

South Western Railway



Wild Life Mitigation Plan

Name Of Proposal: Construction of New BG Railway line in Forest Lands in Various Villages of Shimoga and Davangere District in favour of Deputy Chief Engineer, Construction, South Western Railway, Mysuru.

Name of the Project: Proposed New BG Railway line between Shivamogga – Shikaripura

Proposal No: FP/KA/RAIL/155505/2022



Applicant/User Agency:
Deputy Chief Engineer,
Construction, South Western Railway,
Yadavagiri, Mysuru-570020

WILDLIFE MITIGATION PLAN

Introduction:

The new Railway line project between Shivamogga -Shikaripura BG line: 42.0 km take off from Koteganguru at CH: 08/020. This line covers two districts, i.e, Shivamogga and Shikaripura in Karnataka state. The details of forest land involved in the proposed project are given in the following **Table-1**

Table-1: Details of Forest Land of SHIVAMOGGA - SHIKARIPURA New BG Line

Sl. No	District	Territorial K.F Division	Taluk	Hobli	Village	Sy.No	Hectares	Length of Forest Land
1	Shivamogga	Sagara	Shikaripura	Hosuru	Ittigehalli	81	1.97	705.8
		Sagara	Shikaripura	Hosuru	Ittigehalli	28	0.4	
		Sagara	Shikaripura	Anjanapura	Harogoppa	12	2.16	1016.5
		Sagara	Shikaripura	Anjanapura	Harogoppa	11	1.62	
		Sagara	Shikaripura	Anjanapura	Harogoppa	13	2.51	
		Sagara	Shikaripura	Kasaba	Sadashivapura	32	8.98	863.1
		Sagara	Shikaripura	Anjanapura	Yarekatte	15	10.5	1776.1
		Sagara	Shikaripura	Hosuru	Thimlapura	25	4.96	1447.3
		Sagara	Shikaripura	Hosuru	Dhoopadahalli	27	5.74	491.2
		Sagara	Shikaripura	Hosuru	Dhoopadahalli	49	0.03	
		Shimoga	Shikaripura	Anjanapura	Hirekoralahalli	39	3.71	989.6
		Shivamoga	Shivamoga	Harnahalli	Narayanpura	34	0.17	35.6
		Shivamoga	Shivamoga	Harnahalli	Kondajji	23	1.2	251.7
		Shivamoga	Shivamoga	Harnahalli	Sidlipura	26	0.2	546.2
		Shivamoga	Shivamoga	Harnahalli	Konnagavalli	56	0.33	926.9
2	Davangere	Shivamoga	Nyamathi	Belaguthi	Lakkinakoppa	46	0.21	45.5
		Shivamoga	Nyamathi	Belaguthi	Belakatte	33	3.1	974.5
		Shivamoga	Nyamathi	Belaguthi	Belakatte	32	0.12	
Total							47.91	10070.0

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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 rail 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 rail 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 rail 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 Rail fence along the track about 3.3km to 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' (Wilcove *et 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.

Rail Road kills/accidental fall on to track

The alignment of track at isolated stretches of 10.07km in forest area may lead to Rail 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 Rail 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.
- ii) 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.
- To conserve the wildlife, it is important to provide a wildlife rescue centre or to provide adequate facilities for treating wildlife should be made available in nearby veterinary hospital.
- Various wildlife days, environment days and wildlife week (1st to 7th Oct) will be celebrated in collaboration with forest department to create awareness among the local people for the conservation of wildlife.

SL No.	Conservation Activities
1	Planting of buffer plantation along the Railway line inside the forest area.
2	Construction of underpasses for movement of wild animals across the Railway line
3	At under passes (animal crossing) fencing to be provided for 200 mtr on four sides & also on either side of forest land.
4	Erection of display boards at vantage points to bring awareness among commuters

CONSERVATION ACTIVITIES PROPOSED BY DCF SAGARA and DCF SHIVAMOGGA

Considering the Wildlife movement in the proposed stretch of Railway line DCF Sagara and DCF Shivamogga have proposed following physical structures which facilitates the easy movement of wildlife across the railway line and avoid any wildlife casualties due to railway accidents.

1. Construction of under passes

Total of 21 underpasses/overpasses are planned to be constructed in the proposed project. That includes below 6 structures proposed by DCF Sagar and DCF Shimoga (**Table2**). Some of the sketches along with ID no. of the underpasses are attached with this report (**Annexure-1**)

Sl No.	Forest Division	Village	Name of the Reserve Forest	Locality (Sy No.)	GPS Reading	Proposed Structures
1	Sagara Division	Yarekatte	Gangavvanasara S.F.	15	N 14.200308 E 75.424539	Underpass (5m width)
2	Sagara Division	Yarekatte	Gangavvanasara S.F.	15	N 14.198651 E 75.424666	Underpass (5m width)
3	Sagara Division	Harogoppa	Gangavvanasara S.F.	12	N 14.189291 E 75.425202	Underpass (5m width)
4	Shivamogga Division	Belalkatte	Joga M.F	33	N 14.145803 E 75.422031	Underpass (5m width)
5	Shivamogga Division	Belalkatte	Joga M.F	33	N 14.139994 E 75.427256	Underpass (5m width)

2. Construction of Chain link Mesh Fencing

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

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

Proposed Structure for Mitigation plan in Forest diversion in Shivamogga and Sagara Divisions by RAILWAYS (Table-2)

ID No.	Forest Location	Wild life crossing Location	Structure for wildlife crossing (No. of openings × Width × Height)	Bridge No.	GPS Readings of the proposed Bridges	Remarks
1	10/565 To 10/900	10/781.80	1x1.20x1.80m RCC BOX	Exg.Br.No. 117	N 14.002852 E 75.511300	For passage of wild life from one side of alignment to other side (Sildlipura - Sy.No.26)
2	11/050 To 11/260	11/172	1x1.20x1.80m RCC BOX	Exg.Br.No. 118	N 14.006202 E 75.510595	For passage of wild life & water from one side of alignment to other side (Sildlipura - Sy.No.26)
3	11/550 To 12/190	11/668	1x4.0x4.0 m RCC BOX	Exg.Br.No. 118A	N 14.006133 E 75.513853	For passage of wild life & water from one side of alignment to other side (Konagavalli - Sy.No.56)
4		11/695.38	1x2.0x2.0 m RCC BOX	Exg.Br.No. 119	N 14.010879 E 75.509653	For passage of wild life & water from one side of alignment to other side (Konagavalli - Sy.No.56)
5	30/760 To 32/780	30/813	1x2.0x2.0 m RCC BOX	-	N 14.139652 E 75.428172	For passage of wild life & water from one side of alignment to other side (Belalakatte - Sy.No.33)
6		31/200	1x4.0x4.0 m RCC BOX	-	N 14.145803 E 75.422031	For passage of wild life & water from one side of alignment to other side (Belalakatte - Sy.No.33)
7		31/700	1x4.0x3.0 m RCC BOX	-	N 14.139994 E 75.427256	For passage of wild life & water from one side of alignment to other side (Belalakatte - Sy.No.33)
8		32/230.69	1x7.5x4.0 m RCC BOX	-	N 14.141784 E 75.425382	For passage of wild life & water from one side of alignment to other side (Hirekorlahalli - Sy.No.39)
9		32/375	1x1.20m Dia RCC Pipe	-	N 14.150796 E 75.419986	For passage of wild life & water from one side of alignment to other side (Hirekorlahalli - Sy.No.39)

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10	34/450 To 34/860	34/660	2.0x2.0m RCC BOX	-	N 14.186816 E 75.425534	For passage of wild life & water from one side of alignment to other side (Harogoppa - Sy.No.13)
11	36/270 To 38/670	36/485.55	3x1.20m Dia RCC Pipe1x2	-	N 14.189291 E 75.425202	For passage of wild life & water from one side of alignment to other side. This underpass is proposed by DCF Sagar (Harogoppa - Sy.No.12)
12	36/270 To 38/670	37/500	1x18.30m Composite Girder	-	N 14.200308 E 75.424539	For passage of wild life & water from one side of alignment to other side. This underpass is proposed by DCF Sagara (Yarekatte - Sy.No.15)
13		38/043.32	1x18.30m Composite Girder	-	N 14.198651 E 75.424666	For passage of wild life & water from one side of alignment to other side. This underpass is proposed by DCF Sagara (Yarekatte - Sy.No.15)
14		38/627.21	1x18.30m Composite Girder	-	N 14.206076 E 75.424608	For passage of wild life & water from one side of alignment to other side (Yarekatte - Sy.No.15)
15	42/830 To 44/850	42/912.95	1x30.5m Composite Girder	-	N 14.235384 E 75.404415	For passage of wild life & water from one side of alignment to other side (Ittigehalli - Sy.No.81)
16		43/300	1x3.0x2.0 m RCC BOX	-	N 14.235678 E 75.400719	For passage of wild life & water from one side of alignment to other side (Ittigehalli - Sy.No.81)
17		43/750	1x3.0x2.0 m RCC BOX	-	N 14.238725 E 75.397356	For passage of wild life & water from one side of alignment to other side (Thimlapura - Sy.No.25)

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18		44/364	1x3.0x3.0 m RCC BOX	-	N 14.241907 E 75.392679	For passage of wild life & water from one side of alignment to other side (Thimlapura - Sy.No.25)
19		48/182.89	1x7.5x5.0 m RCC BOX	-	N 14.273774 E 75.380761	For passage of wild life & water from one side of alignment to other side (Sadashivapura - Sy.No.32)
20	48/145 To 49/010	48/550	1x3.0x3.0 m RCC BOX	-	N 14.277044 E 75.380013	For passage of wild life & water from one side of alignment to other side (Sadashivapura - Sy.No.32)
21		48/725	1x3.0x3.0 m RCC BOX	-	N 14.278432 E 75.380114	For passage of wild life & water from one side of alignment to other side (Sadashivapura - Sy.No.32)

Proposed Rail fencing along the alignment on either side of the track (Table-3)

SL No.	Chainage		Remarks
	From	To	
1	10/565	10/900	Chain link Mesh Fencing will be provided on either side of track to prevent wild animals crossing except at the proposed wild life crossing structures
2	11/050	11/260	
3	11/550	12/190	
4	12/600	12/885	
5	19/790	20/018	
6	20/082	20/105	
7	23/348	23/395	
8	30/760	32/780	
9	34/450	34/860	
10	36/270	38/670	
11	40/225	40/350	
12	42/830	44/850	
13	46/320	46/812	
14	48/145	49/010	

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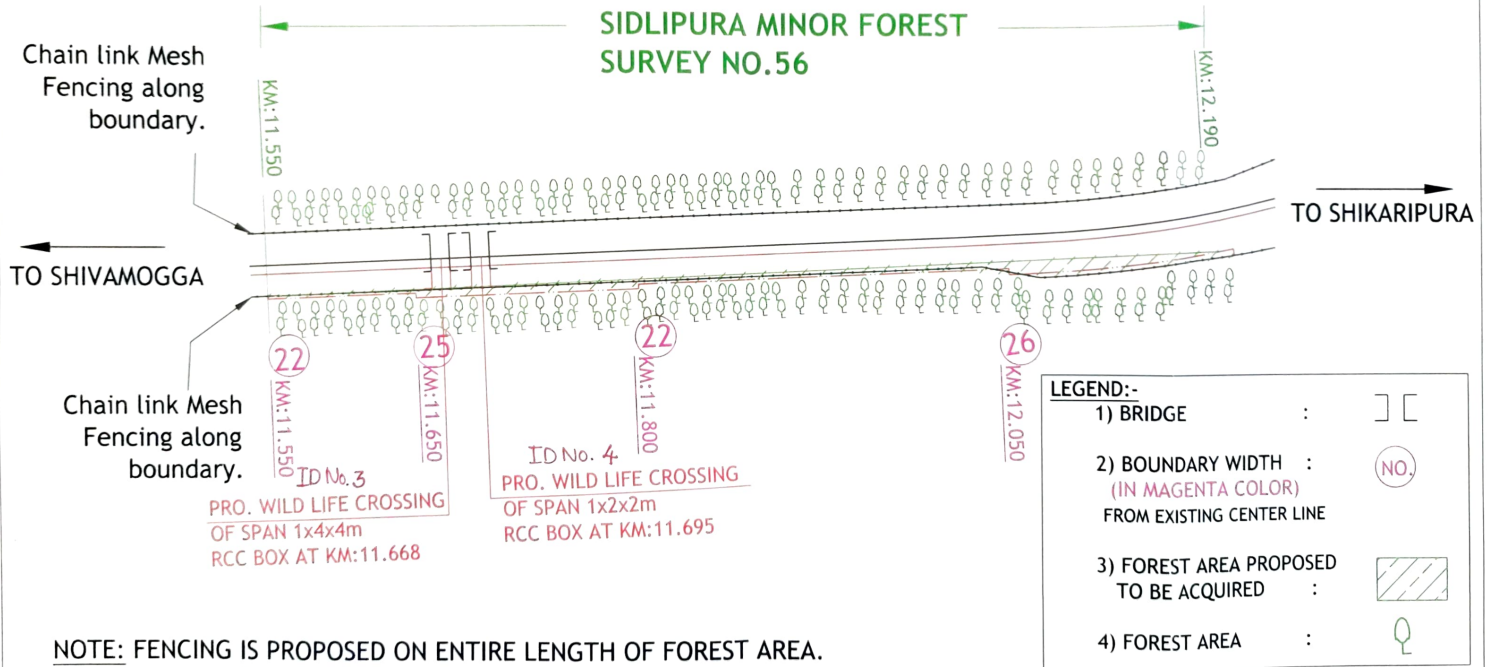
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- 2) BOUNDARY WIDTH : (NO.)
(IN MAGENTA COLOR)
FROM EXISTING CENTER LINE

- 3) FOREST AREA PROPOSED
TO BE ACQUIRED :

- #### 4) FOREST AREA

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK (SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



NOTE: FENCING IS PROPOSED ON ENTIRE LENGTH OF FOREST AREA.

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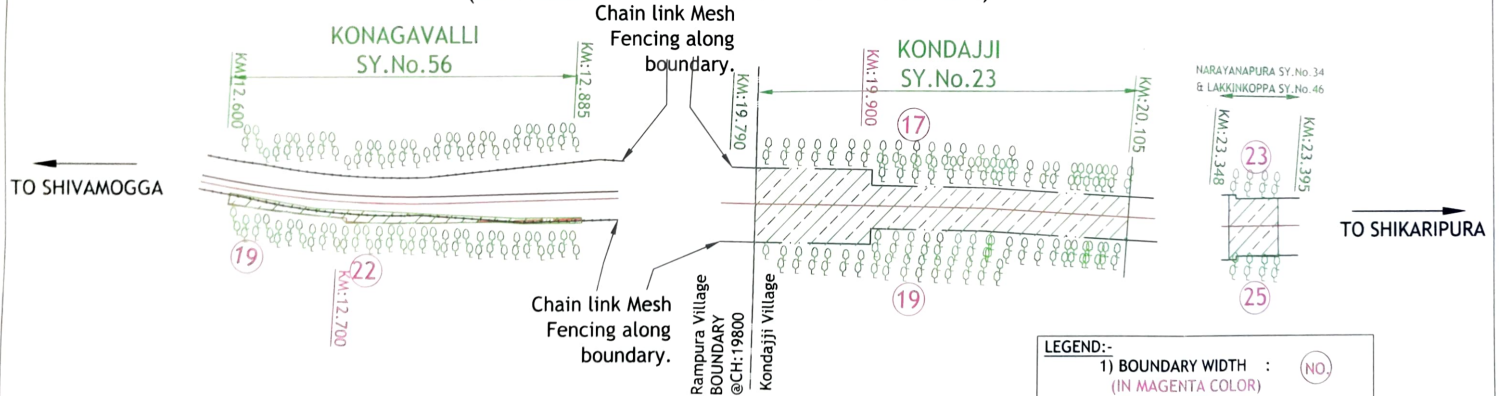
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ANNEXURE-1

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK

(SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



NOTE: i) FENCING IS PROPOSED ON ENTIRE LENGTH OF FOREST AREA.

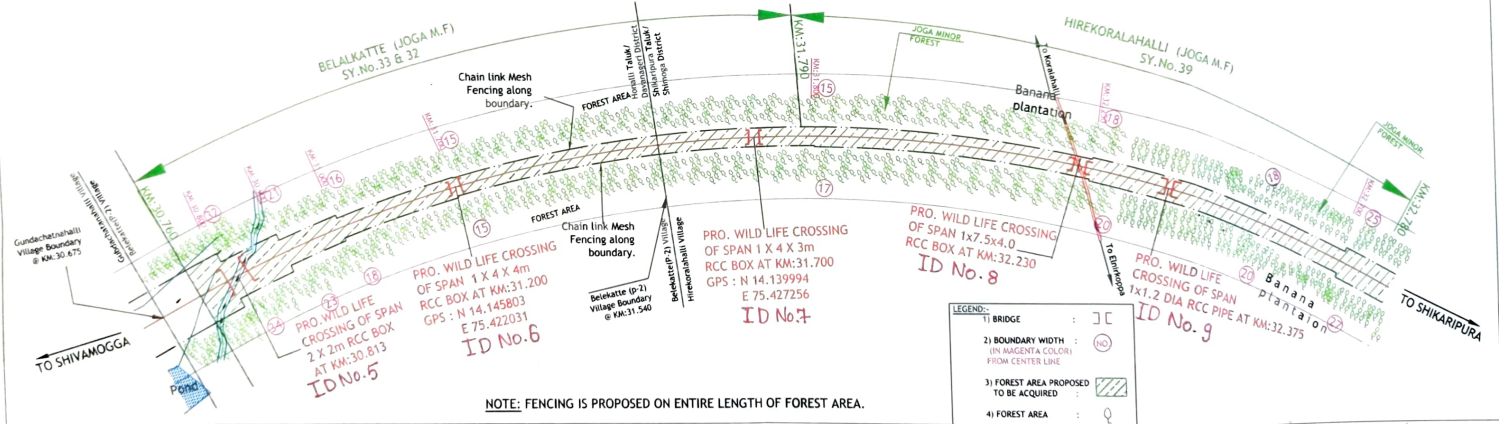
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Do, Chief Conservator of
Forests, Bangalore
25/09/2014
South Western Railway, Mysore

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Deputy Conservator of Forests
Shimoga Division, Shimoga

[ANNEXURE-1]

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK
(SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



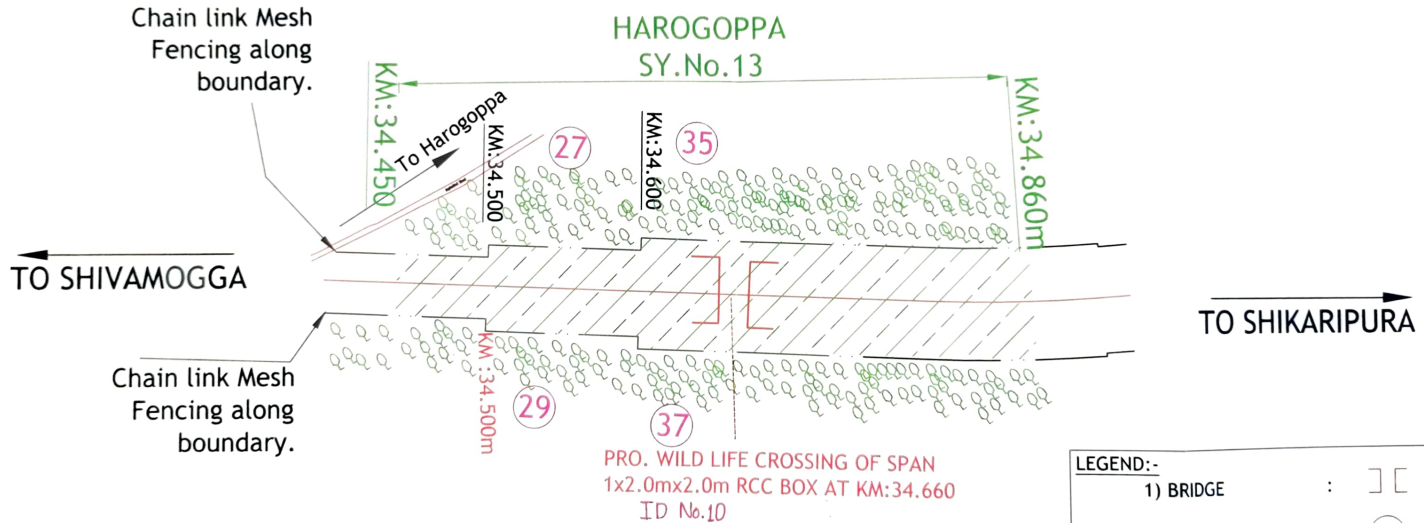
Asst. Executive Engineer
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उप मुख्य
Do. Chief Engineer
South Western Railway, Mysore

Shivamogga
Deputy Conservator of Forests
Shimoga Division, Shimoga

[ANNEXURE-1]

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK (SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



NOTE: i) FENCING IS PROPOSED ON ENTIRE LENGTH OF FOREST AREA.

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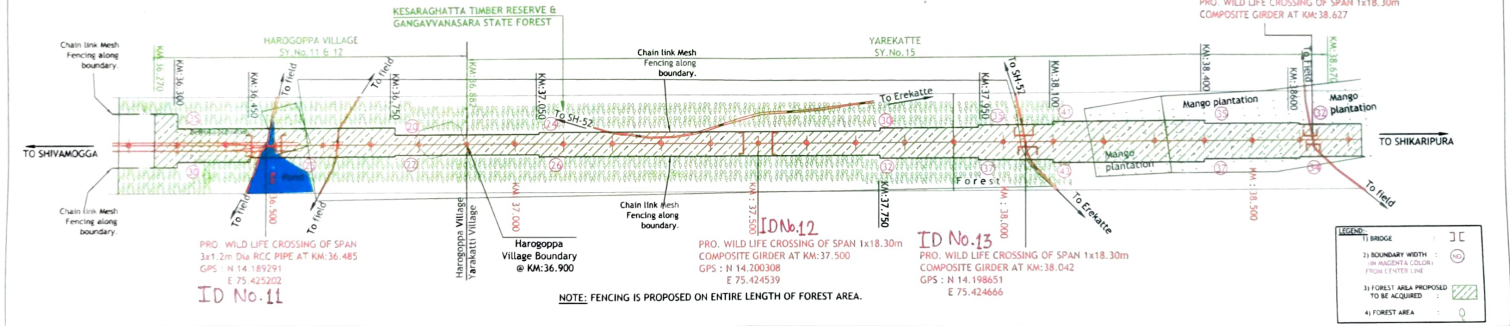
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[ANNEXURE-1]

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK (SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



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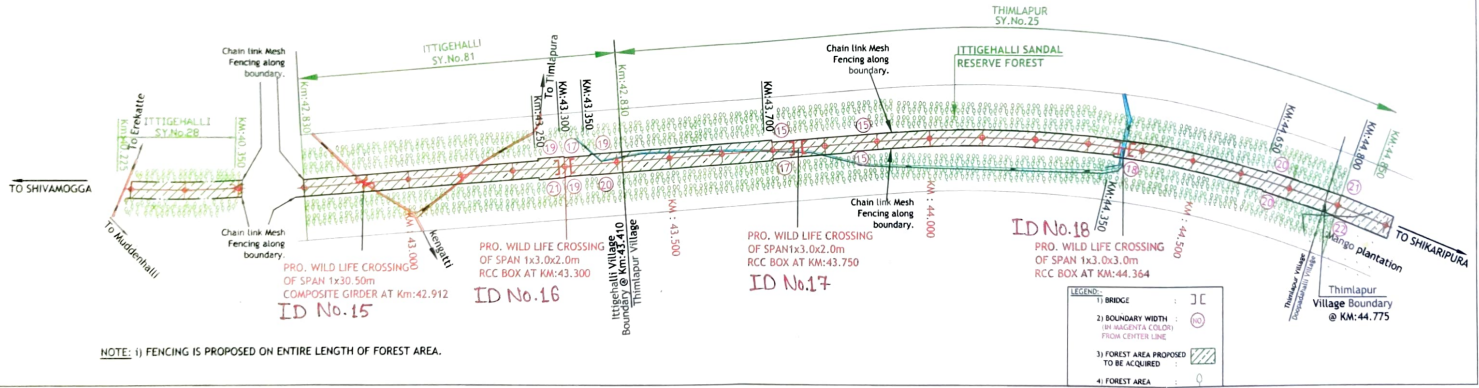
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[ANNEXURE-1]

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK (SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



NOTE: 1) FENCING IS PROPOSED ON ENTIRE LENGTH OF FOREST AREA.

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[ANNEXURE-1]

MITIGATION PLAN FOR MOVEMENT OF WILD LIFE ACROSS THE TRACK (SHIVAMOGGA-SHIKARIPURA NEW LINE PROJECT)



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