



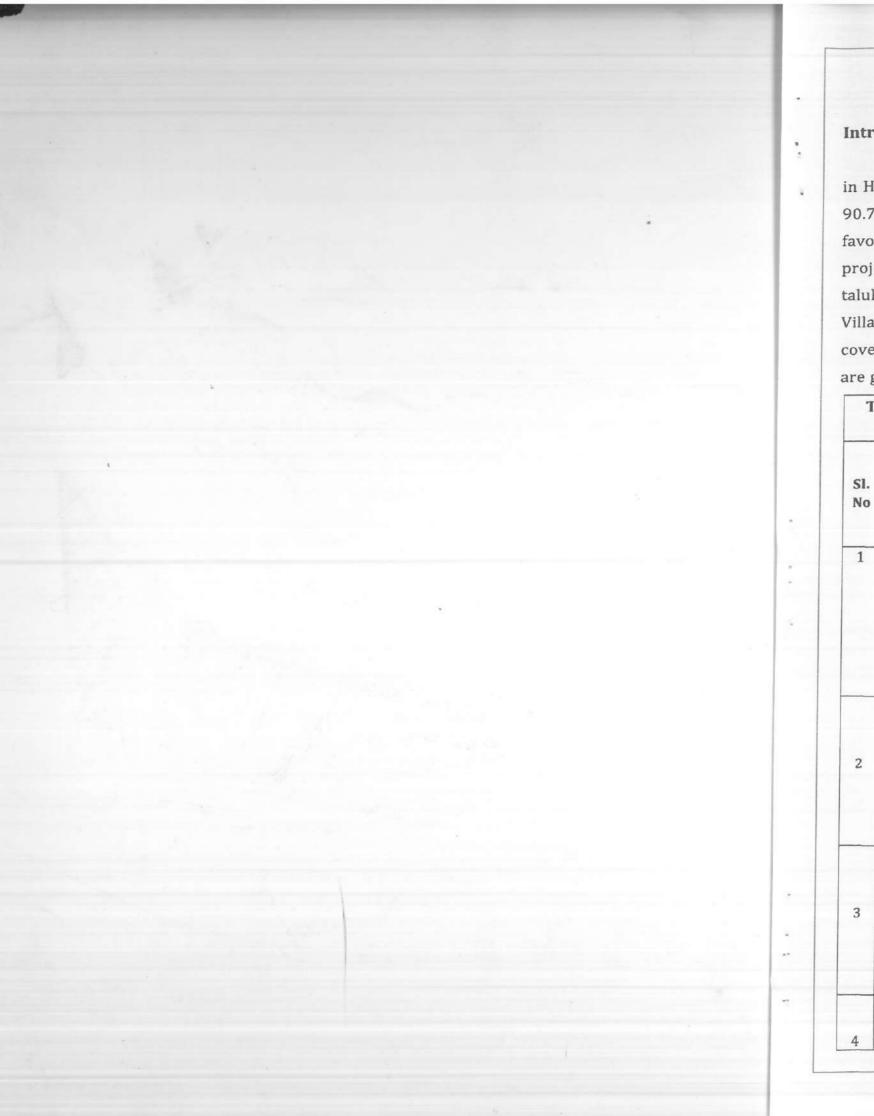
Wild Life Mitigation Plan

Name of the Project: Construction of 2 Lane with Paved shoulder from Km 56.00 to Km 90.70(existing chainage) of NH-766C (complete Realignment of 13.832 Km) with 2 Major Bridges across Sharavathi Backwater on EPC mode under Annual Plan 2022-23 in the State of Karnataka – ADUGODI TO MAVINAKOPPA

Proposal No: FP/KA/ROAD/156224/2022

Applicant/User Agency:

The Superintending Engineer-Regional Officer
KSCFL Building, Race Course Road, Ministry of Transport
and Highways, Bangalore

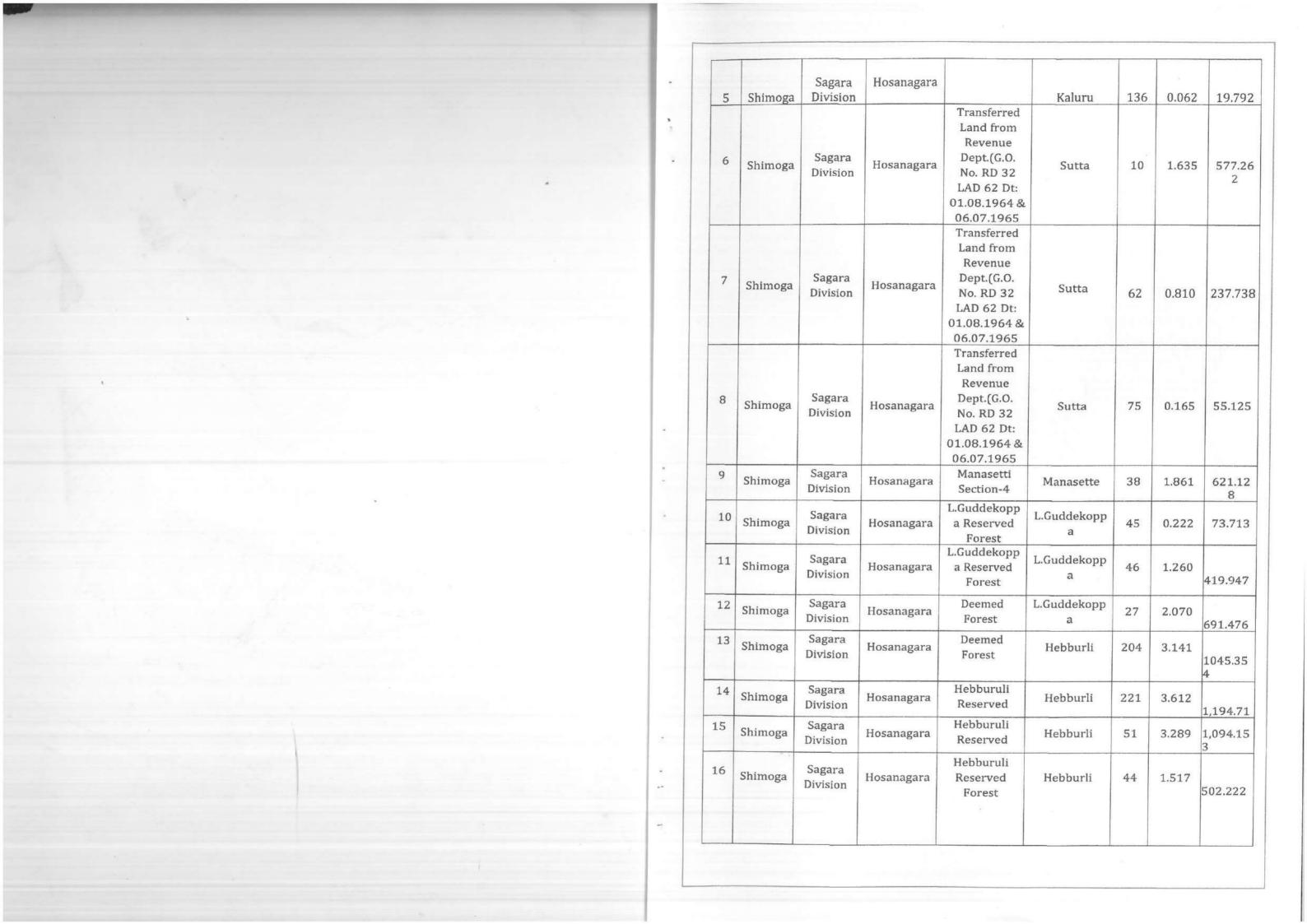


WILDLIFE MITIGATION PLAN

Introduction:

The diversion of forest land proposed for the Diversion of 18.844 Ha of Forest land in Hosanagara (T), Shimoga (D) for Construction of 2L+PS road from km 55.60 to km 90.70 mavinakoppa of NH 766 C with major Bridges across Sharavathi back Water in favour of Executive Engineer, National Highways Division, Shivamogga. The Proposed project requires diversion of 25.763 ha forest land in about 7 villages of Hosanagara taluk in Sagar division. The new Road National Highway project starts at Mavinakoppa Village and ends at Adagodi Village (Bekkodi) with a length of 13+832 km. This Road covers in Shivamogga district. The details of forest land involved in the proposed project are given in the following **Table-1**

SI. No	District	Forest Division	Taluk	Proposed for to Mavinakoppa Name of Forest Area		Sy. No.	Area in Ha	Length of Forest Land
1	Shimoga	Sagara Division	Hosanagara	Transferred Land from Revenue Dept.(G.O. No. RD 32 LAD 62 Dt: 01.08.1964 & 06.07.1965	Ganganakop pa	13	0.420	in (m) 73.542
2	Shimoga	Sagara Division	Hosanagara	Transferred Land from Revenue Dept.(G.O. No. RD 32 LAD 62 Dt: 01.08.1964 & 06.07.1965	Ganganakop pa	21	0.337	112.36 4
3	Shimoga	Sagara Division	Hosanagara	Transferred Land from Revenue Dept.(G.O. No. RD 32 LAD 62 Dt: 01.08.1964 & 06.07:1965	Ganganakop pa	5	0.430	143.341
4	Shimoga	Sagara Division	Hosanagara		Kaluru	133	0.670	223.404



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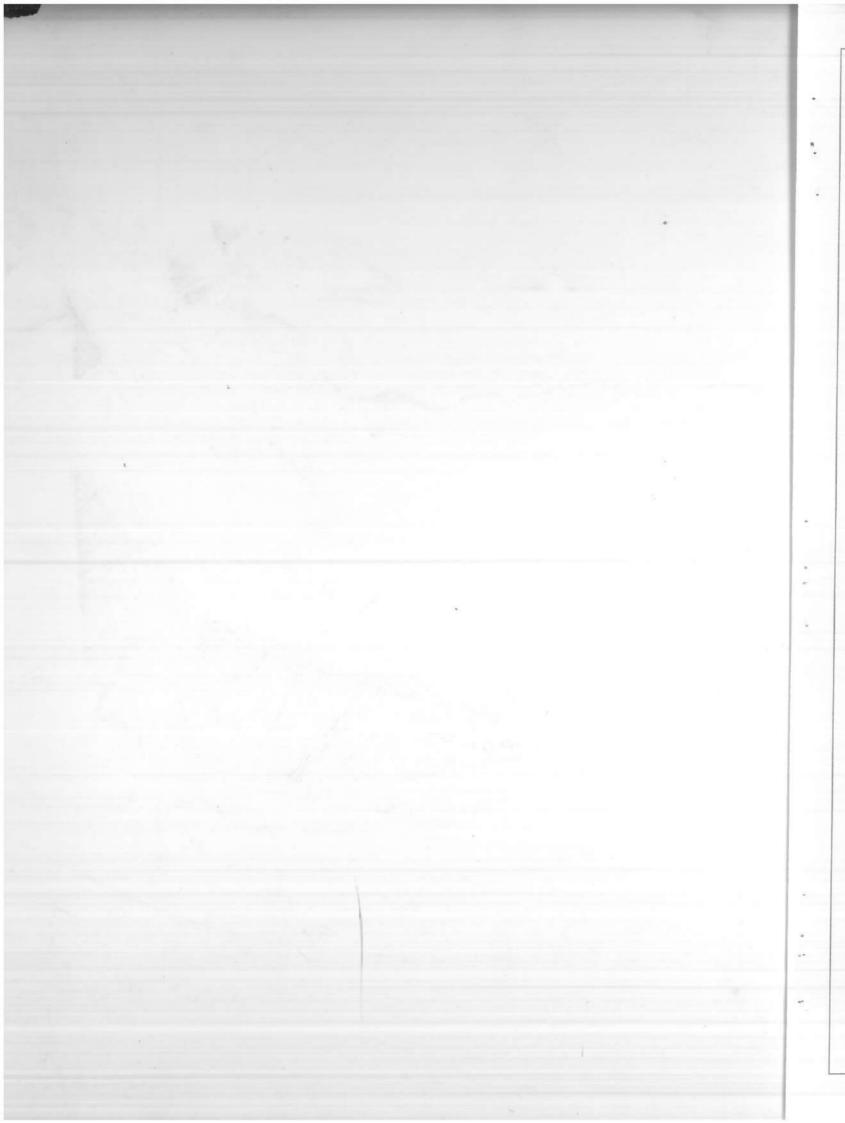
17	Shimoga	Sagara Division	Hosanagara	Transferred Land from Revenue Dept.(G.O. No. RD 32 LAD 62 Dt:01.08.1964 & 06.07.1965	Hosuru	43	0.530	161.428
18	Shimoga	Sagara Division	Hosanagara	Adugodi Reserved Forest	Adugodi	74	1.992	681.37
19	Shimoga	Sagara Division	Hosanagara	Adugodi Reserved	Adugodi	79	1.740	490.952
						Total	25.763	12654

The proposed Diversion area inhabits wild animals like Indian Gaur (Bos gaurus), Sambar (Cervus unicolor), Munt Jack (Muntiacus muntajac), Wild Boar (Sus scrofa), Hanuman Langoor (Macaca semnopethicus), Giant squirrel (Ratufa indica), King Cobra (Ophiophagus hannagh) and other reptiles and Birds like Peacock (Pavo cristatus), Malabar Grey Hornbill (Ocyceros birostris). Animals move through the landscape for variety of reasons and often interact with roads, Traffic and other linear infrastructure. There is always a risk of collision with a vehicle if the animal attempts to cross the National Highway road, resulting in injury or death (road kill) of the animal and sometimes commuters. The rate of wildlife-vehicle collisions (WVC) has been increasing globally. The loss of wildlife from road collision is substantial and is one of the causes of wildlife mortality in our country. The location and timing of WVC are influenced by the location of the NH road in the landscape, traffic volume, vehicle speed and infrastructure provided to the wildlife to cross over and improvement of their habitats etc. understanding all the factors that influence their occurrence are essential to avoid high risk areas and designing effective mitigation plans and adaptive measures.

Need for wildlife Management Plan

Wildlife habitat is considered as the environment used by an animal and is essential for food, mating, cover and other requirements for survival. Any disturbance or loss of such habitat will have adverse effect on the overall population of the animals which live in that area. Whereas, linear projects such as irrigation canal is important to the country for economic growth and to meet the demands of basic needs of the people. Hence, incorporating the ecological considerations into modern design techniques will result in favourable win to win approach to safeguard the interests of both wildlife and people.

In this context, the objectives of the present Wildlife Management & Mitigation plan are as follows:



- To provide a plan to mitigate the impacts due to construction of track inside the forest areas.
- To provide wildlife-crossings at suitable places, which are comfortable and conducive for wildlife movement across the proposed canal.
- To provide structures such as crossings, overpass bridges, culverts, water holes,
 etc so as not to disrupt the wildlife behavior and its activities.
- To improve the habitat factors by augmenting the availability of water to wildlife during pinch period and by carrying out plantation of suitable species.
- To ensure the safety of wildlife by erecting Road fence along the frackto prevent road kills and accidental falls on the track.
- Monitor of wildlife crossings and study the long term impacts.

ANTICIPATED IMPACTS

Habitat Fragmentation

Habitat fragmentation is defined as a process during which 'a large area of habitat is transformed into a number of smaller patches of smaller total area, isolated from each other by a matrix of habitats unlike the original' (Wilcoveet al., 1986).

Construction of the track acts as a physical barrier for wildlife, the species belonging to the area proposed for track construction will lose their habitat and fragmentation will take place. Animal movement will be blocked and chances of animals fall into the canal result in death or injury.

Loss of Habitat

The area proposed for diversion is a habitat for antelopes and sloth bears along with other species. Habitat loss has direct negative effect on genetic diversity and population growth rate. Habitat loss occurs when an area of suitable habitat is altered and becomes unsuitable leading to displacement of resident species. However, landscape as a whole, the area proposed for diversion is small and any changes occurred would be recoverable with appropriate mitigation measures.

Disturbance during project implementation

Impacts due to labour force for construction activities will lead to establishment of campsites, generation of sewage, waste water and solid waste. Further, they may engage in activities that are detrimental to natural habitat such as hunting, illegal extraction of timber for fuel wood and non-timber forest products.



Air and noise pollution will arise due to activities such as excavation, cutting, drilling and filling and compaction work, as well as operation of construction related vehicles during the construction phase will cause disturbance to the wild animals. This can be avoided by following appropriate mitigative measures.

National Highway Road kills/accidental fall on to track

The alignment of Road at isolated stretches of 6.293km in forest area may lead to National Highway road kills of wildlife during its movement to the other side of the track. Accidental fall of animal's especially small and medium sized animals on to the track will result in death or injury to these animals. This can be avoided with erection of Road fencing on either sides of the track.

WILDLIFE MANAGEMENT PLAN

The impacts stated earlier can be minimized through several mitigation measures which are a part of the Wildlife Management Plan. The mitigation measures are as follows:

Provision of Wildlife crossings

Wildlife, like any other living species require the primary needs of food, shelter, water and territory to roam, hunt, search for food etc., the construction of canal in the WLS may pose as a barrier restricting the movement of animals. Daily, weekly or seasonal movements across landscape are necessary for the most terrestrial species.

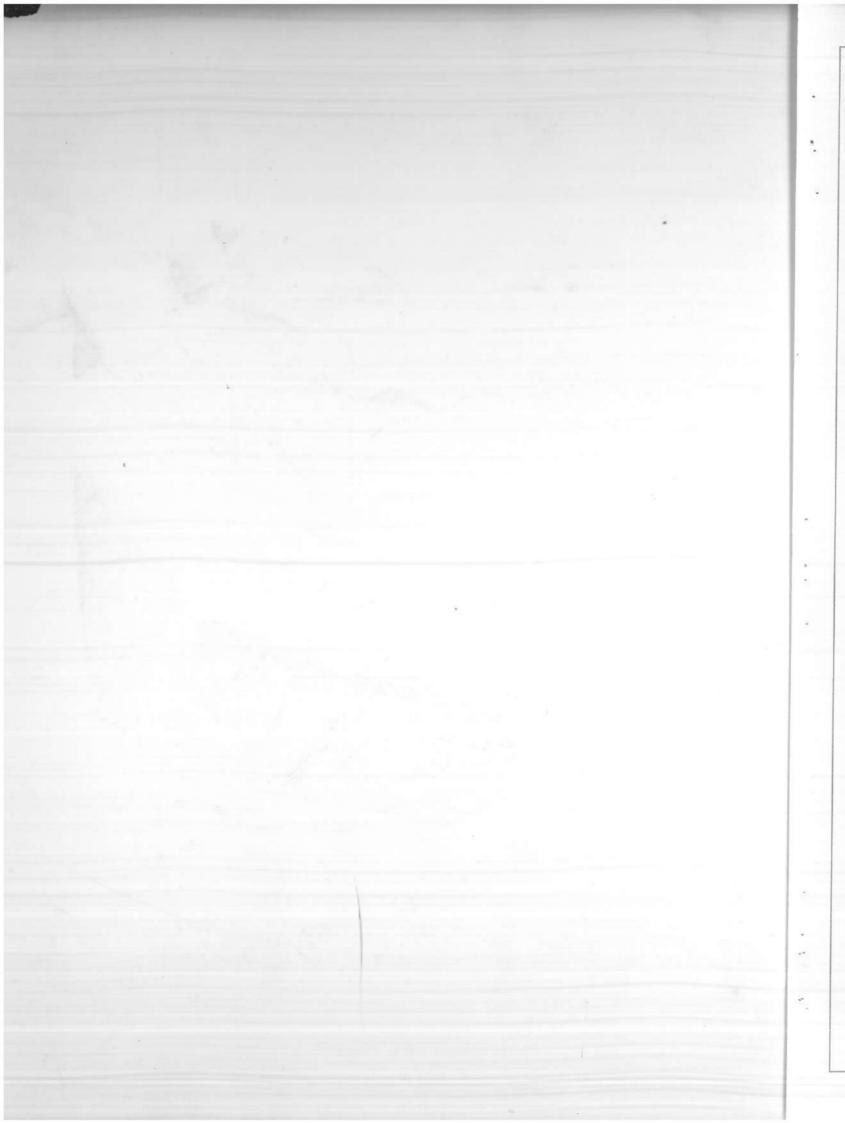
It may not be a serious threat for the smaller mammal and other terrestrial species but the large mammals may get highly affected. This leads to habitat fragmentation and the major impacts are as follows (Jaeger *et. al.*, 2005):

- Limits the availability of habitat for any wild species
- Prevents access to water and other resources on the other side of the canal
- Subdivide wildlife populations into smaller and more vulnerable sub-populations.
- Affects the regular movement path of the wildlife.

Hence it is necessary to construct wildlife crossings in order to facilitate the smooth movement of animals all through its natural habitat. The crossing over construction is necessary for the following elements:

- · To restore pre-development wildlife movement pattern
- To reduce wild life physical barrier due to canals

These structures allow animals to cross human – made barriers safely. These crossings



may include: underpass tunnels, viaducts and overpasses (mainly for large or herd-type animals) amphibian tunnels, tunnels and culverts (for small mammals) green roofs (for butterflies and birds) (Bank *et al.*, 2002). All of these structures are designed to provide semi-natural corridors above and below human constructed barriers like canals so that animals can safely cross without endangering themselves.

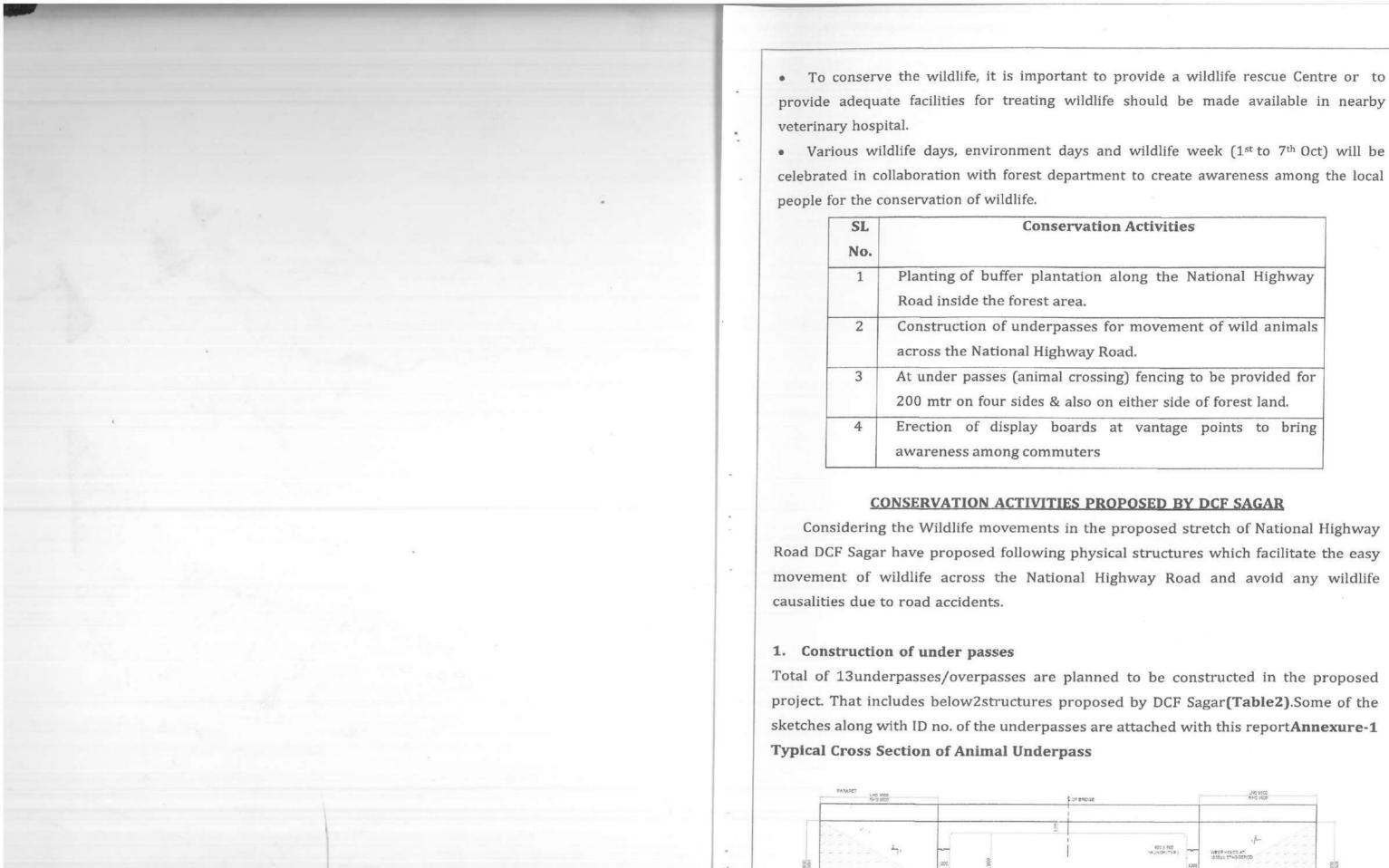
Wildlife crossings are a practice in habitat conservation, allowing connections or reconnections between habitats, combating habitat fragmentation. They also assist in avoiding falling on the track.

Conservation Measures

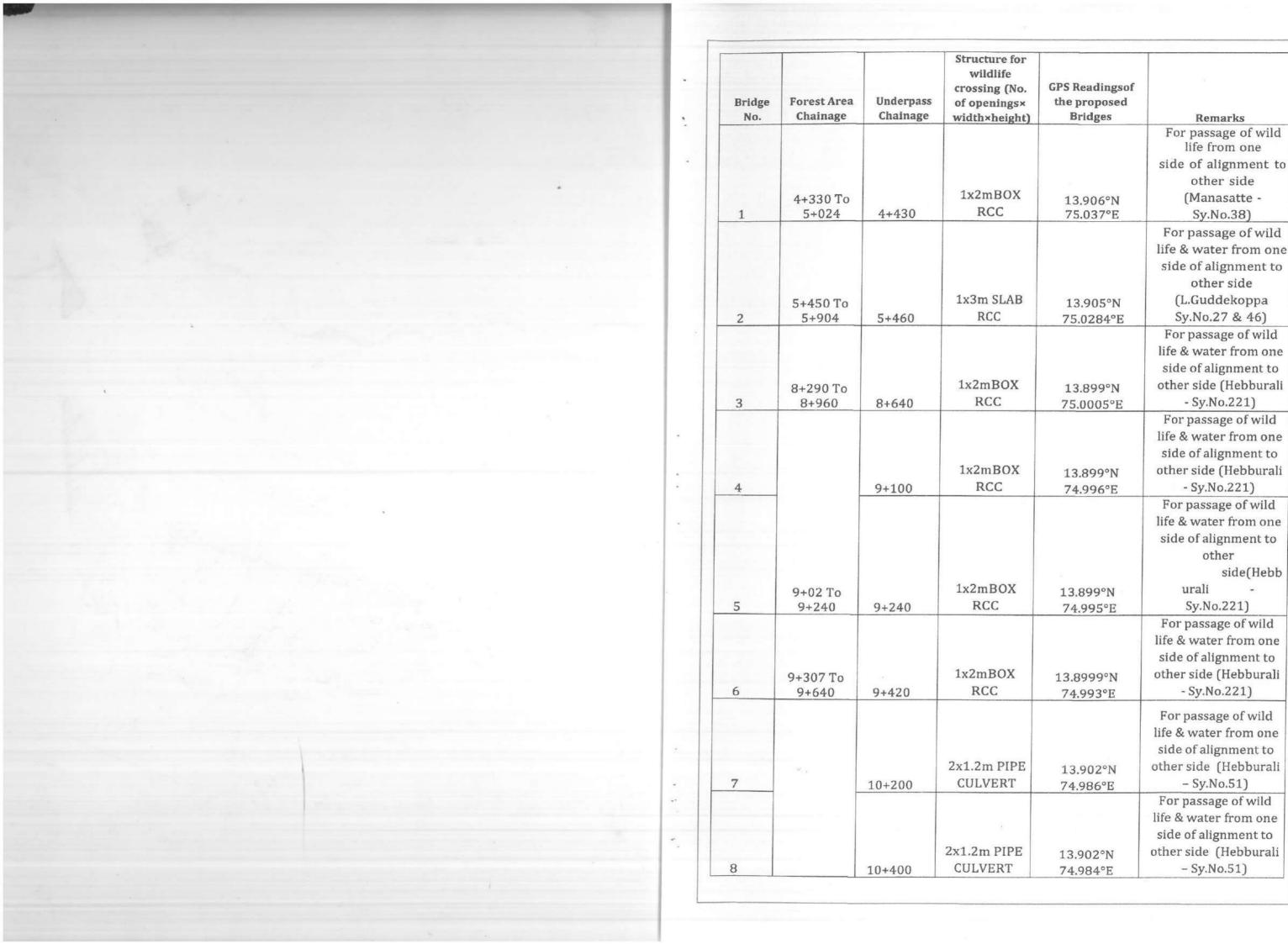
- i) Green belt/plantation will be developed all along the roads and other places for control of air, odour, and fugitive dust emission in the proposed expansion project area as well as in study area where suitable land is available.
- i) Green shelter belt will be developed along the roadside.
- iii) Availability of water throughout the year will be maintained by artificial water holes and ponds deepening wherever required.
- iv) Fire prevention measures will be taken in the forest areas so that fire won't spread from road into the forest. Sparks from exhaust of vehicles and mischievous commuters may lead to forest fire and devastate the forest area. Hence appropriate measures have to be taken to counter this threat.

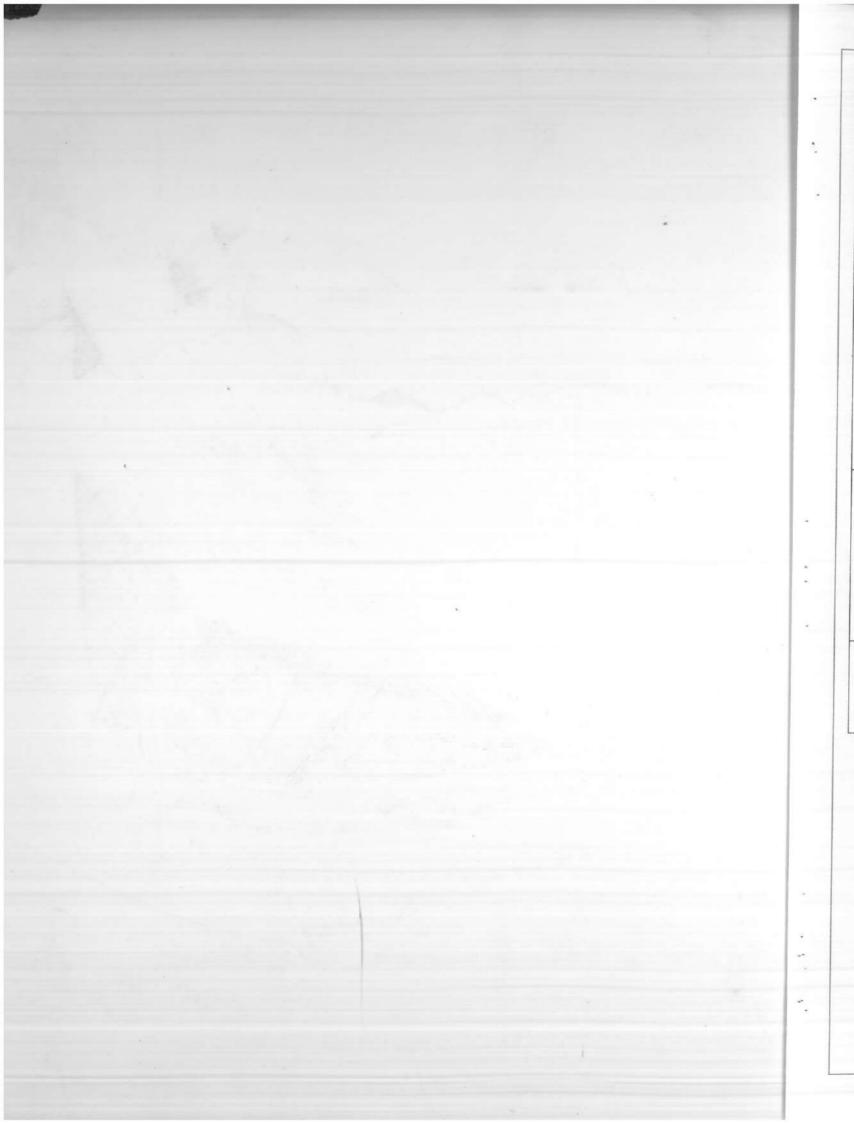
Action Plan for Conservation of Wildlife

- Plantation will be developed near the water bodies and water availability and its quality will be maintained regularly.
- Underpasses will be created at selected sites so that animals can easily cross from
 one side of the road to other freely. This is very essential to ensure easy passage of
 animals and also safety of the passengers on the road. The locations of underpasses
 have been shown in the map below.
- Only indigenous species will be preferred for plantations and grasslands.
- Public awareness will play a major role in conservation of any wildlife. So, various public awareness activities like seminars, conferences, nature club, poster presentation at school and gram panchayath, nature education camps for students and villagers around wildlife habitation.
- Wildlife signage will be used on a very large scale along the road to create awareness.



INDEPENDENT RETURN WALL SECTION 2.2 SCALE F45





9	9+965 To 11+286	10+680	2x1.2m PIPE CULVERT	13.903°N 74.982°E	For passage of wild life & water from one side of alignment to other side (He bburali -Sy.No.51)
10		11+170	1x2m BOX RCC	13.905°N 74.978°E	For passage of wild life & water from one side of alignment to other side.(Hebburali Sy.No.44)
11		11+220	16mx10m RCC BOX	13.906°N 74.978°E	For passage of wild life & water from one side of alignment to other side. This underpass is proposed by DCF Sagar (Hebburali – Sy.No.44)
12		12+760	16mx10 mRCC BOX	13.908°N 74.959°E	For passage of wild life & water from one side of alignment to other side. This underpass is proposed by DCF Sagar (Adgodi - Sy.No.74)
13	12+660 To 13+832	12+960	1x2m RCCBOX	13.907°N 74.955°E	For passage of wild life & waterfrom one side of alignment to other side (Adgodi – Sy.No.79)



2. Construction of Chain link Mesh Fencing

Construction of Chain link mesh Fencing is proposed on either side of the National Highway Road which passes through Forest area. The Chain link mesh Fencing prevents wildlife crossing across the Roads and guides them towards the underpasses which are proposed to be constructed.

The above conservation activities proposed by DCF Sagarhave been included in the Mitigation plan for movement of wild life across the road. Along with that voluntarily few more under passes are provided and Chain link Mesh Fencing will be provided on either side of road to prevent wild animals crossing on entire length of the Road passing through forest area except at the proposed wild life crossing structures. The details of chain-link fencing points is shown in **Table-3**.

Proposed Road Chain Link fencing along the alignment on either side of the road(Table-3)

SL	Cha	inage	Length in	Remarks		
No.	From	То	Km			
1	0+000	0+073	0.073			
2	0+327	0+440	0.112			
3	0+619	0+762	0.143			
4	1+941	2+055	0.113			
-5	2+100	2+210	0.110	Chain link Mesh Fencing		
6	2+333	2+353	0.019	will be provided on either		
7	2+738	2+793	0.055	will be provided on either		
8	2+980	3+218	0.237	side of road to prevent		
9	3+462	4+039	0.577	wild animals crossing		
10	4+326	4+947	0.621	Wild allithats crossing		
11	4+947	5+165	0.217	except at the proposed		
12	5+450	5+905	0.453	wild life crossing		
13	6+293	6+807	0.513	wild life crossing		
14	7+321	9+263	1.940	structures		
15	9+307	9+606	0.299			
16	9+972	11+299	1.326			
17	11+532	11+630	0.098			
18	11+782	11+953	0.171			
19	11+953	12+114	0.161			
20	12+173	12+183	0.009			
21	12+659	13+832	1.172			
Tot	al Length		8.419			

3. Installation of Signboards and Speed Breakers

The construction highway results in the increase in the cruising speed of the oncoming vehicles. In order to reduce the speed of vehicles and to create awareness, specialized signboards must be installed in the forest patches and speed breakers also to be installed to decrease the speed of the coming vehicles in specific paths of highway. The location details for these proposed signboards and speed breakers are given as below.



Sl No	Village	Locality (Sy. No.)	GPS Reading	Proposed Structure	
1	Ganganakoppa	21	13.908° N 74.955° E	Signboards/ Speed breaker	
2	Sutta	10	13.907° N 75.042° E	Signboards/ Speed breaker	
3	Sutta	75	13.907° N 75.054° E	Signboards/ Speedbreaker	
4	Manasette	38	13.906° N 75.039° E	Signboards/ Speed breaker	
5	L.Guddekoppa	27	13.906° N 75.016° E	Signboards/ Speed breaker	
6	L.Guddekoppa	46 45 44	13.906° N 75.025° E	Signboards/ Speed breaker	
7	L.Guddekoppa		13.907° N 75.033° E	Signboards/ Speed breaker	
8	Hebburli		13.907° N 74.975° E	Signboards/ Speed breaker	
9	Hebburli	51	13.901° N 74.988° E	Signboards/ Speed breaker	
10	Hebburli	221	13.901° N 74.992° E	Signboards/ Speed breaker	
11	Hosuru	43	13.909° N 74.971° E	Signboards/ Speed breaker	
12	Adgodi	74	13.909° N 74.965° E	Signboards/ Speed breaker	
13	Adgodi	79	13.908° N 74.955° E	Signboards/ Speed breaker	

4. Providing one Mahindra-Bolero Vehicle for rescue of Wild Animals in Sagar Division:

To take-up rescue and rehabilitation of wild animals during conflict situation one Mahindra-Bolero vehicle will be provided for division from user agency.

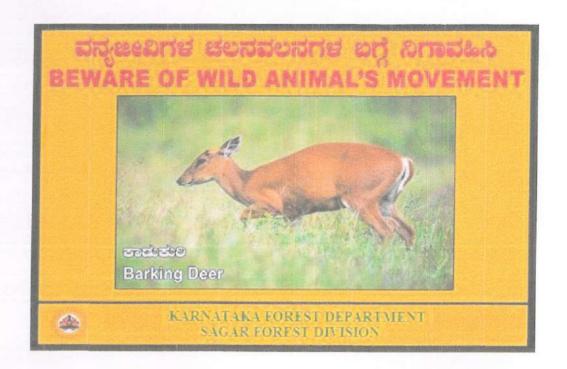
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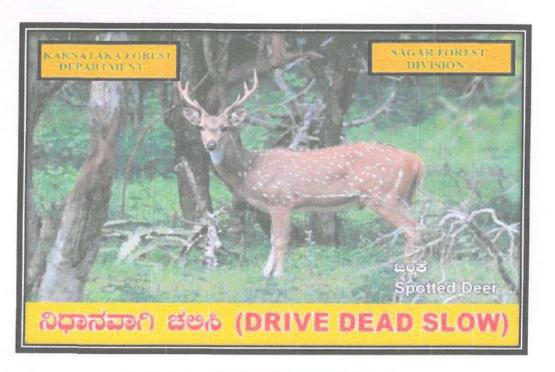
Sagar Division, SAGAR

1SST. CONSERVATOR OF FORESTS
HOSanagara SUB. DN. Hosanagara



Proposed Sign Boards as follows:





Informatory Sign Boards

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Deputy Conservator of Forest Sagar Division, SAGAR

ASST. CONSERVATOR OF FORESTS

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Cautionary Sign Boards



Deputy Conservator of Forest

ASST. CONSERVATOR OF FORESTS

Hosanagara SUB. DN. Hosanagara.

