use of road surfaces by snakes for thermoregulation.

Thermoregulation has been found to be the primary factor influencing the number of snakes on roads or the time spent on the road surface (Brattstrom 1965; Moore 1978; Sullivan 1981; Bernardino & Dalrymple 1992; Ashley & Robinson 1996). Pragatheesh and Rajvanshi (2013) thus recommend placing strips of different surfaces that may be attractive to thermoregulating snakes next to the road in areas known to have high mortality (Figure 9.8), and testing their effectiveness in diverting snakes from the road surface. Results and practical application of these trials should significantly reduce the mortality of snakes of high conservation importance, including the Indian rock python and Russell's viper.

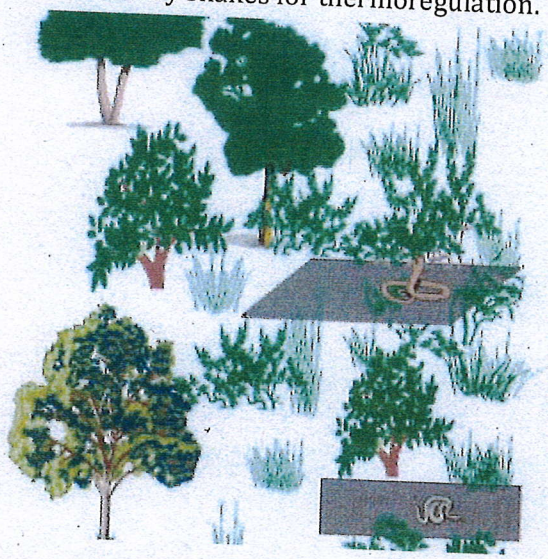

Figure 6 Thermoregulation surface for reptiles

iii. Augmenting the factors of habitat
   a. Clearing vegetation in the 5m belt on both sides of the road.
   b. Creation of water holes at appropriate location inside forest.

iv. Impact monitoring
   a. Changes in movement of wild animals to be monitored by establishing a separate monitoring wing in Almora Range. This wingalso acts as Rapid Response Team / wildlife rescue team. The team will be trained in wildlife rescue, response and mitigation of HWC.

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V. HWC management and mitigation

In recent years human wildlife conflict has become one very sensitive issue in this region. Many such cases related to human-leopard and human-bear conflict were registered in this landscape. These conflicts lead to growing resentment among the local villagers. Hence addressing

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this sensitiveissue is very much essential. In this project, by various interventions, following objectives will be achieved:

- Identify and mitigate conflict hotspots through strategic intervention.
- Implement advanced technologies for early warning systems to reduce HWC incidents.
- Reducing the response time to address the issue.
- Effective monitoring for proactive management strategies.
- Promote community awareness and engagement to foster harmonious coexistence.
- Deployment of QRTs (Quick Response Team) for handling HWC situations and timely intervention.
- Awareness generation among local public & sensitizing them for prevention of conflicts.
- Capacity building of staff for handling HWC cases.
- Equipping the staff with rescue kits, field monitoring equipment, etc for tackling HWC cases.

Proposed Wildlife Mitigation Plan

As per the guidelines issued by Government of India, the state government should submit Wildlife Management Plan, along with detail cost of its implementation into the account of CAMPA along with the Stage-I compliance.

- 2% of total project cost towards the cost of implementation of the Wildlife Management Plan and/or 0.5% of the project cost towards the cost of implementation of Soil and Moisture Conservation Plan, as the case may be, shall be charged from the user agency and deposited into the account of CAMPA and the same may be intimated to the MoEF&CC for the purpose of obtaining approval under the The Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980.
- In respect of linear projects, the stipulated norms of 2% and 0.5% towards the cost of Wildlife Management Plan and Soil and Moisture Conservation Plan, as provided in the Ministry's guidelines dated 8.06.2022, will be proportionate to the extent of forest land involved instead of total project cost or actual cost of implementation of such Plans, whichever is more, should be charged from the user agency.
- The provisions of Wildlife Management Plan or Soil Moisture Conservation Plan shall be approved by the competent authority in the State and accordingly, the deficit amount, if any, from the money already realized from the user agency to the tune of 2% and/or 0.5% of project cost proportionate to the extent of forest land involved, shall be paid by the user agency, and the same shall be deposited in to the CAMPA account.

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Financial Implication of Proposed works

S.N.	Description Of Work	Location	Unit	Rate per unit	1st Year		2nd Year		3rd Year		Total Estimated (In Rupee)	
					Physical	Financial	Physical	Financial	Physical	Financial	Physical	Financial
	Habitat management											
1	Eradication of weeds/removal of invasive species	As per the area identified by forest department	Ha	20000	5	100000	3	60000	3	60000	11	220000
2	Construction of waterholes for wildlife	On location identified by forest department	No.	150000	1	150000	1	150000	1	150000	3	450000
	Wildlife protection											
3	Strengthening/Maintenance of Forest Infrastructure e.g. chowkis/barriers/staff quarter/office/FRH etc.	On location identified by forest department	LS	LS	LS	150000	0	0	0	0	LS	150000
4	Installation of various types of signages for awareness of the vehicular passengers	On location identified by forest department	LS	LS	LS	50000	LS	50000	LS	50000	LS	150000
5	Procurement of High Tech equipment for wildlife rescue e.g. Blowpipe, Jabstick, Axe, Ropes, Ladder, High beam torches, snare poles, tongs, and human wildlife conflict mitigation	RRT	LS	LS	LS	100000	LS	50000	0	0	LS	150000
	Human wildlife conflict management											
6	Procurement of field monitoring equipment e.g. camera traps, binocular, flash light, etc.	Division level	LS	LS	LS	100000	0	0	0	0	LS	100000
7	Administrative expense/office expense/operating expense	Division level	LS	LS	LS	50000	LS	50000	LS	25000	LS	125000
8	Awareness, Extension and sensitization of people for wildlife and Human Wildlife Conflict	Division level	LS	LS	LS	50000	LS	50000	0	0	LS	100000
	Total					**750000**		**410000**		**285000**		**1445000**

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