

सत्यमेव जयते

भारतीय राष्ट्रीय राजमार्ग प्राधिकरण

(सड़क परिवहन एवं राजमार्ग मंत्रालय, भारत सरकार)

National Highways Authority of India

(Ministry of Road Transport & Highways, Govt. of India)

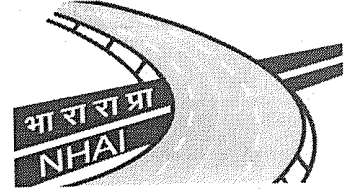
परियोजना कार्यान्वयन ईकाई-वसन्त विहार, (देहरादून)

Project Implementation Unit-Vasant Vihar (Dehradun)

मकान सं० 171, फेज-I, वसन्त विहार, देहरादून - 248006

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वेबसाइट/Website : www.nhai.gov.in



NHAI/PIU-VSNT-VHR/Rishikesh-Bhaniyawala (DPR)/2021/ 2725

Date: 12.07.2022

To,

Authorized Signatory

M/s Yongma Engineering Co. Ltd.

Dehradun, Uttarakhand (248001)

Sub: Four laning of Bhaniyawala-Jollygrant-Rishikesh spur section of NH-07 from Km 0.000 to Km 20.600 in the state of Uttarakhand on Hybrid Annuity Mode - **WWF report on Elephant Underpass Proposal - reg.**

Ref.: CWLW lt. no. 68/12-1 Dehradun dt. 07.07.2022

Sir,

This is in reference to the above cited letter of Chief Wildlife Warden, Forest Department, Government of Uttarakhand, vide which inspection report of "World Wide Fund for Nature (WWF)" regarding the proposal of Elephant Underpass are submitted.

In view of above, you are requested to examine the abovesaid report of WWF and take necessary action at the earliest.

Encl.: As referenced.

Thanking You.

Regards,

Rahul Meena
12/07/22

(Rahul Meena)

Manager (Tech.)

For Project Director

PIU-Vasant Vihar (Dehradun)

Copy to: RO-Uttarakhand, NHAI, Dehradun - For kind information.

कार्यालय मुख्य वन्यजीव प्रतिपालक, उत्तराखण्ड

85 राजपुर रोड, देहरादून, फोन नं० 0135-2742884 फैक्स नं० 0135-2745691 ईमेल-cwlwua@yahoo.co.in

पत्र संख्या - 68/12-1

देहरादून,

दिनांक:- 07 जुलाई, 2022

सेवा में,

✓ परियोजना निदेशक,
भारतीय राष्ट्रीय राजमार्ग प्राधिकरण,
परियोजना कार्यान्वयन इकाई,
वसन्त विहार, देहरादून।

भा.रा.प्र.प्रा. वसन्त विहार (देहरादून) NHAI, PU-Vasant Vihar (Dehradun)
द्वारा प्राप्त/Received by: <u>AL</u>
सं०/No. <u>3476</u>
दिनांक/Date <u>08/07/2022</u>

विषय:- निरीक्षण टिप्पणी।

सन्दर्भ:- इस कार्यालय का पत्रांक 254/12-1 दिनांक 06.07.2022।

महोदय,

दिनांक 07.07.2022 को राष्ट्रीय राजमार्ग सं०-07(राज्य राजमार्ग-24) के स्पर भानियावाला (देहरादून)-जौलीग्रांट-ऋषिकेश कि०मी० 0.000 से कि०मी० 20.600 तक के चार लेन चौड़ीकरण एवं सुदृढीकरण, एलिफैन्ट अण्डरपास के प्रस्ताव से संबंधित किये गये संयुक्त निरीक्षणोपरान्त निर्गत निरीक्षण टिप्पणी संलग्न कर प्रेषित की जाती है। कृपया तदनुसार आवश्यक कार्यवाही करने का कष्ट करें।

संलग्न:- उपरोक्तानुसार।

भवदीय,

पराग मधुकर 7.7.22
(डॉ० पराग मधुकर धकाते)
मुख्य वन्यजीव प्रतिपालक
उत्तराखण्ड।

पत्रांक /12-1 तददिनांकित।

प्रतिलिपि: निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. प्रमुख वन संरक्षक (HoFF), उत्तराखण्ड।
2. प्रमुख वन संरक्षक (वन्य जीव), उत्तराखण्ड।
3. प्रमुख सचिव, वन एवं पर्यावरण, उत्तराखण्ड शासन।
4. प्रमुख सचिव, लोक निर्माण विभाग, उत्तराखण्ड शासन।

① कृपया जाँचें।
② DPR Consultant को भेजें।

पराग मधुकर
(डॉ० पराग मधुकर धकाते)
मुख्य वन्यजीव प्रतिपालक
उत्तराखण्ड।

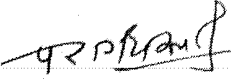
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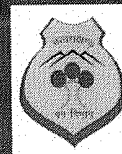
पत्रांक /12-1 तददिनांकित।

प्रतिलिपि: निम्नलिखित को सूचनार्थ एवं आवश्यक कार्यवाही हेतु प्रेषित।

1. मुख्य अभियंता, लोक निर्माण विभाग, उत्तराखण्ड, देहरादून।
2. वन संरक्षक, शिवालिक वृत्त, देहरादून।
3. निदेशक/वन संरक्षक, राजाजी टाइगर रिजर्व, देहरादून।
4. प्रभागीय वनाधिकारी, देहरादून वन प्रभाग, देहरादून को उनकी पत्र सं०-3654/12-1 दिनांक-04.05.2022 के कम में।
5. डॉ० ए०के० सिंह, विश्व प्रकृति निधि, (डब्ल्यू०डब्ल्यू०एफ०) देहरादून।


(डॉ० पराग मधुकर धकाते)
मुख्य वन्यजीव प्रतिपालक
उत्तराखण्ड।

Mitigation measures (underpass,
culverts) to address the impact of
road expansion (SH24) between
Bhانيyawala to Rishikesh



1. Proposed expansion of NH 24 between Bhaniyawala and Rishikesh (Two lane to four lane):

The State Highway 24 (SH 24) between Bhaniyawala and Rishikesh passes through important wildlife habitat of Badkot and Rishikesh ranges of Dehradun Forest Division (Dehradun FD). Currently this is a two-lane state highway. The National Highway Authority of India (NHAI) is proposing to expand this road into a four-lane highway. This road expansion will impact two critical wildlife areas (Fig. 1).

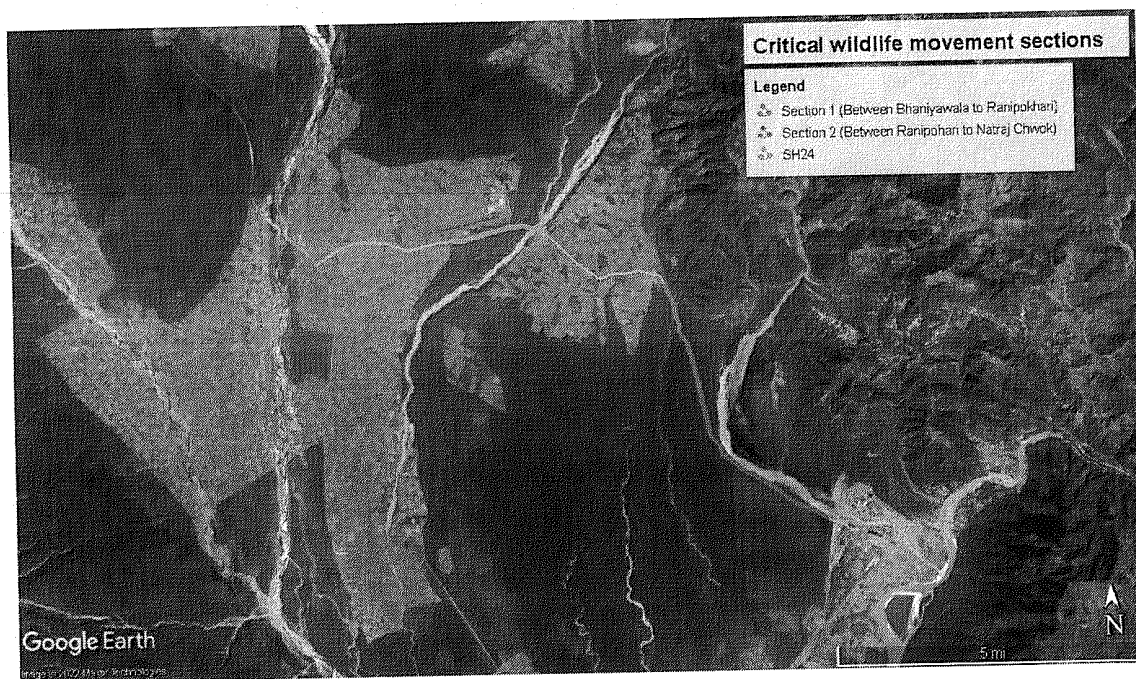


Figure 1: Critical wildlife movement sections on SH24

1.1. Bhaniyawala to Ranipokhari (near Jolly grant)

The road near Jolly Grant Airport (3.800 to 6.200) passes through an important connectivity between Thano and Barkot ranges of Dehradun FD. This bottleneck is the sole connectivity between these two ranges and critical for wildlife movement.



Figure 2: Image showing important connectivity between Thano and Badkot range near Jolly Grant Airport

1.2. Ranipokhari to Natraj Chowk, Rishikesh

The road between Ranipokhari and Natraj chowk, Rishikesh (10.000 to 18.000) passes through dense Sal and mix forest patches. This forest patch is a vital link for the wildlife movement between the Shivpuri range of Narendranagar FD and the Badkot and Rishikesh ranges of Dehradun FD.



Figure 3: Road passing through critical wildlife habitat between Ranipokhari and Rishikesh

2. Inventory study in Dehradun FD

In the Dehradun Forest Division, the WWF-India undertook an extensive inventory study that included sign surveys, camera trapping, and line transects, vegetation sampling and human disturbance index. Along with our inventory survey, our team noted important habitats such as wetlands, grasslands, lantana eradication, wildlife corridors, and animal underpasses on road network throughout the field work.

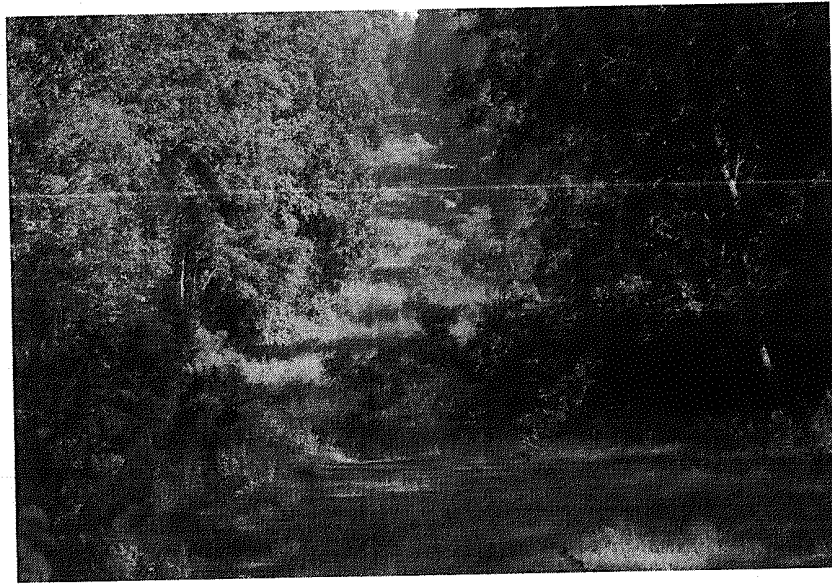


Figure 4: View of 100 foot fire line near anti-poaching camp between Badkot and Rishikesh range, an important elephant crossing route (16.200).

Rishikesh and Badkot ranges are eastern most ranges of Dehradun Forest Division. These ranges are most important ranges and serves as a corridor for movement of many wild animals, including leopards, elephants and tigers. The habitat is dominated by *Shorea robusta* (Sal), along with other species such as *Terminalia tomentosa* (Sen), *Haldina cordifolia* (Haldu), *Terminalia bellirica* (Baheda), *Holoptelea intergrifolia* (Kanju), *Lagerstroemia parviflora* (Dhaudi), *Mallotus philippensis* (Rohini), *Trewia Nudiflora* (Gutel), *Syzigium cumini* (Jamun), *Aegle marmelos* (Beal), *Albizia procera* (Siras). Understory vegetation is formed by *Clerodendrum viscosum* (Kadu), *Ehretia livis* (Chamrod) and *Justicia adhatoda* (Baasa) as well as many patches of *Lantana camara*. The terrain is generally plain. This area has a lot of perennial and seasonal streams. The Jakhan and Song rivers, along with several smaller streams, run across these ranges, supplying water for animals and local people. The Chadrabhaga River separates the Badkot and Rishikesh ranges from the Narendranagar Forest Division.



Figure 5: Image showing team doing sign survey in Badkot range.

As part of inventory study, camera trapping exercise in Barkot and Rishikesh ranges were undertaken between November and December 2021. A total of 56 pairs of camera traps were deployed in these ranges. An effort of 260 Km was made during the sign survey exercise to document presence of carnivores in these range. We also overlaid 16 line transects to estimate the prey population.

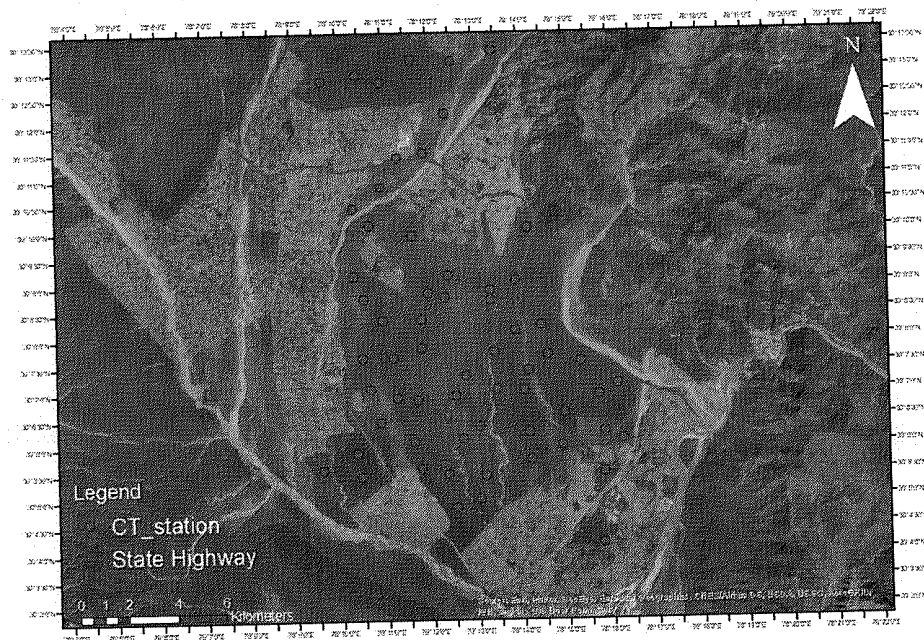


Figure 6: Camera trap locations in Badkot, Rishikesh and Thano ranges

3. Results of Inventory study:

3.1 Results of camera trapping

During camera trapping exercise we captured several important species in Thano, Badkot, and Rishikesh ranges. The most important species captures in camera traps was tiger. We captured tiger presence in all these three ranges. Other important species captured on camera traps were elephants, leopard, hyena, sambar, chital, barking deer, leopard cat, jackal, and small Indian civet.

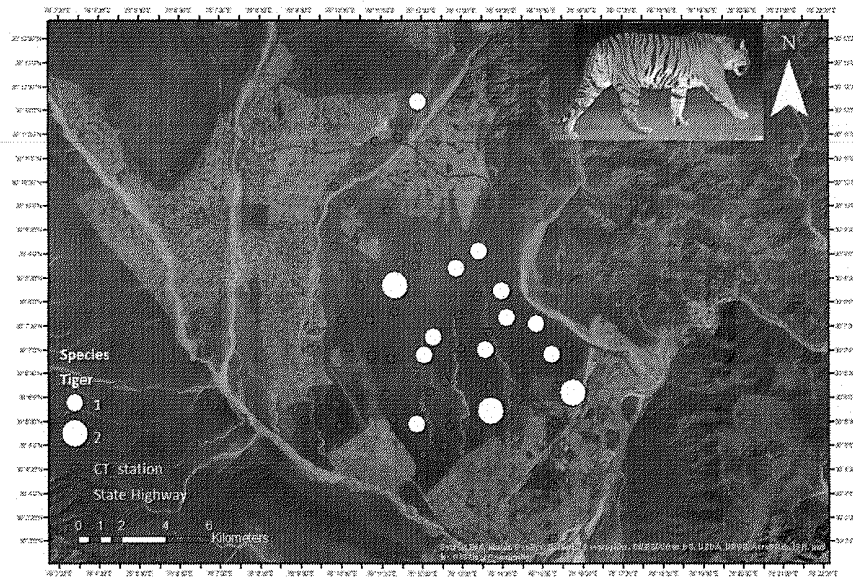


Figure 7: Tiger captures from camera trap exercise

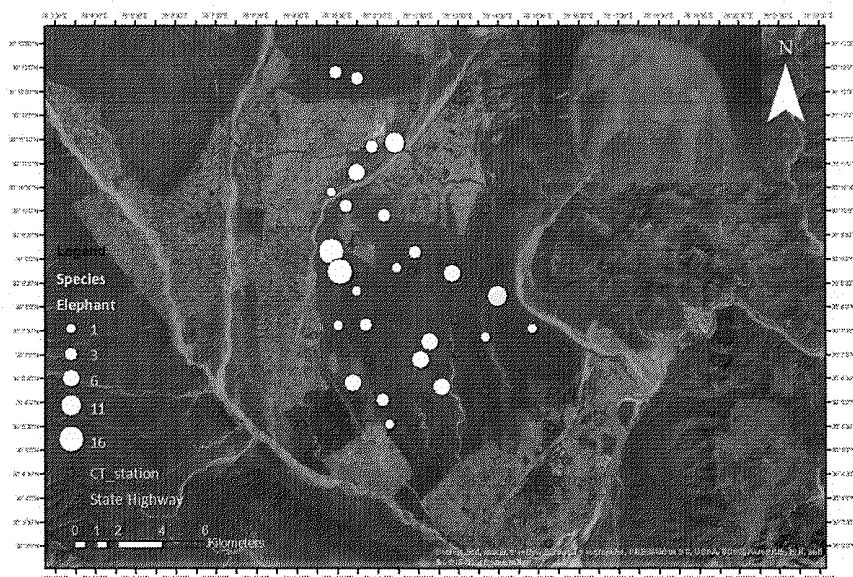


Figure 8: Elephant captures from camera trap exercise

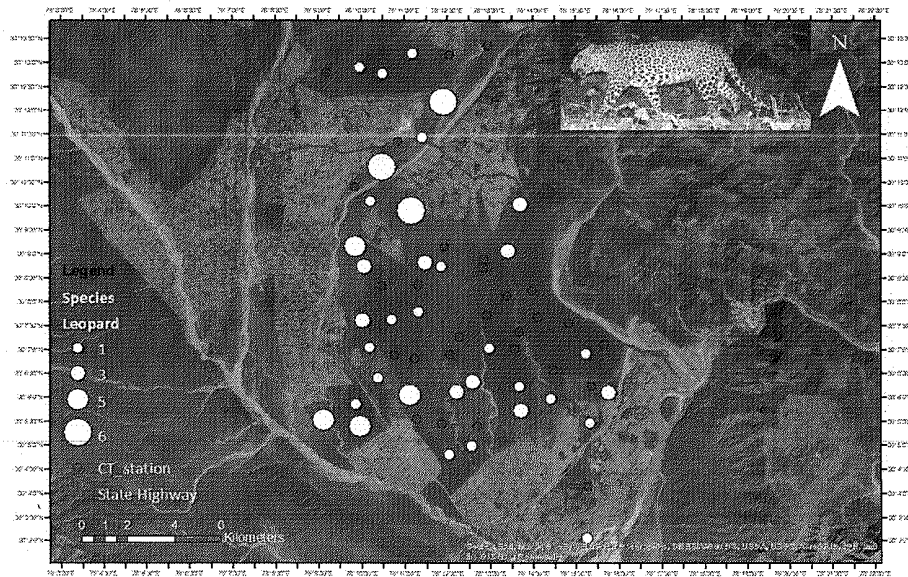


Figure 9: Leopard captures from camera trap exercise

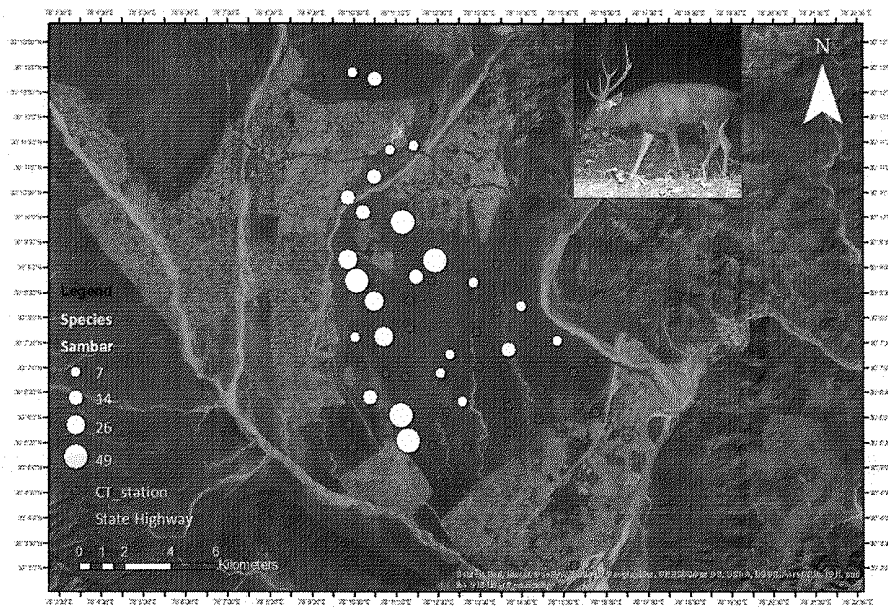


Figure 10: Sambar capture from camera trap exercise

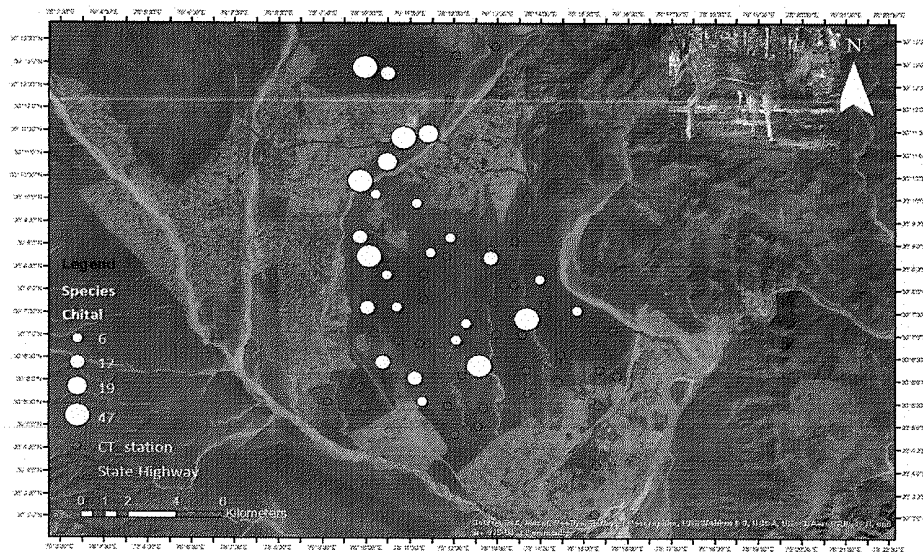


Figure 11: Chital captures from camera trap exercise

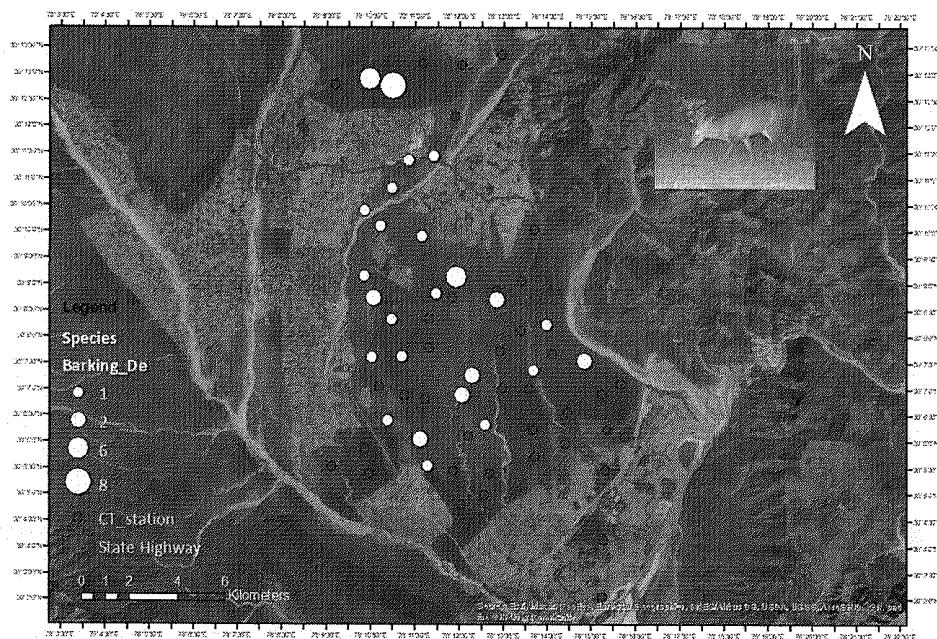


Figure 12: Barking deer captures from camera trap exercise

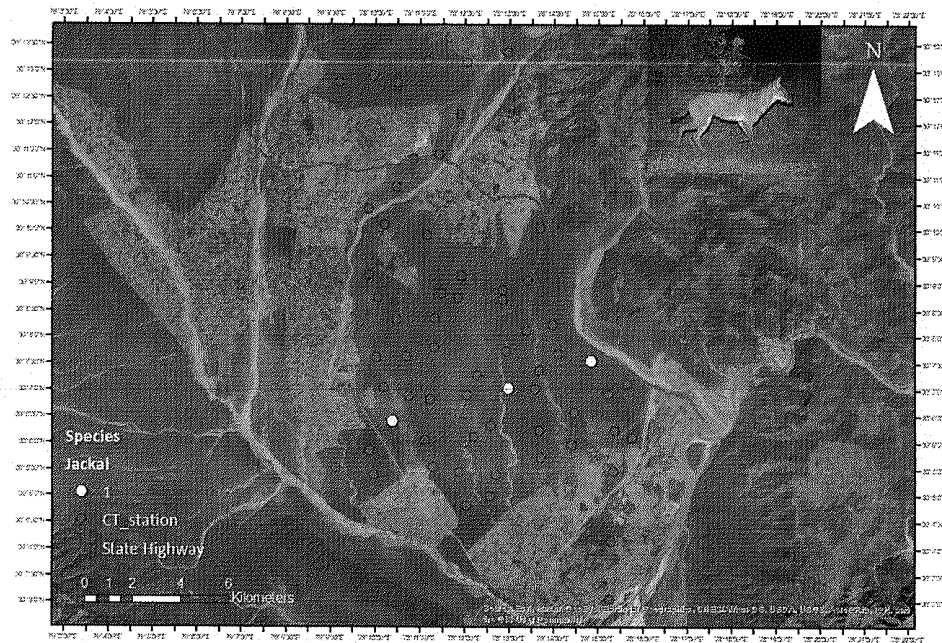


Figure 13: Jackal captures from camera trap exercise

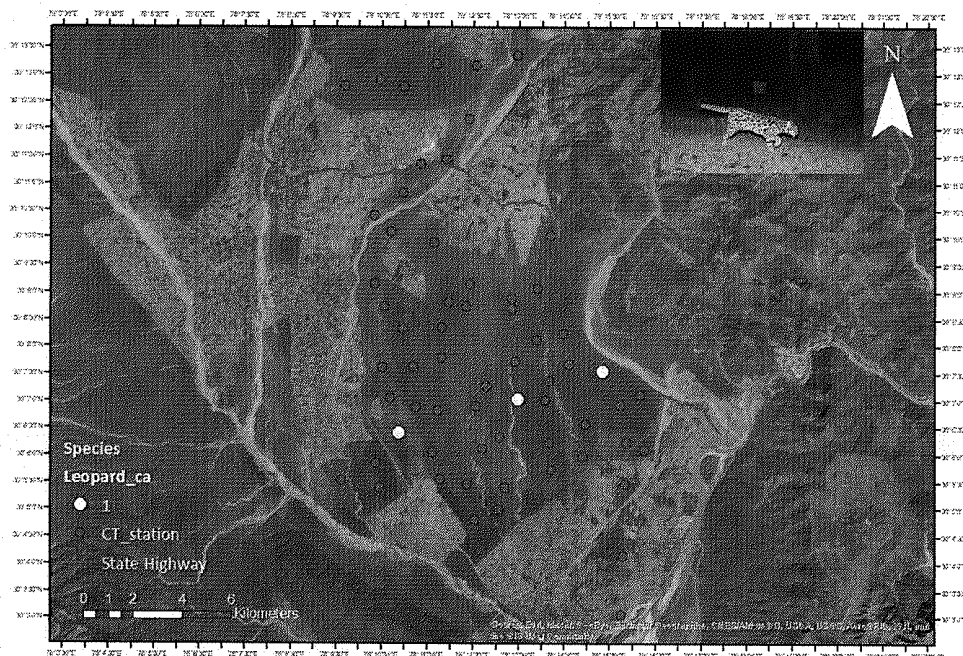


Figure 14: Leopard cat captures from camera trap exercise

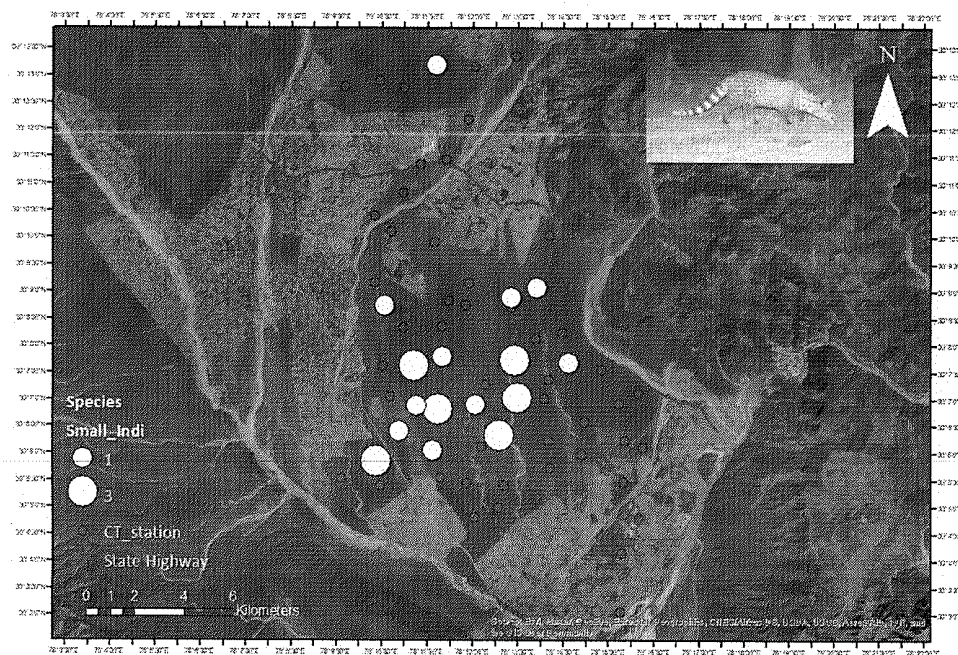


Figure 15: Small Indian civet capture from camera trap exercise

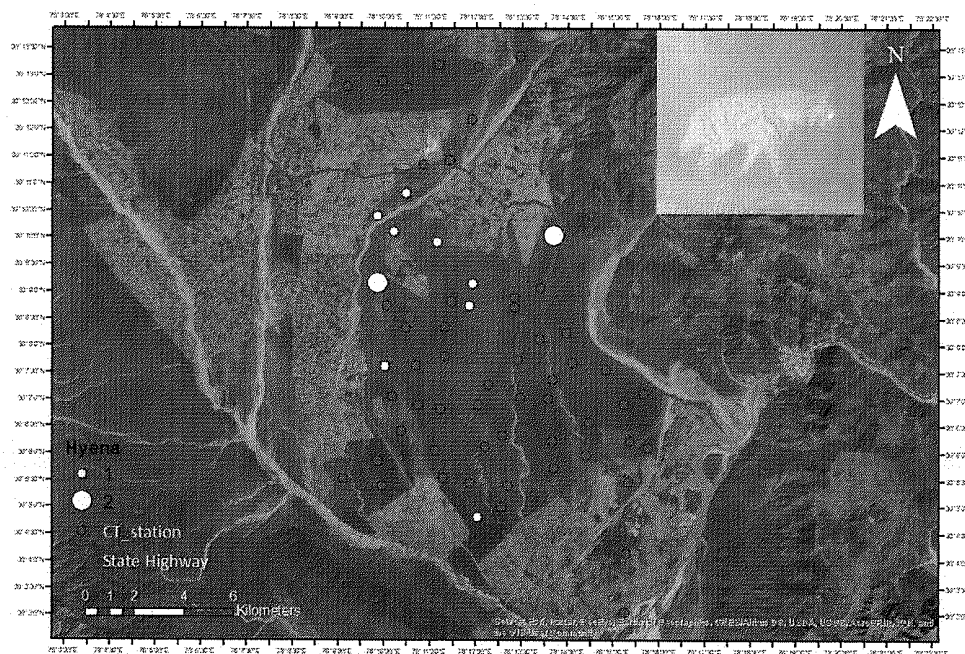


Figure 16: Striped Hyena captures from camera trap exercise

3.2 Sign survey results

We documented frequent signs of Elephants and Leopards from Badkot, Rishikesh and Thano ranges. A total effort of approximately 260km was made for this exercise in both the ranges.

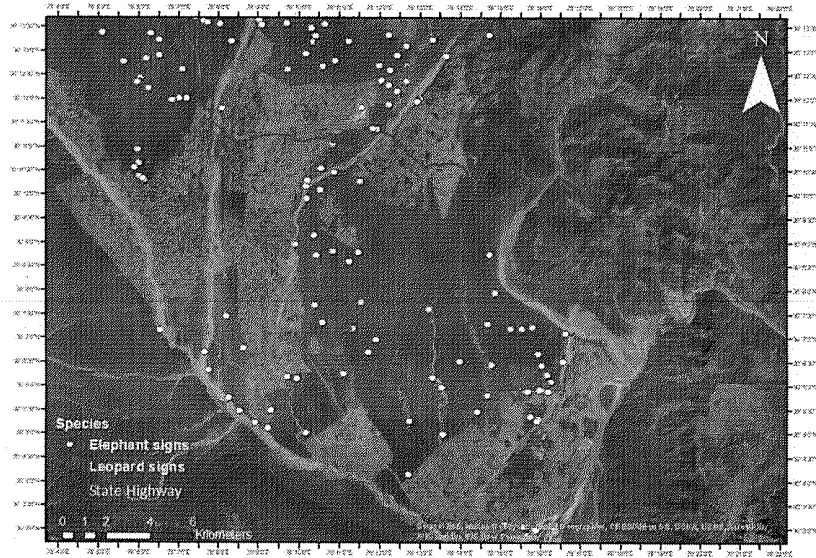


Figure 17: Elephant and Leopard signs noted during sign survey exercise.

4. Documentation of wildlife presence near road:

During our intensive camera trapping and sign survey exercise, we noticed substantial animal signs all along the SH 24 between Ranipokhari and Rishikesh. To identify animal movement, we had deployed a few camera traps close to the highway, and the results were quite remarkable. These camera traps captured images of tigers, elephants, leopards, and other prey species.

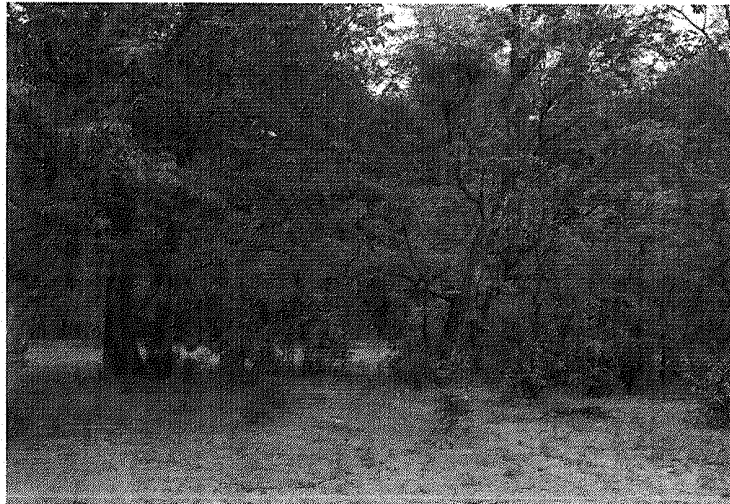


Figure 18: Image showing elephant movement route between Shivpuri range of Narendranagar FD and Badkot range. (NHAI – 16.200 – 16.300)

4.1. Bhaniyawala to Ranipokhari (near Jolly grant)

During camera trapping and sign survey exercise we noticed several evidences of elephants and other species in this section. We got pictures of elephants, leopards, sambars, chitals, and other wildlife (Fig 20). We also photo captured a male tiger on in camera traps near this highway. During sign survey we got elephant and leopard sign in a culvert below this road (Fig 19).



Figure 19: Elephant signs documented under culvert in between Bhaniyawala and Ranipokhari in SH 24 near Jolly Grant Airport. (Road section – 5.500 - 5.600)



Figure 20: Wildlife photo captured in Majri beat (Badkot range) in close vicinity of road section (5.500 to 5.600)

4.2. Ranipokhari to Nataraj Chowk, Rishikesh

This section is important wildlife habitat and crucial connectivity for wildlife movement. During our camera trapping and sign survey exercise we documented presence of tiger, elephant, leopard, sambar, chital, barking deer and hyena (Fig. 21).



Figure 21: Elephants images near Ranipokhari SH24. (Road section - 16.200 – 16.300)

5. Suggested mitigation measures to minimize the impact of road expansion on wildlife

5.1 Proposed underpass for elephant movement by NHAI and other mitigation measures

NHAI have proposed four underpasses in critical wildlife movement areas between Ranipokhari and Nataraj Chowk, Rishikesh to facilitate movement of elephant and other species (Table 1).

Table 1. Details of proposed elephant underpasses by NHAI.

Elephant Pass No	Opening			Vertical Clearance (m)		Vertical clearance more than 7 m		
	from	to	Length(km)	Minimum	Maximum	from	to	length (km)
1	10.800	11.500	0.700	1.93	11.15	10.800	11.360	0.560
2	12.280	12.660	0.380	6.03	8.13	12.310	12.630	0.320
3	13.900	14.380	0.480	4.8	9.49	13.930	14.330	0.400
4	16.670	17.430	0.760	4.49	7.87	16.820	17.350	0.530
	Total		2.320			Total		1.810

In addition to underpasses, NHAI has also proposed for physical barriers to channelize wildlife movement and prevent road accidents, sound barriers and other safety provisions such as signages, speed control devices to minimize the impact of road widening.

5.2 Suggested additional mitigation measures and modifications

In proposed expansion (two lane to four lane) of existing road between Bhaniyawala to Rishikesh, we have following suggestions. These suggestions are based on inventory study recently conducted in the Badkot and Rishikesh Ranges, results of which are mentioned in the previous sections.

Table 2 Wildlife presence in different road sections and suggested modifications in mitigation measures.

Section	Species documented on Camera Trap/Sign Survey	Proposed Underpass by NHAI with vertical clearance more than 7 m	Suggested Underpass/ modification (Minimum clearance 7m)	Suggested Culverts(Minimum clearance 3m)
Section I: (Near Jolly grant Airport)				
3.800 to 6.200	Elephant, Tiger, Leopard, leopard cat, Hyena, Jackal, Sambar, Chital, Barking deer	Nil	4.300 to 6.100	Nil
Section II (Ranipokhari to Natraj Chowk)				
10.100 to 12.000	Tiger, Leopard, Hyena, Sambar, Chital, Barking deer	10.800 to 11.360	Nil	11.800
12.000 to 14.000	Elephant, Tiger, Chital, Barking deer	12.310 to 12.630	Nil	13.100, 13.600
14.000 to 16.000	Elephant, Tiger, Leopard, Jackal, Chital, Sambar, Barking deer	13.930 to 14.330	Nil	15.300,15.700
16.000 to 18.000	Elephant, Tiger, Leopard, Jackal, Chital, Sambar, Barking deer	16.820 to 17.350	16.100 to 16.520	17.300, 17.700

- In road section between Ranipokhari to Natraj Chowk, Rishikesh (10.000 to 18.000), NHAI has proposed four underpasses for elephant movement. Locations of three underpasses are appropriately aligned with wildlife movement. In the course of the inventory study WWF documented frequent elephant movement near road section between 16.200 to 16.300. Therefore, it was suggested to slightly change the location of proposed underpass, which is currently between 16.820 to 17.350. This shall be constructed between 16.100 to 16.520 with minimum clearance of 7 meters to facilitate the elephant movement (Table1).

- We recommend to construct culverts at five places between proposed underpasses to facilitate the movement of large cats, such as tigers and leopards and other wildlife (jackals, leopard cats, porcupine, wild boars, sambar and chital). Minimum height of these culvert should be 3m above the ground and width 3.5 m width (Table 1). Additionally, hume pipes (ideally 900 mm diameter) shall be provided to facilitate movement of reptiles, amphibians and other smaller fauna.
- The road section between Bhaniyawala to Ranipokhari, near Jolly Grant (3.800 to 6.200) is very critical for wildlife movement. We have documented many important wildlife in this section. This section is also being frequently used by elephants. Therefore, it is essential to provide underpass in this road section (Table 2).

5.3 Joint survey by the officials of Uttarakhand Forest Department, NHAI and WWF representatives to suggest mitigation measures and modifications

On 7th July 2022, a joint survey was conducted by the officials of Uttarakhand Forest Department, NHAI and WWF representatives, vide office of the CWLW, Uttarakhand, letter number 54/ 12-1; dated 6th July 2022, to evaluate and finalize the suggest wildlife mitigation measures and modifications to the existing plan.

Participants –

1. Dr. Parag Madhukar Dhakate, IFS – Chief Wildlife Warden, Uttarakhand
2. Mr. Pankaj Kumar Mourya, IES – Project Director, NHAI
3. Dr. Anil Kumar Singh, Team Leader-TAL WWF
4. Mr. Swapnil Anirudha Wayal, IFS – Dehradun Forest Division
5. Mr. N.L. Dobhal – Range Forest Officer, Thanu Range, Dehradun Forest Division
6. Mr. Ashwani – Site Engineer NHAI
7. Mr. R. S. Sharma – Advisor, DPR Consultant NHAI
8. Mr. Rajiv Kumar Singh – Manager, AAI

Suggested Modifications –

1. **Suggested underpass for elephant and other wildlife movement between Bhaniyawala to Ranipokhari (near Jolly grant)**
 - The road section between Bhaniyawala to Ranipokhari, near Jolly Grant (5.350 – 6.200) is very critical for wildlife movement. We have documented many important wildlife movements in this section. This section is also being frequently used by elephants. Therefore, it is essential to provide underpass in this road section. PWD is already in process of construction of a bridge over the Jakhan River. It was observed that the current structure that is being constructed by PWD in the elephant movement area, would block the elephant and other wildlife movement through this section. It was decided to provide openings for movement of elephant and other wildlife in airport side approach of the bridge. The height of the openings should be as per the WII guidelines (6-8 mtrs height). The length of the openings should be minimum 60 mtrs.

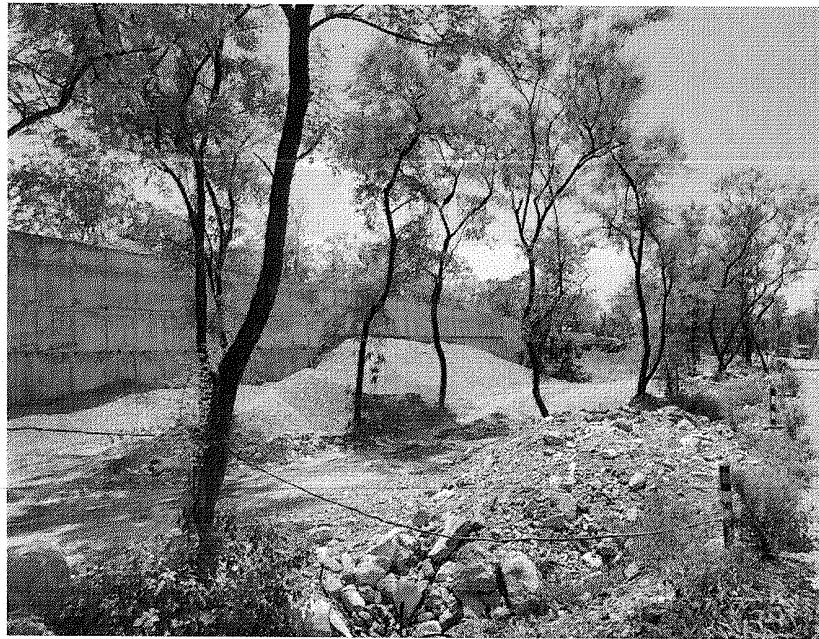


Figure 22: Under construction PWD bridge over the Jakhan River: The airport side approach of the bridge.

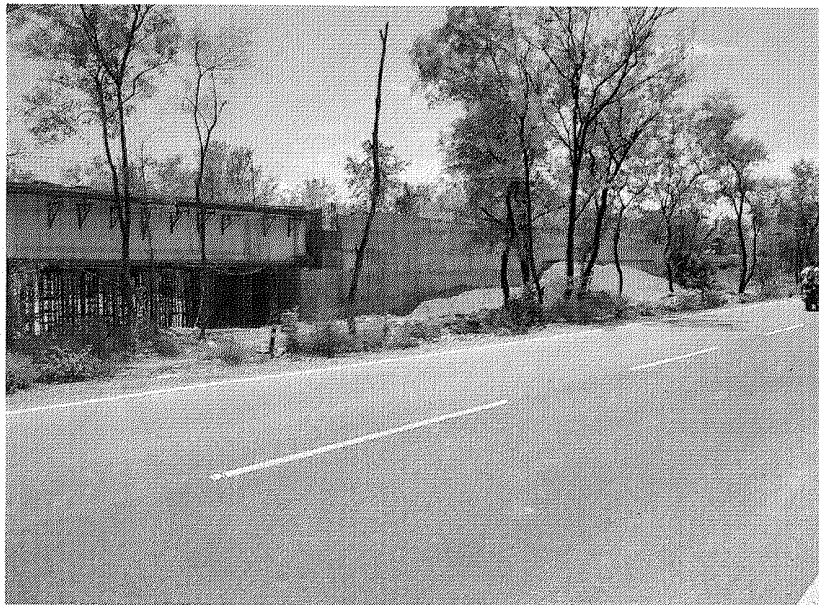


Figure 23: Under construction PWD bridge over the Jakhan River.

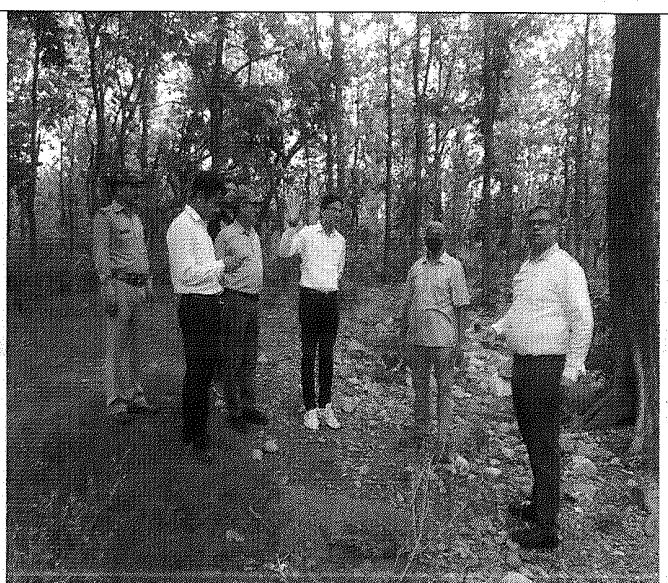
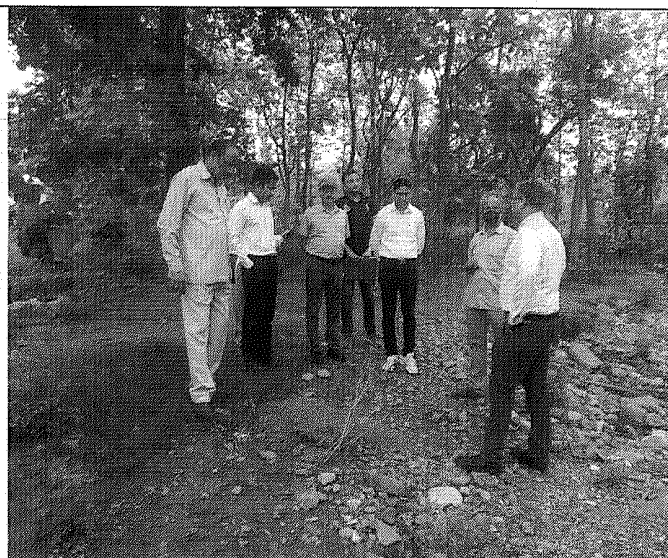
- The new bridge which will be constructed by NHAI parallel to this bridge, should also provide a sufficient passage for elephant movement in the river section, as well as in airport side approach of the bridge as per the WII guidelines (Height of the openings shall not be less than 6-8 mtrs). The length of the proposed bridge on the airport side should be extended by at least 60 mtrs.
- During the joint survey it was also observed that the proposed airport expansion leads to blockage of the wildlife movement in this section. In order to facilitate the wildlife movement, it is important to provide sufficient forest strip between the airport boundary and the river.

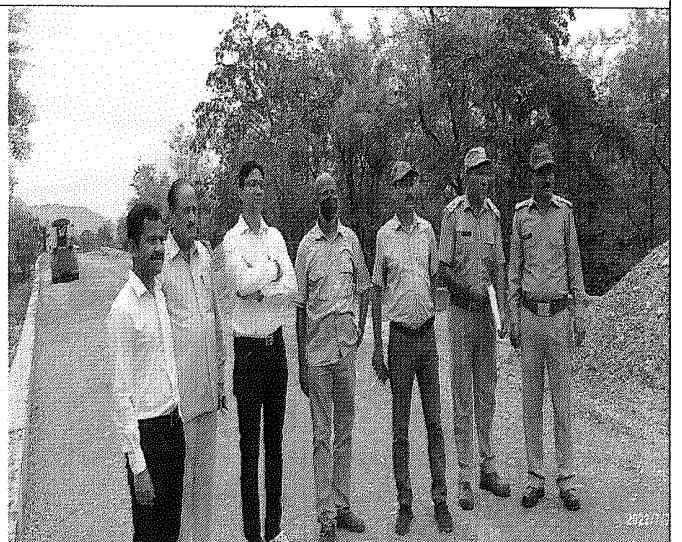
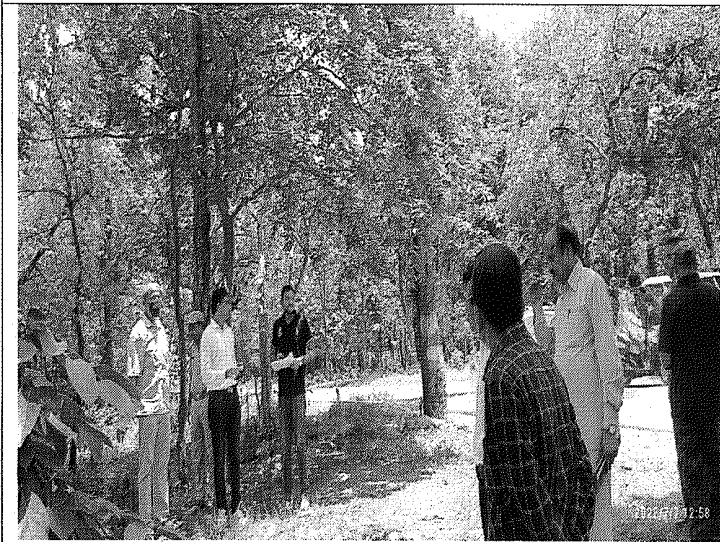
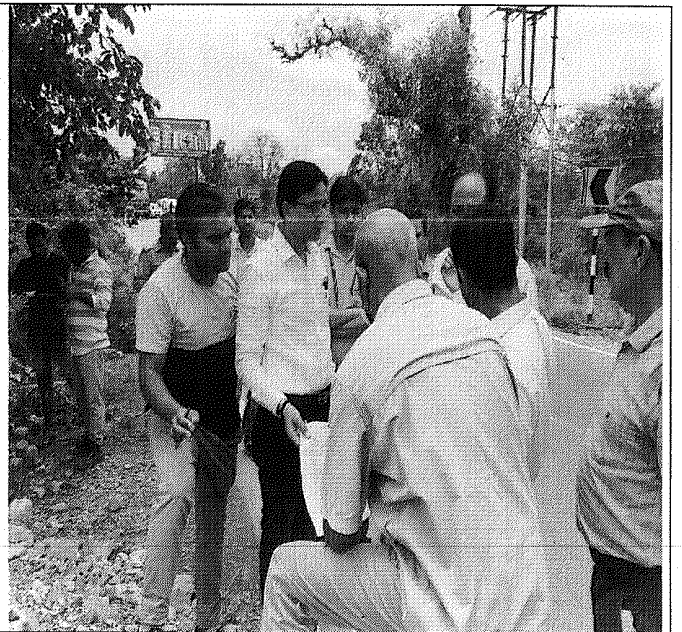
2. Suggested underpass for elephant and other wildlife movement in road section between Ranipokhari to Natraj Chowk, Rishikesh:

- NHAI have proposed four underpasses in critical wildlife movement areas between Ranipokhari and Natraj Chowk, Rishikesh to facilitate movement of elephant and other species. Locations of three underpasses were found appropriately aligned to facilitate the wildlife movement. In the course of the joint survey it was decided to slightly change the location of proposed underpass, which is currently between 16.820 to 17.350. It shall be constructed between 16.100 to 16.520 with minimum clearance of 7 meters to facilitate the elephant movement.
- It was decided to construct culverts at five places between proposed underpasses (11.800, 13.100, 13.600, 15.300, 15.700, 17.300, 17.700) to facilitate the movement of large cats, such as tigers and leopards and other wildlife (jackals, leopard cats, porcupine, wild boars, sambar and chital). Minimum height of these culvert should be 3m above the ground and width 5 m width.
- Additionally, Hume Pipes (Of 1200 mm diameter) shall be provided to facilitate movement of reptiles, amphibians and other smaller fauna. For every blocked length of the road (which does not have any elephant underpass or a culvert), Hume Pipes should be provided for every 300-400 mtrs distance to facilitate the movement of the smaller fauna. There shall be minimum 10 Hume Pipes in this section.
- During discussion it was decided to change the proposed design of median structures (Slooid continuous crash barrier/ New Jersey type) to normal 225 mm height median with anti-glare poles at minimum spacing of 1.2 meter, in order to ensure the smooth movement/ passage for the wild animals.
- It was decided to channel the wildlife movement towards the mitigation structure mainly using bio fences. Initially solar power fence may be used to protect the bio-fences, till its establishment. This activity shall be undertaken by the Forest Department.
- Wildlife underpasses should be covered with noise and light barriers and green hedges shall be established all along the edges in the forest section.
- Protection barrier shall be established wherever road is in cutting section.
- Signage for speed limit to be erected at appropriate locations.

**4-laning of Bhaniyawala – Jollygrant - Rishikesh Road (Spur) of NH-7
from km 0.000 to km 20.600 in the State of Uttarakhand**

**Joint Site Visit on 07.07.2022 in the presence of Chief Wildlife Warden,
Uttarakhand**





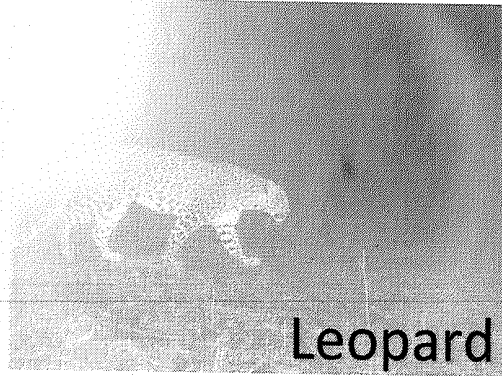
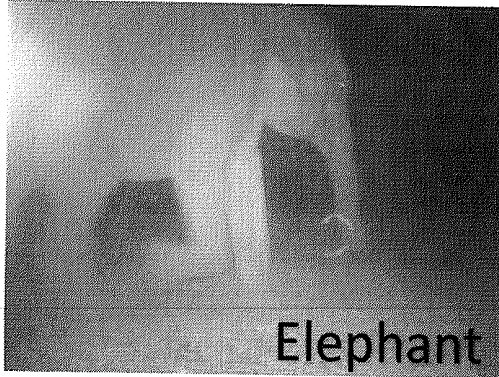
संयुक्त निरीक्षण रिपोर्ट

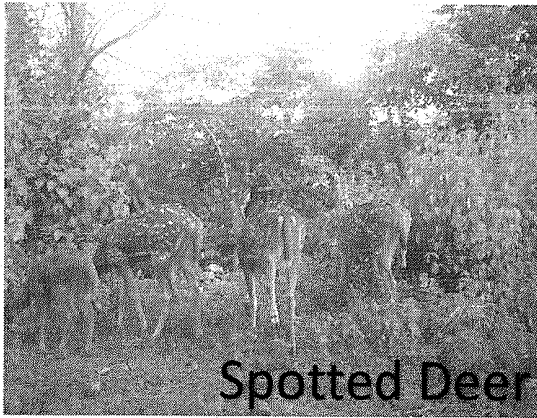
आज दिनांक ०१-०१-२०२० को जानियावाला कृषि विभाग समूह नाम का संयुक्त निरीक्षण श्रीमान डा. पराग मधुकर दासजी मुख्य वन्यजीव प्रतिपालक, उत्तराखण्ड एवं श्री अमिल कुमार सिंह जिला प्रभुति निरीक्षक (NHF) देहादून व पंकज कुमार भाग्य भाग्यमूर उपरमूर व वन विभाग के वानारक्षक अधिकारी व स्टाफ तथा नाम के स्टाफ मौजूद रहे।

क्र.सं.	नाम	पद	विभाग	हस्ताक्षर
1.	डा. पराग मधुकर दास	मुख्य वन्यजीव प्रतिपालक	वन विभाग	
2.	डा. अमिल कुमार सिंह	उत्तराखण्ड	NHF	AKS
3.	श्री पंकज कुमार भाग्य	प्रोजेक्ट डायरेक्टर	NHAI	
4.	श्री लक्ष्मी कान्त	IFS	वन विभाग	
5.	श्री न. लक्ष्मी कान्त	वन संशोधन	वन विभाग	
6.	श्री. उमर. एस. शर्मा		कन्या केंद्र	उमर शर्मा
7.	श्री. अरवि कुमार		NHAI	
8.	श्री. शिव प्रसाद शर्मा	वन वरिष्ठ	वन विभाग	
9.	श्री. देवेन्द्र सिंह मजरा	वन वरिष्ठ	वन विभाग	
10.	श्री. अरवि शर्मा		कन्या केंद्र	
11.	श्री. मधु विन्द पांडे		कन्या केंद्र	
12.	श्री. राजीव कुमार सिंह	समरपेट मैनेजर	समरपेट	अमर सिंह

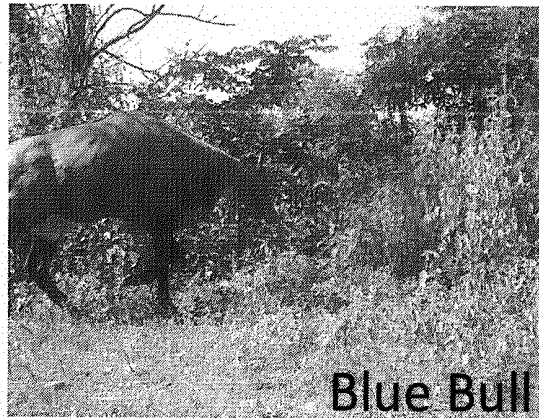
Annexure 1

Wildlife species captured on camera traps near Jolly grant airport between Bhaniyawala and Ranipokhari

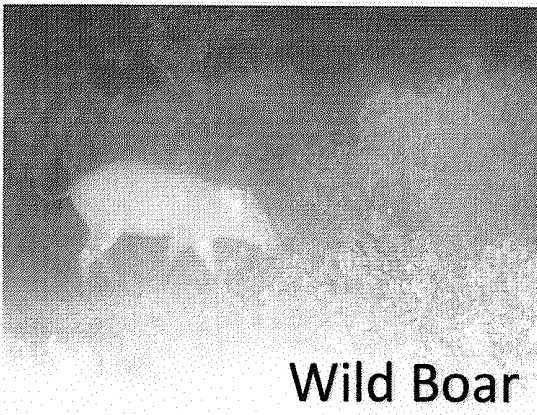




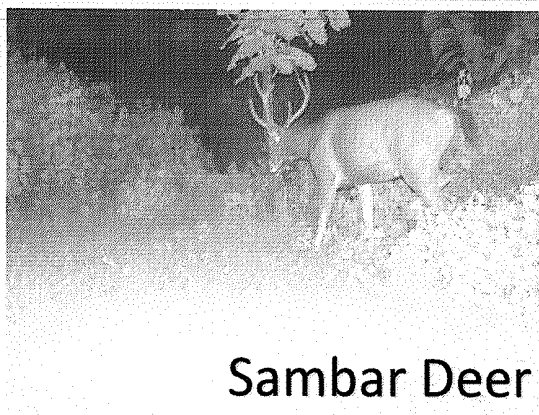
Spotted Deer



Blue Bull

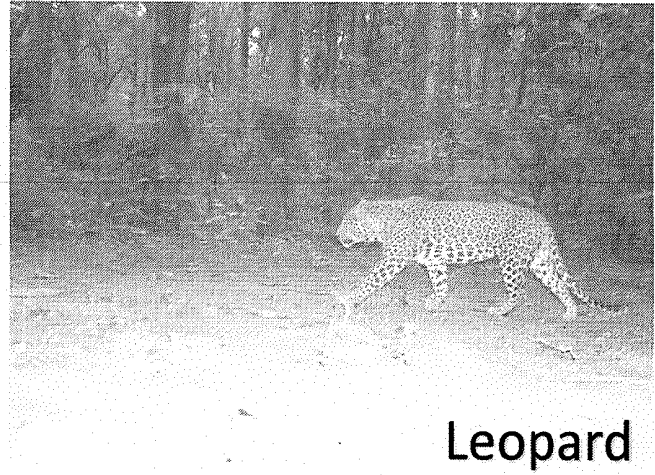


Wild Boar



Sambar Deer

Wildlife species captured on camera traps near SH24 between Ranipokhari to Natraj Chowk, Rishikesh





Jackal



Sambar deer



Blue bull



Spotted deer