FIELD INSPECTION NOTES OF THE DISTRICT FOREST OFFICER, KUMRAM BHEEM-ASIFABAD AND FOREST DIVISIONAL OFFICER, ASIFABAD (FAC) IN ASIFABAD DIVISION

Inspected the site on 20.07.2018 & 04.08.2018 proposed area for Diversion of **16.5099 Ha** Forest land for construction of four Laning of NH 363 from Mancherial to Chandrapur from (Length 94.602 from 0.000 Km to 94.602 in favour of DGM (Tech) & Project Director, NHAI, PIU Nirmal falling in Asifabad and Rebbena Ranges along with concerned staff. As per the field verification of the proposed construction of four Laning of NH - 363 is passing through various Reserve Forests, the details of which are as follows.

Sl. No.	Range	Section	Beat	Compt No	Name of the RF	Width of Row in Mts.	Length in M	Proposed area for Diversion excluding Row		Remarks
								Width in M	Area in Ha	
1	2	3	4	5	6	7	8	9	10	
1	Asifabad	Nawdhari	Ganeshpur	238	Manighar (East)	3.00	1367	42.00	5.7414	Wild life area of Tiger Corridor area of KTR
2	Asifabad	Nawdhari	Nawdhari (East)	239	Manighar (East)	3.00	760	42.00	3.1920	
3	Asifabad	Nawdhari	Nawdhari (East)	240	Manighar (East)	3.00	940	42.00	3.9480	
					Total		**3067**		**12.8814**	
4	Rebbena	Goleti	Ameenguda	306/1	Tandur Ext-I	40.00	1407	5.00	0.7035	
5	Rebbena	Rebbena	Rebbena	283	Rebbena	0.00	650	45.00	2.9250	
							2057		**3.6285**	
			Total				**5124**		**16.5099**	

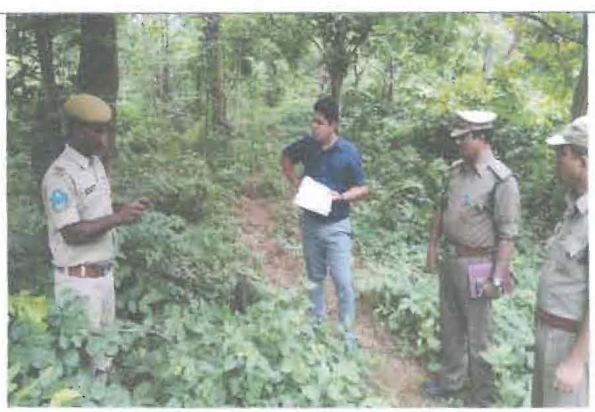
The proposed construction of four Laning of NH 363 is passing through the different Reserve Forests in Rebbena Range, the length is 2057 meters with a width of 5 & 45 Meters and the area required for diversion in Rebbena Range is 3.6285 Ha. The area to be diverted in Compt.No 306/1 of Ameenguda beat has a **connecting patch of thick forest on either side** of the proposed road. This part of road is **crucial for movement of wild animals** from Kagaznagar Division (Shown in image below). As per **guidelines of Wild life institute of India and MoEF&CC (Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife document (attached),** the length of road through the **forest is between 1 to 2 km, therefore one underpass to be provided.** As there are **instances of Leopards and other wild an animal crossing in this area and it is mandatory to form the above mentioned underpasses by the user agency.** Further chain link **fencing to be provided for complete RF area to create funnel like structure to guide the wild animals towards the underpass so that accidents can be avoided,** this work has to be **executed by user agency in consultation with DFO.**

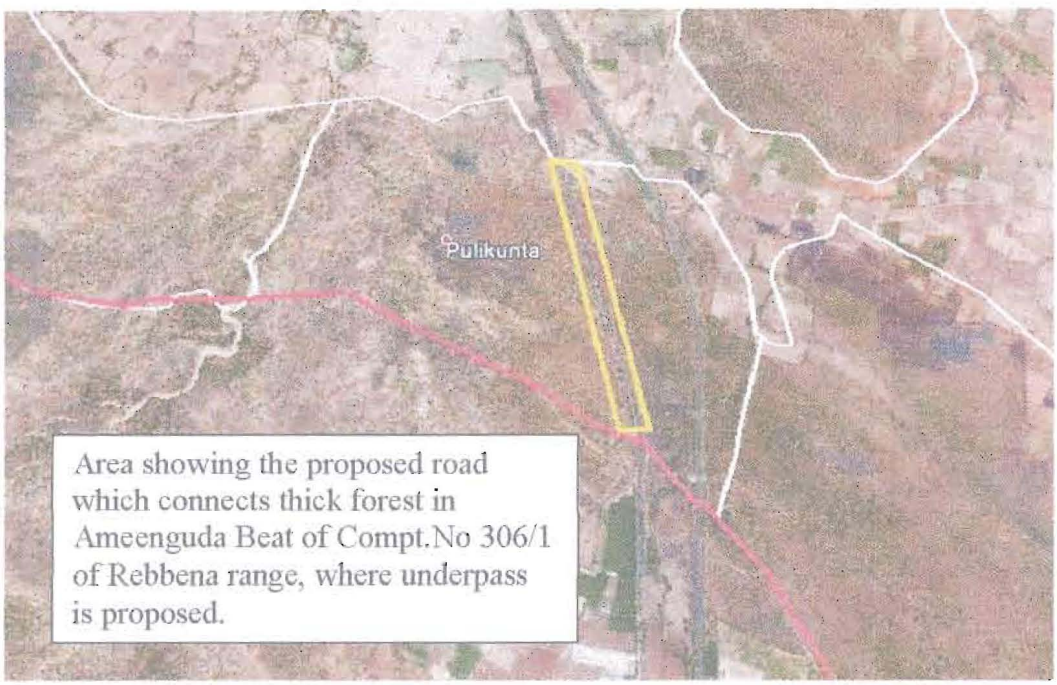
In Asifabad Range, the proposed construction of four Lanning of NH 363 is passing through RF Manighar (East) with the length involving non wild life area of 1700 mtrs with a width of 42 mtrs and the wild life area of Tiger Corridor area of Kawal Tiger Reserve (KTR) with the length of 1367

Mtrs and width of 42.00 Mtrs and the total area required for diversion in Asifabad Range is 12.8814 Ha including tiger corridor area. The patch to be diverted in Compt.No 238 of Ganeshpur beat has a connecting patch of thick forest on either side of the proposed road. This part of road is crucial for movement of wild animals (Shown in image below). As per the guidelines of **Wild life institute of India and MoEF&CC (Eco-friendly measures to mitigate impacts of linear infrastructure on wildlife document, attached)** if the length of road through the **forest is between 1 to 2 km, one underpass is to be provided**. As this area is forming part of **notified Kawal Tiger Reserve Corridor** and also it is a continuous forest patch connecting forest of Maharashtra state, movement of wildlife is crucial, hence, an Eco-Bridge should be constructed at 19.57209, 79.34492 in compartment 238 of Ganeshpur beat (image attached). Further **chain link fencing is required to create funnel like structure to guide the wild animals** towards the underpass to **avoid accidents, this work is to be executed by user agency in consultation with DFO.**

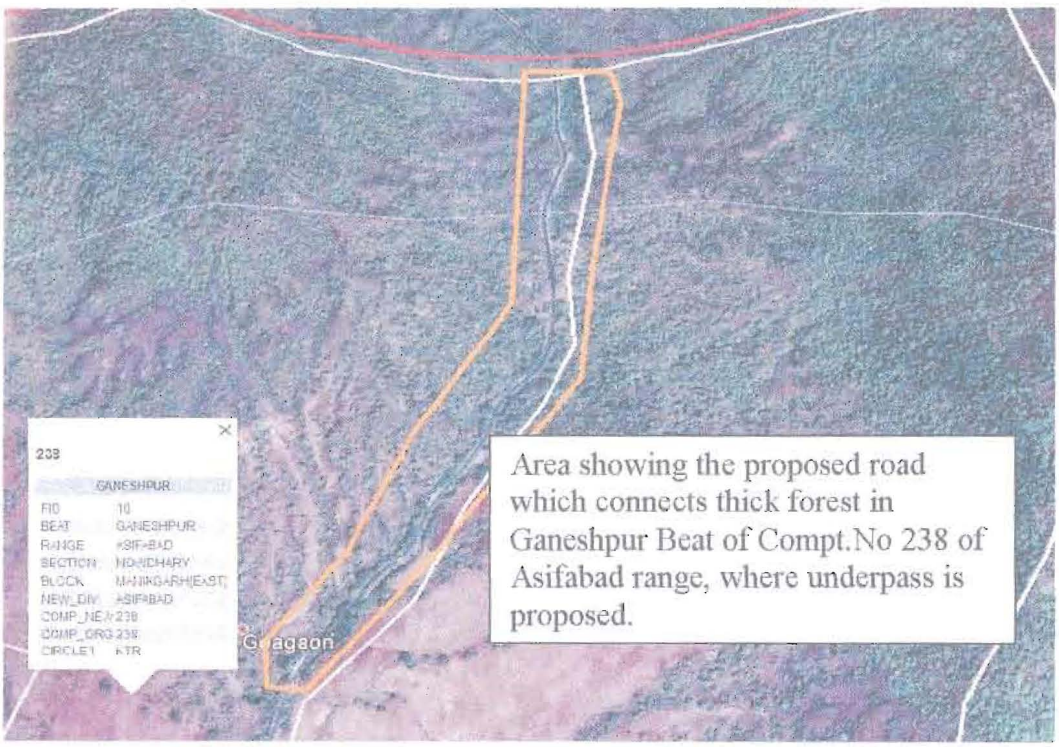
Further, it is observed that trees are of good height and quality, therefore **transplanting of enumerated trees to be done at the cost of user agency** in to adjoining RF area in consultation with DFO.

In the proposed diversion area, no unique tree is found. No protected archaeological / heritage site / defense establishment or any other important monument is found in the area. The proposed area is not falling in National Park, Wildlife Sanctuary, Biosphere reserve, Tiger reserve, Elephant corridor, etc. But an extent of proposed area of **5.7414 Ha** falling in Tiger Corridor Linking Kawal Tiger Reserve, Tadoba and Indravati Tiger Reserves. The proposed area is having 0.1 to 0.7 Density.

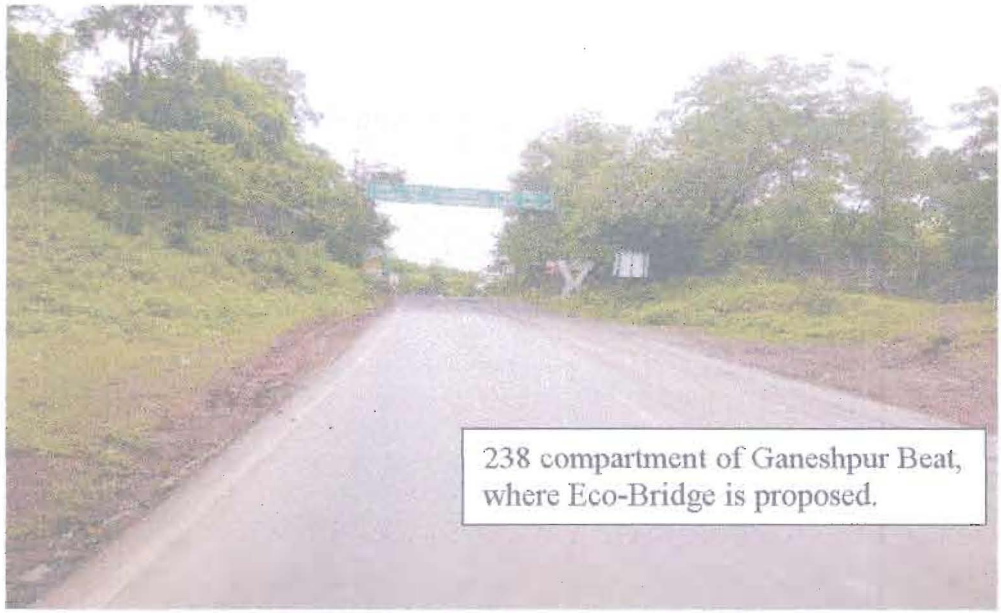


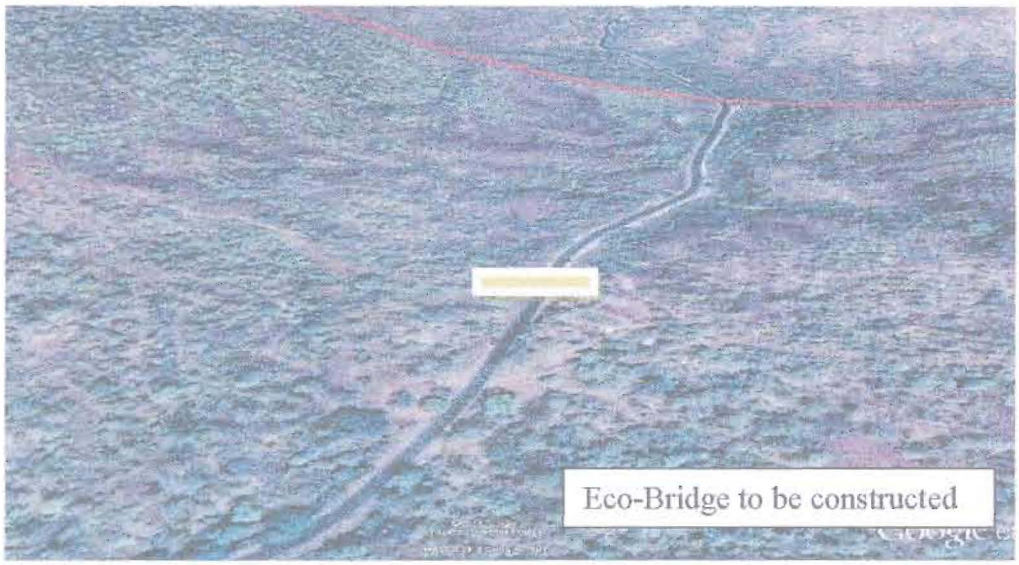


Area showing the proposed road which connects thick forest in Ameenguda Beat of Compt.No 306/1 of Rebbena range, where underpass is proposed.



Area showing the proposed road which connects thick forest in Ganeshpur Beat of Compt.No 238 of Asifabad range, where underpass is proposed.





General rules for maintaining habitat connectivity across the landscape:

The general guidelines set out below to maintain connectivity across an identified species corridor are based on species ecology, such as home range and habitat use pattern, species communities across different landscapes and other ecological information

i. If the width of the corridor through forest habitat is 1 km or less, the construction of flyovers should be undertaken in such a way that the entire stretch of forest remains connected.

ii. If the width of the corridor is 1-2 km, one underpass of 750 m should be provided across the landscape. The exact location of the underpass should be based on topographic features of the area and information about customary animal crossing zones. This 750 m stretch of elevated road could also be divided into two parts of minimum 300 m each, located within that corridor. Their location would depend upon the terrain, characteristics of the particular species and its movement patterns.

iii. If the width of the corridor is 3 km or more or if the forest landscape is to be dissected by either a new road or the upgrading of an existing road, 300 m underpasses are suggested with in every km stretch of the road. The exact location of the underpass should be based on topographic features, crossing zones, and the particular ecological requirements of the affected species.

iv. Other than maintaining connectivity for large mammalian species, for amphibians or reptiles across the landscape, small pipe culverts or bridges should be constructed in every 100 m stretch of road.

Table 8.1. Placement of crossing structures across animal movement corridors of varying widths

Landscape characteristic	Design measure for maintaining connectivity
Connectivity across 1 km species corridor	Entire 1 km stretch to be connected
Connectivity across 1-2 km species corridor	750 m underpass either as one structure or two 300 m each depending upon terrain and other conditions
Connectivity across 3 km species corridor or across the forest landscape to be divided by either a new road or upgrading of existing road	300 m underpasses are suggested at every km of the road
For smaller species such as amphibians and reptiles	Small pipe culverts or bridges at every 100 m stretch of the road.

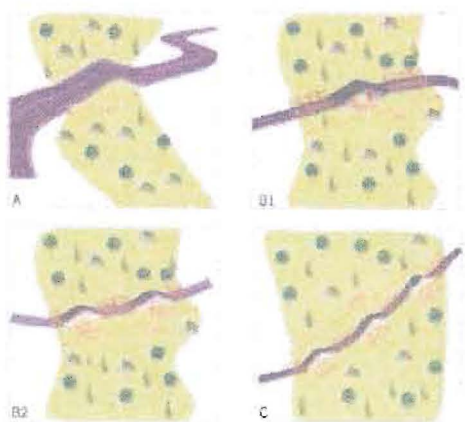


Figure 8.1. Underpass type locations suggested for different lengths of wildlife corridors. (A) 1 km (shown for 1 km wide corridor; B1) a 750 m underpass or two underpasses of 300 m each (B2) for 2 km wide corridor; and C) 3 underpasses of 300 m each for a 3 km wide corridor.

SPECIES-SPECIFIC MEASURES

It is important to consider, and design wildlife crossings and animal passages to cater for, all of the species using the area affected by linear infrastructure, to improve the efficiency and effectiveness of mitigation solutions.

The following section focusses on the use of underpasses as a principal measure to mitigate negative impacts of roads and railways on terrestrial mammals. However, it is useful to note that these underpasses would also be used by other animal taxa.

Underpasses for terrestrial mammals

The following minimum design requirements of underpasses for specific terrestrial mammal species are based on the effectiveness of underpasses for mule deer, which have a shoulder height of 106 cm (Reed et al. 1975; Reed et al. 1979; Reed 1981; Ward 1982; Olbrich 1984; Reed & Ward 1987; Foster & Humphrey 1995; Putnam 1997).

- For chital, with a shoulder height of up to 75 cm, an openness index of 0.52 (metric) is needed.
- For sambar, with a shoulder height up to 160 cm, an openness index of 1.12 (metric) is needed.
- For gaur, shoulder height up to 175 cm, an openness index of 1.22 (metric) is needed.

Figure 8.2 shows the required underpass height in relation to animal size. In landscapes where sambar, gaur and tiger are the largest animals present, a minimum underpass height of 5 m would be acceptable if the viaduct were 300 m long and the span of the underpass were 28–30 m. For any other underpass with a viaduct of less than 300 m, and in landscapes where elephant and rhino are the largest animals in the community, the minimum height of the underpass should be 6–8 m to provide an openness ratio that could provide an optimum passage for these animals.

While approaching the underpass, the animal should preferably be able to view the horizon across the underpass in order to perceive any risks and opportunities on that side. Although a structure 5 m high and passage with a viaduct length of 300 m should be able to provide this view, a 7 m high passage would provide a more liberal view created by a higher openness ratio.

The design of the walls and the piers of an underpass can significantly improve the acceptability of passage structure by animals. Isolated piers are more favourable than wall-type piers: wall-type piers reduce lateral visibility and increase tunnel effects, especially for species that move in groups, such as chital. The inclusion of a cross beam at the top of isolated piers further improves their acceptability. Figure 8.3 shows line drawings and constructed animal underpasses with wall type and isolated piers.

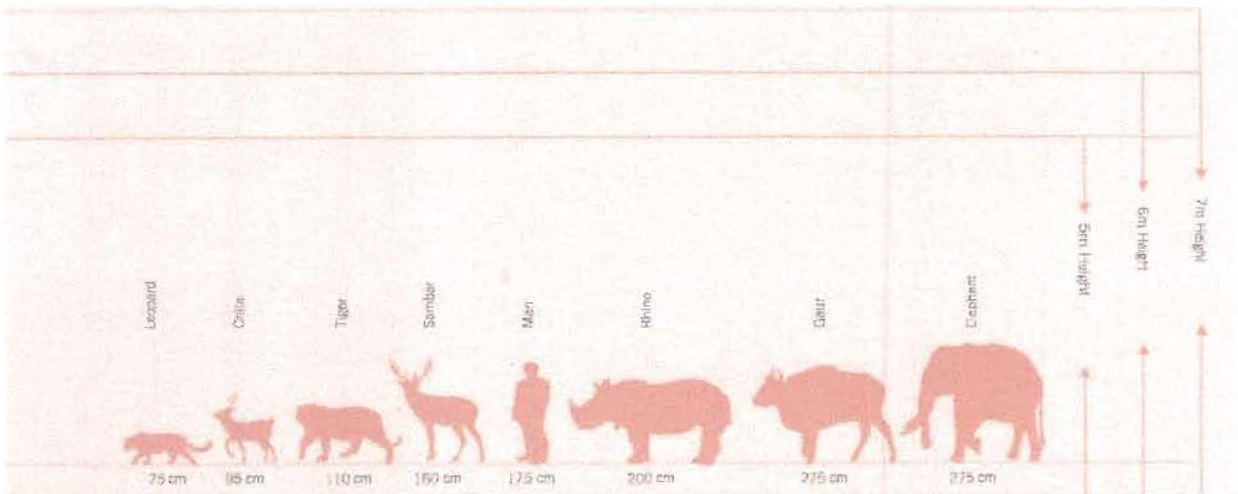


Figure 8.2. Underpass heights as they should relate to animals.

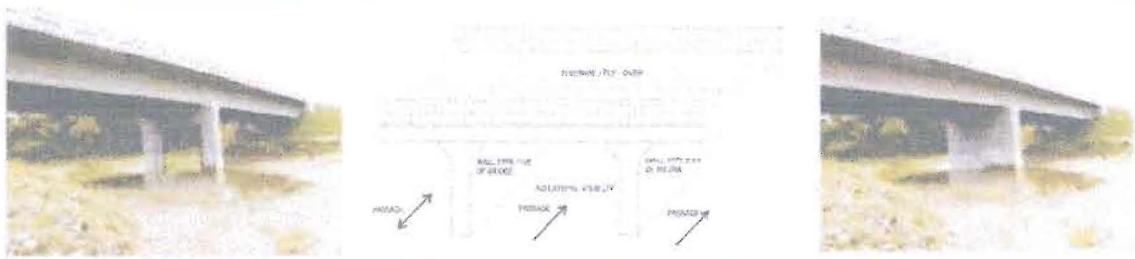


Figure 8.3. Diagrammatic representation of isolated and wall type piers. Source: Adapted from Singh et al. 2010. Illustration by Niharika Saxena.

The area proposed for diversion is barest minimum and unavoidable without alternatives for the project. No violation against the Forest Conservation Act, 1980 has been carried out by the User Agency, hence recommended.

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