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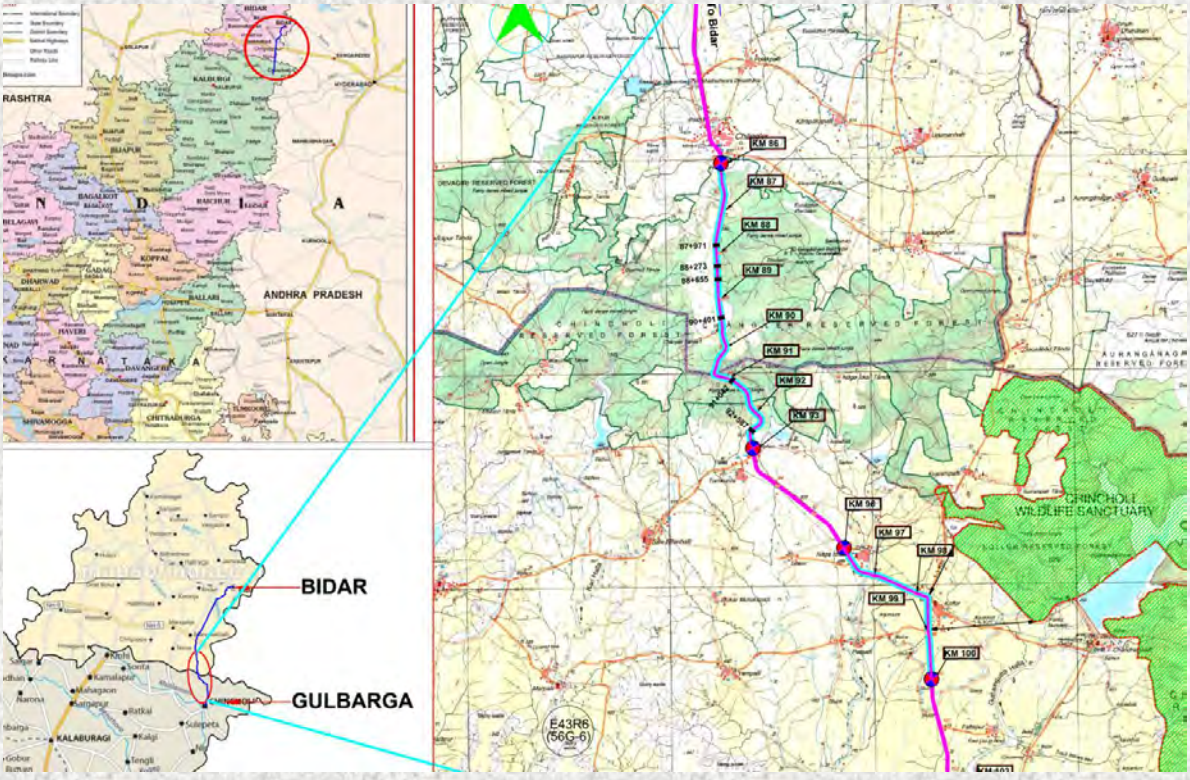
Consultancy Services for Wildlife Survey And Impact Assessment in selected Chainages of Co-finance Project Road from Bidar to Chincholi



Final Report

December 2015

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Wildlife Survey & Impact Assessment Report

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1. BACKGROUND

The Second Karnataka State Highways Improvement Project (KSHIP-II) is a part of the on-going road improvement program to support the economic growth and social development plans in the Karnataka State. As part of the project, the proponent Karnataka Road Development Corporation (KRDCL), Government of Karnataka decided to implement development of 7 selected priority State Highways (about 452 Km) under the concept of co-financing with private financial institutions.

Bidar – NH9 (Mannaekahalli) – Chincholi section of State Highway-15 is one of the road selected under KSHIP II. The project road starts at Bidar and ends at Chincholi and consists of two links 4A (Bidar to Mannaekahalli on NH 9) which starts at existing Km 47.360 and ends at Km 75.054 and Link 4B (Mannaekahalli on NH 9 to Chincholi) which starts at Km 75.054 to existing Km 107.400. The total length of the project stretch is 60.040 Km. The project Stretch passes through Bidar and Gulbarga District. The terrain is mainly plain followed by rolling & hilly terrain for a few km.

Forest areas are also present along certain chainages along the road. The project road runs linearly (nearest distance is 1.3 km at Kollur) to the Chincholi Wildlife Sanctuary which is located within 5 km aerial distance. The Chincholi Wildlife Sanctuary was notified on 28thNovember 2011 by the Karnataka State Forest Department, under Wildlife Protection Act 1972. The sanctuary has an area of around 134.88km^2 and is known to house diverse fauna, like black buck, common fox, four-horned antelope, fruit bat, hyena, Indian wolf, panther and wild boar. Over 35 species of birds, including black drongo, black-winged kite, blossom-headed parakeet, blue pigeon, black-headed oriole and grey partridge are also found in the region.

The EIA & EMP for the project road was prepared & validated by a Design Consultant & Independent Environmental Review Consultant engaged by KRDCL respectively. However, detailed wildlife & biodiversity study for two stretches of the project road was warranted due to the proximity of the wildlife sanctuary& two reserve forests (which are on both side of the road), in order to provide a comprehensive wildlife assessment and propose additional specific mitigation measures as applicable.

In this context, KRDCL had wished to engage a consultant for carrying out survey and assessment of potential impacts of the proposed improvements in selected chainages of project road between Bidar – NH9 (Mannaekhalli) – Chincholi. Accordingly, Feedback Infra Pvt. Ltd. (Feedback Infra) has been awarded the assignment by KRDCL.

2. BRIEF OF PROJECT STUDY SECTION

2.1 Existing Features

- Road part of SH-15, which starts from Bidar at existing Km 47.360 054 and ends at Chincholi at existing Km 107.400. The total length of the SH -15 stretch is 60.040 Km
- Study Road Stretch: Changler (Km. 86.00) to Tumkunta (Km. 93.00) and Nagaidlai (Km. 96.00) to near Kollur (Km. 100.00)
- Study Road Length: 11 Km
- Districts: Bidar & Gulbarga District
- Existing RoW: Varies from 15m to 26m in general
- Existing Carriageway: predominantly Intermediate Lane
- Pavement: Flexible
- Major Intersection: Nil
- Minor Intersection: 3
- Major Bridge: Nil
- Minor Bridges: 3
- Box / Slab and Pipe Culverts: 15

2.2 Proposed Features

Alignment

Following 2 types of configuration are proposed for the project road widening.

- Two Lane with 1.5m Paved shoulder and 1.0m earthen shoulder
- Two Lane with 1.5m Paved shoulder and 1.0m Paver Block in Cut section

Right of Way

- The proposed RoW varies from 15m to 26m
- No new Land Acquisition is proposed

Pavement

- Flexible pavements are proposed for all throughout the road

Geometric Design Aspects

- Minor improvements in geometrics is proposed along with widening of the existing road to 2 lane with paved shoulder status
- Design speed at urban is minimum 10 kmph and in rural is minimum 50 Kmph & maximum 65 Kmph

Proposed cross drainage structure

- Major Bridge: Nil
- Minor bridge: 3
- Box/slab/pipe culvert: 15.

3. OBJECTIVE

The objectives of the assignment are the following:

i. Baseline Study of flora and wildlife fauna along selected stretches (chainages - 86+00 to 93+00 and 96+00 to 100+00) of the project road.
ii. Assessment of Impact on the flora and fauna, especially wildlife movement(s) along the project road due to the proposed improvements
iii. Assess need for additional specific mitigation measures for protection of wildlife, especially with regards to wildlife movement(s) along the project road

4. SCOPE OF WORK

4.1 Task 1 – Conduct Primary Wildlife Fauna Surveys

The Task I of the ToR envisaged the conduct of primary surveys of the wildlife fauna along two selected stretches of the project road (Km 86.000 to Km 93.000 and Km 96.000 to Km 100.000). It was also specified that the survey locations should not be separated by a distance of more than one kilometre and should cover at least the following locations:

(i) For Chainage 86.000 to 93.000: At chainages 87.971, 88.273, 88.555, 90.401, 91.042 & 92.587
(ii) For Chainage 96.000 to 100.000

The survey has been specified to be carried out for a period of 1 month and shall include (but not be limited to) nocturnal fauna and avifauna. The survey for the nocturnal fauna/avifauna shall be limited to visual encounters and augmented with secondary survey. The output of this task shall be the following:-

- Listing / Inventory of wildlife fauna on the selected project road section(s)
- Inventory on Wildlife movement(s) if any, along on the selected project road section(s), with sample photographic evidence

As per the task, a reconnaissance survey was done on 27th June 2015. The details of the study as per the Task 1

shall be a part of the Interim, Draft Final & Final Reports.

4.2 Task 2 – Desk Study / Secondary Survey of all Wildlife Fauna

As per the ToR, it is envisaged that FIPL shall conduct secondary survey / desktop study of the flora, wildlife fauna, including (but not limited to) avifauna of the Chincholi Wildlife Sanctuary, Chincholi Reserve Forest, Changler Reserve Forest and Auranganagar Reserve Forest. The secondary survey shall also include the study of previous records of wildlife movements between the Chincholi wildlife sanctuary and the various reserve forests surrounding it, with reference to the impact on the selected project road stretches. This task shall include consultation with the local public, relevant experts and state wildlife & forest departments. FIPL shall also refer to EIA & EMP studies, list of CD structures within the selected chainages and Strip Plan of project road on Toposheet for the project road. The output of this task shall be the following:-

- Collation of Inventory on flora, fauna, including wildlife movements.
- Reports on Consultations/Verification of output in Task 1 with Local public, relevant experts, state wildlife & forest departments

The details of the Task 2 shall be a part of the Interim, Draft Final & Final Reports.

4.3 Task 3 – Assessment of Wildlife Fauna Movement(s)

It is envisaged as per the ToR that based on outputs defined in Tasks 1 & 2, the wildlife fauna movements within the selected project stretches shall be analysed / assessed and described. It should ascertain whether any potential for degradation of RF or Sanctuary is likely due to the proposed improvements to the road. An assessment of the magnitude and significance of the impacts to wildlife and its habitat should be made. This shall be a part of the Draft Final & Final Reports.

4.4 Task 4 – Propose Additional Specific Mitigation Measures

As per the ToR again, based on findings of Task 3, FIPL shall provide requirement of additional mitigation measures for the project road and the details of additional specific mitigation measures. This shall include the various options / alternatives for the mitigation measures (if any) along with costing. Monitoring and reporting plans with roles and responsibilities and costs for any additional measures proposed should be included. This too shall be a part of the Draft Final & Final Reports.

5. MOBILIZATION & KICK OFF MEETING

A Kick off meeting was held with KRDCL at Bangalore in KRDCL office on 25th June 2015. Following the meeting, the project team including the Team Leader and Wild Life Surveyor-I, reached Bidar on 26th June 2015. The team was augmented with another 3 support team members with expertise in ecology, biodiversity & wildlife, landscape management, avian, herpetology, mammals, flora & butterflies at Bidar.

The project team started the surveys in non-forest areas from 27th June 2015 in Gulbarga Division, on the direction of KRDCL. The surveys as per the ToR for the entire study area including forest areas commenced after discussions between KRDCL & WL authorities and after the second meeting on 2nd July 2015 with the DCF, Bidar. The forest officials at project districts were briefed on the methodology and were intimated that nocturnal surveys (only spotting of wildlife crossing in the project road) shall be done for the entire study area. The minutes of the Kick off meeting is given in Annexure 1.

Figure 1: Kick off Meeting at Bangalore and Mobilisation at Site

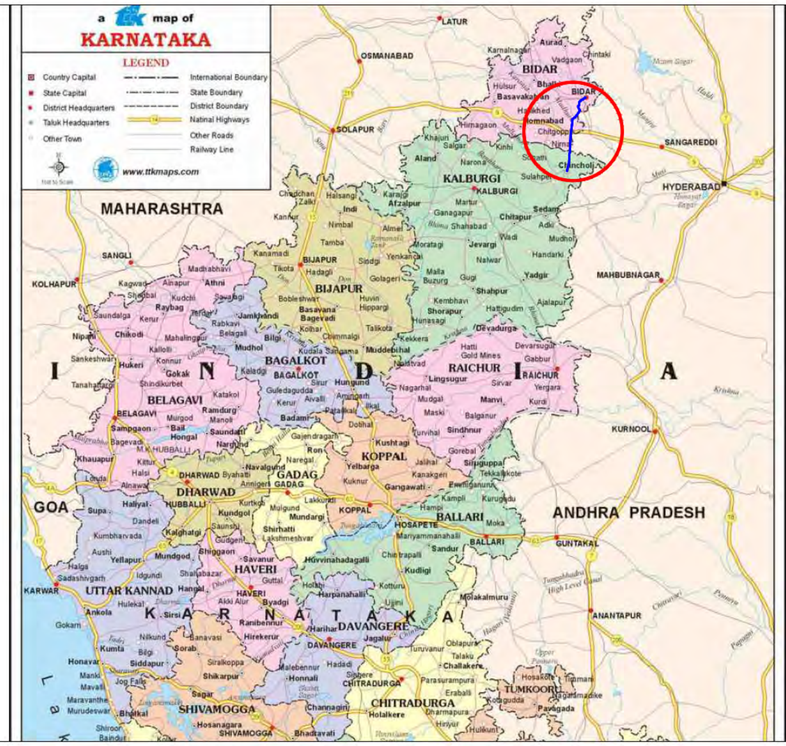
6. STUDY / PROJECT AREA

The present study as per the requirement of the ToR is limited in at two sections of the SH 15 (Bidar – Mannekahalli – Chincholi). The two project sections are

i. Km 86.000 to Km 93.000 and
ii. Km 96.000 to Km 100.000

The project sections fall in the two districts of Bidar & Chincholi in North Eastern part of Karnataka. For the purpose of the study and as elaborated in the study / project area, where the detailed observations shall be undertaken has been limited to 1 Km on both the side of the project sections.

FIGURE - 2 : INDEX MAP & LOCATION MAP



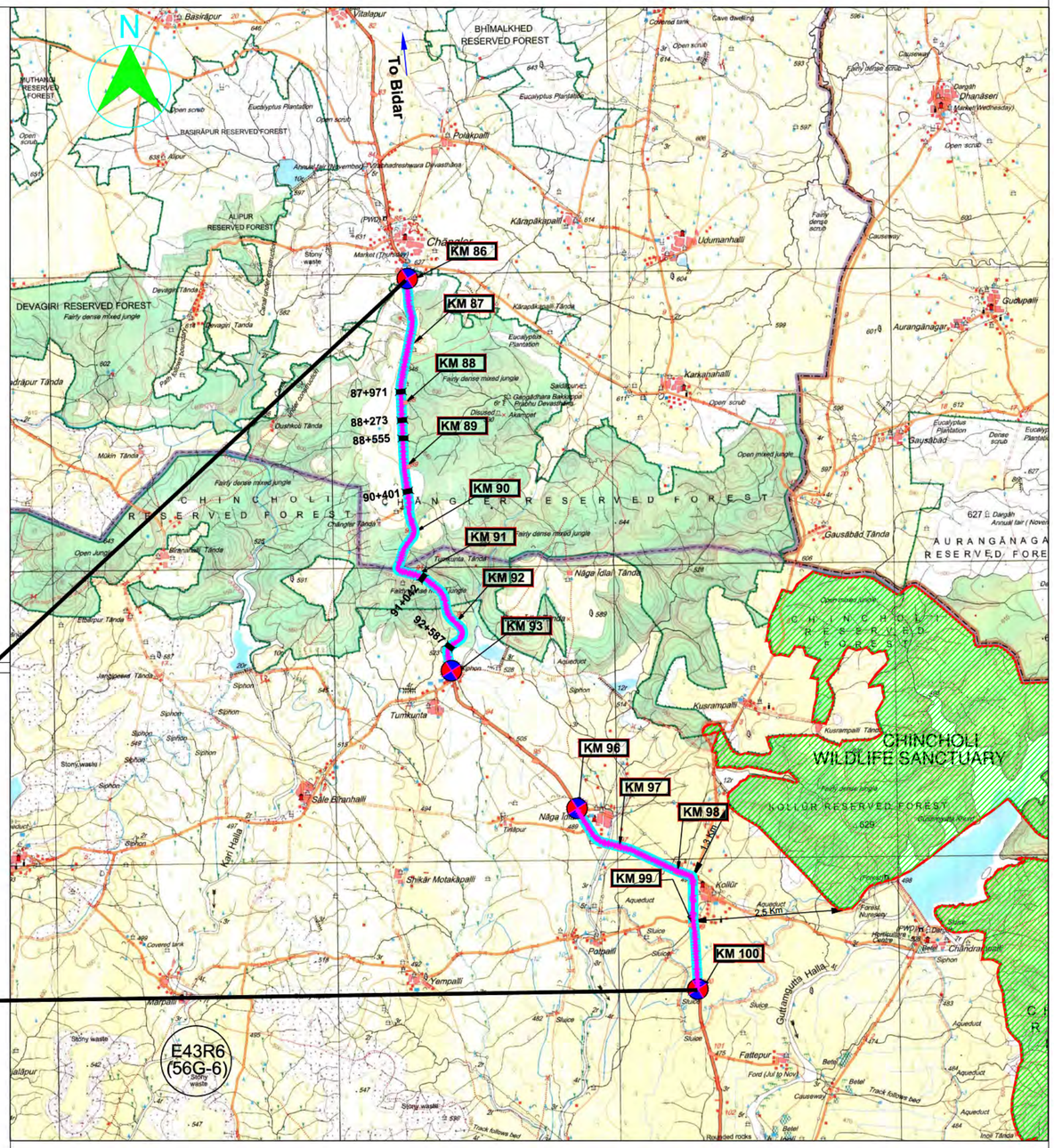


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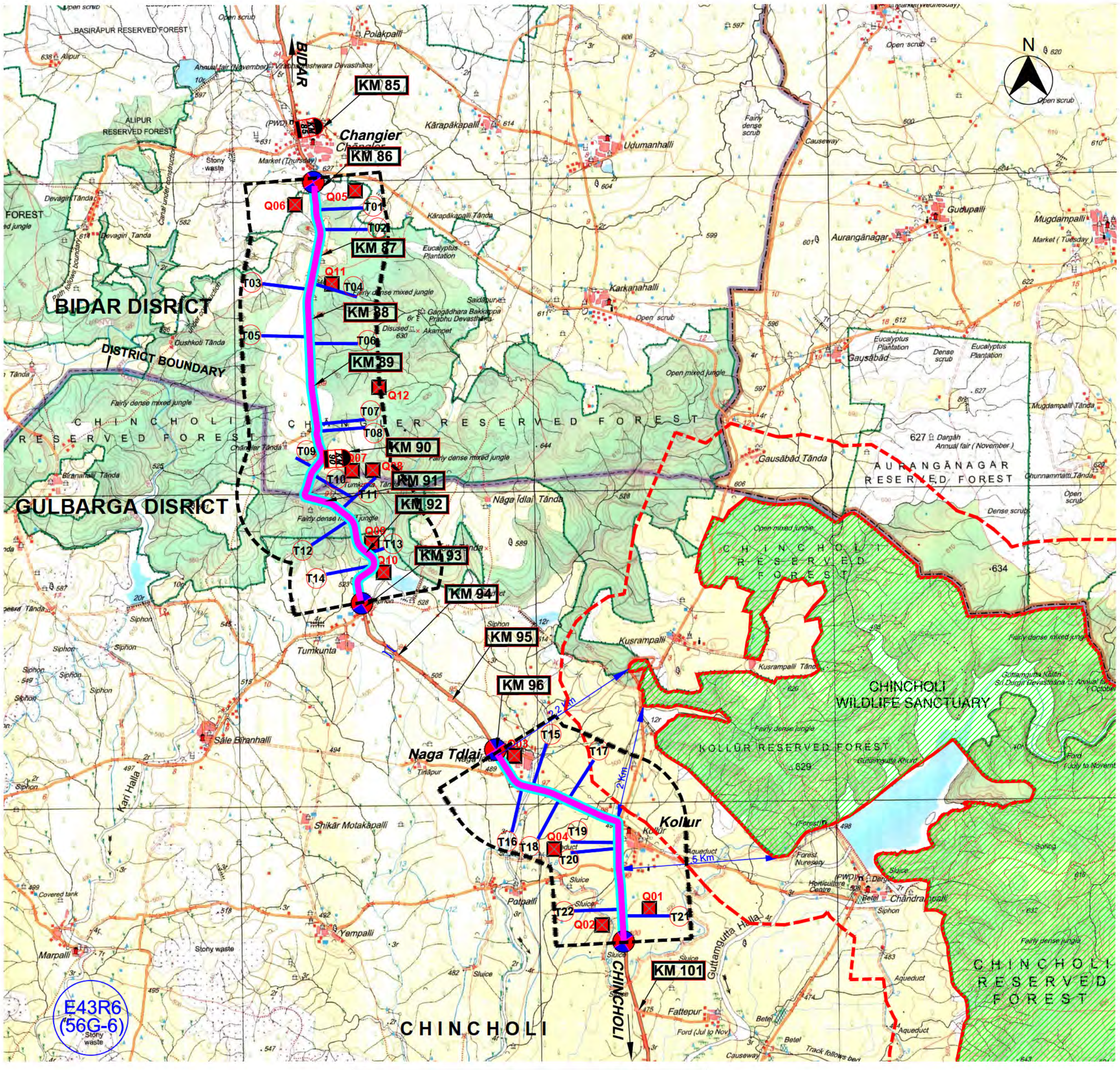
FIGURE-3: MAP OF STUDY AREA & SAMPLING LOCATIONS



LEGEND :

STUDY SECTION	
EXISTING CHAINAGE	
CHINCHOLI WLS BOUNDARY	
1KM BUFFER FROM WLS BOUNDARY	
1KM BUFFER FROM STUDY SECTIONS	
CHINCHOLI WLS AREA	
QUADRAT	Q00
TRANSACT	T00

08/12/2015 – 12:03pm
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7. THE LEGAL FRAMEWORK

7.1 Country Level Legislation

For the present assignment, the following acts were studied:

- Wild Life Protection Act, 1972 – relates to protection of wild life in sanctuaries and National Park. This is not applicable as no Wildlife Sanctuary/ National Park / Biosphere Reserve is present within 1 Km radius as per the guidelines
- Forest (Conservation) Act, 1980 – relates to diversion of forestland for non-forest use. The act is not applicable as no forest land shall be diverted for the project

7.2 World Bank Operational Policies

The EIA report had noted that the World Bank OP 4.04 was triggered due to the presence of Chincholi WL sanctuary within 1.3 Km of the project road. Further there is a presence of 2 RF on both side of the road, which are contiguous to the WL sanctuary. Thus to mitigate any adverse impact of the road and also to fully comply with the requirements of the OP, the present assignment was conceived and done.

8. TRAFFIC CONDITION OF THE STUDY AREA

The important factor of this project is the widening of project road to cater the need of increased vehicular movement. The road widening and the high vehicular movement are the two factors which will have direct impact on the local flora and fauna. During the process of the widening of road it will create temporary impact during the preconstruction & construction activities. To assess the potential impact on the wildlife and its movement, existing and projected traffic pattern is very important.

To understand that, the baseline and projected traffic volume of the study section (data of Chainage 87.500) has been considered. The traffic survey was done by DPR Consultant in the year of 2013-14. The figures for 2015-16 & 2020-21 have been projected by considering Traffic Growth Rates which has been arrived using standard procedure and other relevant factors to get the best projected value. The traffic scenario has been detailed out in design report. The hourly fluctuation of average daily traffic and its projected value has been presented in below sections

Table 1: Hourly Traffic Details

Hours	2013-14[1]	2015-16[2]	2020-21[2]
6 AM - 7 AM	67	94	120
7 AM - 8 AM	88	124	158
8 AM - 9 AM	98	138	176
9 AM - 10 AM	129	182	232
10 AM - 11 AM	111	156	199
11 AM - 12 PM	133	187	239
12 PM - 1 PM	124	174	222
1 PM - 2 PM	100	141	180
2 PM - 3 PM	135	190	242
3 PM - 4 PM	121	170	217
4 PM - 5 PM	141	198	253
5 PM - 6 PM	122	172	220

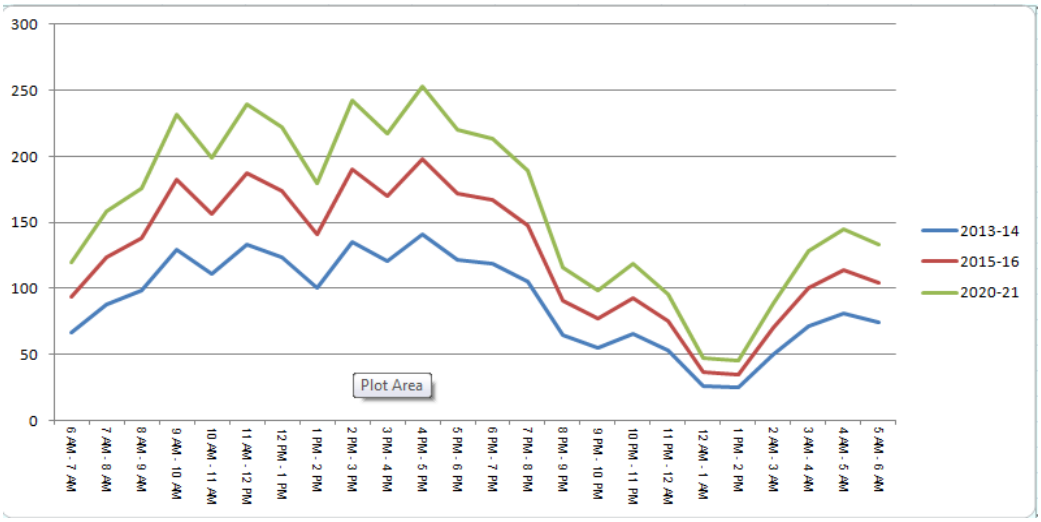
[1] Obtained through Primary Traffic Surveys conducted by DPR Consultant

[2] Obtained by Projection of Primary Traffic Data by DPR Consultant

Hours	2013-14[1]	2015-16[2]	2020-21[2]
6 PM - 7 PM	119	167	213
7 PM - 8 PM	105	148	189
8 PM - 9 PM	65	91	116
9 PM - 10 PM	55	77	98
10 PM - 11 PM	66	93	119
11 PM - 12 AM	53	75	96
12 AM - 1 AM	26	37	47
1 PM - 2 PM	25	35	45
2 AM - 3 AM	50	70	89
3 AM - 4 AM	71	100	128
4 AM - 5 AM	81	114	145
5 AM - 6 AM	74	104	133

Source: Traffic Data at Chainage- 87.500, DPR, 2015

Figure 4: Hourly Fluctuation of Traffic (ADT)



It was observed that the projected traffic for the year 2020-21 is expected to increases by 27 – 30 % of current traffic volume i.e. of 2015-16. Vehicular speed also will increase after improvement of project road section. It is quite vivid that the increased volume of traffic and vehicular speed will have comparatively more impact on local wildlife and its natural movement in future than present scenario.

9. ROAD FEATURES – EXISTING & PROPOSED

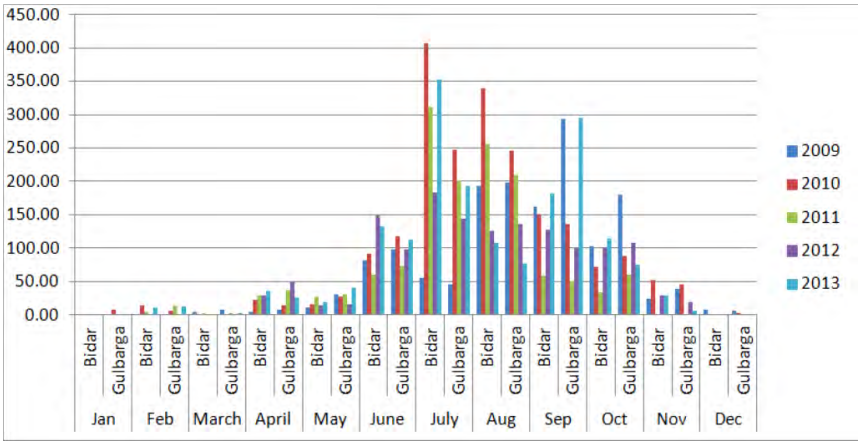
- The project road section is 2 lane without paved shoulders while 2 lane with paved shoulder proposed
- 5 Typical Cross Sections has been proposed in the DPR for the entire road while 3 TCS is applicable for the project road section
- The condition of the project road section presently is generally good with some potholes in few areas
- Presently the pavement is bituminous & flexible and flexible pavement has been proposed in the project sections
- Land use of the project section and area are Agriculture, Barren, Forest and some built up
- The proposed ROW is 18-36m for the entire road

- The existing speed between Km 86.000 to Km 93.000 is a minimum of 20 Kmph for 85m stretch and the maximum is 80 Kmph for approx. 2.766 Km stretch. The speed in general varies between 40-80 Kmph. The Design speed in this section shall be a minimum of 20 kmph (for a stretch of 85m) and the maximum is 100 Kmph for approx. 2.882 Km stretch. The speed in general shall vary between 50-100 Kmph
- The existing speed between Km 96.000 to Km 100.000 is a minimum of 10 Kmph for 43m stretch and the maximum is 80 Kmph for approx. 3.241 Km stretch. The speed in general varies between 50-80 Kmph. The Design speed in this section shall be a minimum of 10 kmph (for a stretch of 43m) and the maximum is 100 Kmph for approx. 3.241 Km stretch. The speed in general shall vary between 65-100 Kmph
- No Service roads/Slip Roads are proposed in the project road section

10. CLIMATOLOGICAL TREND IN PROJECT DISTRICTS

Bidar District experiences semi-arid climate with extreme summer. The dust storms and severe heat waves are common in the district between April and May. The temperature begins to rise towards the end of February till the end of May, which is the hottest month of the year. Coldest months are December and January. The temperature varies in the district between 20ºC and 42ºC. Gulbarga district lies in the northern plains of Karnataka and has semi - arid type of climate. Dry climate prevails for most part of the year. December is the coldest month with mean daily maximum and minimum temperatures being 29.5ºC & 15ºC to 10ºC respectively. During peak summer, temperature shoots up to 45ºC. Relative humidity varies from 26% in summer to 62% in winter. Based on the IMD Rainfall data (2009-2013) it was observed that both of the districts receive maximum downpour between July-August. Rainfall distribution of the study districts is depicted in below figure.

Figure 5: Rainfall Pattern of Project Districts



11. PERIOD OF STUDY

Generally as per the rainfall trend, the study area shows that during monsoon phase the month of June receives less rainfall comparatively, whereas in July the monsoon starts picking up after middle of the month. The sowing activity in the project area takes place during July. This draws attention of herbivores like deer, antelopes & wild boar and which in turn draws the predators also. As per the various secondary literature available for the area, the season of June - August is also the nesting and breeding period of various ground dwelling birds, thus an increase in their numbers is also witnessed.

The larger mammals available in this area also either have their courtship period in this time (hyena, wild dog) or littering time (wolf, jackal). The lesser cats are also supposed to breed during this period. The advent of the rains also brings out the various amphibians and the reptiles out in the open (as their burrows get submerged). These are also the best time to track the butterflies and dragonflies which proves the health of the biodiversity in the area. Beside these, tracking of secondary evidence like pugmarks can be more easily spotted on soft and wet soil

to track the movement of wildlife. Thus the study month of June - July 2015, when the rapid biodiversity assessment is taking place can give the standard representation of the ground dwelling species, which have more chance to get affected due to the proposed road widening project.

12. METHODOLOGY

12.1 Primary Baseline Surveys

12.1.1 Floral & Habitat surveys

Quadrat method which is being adapted to study the local vegetation as well as the habitat structure is an internationally accepted standard method. As the study area is a terrestrial system and shows homogeneity in the vegetation structure hence representative quadrat of fixed size in identified terrains put on a random manner helps to ascertain the habitat structure. The quadrats were taken randomly along the transect lines as well as out of the line transects to obtain maximum representation of the habitats. The quadrats were placed within a maximum distance limit of 1 Km, i.e., within the study area. The sizes of the quadrat were decided to be 10m x 10m and the standard procedure of categorizing of tree, shrub & herbs were followed. As the habitat diversity of the place is more on the LHS along with the fact that the cultivations areas were mainly on the RHS, the quadrats were predominantly taken on the LHS to give more representation of the floral diversity of the place.

Table 2: Details of Quadrat Studied

Sl. No	Chainage (Km)	Quadrat No	Date	LHS / RHS	Latitude & longitude	Habitat Type	Approx. Distance from Road (m)
1	99.500	Q1	3rd July 2015	LHS	17°31'39.12" 77°25'54.22"	Cultivation Land	400
2	99.700	Q2	5th July 2015	RHS	17°31'31.57" 77°25'30.51"	Cultivation Land	300
3	96.300	Q3	10th July 2015	LHS	17°32'53.27" 77°24'47.68"	Cultivation Land	200
4	97.600	Q4	11th July 2015	RHS	17°32'8.26" 77°25'7.01"	Groove at edge of cultivation land	700
5	86.200	Q5	12th July 2015	LHS	17°37'25.43" 77°23'31.64"	Vegetation at edge of Water body	600
6	86.300	Q6	12th July 2015	RHS	17°37'19.04" 77°23'1.50"	Fallow Land/Scrub Land	300
7	90.400	Q7	13th July 2015	LHS	17°35'11.06" 77°23'28.38"	Scrub Forest	600
8	90.400	Q8	13th July 2015	LHS	17°35'11.21" 77°23'38.75"	Scrub Forest	900
9	92.00	Q9	14th July 2015	LHS	17°34'36.15" 77°23'37.75"	Fallow land/Scrub Forest	200
10	92.300	Q10	14th July 2015	LHS	17°34'22.11" 77°23'43.50"	Fallow Land	150
11	87.500	Q11	18th July 2015	LHS	17°36'40.83" 77°23'19.42"	Scrub Forest	300
12	89.100	Q12	18th July 2015	LHS	17°35'51.0" 77°23'42.3"	Scrub Forest	980

Source: Field Study, June - July 2015

Figure 6: Photographs of Floral Survey through Quadrat Sampling

12.1.2 Faunal Survey

To understand the faunal presence and their density in the project area the standard line transect method were adapted. In this method the transect line were chosen randomly perpendicular with the road axis. The length of the transect lines dependent on the habitat and the terrain. This transect lines has been drawn during day time. Randomly selected alternate transects has been made on both the sides of the road. Thus for every Km there are two transects, one on either side of the road. A total of 22 transects were carried out for the faunal survey.

Table 3: Details of Transects Studied

Sl. No	Transact No	Chainage (km)	Date& Start Time	Side	Length (m)	Starting Lat/Long	Ending Lat/Long	Habitat Type
1	86/87/L1 (T1)	86.400	06.07.15 6:00 AM	LHS	700	17⁰37'16.52" 77⁰23'12.13"	17⁰37'17.14" 77⁰23'35.49"	Cultivation Land with scrub and Small tree
2	86/87/L2 (T2)	86.700	06.07.15 8:00 AM	LHS	700	17⁰37'7.03" 77⁰23'14.18"	17⁰37'6.77" 77⁰23'37.45"	Cultivation Land with scrub
3	87/88/L1 (T3)	87.600	07.07.15 6:15 AM	LHS	700	17⁰36'38.25" 77⁰23'8.57"	17⁰36'41.32" 77⁰22'44.79"	Cultivation Land, rocky and scrub land.
4	87/88/R1 (T4)	87.500	07.07.15 7:55 AM	RHS	700	17⁰36'41.50" 77⁰23'8.99"	17⁰36'34.48" 77⁰23'31.82"	Cultivation Land and scattered plants
5	88/89/R1 (T5)	88.300	08.07.15 6:10 AM	RHS	700	17⁰36'15.61" 77⁰23'7.76"	17⁰36'16.40" 77⁰22'43.92"	Cultivation Land and few trees
6	88/89/L1 (T6)	88.400	08.07.15	LHS	700	17⁰36'12.37"	17⁰36'12.01"	Shrubby area

Sl. No	Transact No	Chainage (km)	Date& Start Time	Side	Length (m)	Starting Lat/Long	Ending Lat/Long	Habitat Type
			7:35 AM			77⁰23'8.11"	77⁰23'31.90"	
7	89/90/L1 (T7)	89.600	09.07.15 6:00 AM	LHS	700	17⁰35'33.56" 77⁰23'11.27"	17⁰35'35.52" 77⁰23'34.85"	Shrub jungle
8	89/90/L2 (T8)	89.700	09.07.15 6:45 AM	LHS	700	17⁰35'30.24" 77⁰23'11.35"	17⁰35'31.63" 77⁰23'35.17"	Shrub Forest
9	90/91/R1 (T9)	90.300	10.07.15 5:45 AM	RHS	320	17⁰35'12.43" 77⁰23'9.81"	17⁰35'17.57" 77⁰23'00.33"	Scrub Forest
10	90/91/L1 (T10)	90.400	10.07.15 7:00 AM	LHS	700	17⁰35'9.65" 77⁰23'8.28"	17⁰34'57.89" 77⁰23'28.71"	Cultivation Land
11	91/92/L1 (T11)	91.300	11.07.15 6:30 AM	LHS	700	17⁰34'52.18" 77⁰23'22.26"	17⁰35'07.53" 77⁰23'40.00"	Scrub Forest
12	91/92/R1(T12)	91.500	11.07.15 8:00 AM	RHS	700	17⁰34'47.85" 77⁰23'27.22"	17⁰34'35.71" 77⁰23'07.68"	Scrub Forest
13	92/93/L1(T13)	92.100	24.07.15 6:40 AM	LHS	250	17⁰34'31.16" 77⁰23'35.84"	17⁰34'33.70" 77⁰23'44.04"	Scrub Forest/Cultivation Land
14	92/93/R1(T14)	92.300	25.07.15 8:00 AM	RHS	700	17⁰34'25.63" 77⁰23'38.77"	17⁰34'21.55" 77⁰23'14.93"	Scrub Forest/Cultivation Land
15	96/97/R1 (T15)	96.800	04.07.15 8:05 AM	RHS	700	17⁰32'37.68" 77⁰24'56.50"	17⁰32'58.76" 77⁰25'3.85"	Cultivation Land
16	96/97/L1 (T16)	96.700	04.07.15 6:45 AM	LHS	700	17⁰32'38.39" 77⁰24'51.51"	17⁰32'16.84" 77⁰24'46.11"	Cultivation Land and Human habitation
17	97/98/L1(T17)	97.400	03.07.15 8:15 AM	RHS	700	17⁰32'31.66" 77⁰25'14.19"	17⁰32'50.62" 77⁰25'27.31"	Cultivation Land
18	97/98/R1(T18)	97.300	03.07.15 7:00 AM	LHS	700	17⁰32'32.85" 77⁰25'10.37"	17⁰32'13.37" 77⁰24'59.07"	Cultivation Land
19	98/99/L1(T19)	98.500	01.07.15 6:00 AM	RHS	700	17⁰32'10.98" 77⁰25'39.58"	17⁰32'11.56" 77⁰25'15.44"	Cultivation Land
20	98/99/L2(T20)	98.600	01.07.15 7:20 AM	RHS	700	17⁰32'8.28" 77⁰25'39.21"	17⁰32'6.42" 77⁰25'15.38"	Cultivation Land
21	99/100/L1 (T21)	99.600	28.06.15 6:00 AM	LHS	700	17⁰31'35.80" 77⁰25'40.98"	17⁰31'35.48" 77⁰26'4.69"	Cultivation Land
22	99/100/R1(T22)	99.500	28.06.15 7:15 AM	RHS	700	17⁰31'38.98" 77⁰25'40.51"	17⁰31'38.51" 77⁰25'16.83"	Cultivation Land

Source: Field Study, June - July 2015

Nocturnal random surveys were carried out in every alternate day along the road to identify the presence of nocturnal species in the study area in general and also to study the nocturnal movements of various faunal species in particular. The entire study stretch were monitored during at different time intervals starting from evening 7 PM in the evening till 5 AM at the study section. The study was carried out every alternate day. A general checklist was also prepared from any and all encounter that happened in the study area.

Figure 7: Transect Faunal Surveys

Figure 8: Random Nocturnal Survey

Culvert study was done at chainages 87.971, 88.273, 88.555, 90.401, 91.042 & 92.587. For the initial 20 days the culverts were visited during every field visit. As no movements of wild fauna along the culverts could be identified due to and absence of foot / pug / hoof marks on the rocky terrain below the culverts, impression pads were made & placed at all the culverts to cross check and confirm that whether the existing culverts are being used by wild life. The impression pads were placed from 17th July 2015 and observation were made till 26th July 2015.

Figure 9: Photographs of Culvert Study & Impression Pads

The water bodies in the selected stretch thoroughly searched and surveyed to understand the animal usage and to get an idea about the animal movement to & fro from the water bodies and whether they cross the road to get to the water bodies. The aspect of the ground birds and their foraging were considered with higher priority along with the mammals and reptiles that use the ground as the main mode of dispersion.

12.2 Secondary Study & Stakeholder Consultations

Desktop study of the wildlife fauna including possible wildlife movements in the project area & consultations with local public, Local Experts and Forest & WL department has been conducted. The DCFs of Bidar & Gulbarga and their Subordinate staffs, both at the range and field offices has been met and consulted. The following information & documents has been collected from the forest & WL department:

- Checklists of Flora & Fauna in the project area
- Man Animal Conflict & Road kill records
- Information on Wild life movement
- Information on climate change
- Cropping pattern

The field data has also been verified through structured and unstructured consultations with the local populace, Local Experts and Forest & WL authorities.

Table 4: Brief of Tasks Conducted

Type of Activity/Study	Number
Quadrat Study	12
Transect	22
Nocturnal Survey	15
Consultation with Community	2 at Changler and Naga Idlai villages
Consultation with Local Experts	2
Consultation with Locals	5 locations
Institutional stake holders' Consultation	4 times

12.3 Data Analysis

Data captured during the field survey has been entered in system and analysed to find out the different biodiversity indices. The data collected were transferred to MS Excel Data sheet and used in PAST 3.08 software to analyse the diversity indexes. PAST is free software for scientific data analysis, with functions for plotting, univariate and multivariate statistics, ecological analysis, time series and spatial analysis, morphometrics and stratigraphy. 3.08 (August 2015) version of the software was used for analysis of data

13. FINDINGS OF STUDIES

13.1 Terrain & Habitat

The study area has dry land, high arid zone with patch of dry deciduous and moist deciduous forest type. The study area receives low rain fall and the rock face is highly exposed. 3 different terrains viz. rocky, cultivation land and the area adjacent to the water bodies and stream line found in the project area. There is also a presence of a gorge running continuously & parallel to the road from chainage Km 86.700 to Km 93.000 on the LHS of the study area. The distance of the gorge from the central line of the road varies from 700m to 1km.

There are 4 different major habitats in the study area. These are:

- Cultivation land:
- Forest: the forests along the project road section Changler & Chincholi Reserve Forest. These are mainly Moist Deciduous and Scrub forest
- Gorge & Water body: On the LHS there is a presence of a gorge in between Km 86.700 to Km 93.000. This gorge runs parallel along the road and has a width of 700m to 1 Km. There are 2-3 very small water bodies or pockets having small amount of water. There are presences of nice patches of lentic vegetation along these water puddles which are utilised by the animals. There are also 2 ponds, one at the start near Changler and the other at the end of section 1 approximately near Km 92.500. The water body near Km 92.500 has a nice sloping and is easily accessible for the animals. There are also a number of seasonal water channels which criss-crosses the road. Most of these are presently dry with some water puddles confined in few spaces. One fine specimen of such channel is near Naga Idlai village where lentic vegetation and reeds were found which provided habitation for lesser cats and a host of avian species.
- Scrub & fallow land

13.2 Flora

A total of 131 species of flora have been recorded in the study area. The tree found in the study area all are quite short in height and lacks canopy at high level hence the species recognized as tree but the canopy coverage is very less and thus giving a shape of a scrub forest with a high amount of open area. The findings of quadrat study about the floral community have been briefed in below table. The details of the flora in the project area have been provided in Annexure 2 & 3.

Table 5: Floral Community of Project Area

Type of Flora	Number of Species
Trees	48
Aquatic Plants	3
Creepers	20
Grasses	5
Herbs	30
Palms	1
Shrubs	24
Total	**131**

Source: Field Study, June - July 2015

13.3 Fauna

A total of 229 various faunal species including 123 species of birds, 17 species of mammals, 13 species of reptiles, 10 species of amphibians and 41 species of butterflies has been recorded during the study. The apex of the system is being governed by the *Canis* group. The number of the individuals among the *Canis* group is high as compared to that of the cat species amongst the mammalian species. The secondary information shows presence of leopard in Chincholi wild life sanctuary but the same also confirms that no leopard movement is recorded in the last ten years anywhere near the study area/ the road.

The avian faunal study reveals in total 123 species of birds being sighted in the study area. Among which 14 are ground dwelling and in total 12 does nesting on the ground. The herpeto-faunal sampling shows a total 23 different species out of which 10 belongs to amphibian and 13 are reptilian species.

The following table shows the different faunal group and there relative species number sighted during the study. The details of the faunal species found in the project area are given in Annexure 4 & 5.

Table 6: Faunal Community of Project Area

Type of Fauna	Number of Species Sighted
Butterflies	41
Odonates (Dragonflies & Damsel flies)	25
Amphibia	10
Reptilia	13
Aves	123
Mammals	17
Total	**229**

Source: Field Study, June - July 2015

3 major mammalian fauna, 2 avifauna & 1 reptilian fauna falling under Schedule 1 of the Wild Life Protection Act are found in the project area and tabulated in Table 7 & other faunal species belonging to Schedule II and III including mammals and reptiles were found in the study area are presented in Table 8.

As per the Wildlife (Protection) Act, 1972, Wild animals are listed in different schedules i.e. schedule I, II, III and IV in accordance with the degree of protection accorded to it. Schedule I-II deals with species that are critically endangered and requires greater conservation. Schedule III & IV deals with species which too are endangered but requires a lower degree of protection. Schedule V of the act provides the faunal species which are treated as vermin and can be hunted. Schedule VI deals with floral species those are prohibited from planting and cultivations.

Presence of ground dwelling and ground nesting birds which have the maximum chance of getting affected by the widening of the road and projected increase in car number has also been recorded in Table 9. It is pertinent to note that only a few mammalian species were sighted during the diurnal surveys including the transect studies. The majority of the mammalian species were located during the nocturnal survey.

Table 7: Schedule-I Species in Project Area

Sl. No.	Common Name	Scientific Name	Class	Status & Sightings[3]	Source
1	Indian Wolf	*Canis lupus*	Mammal	Uncommon (2)	Primary
2	Black Buck	*Antelope cervicapra*	Mammal	Uncommon (1)	Primary
3	Indian Pangolin	*Manis crassicaudata*	Mammal	-	Secondary
4	Indian Peafowl	*Pavo cristatus*	Aves	Common (19)	Primary
5	Eurasian Spoonbill	*Platalea leucorodia*	Aves	Uncommon(2)	Primary
6	Bengal Monitor Lizard	*Varanus Benghalensis*	Reptilia	Common (7)	Primary
7	Crimson Rose Butterfly	*Pachliopta hector*	Insecta	Common (20)	Primary

Source: Field Study, June - July 2015

[3] Status relates to the status of the species in the project area, while sightings relates to the number of individuals recorded during the survey period in the survey area. The number of sightings is within parenthesis

Table 8: Schedule II & III Endangered Species Sighted in the Project Area

Sl. No.	Common Name	Scientific Name	Schedule	Class	Status & Sightings[3]	Source
1	Wild Dog	*Cuon alpinus*	II	Mammal	Uncommon (1)	Primary
2	Indian Fox	*Vulpes bengalensis*	II	Mammal	Uncommon (2)	Primary
3	Golden Jackal	*Canis aureus*	II	Mammal	Common (5)	Primary
4	Common Langur	*Semnopithecus entellus*	II	Mammal	Common (8)	Primary
5	Jungle Cat	*Felis chaus*	II	Mammal	Common (15)	Primary
6	Common Palm Civet	*Paradoxurus hemaphroditus*	II	Mammal	Uncommon (1)	Primary
7	Small Indian Civet	*Viverricula indica*	II	Mammal	Uncommon (1)	Primary
8	Flying Fox	*Pteropus giganteus*	II	Mammal	Common (5)	Primary
9	Chameleon	*Chamaeleo zeylanicus*	II	Reptiles	Common (16)	Primary
10	Russell's Viper	*Vipera ruselli*	II	Reptiles	Common (4)	Primary
11	Grey Mongoose	*Herpestes edwarsii*	III	Mammal	Common (6)	Primary
12	Spotted Deer	*Axis axis*	III	Mammal	Uncommon (1)	Primary

Source: Field Study, June-July 2015

Table 9: Ground Dwelling and Ground Nesting Birds Sighted in the Project Area

Sl. No	Common Name	Scientific Name	Schedule	Status & Sightings[3]	Dwelling (D) / Nesting (N)
1	Indian Peafowl	*Pavo cristatus*	I	Common (15)	D&N
2	Painted Francolin	*Francolinnus pictus*	IV	Common (7)	D&N
3	Grey Francolin	*Francolinnus pondicerianus*	IV	Common (18)	D&N
4	Red Wattled Lapwing	*Vanellus indicus*	IV	Common (20)	D&N
5	Yellow Wattled Lapwing	*Vanellus malabaricus*	IV	Uncommon (7)	D&N
6	Indian Courser	*Cursorius coromandelius*	IV	Uncommon (2)	D&N
7	Barred Button Quail	*Turnix suscitator*	IV	Uncommon (3)	D&N
8	Paddy field Pipit	*Anthus rufulus*	IV	Common (4)	D&N
9	Orange Headed Ground Thrush	*Zoothera citrina*	IV	Uncommon (2)	D
10	Little Ring Plover	*Charadrius dubius*	IV	Uncommon (1)	D&N
11	White Breasted Water Hen	*Amauromis phoenicurus*	IV	Common (6)	D
12	Ashy Crowned Sparrow Lark	*Eremopterix griseus*	IV	Common (9)	D&N
13	Indian Bush Lark	*Mirafra erythroptera*	IV	Common (7)	D&N
14	Sykes's Lark	*Galerida deva*	IV	Uncommon (3)	D&N

Source: Field Study, June - July 2015

13.4 Nocturnal Study

As detailed in the methodology section, nocturnal random surveys were carried out on every alternate day along the road to identify the presence of nocturnal species in the study area in general and also to study the nocturnal movements of various faunal species in particular. As stated earlier, the majority of the mammalian fauna were identified during the nocturnal survey. This chainage wise data has been computed to get the idea about the mammalian fauna of the area and has been represented through the diversity index value of the mammalian fauna of the area in the findings.

13.5 Culvert Study

No use of the existing culverts by the wild animals has been found during the study period. This may be due to the following:

i. Some of the culverts were choked and for some openings were covered with undergrowth and hence were not favourable for animal movement
ii. The present culverts have been located to mainly serve the hydrological functions and were never intended for utilisation by the animals
iii. The culverts in general were not placed in the appropriate locations where animal crosses the road

13.6 Road Crossings & Road Kills

Road Crossings by 27 species recorded during the Wildlife Survey. These are given in table below. Also a total of 12 individuals of various species have been found to be killed while crossing the road during the study period. During the consultations, the stakeholders reported the presence of road kills of another 9 different species. The details of the road kills are given in Table 11. The photographs of the road kills are given in Annexure 8.

Table 10: Road Crossings of Animal Sighted

Sl. No.	Common Name	Scientific Name	Class	Schedule	Period	Severity / Remarks
1	Crimson Rose Butterfly	*Pachliopta hector*	Insecta	I	Diurnal	High impact
2	Indian Wolf	*Canis lupus*	Mammalia	I	Diurnal	Low Impact
3	Russell's Viper	*Vipera russeii*	Reptilia	II	Nocturnal	High mortality impact
4	Chameleon	*Chamaeleo zeylanicus*	Reptilia	II	Diurnal	High impact
5	Common Langur	*Semnopithecus entellus*	Mammalia	II	Diurnal	Low Impact
6	Grey Mongoose	*Herpestes edwardsii*	Mammalia	II	Diurnal	Low Impact
7	Ballon Frog	*Uprodon systoma*	Amphibia	IV	Nocturnal	High impact
8	Common Toad	*Duttaphrynus melanostictus*	Amphibia	IV	Nocturnal	High impact
9	Bull Frog	*Hoplobatrachus tigerinus*	Amphibia	IV	Nocturnal	High impact
10	Indian Trinket Snake	*Coelognathus helena*	Reptilia	IV	Nocturnal	High impact
11	Common Vine Snake	*Ahaetulla nasuta*	Reptilia	IV	Diurnal	High impact
12	Garden Lizards	*Calotes versicolor*	Reptilia	IV	Diurnal	High impact
13	Asian Pied Starling	*Gracupica contra*	Aves	IV	Diurnal	No mortality / low impact
14	Brahminy Starling	*Sturnus pagodarum*	Aves	IV	Diurnal	No mortality / low impact
15	Common Myna	*Acridotheres tristis*	Aves	IV	Diurnal	No mortality / low impact
16	Large Grey Babbler	*Turdoides malcolmi*	Aves	IV	Diurnal	No mortality / low impact
17	Rose-ringed Parakeet	*Psittacula krameri*	Aves	IV	Diurnal	No mortality / low impact
18	Indian Peafowl	*Pavo cristatus*	Aves	IV	Diurnal	/ low impact
19	Spotted Dove	*Streptopelia chinensis*	Aves	IV	Diurnal	No mortality / low impact
20	Eurasian Collard Dove	*Streptopelia decaocto*	Aves	IV	Diurnal	No mortality / low impact

Sl. No.	Common Name	Scientific Name	Class	Schedule	Period	Severity / Remarks
21	Red-rumped Swallow	*Hirundo daurica*	Aves	IV	Diurnal	No mortality / low impact
22	House Sparrow	*Paser domesticus*	Aves	IV	Diurnal	No mortality / low impact
23	Painted Francolin	*Francolinnus pictus*	Aves	IV	Diurnal	No mortality / low impact
24	Grey Francolin	*Francolinnus pondicerianus*	Aves	IV	Diurnal	No mortality / low impact
25	Indian Black-nape Hare	*Lepus nigricollis*	Mammalia	IV	Nocturnal	Low Impact
26	Wild Boar	*Sus scrofa*	Mammalia	IV	Nocturnal	High Impact
27	Five-striped Palm Squirrel	*Paradoxurus hemaphroditus*	Mammalia	IV	Diurnal	Low Impact
28	Indian Hairy legged Gerbil	*Tatera indica*	Mammalia	Not included	Nocturnal	High Impact

Source: Field Study, June - July 2015

Table 11: Road Kills Recorded through Direct Sighting during Survey

Sl. No.	Common Name	Scientific Name	Schedule	Class	Date & Time	Chainage	Individual
1	Russell's Viper	*Vipera russelii*	II	Reptilia	4th July, 8:45 PM	91.200	1
2	Crimson Rose Butterfly	*Pachliopta hector*	I	Insecta	7th July, 9:00 AM	91.800	1
3	Jungle Cat	*Felis chaus*	II	Mammalia	10th July, 5:20 AM	97.500	1
4	Ashy Prinia	*Prinia socialis*	Not in Schedule	Aves	14th July, 2:50 PM	99.200	1
5	Greater Coucal	*Centropus sinensis*	Not in Schedule	Aves	18th July, 1:30 PM	90.200	1
6	Cattle (Cow)	*Bos indicus*	Not in Schedule	Mammalia	18th July, 2:00 PM	NA	1
7	Garden Lizard	*Calotes versicolor*	Not in Schedule	Reptilia	19th July, 11:40 AM	89.700	1
8	Domesticated Dog	*Canis familiaris*	Not in Schedule	Mammalia	20th July, 3:30 PM	NA	1
9	Common Vine Snake	*Ahaetulla nasuta*	IV	Reptilia	24th July, 2:50 PM	90.800	1
10	Common Trinket Snake	*Coelognathus helena*	IV	Reptilia	25th July 7:46 AM	90.600	1
11	Chameleon	*Chamaeleo zeylanicus*	1II	Reptilia	26th July, 10:03 AM	92.300	1
12	Large Grey Babbler	*Turdoides malcolmi*	Not in Schedule	Aves	26th July, 10:10 AM	92.800	1

Table 12: Major Road kills Species as Intimated during Stakeholders' Consultations

Sl. No.	Common Name	Scientific Name	Status	Class
1	Bengal Monitor	*Varanus bengalensis*	Schedule I	Reptilia
2	Indian Peafowl	*Pavo cristatus*	Schedule I	Aves
3	Indian Wolf	Canis lupus	Schedule I	Mammalia
4	Jackal	*Canis aureus*	Schedule II	Mammalia
5	Spectacled Cobra	*Naja naja*	Schedule IV	Reptilia
6	Rat Snake	*Ptyas mucosa*	Schedule IV	Reptilia
7	Black-naped Hare	*Lepus nigricollis*	Schedule IV	Mammalia
8	Wild Boar	*Sus scrofa*	Schedule IV	Mammalia
9	Frogs	-	-	Amphibia

Source: Field Study, June - July 2015

13.7 Species Needing Special Attention

The overall study reveals a considerable amount of biodiversity at the study area with presence of some Schedule I & II animals,[4] some of which were found dead on the road. Presence of various ground dwelling avifaunal species were also recorded from site. The ground dwelling birds, entire reptile community & mammals those criss-crosses the project road for food, water or other biological needs are the most prone to road kill. Details of such species that crosses the project road, due to which some species crosses the road and are thus vulnerable to traffic are given in table below.

Table 13: Species Needing Special Attention

Sl. No.	Common Name	Scientific Name	Schedule	Class	Family	Concern
1	Indian Wolf	*Canis lupus*	I	Mammal	Canidae	All schedule I species requires highest degree of conservation. Multiple Road Crossings recorded. Road kills of Indian Wolf, Peafowl, Monitor Lizard & Crimson Rose Butterfly recorded through primary and secondary information.
2	Black Buck	*Antelope cervicapra*	I	Mammal	Bovidae	
3	Indian Pangolin	*Manis crassicaudata*	I	Mammal	Manidae	
4	Indian Peafowl	*Pavo cristatus*	I	Aves	Phasianidae	
5	Bengal Monitor Lizard	*Varanus Benghalensis*	I	Reptilia	Varanidae	
6	Crimson Rose Butterfly	*Pachliopta hector*	I	Insecta	Papilionidae	
7	Jungle Cat	*Felis chaus*	II	Mammal	Felidae	Evidence of road kills recorded through primary & secondary source. 3 species are schedule II animals. 2 species are prey of apex group of canines and other schedule I species found in the locality. The reptiles listed are more prone to road kills
8	Jackal	*Canis aureus*	II	Mammal	Canidae	
9	Russell's Viper	*Vipera russelii*	II	Reptiles	Viperidae	
10	Chameleon	*Chamaeleo zeylanicus*	III	Reptiles	Chamaeleonidae	
11	Common Vine Snake	*Ahaetulla nasuta*	IV	Reptiles	Colubridae	
12	Common Trinket Snake	*Coelognathus helena*	IV	Reptiles	Colubridae	
13	Black-naped Hare	*Lepus nigricollis*	IV	Mammal	Leporidae	
14	Wild Boar	*Sus scrofa*	IV	Mammal	Suidae	

[4] Schedules are defined under Wild Life (Protection) Act, 1972

Sl. No.	Common Name	Scientific Name	Schedule	Class	Family	Concern
15	Wild Dog	*Cuon alpinus*	II	Mammal	Canidae	Schedule II & III animals located in the project area. Spotted Dear is a prey of apex group of canines found in the locality
16	Indian Fox	*Vulpes bengalensis*	II	Mammal	Canidae	
17	Golden Jackal	*Canis aureus*	II	Mammal	Canidae	
18	Common Palm Civet	*Paradoxurus hemaphroditus*	II	Mammal	Viverridae	
19	Small Indian Civet	*Viverricula indica*	II	Mammal	Viverridae	
20	Grey Mongoose	*Herpestes edwarsii*	III	Mammal	Herpestidae	
21	Spotted Deer	*Axis axis*	III	Mammal	Cervidae	
22	Painted Francolin	*Francolinnus pictus*	IV	Aves	Phasianidae	Ground Dwelling and Ground Nesting Birds. Less susceptible & vulnerable to road kills. No separate mitigation measures required for these species. However most of these are prey species of higher vulnerable (to road kills) groups (identified in this table above)
23	Grey Francolin	*Francolinnus pondicerianus*	IV	Aves	Phasianidae	
24	Red Wattled Lapwing	*Vanellus indicus*	IV	Aves	Charadriidae	
25	Yellow Wattled Lapwing	*Vanellus malabaricus*	IV	Aves	Charadriidae	
26	Indian Courser	*Cursorius coromandelius*	IV	Aves	Glareolidae	
27	Barred Button Quail	*Turnix suscitator*	IV	Aves	Turnicidae	
28	Paddy field Pipit	*Anthus rufulus*	IV	Aves	Motacillidae	
29	Orange Headed Ground Thrush	*Zoothera citrina*	IV	Aves	Turdidae	
30	Little Ring Plover	*Charadrius dubius*	IV	Aves	Charadriidae	
31	White Breasted Water Hen	*Amauromis phoenicurus*	IV	Aves	Rallidae	
32	Ashy Crowned Sparrow Lark	*Eremopterix griseus*	IV	Aves	Alaudidae	
33	Indian Bush Lark	*Mirafra erythroptera*	IV	Aves	Alaudidae	
34	Sykes's Lark	*Galerida deva*	IV	Aves	Alaudidae	

13.8 Statistical Analysis of Biodiversity

The simplest way to describe a community is to list the species in it. Species richness (S) is the number of species on that list, and is most often used as the first pass estimate of diversity for a community. Hence in the present study the overall checklists have been prepared to understand the species richness of the study area. The Shannon Weiner Biodiversity Index (H) was created to effectively deliver a message concerning species richness and evenness in a given ecosystem. The index implies that as the number of species increases, or as the distribution of species becomes more even, the better the biological diversity. Typically, the Shannon index in real ecosystems ranges between 1.5 and 3.5 (MacDonald, 2003, p. 409). The value rarely surpasses 4 (Margalef, 1972). Simpson's Biodiversity Index (1-D) is considered a dominance index because it weights towards the abundance of the most common species. Since the present study was done in a random basis, it was important to have the idea about the dominance (D) as well as evenness (E) to understand the basic structure of the community.

In order to understand the biodiversity of the study area, the species richness was calculated followed by an analysis of Shannon Weiner's and Simpson's Biodiversity indexes to understand the diversity as these are the two most used analysis to get an idea about the diversity. The Shannon Weiner's and Simpson's Biodiversity indexes when measured more than 3 along with the fact that if the Simpson's Biodiversity indexes is close to 1 means the area holds considerable amount of diversity. On the other hand, if the data set shows lower value than 3 and <0.5 respectively the area generally shows lower diversity value.

It may be noted that the statistical analysis for the study area is based on the number of species identified and located only during transect and quadrat studies. The other species have been noted in the checklist provided in Annexure 2-5. In the study area the quadrat value of the flora is lower in both the cases denoting lower floral diversity character of the area and also low species richness. The avian diversity is high considering that the average value for Shannon Weiner's Biodiversity index is more than 3 while scoring more than 0.75 in the Simpson's Biodiversity index. The mammalian diversity value for the area is quite nice though the results show specific dominance.

The table 13 shows the floral diversity at different quadrat with respect to trees, herbs, shrubs and creepers diversity level. In that table, Type refers to the type of flora (Tree, Shrub, Herb, and Creeper). The quadratic analysis of the floral data reveals floral diversity close to the road as well as the quadrats from the area adjacent to the cultivation area has lowest density and diversity. The richness is also low. Q1, Q2, Q3 reflects such habitat. Only for Q4 and Q6 the quotient of floral diversity are relatively high. The area overall lacks tree density. That is one of the major reasons of top soil erosion in the area. The areas that are near the Q9-11 shows moderate density.

Table 14 & 15 shows the diversity of the avian fauna at the study site at different transect (Chainage 86-100). Table 16 shows the diversity of the Mammalian fauna at the study site along the chainage at different transect lines (Chainage 86-93 & 96-100). The table shows that the transects in the first seven kilometres has a higher value of avian diversity and mammalian diversity is higher on the lower chainage area where there is more open area due to the cultivations. A Chainage wise Mammalian & Avian fauna Richness Analysis has been shown in table 17.

The Annexure 6 provides the Quadrat Wise Finding of Flora in Project Area while Annexure 7 provides the Transect and Chainage Wise Finding of Fauna in Project Area.

Table 14: Quadrat wise Floral Biodiversity Analysis

Parameters	Quadrat											
	Q1	Q2	Q3	Q4	Q5	Q6	Q7	Q8	Q9	Q10	Q11	Q12
Type	3	4	1	4	3	4	3	3	2	2	3	2
Individuals	7	8	4	13	14	13	14	14	16	14	19	15
Dominance_D	0.3878	0.2813	1	0.2663	0.3878	0.3018	0.4796	0.4184	0.8828	0.8673	0.385	0.52
Simpson_1-D	0.6122	0.7188	0	0.7337	0.6122	0.6982	0.5204	0.5816	0.1172	0.1327	0.615	0.48
Shannon_H	1.004	1.321	0	1.352	1.004	1.266	0.8921	0.98	0.2338	0.2573	1.013	0.673
Evenness_e^H/S	0.9099	0.9367	1	0.966	0.9099	0.8865	0.8134	0.8881	0.6317	0.6467	0.9182	0.9801

Table 15: Transect wise Avian Biodiversity Analysis

Parameters	Transects										
	T1	T2	T3	T4	T 5	T6	T7	T 8	T 9	T 10	T11
Taxa_Species	43	40	44	38	43	36	36	45	40	50	44
Individuals	116	94	90	98	96	82	84	108	96	115	85
Dominance_D	0.04206	0.05251	0.03975	0.0506	0.04449	0.04759	0.05839	0.04784	0.04384	0.04106	0.04221
Simpson_1-D	0.9579	0.9475	0.9602	0.9494	0.9555	0.9524	0.9416	0.9522	0.9562	0.9589	0.9578
Shannon_H	3.416	3.27	3.492	3.254	3.404	3.282	3.169	3.384	3.38	3.514	3.468
Evenness_e^H/S	0.7083	0.6577	0.7464	0.6816	0.7	0.7397	0.6605	0.6553	0.734	0.6714	0.7288

Table 16: Transect wise Avian Biodiversity Analysis

Parameters	Transects										
	T12	T 13	T14	T 15	T 16	T17	T18	T 19	T 20	T 21	T 22
Taxa_Species	36	41	37	40	41	35	47	44	48	49	50
Individuals	79	87	84	100	81	73	148	137	122	99	97
Dominance_D	0.05272	0.04875	0.06207	0.0504	0.04466	0.05273	0.0798	0.1293	0.0512	0.04908	0.04028
Simpson_1-D	0.9473	0.9512	0.9379	0.9496	0.9553	0.9473	0.9202	0.8707	0.9488	0.9509	0.9597
Shannon_H	3.245	3.349	3.187	3.285	3.399	3.228	3.166	2.918	3.37	3.463	3.584
Evenness_e^H/S	0.713	0.6944	0.6546	0.6675	0.7303	0.7209	0.5044	0.4206	0.6061	0.6511	0.7202

The following table shows the diversity of the Mammalian fauna at the study site along the chainage at different transects (Chainage 86-93, 96-100)

Table 17: Chainage wise Mammalian Faunal Biodiversity Analysis

Parameters	Chainage (Km)										
	86-87	87-88	88-89	89-90	90-91	91-92	92-93	96-97	97-98	98-99	99-100
Taxa_S	2	3	3	5	5	4	5	5	3	6	2
Individuals	6	7	7	14	13	17	11	23	14	20	5
Dominance_D	0.5556	0.3878	0.4286	0.2245	0.2308	0.3356	0.2562	0.3384	0.551	0.275	0.52
Simpson_1-D	0.4444	0.6122	0.5714	0.7755	0.7692	0.6644	0.7438	0.6616	0.449	0.725	0.48
Shannon_H	0.6365	1.004	0.9557	1.55	1.525	1.218	1.468	1.311	0.7963	1.488	0.673
Evenness_e^H/S	0.9449	0.9099	0.8668	0.9421	0.9188	0.8453	0.8682	0.7422	0.7391	0.7379	0.9801

Table 18: Chainage wise Mammalian & Avian Richness Analysis

Parameter	Chainage (Km)										
	86-87	87-88	88-89	89-90	90-91	91-92	92-93	96-97	97-98	98-99	99-100
Mammalian species	2	3	3	5	5	4	5	5	3	6	2
Avian species	47	44	46	43	45	39	47	47	48	52	51

14. STAKEHOLDER & COMMUNITY CONSULTATION

The stakeholder consultation adopted was rapid appraisal methodology which included community meetings and in-depth interviews with institutional stakeholders. The individuals, community, local experts, concerned authorities like forest & wildlife department were consulted to understand the pattern of local ecology & biodiversity and interactions among the local floral and faunal components. Their views on probable impact and mitigation were also taken into consideration. For the project road, following major groups of stakeholders were identified for consultations during biodiversity survey:

- **Primary Stakeholders:** locals including community, local residents, shopkeepers, farmers, etc.;
- **Institutional Stakeholders:** concerned govt. departments like forest & wildlife
- **Local Experts:** local researchers, local wildlife experts/naturalist

Consultations were done using various tools including, interviews with government officials, dialogues were set-up with the locals and community through structured questionnaire on general environment, climate & other related issues. The institutional level consultations were held with representatives of State Forest & Wildlife Department having stakes in implementation of the project.

During the field surveys 5 individuals were separately questioned while 2 community consultations were done at 2 Gram Panchayats at Changler and Naga Idlai. Prior intimation to the community was given about the schedule of meeting to ensure maximum level of participation. 2 local experts including 1 researcher working on Chincholi WLS are also consulted for several times during the study period.

The consultation revealed that the rainfall has decreased in the area over the past few years. The local feels the main culprit for decrease in rainfall is the declining green cover of the area. Introduction of exotic species like *Eucalyptus* spp. played a major role in the depletion of ground water. As per them, leopard and wild dogs were sighted regularly earlier 20-25 years back but this two species has now been reduced severely especially in and around the villages like Naga Idlai, Kollur and also in the forest areas near Changler. There are no leopard sightings in the last 10 years in the areas, where the consultations were done. A year ago near Chandrampalli Dam which is in the fringe / buffer area of Chincholi WL Sanctuary, a leopard was spotted by a shepherd. This change has increased the wild boar population in the area which as per the populace is the main road kill mammal. The deer and blackbucks are also not so frequent at the study area. The boar, deer, blackbuck and other herbivores comes out of the forest areas mainly when the harvest is ready in the field. This sometime brings the wolf and hyena out in the open but they are not so frequent on the road side area. The jungle cat population is quite good along with the black naped hare. As per the local population the reptiles are the one which get killed on the road maximum followed by the wild boar.

Table 19: Outcome of the Stakeholders Consultation

Sl. No.	Date	Stakeholders Consulted	Outcome
1	26th June 2015 and 2nd July 2015	Mr. Srinivasaiah, ACF – Homnabad, Bidar Divison	He shared his idea about the area the general features of the study area.
2	27th June 2015 and 02th July 2015	Amba Das, Forest Section Officer, Changler, Bidar Division	He accompanied us once in the study site to tell us about the local flora. He just said that the animal crossings do happen but there is no definite route that he knows.
3	28th June 2015	Chinappa, Farmer, Kollur	Told us about the change in rain fall. Presence of snakes in the crop field, Presence of Fruit bat in the banana orchard
4	29th June 2015	Gopal Rao, Village Head Kollur	Shared information about local flora and fauna. Informed that there has been a marked change in the faunal presence

Sl. No.	Date	Stakeholders Consulted	Outcome
5	26th June 2015 and 2nd July 2015	Mr. Dhananjay, DCF, Bidar	Told us that there is not many data available with him other than the copy of the management plan. He also told us about the soil erosion and what the department is doing. The general plantations that are being carried out
6	2nd July 2015	Mr. Vivek Krishnamurthy, Local Avifaunal Expert	He shared a good lot of information about the local birds and general reptiles. He accompanied us to the field where the movements of the hyena and wolf happen.
7	18th July 2015	Mr. Shravan Kumar, PhD student of Gulbarga University	He shared his information about few road kills he witnessed. Also informed us about the local Flora. He confirmed about the presence of Indian Pangolin
8	7th July 2015	Kedarnath, Farmer, Naga Idilai	He confirmed the presence of wolf and occasional visit of wild dog.
9	8th July 2015	Mr. Narayan, Farmer, Changler	He told us about the water body near Chainage 86 how birds use to come over there and for the last three seasons there is very bad rainfall which has changed the cropping pattern as well as reduced the number of migratory visitors.
10	11th July 2015	Mr. Prabhakar, Kollur	He told us about the animal he has seen crossing the road, like wild boar, snakes and birds like peacock etc.
11	21st July 2015	Mr. Narayanmurty, DCF Gulbarga	He shared the local checklist with us of flora and fauna. Told us about the last finding of leopard pug mark from Chincholi WLS
12	19th July 2015	Changler	The populace gathered over there unimously said that the rain fall has changed a lot over the last 5-6 years. That has made an impact on the cropping pattern. The movement of animal reduced a lot as the forest cover also changed. As per them the highest road kill what they observe that is of reptiles followed by wild boar
13	21st July 2015	Kollur, Naga Idlai	The people here shown more concerned about wild life and the villagers said that wild boar population increased along with langur which became a nuisance for the farming. They also said that Bengal monitor is good for the area as they kill other snake. The wolf and the jungle cat population is steady, hare is in good number but the wild dog and leopard which use to visit the village long back are not seen now. They told us about the presence of Indian Pangolin also.

Source: Field Study, June - July 2015

The details of Public Consultation have been attached as Annexure 10.

Figure 10: Meeting with Forest Officials

ACF Homnabad & DCF Bidar along with the team

ACF Homnabad with the Team Leader & WL Surveyor

Forest Section Officer, Changler, Bidar Division

Meeting with DCF, Gulbarga Division

Figure 11: Meeting with Local Populace

Figure 12: Consultation Meetings

Consultations at Changler

Consultation at Kollur / Naga Idlai

15. IMPACT ASSESSMENT & MITIGATION PROPOSED

15.1 Impact

15.1.1 Forest Areas

The widening of the proposed road sections shall not have any impact on the forest areas as no diversion of forest land shall be required.

15.1.2 Flora

As per the development proposal of project, no additional land will be taken and project will be accommodated within available ROW in the entire study section. Hence, there shouldn't be any significant impact over floral community outside the ROW. Few roadside planted trees are likely to get affected due to the proposed widening. Approximately 164 trees are likely to be affected in the study section of 11 Km. The species are predominantly *Eucalyptus* spp. & *Azadirachta Indica* (Neem). Best effort shall be given to reduce the number of felling to the maximum extent possible. Impact on endangered of endemic species are not envisaged

15.1.3 Fauna

The overall study reveals a considerable amount of biodiversity at the study area with presence of some scheduled animals as per the Wild Life Protection Act and some of them were found dead on the road. Now with a lower traffic load on a narrow road the rate of mortality is not so high 16 individual found during the survey. But as per the locals, the road kills rate increases with the increase of monsoon, which incidentally was also not so high this year during the study. As the study section of the road shall be widened there will be a chance of increased mortality of the animals using road.

15.2 Proposed Mitigation

After analysing the impacts and also analysing the presence of schedule I animals at the study site the following mitigation being proposed.

- To provide RCC Box culverts/Animal Underpass (2.5m wide and 1.5m height) at various strategic point, so that along with water various wildlife can also pass through the culvert to reach the other side of the road. Detailed drawings provided in Drawing No. FIPL-KRDCL-WLS-01
- Some existing pipe culverts may also be upgraded to box culverts cum animal underpass
- The culvert floor must be naturalized so that small vegetation can grow and give the underneath area a natural passage look
- The culvert height must accommodate animals like Hyena, Wolf, Jackal, Wild boar etc.
- 100m length of wire fencing is suggested on RHS from Km 88.225 to Km 88.325, Km 88.500 to Km 88.600 and on the LHS of the road at Km 92.540 to Km 92.640 so as to prevent movement of bigger mammals & channelize animal movements through culvert
- Posters & sign boards describing the biodiversity of the area & also providing the mobile numbers of the forest officers for intimation in cases of road kills. Detailed signage drawings provided in Drawing No. FIPL/KRDCL/WLS-03
- Provide trench on both the side of 1.4 m width at Top, 0.6 m width at bottom with a depth of 0.8 m all along 7 Km of project road section (Km 86.000 – Km 93.000) to create a barrier as well as to channelize animal movement towards nearest underpass. Detailed drawings provided in Drawing No. FIPL-KRDCL-WLS-02
- The first 7 Km of the study project section the maximum speed of the vehicle should be limited to 45 km/hr. The traffic in the night need to be controlled with putting up movable barriers at Km 89.000 to Km 91.000. The toll plaza should not be in between Km 85 – Km 102
- The hydrological importance shall also be kept in mind while deciding on the relocation / modification of the culverts
- During Construction period no construction work shall be allowed after night fall
- Special care should be taken to ensure that the animal movement is not restricted due to the construction work
- Workers & local populace should be made aware through awareness workshops about the importance of wildlife and biodiversity and special attention paid that no poaching and hunting takes

place

Table 20: Proposed Mitigation Measures: Modifications of Existing Cross Drainage Structures

Sl. No.	Existing CH	Proposed CH	Existing Structure	Remarks
1	87.960	87.971	Pipe Culvert	Convert to RCC box culvert cum Animal Underpass
2	88.540	88.555	Pipe Culvert	
3	90.390	90.401	Pipe Culvert	
4	92.600	92.587	Pipe Culvert	
5	98.970	98.952	Pipe Culvert	

It may be noted that no structural changes or up gradation of culverts in Existing Km 87.400, 88.260, 88.630, 88.960, 90.340, 90.680, 90.880, 91.040, 96.840, 97.250,97.850, 98.500, 98.680, 99.580. These are to be maintained and periodically cleaned

Table 21: Proposed Mitigation Measures: New Underpasses

Existing Ch (DPR)	Proposed Ch (DPR)	Remarks
87.590	87.600	New Animal Underpass Proposed
90.590	90.600	New Animal Underpass Proposed
97.010	97.000	New Animal Underpass Proposed
98.020	98.000	New Animal Underpass Proposed

Figure 13: Proposed Trench along the Project Road

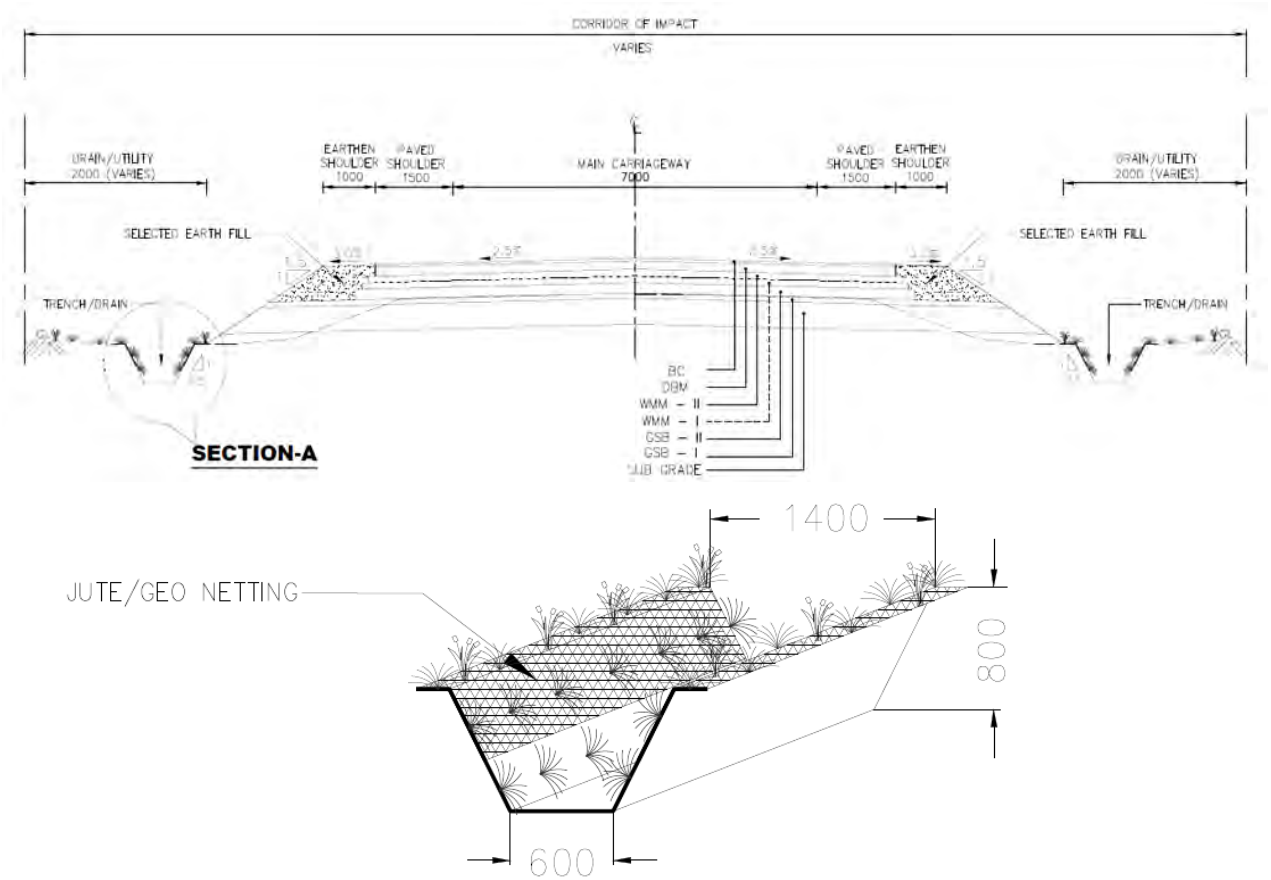


Figure 14: Underpass for Animal Movement

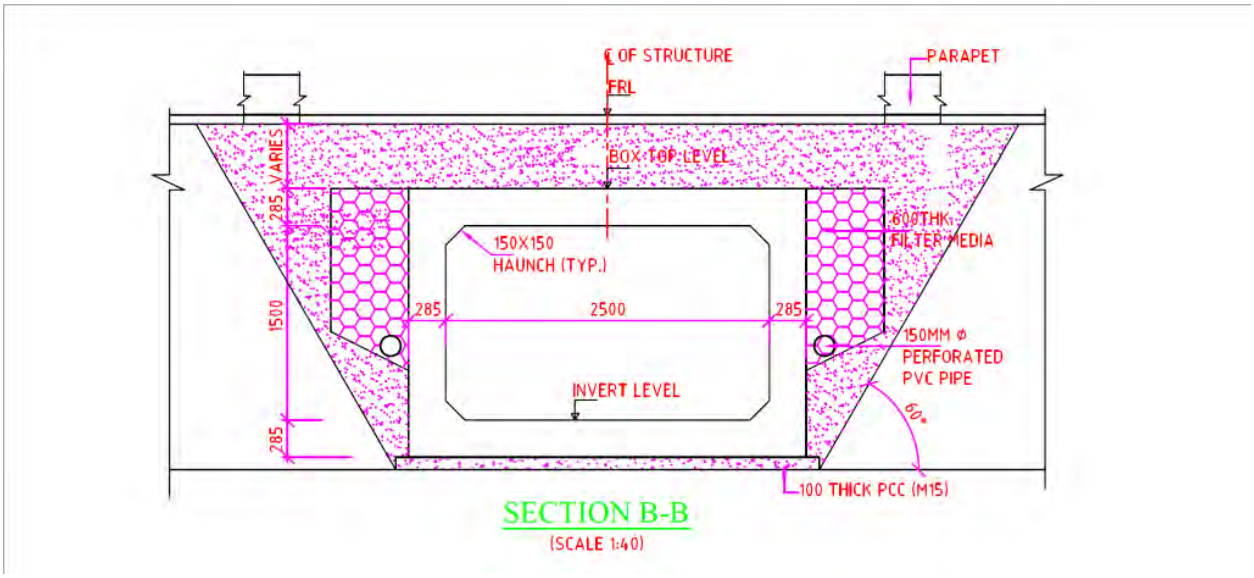


Table 22: Biodiversity & Wildlife Management Plan

Sl. No.	Environmental Issue	Location / sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
Pre-Construction Phase					
P1	Biodiversity & Design Proposal	Study Area	• Proper underpasses for WL movement • Provision of trench line along the road • Minimization of Tree Felling • Planning of Toll Plaza beyond Km 85.000 -102.000	WL Consultant, IE, Concessionaire, Contractor	IE, KRDCL
P2	Planning for Traffic Diversions & Detours	Project road section	• Needs to be planned and designed meticulously with the help of the environmental expert present at the site so that it does not spoil / fragment wildlife habitat	Concessionaire/ Contractor	IE, KRDCL and Traffic Police
P3	Siting of Labour Camp	Labour Camp & Camp site	• No camp site should be permitted within the stretch i.e. 85.000-102.000 Km Chainage.	Concessionaire/ Contractor	IE, KRDCL
Construction Phase					
C1	**Site Clearance**				
C.1.1	Clearing & Grubbing	Within ROW	• No Debris should be dumped between km 85.000 - 102.000. They need to be collected and removed from immediately after generation	Concessionaire/ Contractor	IE and KRDCL, Regulatory Authorities
C.1.2	Disposal of debris from dismantling structures & excavation of the existing road surface & pavements	Within ROW	• No Debris should be dumped here. They need to be collected and removed from the site on ASAP basis. The Chainage 85-102 need to be kept clean as much as possible during the construction work.	Concessionaire/ Contractor	IE and KRDCL, Regulatory Authorities
C.1.3	Instrument & Heavy Vehicle	Within ROW	• Instrument and heavy vehicle parking	Concessionaire/	IE, KRDCL

Sl. No.	Environmental Issue	Location / sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
	Parking		shouldn't be allowed between Chainage 87.000 – 91.000	Contractor	
C.1.4	Stripping, stocking and preservation of top soil	Camp site and Borrow Area	• The locations for stock piling should not be located between Chainage 87.000-90.500. Stock piling may be done in other section of the project road in consultation and with approval of Environmental Specialist of IE.	Concessionaire/ Contractor	IE and KRDCL,
C.1.5	Wildlife	Study Area	• Sighting/Road Kill of wildlife & uncommon species. Annexure 9 provides a format for the recording	Concessionaire/ Contractor	IE, KRDCL
C.1.7	Habitat Fragmentation & Impact on Biodiversity	Study Area	• Biodiversity Impact Assessment • Study of mitigation efficacy • Proposal for modified mitigation	WL Expert	KRDCL
C1.8	Workshop	Study Area	• Periodic awareness workshops (at least 2 in a financial year)	WL Expert , Concessionaire, Contractor	IE, KRDCL
C 2	**Procurement of Construction Material**				
C.2.1	Borrow Areas	Borrow area used for project road	• Finalizing borrow areas for borrowing earth & all logistic arrangements need to be done after the sites are being finalised by the environmental expert. No earth should be collected from the areas identified for preparing corridor for animal movement. • Planning of haul roads for accessing borrows areas will be undertaken during this stage. The haul roads should be routed to avoid areas needed for maintaining the corridors & should use	Concessionaire/ Contractor	IE, KRDCL and Regulatory Authorities

Sl. No.	Environmental Issue	Location / sources	Mitigation Measures	Implementing Agency	Supervising & Monitoring Agency
			the existing village roads wherever available.		
C 2	**Working Period during Construction Material**				
C.2.1	Wild Life Movement	Study Area	• Working hours shall be strictly during the day time only and no night time construction shall be taken up • Daytime shall be counted from 1hour after sunrise and till sunset • It is advisable that the construction activity is not taken up immediately before Monsoon and till Monsoon season (start of June to mid of August approx.) in the study section	Concessionaire/ Contractor	IE, KRDCL and Regulatory Authorities
Operation Stage					
O1	Wildlife	Study Area	• Sighting/Road Kill of wildlife & uncommon species	Concessionaire, Contractor	IE, KRDCL
O2	Habitat Fragmentation & Impact on Biodiversity	Study Area	• Biodiversity Impact Assessment • Study of mitigation efficacy • Proposal for modified mitigation	WL Expert	KRDCL
O3	Clearing & Maintenance of culverts	Culverts & Underpasses	• Periodic cleaning and maintenance of Culverts	Concessionaire, Contractor	IE, KRDCL
O4	Information through Signage	Study Area	• Installation of Sign boards describing the biodiversity of the area & also providing the mobile numbers of the forest officers for intimation in cases of road kills	Concessionaire, Contractor	IE, KRDCL

16. IMPLEMENTATION ARRANGEMENT

The detailed Implementation Arrangement has been furnished in EMP Report of Road No. 2: Bidar - NH-9 (Ekhelli) – Chincholi prepared by the DPR consultant and validated by the Independent Environmental Review Consultant. The same shall continue for the implementation of the mitigation measures as proposed under the study. It is envisaged that in addition to the responsibilities specified in EMP for Environmental Officer of Concessionaire/ Contractor, he will also report sighting & kill of wildlife/uncommon species with photographic evidence to KRDCL through IE. Environmental Expert of KRDCL will subsequently intimate the fact to concerned Forest / WL authority and take their suggestion if needed.

17. REPORTING SYSTEM

Reporting system has been detailed out in EMP Report. In addition to that the following roles and responsibilities should be covered as detailed in table below.

Table 23: Summary of Reporting and Responsibilities

Format No.	Item	Timing	IE / Wildlife Expert		KRDCL
			Supervision	Reporting	Overseeing / Compliance
PRE-CONSTRUCTION PHASE					
P1	Reporting by concessionaire / contractor to IE & IE to KRDCL for sighting/Road Kill of wildlife & uncommon species	Continuous before start of construction	Continuous	Immediately after occurrence	As required
CONSTRUCTION PHASE					
C1	Reporting by concessionaire / contractor to IE & IE to KRDCL for sighting/Road Kill of wildlife & uncommon species	Continuous during construction	Immediately after occurrence	Immediately after occurrence	As required
C2	Reporting by Wildlife Experts to KRDCL for Biodiversity Assessment & WL Management	During construction - in Post Monsoon season	Once in a year	Once in a year	As required
OPERATION PHASE					
O1	Reporting by concessionaire to IE & IE to KRDCL for sighting/Road Kill of wildlife & uncommon species	During Operation	Immediately after occurrence	Immediately after occurrence	As required
O2	Reporting by Wildlife Expert to KRDCL for Biodiversity Assessment & WL Management	During Operation – covering all the seasons in 4 years: 1st Year: Pre-monsoon season 2nd Year: monsoon season 3rd Year: Post	Once in a year for 4 years	Once in a year for 4 years	As required

Format No.	Item	Timing	IE / Wildlife Expert		KRDCL
			Supervision	Reporting	Overseeing / Compliance
		monsoon season 4th Year: Winter season			

The reporting system between the World Bank & KRDCL has been detailed out in the EMP report. Reporting arrangement to the bank during the construction and operation phase will be finalised by KRDCL and will be shared with World Bank.

18. COST OF MITIGATION MEASURES

The cost for provision of mitigation measures is given below:

Table 24: Mitigation Cost

Sl. No.	Particular	Unit	Quantity	Rate (INR)	Total (INR Lakh)
1	New Box Culverts as Underpasses	No.	4	1500000	60.00
2	Up gradation of Old culverts as RCC Box Culverts	No.	5	1850000	92.50
3	Trench including cost for turfing & jute protection	Running m	14000	168	23.52
4	Maintenance/clearing of Trench	Years	8	150000	12.00
5	Signage – Information (size 900 x 1800 mm) including lettering as per IRC code	No.	10	25000	2.50
6	Signage – Information (size 1200 x 600 mm) including lettering as per IRC code	No.	25	15000	3.75
7	Cautionary/ Warning signs (900 mm Eq. triangle) as per IRC code	No.	35	6000	2.10
8	Mandatory / Regulatory sign (60 cm circular) as per IRC code	No.	22	5000	1.10
9	Wire fencing	Running m	300	1500	4.50
Total (INR Lakh)					**201.97**
Total (INR Crore)					**2.0197**

19. PERIODIC BIODIVERSITY MONITORING

Keeping in view the biodiversity and the wild life in the area it is proposed that KRDCL carries out periodic & rapid Wildlife Surveys & Biodiversity Assessment Studies to assess the actual impact of the road on the wildlife and biodiversity during the Construction & Operation phase. For this purpose they shall engage a team of Wildlife & Ecology experts either directly or through the Concessionaire.

The Deputy Conservator of Forest, Territorial Division, Kalaburagi has also instructed the user agency to take up periodical impact assessment studies at regular intervals to adopt further necessary mitigation measures vide Letter No. A3/BUD/KRDCL/CR/2015-16 Dated. 21/10/2015. The Copy of the letter has been attached as Annexure 12.

Time & Duration: The assessment study should be conducted at least once a year during construction & operation stage for 6 years i.e., twice during construction and 4 times during operation phase. The study period shall cover pre-monsoon, monsoon, post-monsoon & winter seasons. The survey period should be chosen in such a way so as to ensure that all the seasons are covered. The study period shall not be less than 30 days since the baseline was established on basis of 1 month's data. This will help to have a comparative

pattern of local ecosystem in respect to time. & variation will be reflected (if any).

Need for further study should be discussed with concerned stakeholders and should be decided accordingly by user agency after completion of 6 Years' study period.

Expertise: The team of wildlife experts should consist of ecologists (Avian & Faunal expertise required) along with wildlife surveyors. The experts should have carried out at least 1 such survey for a multilateral funded road project successfully. The sighting/road kill records maintained by KRDCL shall be shared with the experts for their understanding and evaluating the efficacy of mitigation measures adopted. The experts may suggest for modification of Wildlife Management if needed.

Study Methodology & Objective: Methodology for the study of biodiversity should be similar to the current study. This will help to have a comparative pattern of local ecosystem in respect to time. & variation will be reflected (if any). However, based on the need study approach could be changed if Wildlife Experts feel. The study should cover but not be limited to:

- Biodiversity of Floral Community including statistical analysis
- Biodiversity of Faunal Community (including Mammal, Avifauna, Herpetofauna etc.) including statistical analysis
- Movement of wildlife towards road side
- Condition of Trench cum unlined drain
- Condition of Underpasses cum Culverts & suitability for animal crossing
- Condition of wildlife awareness sign boards placed along the road
- Random checking of traffic speed
- Consultation with concerned institutional stakeholders and experts to obtain secondary information on ecology & biodiversity
- Conduct Awareness program and collection of secondary information (on ecology & biodiversity) from local community
- Analysis of effectiveness of adopted mitigation measure through Biodiversity Surveys & Road Kill data
- Understand need for modification of mitigation, if any
- Proposal for modified mitigation

Determination of Effectiveness of Adopted Mitigation Measure

The Efficacy of the adopted mitigation measures can be judged on the basis of the following parameters:

- Steadiness of Biodiversity of Floral & Faunal Community
- Movement of wildlife towards road side
- Condition of Trench cum unlined drain
- Condition of Underpasses cum Culverts - suitability for animal crossing
- Condition of wildlife awareness sign boards placed along the road
- Random checking of traffic speed
- Consultation with concerned institutional stakeholders and experts to obtain secondary information on ecology & biodiversity
- Awareness program and collection of secondary information (on ecology & biodiversity) from local community
- Recorded Road Kill data

20. TEAM COMPOSITION OF PRESENT STUDY

The project team that has been mobilized along with the task assigned for the assignment are given below:

Table 25: Key Personnel & their Assigned Tasks

Sl. No.	Proposed Personnel	Name of Personnel	Task Assigned
1	Wildlife Scientist cum Team Leader	Dr. Parikshit Gautam	• Liaison with the client and initialisation of study • Conduct & supervise surveys and study • Co-ordinate among all the team members • Consultations with local populace & institutional stakeholders • Provide mitigation measures • Responsible for all the reports
2	Transport Specialist	Prashanth Kalathil	• Liaison with the client • Analysis & Review of Traffic Report prepared for the project road • Analysis & review of existing road alignment & design features • Suggestion of mitigation measures including better road features & signage to avoid road kills • Integration of safety measures & mitigation measures suggested by Wild Life Scientist • Road Safety Audit Report • Support & Assist the TL for publishing of maps and the reports

Table 26: Support Staff & their Assigned Tasks

Sl. No.	Proposed Personnel	Name of Personnel	Task Assigned
1	Wildlife Surveyor 1	Arijit Choudhury	• Site visit under guidance of the TL • Conduct primary survey of wildlife fauna under guidance of the TL • Conduct floral biodiversity survey along the project corridor under guidance of the TL • Prepare draft inventory & checklist of wild mammalian & avifauna fauna & flora on the selected project road sections • Prepare draft inventory of on wildlife movements, if any, along on the selected project road sections • Consultation and verification of primary survey results with the local public & Field forest & wild life staff under guidance of TL • Primary analysis of field data on the wildlife fauna movements within the selected project stretches • Primary analysis & presentation based on survey data the species richness, biodiversity, species abundance etc. • Assist preparation and Submission of all Reports
2	Wildlife Surveyor 2	Satyajit Ray	

The project team was also assisted in the field by a team of 4 persons with specialised niche in the field of biodiversity and wildlife. This extra support team of specialised wild life surveyors are given below:

Table 27: Extra Support (Specialised Wildlife Surveyors) Team

Sl. No	Name	Years of Experience	Expertise
1	Arjan Basu Roy	15+	Butterflies, Flora, Herpetology &Avian
2	Rishin Basu Roy	8+	Ecology, Biodiversity & Wildlife, Landscape Management
3	Arpita Dutta	6+	Avian, Herpetology & Mammals
4	Animesh Manna	3+	Avian & Flora, Butterflies

21. CONCLUSION

The area holds a considerable amount of diversity with a considerable richness of the flora fauna. That makes the area important from biological diversity point of view. At the same time a better managed road is important keeping the fact in mind that road accident chance is high in a narrow road with high PUC and LMV and Axle vehicles. The road needs to be widened keeping the balance and for that the mitigation proposed need to be followed. If proper mitigations are being taken care off then there should not be any problem with the road work.

22. REFERENCE

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Annexure

Annexure 1: Minutes of the Kick off Meeting

Project: Consultancy Services for Wildlife Survey and Assessment in selected Chainages of road between Bidar – NH9 (Mannaekhalli) – Chincholi

Location: KRDCL Meeting Room, Bangalore

Date: 25th June 2015. Time 4:00 PM

Attendees: The following persons were present

Sl. No.	Name of the person	Designation	Organisation
1	Mr. SP Bagali	Executive Engineer	KRDCL
2	Vijaylakshmi	Assistant Executive Engineer	KRDCL
3	Mr. Aswath Narayan	Environmental Specialist	KRDCL
4	Dr. Parikshit Gautam	Team Leader	FIPL
5	Mr. Arijit Choudhury	AGM & Ecology Surveyor	FIPL
6	Mr. Satish NL	AGM	FIPL

A meeting was scheduled for kickoff meeting for the project. The meeting was chaired by SP Bagali. The Chief Engineer couldn't attend the meeting due to some other urgent appointments.

Satish NL introduced the team members of the project to KRDCL. He stated that the team has been mobilized and both the TL and the Surveyor are travelling to Bidar by train in the evening. They shall be meeting the DCF Bidar on 26th and then be starting the surveys from 27th June onwards.

Dr. Gautam as the team leader then described the works that shall be undertaken as below:

- The methodology of the surveys that shall be undertaken for the project. It was described that line transect methods shall be adopted for faunal surveys while random quadrats survey methods shall be adopted for the floral surveys
- The surveys shall be undertaken both during the daytime and night
- Nocturnal surveys shall be limited to visual encounters only
- The deliverables and the timelines were also discussed as per the ToR provided
- Forest officials at the site and the divisional HQ shall be consulted for getting the secondary information

The following points were raised by FIPL and where the help of KRDCL were sought

- Permissions from Bidar & Gulbarga DCFs and the permission of the PCCF (HOFF) & PCCF (WL). The KRDCL team clarified that the letters shall be signed and sent to the concerned officials by email and both PCCF shall be contacted for permissions
- An official map of the sanctuary from the PCCF may be kindly obtained. KRDCL agreed to meet and obtain the map
- Mobilisation was requested as site works were involved. Further the formal Work Order was not issued by KRDCL. KRDCL requested that Major Aswath Kumar B meets the KRDCL MD (who is out of station) on Monday for the work order letter, payment schedules and mobilization amount and other administrative works
- KRDCL were requested to arrange for lodging in the PWD Inspection Bungalow at Chincholi or at Changler. KRDCL AEE at Gulbarga was contacted who promised to make some arrangements in discussions with the local PWD staff

The meeting ended with a thanks to the chair.

Annexure 2: Checklist of Flora through Primary Study

Trees

Sl. No	Common Name	Scientific Name	Family
1	Mango	*Mangifera indica*	Anacardiaceae
2	Custard Apple	*Annona squamosa*	Annonaceae
3	Pala Indigo	*Wrightia tinctoria*	Apocynaceae
4	Butterfly Tree	*Bauhinia purpurea*	Caesalpiniaceae
5	Golden Shower	*Cassia fistula*	Caesalpiniaceae
6	Kassod Tree	*Cassia siamea*	Caesalpiniaceae
7	Gold Mohur / Flame Tree	*Delonix regia*	Caesalpiniaceae
8	Copper Pod Tree	*Peltoforum pterocarpum*	Caesalpiniaceae
9	Tamarind	*Tamarindus indica*	Caesalpiniaceae
10	Pigeon Wood	*Treama orientalis*	Cannabaceae
11	Arjun	*Terminalia arjuna*	Combretaceae
12	Bahera	*Terminalia bellirica*	Combretaceae
13	Indian Almond	*Terminalia cattapa*	Combretaceae
14	Haritaki	*Terminalia chebula*	Combretaceae
15	Indian Cherry	*Cordia dichotoma*	Ehretiaceae
16	East Indian Ebony	*Diospyros melanoxylon*	Ehretiaceae
17	Golden Shower	*Acacia auriculiformis*	Fabaceae
18	Babul	*Acacia nilotica*	Fabaceae
19	Gliricidia	*Gliricidia sepium*	Fabaceae
20	Vilaiti Keekar	*Prosopis juliflora*	Fabaceae
21	Siris	*Albizia lebbeck*	Fabeceae
22	North Indian Rosewood	*Dalbergia sissoo*	Fabeceae
23	Castor Oil Tree	*Pongamia pinnata*	Fabeceae
24	Clearing-nut Tree	*Strychnos potatorum*	Loganiaceae
25	Phalsha	*Grewia subinaequalis*	Malvaceae
26	Neem Tree	*Azadirachta indica*	Meliaceae
27	Subabul	*Leucena leucocephela*	Mimosaceae
28	Rain Tree	*Samanea saman*	Mimosaceae
29	Fig Tree	*Ficus hispida*	Monaceae
30	-	*Ficus altissima*	Moraceae
31	Banyan Tree	*Ficus benghalensis*	Moraceae
32	Cluster Fig	*Ficus glomerata*	Moraceae
33	Peepul Tree	*Ficus religiosa*	Moraceae
34	Eucalyptus	*Eucalyptus spp.*	Myrtaceae
35	Indian Blackberry	*Syzygium cumini*	Myrtaceae
36	Indian Blackberry (Small)	*Syzygium sp.*	Myrtaceae
37	Queen of the night	*Nyctanthes arbortristis*	Oleaceae
38	Indian Jujube / Ber	*Ziziphus mauritiana*	Rhamnaceae
39	Aal	*Morinda pubescens*	Rubiaceae
40	Rusa	*Pavetta crassicaulis*	Rubiaceae
41	-	*Tamilnadia uliginosa*	Rubiaceae
42	Golden Apple	*Aegle marmelos*	Rutaceae
43	East indian Stainwood	*Chloroxylon swietenia*	Rutaceae
44	-	*Dodonea vericosa*	Sapindaceae
45	Mahua	*Madhuca longifolia*	Sapotaceae
46	Wild Almond	*Sterculia foetida*	Sterculiaceae
47	Indian Elm	*Holoptelea integrifolia*	Ulmaceae
48	Burma Teak	*Tectona grandis*	Verbenaceae

Shrubs

Sl. No	Common Name	Scientific Name	Family
1	Oleander White	*Nerium oleander 'Roseum'*	Apocynaceae
2	Common Cocklebur	*Xanthium strumarium L.*	Asteraceae
3	Tecoma	*Tecoma goudichoudi*	Bignoniaceae
4	Caesalpinia	*Caesalpinia pulcherrima*	Caesalpiniaceae
5	Gray Nicker	*Caesalpinia bonduc*	Caesalpiniaceae
6	Jangli-arandi	*Jatropha curcus L.*	Euphorbiaceae
7	Roast Potato Plant	*Phyllanthus reticulatus Poir.*	Euphorbiaceae
8	Rattlepods	*Clotalaria pallida*	Fabaceae
9	Kasunda / Baner	*Cassia occidentalis*	Fabaceae
10	Kasunda / Baner	*Cassia sophera*	Fabaceae
11	Tanner's Cassia	*Cassia auriculata*	Leguminosae
12	-	*Pterolobium hexapetalum*	Leguminosae
13	Indian Mallow	*Abutilon indicum*	Malvaceae
14	-	*Grewia flavescens*	Malvaceae
15	-	*Grewia hirsuta*	Malvaceae
16	Pigeon Pea	*Cajanus cajan*	Papilionaceae
17	Karipata	*Murraya koenigii*	Rutaceae
18	-	*Dodonea vericosa*	Sapindaceae
19	Dhutra	*Datura fastuosa*	Solanaceae
20	Black Nightshade	*Solanum nigram*	Solanaceae
21	Bamanhati	*Clerodendrum indicum*	Verbenaceae
22	Glorybower	*Clerodendrum inerme*	Verbenaceae
23	Nishinda	*Vitex negundo*	Verbenaceae
24	Wild jessamine,Carray cheddie	Canthium parviflorum	Rubiaceae

Creeper

Sl. No	Common Name	Scientific Name	Family
1	Anantamul	*Hemidesmus indicus*	Asclepiadaceae
2	Aparajita	*Clitoria ternatea*	Fabaceae
3	Yam / Air Potato	*Dioscorea bulbifera*	Dioscoreaceae
4	Jungli Angur	*Vitis latifolia*	Vitaceae
5	Wild Kulthi	*Atylosia scarabaeoides*	Fabaceae
6	Woodroses	*Merremia emarginata*	Convolvulaceae
7	Trellis-vine	*Daemia extensa R. Br.*	Asclepiadaceae
8	Aiea morning glory	*Ipomoea triloba*	Convolvulaceae
9	Gulanchalata	*Tinospora cordifolia*	Menispermaceae
10	Indian Stinging Nettle	*Tragia involucrata*	Euphorbiaceae
11	Jasmine	*Jasminum officinale*	Oleaceae
12	Indian Caper	*Capparis zeylanica*	Capparaceae
13	Purple Yam	*Dioscorea alata*	Dioscoreaceae
14	Crab's eye / Rosary Pea	*Abrus precatorius*	Fabaceae
15	Jewel Vine	*Derris scandens*	Fabeceae
16	Asparagus	*Aspaagus recemosus*	Asparagaceae
17	Heartseed	*Cardiospermum halicacabum L.*	Sapindaceae
18	Telakuchu	*Coccinia grandis*	Cucurbitaceae
19	Panacea Twiner	*Tylophora indica*	Apocynaceae
20	Green Milkweed Climber	*Wattakaka volubilis*	Apocynaceae

Grasses

Sl. No	Common Name	Scientific Name	Family
1	Commelina	*Commelina oblique*	Commelinaceae
2	Commelina	*Commelina benghalensis*	Commelinaceae
3	Commelina	*Commelina salicifolia Roxb.*	Commelinaceae

Sl. No	Common Name	Scientific Name	Family
4	Sugar Cane	Sacharum Officinarum	Graminaceae
5	Durba	*Cynodon dactylon*	Graminae

Herbs

Sl. No	Common Name	Scientific Name	Family
1	Hemigraphis	*Hemigraphis hirta*	Acanthaceae
2	Kulekhara	*Hygrophila schulli*	Acanthaceae
3	Bluebell	*Ruelia prostrata*	Acanthaceae
4	Alternanthera	*Alternanthera paronychioides*	Amaranthaceae
5	Alternanthera	*Alternanthera sessilis*	Amaranthaceae
6	Achyranthes	*Achyranthes aspera*	Amaranthaceae
7	Keshut	*Eclipta alba*	Asteraceae
8	Madras Carpet	*Grangea maderaspatana*	Asteraceae
9	Famine Weed	*Parthenium hysterophorus*	Asteraceae
10	Sahadebi	*Vernonia cinerea*	Asteraceae
11	Sonchus	*Sonchus arvensis L.*	Asteraceae
12	Synedrella	*Synedrella Nudiflora*	Asteraceae
13	Coat Bottons	*Tridax procumbens*	Asteraceae
14	Cleome	*Cleome Viscosa*	Capparidaceae
15	Helencha	*Enydra fluctuans*	Compositae
16	Bon Tulshi	*Croton bonpladianum*	Euphorbiaceae
17	khirika	*Euphorbia hirta*	Euphorbiaceae
18	Seed-under-leaf	*Phyllanthus simplex Retz.*	Euphorbiaceae
19	Seed-under-leaf	*Phyllanthus urinaria Linn.*	Euphorbiaceae
20	Soya Bean	*Glycine max*	Fabeceae
21	Indian Catmint	*Anisomeles indica*	Lamiaceae
22	Peet Berela	*Sida acuta*	Malvaceae
23	Common Purslane	*Portulaca oleracea L.*	Portulacaceae
24	Bon Tepari	*Physalis minima L.*	Solanaceae
25	Graceful Pouzalz's Bush	*Pouzalzia indica*	Urticaceae
26	Hen's Nettle	*Fleurya interrupta*	Urticaceae
27	Bhuiokra	*Phyla nodiflora*	Verbenaceae
28	Turmeric	*Curcuma longa*	Zingiberaceae
29	-	*Tribulus terrestris*	Zygophyllaceae
30	Devil's Claw	*Martynia annua*	Martyniaceae

Palms

Sl. No	Common Name	Scientific Name	Family
1	Indian Datepalm	*Phoenix sylvestris*	Palmae/ Arecaceae

Aquatic Plants

Sl. No	Common Name	Scientific Name	Family
1	Bush Morning Glory	*Ipomoea carnea*	Convolvulaceae
2	Common Marsh Buckwheat	*Polygonum glabrum*	Polygalaceae
3	Cattail	*Typha angustata*	Thypaceae

Annexure 3: Checklist of Flora through Secondary Study

Sl.No.	Botanical Name.	Family.	Local Name.
1	*Acacia latronum*	Mimosoidae	Hottejali, Anegobli
2	*Acacia nilotica*	”	Babul,Karijali, Gobli.
3	*Acacia senegal*	”	Mugli
4	*Acacia chundra*	”	Kempu jali.
5	*Acacia leucophloea*	”	Bili jali.
6	*Acacia intia*	”	Korinda kanajige
7	*Acacia catechu*	”	Kaggali.
8	*Acacia ferruginea*	”	Banni.
9	*Acacia pennata*	”	Kaadu seege.
10	*Albizzia amara*	”	Tugli, Chigare.
11	*Albizzia lebbeck*	”	Bage, Siris.
12	*Albizzia procera*	”	Belati, Hill siris, Safed siris.
13	*Anacardium occidentale*	Anacardiaceae	Cashewnut
14	*Aegle marmelos*	Rutaceae	Bael, Bel.
15	*Ailanthus excelsa*	Meliaceae	Kudrebevu, Helarimara.
16	*Abrus precatorius*	Faboideae	Gulganji
17	*Anogeissus latifolia*	Combretaceae	Dindiga, Sirwal.
18	*Andropogon contortus*	Poaceae	Surili grass.
19	*Annona reticulata*	Annonaceae	Ramphal.
20	*Annona squamosa*	”	Shareefa, Seethaphal
21	*Aporosa lindleyana*	Euphorbiaceae	Challe.
22	*Azadirachta indica*	Meliaceae	Bevu.
23	*Apluda mutica*	Poaceae	Karry guddi.
24	*Aloe vera*	Liliaceae	Lolesara
25	*Andropogon schoenanthus*	Poaceae	Rausa grass.
26	*Agave sisalana*	Liliaceae	Kattale, Sisal fibre.
27	*Aristida setacea*	Poaceae	Ragsapeta, Jadoo-ki-ghas.
28	*Bassia latifolia*	Sapotaceae	Mohwa, Hippe.
29	*Bauhinia racemosa*	Caesalpiniaceae	Sannabasavanapada.
30	*Bauhinia purpurea*	”	Doddabasavanpada.
31	*Boswellia serrata*	Burseraceae	Dhup, Salai gum tree.
32	*Buchnania latifolia*	Anacardiaceae	Malli, Chiranji.
33	*Butea monosperma.*	Papilionaceae	Muttugada mara, Flame of the forest
34	*Butea superba.*	”	Muttugada balli.
35	*Bombax malabaricum.*	Bombacaceae	Buraga.
36	*Cassia fistula.*	Caesalpiniaceae.	Amaltas, Kakke.
37	*Cassia auriculata.*	”	Thangadi.
38	*Cassia siamea.*	”	Seeme Tangadi.
39	*Careya arborea*	Myrtaceae	Kaval, Buda.
40	*Cymbopogon celoratus.*	Poaceae.	Bodha grass.
41	*Calastrus senegalensis.*	-	Danthi, Kubja.
42	*Chloroxylon swietenia.*	-	Mashiwal, Bittla.
43	*Carissa carandus*	Apocynaceae	Kavale.
44	*Cymbopogon martinii.*	Poaceae	Rosha grass.
45	*Diospyros melanoxylon.*	Ebenaceae	Tupra, Tumri.
46	*Dalbergia sissoo.*	Papilionaceae	Sissoo.
47	*Dalbergia latifolia.*	”	Rosewood, Beete.
48	*Delonix regia.*	Caesalpiniaceae	May Flower, Gulmohar.
49	*Dendrocalamus strictus.*	Poaceae	Male bamboo.
50	*Dalbergia paniculata.*	Pappilionaceae	Pachali.
51	*Desmodium pulchellum.*	Fabaceae	Seegate gida.
52	*Dodonia viscosa*	Sapindaceae	Bandarike.

Sl.No.	Botanical Name.	Family.	Local Name.
53	*Emblica officinalis.*	Euphorbiaceae	Amla, Nelli.
54	*Eucalyptus spp.*	Myrtaceae	Nilgiri.
55	*Euphorbia tirucalli.*	Euphorbiaceae	Kalli.
56	*Elaeodendron glaucum.*	Celastraceae	Mukarthi.
57	*Ficus bengalensis*	Moraceae	Aala.
58	*Ficus glomerata*	”	Atti.
59	*Ficus religiosa*	”	Arali, Peepal.
60	*Ficus mysorensis*	”	Goni
61	*Grewia tiliaefolia*	Tiliaceae	Tadasalu.
62	*Gardenia gummifera*	Loganiaceae	Bikke
63	*Gardenia latifolia*	”	Adavi Bikke
64	*Gmelina arborea*	Verbenaceae	Shivane.
65	*Hardwickia binata*	Caesalpiniaceae	Kamara, Anjan, Aasu.
66	*Holoptelia integrifolia*	Urticaceae	Tapasi.
67	*Ixora arborea*	Rubiaceae	Goravi.
68	*Kigelia pinnata*	Bignoniaceae	Aane Toradu mara.
69	*Lantana camara*	Verbenaceae	Lantana.
70	*Lagerstroemia parviflora*	Lythraceae	Channangi.
71	*Mangifera indica*	Anacardiaceae	Mavinamara.
72	*Morinda tinctoria*	-	Kadukumbala.
73	*Michelia champaca*	Magnoliaceae	Sampige.
74	*Melia azedarach*	Meliaceae	Arebevu, Huchbevu.
75	*Mitragyna parviflora*	Rubiaceae	Kalam tree, Kongu.
76	*Nerium adorum*	Apocynaceae	Kanagalu.
77	*Opuntia dillenii*	Cactaceae	Papaskalli.
78	*Ocimum sanctum*	Labiatae	Tulsi.
79	*Pterocarpus marsupium*	Papilionaceae	Honne, Bijasal.
80	*Pterocarpus santalinus*	”	Rakta chandan.
81	*Pongamia pinata*	”	Honge, Kanige.
82	*Phoenix sylvestris*	Palmae	Ichalu
83	*Prosopis juliflora*	Mimosoidae	Bellary jali.
84	*Parthenium histerophorus*	Asteraceae	Parthenium, Congress grass.
85	*Randia dumetorum.*	Rubiaceae	Mangare.
86	*Randia uliginosa*	”	Kare.
87	*Samania, saman.*	Mimosoidae	Rain tree.
88	*Santalum album*	Santalaceae	Shrigandha, Sandal wood.
89	*Sapindus emarginatus.*	Sapindaceae	Soapnut tree, Rita.
90	*Semecarpus anacardium*	Anacardiaceae	Geru, Marking nut.
91	*Soymida febrifuga*	”	Some.
92	*Syzygium cuminii*	Myrtaceae.	Nerale.
93	*Tamarindus indica.*	Caesalpiniaceae	Tamarind, Hunise .
94	*Tectona grandis.*	Verbenaceae.	Teak, Tega,Sagavani.
95	*Terminalia tomentosa.*	Combretaceae.	Karimatti.
96	*Terminalia chebula.*	”	Alale, Harda.
97	*Terminalia arjuna*	”	Arjun, Holematti, Bilimatti.
98	*Terminalia belerica*	”	Tare.
99	*Tetrameles nudiflora.*	Dasticaceae.	Kadbende.
100	*Typha angustata*	Typhaceae	Aapu, Anechondu.
101	*Vitex negundo*	Verbenaceae	Lakkigida.
102	*Wrightia tinctoria*	Apocynaceae.	Hale, Halgouri.
103	*Zizyphus xylocarpus*	Rhamnaceae	Gotte.
104	*Zizyphus jujuba.*	”	Bare.

Annexure 4: Checklist of Fauna through Primary Study

Mammals

S. No.	Common / Local Name	Scientific name	Family	IUCN Status	Schedule (WL Act, 1972)
1	Golden Jackal	*Canis aureus*	Canidae	Least Concern	II
2	Common Langur	*Semnopithecus entellus*	Cercopithecidae	Least Concern	II
3	Grey Mongoose	*Herpestes edwardsii*	Herpestidae	Least Concern	II
4	Jungle Cat	*Felis chaus*	Felidae	Least Concern	II
5	Common Palm Civet	*Paradoxurus hemaphroditus*	Viverridae	Lower Risk	II
6	Small Indian Civet	*Viverricula indica*	Viverridae	Least Concern	II
7	Flying Fox	*Pteropus giganteus*	Pteropodidae	Least Concern	II
8	Black-naped Hare	*Lepus nigricollis*	Leporidae	Least Concern	IV
9	Spotted Deer	*Axis axis*	Cervidae	Least Concern	III
10	Blackbuck	*Antilope cervicapra*	Bovidae	Near Threatened	I
11	Indian Grey Wolf	*Canis lupus*	Canidae	Least Concern	I
12	Wild Boar	*Sus scrofa*	Suidae	Least Concern	III
13	Striped Hyena	*Hyaena hyaena*	Hyaenidae	Near Threatened	III
14	Wild Dog	*Cuon alpinus*	Canidae	Endangered	II
15	Indian Fox	*Vulpes bengalensis*	Canidae	Least Concern	II
16	Five Striped Palm Squirrel	*Paradoxurus hemaphroditus*	Sciuridae	Least Concern	-
17	Indian Gebril	*Tatera indica*	Muridae	Least Concern	-

Birds

S. No.	Common / Local Name	Scientific name	Family	IUCN Status	Schedule (WL Act, 1972)
1	Painted Francolin	*Francolinnus pictus*	Phasianidae	Least Concern	IV
2	Grey Francolin	*Francolinnus pondicerianus*	Phasianidae	Least Concern	IV
3	Indian Peafowl	*Pavo cristatus*	Phasianidae	Least Concern	I
4	Indian Spot-billed Duck	*Anas poecilorhyncha*	Anatidae	Least Concern	IV
5	Little Grebe	*Tachybaptus ruficollis*	Podicipedidae	Least Concern	IV
6	Painted Stork	*Mycteria leucocephala*	Ciconiidae	Near Threatened	IV
7	Woolly-necked Stork	*Ciconia episcopus*	Ciconiidae	Vulnerable	IV
8	Black-headed Ibis	*Threskiornis melanocephalus*	Threskiornithidae	Near-threatened	IV
9	Red-naped Ibis	*Pseudibis papillosa*	Threskiornithidae	Least Concern	IV
10	Eurasian Spoonbill	*Platalea leucorodia*	Threskiornithidae	Least-concern	I
11	Indian Pond Heron	*Ardeola grayii*	Ardeidae	Least-concern	IV
12	Grey Heron	*Ardea cinerea*	Ardeidae	Least-concern	IV
13	Purple Heron	*Ardea perpurea*	Ardeidae	Least-concern	IV
14	Cattle Egret	*Bubulcus ibis*	Ardeidae	Least-concern	IV
15	Great Egret	*Casmerodius albus*	Ardeidae	Least-concern	IV
16	Intermediate Egret	*Mesophoyx intermedia*	Ardeidae	Least-concern	IV
17	Little Egret	*Egretta garzetta*	Ardeidae	Least-concern	IV
18	Darter	*Anhinga melanogester*	Anhingidae	Near Threatened	IV
19	Little Cormorant	*Phalacrocorax niger*	Phalacrocoracidae	Least-concern	IV
20	Indian Cormorant	*Phalacrocorax fuscicollis*	Phalacrocoracidae	Least-concern	IV
21	Great Cormorant	*Phalacrocorax corba*	Phalacrocoracidae	Least-concern	IV
22	Common Kesterl	*Falco tinnunculus*	Falconidae	Least-concern	IV
23	Black-shouldered Kite	*Elanus caeruleus*	Accipitridae	Least-concern	IV

S. No.	Common / Local Name	Scientific name	Family	IUCN Status	Schedule (WL Act, 1972)
24	Black Kite	*Milvus migrans*	Accipitridae	Least-concern	IV
25	Oriental Honey-Buzzard	*Pemis ptilorhyncus*	Accipitridae	Least-concern	IV
26	Short-toed Snake Eagle	*Circaetus gallicus*	Accipitridae	Least-concern	IV
27	Crested Serpent Eagle	*Spiaornis cheela*	Accipitridae	Least-concern	IV
28	Shikra	*Accipiter badius*	Accipitridae	Least-concern	IV
29	White-eyed Buzzard	*Butastur teesa*	Accipitridae	Least-concern	IV
30	Changeable Hawk Eagle	*Nisaetus limnaeetus*	Accipitridae	Least-concern	IV
31	White-breasted Waterhen	*Amauromis phoenicurus*	Rallidae	Least-concern	IV
32	Barred Buttonquil	*Turnix suscitator*	Turnicidae	Least-concern	IV
33	Black-winged Stilt	*Himantopus himantopus*	Recurvirostridae	Least-concern	IV
34	Yellow-wattled Lapwing	*Vanellus malabaricus*	Charadriidae	Least-concern	IV
35	Red-wattled Lapwing	*Vanellus indicus*	Charadriidae	Least-concern	IV
36	Little Ringed Plover	*Charadrius dubius*	Charadriidae	Least-concern	IV
37	Common Redshank	*Tringa totanus*	Scolopacidae	Least-concern	IV
38	Wood Sandpiper	*Tringa glareola*	Scolopacidae	Least-concern	IV
39	Indian Courser	*Cursorius coromandelius*	Glareolidae	Least-concern	IV
40	Common Tern	*Sterna hirundo*	Laridae	Least-concern	IV
41	River Tern	*Sterna aurantia*	Laridae	Near Threatened	IV
42	Common Pigeon	*Columba livia*	Columbidae	Least Concern	IV
43	Eurasian Collared Dove	*Streptopelia decaocto*	Columbidae	Least Concern	IV
44	Spotted Dove	*Streptopelia chinensis*	Columbidae	Least Concern	IV
45	Laughing Dove	*Streptopelia senegalensis*	Columbidae	Least Concern	IV
46	Yellow-footed green Pigeon	*Treron phoenicoptera*	Columbidae	Least Concern	IV
47	Rose-ringed Parakeet	*Psittacula krameri*	Psittacidae	Least Concern	IV
48	Plum-headed Parakeet	*Psittacula cyanocephala*	Psittacidae	Least Concern	IV
49	Jacobin Cuckoo	*Clamator jacobinus*	Cuculidae	Least Concern	IV
50	Common Hawk Cuckoo	*Hierococcyx varius*	Cuculidae	Least Concern	IV
51	Grey-bellied Cuckoo	*Cacomantis passerinus*	Cuculidae	Least Concern	IV
52	Asian Koel	*Eudynamys scolopacea*	Cuculidae	Least Concern	IV
53	Blue-faced Malkoha	*Rhopodytes viridirostris*	Cuculidae	Least Concern	IV
54	Sirkeer Malkoha	*Taccocua leschenaultii*	Cuculidae	Least Concern	IV
55	Greater Coucal	*Centropus sinensis*	Cuculidae	Least Concern	IV
56	Spotted Owlet	*Athene brama*	Strigidae	Least Concern	IV
57	Mottled Wood Owl	*Strix ocellata*	Strigidae	Least Concern	IV
58	Indian Nightjar	*Caprimulgus asiaticus*	Caprimulgidae	Least Concern	IV
59	Asian Palm Swift	*Cypsiurus balasiensis*	Apodidae	Least Concern	IV
60	Little Swift	*Apus affinis*	Apodidae	Least Concern	IV
61	Common Hoopoe	*Upupa epops*	Upupidae	Least Concern	IV
62	Indian Roller	*Coracias benghalensis*	Coraciidae	Least Concern	IV
63	White-throated Kingfisher	*Halcyon smyrnesis*	Halcyonidae	Least Concern	IV
64	Common Kingfisher	*Alcedo atthis*	Alcedinidae	Least Concern	IV
65	Pied Kingfisher	*Ceryle rudis*	Halcyonidae	Least Concern	IV
66	Green Bee-eater	*Merops orientalis*	Meropidae	Least Concern	IV
67	Indian Grey Hornbill	*Ocyceros birostris*	Bucerotidae	Least Concern	IV
68	Coppersmith Barbet	*Megalaima haemacephala*	Ramphastidae	Least Concern	IV
69	Large Cuckooshrike	*Coracina macei*	Campephagidae	Least Concern	IV
70	Black-headed Cuckooshrike	*Coracina melanoptera*	Campephagidae	Least Concern	IV
71	Common Iora	*Aegithina tiphia*	Aegithinidae	Least Concern	IV

S. No.	Common / Local Name	Scientific name	Family	IUCN Status	Schedule (WL Act, 1972)
72	Marshall's Iora	*Aegithina nigrolutea*	Aegithinidae	Least Concern	IV
73	White-bellied Minivet	*Pericrocotus erythropygius*	Campephagidae	Least Concern	IV
74	Small Minivet	*Pericrocotus cinnamomeus*	Campephagidae	Least Concern	IV
75	Bay-backed Shrike	*Lanius vittatus*	Laniidae	Least Concern	IV
76	Black Drongo	*Dicrurus macrocercus*	Dicruridae	Least Concern	IV
77	White-bellied Drongo	*Dicrurus caerulescens*	Dicruridae	Least Concern	IV
78	Black-hooded Oriole	*Oriolus xanthornus*	Oriolidae	Least Concern	IV
79	White-throated Fantail	*Rhipidura albicollis*	Rhipiduridae	Least Concern	IV
80	Asian Paradise Flycatcher	*Terpsiphone paradise*	Monarchidae	Least Concern	IV
81	Rufous Treepie	*Dendrocitta vagabunda*	Corvidae	Least Concern	IV
82	Eastern Jungle Crow	*Corvus macrorhynchos levaillantii*	Corvidae	Least Concern	IV
83	House Crow	*Corvus splendens*	Corvidae	Least Concern	IV
84	Dusky Crag Martin	*Ptyonoprogne concolor*	Hirundinidae	Least Concern	IV
85	Wire-tailed Swallow	*Hirundo smithii*	Hirundinidae	Least Concern	IV
86	Streak-throated Swallow	*Petrochelidon fluvicola*	Hirundinidae	Least Concern	IV
87	Red-rumped Swallow	*Hirundo daurica*	Hirundinidae	Least Concern	IV
88	Indian Bushlark	*Mirafra erythroptera*	Alaudidae	Least Concern	IV
89	Ashy-crowned Sparrow Lark	*Eremopterix griseus*	Alaudidae	Least Concern	IV
90	Sykes's Lark	*Galerida deva*	Alaudidae	Least Concern	IV
91	Red-vented Bulbul	*Pycnonotus cafer*	Pycnonotidae	Least Concern	IV
92	White-browed Bulbul	*Pycnonotus luteolus*	Pycnonotidae	Least Concern	IV
93	Grey-breasted Prinia	*Prinia hodgsonii*	Cisticolidae	Least Concern	IV
94	Jungle Prinia	*Prinia sylvatica*	Cisticolidae	Least Concern	IV
95	Plain Prinia	*Prinia inornata*	Cisticolidae	Least Concern	IV
96	Ashy Prinia	*Prinia socialis*	Cisticolidae	Least Concern	IV
97	Zitting Cisticola	*Cisticola juncidis*	Cisticolidae	Least Concern	IV
98	Common Tailorbird	*Orthotomus sutorius*	Cisticolidae	Least Concern	IV
99	Tawny-bellied Babbler	*Dumeti hyperythra*	Timaliidae	Least Concern	IV
100	Large Grey Babbler	*Turdoides malcolmi*	Timaliidae	Least Concern	IV
101	Yellow-billed Babbler	*Turdoides affinis*	Timaliidae	Least Concern	IV
102	Yellow-eyed Babbler	*Chrysomma sinense*	Timaliidae	Least Concern	IV
103	Oriental White-eye	*Zosterops palpebrosus*	Zosteropidae	Least Concern	IV
104	Common Myna	*Acridotheres tristis*	Sturnidae	Least Concern	IV
105	Asian Pied Starling	*Gracupica contra*	Sturnidae	Least Concern	IV
106	Brahminy Starling	*Sturnus pagodarum*	Sturnidae	Least Concern	IV
107	Chestnut-tailed Starling	*Sturnus malabaricus*	Sturnidae	Least Concern	IV
108	Orange-headed Thrush	*Zoothera citrina*	Turdidae	Least Concern	IV
109	Oriental Magpie Robin	*Copsychus saularis*	Muscicapidae	Least Concern	IV
110	Indian Robin	*Saxicoloides fulicata*	Muscicapidae	Least Concern	IV
111	Pied Bushchat	*Saxicola caprata*	Muscicapidae	Least Concern	IV
112	Tickell's Blue Flycatcher	*Cyornis tickelliae*	Muscicapidae	Least Concern	IV
113	Jerdon's Leafbird	*Chloropsis jerdoni*	Choloropseidae	Least Concern	IV
114	Pale-billed Flowerpecker	*Dicaeum erythrorhynchos*	Dicaeidae	Least Concern	IV
115	Purple-rumped Sunbird	*Nectarinia zeylonica*	Nectariniidae	Least Concern	IV
116	Purple Sunbird	*Nectarinia asiatica*	Nectariniidae	Least Concern	IV
117	Streaked Spiderhunter	*Arachnothera magna*	Nectariniidae	Least Concern	IV
118	House Sparrow	*Passer domesticus*	Passeridae	Least Concern	IV
119	Baya Weaver	*Ploceus philippinus*	Ploceidae	Least Concern	IV
120	Indian Silverbill	*Euodice malabarica*	Estrildidae	Least Concern	IV
121	Scaly-breasted Munia	*Lonchura punctulata*	Estrildidae	Least Concern	IV

S. No.	Common / Local Name	Scientific name	Family	IUCN Status	Schedule (WL Act, 1972)
122	White-browed Wagtail	*Motacilla maderaspatensis*	Motacillidae	Least Concern	IV
123	Paddy field Pipit	*Anthus rufulus*	Motacillidae	Least Concern	IV

Reptiles & Frogs

S. No.	Common / Local Name	Scientific name	Family	IUCN Status	Schedule (WL Act, 1972)
1	Common Toad	*Duttaphrynus melanostictus*	*Bufonidae*	Least Concern	IV
2	Ferguson's Toad	*Duttaphrynus scaber*	*Bufonidae*	Least Concern	IV
3	Indian Painted Frog	*Kaloula taprobanica*	*Microhylidae*	Least Concern	IV
4	Ornate Narrow-mouthed Frog	*Microhyla ornata*	*Microhylidae*	Least Concern	IV
5	Marbled Balloon Frog	*Uprodon systoma*	*Microhylidae*	Least Concern	IV
6	Skipper Frog	*Euphlyctis cyanophlyctis*	*Dicroglossidae*	Least Concern	IV
7	Cricket Frog	*Fejervarya sp.*	*Dicroglossidae*	Least Concern	IV
8	Indian Bull Frog	*Hoplobatrachus tigerinus*	*Dicroglossidae*	Least Concern	IV
9	Common Tree Frog	*Polypedates maculatus*	*Rhacophoridae*	Least Concern	IV
10	Indian Burrowing Frog	*Sphaerotheca sp.*	*Dicroglossidae*	Least Concern	IV
11	Bronze Grass Skink	*Eutropis macularia*	*Scincidae*	Least Concern	IV
12	Spotted Supple Skink	*Lygosoma punctata*	*Scincidae*	Least Concern	IV
13	Common Grass Skink	*Eutropis carinata*	*Scincidae*	Least Concern	IV
14	Fan-throated Lizard	*Sitana ponticeriana*	*Agamidae*	Least Concern	IV
15	Garden Lizard	*Calotes versicolor*	*Agamidae*	Least Concern	IV
16	Forest Lizard	*Calotes rouxii*	*Agamidae*	Least Concern	IV
17	Bengal Monitor Lizard	*Varanus bengalensis*	*Varanidae*	Least Concern	I
18	Chamaeleon	*Chamaeleo zeylanicus*	*Chamaeleonidae*	Least Concern	II
19	Russel's Viper	*Daboia russelii*	*Viperidae*	Least Concern	II
20	Common Bronzeback Tree Snake	*Dendrelaphis sp.*	*Colubridae*	Least Concern	IV
21	Common Vine Snake	*Ahaetulla nasuta*	*Colubridae*	Least Concern	IV
22	Indian Trinket Snake	*Coelognathus helena*	*Colubridae*	Least Concern	IV
23	Spectacaled Cobra	*Naja naja*	*Elapidae*	Least Concern	II

Butterflies

S. No.	Common / Local Name	Scientific name	Family
1	Spot Swordtail	*Graphium nomius*	Papilionidae
2	Common Rose	*Pachliopta aristolochiae*	Papilionidae
3	Crimson Rose	*Pachliopta hector*	Papilionidae
4	Common Mormon	*Papilio polytes*	Papilionidae
5	Lime	*Papilio demoleus*	Papilionidae
6	Common Mime	*Papilio clytia*	Papilionidae
7	Common Grass Yellow	*Eurema hecabe*	Pieridae
8	Small Grass Yellow	*Eurema brigitta*	Pieridae
9	Common Emigrant	*Catopsilia pomona*	Pieridae
10	Mottled Emigrant	*Catopsilia pyranthe*	Pieridae
11	Eastern Striped Albatross	*Appias olferna*	Pieridae
12	Common Jezebel	*Delis eucharis*	Pieridae
13	White Orange Tip	*Ixias marianne*	Pieridae
14	Small Orange Tip	*Colotis etrida*	Pieridae
15	Psyche	*Leptosia nina*	Pieridae
16	Common Silverline	*Spindasis vulcanus*	Lycaenidae
17	Common Pierrot	*Castalius rosimon*	Lycaenidae
18	Spotted Pierrot	*Tarucus callinara*	Lycaenidae

S. No.	Common / Local Name	Scientific name	Family
19	Common Cerulean	*Jamides celeno*	Lycaenidae
20	Tiny Grass Blue	*Zizula hylax*	Lycaenidae
21	Common Quakar	*Neopithecops zalmora*	Lycaenidae
22	Striped Tiger	*Danaus genutia*	Nymphalidae
23	Plain Tiger	*Danaus chrysippus*	Nymphalidae
24	Blue Tiger	*Tirumala limniace*	Nymphalidae
25	Common Crow	*Euploea core*	Nymphalidae
26	Common Evening Brown	*Melanitis leda*	Nymphalidae
27	Baronet	*Symphaedra nais*	Nymphalidae
28	Joker	*Byblia ilithyia*	Nymphalidae
29	Common Bush Brown	*Mycalesis perseus*	Nymphalidae
30	Common Five Ring	*Ypthima baldus*	Nymphalidae
31	Common Leopard	*Phalanta phalantha*	Nymphalidae
32	Tawny Coster	*Acraea violae*	Nymphalidae
33	Common Castor	*Ariadne merione*	Nymphalidae
34	Angled Castor	*Ariadne ariadne*	Nymphalidae
35	Blue Pansy	*Junonia orithya*	Nymphalidae
36	Peacock Pansy	*Junonia almana*	Nymphalidae
37	Grey Pansy	*Junonia atlites*	Nymphalidae
38	Lemon Pansy	*Junonia lemonis*	Nymphalidae
39	Yellow Pansy	*Junonia hierta*	Nymphalidae
40	Great Egg Fly	*Hypolimnas bolina*	Nymphalidae
41	Common Banded Awl	*Hasora chromus*	Hesperiidae

Odonates

S. No.	Common / Local Name	Scientific name	Family
1	Common Clubtail	*Ictinogomphus rapax*	Gomphidae
2	Common Hooktail	*Paragomhus lineatus*	Gomphidae
3	Blue Darner	*Anax immaculifrons*	Aeshnidae
4	Ditch Jewel	*Brachythemis contaminata*	Libellulidae
5	Granite Ghost	*Bradinopyga geminata*	Libellulidae
6	Ruddy Marsh Skimmer	*Crocothemis servilia*	Libellulidae
7	Ground Skimmer	*Diplacodes trivialis*	Libellulidae
8	Asiatic Blood Tail	*Lathrecista asiatica*	Libellulidae
9	Tricoloured Marsh Hawk	*Orthetrum luzonicum*	Libellulidae
10	Crimson-tailed Marsh Hawk	*Orthetrum pruinosum*	Libellulidae
11	Green Marsh Hawk	*Orthetrum sabina*	Libellulidae
12	Wandering Glider	*Pantala flavescens*	Libellulidae
13	Yellow-tailed Ashy Skimmer	*Potamarcha congener*	Libellulidae
14	Coral-tailed Cloud Wing	*Tholymis tillarga*	Libellulidae
15	Red Marsh Trotter	*Tramea basilaris*	Libellulidae
16	Crimson Marsh Glider	*Trithemis aurora*	Libellulidae
17	Black Stream Glider	*Trithemis festiva*	Libellulidae
18	Scarlet Rock Glider	*Thrithemis kirbyi*	Libellulidae
19	Greater Crimson Glider	*Urothemis signata*	Libellulidae
20	Pigmy Dartlet	*Agriocnemis pygmaea*	Coenagrionidae
21	Coromandel Marsh Dart	*Ceriagrion coromandelianum*	Coenagrionidae
22	Golden Dartlet	*Ischnura aurora*	Coenagrionidae
23	Bush Dart	*Copera sp.*	Platycnemididae
24	Un Id	-	Platycnemididae
25	Un Id	-	Platycnemididae

Annexure 5: Checklist of Fauna through Secondary Study

Mammals

Sl.No.	Common Name.	Scientific Name
1	Black buck	*Antelope cervicapra*
2	Common langur	*Presbtlis entellus*
3	Common fox	*Vulpes bengalensis*
4	Fruit bat	-
5	Hyaena	*Hyaena, hyaena*
6	Hare	*Lapus nigricallis*
7	Indian porcupine	*Hystrix indica*
8	Indian wolf	*Canis lupus pallipes*
9	Jackal	*Canis aureus*
10	Jungle cat	*Felis chans*
11	Mice	-
12	Mongoose	*Herpestes Spp.*
13	Panther	*Panthera pardus*
14	Rat	-
15	Squirrel	-
16	Sloth bear	*Melursus ursinus*
17	Spotted Deer	*Axis axis*
18	wild boar	*Sus scrofa*
19	Indian Pangolin	*Manis crassicaudata*

Birds

Sl. No.	Common Name.	Scientific Name
1	Ashy wren warbler	*Prinia socialis*
2	Black drongo	*Dicrurus adsimilis*
3	Black winged kite	*Elanus caerulus*
4	Blossom headed parakeet	*Psittacula cyanocephala*
5	Blue pigeon	*Columba livia*
6	Blue jay	*Coracias benghalensis*
7	Black headed oriole	*Oriolus xanthornus*
8	Common weaver bird	*Ploceus philippinus*
9	Crow pheasant	*Centropus sinensis*
10	Chestnut bellied nut-hatch	*Sitta castanea*
11	Common myna	*Acridotheres tristis*
12	Common hawk	*Cuculus varins*
13	Cattle egret	*Babulus ibis*
14	Common peafowl	*Pavo cristatus*
15	Common kingfisher	*Alcedo atthis*
16	Grey babbler	*Turdoides malcolmi*
17	Grey wagtail	*Motacilla caspica*
18	Grey jungle fowl	*Gallus sonnerata*
19	Great horned owl	*Bubo bubo*
20	Grey patridge	*Francolinus pondicerianus*
21	Golden backed wood pecker	*Dinopium benghalensis*
22	House sparrow	*Passer domesticus*
23	Indian robin	*Saxicoloides fulicata*
24	Jungle babbler	*Turdoides striatus*
25	Jungle myna	*Acridotheres fusens*
26	Jungle crow	*Corvus macroshynchos*
27	Koel	*Eudynamys scolopacea*
28	Luggar falcon	*Falco biarmicus jugger*
29	Munia	*Lonchura Spp.*

Sl. No.	Common Name.	Scientific Name
30	Pied wagtail	*Motacilla maderaspatensis*
31	Pariah kite	*Milnus migrans*
32	Red vented bulbul	*Pycnonotus eafer*
33	Red turtle dove	*Streptopelia Spp.*
34	Roseringed parakeet	*Psittaculla krameri*
35	Whistling thrush	*Myiophoneus horsfieldii*

Reptiles

Sl. No.	Common Name.	Scientific Name
1	Cobra	*Naja tripudians*
2	Chameleon	*Chameleo calcaratus*
3	Garden lizard	-
4	Krait	*Bangarus ceruleus*
5	Monitor lizard	-
6	Python	-
7	Rat snake	-
8	Tortoise	-
9	Viper	*Echis carinata*

Crustaceans and Insects

Sl. No.	Common Name.	Scientific Name
1	Butterflies and moths	-
2	Beetles	-
3	Crabs	-
4	Scorpions	-

Annexure 6: Quadrat Wise Finding of Flora in Project Area

Sl. No	Local/Common Name	Scientific Name	Family	Local Status	Type
Quadrat -1					
1	Sahadebi	*Vernonia cinerea*	Asteraceae	Common	Herb
2	Seed-under-leaf	*Phyllanthus simplex Retz*	Euphorbiaceae	Common	Herb
3	Turmeric	*Curcuma longa*	Zingiberaceae	Very Common	Herb
4	Tanner's Cassia	*Cassia auriculata*	Leguminosae	Common	Shrub
5	Golden Shower	*Cassia fistula*	Caesalpiniaceae	Uncommon	Tree
6	Vilaiti Keekar	*Prosopis juliflora*	Fabaceae	Very Common	Tree
7	Aal	*Morinda pubescens*	Rubiaceae	Common	Tree
Quadrat -2					
1	Green Milkweed Climber	*Wattakaka volubilis*	Apocynaceae	Common	Creeper
2	Alternanthera	*Alternanthera sessilis*	Amaranthaceae	Very Common	Herb
3	Bluebell	*Ruelia prostrata*	Acanthaceae	Common	Herb
4	Pigeon Pea	*Cajanus cajan*	Papilionaceae	Very Common	Shrub
5	Castor Oil Plant	*Ricinus communis L.*	Euphorbiaceae	Common	Shrub
6	Aal	*Morinda pubescens*	Rubiaceae	Common	Tree
7	Castor Oil Tree	*Pongamia pinnata*	Fabeceae	Common	Tree
8	Butterfly Tree	*Bauhinia purpurea*	Caesalpiniaceae	Uncommon	Tree
Quadrat -3					
1	Turmeric	*Curcuma longa*	Zingiberaceae	Very Common	Herb
2	Sahadebi	*Vernonia cinerea*	Asteraceae	Common	Herb
3	Seed-under-leaf	*Phyllanthus simplex Retz.*	Euphorbiaceae	Common	Herb
4	Soya Bean	*Glycine max*	Fabeceae	Common	Herb
Quadrat -4					
1	Anantamul	*Hemidesmus indicus*	Asclepiadaceae	Uncommon	Creeper
2	Trellis-vine	*Daemia extensa R. Br.*	Asclepiadaceae	Common	Creeper
3	Commelina	*Commelina oblique*	Commelinaceae	Uncommon	Herb
4	Bon Tepari	*Physalis minima L.*	Solanaceae	Common	Herb
5	Achyranthes	*Achyranthes aspera*	Amaranthaceae	Common	Herb
6	khirika	*Euphorbia hirta*	Euphorbiaceae	Common	Herb
7	Tanner's Cassia	*Cassia auriculata*	Leguminosae	Common	Shrub
8	Nishinda	*Vitex negundo*	Verbenaceae	Common	Shrub
9	Pigeon Pea	*Cajanus cajan*	Papilionaceae	Very Common	Shrub
10	Babul	*Acacia nilotica*	Fabaceae	Common	Tree
11	-	*Tamilnadia uliginosa*	Rubiaceae	Uncommon	Tree
12	North Indian Rosewood	*Dalbergia sissoo*	Fabeceae	Common	Tree
13	Vilaiti Keekar	*Prosopis juliflora*	Fabaceae	Very Common	Tree
Quadrat -5					
1	Anantamul	*Hemidesmus indicus*	Asclepiadaceae	Uncommon	Creeper
2	Jungli Angur	*Vitis latifolia*	Vitaceae	Uncommon	Creeper

Sl. No	Local/Common Name	Scientific Name	Family	Local Status	Type
3	Indian Stinging Nettle	*Tragia involucrata*	Euphorbiaceae	Uncommon	Creeper
4	Jasmine	*Jasminum officinale*	Oleaceae	Uncommon	Creeper
5	Indian Caper	*Capparis zeylanica*	Capparaceae	Near Taranpur Ghat	Creeper
6	Wild Kulthi	*Atylosia scarabaeoides*	Fabaceae	Uncommon	Creeper
7	Seed-under-leaf	*Phyllanthus simplex Retz.*	Euphorbiaceae	Common	Herb
8	-	*Tribulus terrestris*	Zygophyllaceae	Common	Herb
9	Aal	*Morinda pubescens*	Rubiaceae	Common	Tree
10	Indian Jujube / Ber	*Ziziphus mauritiana*	Rhamnaceae	Uncommon	Tree
11	Custard Apple	*Annona squamosa*	Annonaceae	Very Common	Tree
12	Indian Cherry	*Cordia dichotoma*	Ehretiaceae	Common	Tree
13	Indian Elm	*Holoptelea integrifolia*	Ulmaceae	Common	Tree
14	Pala Indigo	*Wrightia tinctoria*	Apocynaceae	Common	Tree
Quadrat -6					
1	Jungli Angur	*Vitis latifolia*	Vitaceae	Uncommon	Creeper
2	Green Milkweed Climber	*Wattakaka volubilis*	Apocynaceae	Common	Creeper
3	Panacea Twiner	*Tylophora indica*	Apocynaceae	Common	Creeper
4	Coat Bottons	*Tridax procumbens*	Asteraceae	Very Common	Herb
5	Sahadebi	*Vernonia cinerea*	Asteraceae	Common	Herb
6	Turmeric	*Curcuma longa*	Zingiberaceae	Boy's Gurukul Area	Herb
7	Indian Catmint	*Anisomeles indica*	Lamiaceae	Uncommon	Herb
8	Nishinda	*Vitex negundo*	Verbenaceae	Very Common	Shrub
9	Custard Apple	*Annona squamosa*	Annonaceae	Very Common	Tree
10	Pala Indigo	*Wrightia tinctoria*	Apocynaceae	Common	Tree
11	Indian Elm	*Holoptelea integrifolia*	Ulmaceae	Common	Tree
12	Gliricidia	*Gliricidia sepium*	Fabaceae	Uncommon	Tree
13	Aal	*Morinda pubescens*	Rubiaceae	Common	Tree
Quadrat -7					
1	Coat Bottons	*Tridax procumbens*	Asteraceae	Very Common	Herb
2	Seed-under-leaf	*Phyllanthus simplex Retz.*	Euphorbiaceae	Common	Herb
3	khirika	*Euphorbia hirta*	Euphorbiaceae	Common	Herb
4	Tanner's Cassia	*Cassia auriculata*	Leguminosae	Common	Shrub
5	Nishinda	*Vitex negundo*	Verbenaceae	Common	Shrub
6	Golden Shower	*Acacia auriculiformis*	Fabaceae	Very Common	Tree
7	Babul	*Acacia nilotica*	Fabaceae	Common	Tree
8	Siris	*Albizia lebbeck*	Fabeceae	Common	Tree
9	Neem Tree	*Azadirachta indica*	Meliaceae	Common	Tree
10	Butterfly Tree	*Bauhinia purpurea*	Caesalpiniaceae	Uncommon	Tree
11	Golden Shower	*Cassia fistula*	Caesalpiniaceae	Uncommon	Tree
12	East Indian Ebony	*Diospyros melanoxylon*	Ehretiaceae	Very Common	Tree
13	Fig Tree	*Ficus hispida*	Monaceae	Common	Tree

Sl. No	Local/Common Name	Scientific Name	Family	Local Status	Type
14	Vilaiti Keekar	*Prosopis juliflora*	Fabaceae	Very Common	Tree
Quadrat -8					
1	Graceful Pouzalz's Bush	*Pouzalzia indica*	Urticaceae	Common	Herb
2	Indian Catmint	*Anisomeles indica*	Lamiaceae	Uncommon	Herb
3	Seed-under-leaf	*Phyllanthus urinaria Linn.*	Euphorbiaceae	Common	Herb
4	Dhutra	*Datura fastuosa*	Solanaceae	Uncommon	Shrub
5	Bamanhati	*Clerodendrum indicum*	Verbenaceae	Uncommon	Shrub
6	Glorybower	*Clerodendrum inerme*	Verbenaceae	Uncommon	Shrub
7	Kassod Tree	*Cassia siamea*	Caesalpiniaceae	Common	Tree
8	East indian Stainwood	*Chloroxylon swietenia*	Rutaceae	Common	Tree
9	Indian Cherry	*Cordia dichotoma*	Ehretiaceae	Common	Tree
10	North Indian Rosewood	*Dalbergia sissoo*	Fabeceae	Common	Tree
11	Banyan Tree	*Ficus benghalensis*	Moraceae	Uncommon	Tree
12	Fig Tree	*Ficus hispida*	Monaceae	Common	Tree
13	Gliricidia	*Gliricidia sepium*	Fabaceae	Uncommon	Tree
14	Phalsha	*Grewia subinaequalis*	Malvaceae	Uncommon	Tree
Quadrat -9					
1	Common Marsh Buckwheat	*Polygonum glabrum*	Polygalaceae	Common	Aquatic Plant
2	Commelina	*Commelina oblique*	Commelinaceae	Uncommon	Grass
3	Commelina	*Commelina benghalensis*	Commelinaceae	Common	Grass
4	Alternanthera	*Alternanthera paronychioides*	Amaranthaceae	Very Common	Herb
5	Achyranthes	*Achyranthes aspera*	Amaranthaceae	Common	Herb
6	Bon Tulshi	*Croton bonpladianum*	Euphorbiaceae	Common	Herb
7	khirika	*Euphorbia hirta*	Euphorbiaceae	Common	Herb
8	Common Purslane	*Portulaca oleracea L.*	Portulacaceae	Common	Herb
9	Seed-under-leaf	*Phyllanthus simplex Retz.*	Euphorbiaceae	Common	Herb
10	Madras Carpet	*Grangea maderaspatana*	Asteraceae	Uncommon	Herb
11	Peet Berela	*Sida acuta*	Malvaceae	Uncommon	Herb
12	Bluebell	*Ruelia prostrata*	Acanthaceae	Common	Herb
13	Sahadebi	*Vernonia cinerea*	Asteraceae	Common	Herb
14	Sonchus	*Sonchus arvensis L.*	Asteraceae	Common	Herb
15	Synedrella	*Synedrella Nudiflora*	Asteraceae	Uncommon	Herb
16	-	*Tribulus terrestris*	Zygophyllaceae	Common	Herb
17	Kasunda / Baner	*Cassia occidentalis*	Fabaceae	Uncommon	Shrub
Quadrat -10					
1	Common Marsh Buckwheat	*Polygonum glabrum*	Polygalaceae	Common	Aquatic Plant
2	Commelina	*Commelina oblique*	Commelinaceae	Uncommon	Grass
3	Commelina	*Commelina benghalensis*	Commelinaceae	Common	Grass

Sl. No	Local/Common Name	Scientific Name	Family	Local Status	Type
4	Bon Tulshi	*Croton bonpladianum*	Euphorbiaceae	Common	Herb
5	khirika	*Euphorbia hirta*	Euphorbiaceae	Common	Herb
6	Common Purslane	*Portulaca oleracea L.*	Portulacaceae	Common	Herb
7	Seed-under-leaf	*Phyllanthus simplex Retz.*	Euphorbiaceae	Common	Herb
8	Madras Carpet	*Grangea maderaspatana*	Asteraceae	Uncommon	Herb
9	Peet Berela	*Sida acuta*	Malvaceae	Uncommon	Herb
10	Bluebell	*Ruelia prostrata*	Acanthaceae	Common	Herb
11	Sahadebi	*Vernonia cinerea*	Asteraceae	Common	Herb
12	Sonchus	*Sonchus arvensis L.*	Asteraceae	Common	Herb
13	Synedrella	*Synedrella Nudiflora*	Asteraceae	Uncommon	Herb
14	-	*Tribulus terrestris*	Zygophyllaceae	Common	Herb
15	Kasunda / Baner	*Cassia occidentalis*	Fabaceae	Uncommon	Shrub
Quadrat -11					
1	Peet Berela	*Sida acuta*	Malvaceae	Uncommon	Herb
2	Bluebell	*Ruelia prostrata*	Acanthaceae	Common	Herb
3	Sahadebi	*Vernonia cinerea*	Asteraceae	Common	Herb
4	Sonchus	*Sonchus arvensis L.*	Asteraceae	Common	Herb
5	Synedrella	*Synedrella Nudiflora*	Asteraceae	Uncommon	Herb
6	-	*Tribulus terrestris*	Zygophyllaceae	Common	Herb
7	Coat Bottons	*Tridax procumbens*	Asteraceae	Very Common	Herb
8	Tanner's Cassia	*Cassia auriculata*	Leguminosae	Common	Shrub
9	-	*Pterolobium hexapetalum*	Leguminosae	Common	Shrub
10	-	*Dodonea vericosa*	Sapindaceae	Common	Shrub
11	Golden Apple	*Aegle marmelos*	Rutaceae	Common	Tree
12	Siris	*Albizia lebbeck*	Fabeceae	Common	Tree
13	Neem Tree	*Azadirachta indica*	Meliaceae	Common	Tree
14	Butterfly Tree	*Bauhinia purpurea*	Caesalpiniaceae	Uncommon	Tree
15	Kassod Tree	*Cassia siamea*	Caesalpiniaceae	Common	Tree
16	East indian Stainwood	*Chloroxylon swietenia*	Rutaceae	Common	Tree
17	Mahua	*Madhuca longifolia*	Sapotaceae	Common	Tree
18	Aal	*Morinda pubescens*	Rubiaceae	Common	Tree
19	Castor Oil Tree	*Pongamia pinnata*	Fabeceae	Common	Tree
Quadrat -12					
1	Gray Nicker	*Caesalpinia bonduc*	Caesalpiniaceae	Common	Shrub
2	Jangli-arandi	*Jatropha curcus L.*	Euphorbiaceae	Common	Shrub
3	Roast Potato Plant	*Phyllanthus reticulatus Poir.*	Euphorbiaceae	Common	Shrub
4	Rattlepods	*Clotalaria pallida*	Fabaceae	Uncommon	Shrub
5	Kasunda / Baner	*Cassia occidentalis*	Fabaceae	Uncommon	Shrub
6	Indian Mallow	*Abutilon indicum*	Malvaceae	Uncommon	Shrub
7	-	*Dodonea vericosa*	Sapindaceae	Common	Shrub
8	Glorybower	*Clerodendrum inerme*	Verbenaceae	Uncommon	Shrub

Sl. No	Local/Common Name	Scientific Name	Family	Local Status	Type
9	Nishinda	*Vitex negundo*	Verbenaceae	Very Common	Shrub
10	Arjun	*Terminalia arjuna*	Combretaceae	Very Common	Tree
11	Bahera	*Terminalia bellirica*	Combretaceae	Common	Tree
12	Tamarind	*Tamarindus indica*	Caesalpiniaceae	Common	Tree
13	Rusa	*Pavetta crassicaulis*	Rubiaceae	Common	Tree
14	Vilaiti Keekar	*Prosopis juliflora*	Fabaceae	Very Common	Tree
15	Indian Jujube / Ber	*Ziziphus mauritiana*	Rhamnaceae	Uncommon	Tree

Annexure 7: Transect and Chainage Wise Finding of Fauna in Project Area

Transact- Wise Findings: Birds

S. No.	Name of the Species	Transact wise Numbers found																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
1	Painted Francolin	3	1	2	0	1	1	0	0	4	0	1	0	1	0	6	1	0	5	0	0	3	2
2	Grey Francolin	0	0	0	2	1	1	2	1	1	1	3	1	1	1	1	2	1	1	2	1	1	2
3	Indian Peafowl	1	5	1	1	0	4	0	1	3	0	1	0	1	7	1	1	1	3	0	8	1	1
4	Eurasian Spoonbill	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
5	Indian Pond Heron	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
6	Cattle Egret	0	0	0	0	0	0	0	0	0	1	1	1	1	1	1	0	0	0	1	1	1	1
7	Black-shouldered Kite	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
8	Black Kite	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
9	Oriental Honey-Buzzard	1	0	0	0	1	0	1	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0
10	Short-toed Snake Eagle	0	0	1	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	1
11	Shikra	0	0	0	0	1	1	0	1	0	0	0	0	0	0	0	1	0	1	0	1	0	0
12	White-eyed Buzzard	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0
13	White-breasted Waterhen	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	1	1
14	Barred Bottonquil	0	0	0	0	0	0	0	4	0	6	0	0	0	0	3	7	1	6	4	0	0	0
15	Yellow-wattled Lapwing	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
16	Red-wattled Lapwing	2	1	3	1	2	2	0	0	0	0	1	0	4	0	0	2	5	1	2	1	1	2
17	Wood Sandpiper	1	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	0
18	Indian Courser	6	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
19	Common Pigeon	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0
20	Eurasian Collared Dove	6	8	4	7	5	6	2	8	5	4	2	7	8	6	9	6	5	4	2	7	5	3
21	Spotted Dove	3	4	2	8	5	4	1	6	5	8	6	4	7	6	8	5	6	2	5	4	3	5
22	Laughing Dove	2	3	2	3	4	3	6	5	2	6	6	3	2	3	4	5	3	6	1	1	1	1
23	Yellow-footed green Pigeon	0	0	0	0	0	0	0	2	1	4	3	3	2	0	0	0	0	0	0	0	0	0
24	Rose-ringed Parakeet	6	4	6	7	9	1	5	10	6	5	2	3	4	5	6	2	2	4	5	3	2	3
25	Plum-headed Parakeet	4	1	1	3	2	2	3	4	2	1	4	3	2	2	1	2	2	1	4	2	7	2
26	Jacobin Cuckoo	0	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	1	0	0	0	0
27	Common Hawk Cuckoo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

S. No.	Name of the Species	Transact wise Numbers found																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
28	Asian Koel	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
29	Blue-faced Malkoha	0	0	0	0	0	0	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0
30	Sirkeer Malkoha	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
31	Greater Coucal	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
32	Spotted Owlet	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	0
33	Asian Palm Swift	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
34	Indian Roller	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
35	White-throated Kingfisher	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1
36	Common Kingfisher	1	1	1	0	0	0	0	0	0	0	1	1	1	1	1	1	1	1	1	1	1	1
37	Green Bee-eater	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
38	Indian Grey Hornbill	0	0	2	0	0	0	0	2	0	0	0	0	0	0	0	0	0	0	2	0	0	1
39	Coppersmith Barbet	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0
40	Common Iora	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
41	Marshall's Iora	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	1	1	1	1	1
42	White-bellied Minivet	0	0	0	0	0	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0
43	Small Minivet	0	0	1	0	1	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
44	Bay-backed Shrike	0	0	1	1	0	0	0	0	0	1	0	0	0	0	0	0	0	1	1	1	1	1
45	Black Drongo	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
46	Black-hooded Oriole	0	1	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	1	0	0	0
47	Rufous Treepie	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
48	Eastern Jungle Crow	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
49	House Crow	0	0	0	0	1	0	0	0	0	0	0	0	1	0	0	0	0	1	1	1	1	1
50	Wire-tailed Swallow	0	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	1	0	0	1	1
51	Red-rumped Swallow	5	1	4	1	1	2	1	2	2	1	1	1	4	2	1	1	1	6	5	5	4	3
52	Red-vented Bulbul	6	8	6	9	6	5	9	6	10	10	6	6	5	4	3	7	8	10	12	10	14	12
53	White-browed Bulbul	0	0	0	0	0	0	0	0	4	2	2	3	0	0	0	0	0	0	0	0	0	0
54	Grey-breasted Prinia	5	6	5	6	5	7	8	5	6	6	8	10	9	14	5	6	7	8	3	8	7	6
55	Jungle Prinia	1	0	0	0	0	0	1	0	0	1	1	1	0	0	1	0	0	0	0	0	0	0
56	Plain Prinia	1	1	0	1	1	0	0	1	0	0	0	0	1	1	1	1	0	1	0	1	1	1
57	Ashy Prinia	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1

S. No.	Name of the Species	Transact wise Numbers found																					
		1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
58	Common Tailorbird	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
59	Tawny-bellied Babbler	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	1	0	0	0
60	Large Grey Babbler	10	8	4	1	1	7	1	1	1	9	1	1	1	1	10	1	1	11	1	14	7	6
61	Yellow-billed Babbler	0	4	0	0	3	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0
62	Yellow-eyed Babbler	0	0	0	0	0	0	0	0	4	3	0	0	0	0	0	0	0	0	0	0	0	0
63	Oriental White-eye	3	1	2	2	1	4	1	1	6	1	1	3	1	1	1	3	1	1	1	4	2	3
64	Common Myna	9	1	1	7	6	1	5	1	3	4	1	1	2	2	6	1	4	6	7	1	3	4
65	Brahminy Starling	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
66	Chestnut-tailed Starling	0	0	0	0	0	0	0	0	1	1	0	0	0	0	0	0	0	0	0	0	1	1
67	Orange-headed Thrush	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	0	1	1	0
68	Oriental Magpie Robin	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	0	0	0	0	1	0	0
69	Indian Robin	6	1	8	5	4	6	3	3	4	7	2	5	3	5	5	4	3	7	6	4	1	2
70	Pied Bushchat	0	0	0	0	0	0	0	0	0	1	0	0	0	0	0	0	0	1	0	1	0	1
71	Tickell's Blue Flycatcher	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
72	Pale-billed Flowerpecker	2	0	1	0	1	3	0	1	1	2	0	0	0	0	1	2	0	2	1	3	0	1
73	Purple-rumped Sunbird	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
74	Purple Sunbird	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1	1
75	House Sparrow	1	1	1	0	0	0	0	0	0	0	0	0	1	0	0	1	0	0	0	1	1	1
76	Baya Weaver	6	5	6	7	8	5	9	11	1	1	4	5	7	1	6	1	1	34	45	12	5	4
77	Indian Silverbill	2	1	4	3	2	1	1	2	2	4	6	1	1	3	2	1	4	1	3	1	1	4
78	Scaly-breasted Munia	6	10	2	5	6	0	7	8	5	1	1	0	0	0	0	0	0	3	2	4	1	1

Chainage Wise Findings: Mammals

S. No.	Name of the Species	Chainage Wise Numbers Found									
		86-87	87-88	88-89	89-90	90-91	91-92	92-93	96-97	97-98	98-99	99-100
1	Golden Jackal	0	0	0	4	0	0	4	4	0	0	0
2	Common Langur	0	0	0	0	0	8	0	12	10	6	0
3	Grey Mongoose	0	0	0	2	0	0	0	1	0	1	0
4	Jungle Cat	2	3	0	4	3	2	1	3	2	2	3
5	Common Palm Civet	0	0	1	0	0	0	0	0	0	0	0

S. No.	Name of the Species	Chainage Wise Numbers Found										
		86-87	87-88	88-89	89-90	90-91	91-92	92-93	96-97	97-98	98-99	99-100
6	Small Indian Civet	0	0	0	0	1	0	0	0	0	0	0
7	Flying Fox	0	0	0	0	4	0	0	0	0	8	0
8	Indian Hare	4	3	2	2	3	5	2	3	2	2	2
9	Barking Deer	0	0	0	0	0	0	0	0	0	0	0
10	Spotted Deer	0	0	0	0	0	0	0	0	0	0	0
11	Blackbuck	0	0	0	0	0	0	0	0	0	0	0
12	Indian Grey Wolf	0	1	0	2	2	0	0	0	0	0	0
13	Wild Boar	0	0	4	0	0	0	0	0	0	1	0
14	Striped Hyena	0	0	0	0	0	0	1	0	0	0	0
15	Wild Dog	0	0	0	0	0	2	0	0	0	0	0
16	Indian Fox	0	0	0	0	0	0	3	0	0	0	0

Annexure 8: Road Kill Record

Species: Jungle Cat (*Felis chaus)*
Kill Recorded: on 10.7.15 @ 05:29 AM; Ch: 97.500

Species: Chameleon (*Chamaeleo zeylanicus*)
Kill Recorded: on 26.7.15 @ 10:03 AM; Ch: 92.300

Species: Garden Lizard (*Calotes versicolor)*
Kill Recorded: on 19.7.15 @ 11:41 AM; Ch: 89.700

Species: Crimson Rose (*Pachliopta hector*)
Kill Recorded: on 7.7.15 @ 9:00AM; Ch: 91.800

Species: Russell's Viper (*Vipera russeli*)
Kill Recorded: on 4.7.15 @ 8:45PM; Ch: 91.200

Species: Large Grey Babbler (*Turdoides malcolmi*)
Kill Recorded: on 26.7.15 @ 10:10 AM; Ch: 92.800

Species: Common Vine Snake (*Ahaetulla nasuta*)
Kill Recorded: on24.7.15 @ 2:50 PM; Ch: 90.800

Species: Common Trinket (*Coelognathus helena*)
Kill Recorded: on25.7.15 @ 7:46 AM; Ch: 90.600

Annexure 9: Format for Reporting of Road Kill/ Sighting of Uncommon Species

Date				**Time**	
Chainage (Km)-		**Village-**		**Distance from Road (m)**	
Local/ Common Name of Species		**Scientific Name (if known)**		**Sighting / Kill**	
Photographs (for Road Kill)					
Top View		**View from LHS**		**View from RHS**	
Photographs (for Sighting)					
Any Photograph Captured					
Signature (Contractor)		**Signature (Concessionaire)**		**Signature (IE)**	

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	Chinappa Farmer	Age	63
Address	Kollur	Occupation	Farming
Date	28/06/15	Time	

Attendees Response & Outcome of the Consultation

Q) What are you farming?
He takes care of the Banana orchard.

Q) How is the cropping?
Because of poor rainfall the in general cropping is very bad.

Q) Since when the rainfall is not optimum?
For the last 7-8 years.

Q) Is the rainfall affecting any pressure or change in the local animal or flora.
The less rainfall is due to deforestation and for that all the animals are also getting disturbed.

Q) What are the common animal you get to see?
Wild Boar, Peacock, Wolf, Russell's Vipers, Cobras Krait, Grey Francolin etc.

Q) Have you seen any road kill?
Wild Boar, Snakes, Lizards, birds

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	Gopal Rao	Age	67
Address	Koller Village	Occupation	Village head Koller
Date	29/08/15	Time	

Attendees Response & Outcome of the Consultation

Q ⇒ What are the main animals of this area?

⇒ Wild boar / Indian wolf / Striped Hyena / Jungle Cat / Hare / Black Buck / Barking Deer / Indian Pangolin Porcupine / Peacock / Langur / Russell Vipers / Python etc...

Q Over the time what change you have seen in the animal world.

⇒ Long back 30-35 yrs ago Tiger was there / Leopard was there in good number now not seen regularly.

⇒ When you saw leopard last time?

⇒ 12 years back

⇒ What are animals come to your fields?
Wild Boar & langur ⇒ Main disturbance
Peacock / earthworm / Monitor Lizard good for farmers

⇒ Snakes do good by killing rats.

⇒ Have you seen any road kill in this area?
Mainly snakes, Wild Boar, Jungle Cat / Wolf are not the who gets killed easily.

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	Vivek Krishnamurthy	Age	
Address	Bidar.	Occupation	
Date 02/07/15	Local expert 8970780384.	Time	

Attendees Response & Outcome of the Consultation

Q What are the Birds and specially Migratory Birds you can get in the proximal water bodies of Changler and Tunkunda.

Spoonbill, Black Headed and Red naped Ibis. Spot billed Duck, Coot, Gadwall, Garganey, Falcated Duck, Tufted Duck, Pintail (N), Shoveller etc,

Q What are the ground nesting birds we can get here. Lapwings, Courser, Larks, etc.

Q. What are the other fauna available here?

Black Buck, Spotted Deer, Barking Deer, Indian wolf, Striped Hyena, Black Naped Hare, Jungle Cat, Jackal, Fox, Python, Spectacled Cobra, Bengal Monitor. etc. Russell Viper

Q. Which of this or any of this have you seen Crossing the road or getting killed?

Black Buck, Wild Boar, Viper, Other Snakes, lizards, porcupine, peacock, francolin.

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	SHRAWANKUMAR TOMPE	Age	35
Address	Govt. P.U. college for Boys Thermaidan Humnabad Bidar. ☎ 9590090551	Occupation	Lecturer
Date	18-07-2015	Time	4.00 pm

Attendees Response & Outcome of the Consultation

What you think is the speciality of Chincholi area wild life wise?

⇒ The Scrub forest/ Wild dog/ Indian Wolf/ Chandrampalli Dam. Indian Pangolin, Porcupine.

Bidar - Chincholi Road what are the animal movement you have seen during your visit.?

⇒ Wild Boar, Black Buck, Hare, Jungle Cat, Russel Viper, Vine Snake, Cobra.

⇒ Have you seen any road kill on this road from Changler to Kolur Section? if Then where about.
Yes! Near the tanda area after Changler There is wall type on bothside after that the road slopes in that area.

⇒ What all you have seen as road kill?
, snakes and birds mainly twice only mammals one jungle Cat and Wild boar.

⇒ What about the weather pattern in the area ?
The rainfall is going down every year instead of three months of monsoon rainfall is happening sporadically for three-5 days and stops again.

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	Kedarnath	Age	54
Address	Nagaidhlai	Occupation	Farmer
Date 07/07/15		Time	

Attendees Response & Outcome of the Consultation

What do you farm?
Generally earlier used to do rice, due to lack of Rainfall now a day does, nut, haldi, etc.
Other than rainfall what are the other threats?
Wild Boar and langur destroys crop.
What other animals are there? Is there any animal which kills wild Boar.
Wolf, Hyena, Jungle Cat, Hare, peacock, pangolin earlier when wild dogs were there in good number then the problem of wild boar was less.. Now also wild Dogs comes but in a very low frequency.
leopard was also there but long back.
Have you seen any of this animal getting killed on the road.
Wild Boar, Peacock, Snakes, lizards etc.

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	Narayan	Age	
Address	Changler.	Occupation	Farming
Date 8/07/15		Time	

Attendees Response & Outcome of the Consultation

Language was a lil problem.

* What are the animals you get to see here?
  Hare, Jungle Cat, Wolf, Wild Boar, Langur
* What are the Snakes you find here?
  Cobra, Python, Vipers.
* What are the time you see them more?
  Generally in the evening and late night.
* Have you seen any of this getting killed on the road?
  Snakes & Wild Boar.
* How is the rainfall condition?
  Very poor.

CONSULTATION WITH LOCAL POPULACE

Contacted Persons' Name	Prabhakar	Age	28
Address	Kollur	Occupation	Road side stall & Farming.
Date 11/07/15		Time	3:30 PM

Attendees Response & Outcome of the Consultation

Q. Since when you have started this stall?
for the last 6-7 years the rainfall is very poor for the crop yield is very bad, so he started the stall. Still owns a small piece of farm land.

Q. What are the animals you have seen here?
Mostly Hare, Jungle Cat, Wolf, Python, Vipers, Cobra, Black Buck, Barking Deer, Hyena. Wild Boar

Q Do any of these animal cause to harm farming?
Wild Boar & Langur Sometimes deers.

Q On this road have you seen any animal getting run over
Snakes, Wild Boar, few birds

Q When does it happen the most morning/Day/Night?
Mostly in the night as the Boar, Deer goes in the cultivated fields in the night. and Snakes in the ~~xxx~~ night mostly some time during the day.

Structured Questionnaire followed for Consultation with Forest/Wildlife Officials

NAME **DESIGNATION** **ADDRESS** **DATE:** **TIME:**		
SL.No.	**Issues Discussed**	**Outcome**
1	Forest Map showing the alignment & Other relevant Maps	
2	Forest Land Details Crossing the Road or Adjoining:	
3	Flora & Fauna Check List : Over all	
4	Flora & Fauna Check List : Area Specific (if Available)	
5	Animal Crossing/ Corridor crossing the project area:	
6	Movement of Wildlife	
7	Record of Man/Animal Conflict	
8	Record of kill (wildlife) due to road accident	
9	Whether there is any habitat area of migratory species close to Project Area	
10	Is there any species which is not seen in recent days (Report on Local Extinction):	
11	Presence of Endemic / Endangered Species	
12	Potential impact due to the project	
13	What do you suggest to minimize the impact?	
14	Any suggestion shared	

Structured Questionnaire followed for Consultation with Community

WILDLIFE SURVEY (Community Consultation Format)
Community's View

Km: From- To- Community / Village Name-

Q.1- Rainfall trend of the area

Q.2- Change in cropping pattern

Q.3- Change in tree Species and tree Cover of the area

Q.4- Animals/Insects affecting their crops and time of the year

Q.5- Are the crop destroying animals getting naturally predated?

Q.6- If yes, which are those preys and Predators?

Q.7- Location of Crop damage occurrence in respect to road

Q.8- Species Observed in field or Vicinity

Reptiles & Snakes

Amphibians

Birds

Mammals

Q.9- Road kills observed by local populace

Community Consultation Attendance Sheets

Community Consultation Attendance Sheet

Project	WILDLIFE SURVEY & ASSESSMENT : BIDAR - MANNAEKHALLI - CHINCHOLI (SH15)						
District	BIDAR	Taluka	HUMNABAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/2015	Time	6:00pm	Total No. of Participants	Male	Female	Total
					54	–	54

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1)	jagonauts	26	male	ST	[illegible]		[illegible]
2)	MD. A Parjo	26	male		[illegible]		[illegible]
3)	[illegible]	29	male				[illegible]
4)	[illegible]	26	male	SC			[illegible]
5)	Rajkumar	29	male	SC	Agriculture		[illegible]
6)	Shrimanth	20	male	SC	Studing		[illegible]
7)	Goutham	30	male	SC	Driver		[illegible]
8)	Prakash	24	male	SC	JCB operator		[illegible]

Community Consultation Attendance Sheet

Project							
District	BIDAR	Taluka	HUMNABAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/2015	Time	6:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
9)	Manju Varma	23	male	SC	Studing		
10)	Sachin	20	male	SC	Studing		
11)	kumar thangappa	20	male	SC	Studing		
12)	Suryekanth	28	male	SC			
13)	Sunil	21	male	SC	Agriculture		
14)	Rupendar	32	male	SC	KSRTC		
15)	laxman	35	male	SC	Tailor		
16)	Shivasharanappa	30	male	SC	SKS		
17)	Shankar	45	male	SC	Farmer		

Community Consultation Attendance Sheet

Project							
District	BIDAR	Taluka	HUMNABAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/2015	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
18)	Ravi Prasad	25	Male	SC	mistri		
19)	ASHOK	31	male	SC	G.P member	8548045620	ASHOK
20)	Karunasheel	28	male	SC	Machanic	9742864299	Karuna
21)	Arjun	42	male	SC	G.P number		
22)	M.d AFZal	22	male	OBC	Studing		
23)	M.d Rahman	22	male	OBC	Agriculture		
24)	Ravi	27	male	General	Farmer		
25)	m.d mustan	25	male	OBC	Agriculture	9743652724	
26)	M.d. Zakir	28	male	OBC	Agriculture	9591931012	

Community Consultation Attendance Sheet

Project							
District	BIDAR	Taluka	HUMNABAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/2015	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
27)	Elappa	65	male	SC	water man		
28)	Dasharth	49	male	gensal	Tailor		
29)	Elappa pujar	60	male	ST	Agriculture		
30)	laxman	65	male	ST	Agriculture		
31)	Shek Ahmad Sab	55	male	OBC	Agriculture		
32)	Sagar Gupta	21	male	SC	Studing		
33)	Satish Sagar	26	male	SC	Farmer		
34)	Ashok Gupta	44	male	SC	Social worker		
35)	laxman	20	male	SC	Studing		

Community Consultation Attendance Sheet

Project							
District	BIDAR	Taluka	HUMNABAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/2015	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
36)	Jaganath	30	male	ST	Driver		
37)	Azu	20	male	OBC	Studing		
38)	Jabel	20	male	OBC	Sudent		
39)	Rajeshwar	28	Mel	ST	BS		
40	Sangeshwar	30	M	ST	Cooly		
41	Subhash	28	M	30	ST		
42	Sachin	25		25	ST		
43	Nagappa	26	Mel	25	ST		
44	Malappa	25	M	25	OBC		

Community Consultation Attendance Sheet

Project							
District	BIDAR	Taluka	HOMNADAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/15	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
45	Sunita Kumar	28	Mey	SC.	Gurley		[signature]
46	Nagashetty	32	Mey	Gouli		9008264088	[signature]
47	Devrappa pasad	35	male	SC	ACC agent		[signature]
48	M.d Ali	22	male	OBC	Studing		[signature]
49	Jagan	48	male	ST	G.P member		[signature]
50	Baburao	37	male	Gouli	Farmer		[signature]
51	Khajamiya	35	male	OBC	Charmen		[signature]
52	Ravi	30	male	SC	G.P member		[signature]
53	Rudrmuni Swami	31	male	general	Driver		[signature]

Community Consultation Attendance Sheet

Project							
District	BIDAR	Taluka	HUMNABAD	Block / Ward No		GP / MC	CHANGLER
Settlement	CHANGLER	PS / Thana		Chainage / Km		Venue	NEHRU CIRCLE
Date	19/07/15	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
54	Iqbal patel	33	male	OBC	Businessmen		

Community Consultation Attendance Sheet

Project	WILDLIFE SURVEY & ASSESSMENT : BIDAR – MANAEKHALLI – CHINCHOLI (SH 15)						
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGAIDHILAI
Settlement	NAGADHILAI & KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN MANDIR
Date	21/07/15	Time	6.00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
1	Narasappa	40	Gnal	ST	Agri		
2	Ravi Pedi	41	gnal	Farmer	–	9901719757	
3	Tippareddy Bhandu	60	male	general	11	9591162311	
4	Subhash kattolli	45	male	general	11	9980776420	
5	Tippanamelintoji	62	male	ST	11		
6	Veerapa Gosell	45	male	ST	11	9535550059	
7	Bakkappa madag	60	male	SC	11	8861999307	
8	Satish Sindol	40	male	general	11	9686900772	
9	Attar patel	65	male	General	11	9845197255	

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGAIDHILAI
Settlement	NAGADHILAI & KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN MANDIR
Date	21/07/15	Time	6:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
10	Prabhakar Reddy	38	male.	General.	Agri	9900719474	P.M.R
11	Prakash Reddy.	35	male	General.	"	7676747475	Reddy
12	Sanga Reddy anant Reddy	36	male	General.	"	9008040280	[illegible]
13	Rajnikanth	22	male	General	"	8792949029	[illegible]
14	mallikarjun	30	male	General	"	9632675182	[illegible]
15	Akash Patil	21	male	General	"	9743361071	Patil
16	Sanjukumar Patil	32	male	General	"	8088521134	[illegible]
17	Santosh Reddy	33	male	General.	"	9741680675	Reddy
18	Basavaraj Patil	55	male	General	"	9972470545	[illegible]

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGADHRAI
Settlement	NAGADHILAI & KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN MANDIR
Date		Time	6:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
19	Shaikhan Pathan	36	male	General.	Agri	9980495268	
20	Prakash Patil	42	male	General.	"	9731827534	9731827534
21	Jagnath Reddy	40	male	General	"	9972048279	
22	Pavankumar Reddy	23	male	General.	"	9535915535	
23	Manjunath Reddy	25	male	General.	"	8197773957	
24	Shirish Reddy	22	male	General.	"		
25	Dhanraj Patil	21	male	General.	"	9591128420	
26	Srinivas Reddy	48	male	General.	"	9740480450	
27	Rayshekhar Sajjan	50	male	General	"	7259269883	

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGADHILAI
Settlement	NAGADHILAI KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN MANDIR
Date	21/07/15	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
28	GopalReddy	38	Male	General	Agri	no.	
29	Rajshekhar	51	male	General	"	9901950763	
30	Rajshekhar patil	40	male	General	"	9900489434	
31	Mallu Reddy Charge	21	male	General	"	9742876463	
32	Jagannath B. Nelli	30	male	General	"	— no —	
33	Sashikanth Nelli	19	male	General	"	— no —	
34	Veerashetty.	26	male	General	"	— no —	
35	Basavaraj	64	M	OBC	"	—	
36	Shivaraj	55	M	OBC	"	—	

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGADHILAI
Settlement	NAGADHILAI & KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN MANDIR
Date	21/07/15	Time	06.00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
37	Vijay. B Patil	40	male	II B	Agriculture		
38	Gundappa	60	M	OBC	Agriculture		
39	Basanappa Patil	75	M	OBC	Agri.		
40	Manshetti Singole	65	M	OBC	11		
41	Wanjra	60	M	OBC	Agri		
42	Mallikarjun	32	M	OBC	Agri		
43	Basawaraj	40	M	OBC	Agri		
44	Sidhram Appa	25	M	OBC	Business		
45	Sankarappa Shetti	65	M	OBC	Agri		

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGADHILAI
Settlement	NAGADHILAI & KALLUR	PS / Thana		Chainage / Km		Venue	HANUMAN MANDIR
Date	21/07/15	Time	06:00pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
46	Shankar Kolur	50	M	OBC	Agriculture	-	
47	Sajad bee	50	F	OBC	Labour		
48	Ismal saab	45	M	OBC	"		
49	Gopal Bhimalgi	30	M	SC	Teacher		
50	Gopal Reddy	35	M	OBC	Teacher		
51	Muthujali	40	M	OBC	Agricultur		
52	Sidappa Balkalli	55	M	OBC	Agriculture		Siddappa
53	Shivaraj	30	M	OBC	Education		
54	Manik Reedy	75	M	OBC	Agriculture		

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGADHILAI
Settlement	NAGADHILAI & KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN TEMPLE
Date	21/07/15	Time	06:00 pm	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
55	Shaikfareed	59	M	Muslim	FDA -	FDA-GHS Chimmanchod	
56	Hannanthappa Kambar	60	M	Kambarge	Mechanic	9535895253	
57	Imamshaik	60	M	Muslim	Agriculture		
58	Md Qudabodin	35	M	Muslim	Agriculture		
59	Esubmiyan	40	M	Muslim	labour		
60	Basavraj Gobur	40	M	Lingayat	Agriculture		
61	Srinivas Baktampalli	40	M	OBC	Agriculture		
62	Venkatreddy Kolla	50	M	OBC	Agriculture		
63	Bheem Reddy	50	M	OBC	Agriculture		

Community Consultation Attendance Sheet

Project							
District	GULBARGA	Taluka	CHINCHOLI	Block / Ward No		GP / MC	NAGADHILAI
Settlement	NAGADHILAI & KOLLUR	PS / Thana		Chainage / Km		Venue	HANUMAN TEMPLE
Date	21/07/15	Time	06:00 pm.	Total No. of Participants	Male	Female	Total

S. No.	Name	Age	Gender	Caste	Occupation	Contact Details	Signature
64	Saibanna	40	M	OBC			
65	Hasan saab	50	M	OBC			
66	Sirajuddin	40	M	OBC			
67	Shashikanth	30	M	OBC	Labour		
68	Papawi Reddy	45	M	OBC	Agriculture		
69	Devendrappa	45	M	OBC	Agriculture		
70	Malli Karjun	45	M	OBC	Agriculture		
71	Syed miyan	60	M	OBC	Agriculture		
72	Shankreppa	65	M	OBC	Labour		

Annexure 11: Picture Plates

Acacia nilotica Chainage: 99-100

Cassia fistula Chainage: 90-91

Dichrostachys cinerea Chainage: 96-97

Calotropis gigantea Chainage: 91-92

Cassia auriculata Chainage: 90-91

Jatropha Curcas Chainage: 88-89

Chloroxylon swietenia Chainage: 89-90

Tylophora indica Chainage: 92-93

Mottled Wood Owl Chainage: 99-100

Short-toed Snake Eagle Chainage: 90-91

Blue-faced Malkoha Chainage: 96-97

White-eyed Buzzard Chainage: 91-92

Eurasian Spoonbill Chainage: 90-91

Indian Peafowl Chainage: 88-89

Grey Francolin Chainage: 89-90

Indian Courser Chainage: 92-93

Indian Grey Wolf Chainage: 90-91

Jungle Cat Chainage: 98-99

Golden Jackal Chainage: 96-97

Black-naped Hare Chainage: 87-88

Indian Gerbil Chainage: 89-90

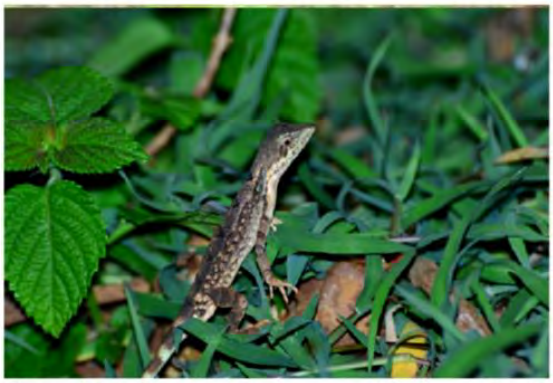
Grey Langur Chainage: 96-97

Grey Mongoose Chainage: 90-91

Striped Hyena Pug Mark Chainage: 91-92

Bengal Monitor Lizard Chainage: 99-100

Chameleon Chainage: 92-93

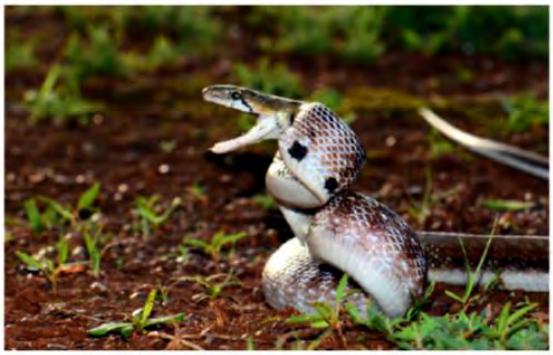


Forest Lizard Chainage: 86-87

Fan-throated Lizard Chainage:96-97

Russell's Viper Chainage: 96-97

Brook's House Gecko Chainage: 88-89



Common Trinket Snake Chainage: 88-89

Spectacled Cobra Chainage: 90-91

Annexure 12: Letter of DCF, Territorial Division, Kalaburagi

GOVERNMENT OF KARANATAKA
(Forest Department)

No. A3/BUD/KRDCL /CR- /2015-16

Office of the
Deputy Conservator Forests,
Territorial Division, Kalaburagi
Dated:21.10.2015

To,
The Chief Conservator of Forests,
Kalaburagi Circle,
KALBURAGI
Sir,

Subject: Development of State highways by KRDCL under KSHIP-II Co-finance project with World Bank Assitance-information related to Chincholi Wildlife Sanctuary, Local Ecology & Biodiversity and information for carrying out biodiversity study in the vicinity of Chincholi Wildlife Sanctuary along Bidar-Chincholi Road (SH 15)

Ref-: Principal Chief Conservator of Forests, (Wildlife) & Chief Wildlife Warden, Karnataka, Bangalore, letter No. PCCF(WL)/D/CR-7/2015-16, Date 30.06.2015

* * *

The report of impact Assessment and mitigation proposal has been submitted by the Executive Engineer, KRDCL Kalaburagi. The details of the report have been examined by the undersigned and it is found that due to widening of the Road, there is going to be definitely increase in mortality of Wild animals while crossing the road.

In order to reduce the impact of traffic increase on the said road, after widening the mitigations proposed by the study team are found sufficient enough. After the widening of the road and also after implementing the mitigation measures, One more study may be carried-out in order to improve the situation and if necessary many more mitigation measures may be imposed on the User agency, based on the study.

User agency may be instructed to conduct periodical impact studies and be monitor at regular intervals and necessary mitigation activities should be carried- out in the interest of Wildlife.

This is for your kind information and onward submission to the Principal Chief Conservator of Forests (Wildlife) along with your kind remarks and suggestive improvised mitigation measures. Copy of the Impact study Mitigation measures proposed by the User agency is enclosed for ready reference.

Yours faithfully,

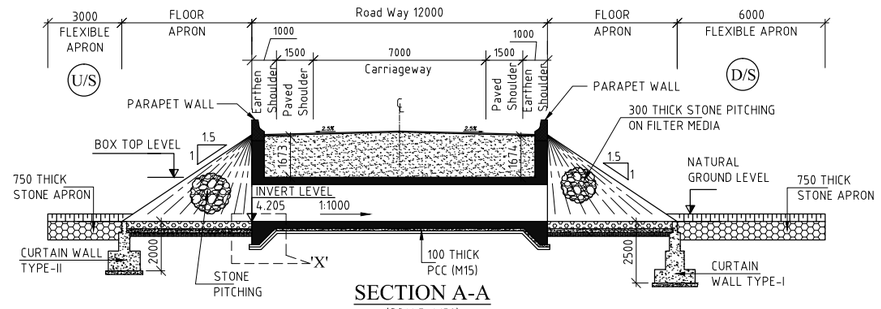
Sd/-
Deputy Conservator of Forests
Territorial Division, Kalaburagi

1) Copy submitted to the Principal Chief Conservator of Forests, (Wildlife) Bangalore for kind information and needful action in the matter.
2) Copy to the Chief Engineer, KRDCL, Ist Floor, 16/J, Millar Tank Bed Area Thimmaiah Road, Cross Bangalore- 560052 for information.

Deputy Conservator of Forests
Territorial Division, Kalaburagi

G:\EST. Misc.(E).doc

Drawings



SECTION A-A
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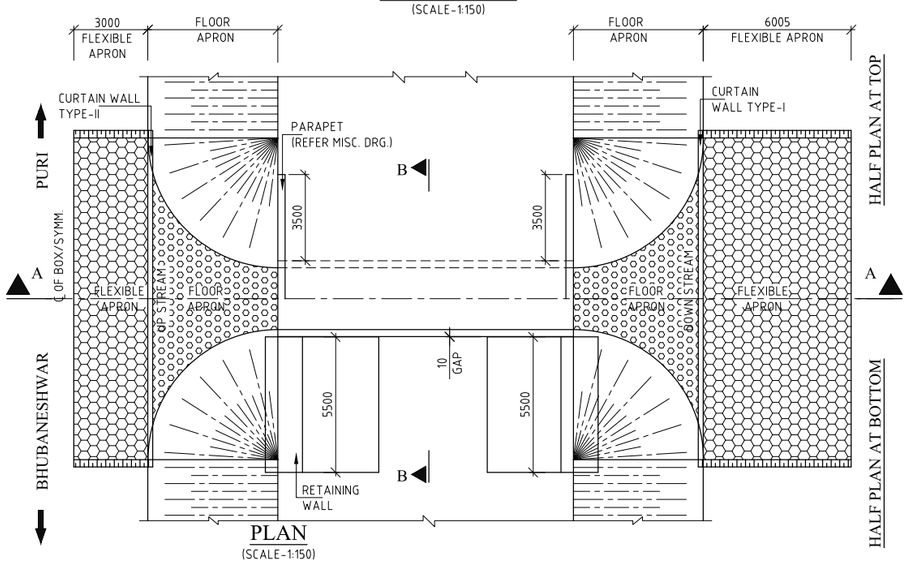
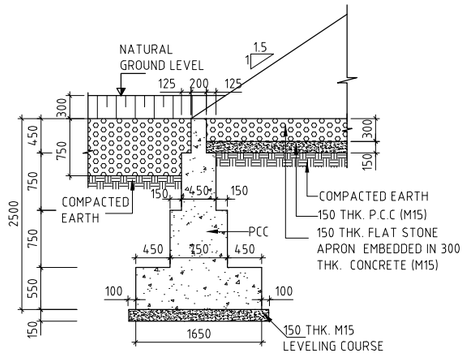
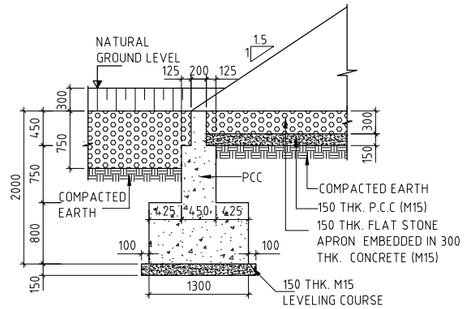


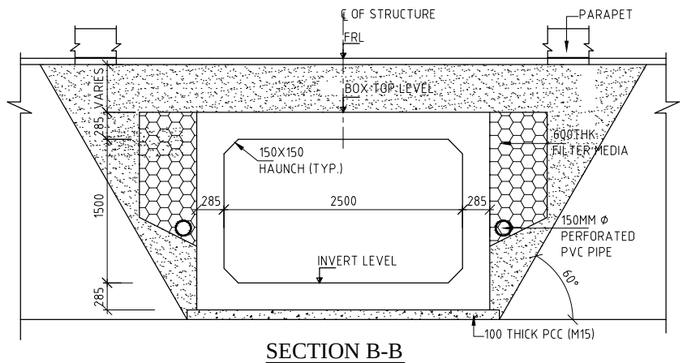
PLAN
(SCALE-1:150)



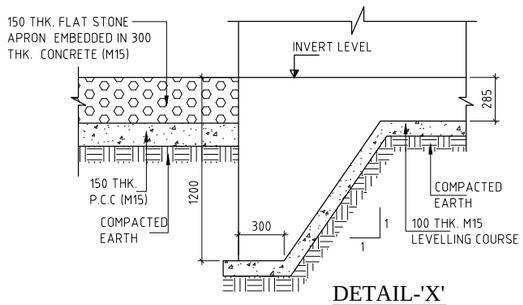
DETAIL OF CURTAIN WALL-I
(DOWN STREAM SIDE)
(SCALE 1:50)



DETAIL OF CURTAIN WALL-II
(UP STREAM SIDE)
(SCALE 1:50)



SECTION B-B
(SCALE 1:40)



DETAIL-'X'
(SCALE 1:25)

NOTES:-

1. ALL DIMENSION ARE IN MM, UNLESS SPECIFIED OTHERWISE MENTIONED.
2. DO NOT MEASURE THE DRAWING FOLLOW WRITTEN DIMENSION ONLY.
3. BACKFILL GRANULAR SOIL MATERIAL BEHIND BOX STRUCTURE SHALL HAVE THE FOLLOWS PROPERTIES AS ,g= 1800 Kg/M^3 g C = 0, Ø = 30°.
4. THE STRUCTURE IS DESIGNED TO CATER TO MAXIMUM OF:-
   a. CLASS "A" LOADING - ONE, TWO LANES, THREE LANES.
   b. ONE LANE OF CLASS 70R WHEEL OR TRACK.
   c. ONE LANE OF CLASS A WITH ONE LANE OF 70R WHEEL OR TRACK.
5. CONCRETE GARDE :-
   M30 - FOR RCC (BOX CELL STRUCTURE & RETAINING WALL)
   M15 - FOR PCC CURTAIN WALL & LEVELING COURSE
   M30- PARAPET
   UNTENSIONED REINFORCEMENT :- Fe.500 (T.M.T. DEFORMED BARS)
6. 450mm THICK FLOOR APRON SHALL CONSIST OF 300mm THICK M-15 GRADE CONCRETE WITH FLAT STONE EMBEDDED LAID OVER 150mm THICK PCC M-15 GRADE CONCRETE.
7. ALL CONSTRUCTION SHALL CONFIRM TO CONTRACT SPECIFICATIONS.
8. COMPACTED EARTH SHOULD CONFORM TO CLAUSE 305.2.1.5 OF MORTH SPECIFICATIONS.
9. PERFORATED P.V.C. PIPE 150Ø TO BE PROVIDED OF GROUND LEVEL BEHIND WALL FOR DRAINAGE.
10. SOFT AND LOOSE PATCHES IN THE BEARING AREA ARE TO BE REPLACED BY COMPACTED GRANULAR FILLS WITH LAYERS NOT EXCEEDING 300mm.
11. 600mm THK. FILTER MATERIAL BEHIND RETAINING WALL SHALL BE LAID AS PER APPENDIX 6 OF IRC 78-2000.

DATE	NO	REVISION	BY

CLIENT:
KARNATAKA ROAD DEVELOPMENT CORPORATION LIMITED
BANGALORE

CONSULTANT:
FEEDBACK INFRA
Making Infrastructure Happen
15th Floor, Tower 9B, DLF Cyber City Phase-III, Gurgaon 122002

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PROJECT:	PROJECT TITLE: CONSULTANCY SERVICES FOR WILDLIFE SURVEY AND IMPACT ASSESSMENT IN SELECTED CHAINAGES OF CO-FINANCE PROJECT ROAD FROM BIDAR TO CHINCHOLI		REVISION 0
TITLE:	RCC BOX CULVERT AS ANIMAL UNDERPASS		SCALE@A2 AS SHOWN
DRG. No:	FIPL-KRDCL-WLS-01		
DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
RKH	S.M.	A.C.	P.K.

28/08/2015 – 4:08pm
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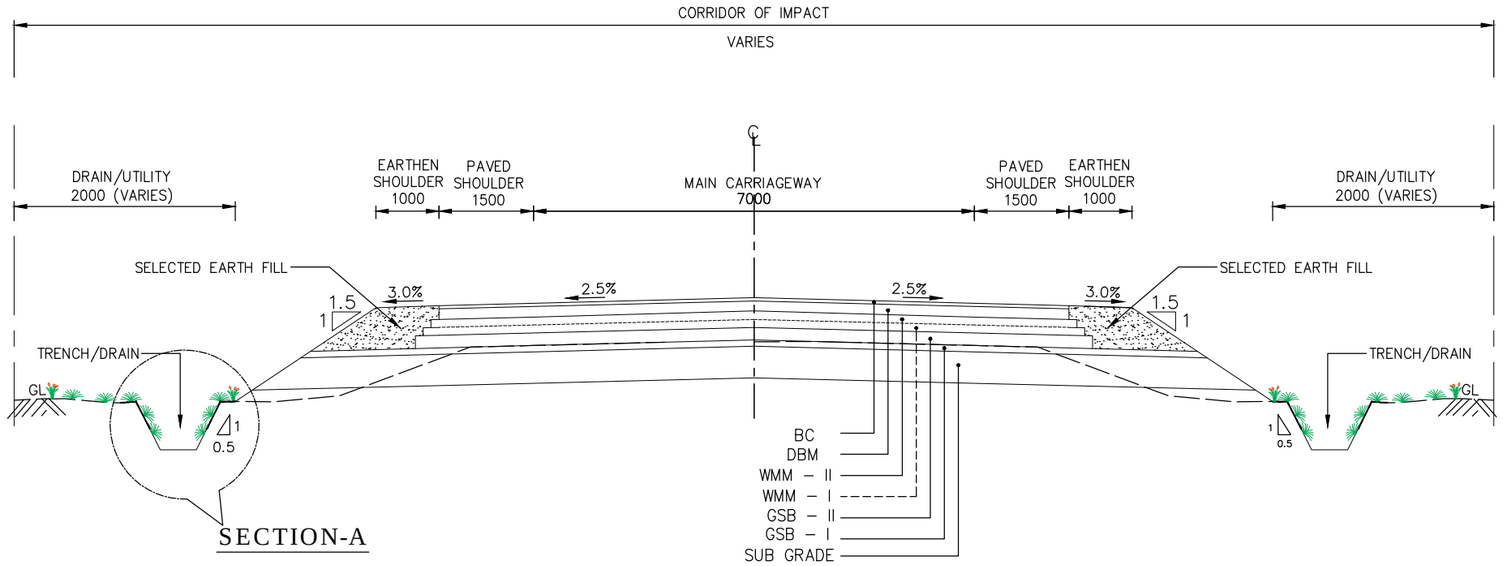
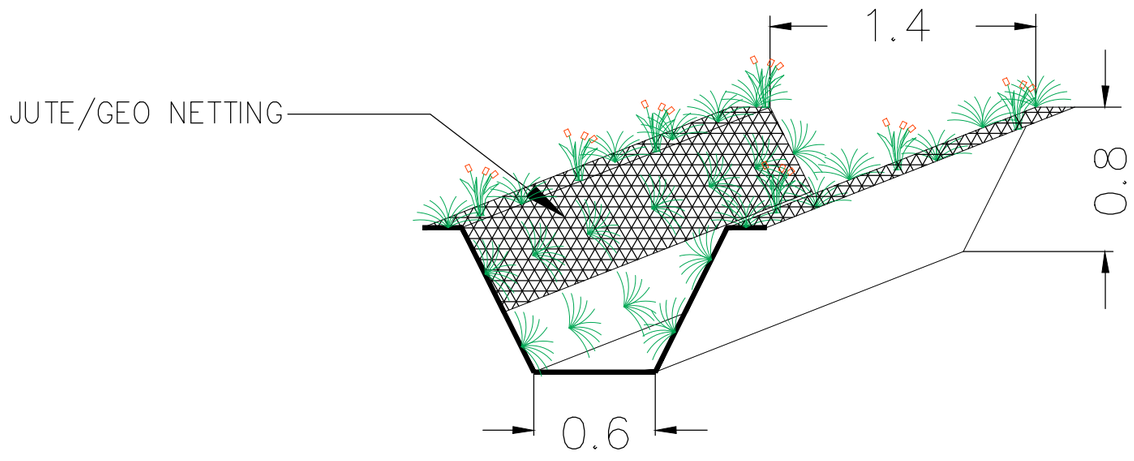
Size: A2



TYPE E - RURAL CROSS-SECTION WITH PAVED SHOULDER



SECTION-A DETAIL

DATE	NO	REVISION	BY

CLIENT:
KARNATAKA ROAD DEVELOPMENT CORPORATION LIMITED
BANGALORE

CONSULTANT:
FEEDBACK INFRA
Making Infrastructure Happen
15th Floor, Tower 9B,
DLF Cyber City Phase-III,
Gurgaon 122002

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PROJECT:	PROJECT TITLE: CONSULTANCY SERVICES FOR WILDLIFE SURVEY AND IMPACT ASSESSMENT IN SELECTED CHAINAGES OF CO-FINANCE PROJECT ROAD FROM BIDAR TO CHINCHOLI		REVISION R0
TITLE:	TRENCH DETAILS		SCALE@A2 AS SHOWN
DRG. No:	FIPL-KRDCL-WLS-02		

DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
RKH	S.M.	A.C.	P.K.

08/12/2015 – 12:23pm
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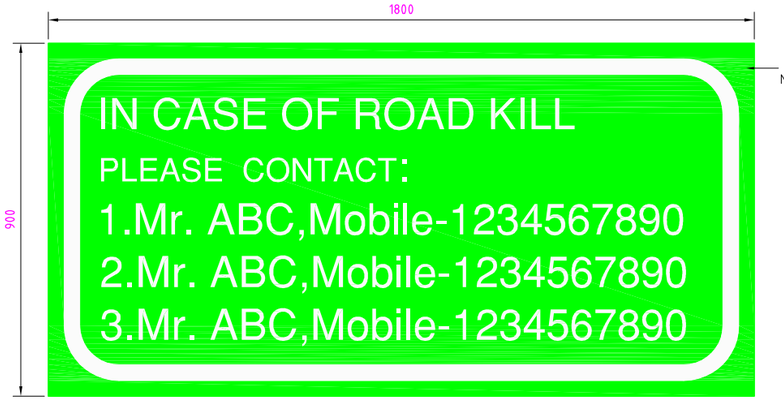
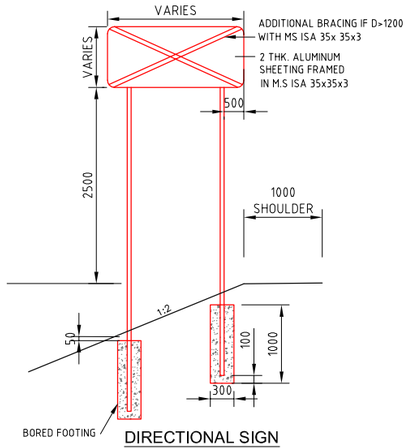


PLACE IDENTIFICATION SIGN

01

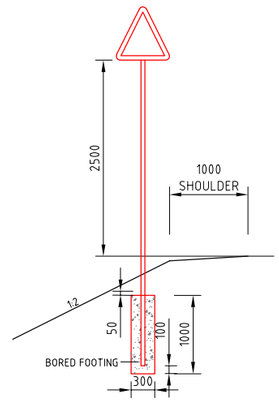
PLACE IDENTIFICATION SIGN

02



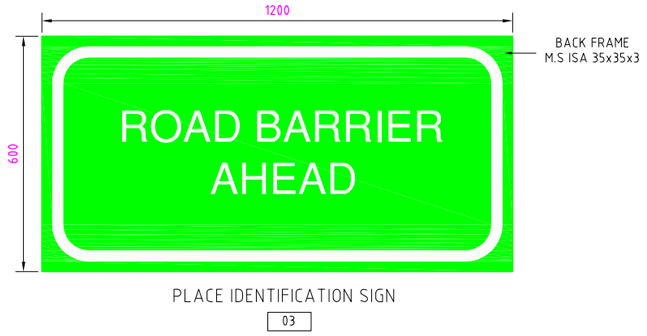
DIRECTIONAL SIGN
(WITH BORED FOOTING)

A2 SIZE SCALE 1:50
A3 SIZE SCALE 1:75



SINGLE LEAF SIGN

A2 SIZE SCALE 1:50
A3 SIZE SCALE 1:75



PLACE IDENTIFICATION SIGN

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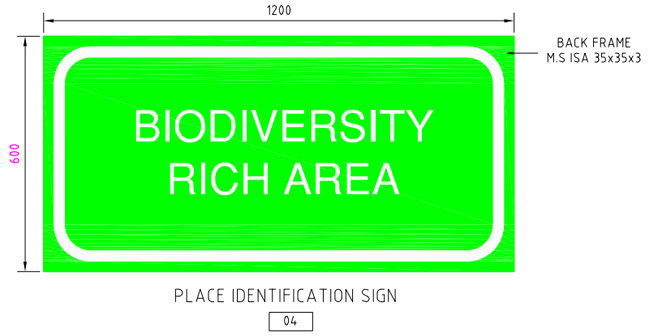
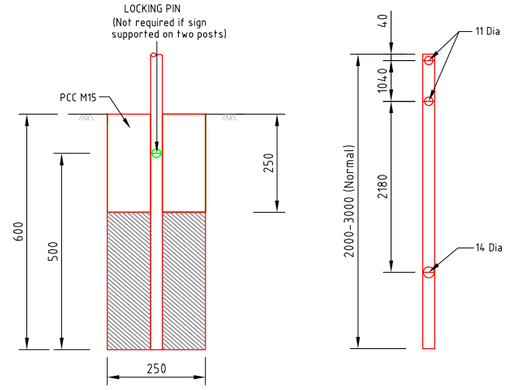


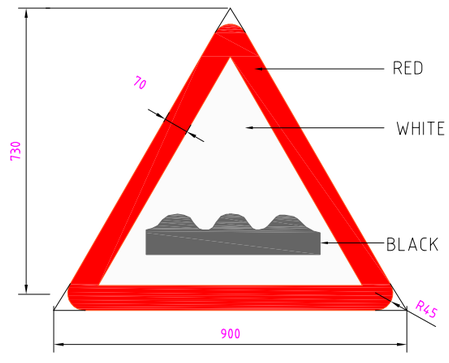
PLACE IDENTIFICATION SIGN

04

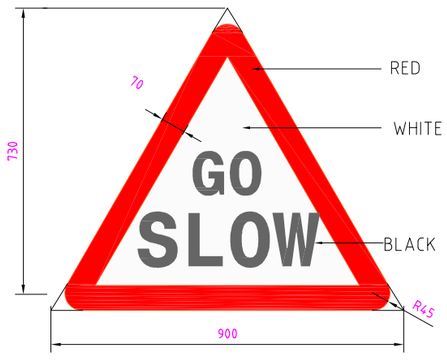


FOOTING DETAILS FOR SINGLE SIGN SUPPORT

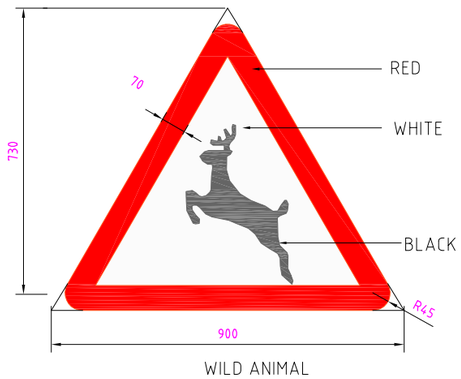
A2 SIZE SCALE 1:10
A3 SIZE SCALE 1:15



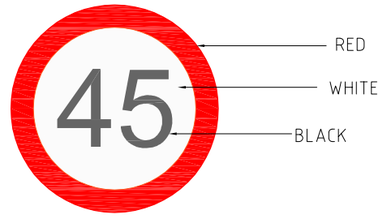
RUMBLE STRIP



GO SLOW



WILD ANIMAL



MAXIMUM SPEED LIMIT

Notes :

1. ALL THE DIMENSIONS ARE IN MILLIMETER UNLESS SPECIFIED
2. RETROREFLECTORISED SHEETING SHALL BE CONFORMING TO ASTM D-4957-2001/ (TYPE VIII AND TYPE IX).
3. SIGN SHALL BE AS PER IRC:67-2001 & IRC:30-1968

DATE	NO	REVISION	BY

CLIENT:

KARNATAKA ROAD DEVELOPMENT CORPORATION LIMITED
BANGALORE

CONSULTANT:

FEEDBACK INFRA
Making Infrastructure Happen
15th Floor, Tower 9B, DLF Cyber City Phase-III, Gurgaon 122002

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PROJECT:	PROJECT TITLE: CONSULTANCY SERVICES FOR WILDLIFE SURVEY AND IMPACT ASSESSMENT IN SELECTED CHAINAGES OF CO-FINANCE PROJECT ROAD FROM BIDAR TO CHINCHOLI		REVISION
TITLE:	DETAILS OF TRAFFIC SIGNS & BOARD		SCALE@A2 NTS
DRG. No:	FIPL/KRDCL/WLS/03		
DRAWN BY	DESIGNED BY	CHECKED BY	APPROVED BY
RKH	S.M.	A.C.	P.K.

28/08/2015 – 3:30pm
PATH: D:\Other\Tapas\MISC\MIS-13.dwg

Size: A2