MITIGATION ROAD ECOLOGY LINEAR INFRASTRUCTURE

Volume 1

A Policy Framework for Connectivity Conservation and Smart Green Linear Infrastructure Development in the Central Indian and Eastern Ghats Tiger Landscape

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Wildlife Conservation Trust

Volume 1

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Using the tiger as a metaphor for all of nature, the Wildlife Conservation Trust (WCT), a not-for-profit, was envisioned to preserve and protect India's rich natural heritage. WCT works closely with the government for the conservation of forests and wildlife in over 160 Protected Areas (PAs) and in forests outside the PA network, in 23 states. The organisation is involved in improving the protection mechanism of national parks and sanctuaries, in enforcement training, habitat and species conservation, mitigation of human-wildlife conflict, introducing innovative technologies in conservation and monitoring of large carnivores, and in providing healthcare to the frontline forest staff. Having understood the acute need for sustainability of both natural resources and humans, the organisation lays equal emphasis on conservation of ecosystems and rural development. Hence, creating better livelihood options for local communities and enhancing the quality of education in rural schools are important areas of intervention for the organisation.

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High resolution versions of the maps presented in this report can be accessed at
www.connectivityconservationindia.org

Disclaimer : Data for the report has been taken from the MoEFCC website *http://www.forestsclearance.nic.in* over a period of four months. Any inaccuracies which may have crept in are due to the data uploaded by user agencies on the MoEFCC portal. Some of the projects may have been withdrawn and for various reasons may no longer be accessible on the MoEFCC website. WCT does not take any responsibility for the inaccuracies which may have crept in. This report only aims to present a policy framework as a win-win solution for wildlife and development. The boundaries of India shown in various maps in this report are neither authenticated nor verified and are not to scale. They are only meant for graphical representation. All efforts have been made to make them accurate, however WCT does not own any responsibility for the correctness or autheticity of the same.

"I strongly believe that tiger conservation, or conservation of nature, is not a drag on development. Both can happen in a mutually complementary manner. All we need is to re-orient our strategy by factoring in the concerns of the tiger in sectors where tiger conservation is not the goal. This is a difficult task but can be achieved. Our genius lies in "smartly" integrating the tiger and wildlife safeguards in various infrastructures at the landscape level. This essentially takes us to the much needed "smart green infrastructure", while adopting a landscape approach....

...at the end, I would like to emphasise that conservation of tigers is not a choice. It is an imperative."

Honourable Prime Minister of India Shri Narendra Modi

at 3rd Asia Ministerial Conference on Tiger Conservation on 12th April 2016

Vigyan Bhawan, New Delhi, India

A leopard walking along the Chandrapur-Mul Road. This road, which passes through the Tadoba-Kawal tiger corridor, is proposed for expansion into a national highway.

@SheetalNavgire, WCT

Bor Tiger Reserve's dominant male tiger, BTR-T2 (Bajirao) knocked dead on NH6 on Dec 29, 2017. This section of NH6 cuts through the Bor-Melghat corridor and was expanded without any mitigation measures in 2009

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Foreword

While numerous historic threats to tigers and their habitat remain, linear infrastructure development has emerged as the single largest threat to the demographic viability of tigers.

Development of linear infrastructure, without considering impacts on forests and wildlife, tends to fragment natural landscapes severing habitat connectivity, which is vital for the demographic and genetic viability of several endangered species.

India is now witnessing a rapid growth of its transportation networks and it is imperative to move beyond piecemeal solutions to get win-win solutions at the landscape scale.

While several reports, studies and guidelines aim to address this issue of mitigating the negative impacts of such linear infrastructure on natural landscapes and conserving the connectivity that they offer to small populations of endangered species of wildlife, there is a lack of timely information on whether a particular project is likely to affect corridor/s. This report primarily seeks to address this specific lacuna.

This policy framework is not a holistic solution by itself as solutions need to be project specific, site specific, science-based and are the mandate of the statutory agencies.

This study builds on the earlier work by other entities and presents a way forward for better planning of linear infrastructure without compromising on the connectivity needs of wildlife. Use of this policy framework in conjunction with other existing statutory provisions and guidelines for building linear infrastructure through forests, will help devise site-specific solutions that take into consideration the need for development without ignoring the ecology of wildlife.

This policy framework for tiger connectivity in the Central Indian and Eastern Ghats tiger landscape uses extensive data on tiger presence, existing and proposed roads, railways and canals, and presents results which can be used

by policymakers and planners for incorporating “smart” and “green” measures that addresses both the needs of development and movement of multiple species of wildlife in the planning stage of linear infrastructure projects itself, thus reducing time and cost over-runs in infrastructure project implementation.

The same framework with improvements can be adopted by the statutory agencies for the other three important tiger landscapes in India, namely, the Western Ghats, Shivalik-Gangetic Landscape and the North East Indian Landscape by incorporating information on the corridors and proposed projects in the respective landscapes. Work is in progress on these three reports which we hope will have a positive impact nationally.

This is the first of a series of planned reports.

We also hope that this framework will be of use to regulatory agencies such as the Ministry of Environment, Forests and Climate Change (MoEFCC), the National Board for Wildlife (NBWL), the National Tiger Conservation Authority (NTCA), Project Elephant, Ministry of Road Transport and Highways, State Public Works Departments, the National Highways Authority of India (NHAI), the Ministry of Railways and the Ministry of Water Resources and River Development & Ganga Rejuvenation and infrastructure finance institutions to pro-actively safeguard corridors by putting appropriate mitigation measures in a timely manner and saving cost of delay due to litigation, help in updating the corridor plans of the Tiger Conservation Plans (TCPs) as mandated by the Wildlife (Protection) Act, 1972 and as an input for periodic habitat integrity assessments.

We hope that this policy framework will prove to be a paradigm shift in the way we plan our infrastructure development.

Introduction

Global tiger populations and distribution have seen drastic declines. While numerous historic threats to tigers remain, linear infrastructure development has emerged as the single largest threat to the demographic viability of tigers[1,2]. Studies by multi-national banks[3,4] show that linear infrastructure development has already increased vastly and is further poised to increase in Tiger Range Countries (TRCs) as a result of their aspirations for higher rates of economic growth.

Linear infrastructure such as roads, railways, canals and power lines are among the largest artificial structures built on this planet and are ubiquitous. Development of this linear infrastructure without considering impacts on forests and wildlife tends to fragment natural landscapes severing habitat connectivity which is vital for the demographic and genetic viability of several endangered species.

The Central Indian and Eastern Ghats tiger landscape is spread over eight Indian states viz. Andhra Pradesh, Chhattisgarh, Jharkhand, Madhya Pradesh, Maharashtra, Odisha, Rajasthan and Telangana. This definition[5,6] of the landscape is based on the assumption that the landscape would have been contiguous in the not so distant past and therefore forms a common gene pool.

With 23 tiger reserves (TRs), about 46 other protected areas (PAs) with tiger presence, most of them connected by corridors, the Central Indian and Eastern Ghats tiger landscape is one of the largest[6] tiger landscapes in India and harbours about 31% of the country's tiger population[7] (approximately 688 tigers out of the national estimate of 2226 tigers). This meta-population of tigers has the highest genetic diversity of wild tiger populations anywhere in the world[8].

This meta-population of tigers in the Central Indian Tiger Landscape has the highest genetic diversity of wild tiger populations anywhere in the world.

The landscape has long been recognised as an important landscape for long-term tiger conservation. In fact, of the original nine tiger reserves that constituted Project Tiger during its inception[9], five (viz. Kanha, Melghat, Palamau, Ranthambhore and Similipal) are from the Central Indian and Eastern Ghats tiger landscape[9]. Even today, some of the largest wilderness areas and Tiger Conservation Landscapes (TCLs) in the country are located in the Central Indian and Eastern Ghats tiger landscape[10].

Notable among other highly endangered fauna of this landscape are Asiatic Wild Buffalo (*Bubalus arnee*) in Udanti-Sitanadi and Indravati Tiger Reserves in Chhattisgarh and adjoining forests of the state of Maharashtra and the only population of the hard ground Barasingha (*Rucervus duvauceli branderi*) in the world - in Kanha Tiger Reserve (and now Satpura Tiger Reserve of Madhya Pradesh, where it was recently reintroduced). The Eurasian Otter (*Lutra lutra)*

has been discovered recently in Satpura Tiger Reserve and Balaghat Forest circle in Madhya Pradesh[31,32]. Among other large mammals, the landscape supports four species belonging to the family *Canidae*, seven cat species (family *Felidae*), six species belonging to the family *Bovidae*, and six species belonging to the family *Cervidae*. The landscape also supports an endangered species of owl, the Forest Owlet (*Heteroglaux blewetti*). The eastern parts of the landscape, in the state of Odisha and Jharkhand also harbour populations of the Asian elephant (*Elephas maximus*). Also harboured within this landscape are two biosphere reserves and eight elephant reserves [11]

Central Indian and Eastern Ghats tiger landscape as a functional tiger meta-population:

Of the 3,38,378 km^2 of available tiger habitat in the landscape, about 41,974km^2 [(7)] is occupied by tigers. Between the three national tiger estimations carried out in the year 2006, 2010 and 2014 the landscape has seen stable tiger population but declines in habitat occupancy and connectivity and increase in habitat loss.

The NTCA estimates that a tiger population of 80-100 tigers (with 20 females of breeding age) is required to be genetically viable on its own[9]. Not a single tiger sub-population in the Central Indian Landscape is genetically viable in the long run by itself. Therefore, immigration and emigration of adult tigers from other sub-populations within the landscape is a must[6] and the long-term survival of tigers is highly dependent on the connectivity of tiger populations through a network of intervening forest corridors. Genetic studies have shown that tigers disperse over large distances (up to 650 kms) in the Central Indian and Eastern Ghats tiger landscape[26].

Several small tiger sub-populations in the landscape face numerous threats that work to make the populations even smaller. Smaller populations face a higher probability of extinction over the long run. Recent genetic studies on tigers show that currently, the Central Indian tiger population has the highest genetic diversity[8] in the world. However, another recent study which modelled the impact of linear infrastructure on tiger connectivity predicts a 50% loss in genetic diversity (over 20 tiger generations) in a business as usual scenario[12].

Not a single tiger population in the Central Indian Landscape is genetically viable in the long run by itself.

Managing the Central Indian tiger population as a meta-population, with connectivity offered by corridors, is also important from the perspective of conserving other endangered species of carnivores such as Asiatic wild dog and wolf which also disperse over large distances and for herbivores such as gaur which are under threat of local extinction e.g.: Bandhavgarh, where gaur population had gone extinct due to anthropogenic reasons. Gaur had to be

reintroduced in Bandhavgarh by translocating individuals from Kanha. Many of our small protected areas in the Central Indian and Eastern Ghats tiger landscape are slowly losing prey species such as the gaur, sambar and barking deer, which in turn is likely to increase the conflict between human and carnivores as carnivores will be forced to prey upon livestock in the absence of healthy wild prey populations.

One popular model of tiger conservation proposed is to protect the source populations at all costs since they hold up to 90%[9] of the potential carrying capacity[13] given adequate protection. However, this model is rather species-specific and ignores the conservation values of the tiger as a flagship species. Such an approach fails to meet the ecological needs of tigers, the need to maintain genetic diversity and ignores the conservation needs of other species which are equally endangered. Moreover, this model does not take into consideration the small size of Protected Areas in India and also the emerging threats such as impact of disease, climate change and other unforeseen anthropogenic perturbations.

Evidence of the loss of genetic structure within tiger populations in India[14] also indicates that habitat loss outside Protected Areas due to infrastructure development and other forms of land use poses a permanent and irreversible threat and highlights the importance of conserving corridors as an alternate model. Multiple studies[12,15] point out a middle path where conservation of the core source sites to increase tiger numbers along with preserving connectivity to allow dispersal of tigers and prey is the way forward. The NTCA is working on a similar concept[9] and the Wildlife (Protection) Act, 1972[16] also emphasises the conservation of corridors.

Project Tiger, the landmark tiger conservation programme launched in the early 1970's envisaged a similar landscape/population management strategy right from the beginning. Its objective was "*to ensure the* ***maintenance of a viable population*** *of the tiger in India and to preserve, for all times, such areas as part of our national heritage for the benefit, education and enjoyment of future generations"*[17]. The Project Tiger further envisaged *"the best method of protection of the tiger is to have large areas of at least 2,000 square kilometres (sq km), with similar contiguous areas so that* ***a viable population of about 300*** *tigers in each such area can be maintained"*[17]*. Also, the task force was conscious that "****maintaining a genetically viable population of tigers would require larger areas than the reserves and their contiguous forests provided.*** *The members strongly ruled against any operation to hold tiger populations at artificially high levels by using methods like habitat modification or artificial breeding.* They believed, instead*, "that the tiger reserves would provide a breeding nucleus from which* ***surplus animals could disperse into surrounding habitats"*** [17]***.***

"...maintaining a genetically viable population of tigers would require larger areas than the reserves and their contiguous forests provided."

Originally, Project Tiger envisaged what isolated tiger populations would look like in the event that conservation efforts failed. "*Failure to undertake such measures, said the report, would mean the success of management in tiger reserves — the report called them "**islands of conservation" — could be short-lived,** irrespective of how scientifically it was conceived: "If the land surrounding such effort — sustained islands — continues to deteriorate in productivity affecting the availability of resources for the communities, **these islands are bound to succumb** one day to the community's demands." It also **warned these 'islands' would be inadequate to meet ecological imperatives, not being able to function as vibrant genetic pools"** [17]. Mid-term reviews of Project Tiger[18] also threw up issues of connectivity, as the following extract suggests; "*In fact, conservation demanded that **efforts must go beyond this issue to identify link corridors and management of forests outside the reserves".***

Under Indian law, the Wildlife (Protection) Act, 1972 is the main legislation which affords protection to tiger reserves and corridors.

In the year 2006, an amendment of the Wildlife (Protection) Act, 1972 led to the creation of the National Tiger Conservation Authority (NTCA). Section 38[9,16] lists the powers and duties of the NTCA. Section 38.O.1. g specifies that "*the tiger reserves and areas linking one protected area or tiger reserve with another tiger reserve are not diverted for ecologically unsustainable uses, except in public interest and with the approval of the National Board of Wildlife and on the advice of the Tiger Conservation Authority only*"[16]. Section 38.O.2. goes on to say that "*the NTCA may, in the exercise of its powers and performance of its functions under this chapter, issue directions, in writing to any person, officer or authority for the protection of tiger, tiger reserves and such person, officer or authority shall be bound to comply with the directions*" [16].

The Wildlife (Protection) Act, 1972 also provides for the preparation of a Tiger Conservation Plan (TCP). One of the objectives of the TCP is to ensure "*ecologically compatible land uses in the tiger reserve and areas linking one protected area or tiger reserve with another for addressing the livelihood concerns of local people, so as to provide dispersal habitats and corridors for spill over population of wild animals from the designated core areas of tiger reserves or from tiger breeding habitats within other protected areas" [16]*.

A set of guidelines which aim to mitigate the impacts of linear infrastructure have also been recently developed[2,19] following up on earlier efforts. The guidelines advocate measures to avoid, mitigate or compensate for such linear infrastructure development.

"The tiger reserves and areas linking one protected area or tiger reserve with another tiger reserve are not diverted for ecologically unsustainable uses, except in public interest and with the approval of the National Board of Wildlife and on the advice of the Tiger Conservation Authority only"

Section 38.O.1.g of Wildlife (Protection) Act, 1972

Defining the problem

The rate at which development/expansion/upgradation of linear infrastructure has increased over the last one decade with further rapid growth proposed, India now has the second largest road network in the world[19] and road building is progressing at a rate of 22 km/day, while a target of 41 km/day is set by the government[20].

Linear infrastructure, especially upgradation often requires relatively very little forest land as compared to other alternate land use forms such as dams or mining. However, the negative impacts of linear infrastructure are disproportionately high compared to the area diverted.

We analysed data from over 17,000 proposals (nationwide; all diversion categories / all applications post-July 2014 only) for the amount of forest land proposed for diversion[21]. We found that the average linear infrastructure development requires only 38.4 hectares (Railway), 16.9 hectares (Road) and 16 hectares (Transmission line). Comparatively other categories need hundreds of hectares and thus attracts more regulatory / conservation attention.

Though the area of forest land (in hectares) required for diversion is very less, it has a significant negative impact on connectivity and population viability, in addition to other environmental impacts. This disproportionate negative impact is further amplified due to the lack of awareness regarding the ecological importance of the area being diverted and often such projects are cleared on the basis of public interest and also because diversion of a relatively small amount of forest land is required.

Another problem is the lack of information about the importance of specific forest patches offering connectivity to endangered wild animals that disperse across large distances. Most often the user agency/project proponent is unaware about the ecological value of a particular forest patch where it is seeking forest land diversion. The user agency thus prepares a Detailed Project Report (DPR) and budget without incorporating mitigation measures and submits the same for forest clearance.

Most corridors either remain unidentified or are shrouded by a lack of awareness regarding them. For example, the WII report on corridors identifies only 26 corridors[22] in the Central Indian and Eastern Ghats tiger landscape while in fact there are many more corridors. In the state of Maharashtra, adjoining the Tadoba Andhari Tiger Reserve, the Nagbhid-Bramhapuri Road is being expanded currently with no mitigation measures, even though there is adequate information from long-term camera trapping exercise which indicates that the area is being used by over five tigers[23]. Data from long-term monitoring

of tiger populations outside Protected Areas[23] and radio-telemetry[24] also identifies the same forest patch as being extremely important for tiger movement across the Nagbhid-Bramhapuri Road.

To address the issue of lack of information while considering forest land diversion proposals, the Hon'ble Supreme Court of India judgement dated 06th July, 2011 in I.A. NOS. 1868, 2091, 2225-2227, 2380, 2568 and 2937 in Writ Petition (C) No. 202 OF 1995 (also known as the Lafarge judgement) had given emphasis for the need for "Creation and regular updating of a GIS based decision support database, tentatively containing inter-alia the district-wise details of the location and boundary of (i) each plot of land that may be defined as forest for the purpose of the Forest (Conservation) Act, 1980; (ii) the core, buffer and eco-sensitive zone of the protected areas constituted as per the provisions of the Wildlife (Protection) Act, 1972; (iii) the important migratory corridors for wildlife; and (iv) the forest land diverted for non-forest purpose in the past in the district. The Survey of India toposheets in digital format, the forest cover maps prepared by the Forest Survey of India in preparation of the successive State of Forest Reports and the conditions stipulated in the approvals accorded under the Forest (Conservations) Act, 1980 for each case of diversion of forest land in the district will also be part of the proposed decision support database".

Such a GIS-based decision support system as specified by the Hon'ble Supreme Court is not placed in the public domain.

Most often, the development agencies apply for project clearance on a piecemeal basis and develop the linear infrastructure outside the forest area. e.g For the Maharashtra Samruddhi Mahamarg, there are five separate proposals for forest clearance, for NH-353C there are six separate proposals and for the NH-353D there are eight separate proposals. This presents a fait accompli situation to the regulatory authorities who are forced to clear the project through forest land quoting money already invested into a particular project. Guidelines for the Forest (Conservation) Act, 1980 also state that *"projects for roads and railway line construction will be processed in their entirety, therefore proposals in piecemeal should not be submitted"* [33]. The key point is that the existing statutory requirements are in place to prevent a *fait accompli* sitution however it is the lack of spatial information and complete picture of the proposed project that keeps project planners and regulatory authorities in the dark.

Development agencies apply for project clearance on a piecemeal basis and develop the linear infrastructure outside the forest area. This presents a fait accompli situation to the regulatory authorities who are forced to clear the project.

We looked at the forest clearance project proposals and justification documents for roads in the state of Maharashtra. In a bulk of the projects, options for alternative alignment are not even examined. Although, in many cases of linear infrastructure development, there are few or no alternate alignments possible as these are also likely to cut through the same corridor. For example, in the case

of the Navegaon-Nagzira corridor (Maharashtra) and National Highway 6, there is no possibility of an ecologically viable alternate alignment.

As a result, in an overwhelming number of proposals for forest land diversion, the user agency denies the value of the forest as a corridor offering connectivity and the need for a clearance from the National Board for Wildlife. As per the Section 38.O.1.g, diversion of forest land for non-forest purposes, even if it is beyond the notified/default 10 kilometre Eco-sensitive Zone (ESZ) requires the advice of the NTCA and the recommendation of the NBWL. When the user agency itself denies the requirement of clearance from the NBWL in the Form A, coupled with the lack of published information about corridors, there is a high probability of the project being cleared without offering adequate mitigation measures.

This is best exemplified by two cases.

A. In the case involving the expansion of National Highway 7 requiring the diversion of forest land from the best studied Kanha-Pench corridor, the user agency denied (in the Form-A) that the land offered corridor values and all regulatory authorities subsequently cleared the proposal without question.

B. In the case of expansion of the Nagbhid-Bramhapuri Road, no mitigation measures have been suggested despite having enough knowledge about the forest adjoining the road being important from the perspective of tiger movement.

Another major problem is that user agencies apply for diversion of a lesser amount of forest land by reducing the width of the road in forested areas, while the rest of the road remains 4–lane. This creates a lose – lose scenario for both wildlife and traffic movement as the narrow patch within the forest area ends up bottlenecking traffic, increasing the risk of wildlife-vehicle collisions and eventually creating an impregnable barrier for wildlife[30]. There are several examples of this across the landscape.

Further, to avoid going in for clearance under the Forest (Conservation) Act, 1980 user agencies also prefer to widen the roads using existing right of way (ROW), which eliminates the road verge making it dangerous for wild animals. The existence of the road verge allows animals to make a judgement about traffic before attempting to cross the carriageway[30] e.g. Chandrapur-Mul Road (Maharashtra) despite a proposal for 4-laning which is pending

Examples of linear projects affecting connectivity

Linear infrastructure development agencies often claim that the roads/railway lines have existed since many decades and therefore they enjoy a right of way and that Forest (Conservation) Act, 1980 or the Wildlife (Protection) Act, 1972 does not apply to them.

The Ministry of Railways has claimed, unsuccessfully, that they enjoy a right of way under the Railways Act and thus can expand any railway line without statutory wildlife and forest clearances. This claim was subjected to the legal opinion of the Ministry of Law which ruled against the Ministry of Railways [29]. However, various road building agencies are still claiming that they have a right of way and this is a lacuna which remains to be addressed by the MoEFCC.

Symptomatic of the problem defined in the previous section of this report, several known (and many unknown) examples exist within the Central Indian and Eastern Ghats landscape where expansion of linear infrastructure has severed corridors without any safeguards/mitigation measures.

Some examples of this problem are:

1. Expansion of the National Highway 7 (now NH-44) into 4-lane divided carriageway from Seoni northwards towards Jabalpur (Madhya Pradesh) without any mitigation measures and ignoring the fact that the roads cuts through the Kanha-Satpura Corridor (in 2015).
2. Expansion of the National Highway 7 (now NH-44) in Telangana without any mitigation measures, posing a threat to the corridors connecting Kawal Tiger Reserve.
3. Expansion of the National Highway 6 into 4-lane highway cutting the Kanha-Nawegaon-Tadoba-Indravati corridor and the Nagzira-Nawegaon corridors (in 2009-2010).
4. Expansion of the National Highway 6 into 4-lane highway cutting two separate corridors connecting Melghat and Bor Tiger Reserve (Maharashtra).
5. Expansion of the Nagpur-Betul Highway, which passes through the Pench-Melghat corridor (Madhya Pradesh) into 4-lane highway without mitigation measures.

   Expansion of the Nagpur-Chhindwara road into 4 lane highway with 2-lane sections through the Pench-Satpura corridor (Madhya Pradesh) without any mitigation measures. This was done even though the Wildlife Institute of India had recommended mitigation measures in the year 2012.

Agencies often claim that the roads/railway lines have existed since many decades and therefore they enjoy a right of way and that Forest (Conservation) Act, 1980 or the Wildlife (Protection) Act, 1972 does not apply to them.

7. The main railway line from New Delhi to Chennai passes through as many as seven corridors, however only one section of the railway line has come under scrutiny for safeguards/mitigation measures (Ratapani WLS, Madhya Pradesh) while the status of others remain unknown.

8. The Chandrapur-Gondia-Balaghat railway line passes through the Tadoba-Nawegaon and the Kanha-Pench corridor. While limited (due to the *fait accompli* situation) mitigation measures have been put in the stretch through Balaghat Forest Circle, no mitigation measures have been incorporated in the Chandrapur Forest Circle

9. Expansion of three state highways passing through three seperate corridors connecting the Tadoba-Andhari Tiger Reserve, Maharashtra without any mitigation measures.

10. Expansion of the Nagpur-Chhindwara Railway line passing through the Pench-Satpura corridor without any mitigation measures/safeguards.

Methodology to identify tiger corridors

We used tiger as the focal species due to the flagship nature of the species. Further, tiger corridors are the only corridors which enjoy some level of legal protection under the law[9,16]. Also tiger corridors help in preserving connectivity for multiple other endangered species.

Genetic studies in the Central Indian and Eastern Ghats tiger landscape have established the presence of dispersing individuals and that connectivity for tigers exists between its Protected Areas[26,27,28]. Earlier studies correlating genetic connectivity with landscape elements have revealed that tiger movement is negatively impacted by human settlements within the Central Indian and Eastern Ghats tiger landscape[26]. A recent study[12] shows that Land-use Land-cover (LULC), human settlements and roads influence the probability of tiger dispersal in the Central Indian and Eastern Ghats tiger landscape. In this report, we have adopted the approach of Thatte et al.[12] and limited the factors that influence tiger dispersal to LULC and presence of human settlements. We did not use roads as several studies have documented the impact of roads on connectivity and we were interested in assessing how many existing roads, railway lines pass through potential tiger corridors. At a resolution of 200m, each grid cell in the Central Indian and Eastern Ghats tiger landscape was assigned a resistance value to the movement as a combined effect of LULC and human settlements. All Protected Areas with tiger presence and forest blocks (>100km^2) with persistent tiger presence for multiple sampling periods (2006–2016)[5,6,7] were used as sources to model potential connectivity.

@VishalBansod, WCT

Jungle cat (*Felis chaus*) run-over on Paratwada-Dharni road passing through core area of Melghat Tiger Reserve

Connectivity in the landscape

The Central Indian and Eastern Ghats tiger landscape is the second largest tiger landscape in India with multiple corridors between majority of its Protected Areas. Looking at the photographic tiger dispersal records and the genetic studies in the Central Indian landscape, there is robust evidence that highlights the functionality of these corridors and the role they play in maintaining the geneflow among tiger populations at the landscape scale.

With advances in the science of connectivity research, we have been able to source information on multiple aspects of large carnivores at various spatial scale. The results from this exercise demonstrate that the Central Indian and Eastern Ghats landscape is a matrix of Protected Areas with varying degree of connectivity. The results show that most of the Protected Areas have more than one path of connectivity to the nearby Protected Area/node (outside Protected Areas forest block which shows persistent tiger presence over multiple sampling periods). The results also highlight the role of small Protected Areas as stepping stones in maintaining connectivity among Protected Areas over large distances. Tigers being a long-ranging species, mitigation measures along linear infrastructure will be highly beneficial to the species in such landscapes that provide multiple dispersal routes between existing PAs and the other conservation blocks for sustaining viable tiger populations over the long-term. The results provide a visual representation of the existing connectivity among

The results show that most of the PAs have more than one path of connectivity to the nearby PA/node (outside PA forest block which shows persistent tiger presence over multiple sampling periods).

the Protected Area/node in the Central Indian and Eastern Ghats landscape overlaid with an infrastructure layer. We present a landscape scale view of the proposed linear development projects (post July 2014) and the scale at which it negatively impacts tiger connectivity.

A policy framework that aims to solve the problem

A network of multiple roads and railway lines cuts across multiple corridors by the virtue of centrality of the landscape. Hence, mitigation measures cannot be suggested by looking at one infrastructure project at a time, and rightly so, many studies and reports have identified the need for a Cumulative Impact Assessment (CIA) or a Strategic Environmental Assessment (SEA) as a holistic solution to major environmental problems[2].

We decided to address the issue of preserving tiger connectivity in the light of the projected rapid expansion of linear infrastructure. To tackle the issue of lack of information on tiger corridors, we decided to identify all the potential tiger corridors and put it onto one map. To address the infrastructure development needs, we decided to analyse data from the proposals for linear infrastructure development (roads, railways and canals only) formally submitted to the MoEFCC for diversion of forest land. Each of these proposals has spatial information about the quantum of land sought for diversion. We downloaded data from 1697 proposals for the Central Indian and Eastern Ghats landscape.

Number of proposals for forest land diversion (post-July 2014)

States	Irrigation	Railway	Road	Grand Total
Andhra Pradesh	28	3	127	158
Chhattisgarh	16	5	51	72
Jharkhand	12	19	147	178
Madhya Pradesh	113	21	169	303
Maharashtra	134	25	239	398
Odisha	28	12	106	146
Rajasthan	23	10	270	303
Telangana	21	2	116	139
Grand Total	**375**	**97**	**1225**	**1697**

Cumulative Impact Assessment (CIA) or a Strategic Environmental Assessment (SEA) as a holistic solution to major environmental problems.

Total area of forest land in hectares proposed to be diverted (post July 2014)				
States	**Irrigation**	**Railway**	**Road**	**Grand Total**
Andhra Pradesh	1989	123	531	2643
Chhattisgarh	474	533	754	1761
Jharkhand	2895	1722	1192	5809
Madhya Pradesh	19052	1368	1827	22247
Maharashtra	6447	361	3024	9832
Odisha	1708	849	1875	4432
Rajasthan	590	204	1303	2097
Telangana	7455	14	781	8250
Grand Total	**40610**	**5174**	**11287**	**57071**

From the 1697 proposals, we identified 399 proposals which are likely to have a negative impact on tiger corridors. The primary criteria used for this classification is whether the proposed project passes through a corridor or bisects a corridor. However, to estimate potential negative impacts, ancillary information on the project such as width of linear project, type of carriageway (single lane, 2-lane, 4-lane, presence of paved shoulders, presence of dividers, presence of road verge, traffic speeds, traffic volumes, length of road through forest patch, alignment through forest patch (bisecting/via the edge) need to be considered. Often such information is absent in the Form A and project documents. In such cases we have classified the proposal as potentially affecting connectivity under the precautionary principle. Assessment of each individual project would be the responsibility of the various statutory authorities namely the Forest Advisory Committee, NBWL and the NTCA. We have left out some projects which will currently have very little impact, such as the roads under Pradhan Mantri Gram Sadak Yojana / Mukhya Mantri Gram Sadak Yojana as they are likely to be small roads, with low traffic volumes, connecting small villages with potentially little impact on connectivity, even though they would need NBWL clearance upon the advice of the NTCA (e.g wildlife clearance) as there may be impacts in the future with new development plans.

The spatial data on proposed linear infrastructure has been overlaid on the corridor map. Individual maps have been produced for the eight states which make up the Central Indian and Eastern Ghats tiger landscape. The identified projects have been listed in a state-wise table reflecting the status/requirement of wildlife clearance as declared by the user agency's application.

We found that in an overwhelming number of cases, 345 (86%) the user agency has denied the requirement of "wildlife clearance" i.e. clearance from the NTCA

In an overwhelming number of cases, 345 (86%) the user agency has denied the requirement of "wildlife clearance" / viz. clearance from the NTCA and the NBWL.

and the NBWL. By identifying specific projects which potentially tend to impact connectivity and suffer from the legal lacunae of being classified as ones that do not require the necessary clearances from the NTCA and NBWL, we hope that the regulatory authorities will be able to process the project applications in a timely manner without compromising on the merit to do so and will also be able to incorporate appropriate and adequate safeguards.

Of the 1697 proposals of linear infrastructure, currently awaiting clearance, 1452 proposals are pending at various stages.

	Proposal Status	AP	CH	JH	MP	MH	OD	RJ	TL	Total
85.6% Pending	Draft	86	36	128	184	231	70	148	81	**964**
	Under Examination	1	1	4	6	2	2	18		**34**
	Pending at CF/CCF	1	1	1	4	5	5	4		**21**
	Pending at DFO for verifying compliance of conditions				4					**4**
	Pending at DFO/DCF	1	23	2	25	49	11	7		**118**
	Pending at HO				4					**4**
	Pending at HO for Stage-II				2			1		**3**
	Pending at Nodal Officer		2	1	5	24	10	9		**51**
	Pending at RO		1	3	2	4		7	1	**18**
	Pending at RO for Stage-II			1	4			2		**7**
	Pending with UA	23	1	22	16	55	33	20	19	**189**
	Pending with SG	3	4	1	8	11		5	6	**38**
	Pending with SG for verifying compliance of conditions							1		**1**
14.3% Approvals	Recommended by REC							1		**1**
	In-principle	38	3	14	37	17	15	46	31	**201**
	Approved	2		1	2			34	1	**40**
0.2% Rejected	Rejected	3								**3**
	Grand Total	**158**	**72**	**178**	**303**	**398**	**146**	**303**	**139**	**1697**

Abbreviations used : CF= Conservator of Forests, CCF = Chief Conservator of Forests, DFO = Divisional Forest Officer, DCF = Deputy Conservator of Forests, HO = Head Office, RO = Regional Office, UA = User Agency, SG = State Government, REC = Regional Empowered Committee.

It is clear that nearly 86% of the project proposals are at various stages in the clearance process. This presents an opportunity to suggest corrective measures and incorporate mitigation structures so as to achieve a win-win solution for both development and wildlife. Often a lack of incorporation of mitigation measures leads to litigation, consequent delays and cost escalation.

We believe that the maps of corridors with projects overlaid on them will help identify the areas where suitable mitigation measures can be worked out without delaying the project proposals further.

In its 47th meeting, the Standing Committee of the National Board for Wildlife recommended that "*in future when user agencies involved in linear infrastructure development should take into consideration the advisory made in the guidelines of the Wildlife Institute of India while designing the linear infrastructures inside the Protected Areas, notified ESZ area around PAs. Hence linear infrastructure proposals would be accompanied by an animal passage plan, if required, by the project proponent*".

The total project cost of the 399 identified projects runs into approximately 130,000 crores. Even a tiny percentage of cost escalation due to project delays is a huge loss to the national exchequer/tax payer.

Indian Fox (*Vulpes bengalensis*) run-over on a road passing through Kanha-Pench corridor.

@AnishAndheria, WCT

The identification of specific projects in this report would serve as a baseline for the National Board for Wildlife (NWBL) to decide on the magnitude of mitigation measures while considering proposals for diversion of forest land in the Central Indian and Eastern Ghat tiger landscape and benefit other species as well.

We feel that this baseline policy framework will help preserve tiger connectivity in the long run in the Central Indian and Eastern Ghats tiger landscape and benefit other species as well.

The total project cost of the 399 identified projects is approximately Rs.130,000 crores. Even a tiny percentage of cost escalation due to project delays is a huge loss to the national exchequer/tax payer. Further, the huge amount of money proposed as project cost also proves that necessary funds are available with the government and it should seriously consider spending a small fraction of this on mitigation measures thereby providing a permanent solution to future wildlife population collapse due to factors such as fragmentation and isolation. The timely incorporation of suitable mitigation measures at the initial/planning stage of the project can help save the national exchequer a lot of money while simultaneously securing India's biodiversity.

"in future when user agencies involved in linear infrastructure development should take into consideration the advisory made in the guidelines of the Wildlife Institute of India while designing the linear infrastructures inside the Protected Areas, notified ESZ area around PAs. Hence linear infrastructure proposals would be accompanied by an animal passage plan, if required, by the project proponent."

47th Meeting of Standing Committee of NBWL

	Project Cost (Rs. In Crores)		
	Road	**Rail**	**Irrigation**
Maharashtra	18393	4325	2420
Madhya Pradesh	8076	3396	18703
Chhattisgarh	4844	14441	2266
Jharkhand	1479	10757	2268
Odisha	7037	4846	1073
Telangana	1297	0	16390
Andhra Pradesh	2232	1313	1821
Rajasthan	3366	0	0
Total	**46724**	**39078**	**44941**

The 399 identified proposals cover the entire Central Indian and Eastern Ghats landscape. These proposals are likely to be executed over the next few years. We believe that the maps and annexures with this report present a holistic picture of the landscape by incorporating both tiger corridors and forthcoming linear infrastructures and also look ahead into the future. We hope that the regular updation of this dataset and maps combined with joint meetings of various statutory authorities, linear infrastructure agencies and financial institutions can pave the way for a win-win solution that conserves connectivity for wildlife and also facilitates development in a smart and environment friendly manner.

Recommendations for the way forward:

All recommendations are being made keeping in mind the joint need for development and also that of conservation of forest and wildlife.

A major issue with forest clearance proposals is the clearance of projects without considering other existing/proposed projects within a landscape. Proposals for forest land diversion have their Detailed Project Reports (DPRs) and budgets finalised even before the project proposal is submitted for clearance under Section 2 of the Forest (Conservation) Act, 1980. In case additional mitigation measures are suggested by the regulatory authorities, the proposal has to go back to the drawing board for a fresh DPR and budgeting, which is a time consuming process, causing further delays. Ideally, as suggested in this report, adequate planning to identify if the proposed project is likely to affect a corridor or Eco-sensitive Zone or Protected Area needs to be done in the pre-DPR stage, not after the DPR is finalised.

1. Guidelines for the Forest (Conservation) Act, 1980 also state that *"projects for roads and railway line construction will be processed in their entirety, therefore proposals in piecemeal should not be submitted"* [33]. If followed stringently, these guidelines will help decision makers to evaluate the project as a whole and take an informed decision. Additionally, it will also help to evaluate the total cost of mitigation in context of the total budget of the entire project, which is likely to be a fraction of the total project cost. However, currently, since projects are broken down into multiple sections/stages, and cost of mitigation in a particular section/stage is evaluated in relation to the cost of building that particular section/stage, the cost of mitigation appears to be sizeable even when it is not so. This creates a false perception that the suggested mitigation measures are prohibitively expensive, which in turn gives rise to disagreement between the project proponent and environmentalists, unnecessarily delaying the project. Adherence to the existing guidelines will smoothen up the clearance process, benefitting both – the wildlife and the project proponent.

2. Corridors need to be defined in a more comprehensive manner than the Least Cost Paths identified currently. The same should be put in the public domain so that all user agencies are aware of the ecological value of the forest patches that their proposed projects are likely to affect.

3. The NTCA needs to play a leading role in organising regular multi-stakeholder meetings involving all user agencies that propose linear infrastructure development, as it is the statutory body that looks after the protection of tiger corridors.

4. Proposed project alignments from various user agencies at pre-DPR stage need to be spatially overlaid on a corridor map and the inputs given to the user agency so that they can incorporate the cost of suitable mitigation measures in the DPR/budget at the inception of the project. Project proposals will take lesser time to get the requisite forest and wildlife clearances if this process is followed.

5. Identification of projects requiring "wildlife clearance" (viz. clearance from NBWL upon the advice of the NTCA) needs to be comprehensively carried out using the latest spatial tools. Proposed project alignments should be overlaid on corridor maps and the Form-A should accordingly be updated if the project is found to pass through a corridor. The same should be shared with FAC, NBWL and the nodal officers for forest clearance in respective states.

6. The section in the Form-A pertaining to the "wildlife clearance" (Part-1, section I), needs to be amended such that it clearly asks whether the proposed project will affect not just a protected area or Eco-sensitive Zone, but also wildlife corridors. This is important, specifically since many corridors extend beyond the Eco-sensitive Zone.

7. Proposals identified as having a negative impact on corridors or wildlife connectivity need to mandatorily include a science-based "mitigation plan" as per the latest knowledge and guidelines.

A leopard (Panthera pardus) scavenging on a cattle carcass(probably killed in a road accident), along the Chandrapur-Mul road which passes through the Tadoba-Kawal tiger corridor.

@KamleshThakur

Abbreviations

CIA	Cumulative Impact Assessment
DPR	Detailed Project Report
ESZ	Eco-Sensitive Zone
FAC	Forest Advisory Committee
FCA	Forest (Conservation) Act, 1980
GIS	Geographical Information Systems
LCP	Least Cost Path
LULC	Land Use Land Cover
MoEFCC	Ministry of Environment, Forests and Climate Change
MoRTH	Ministry of Road Transport and Highways
NBWL	National Board for Wildlife
NH	National Highway
NHAI	National Highway Authority of India
NTCA	National Tiger Conservation Authority
PA	Protected Area
ROW	Right of Way
SEA	Strategic Environmental Assessment
TCL	Tiger Conservation Landscape
TCP	Tiger Conservation Plan
TR	Tiger Reserve
TRC	Tiger Range Country
WCT	Wildlife Conservation Trust
WII	Wildlife Institute of India
WLPA	Wildlife (Protection) Act, 1972

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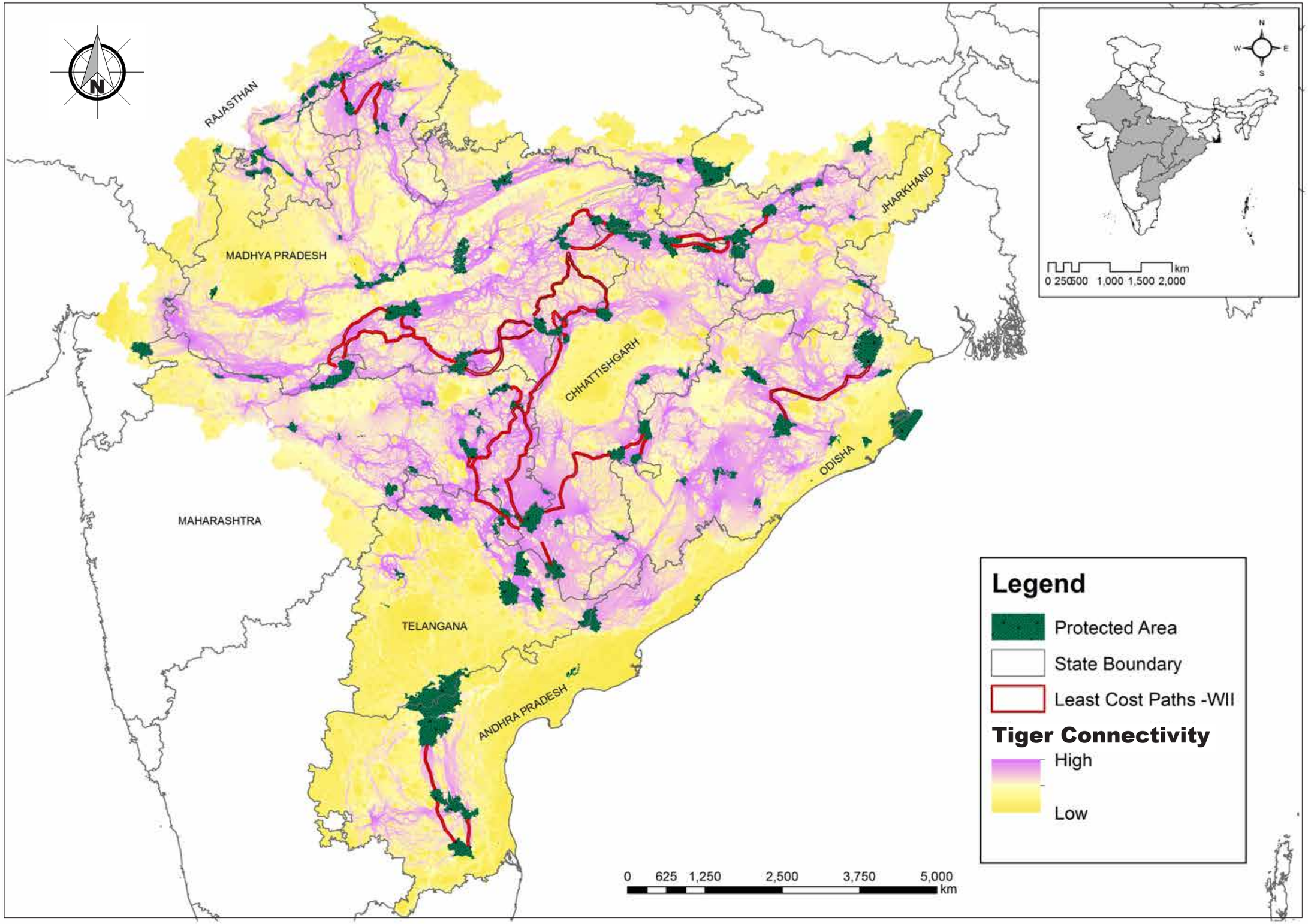
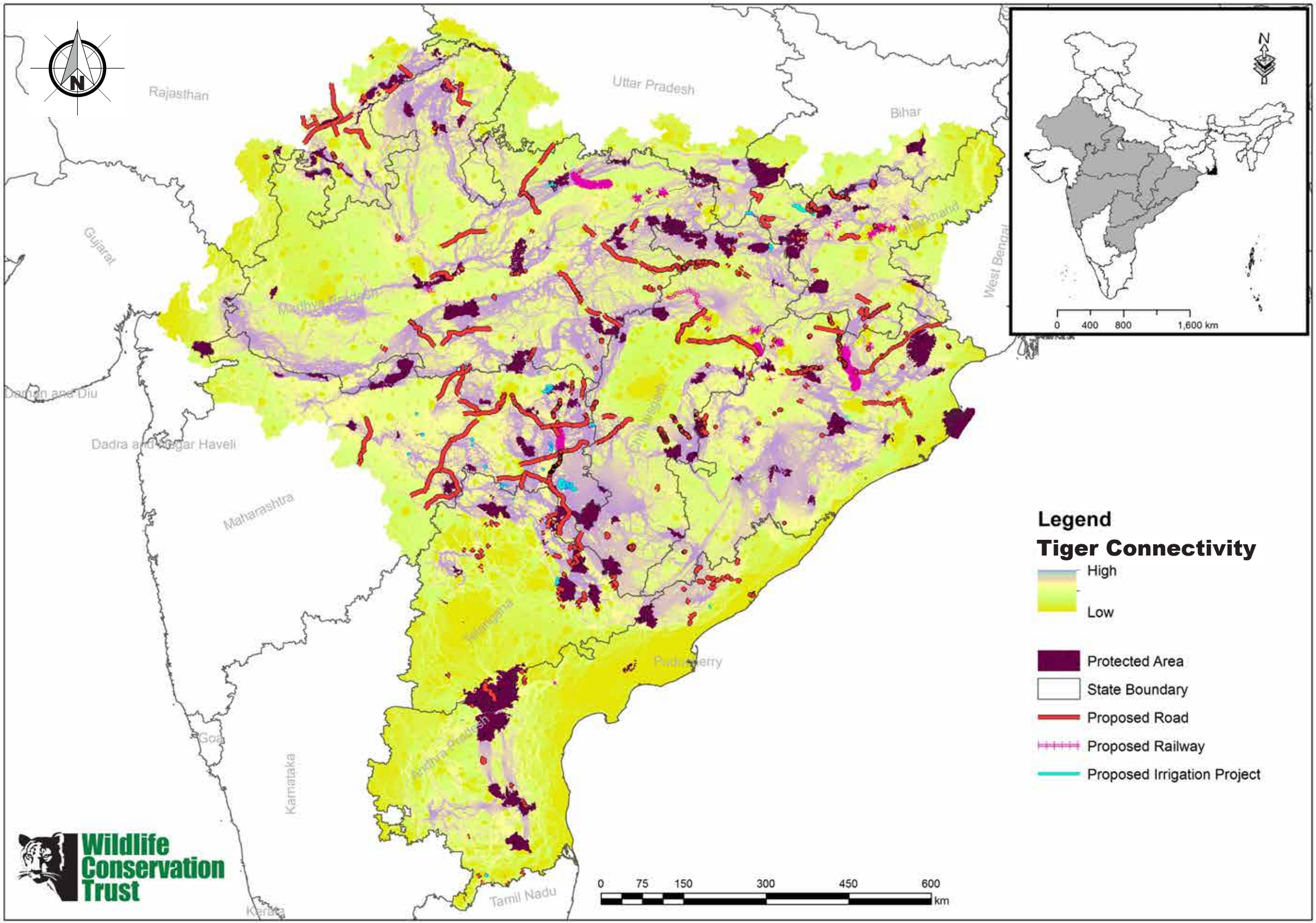


Map showing the Least Cost Paths (LCP) identified by WII[22] and the actual corridors as identified in this report using Circuitscape. (Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)



Map showing the actual corridors as identified in this report using Circuitscape and proposed linear infrastructure in the landscape. (Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Andhra Pradesh

Note : Road projects are identified by the prefix “RO”. Railway projects are identified by the prefix “RY”. Irrigation projects are identified by the prefix “IR”. In majority of the cases project shape files only show the portion of the project passing through the forested area for which clearance is being sought. In some cases projects cut through multiple patches of forest, therefore the said project may have multiple shape files. In such cases a particular proposal number may have multiple corresponding shape files. The multiple shape files for that particular proposal are numbered as per the following example: IR 10, IR 10-1, IR 10-2. The legend on the map and corresponding table in the following pages will show the multiple shape files in the following format IR_10-10-1-10-2.

Andhra Pradesh

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1	FP/AP/IRRIG/ 20226/2016	Papayapalem Lift Irrigation Scheme on Pilleru vagu in Bellamkonda (M), Guntur District	In-Principle	No	1182
IR_2	FP/AP/IRRIG/ 13795/2015	Chintalapudi Lift Irrigation Scheme	In-Principle	No	170100
IR_3	FP/AP/IRRIG/ 15739/2015	Somasila Swarnamukhi Link Canal (SSLC)	Draft	No	10853
IR_4	FP/AP/IRRIG/ 7709/2014	Modernization And Improvements To Existing Balighattam Major Canal Of Thandava Reservoir Project	Pending with UA	No	5500
					182135

Railway Projects

Andhra Pradesh

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
AP1-1-2-1-3	FP/AP/RAIL/17757/2016	Construction of New BG Railway line between Nadikudiand Srikalahasti Stations 1	In-Principle	No	131399
					1313.99

Andhra Pradesh

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/AP/ROAD/ 22609/2016	Upgradation of the existing Katcha Road into Pucca Road.	Pending with UA	No	370
RO_2	FP/AP/ROAD/ 22175/2016	Upgradation of NH-565 from Km.361/327 to Km.420/800 (Dornlala T Junction to Penchalakona section)	In-Principle	Yes	45984
RO_3	FP/AP/ROAD/ 19041/2016	Formation of BT road from Sivapuramgudem to Kolanubharathi templeFormation of BT road from Sivapuramgudem to Kolanubharathi temple	Pending with SG	Yes	100
RO_4	FP/AP/ROAD/ 19911/2016	Roads & Buildings Department, EE, NH, Vijayawada.	Pending with SG	No	19445
RO_5		Diversion of forest land passing through chettapenta & Nellipatla reserve forest of Palamaner sub division , chittoor (west) division for formation of black top road road km 110	Draft	No	
RO_6	FP/AP/ROAD/ 17950/2016	Up-gradation of NH-565 from Km.294/000 to 361/327 i.e from Vaggampalli to Dornala T-Junction under NHDP-IV	In-Principle	No	25899
RO_7	FP/AP/ROAD/ 17571/2016	Upgradation of NH-67 from Km. 641/000 to Km.695/000 i.e from Dornla T Junction to Atmakur Section	Draft	No	
RO_8	FP/AP/ROAD/ 15793/2015	Bakkannapalem to Old Adavivaram-Sontyam Connectivity Road via Dabbanda & Sambuvani Palem Villages	Draft	No	5500
RO_9-10-11-12	FP/AP/ROAD/ 16137/2015	Upgradation of Chennai-Chittoor-Bangalore Road NH4 (New NH-69&40)	Draft	No	120000
RO_13	FP/AP/ROAD/ 12568/2015	Karakavalasa Road to Marika	Draft	No	500
RO_14	FP/AP/ROAD/ 11459/2015	Improvements to Araku Valley to Panchipenta road from Working Reach Km 24/0 to 35/0	Pending with SG	No	530

Road Projects

Andhra Pradesh

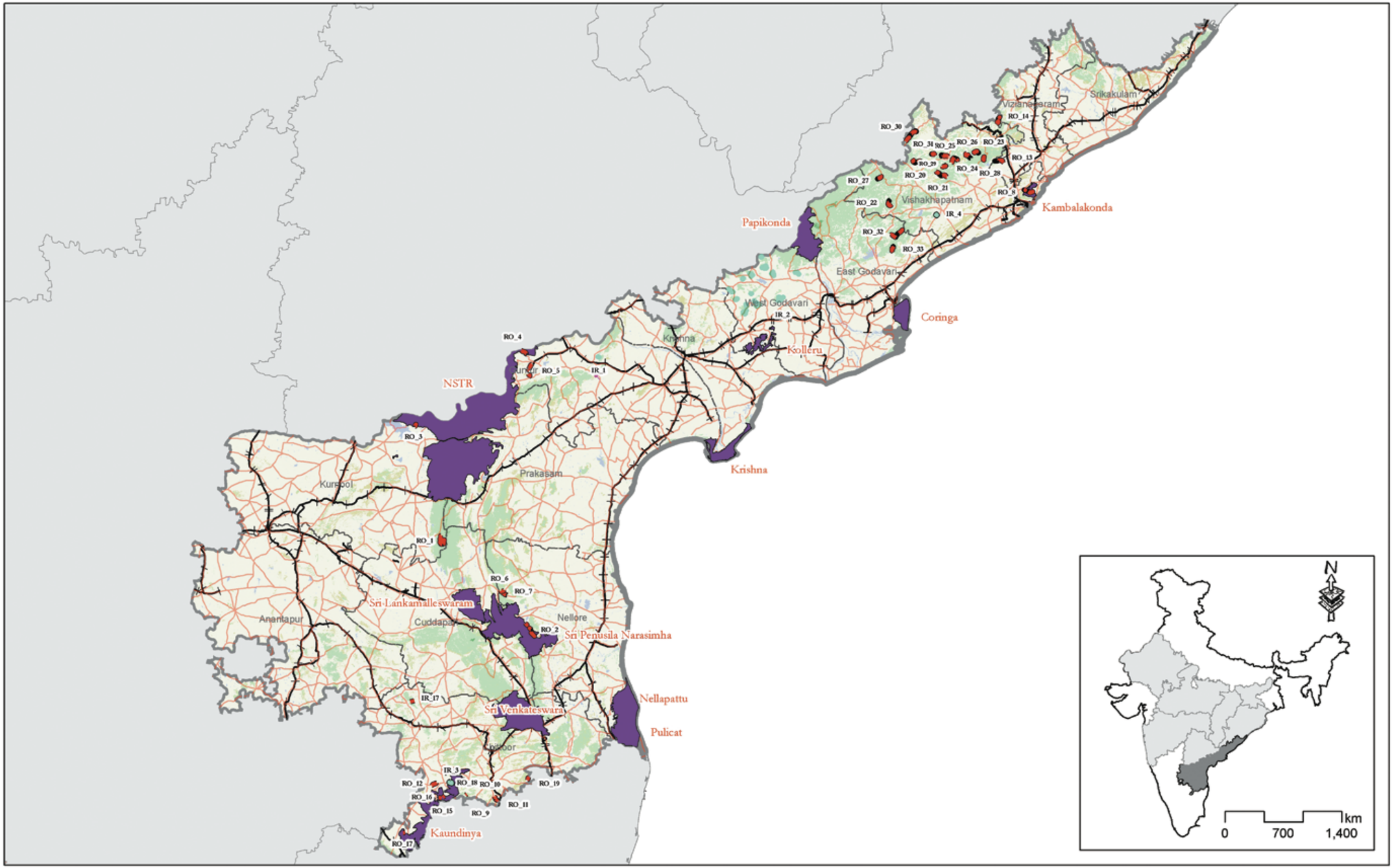
No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_15	FP/AP/ROAD/ 10284/2015	Diversion of forest land passing through chettapenta & Nellipatla reserve forest of Palamaner sub division , chittoor (west) division for formation of black top road road km 11/0 to 13/075 & 14/850 to 18/150 of Palamaner-Guddiyatham to Nellipatla road	Draft	No	300
RO_16	FP/AP/ROAD/ 10244/2015	black top road from Thamballapalle to Sivapuram road (from Km 4/0 to 8/0)	Draft	No	400
RO_17	FP/AP/ROAD/ 10112/2015	Nanjampeta-Ganeshpuram road	Draft	No	200
RO_18	FP/AP/ROAD/ 10081/2015	Diversion of forest land in passing through ragimanupenta reserve forest of chittoor west division for Formation of black top road from Km 3/620 to 5/0 of Ragimanupenta to Km Kandriga Road over an extent of 1.38 H	Draft	No	100
RO_19	FP/AP/ROAD/ 10078/2015	Diversion of forest land in Pullur West Block of Chittoor East Range of Chittoor East Division for formation of Black Top road from Rachapalem-Vanadurgapuram road over an Extent of 3.20H	Draft	No	76
RO_20	FP/AP/ROAD/ 9697/2015	Luvasingi to alagam road	Rejected	No	
RO_21	FP/AP/ROAD/ 9224/2015	Road from Solabham to Chilakalamamidi in G.Madugula mandal of Visakhapatnam District	Pending with UA	No	
RO_22	FP/AP/ROAD/ 7941/2014	Providing BT road from Doddavaram to Mukkudupalli in Koyyuru Mandal	Draft	No	
RO_23	FP/AP/ROAD/ 9196/2015	Road from Pedakota(Jalada) to Velamamidi of Ananthagiri Mandal Visakhapatnam	In-Principle	No	263.88

Andhra Pradesh

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_24	FP/AP/ROAD/ 9125/2015	Formation of BT road from Dabbagaruvu to Patipally via Bangarumetta, Utagedda in Hukumpeta Mandal of Visakhapatnam Division	Pending with UA	No	365
RO_25	FP/AP/ROAD/ 8841/2014	Paderu-Araku R&B road to D. Gonduru	Draft	No	230
RO_26	FP/AP/ROAD/ 8836/2014	Waddadi-Paderu R&B road to Dallapally	Draft	No	570
RO_27	FP/AP/ROAD/ 7882/2014	Providing BT surface to the road from Sapparla to Galikonda in G.K.Veedhi Mandal	In-Principle	No	729.63
RO_28	FP/AP/ROAD/ 8210/2014	Formation of road from Reddy to Rachakillam of Vsp District	Draft	No	22
RO_29	FP/AP/ROAD/ 7703/2014	BT road from Bangarumetta to Vanthala	Draft	No	200
RO_30	FP/AP/ROAD/ 8175/2014	Providing the road from P.S.Road to Jamiguda (via) Rudakota in Munchingput Mandal of Visakhapatnam District	Draft	No	68.2
RO_31	FP/AP/ROAD/ 8167/2014	formation and BT to road including construction of culverts from P.Kodapalli to PL R&B Road (via) Urugonda in Paderu Mandal through Sersapalli RF In Paderu Division	Draft	NIL	793
RO_32	FP/AP/ROAD/ 7290/2014	Providing B.T. Road from Komarapuram to Saralanka	Draft	No	332
RO_33	FP/AP/ROAD/ 6713/2014	Road from Busmamidi to Buradakota of Prathipadumandal East Godavari District	Draft	NIL	230
					223207.71

MAP 3



Wildlife Conservation Trust

ANDHRA PRADESH

0 25 50 100 150 200 km

Legend

- Protected Area
- District Boundary
- State Boundary
- Existing Road Network
- Existing Railway Network
- Proposed Road
- Proposed Railway
- Proposed Irrigation Project

N

(Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Chhattisgarh

Note : Road projects are identified by the prefix "RO". Railway projects are identified by the prefix "RY". Irrigation projects are identified by the prefix "IR". In majority of the cases project shape files only show the portion of the project passing through the forested area for which clearance is being sought. In some cases projects cut through multiple patches of forest, therefore the said project may have multiple shape files. In such cases a particular proposal number may have multiple corresponding shape files. The multiple shape files for that particular proposal are numbered as per the following example: IR 10, IR 10-1, IR 10-2. The legend on the map and corresponding table in the following pages will show the multiple shape files in the following format IR_10-10-1-10-2.

Chhattisgarh

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1	FP/CG/IRRIG/ 23251/2016	Markatola Jalashaya	Pending with SG	No	1380
IR_2	FP/CG/IRRIG/ 13417/2015	Diversion of 21.293ha Of forest land for construction of canal of Khutpali Diversion scheme	In-Principle	Nil	46.44
IR_3	FP/CG/IRRIG/ 21363/2016	Forest Land Diversion Under Submersion Area For Block Ramchandrapur District, Balrampur, Ramanujganj Under FTL In Kanhar Interstate Irrigation Project	Draft	No	225229
					226655.44

Railway Projects

Chhattisgarh

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RY_1	FP/CG/RAIL/ 13044/2015	NTPC Tallaipalli Coal Mining Project	Draft	No	1174100
RY_2-2-1	FP/CG/RAIL/ 12523/2015	East Rail Corridor Spur	In-Principle	No	20000
RY3	FP/CG/RAIL/ 6817/2014	Railway Line	Pending with SG	No	250000
					1444100

Chhattisgarh

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/CG/ROAD/ 29577/2017	Bypass road_Kondangaon	NA	NA	7001
RO_2-2-7	FP/CG/ROAD/ 8090/2014	Amarpur-Chirmiri road widening	Draft	No	2178.7
RO_3-3-1	FP/CG/ROAD/ 29243/2017	Jhalmala-Balod-Kusumkasa-Manpur-Kohka NH930	Under Examination	No	63395
RO_4	FP/CG/ROAD/ 28923/2017	Bilaspur-Katghora-NH111	Draft	No	
RO_5-5-3	FP/CG/ROAD/ 28920/2017	Bilaspur-Karghora section of NH 111_Package-I)0+00 to 53_700)	Draft	No	60074
RO_6	FP/CG/ROAD/ 27052/2017	Seepat-Baloda-Urga road	Draft	No	2500
RO_7	FP/CG/ROAD/ 27458/2017	Bijpaur bypass road	Draft	No	4766
RO_8	FP/CG/ROAD/ 26359/2017	Parmeshwarpur-Jajawal road	Pending at DFO/DCF	No	1508.94
RO_9	FP/CG/ROAD/ 26345/2017	Kowatal-Mahkoni road	Draft	No	531.17
RO_10	FP/CG/ROAD/ 18666/2016	Thadpathra-Kevch approach road	Draft	No	15.242
RO_11	FP/CG/ROAD/ 24943/2017	Lohara-Rengadabri-Chowki road	Pending at DFO/DCF	No	11924.928
RO_12	FP/CG/ROAD/ 24860/2017	Chichola-Chhuriya-Kallubanjari road	Pending with UA	No	6146.285
RO_13	FP/CG/ROAD/ 24797/2017	Tara premnagar-Ramanuj nagar road	Pending at DFO/DCF	NIL	13057
RO_14	FP/CG/ROAD/ 24794/2017	Baramkela-Sohela road	Pending at DFO/DCF	NIL	9152
RO_15	FP/CG/ROAD/ 24500/2017	Bishrampur-Datima road	Pending at DFO/DCF	NIL	2471
RO_16	FP/CG/ROAD/ 24377/2017	Karegaon-Gatasilli-Birgidi road	Pending at DFO/DCF	No	4558
RO_17	FP/CG/ROAD/ 21393/2016	Widening & upgrading NH 43	Pending at DFO/DCF	No	43000
RO_18	FP/CG/ROAD/ 21213/2016	Gaurela-Karangra road	Pending with UA	No	4000
RO_19	FP/CG/ROAD/ 15418/2015	Bailadila Iron ore project	Pending at DFO/DCF	No	2085.92

Road Projects

Chhattisgarh

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_20-20-10	FP/CG/ROAD/12117/2015	Ambikapur-Pathalgaon-NH78	Pending with SG	No	47500
RO_21	FP/CG/ROAD/22300/2016	Wadarf nagar bypass road Ambikapur-Banaras NH	In-Principle	No	2080.95
RO_22	FP/CG/ROAD/21393/2016	NH43_Katni-Gumla Road_From Manendragarh to Dumaria (Baikunthpur)	Pending with DFO/DCF	No	43000
RO_23	FP/CG/ROAD/21393/2016	NH43_Katni-Gumla Road_From Manendragarh to Dumaria (Baikunthpur)	Pending with DFO/DCF	No	
RO_24	FP/CG/ROAD/19527/2016	Bhopalpatnam-Tarlaguda NH163	Pending with UA	No	19000
RO_25	FP/CG/ROAD/16728/2015	NH49_Bilaspur-Ragarh-Odisha border	In-Principle	No	134500
					484446.135

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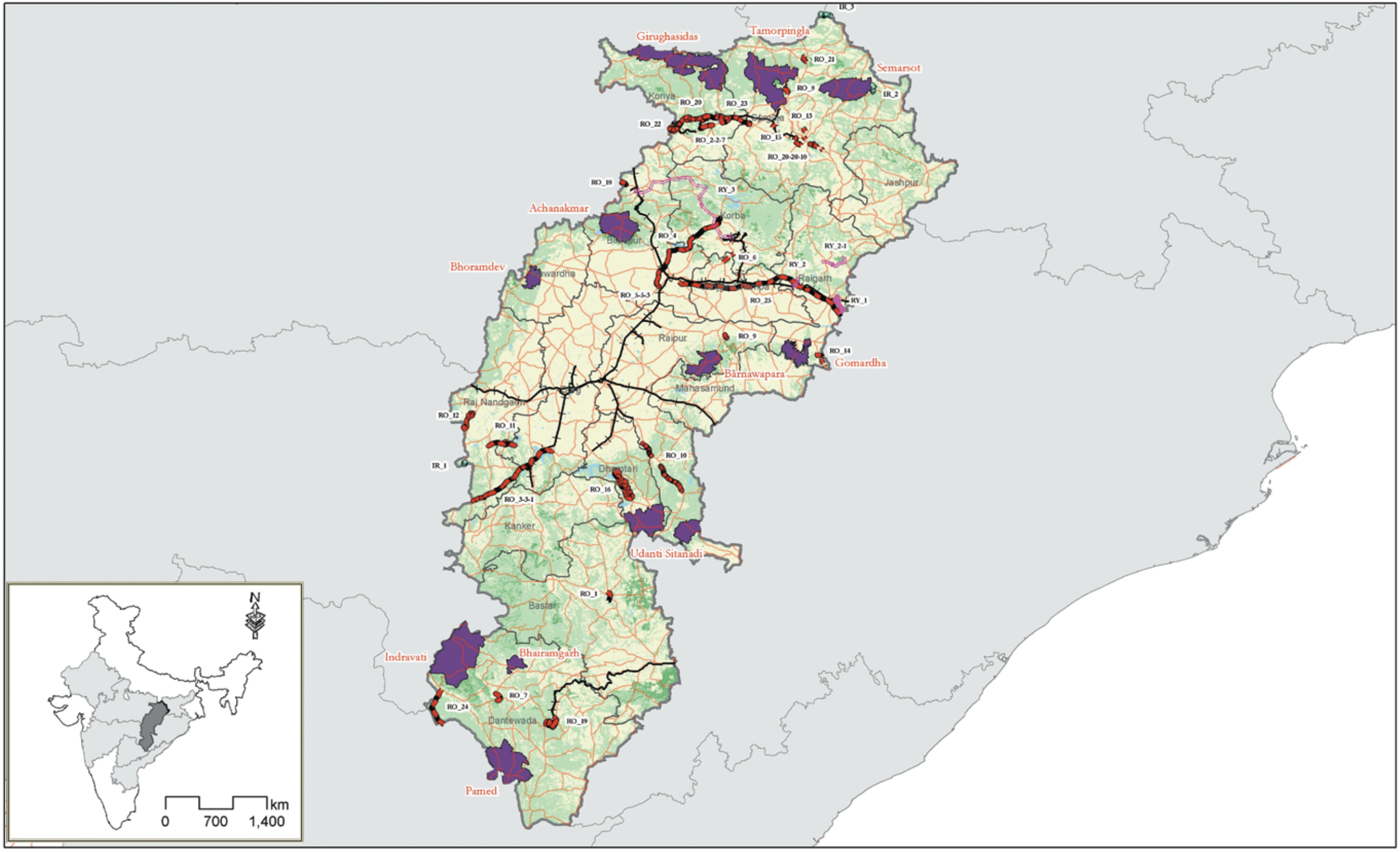
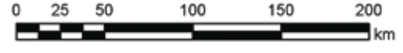
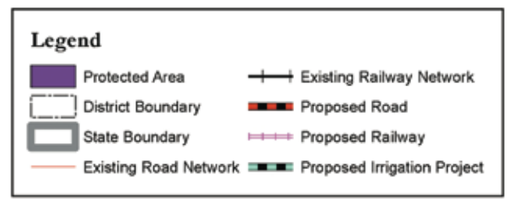


CHHATTISGARH





MAP 4

(Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Jharkhand

Note : Road projects are identified by the prefix "RO". Railway projects are identified by the prefix "RY". Irrigation projects are identified by the prefix "IR". In majority of the cases project shape files only show the portion of the project passing through the forested area for which clearance is being sought. In some cases projects cut through multiple patches of forest, therefore the said project may have multiple shape files. In such cases a particular proposal number may have multiple corresponding shape files. The multiple shape files for that particular proposal are numbered as per the following example: IR 10, IR 10-1, IR 10-2. The legend on the map and corresponding table in the following pages will show the multiple shape files in the following format IR_10-10-1-10-2.

Jharkhand

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1	FP/JH/IRRIG/ 23840/2017	North Koel Reservoir Project	Pending at DFO/DCF	Yes	192782
IR_2	FP/JH/IRRIG/ 15780/2015	Amanat Barrage Scheme	In-Principle	No	34110.91
					226892.91

Railway Projects

Jharkhand

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RY_1-1-1	FP/JH/RAIL/ 26435/2017	Jarangdih to Danea & Danea to Ranchi Road doubling Rail Line Project	Pending with UA	No	65584
RY_2	FP/JH/RAIL/ 24639/2017	Tori Shivpur Rail Project	Draft	NIL	158865
RY_3	FP/JH/RAIL/ 11986/2015	Shivpur-kathotia railway project	Draft	No	198305
RY_4	FP/JH/RAIL/ 18720/2016	Dedicated Freight Corridor	Pending with UA	No	612200
RY_5	FP/JH/RAIL/ 18651/2016	RKSN-DPS 3rd New Line Railway Project	Pending at DFO for verifying Compliance of Conditions	No	40748
					1075702

Jharkhand

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/JH/ROAD/ 29830/2017	Sarbil-Patung VR-168	Pending with UA	No	1157.45
RO_2	FP/JH/ROAD/ 29825/2017	Posaita-BaliyaleVenta	Pending with UA	No	1280.19
RO_3	FP/JH/ROAD/ 28954/2017	Kalitungri (Hirak road) Birhortanda to Tuti Jharna via Pindra	Draft	No	651.409
RO_4	FP/JH/ROAD/ 26482/2017	Hurdag to Purnapani	Draft	No	495.763
RO_5	FP/JH/ROAD/ 26614/2017	Chaibasa - Tonto - Roam Road	Draft	No	17310.945
RO_6-6-1	FP/JH/ROAD/ 26099/2017	Itkhori Road To Bodh Gaya Upto Jharkhand Border	Draft	No	22148
RO_7	FP/JH/ROAD/ 26179/2017	Sonua-Pansua-Lodhai-Gudari Road	Draft	No	9779.05
RO_8	FP/JH/ROAD/ 25400/2017	Toto-Anjandham Road from km 0.00 to km 9.35	Draft	No	1963.62
RO_9-9-1	FP/JH/ROAD/ 25582/2017	Garu Mahuadar Road to Beshnakhaur	Draft	No	126.29
RO_10	FP/JH/ROAD/ 25736/2017	PMGSY Road from PWD Road to Mukundpur via Korwatoli Piri	Draft	NIL	461.659
RO_11	FP/JH/ROAD/ 25727/2017	PMGSY road Laver Mandal road to Gasedag	Draft	No	39.676
RO_12	FP/JH/ROAD/ 25726/2017	PMGSY road Kotam Latehar Sima to Bandua	Draft	No	364.949
RO_13	FP/JH/ROAD/ 25718/2017	PWD road to Henar	Draft	No	166.7
RO_14	FP/JH/ROAD/ 25706/2017	Auranga river on road NH Manika to Antikheta	Draft	No	499.85
RO_15	FP/JH/ROAD/ 25699/2017	PMGSY road Nawadih to Goa	Draft	No	159.69
RO_16	FP/JH/ROAD/ 25705/2017	PMGSY Road PWD road Labhar to Karmdih	Draft	No	215.576
RO_17	FP/JH/ROAD/ 25704/2017	PMGSY road from Mandal road to Tatha	Draft	Yes	118.2
RO_18	FP/JH/ROAD/ 24373/2017	Koderma-Meghatari section (Km 27.665 to Km 47.700) of NH-31	Pending with UA	Yes	24206

Road Projects

Jharkhand

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_19	FP/JH/ROAD/ 25578/2017	POSAITA TO BALIYA LEVENTA	Pending with UA	No	1280.19
RO_20	FP/JH/ROAD/ 25160/2017	nagar untari - bhawanathpur-kharaundhi Dala road up to UP border	Draft	No	6666
RO_21	FP/JH/ROAD/ 24523/2017	ranka to chiniya road (from km 0.00 to 23.395)	Pending with UA	No	3266.399
RO_22	FP/JH/ROAD/ 24303/2017	Gua Link Road.(MDR-187)[Hathi Chowk(Baraiburu) to Gua]	Pending with SG	No	3638.903
RO_23	FP/JH/ROAD/ 23725/2017	chiniya ranpura khutuwa	Pending with UA	No	8011.82
RO_24	FP/JH/ROAD/ 23753/2017	ketar kadhwan hariharpur road (km0.00 to 20.275)	Pending with UA	No	3837.1955
RO_25	FP/JH/ROAD/ 23802/2017	Gua-Salai Road from km 11.00 to 29.00	Pending with SG	No	622.527431
RO_26	FP/JH/ROAD/ 23668/2017	NH 78 in Gumla.	Draft	No	22100.8
RO_27	FP/JH/ROAD/ 23388/2016	Patratu-Hendegire-Macluskiganj Road between Km 0.000 to Km 47.260 Section in Ramgarh, Hazaribagh and Ranchi Districts	Draft	No	16800
RO_28	FP/JH/ROAD/ 20416/2016	Manatu Action Plan (Road)	Draft	No	3.63
RO_29	FP/JH/ROAD/ 17394/2016	Manatu Action Plan (Road)	Draft	No	571
					147943.4819

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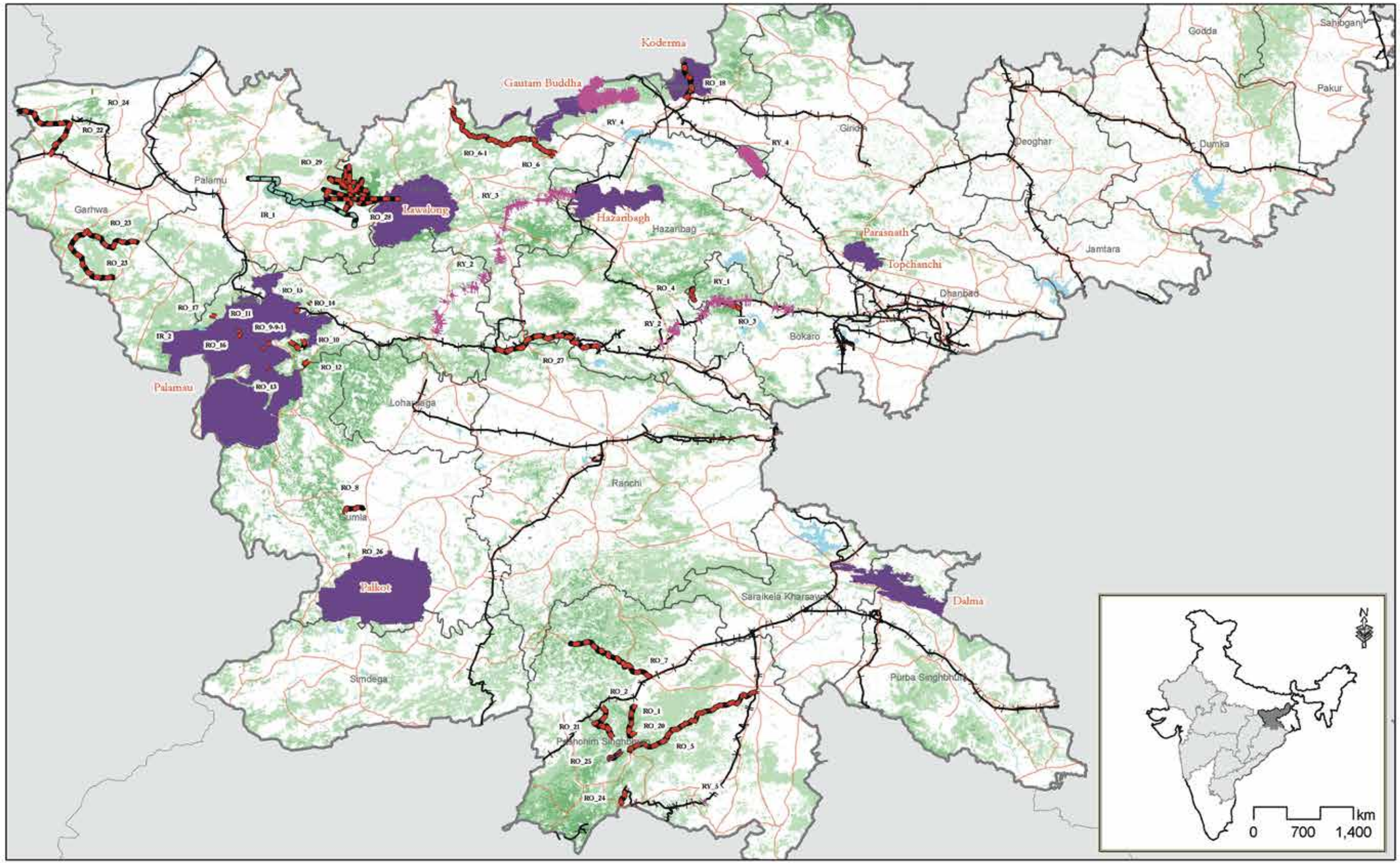


JHARKHAND

0 10 20 40 60 80 km

Legend

- Protected Area
- District Boundary
- State Boundary
- Existing Road Network
- Existing Railway Network
- Proposed Road
- Proposed Railway
- Proposed Irrigation Project

MAP 5

(Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Madhya Pradesh

Note : Road projects are identified by the prefix "RO". Railway projects are identified by the prefix "RY". Irrigation projects are identified by the prefix "IR". In majority of the cases project shape files only show the portion of the project passing through the forested area for which clearance is being sought. In some cases projects cut through multiple patches of forest, therefore the said project may have multiple shape files. In such cases a particular proposal number may have multiple corresponding shape files. The multiple shape files for that particular proposal are numbered as per the following example: IR 10, IR 10-1, IR 10-2. The legend on the map and corresponding table in the following pages will show the multiple shape files in the following format IR_10-10-1-10-2.

Madhya Pradesh

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1-1-2	FP/MP/IRRIG/ 23033/2016	Gond Major Irrigation Scheme	Pending at DFO/DCF	Yes	109767.36
IR_2	FP/MP/IRRIG/ 29552/2017	Aullliya Medium Project	Pending at DFO/DCF	No	16506
IR_3	FP/MP/IRRIG/ 29684/2017	Chhitakhudri medium project at kundam dist Jabalpur	Draft	No	31003
IR_4	FP/MP/IRRIG/ 29283/2017	Satdharu Medium Tank Project	Pending at HO	No	31565
IR_5	FP/MP/IRRIG/ 29139/2017	Sindh (Seondha) Barrage	Draft	No	
IR_6	FP/MP/IRRIG/ 28814/2017	Bham (Rajgarh) Medium Lift Irrigation Scheme	Pending at DFO/DCF	No	22811
IR_7	FP/MP/IRRIG/ 23086/2016	Kadan Medium Project	PENDING WITH-SG	No	38579
IR_8	FP/MP/IRRIG/ 27238/2017	Jamuniya Gound Tank	Draft	No records found	
IR_9	FP/MP/IRRIG/ 21268/2016	Construction of Sihudi Tank	Draft	No	696.74
IR_10	FP/MP/IRRIG/ 17477/2016	Pawai Medium Irrigation Project Canal Work	Pending with SG	Nil	261.54
IR_11-11-1	FP/MP/IRRIG/ 18102/2016	Sajali medium irrigation project	Pending at DFO/DCF	No	36600
IR_12	FP/MP/IRRIG/ 23758/2017	Shyamari Medium Project Distt Chhatarpur MP	Pending at DFO/DCF	No	11475
IR_13	FP/MP/IRRIG/ 23790/2017	Bichhli Nala Tank Scheme	Pending at DFO/DCF	No	2356.95
IR_14	FP/MP/IRRIG/ 23741/2017	Construction Of Dharampura Tank	Pending with UA	No	646.8
IR_15	FP/MP/IRRIG/ 18246/2016	Diya Pipar Irrigation Tank Project	Pending at Nodal Officer	No	1208.15
IR_16	FP/MP/IRRIG/ 23702/2017	Odari Diversion-II	Pending at DFO/DCF	No	2828.34
IR_17	FP/MP/IRRIG/ 20865/2016	Samdhin Irrigation Tank Minor Project	Pending at DFO/DCF	No	2877.09
IR_18	FP/MP/IRRIG/ 23701/2017	Rimar Tank Canal Scheme	Pending at DFO/DCF	No	1007.25
IR_19	FP/MP/IRRIG/ 22945/2016	Bhasuda nalla project	Pending at RO	No	1158.02

Irrigation Projects

Madhya Pradesh

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_20	FP/MP/IRRIG/ 22109/2016	Gopalpura Canal Medium Project	In-Principle	No	7905.21
IR_21-21-1 -21-2	FP/MP/IRRIG/ 21423/2016	Mangarh Water Tank	Pending at RO for Stage-II	No	1242.64
IR_22	FP/MP/IRRIG/ 18675/2016	Gopalpura canal Project	Draft	No	7905.21
IR_23-23-1	FP/MP/IRRIG/ 18070/2016	Parkul Medium Tank	Pending with SG	No	11496.4
IR_24	FP/MP/IRRIG/ 20856/2016	Karam Medium Tank	Pending at HO for Stage-II	No	30444.79
IR_25	FP/MP/IRRIG/ 20767/2016	Hiran Medium Tank project	Pending with UA	No	22599.18
IR_26	FP/MP/IRRIG/ 19545/2016	Bhawsa Medium Irrigation Tank project	Pending at HO	No	12330
IR_27	FP/MP/IRRIG/ 19869/2016	Chanderi Micro Irrigation Scheme	Draft	No	38900
IR_28	FP/MP/IRRIG/ 19987/2016	Amohradol Tank Scheme	Draft	No	1433.33
IR_29	FP/MP/IRRIG/ 17911/2016	Bahuti Canal Scheme	In-Principle	No	85960
IR_30	FP/MP/IRRIG/ 17450/2016	Tirrigurne Tank Project	Draft	Nil	
IR_31	FP/MP/IRRIG/ 15988/2015	Ambedi Tank	Returned	No	359.6
IR_32-32-1	FP/MP/IRRIG/ 16372/2015	Ken-Betwa Link Project	In-Principle	Yes	939300
IR_33	FP/MP/IRRIG/ 14872/2015	Khora Tank Scheme	Pending at DFO/DCF	No	217.48
IR_34-34-3 4-7	FP/MP/IRRIG/ 15676/2015	Narmada-Malwa-Gambhir Link Project	In-Principle	No	218721
IR_35	FP/MP/IRRIG/ 15320/2015	Chunar Tank	Pending at HO for Stage-II	No	2582.92
IR_36-36-1	FP/MP/IRRIG/ 14401/2015	Dehri Tank Project	Draft	No	399.9
IR_37-37-7	FP/MP/IRRIG/ 11437/2015	Sajaniya Tank	In-Principle	No	623.89
IR_38-38-1	FP/MP/IRRIG/ 11717/2015	Bhadari forest case	Pending with SG	No	627.72

Madhya Pradesh

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_39	FP/MP/IRRIG/ 10908/2015	Tirrigurne Tank	Draft	No	
IR_40		Khora Minor Irrigation Tank	Draft	NA	
IR_41-41-1	FP/MP/IRRIG/ 9580/2015	Bansaker Tank	Pending at DFO/DCF	No	347.2
IR_42	FP/MP/IRRIG/ 7196/2014	Wandehi Minor Project	Pending at DFO/DCF	No	1647.52
IR_43	FP/MP/IRRIG/ 7044/2014	Kohka Tank Irrigation Minor Project	In-Principle	No	672.62
IR_44	FP/MP/IRRIG/ 7121/2014	Majhgaon Dam	Pending at HO	Yes	35899
IR_45-45-5	FP/MP/IRRIG/ 8093/2014	Patpara Nalla Minor Irrigation Tank	In-Principle	No	992.6
	FP/MP/IRRIG/ 7015/2014	Patpariha Tank Irrigation Minor Project	In-Principle	No	616
IR_46	FP/MP/IRRIG/ 7403/2014	Ken - Betwa Link Project	Pending at HO	No	137083
IR_47	FP/MP/IRRIG/ 6815/2014	Ghoghari Tank Irrigation Minor Project	Pending at RO for Stage-II	No	705.2
					1870364.93

Railway Projects

Madhya Pradesh

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RY_1-1-1-1-2	FP/MP/RAIL/15076/2015	Rewa-Sidhi	Pending with SG	No	102982
RY_2	FP/MP/RAIL/18640/2016	Anuppur-Katni 3rd line	Draft	NIL	
RY_3	FP/MP/RAIL/17246/2015	Sontalai Bagra Tawa Doubling	Draft	NIL	9644
RY_4	FP/MP/RAIL/16724/2015	Chhindwara Nainpur Mandla Fort guage conversion project	Pending with SG	No	59091
RY_5	FP/MP/RAIL/16682/2015	Barkhera-Budni_3rd railway line	Pending with SG	Yes	70000
RY_6	FP/MP/RAIL/14393/2015	Panna - Satna New B.G Railway Line (74 Km) a part of Lalitpur Singrauli, Mahoba Khajuraho Railway Line project	Draft	No	97900
					339617

Madhya Pradesh

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/MP/ROAD/ 29516/2017	Gwalior-Shivpuri NH-3	Pending at DFO/DCF	No	1055
RO_2	FP/MP/ROAD/ 29342/2017	Gadarwara-Gotitoriya road - Badegaon	Draft	No	2000
RO_3	FP/MP/ROAD/ 29109/2017	Roshni-Ambada-Kotwariya-Sawlikheda	Draft	No	4633.03
RO_3-1					
RO_4-4-5	FP/MP/ROAD/ 26325/2017	Up-gradation from Km 66.0 (Hiran River) to Km. 130.0 (Sindoor River) of NH-12 (Package-II) (Design Length 64.00 Km.) to four lane with paved shoulder under NHDP-III through Engineering, Procurement & Construction	Pending at CF/ CCF	No	59269
RO_5	FP/MP/ROAD/ 28967/2017	Panna-Pahadikhera road (Sarangpur) to Jamunhai	Draft	No	267.53
RO_6	FP/MP/ROAD/ 27700/2017	Badokhar-Gidher road	In-Principle	No	582.86
RO_7	FP/MP/ROAD/ 27618/2017	Rampur-Chandaniya Koyalwadi road	Draft	No	442.24
RO_8	FP/MP/ROAD/ 26648/2017	Boda-Lakhora road	Draft	No	998.53
RO_9	FP/MP/ROAD/ 26645/2017	Bamhani-Keshwani Road	Pending at DFO/DCF	No	378.07
RO_10	FP/MP/ROAD/ 19740/2016	Beohari-Manpur	In-Principle	No	4419
RO_11	FP/MP/ROAD/ 25884/2017	Badgor (Ronija)-Jargawansani	Draft	NIL	92.11
RO_12	FP/MP/ROAD/ 25506/2017	Gaganwada-Kartoli	Draft	Yes	402
RO_13	FP/MP/ROAD/ 24666/2017	Amganwa-Pondi	Draft	NIL	384.34
RO_14	FP/MP/ROAD/ 23427/2017	Indore-Betul NH59A	Draft	No	3738
RO_15	FP/MP/ROAD/ 21928/2016	Shivpuri loop-Shitla mata Chinor Dabra road	Draft	No	917.21
RO_16	FP/MP/ROAD/ 21427/2016	Fulwaritola-Dumarkachhar	Draft	No	
RO_17	FP/MP/ROAD/ 18383/2016	Mohgaon-Khawasa	Draft	Yes	56680

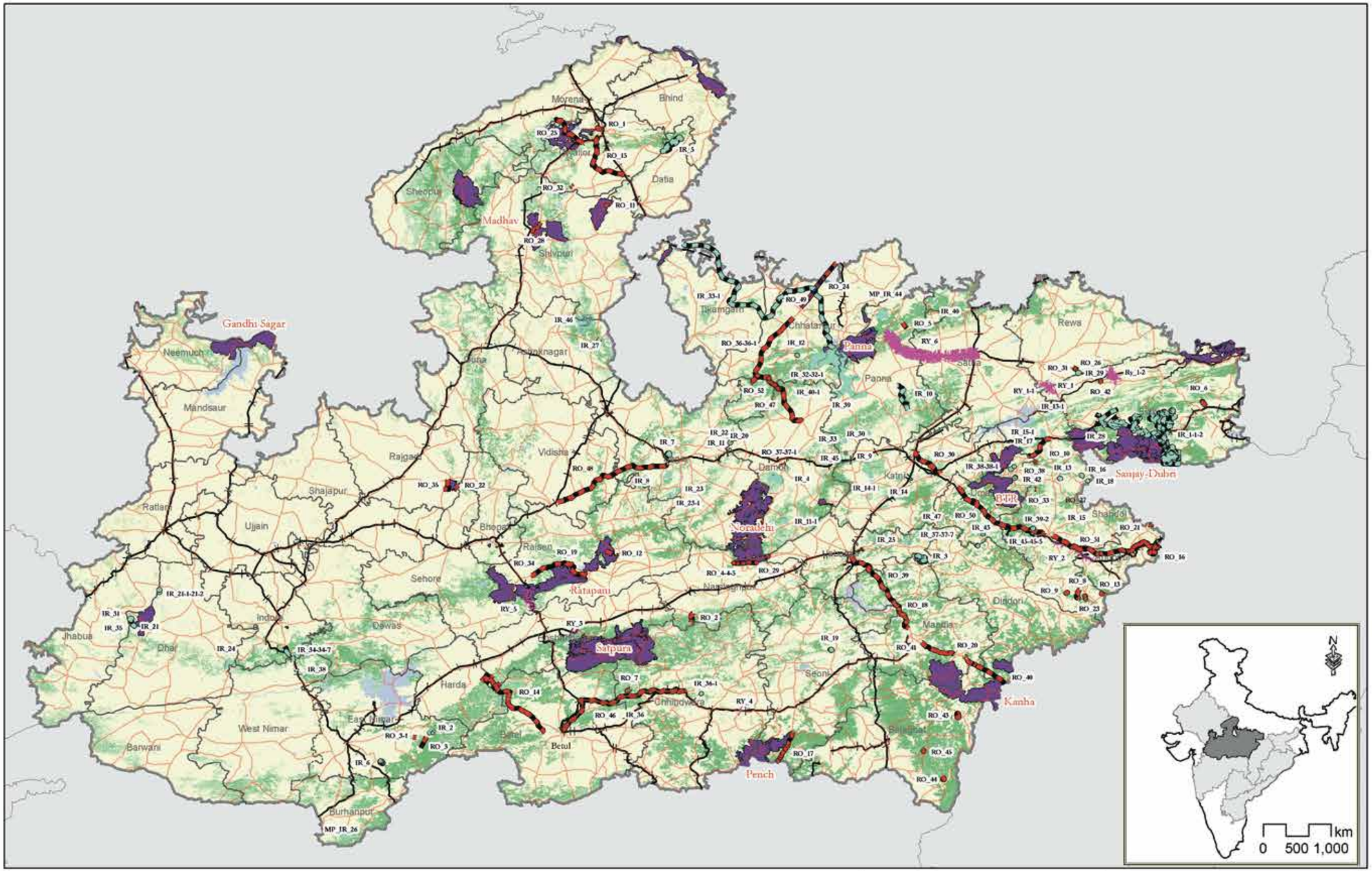
Road Projects Madhya Pradesh

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_18	FP/MP/ROAD/ 19946/2016	Jabalpur-Mandla-Chilpi	Draft	NIL	32700
RO_19	FP/MP/ROAD/ 20035/2016	Bhopal-Jabalpur NH12	Draft	NIL	49000
RO_20	FP/MP/ROAD/ 20012/2016	Mandla-Chilpi NH-12A	In-Principle	No	64100
RO_21	FP/MP/ROAD/ 19782/2016	Pipariya-Saristal	In-Principle	No	281.34
RO_22	FP/MP/ROAD/ 19753/2016	Mukhya Mantri Gram Sadak, Hanapura Resai Marg to Chhabad	Draft	Yes	32.38
RO_23	FP/MP/ROAD/ 19444/2016	Pathaiti-Gadidadar	In-Principle	No	956.23
RO_24	FP/MP/ROAD/ 19475/2016	Bhopal-Sanchisagar NH-86 extn	Draft	NIL	16437.72
RO_25	FP/MP/ROAD/ 19424/2016	Panihar-Pagara	Draft	No	800
RO_26	FP/MP/ROAD/ 19076/2016	Rewa-Sidhi NH75E (Road tunnel)	In-Principle	No	53000
RO_27	FP/MP/ROAD/ 18695/2016	Barai-Morga	Pending at DFO/DCF	No	115.93
RO_28	FP/MP/ROAD/ 18310/2016	Gwalior-Shivpuri NH3	In-Principle	Yes	105500
RO_29	FP/MP/ROAD/ 18302/2016	Jabalpur-Bhopal NH12	Draft	NIL	
RO_30	FP/MP/ROAD/ 17333/2015	Katni-Umaria-Shahdol	In-Principle	No	32000
RO_31	FP/MP/ROAD/ 17249/2015	Rewa-Sidhi	In-Principle	No	2460
RO_32	FP/MP/ROAD/ 13896/2015	Ranighati Chitoli road-Lakeshwari Mata mandir approach road	Pending at Nodal Officer	No	591.69
RO_33	FP/MP/ROAD/ 16419/2015	Karkat-Vishanpurwa	Pending at DFO/DCF	No	
RO_34	FP/MP/ROAD/ 16606/2015	Bhopal-Jabalpur	Draft	No	49000
RO_35	FP/MP/ROAD/ 16511/2015	Construction and widening of Bhopal-Jabalpur road (NH-12) from Ch. 255.300 to Ch. 301.800 length is 49.35 Km (Pkg. -5)	In-Principle	No	99500

Madhya Pradesh

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_36-36-1	FP/MP/ROAD/16304/2015	NH86 widening	Pending at DFO/DCF	No	17000
RO_37-37-1	FP/MP/ROAD/12849/2015	Sagar bypass in Damoh-Katni road	Draft	NIL	27207
RO_38	FP/MP/ROAD/15977/2015	Ghiyar-Hartala road	Pending with UA	No	196.13
RO_39	FP/MP/ROAD/16081/2015	Jabalpur-Mandla-Chilpi	In-Principle	No	32700
RO_40	FP/MP/ROAD/16074/2015	Jabalpur-Mandla-Chilpi	In-Principle	No	
RO_41	FP/MP/ROAD/16072/2015	Jabalpur-Mandla-Chilpi	In-Principle	No	
RO_42	FP/MP/ROAD/14032/2015	Rewa-Sidhi	In-Principle	No	2601
RO_43	FP/MP/ROAD/9645/2015	Songguda-Panewahi	Draft	NIL	
RO_44	FP/MP/ROAD/8592/2014	Intragation Action Plan	Draft	No	223.33
RO_45	FP/MP/ROAD/8033/2014	Intragation Action Plan	Draft	No	614.6
RO_46	FP/MP/ROAD/8287/2014	Betul-Sarni-Pipariya SH43	In-Principle	No	243.24
RO_47	FP/MP/ROAD/20545/2016	Hata-Darguwa SH48	In-Principle	No	780
RO_48	FP/MP/ROAD/19475/2016	Bhopal-Sanchisagar NH86 extn	Draft	NIL	16437.72
RO_49	FP/MP/ROAD/19404/2016	Sagar-Chhatarpur NH-86	Draft	No	17823
RO_50	FP/MP/ROAD/17333/2015	Katni-Umaria-Shahdol NH78	In-Principle	No	32000
RO_51	FP/MP/ROAD/16418/2015	Shahdol-MP/CG border NH78	In-Principle	No	53
RO_52	FP/MP/ROAD/16304/2015	NH86 widening	Draft	NIL	17000
					807613.23



MAP 6

(Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Maharashtra

Note : Road projects are identified by the prefix "RO". Railway projects are identified by the prefix "RY". Irrigation projects are identified by the prefix "IR". In majority of the cases project shape files only show the portion of the project passing through the forested area for which clearance is being sought. In some cases projects cut through multiple patches of forest, therefore the said project may have multiple shape files. In such cases a particular proposal number may have multiple corresponding shape files. The multiple shape files for that particular proposal are numbered as per the following example: IR 10, IR 10-1, IR 10-2. The legend on the map and corresponding table in the following pages will show the multiple shape files in the following format IR_10-10-1-10-2.

Maharashtra

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1	FP/MH/IRRIG/28653/2017	Sorna Medium Project	Pending at DFO/DCF	No	163.36
IR_2	FP/MH/IRRIG/28933/2017	Minor Irrigation Tank at Jiwati-2	Draft	No	465.3
IR_3	FP/MH/IRRIG/28947/2017	Minor Irrigation Tank at Gudsela	Draft	No	498.4
IR_4	FP/MH/IRRIG/28560/2017	Kodepur M.I. Tank	Draft	No	750.1
IR_5	FP/MH/IRRIG/28831/2017	Chenna Project	Draft	No	
IR_6-6-6	FP/MH/IRRIG/25880/2017	Kotgal Barrage Dist. Gadchiroli	Pending at DFO/DCF	No	36571
IR_7	FP/MH/IRRIG/24961/2017	Mahadapur Minor Irrigation project, Tal Zarijamni, Dist Yavatmal	Draft	Nil	NA
IR_8	FP/MH/IRRIG/17077/2015	Mahadapur M.I.Project	Draft	Nil	NA
IR_9-9-1-9-2	FP/MH/IRRIG/15702/2015	Surewada Lift Irrigation Scheme	In-Principle	Yes	6858.658
IR_10-10-1-10-2	FP/MH/IRRIG/14900/2015	Raperi Storage Tank	Pending at DFO/DCF	Yes	683.625
IR_11	FP/MH/IRRIG/13270/2015	Dumi Nala Project	Draft	No	6268.29
IR_12-12-1-12-2	FP/MH/IRRIG/9277/2015	Asolamendha Renovation Project	Draft	No	189391
IR_13-13-1	FP/MH/IRRIG/8281/2014	Uma Barrage	Pending at Nodal Officer	No	237.23
IR_14	FP/MH/IRRIG/8418/2014	Irrigation Tank at Nandpur	Draft	No	10
IR_15	FP/MH/IRRIG/6212/2014	Zadkinhi Percolation Tank	Draft	No	130.65
					242027.61

Railway Projects

Maharashtra

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RY_1	FP/MH/RAIL/ 26520/2017	Construction of New Broad Gauge Railway Line between Wadsa-Gadchiroli	Pending at Nodal Officer	No	40300
RY_2	FP/MH/RAIL/ 6560/2014	Wardha-Nanded_new railway line	Pending with UA	No	250105
RY_3	FP/MH/RAIL/ 21214/2016	Convertion of Existing MG to BG between Akot - Amal Kd	Draft	Yes	142100.2
					432505.2

Maharashtra Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/MH/ROAD/ 23603/2017	Kurkheda to Korchi	Draft	No	17579
RO_2	FP/MH/ROAD/ 23208/2016	Kohmara to Gondia_NH753	Draft	No	13000
RO_3	FP/MH/ROAD/ 23193/2016	Sakoli to Gadchiroli_NH353C	Draft	Nil	36196
RO_4	FP/MH/ROAD/ 23193/2016	Sakoli to Gadchiroli	Draft	Nil	36196
RO_5	FP/MH/ROAD/ 23161/2016	Kohmara to Gondia_NH753	Draft	Nil	12133
RO_6	FP/MH/ROAD/ 21567/2016	Gadchiroli to Ashti_NH353C	Pending at DFO/DCF	No	68392
RO_7	FP/MH/ROAD/ 21435/2016	Bamni to MS Border	Draft	No	54000
RO_8	FP/MH/ROAD/ 21435/2016	Bamni to MS border	Draft	No	
RO_9	FP/MH/ROAD/ 21434/2016	Bramhapuri to Kurkheda	Draft	No	58710
RO_10	FP/MH/ROAD/ 21112/2016	Umred to Naghbir	Draft	Yes	46208.2
RO_11		Murumgaon to Chandrapur	Draft	No	
RO_12	FP/MH/ROAD/ 21085/2016	Upgradation of Existing National Highway No.930_from Murumgaon to Chandrpaur	Draft	No	84339
RO_13	FP/MH/ROAD/ 20411/2016	Nagpur Mumbai expressway_Jamtha to Pulgaon	Pending at DFO/DCF	No	460000
RO_14	FP/MH/ROAD/ 18589/2016	Nagpur-Nagbhir_Bramhapuri_Armori_NH353D	Draft	Yes	90432
RO_15	FP/MH/ROAD/ 17878/2016	Gadchiroli-Sironcha_NH353C	Pending with UA	No	200000
RO_16_17_18	FP/MH/ROAD/ 16119/2015	Wardha-Yavatmal-Wardha_Nanded_NH361	Pending at RO	No	319600
RO_19	FP/MH/ROAD/ 26861/2017	Wadi to Asola-NH353I	Pending at DFO/DCF	No	36383
RO_20	FP/MH/ROAD/ 26789/2017	Sakoli to Gadchiroli	Pending with UA	No	3889.7
RO_21	FP/MH/ROAD/ 26789/2017	Wadsa line	Pending with UA	No	

Road Projects

Maharashtra

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_22	FP/MH/ROAD/ 26786/2017	Sec1_Sakoli to Gadchiroli	Pending at DFO/DCF	Yes	4924.7
RO_23	FP/MH/ROAD/ 26063/2017	Korchi-Deori-Amgaon-Gondia NH543	Pending at DFO/DCF	No	37870
RO_24	FP/MH/ROAD/ 25848/2017	Nanded-Kinwat-Mahur-Arni	Pending at DFO/DCF	Nil	22262
RO_25	FP/MH/ROAD/ 25803/2017	Talegaon to Gonapur-NH347A	Draft	Nil	40696
RO_26	FP/MH/ROAD/ 25563/2017	NH353C_Bamni to Gondpipri upto Ashti	Pending at DFO/DCF	No	29100
RO_27	FP/MH/ROAD/ 25019/2017	Wardha - Arvi	Pending with UA	Nil	22232
RO_28	FP/MH/ROAD/ 24814/2017	Korchi_Deori_Amgaon_Gondia NH543	Pending at DFO/DCF	Nil	4096
RO_29-29-1	FP/MH/ROAD/ 24710/2017	Amravati-Nandgaon-Morshi-Warud-Pandhurna NH	Pending at DFO/DCF	No	85748
RO_30-30-1	FP/MH/ROAD/ 23243/2016	Khamgaon-Mehkar from Km 0.000 to 72.197	Pending at DFO/DCF	No	55319
					1839305.6

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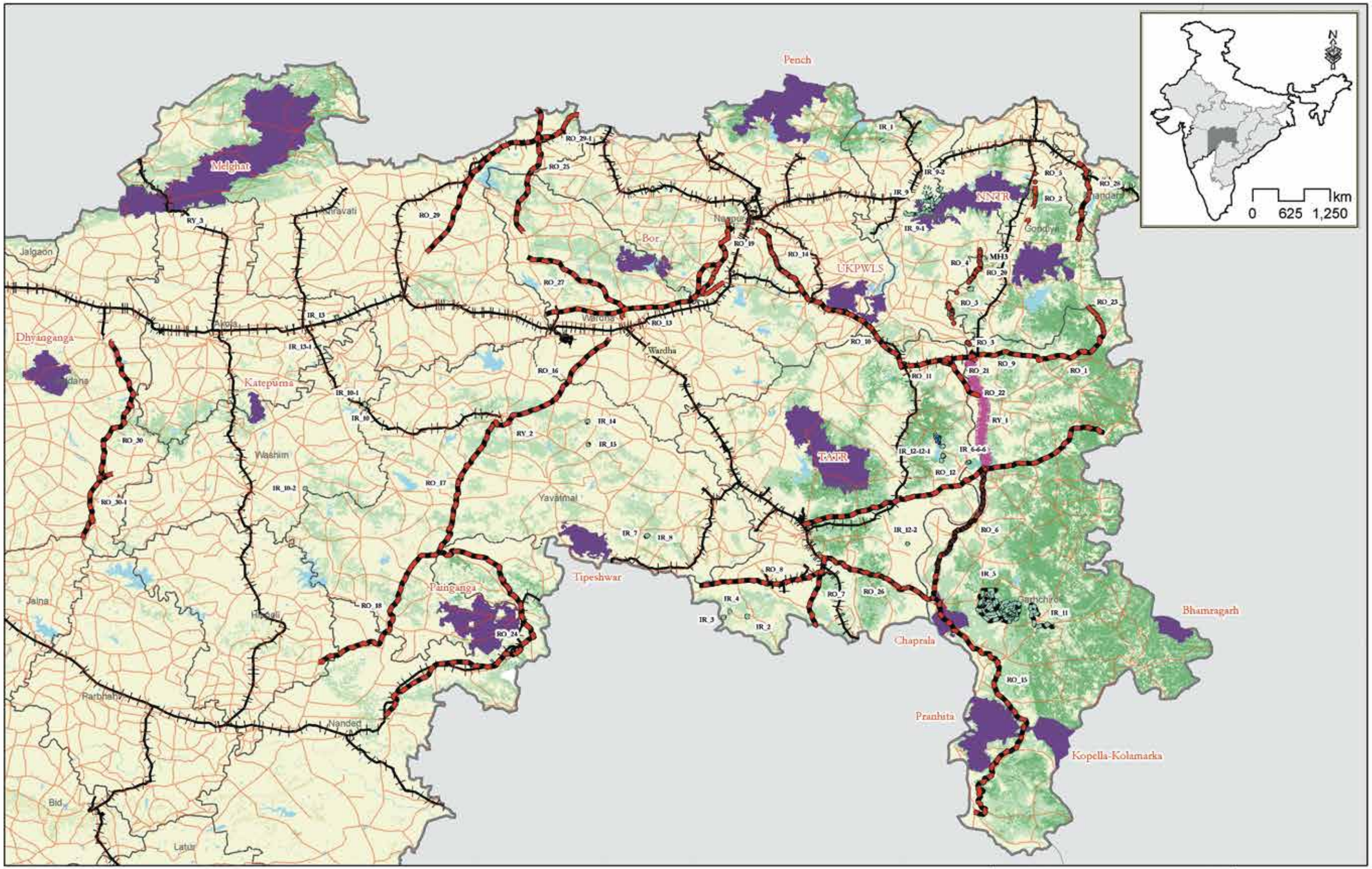

MAP 7

Tiger habitats in western Maharashtra are not covered in this report as they form part of the Western Ghats Tiger Landscape. (Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Odisha

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Odisha

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1	FP/OR/IRRIG/ 28837/2017	Hidsing Irrigation Project	Pending with UA	Yes	12932
IR_2	FP/OR/IRRIG/ 27768/2017	Kala Barrage Project	Draft	No	
IR_3	FP/OR/IRRIG/ 27418/2017	Proposal for Diversion of Fresh Forest Land Over 429.9064 Ha for construction of Rengali Irrigation Project	Pending with UA	No	78983.61
IR_4	FP/OR/IRRIG/ 27182/2017	Turpi Minor Irrigation Project	Pending at Nodal Officer	No	550.5
IR_5-5-1	FP/OR/IRRIG/ 25941/2017	Upper Lanth Medium Irrigation Project	Pending with UA	No	4899
IR_6-6-1	FP/OR/IRRIG/ 24883/2017	Samakoi Irrigation Project	Pending with UA	No	4385
IR_7-7-1	FP/OR/IRRIG/ 13364/2015	Aherajore Irrigation Project	IN-PRINCIPLE	No	5599.65
					107349.76

Railway Projects

Odisha

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RY_1	FP/OR/RAIL/ 23845/2017	Talcher-Bimalagarh New B.G. Raillink Project, Phase-II (Chainage 25.00km to 153.90km)	Pending with UA	No	192807
RY_1-2	FP/OR/RAIL/ 23845/2017	Talcher-Bimalagarh New B.G. Rail link Project, Phase-II (Chainage 25.00km to 153.90km)	Pending with UA	No	
RY_2	FP/OR/RAIL/ 22426/2016	Talcher-Sambalpur Railway Line Doubling Project	Pending with UA	No	111199
RY_3-3-8	FP/OR/RAIL/ 20055/2016	NTPC Ltd, Darlipali Super Thermal Power Project	Pending with UA	No	17600
RY_4	FP/OR/RAIL/ 20653/2016	Proposal for diversion of 13.630 ha of Sabik Kissam Revenue forest in Sundargarh and Jharsuguda 1	In-Principle	No	102600
RY_5-5-7	FP/OR/RAIL/ 22426/2016	Proposal for diversion of 23.20 Ha of Forest Land for Talcher-Sambalpur Railway Line Doubling Projec	Pending with UA	No	
RY_6-6-2	FP/OR/RAIL/ 18399/2016	Sambalpur - Titlagarh Railway Project	Pending at DFO/DCF	No	60400
					484606

Odisha

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/OR/ROAD/ 29316/2017	Sunabeda-Dhekunpani	Pending at DFO/DCF	Yes	310.96
RO_2	FP/OR/ROAD/ 29314/2017	Cherichuan to Kankermenji (Part-B) Via-Kholigaon , Majhagaon, Haluapali	Draft	NIL	505.72
RO_3	FP/OR/ROAD/ 29317/2017	Batibahal-Sunabeda	Pending at DFO/DCF	Yes	545.22
RO_4	FP/OR/ROAD/ 29343/2017	Dharmabandha to Katingpani via Bharuamunda	Pending at DFO/DCF	Yes	542.44
RO_5	FP/OR/ROAD/ 29345/2017	Komna-Nuagaon-Patpani	Pending at DFO/DCF	No	208.31
RO_6	FP/OR/ROAD/ 29359/2017	Sunabeda-Soseng	Pending at DFO/DCF	Yes	496.53
RO_7	FP/OR/ROAD/ 29360/2017	Sunabeda-Jamgaon	Pending at DFO/DCF	Yes	348.54
RO_8	FP/OR/ROAD/ 29018/2017	Batibahal-Sunabeda	Pending at DFO/DCF	Yes	546.56
RO_9	FP/OR/ROAD/ 29093/2017	Dharambandha-Siliaribahar	Pending at DFO/DCF	Yes	
RO_10	FP/OR/ROAD/ 29089/2017	Sunabeda-Gatibeda	Draft	NIL	311.05
RO_11	FP/OR/ROAD/ 29088/2017	Kotrabeda-Deosil	Draft	NIL	448.7
RO_12	FP/OR/ROAD/ 29092/2017	RD to Sethjamapni via-Musrangi	Pending at DFO/DCF	Yes	
RO_13	FP/OR/ROAD/ 29087/2017	Cherichuan to Kankermenji (Part-I) via-Kholigaon, Majhagaon, Haluapali	Draft	NIL	533.06
RO_14	FP/OR/ROAD/ 29084/2017	PMGSY works Package No. OR-28-243/ Batch-III (RD road MKata Jhamkari	Pending at Nodal Officer	No	744.57
RO_15	FP/OR/ROAD/ 29074/2017	PMGSY for the Package No. OR-28-229//Batch-II (Talab to Phulkusum).	Pending at Nodal Officer	No	416.06
RO_16	FP/OR/ROAD/ 29065/2017	Podabalanda chhak to Amjhari	Pending at Nodal Officer	No	340.32
RO_17	FP/OR/ROAD/ 29054/2017	PMGSY work Package- No-OR-28-209/ Batch-II (Telesingh Chhack to Arkhahude)	Pending at Nodal Officer	No	345.51

Road Projects

Odisha

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_18	FP/OR/ROAD/ 28940/2017	R.D. Road to Aradapal PMGSY Road	Pending with UA	No	196.45
RO_19	FP/OR/ROAD/ 25629/2017	Balasore-Baripada-Jharpokharia Section of NH-5	Pending at DFO/DCF	No	753.25
RO_20-20-1	FP/OR/ROAD/ 26360/2017	NH6 to Sarda in Jamankira block	Pending at DFO/DCF	Yes	320
RO_21	FP/OR/ROAD/ 25879/2017	Karda Jharbeda road of Chandiposh GP under Gurundisa Block	Draft	NIL	209.98
RO_22-22-2	FP/OR/ROAD/ 17495/2016	NH-6 Tansara Road in Jamankira block of Sambalpur District	Pending at DFO/DCF	Yes	212
RO_23-23-4	FP/OR/ROAD/ 17543/2016	Nh-6 to Lunvet road in Jamankira block of Sambalpur District	Pending with UA	Yes	640
RO_24	FP/OR/ROAD/ 24576/2017	Talchar-Dubari-Chandikhole section of NH-200	Draft	No	149456
RO_25	FP/OR/ROAD/ 23652/2017	Khadibahal Chowk-Palabani RD	Pending with UA	No	
RO_26-26-1	FP/OR/ROAD/ 23825/2017	NH-217 to Kankerminji via, Kermeli, Ptehipali, Golabandha	Pending with UA	No	1081.95
RO_27	FP/OR/ROAD/ 23286/2016	327/700 to 413/700km of NH326_Vijaywada-Ranchi corridor	Pending at Nodal Officer	No	21518.71
RO_28-28-1	FP/OR/ROAD/ 20160/2016	Widening & strengthening to NH-220 from km 35/700 to 71/120 km (Rairangpur - Jashipur section	Draft	No	9250.2
RO_29-29-1	FP/OR/ROAD/ 18943/2016	Singara - Brinjabahal Section of NH-6	Pending at Nodal Officer	No	95413
RO_30	FP/OR/ROAD/ 18864/2016	Brinjabahal - Teleibani Section of NH-6	Pending at Nodal Officer	No	92794
RO_31	FP/OR/ROAD/ 18846/2016	PMGSY from Banamahuladiha to Rohiniduma	Draft	No	107.18
RO_32	FP/OR/ROAD/ 18055/2016	road under PMGSY from Banamahuladiha to Rohiniduma in the district of Keonjhar.	Draft	No	776.84
RO_33	FP/OR/ROAD/ 18177/2016	Allada Baijhal PMGSY	Pending at DFO/DCF	No	120.226
RO_34	FP/OR/ROAD/ 17959/2016	Palaspanga-Bamebari KIDCO road	Pending with UA	No	16.57

Odisha

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_35	FP/OR/ROAD/ 17857/2016	Teleibani Sambalpur Section of NH-6	IN-PRINCIPLE	No	52282
RO_36	FP/OR/ROAD/ 17631/2016	Balngir-Sonpur section of NH57	Pending at Nodal Officer	No	15729.74
RO_37	FP/OR/ROAD/ 17550/2016	Bahargora To Singara	Draft	Yes	128294
RO_38	FP/OR/ROAD/ 17475/2016	SH24-Gardega	Pending at DFO/DCF	No	480
RO_39	FP/OR/ROAD/ 17128/2015	NH-149 from Pallahara to Pitri Section (Pallahara Bypass road)	Pending with UA	No	34205
RO_40	FP/OR/ROAD/ 7575/2014	Bankibahal-Kanika railway siding road	In-Principle	No	28518
RO_41	FP/OR/ROAD/ 15279/2015	Birmitrapur-Barkote_NH-23	Draft	NIL	1292.87
RO_42	FP/OR/ROAD/ 8446/2014	Roida-I_Iron ore mines	Pending with SG	No	87.7
RO_43	FP/OR/ROAD/ 15279/2015	Birmitrapur-Barkote_NH-23	Pending with UA	Yes	1292.87
RO_44	FP/OR/ROAD/ 14688/2015	0141_140/900 to 162/01 km of NH-57	In-Principle	No	9781
RO_45	FP/OR/ROAD/ 17857/2016	Teleibani-Sambalpur	Pending at Nodal Officer	No	52282
					703755.086

MAP 8

ODISHA

Legend

- Protected Area
- District Boundary
- State Boundary
- Existing Road Network
- ExistingRailway Network
- Proposed Road
- Proposed Railway
- Proposed Irrigation project

0 25 50 100 150 200 km

0 250 500 1,000 1,500 km

(Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Rajasthan

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Rajasthan

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/RJ/ROAD/ 29822/2017	Lakheri-Bijoliya	Draft	NIL	NA
RO_2	FP/RJ/ROAD/ 29821/2017	Bundi-Seelor-Gardara	Draft	NIL	NA
RO_3	FP/RJ/ROAD/ 29543/2017	Construction of 4-lane Road on NH-12 (New NH-52) from Km 289.500 to 299.000 (Design Chainage from -0.050 to 9.860) (Darah-Jhalawar-Teendhar section) including 6-lane Elevated Section in Mukandra National Park in the State of Rajasthan under NHDP Phase-I	Under Examination	Yes	84428
RO_4	FP/RJ/ROAD/ 29472/2017	NH-12 (New NH-52) from Km 289.500 to 299.000 (Design Chainage from -0.050 to 9.860) (Darah-Jhalawar-Teendhar section) including 6-lane Elevated Section in Mukandra National Park in the State of Rajasthan under NHDP Phase-III on EPC Mode	Draft	Yes	NA
RO_5	FP/RJ/ROAD/ 29365/2017	Construction of Bundi bypass for SH. 29 km. 95/500 to N.H. 12 (New N.H. 52) Km. 217/400	Under Examination	No	4000
RO_6	FP/RJ/ROAD/ 28770/2017	Road From Meena Koleta to Bhanwra via Naneta Ghati	Under Examination	No	626.52
RO_7	FP/RJ/ROAD/ 28829/2017	Road Repair From Akeda Doonger to Sisyawas Road Km 0/0 to 3/400	Draft	Yes	75.48
RO_8	FP/RJ/ROAD/ 16316/2015	Constrction of B.P Road from Nathara Bada Chouraha to Gota Pani .	Under Examination	No	305.07
RO_9	FP/RJ/ROAD/ 16317/2015	B.T. Road From Mandas To Kalat Phala Km.0/0-5/100	Draft	No	222.49
RO_10	FP/RJ/ROAD/ 20374/2016	Bt Road From Manpur To Handiphala	Draft	No	223.45
RO_11	FP/RJ/ROAD/ 20386/2016	Bt Road Kakan Gadawan To Khada Fala	Draft	No	146.55
RO_12	FP/RJ/ROAD/ 20389/2016	Bt Road From Alsigarh To Nal Phalla Road	Draft	No	291.76

Road Projects

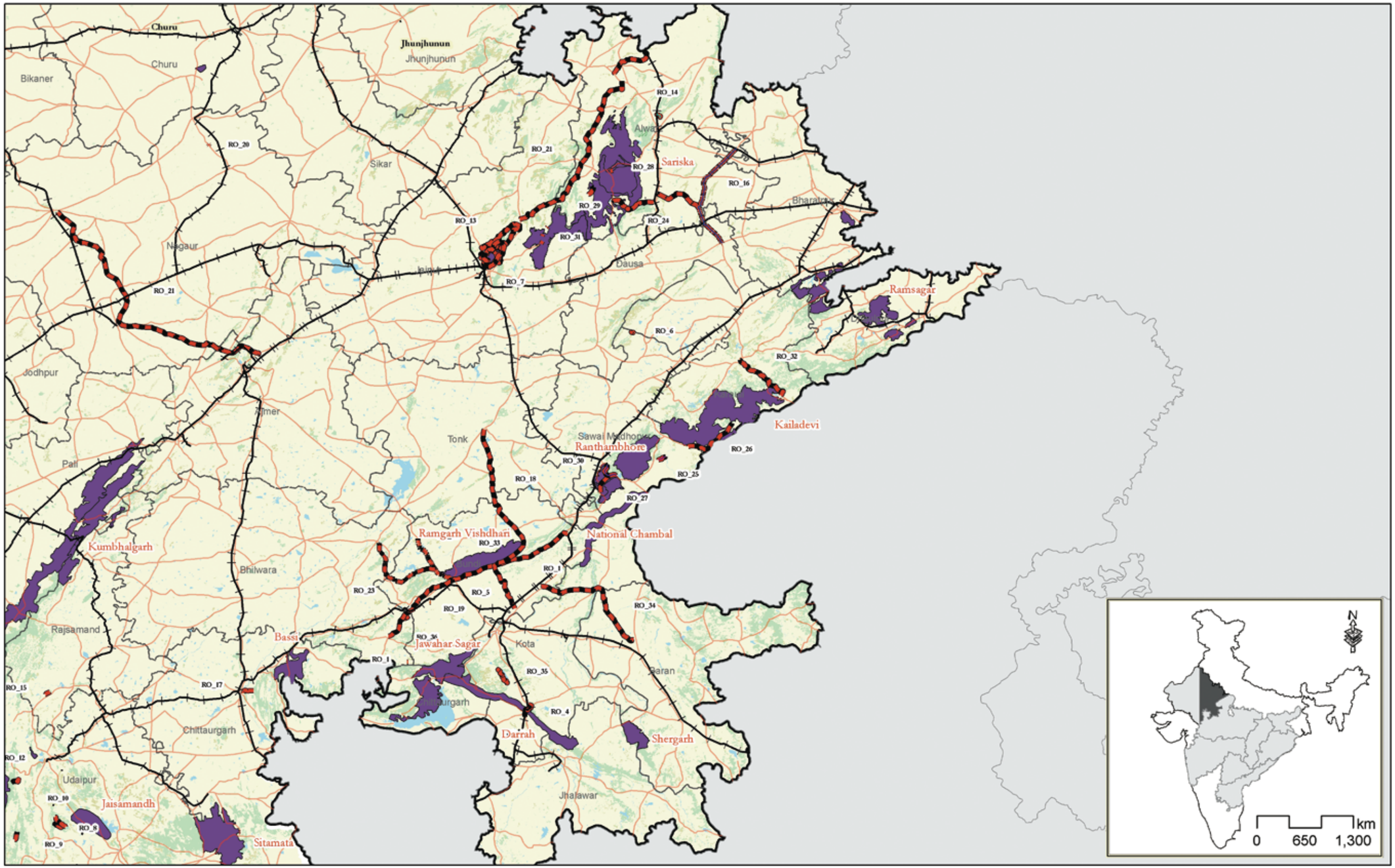
Rajasthan

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_13	FP/RJ/ROAD/ 26707/2017	Construction of Renewal Road Repair From Akeda Doonger to Sisyawas Road Km 0/0 to 3/400	Draft	Yes	75.48
RO_14	FP/RJ/ROAD/ 26659/2017	Construction of Missing Link Road Village Sirmoli to Naurangabad 0.9735 Ha	Under Examination	No	137.6
RO_15	FP/RJ/ROAD/ 17192/2015	Widening of existing intermediate lane to 2 lane with paved shoulder from design km 0+000 to km 142+028,Charbuja to Bhatever of NH-162E	Under Examination	No	43900
RO_16	FP/RJ/ROAD/ 25089/2017	Two laning of Km 0.0 to Km 62 from Mahuwa to Govindgarh (via Lakshmangarh) Section of SH-35	Under Examination	No	16182
RO_17	FP/RJ/ROAD/ 24722/2017	Widening, Strengthen & Recarpeting of Road From Delhi Gate NH-79 Via Manpura/ Gopalnagar, Chittorgarh	Under Examination	No	748
RO_18	FP/RJ/ROAD/ 21227/2016	Tonk - Nainwa - Keshoraipatan Road (SH-34)	Draft	NIL	10734
RO_19	FP/RJ/ROAD/ 21226/2016	Bundi - Silor - Gararda - Bhopatpura Road (SH-29)	Draft	NIL	10734
RO_20-20-1	FP/RJ/ROAD/ 22585/2016	Ajmer to Nagaur section of NH-89 between km.0/00 to 161/00	Pending with UA	No	37715
RO_21	FP/RJ/ROAD/ 21853/2016	Two Lanning of Azarka (SB)-Thanagazi-Tala Highway, Section of SH52 A, from km 0.000 to km 132.000, in the state of Rajasthan.	Under Examination	No	23786
RO_22	FP/RJ/ROAD/ 14613/2015	NH-148D Gulabpura-Uniara	Draft	Yes	73438
RO_23	FP/RJ/ROAD/ 14613/2015	NH-148D Gulabpura-Uniara	Draft	Yes	NA
RO_24	FP/RJ/ROAD/ 15308/2015	Tehla-Rajgarh-Gadi swai ram, SH-25A	NA	NA	NA
RO_25	FP/RJ/ROAD/ 15599/2015	Baler Karanpur road MDR-3 Km 42/0 to 65/0	Draft	NIL	679.58
RO_26	FP/RJ/ROAD/ 16547/2015	Construction of B.T. Road from Khandar Baler Road to Parsipura	Under Examination	Yes	145.29

Rajasthan

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_27	FP/RJ/ROAD/ 16554/2015	Construction of Sawai Madhopur Bye Pass Road	Draft	Yes	4133.49
RO_28	FP/RJ/ROAD/ 16591/2015	Construction of Road From Bharthari to Kundalka Village	Under Examination	Yes	23.18
RO_29	FP/RJ/ROAD/ 16592/2015	Construction of Road From Kishori to Raipura Village	Under Examination	Yes	131.21
RO_30	FP/RJ/ROAD/ 16889/2015	Widening, Strengthening and Reconstruction of Sawai Madhopur - Shivpuri Road (SH-30)	Pending at Nodal Officer	Yes	7404.35
RO_31	FP/RJ/ROAD/ 19379/2016	Repair of Ramgarh dam to Raisar road, Jamwaramgarh, jaipur, rajasthan	Draft	Yes	190
RO_32	FP/RJ/ROAD/ 19709/2016	Development of Mandrayal - Karauli SH-22 road, from km 0.000 to km 38.750, in the state of Rajasthan	Under Examination	Yes	NA
RO_33	FP/RJ/ROAD/ 20991/2016	Tonk - Nainwa - Keshoraipatan Road (SH-34)	Draft	NIL	NA
RO_34	FP/RJ/ROAD/ 21558/2016	Development of Kaprain-Baran Highway, Section of SH-37A , From Design Chainage km 0.000 to km 67.750 in the state of Rajasthan(Highway-IV of East West Corridor- South	Under Examination	Yes	15997
RO_35	FP/RJ/ROAD/ 19525/2016	Construction of road Mandliya to Pachpahar	NA	NA	NA
RO_36	FP/RJ/ROAD/ 20888/2016	SH-29 (Km. 139/500) to Lorda Road	Pending at DFO/DCF	No	183.35
					336656.85



Wildlife Conservation Trust

RAJASTHAN

0 25 50 100 150 200 km

Legend

- Protected Area
- District Boundary
- State Boundary
- Existing Road Network
- Existing Railway Network
- Proposed Road

N

(Please note that some of the project shapes are too small to be visually depicted on a map of this scale. Please refer to the web portal www.connectivityconservationindia.org for a better visualisation)

Projects in

Telangana

Note : Road projects are identified by the prefix “RO”. Railway projects are identified by the prefix “RY”. Irrigation projects are identified by the prefix “IR”. In majority of the cases project shape files only show the portion of the project passing through the forested area for which clearance is being sought. In some cases projects cut through multiple patches of forest, therefore the said project may have multiple shape files. In such cases a particular proposal number may have multiple corresponding shape files. The multiple shape files for that particular proposal are numbered as per the following example: IR 10, IR 10-1, IR 10-2. The legend on the map and corresponding table in the following pages will show the multiple shape files in the following format IR_10-10-1-10-2.

Telangana

Irrigation Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
IR_1	FP/TG/IRRIG/ 29724/2017	Sitarama Lift Irrigation Project in Bhadradri - Kothagudem and Khammam Districts	Pending at RO	Yes	1326386
IR_2-2-1	FP/TG/IRRIG/ 29008/2017	Construction of Dindi Balancing Reservoir of AMRSLBC Tunnel Scheme across Dindi River near Mothiyathanda, Teldevarapally (V), Chandampet (M, Nalgonda District)	Draft	Yes	281300
IR_3	FP/TG/IRRIG/ 26376/2017	Construction of Checkdam and excavation of Feeder Channel to Singhabhupalem reservoir under Misson Kakatiya Phase-I in Bhadradri Kothagudem district	Pending with UA	No	213
IR_4	FP/TG/IRRIG/ 25749/2017	JCR DLIS - Phase -III, Package-V in Warangal (R) and Jayashanker Bhupalpalli District	Pending with UA	Yes	30569.6
IR_5	FP/TG/IRRIG/ 25407/2017	Excavation of canal for formation of banks near Buthermanala Vagu, Asifabad - Komaram Bheem District	Pending with UA	No	697
					1639165.6

Road Projects

Telangana

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_1	FP/TG/ROAD/ 29591/2017	Pasra-Bhupalpally road from km 46/100 to 58/040 in Jayashanker Bhupalpally District	NA	NA	2350
RO_2	FP/TG/ROAD/ 29181/2017	RF Bussapur-Laknavaram of Govindaraopet	Under Examination	No	200
RO_3	FP/TG/ROAD/ 28931/2017	Nizamabad-Jagdalpur section of NH-63	Under Examination	No	
RO_4	FP/TG/ROAD/ 27534/2017	Nakrekal - Nagarjunasagar section of NH-565 from km 75/460 to 73/395 in Nelikal Rf in Nalgonda district	Pending with SG	Yes	27000
RO_5	FP/TG/ROAD/ 25623/2017	approach road from Gajulagudem Railway sliding to the plant site of M/s. Navabharath Ventures Ltd	Pending at DFO/DCF	No	0
RO_6	FP/TG/ROAD/ 24732/2017	road Yellandu to Pakhal from km 48/000 to 59/100 in warangal district	Draft	Yes	1350
RO_7	FP/TG/ROAD/ 23554/2017	Existing National Highway road between Hyderabad to Thokapally	Under Examination	NIL	
RO_8	FP/TG/ROAD/ 23697/2017	Kamarpally (V) to Mallana Gutta Malikarjuna Swamy Temple Road in Siddipet District	In-Principle	No	60
RO_9	FP/TG/ROAD/ 23460/2017	BT Road Balijapally to Karne Thanda of Ghanpur Mandal, Mahabubnagar District	In-Principle	No	400
RO_10	FP/TG/ROAD/ 21649/2016	Nakerrekal to Mallampally of NH- 365 in Warangal District	Draft	No	12000
RO_11	FP/TG/ROAD/ 21408/2016	Yellandu Gundala Road from km 0/0 to 51/6 in Khammam Dist	Draft	No	9537.79
RO_12	FP/TG/ROAD/ 21163/2016	Mothukuraopet Road from km 0/0 to km 13/0 in Karimanagar Dist	Draft	No	210
RO_13	FP/TG/ROAD/ 20665/2016	Beeravelly to Loolam in Adilabad District	Draft	No	24400
RO_14	FP/TG/ROAD/ 20525/2016	Seethanagarm to Kurnapally from km 0/0 to 20/0 , Khammam Dist	Draft	No	3500

Telangana

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_15	FP/TG/ROAD/ 20523/2016	R.Kothagudem to Kurnapally from km 0/0 to 11/600 , Khammam Dist	Draft	No	1800
RO_16	FP/TG/ROAD/ 20381/2016	PWD Road to Pegadapally to Medaram Road from km 0/0 to 19/2 in Karimnagar District	Draft	No	1920
RO_17	FP/TG/ROAD/ 20352/2016	Urattum to Iylapur road via kondai from km 1/9 to km 23/9 and from iylapur to Buttaigudem road via sarvai from km 0/0 to 13/0 in Warangal District	Draft	Yes	4850
RO_18	FP/TG/ROAD/ 20349/2016	Mukunur to Tupakulagudem road from km 2/3 to km 8/8 in Warangal District	Draft	No	600
RO_19	FP/TG/ROAD/ 20335/2016	Korutla to Mallapur Road from km 15/0 to 26/250 in Karimnagar District	Draft	No	1300
RO_20	FP/TG/ROAD/ 20334/2016	Medipally to Bornapally Road from km 0/0 to 30/8 in Karimnagar District	Draft	No	7000
RO_21	FP/TG/ROAD/ 20260/2016	Sirikonda - Vemulawada Road from km 0/0 to 20/5 in Nizamabad District	Draft	No	2500
RO_22	FP/TG/ROAD/ 20199/2016	R & B Road to Dharmapuram via Mondithogu from km 2/0 to 6/600 in Yellandu Mandal of Khammam District	Pending at DFO/DCF	No	314
RO_23	FP/TG/ROAD/ 20107/2016	Vemanapally to Mukkidigudem road from km 0/0 to 7/3 and Mukkidigudem to Motlagudem Road from km 0/0 to 12/0 in Adilabad Dist	Pending at DFO/DCF	No	4400
RO_24	FP/TG/ROAD/ 20103/2016	Chennur -Vemanapally Road from km 6/5 to 31/125 km in Adilabad Dis	Pending at DFO/DCF	No	3130
RO_25	FP/TG/ROAD/ 19048/2016	Kotapally to Konampet road via Pangidisomaram (Kharji to Mannegudem) of Nennel Mandal, Adilabad District	Draft	No	347.4

Road Projects

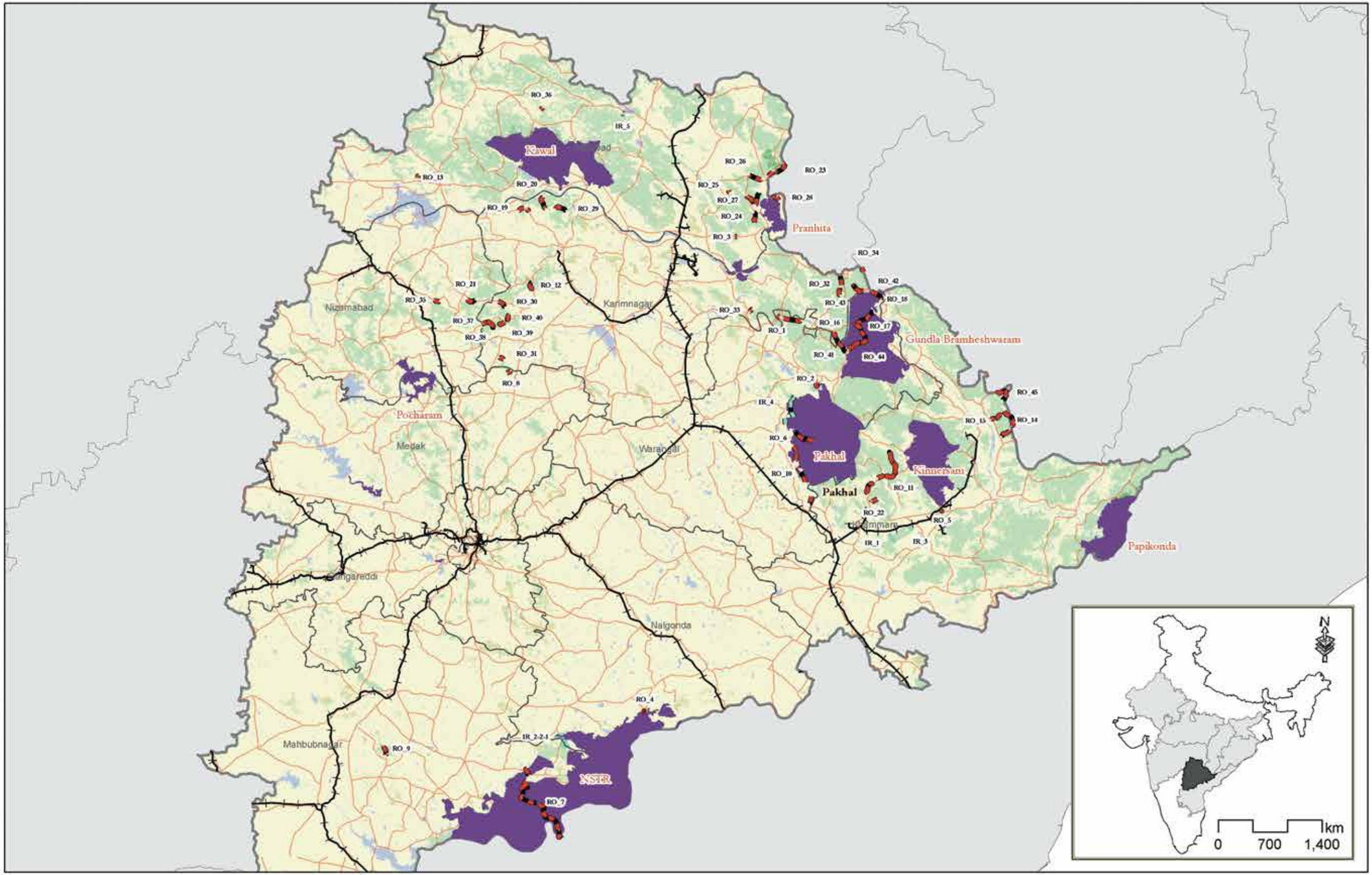
Telangana

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_26	FP/TG/ROAD/ 19045/2016	R & B Road from km 36/0 Vemanpally to Muthapur of Vemanapally Mandal from 0 to 11 km (Manganpally to Nagaram), Adilabad District	Draft	No	442.2
RO_27	FP/TG/ROAD/ 18952/2016	Mallampet to Baddampally via Nakkalapally	Draft	No	200
RO_28	FP/TG/ROAD/ 18953/2016	NH 63 Road @ 217/0 km to Neelwai via Venchapally	Draft	Yes	450
RO_29	FP/TG/ROAD/ 18939/2016	Rechnapally to Thatlawai Road	Draft	No	210
RO_30	FP/TG/ROAD/ 18918/2016	PWD Road (chandrampet) to Marrimadla via konaraopet	Draft	No	3600
RO_31	FP/TG/ROAD/ 18915/2016	Machareddy - Mustabad - Siddipet	Draft	No	2327
RO_32	FP/TG/ROAD/ 18615/2016	Pankena to Kanakanur Road from km 0/0 to 12/600 in Karimnagar District	Pending at RO	No	2350
RO_33	FP/TG/ROAD/ 18274/2016	Mallaram to Shatrajpally, Karimnagar District	Pending at CF/ CCF	No	401
RO_34	FP/TG/ROAD/ 18200/2016	Burugudem to Dammur Road from km 0/0 to 1/450 in Karimnagar District	Draft	No	260
RO_35	FP/TG/ROAD/ 18115/2016	Indalwai - Bheemgal Road from km 8/5 to 38/5 , Nizamabad district	In-Principle	No	1000
RO_36	FP/TG/ROAD/ 17957/2016	Hasnapur to Yellapur from km 0/0 to 10/4	Pending with UA	No	1250
RO_37	FP/TG/ROAD/ 17363/2016	Maddimala ZP road to Somarampet	Pending at DFO/DCF	No	
RO_38	FP/TG/ROAD/ 17362/2016	maddimala to Gundaram	In-Principle	No	320
RO_39	FP/TG/ROAD/ 17361/2016	PWD almaspur to Guntapallycheruthanda	IN-Principle	No	149.5
RO_40	FP/TG/ROAD/ 17357/2016	BT road from PWD road kancherla upto eklaspur	Pending with SG	No	290
RO_41	FP/TG/ROAD/ 17317/2015	R&B road at Narlapur to Kalvapally of Tadavai Mandal of Warnagal District	In-Principle	No	455

Telangana

Road Projects

No. in Map	Proposal No.	Name of Proposal	Proposal Status	Wildlife Clearance Required ?	Project Cost. (Rs. in Lakhs)
RO_42	FP/TG/ROAD/ 13147/2015	BT Road TO5 Palimela to Devadula via kamanpally to Mukunur in Mahadevpur	Pending at DFO/DCF	No	1009.13
RO_43	FP/TG/ROAD/ 13147/2015	BT Road TO5 Palimela to Devadula via kamanpally to Mukunur in Mahadevpur	Pending at DFO/DCF	No	
RO_44	FP/TG/ROAD/ 20352/2016	Urattum to Iylapur road via kondai from km 19 to km 239 and from iylapur to Buttaigudem road via sarva	Draft	Yes	4850
RO_45	FP/TG/ROAD/ 20524/2016	Road from Tippapuram to Chennapuram	Draft	No	1000
					129733.02



Wildlife Conservation Trust

TELANGANA

0 25 50 100 150 200 km

Legend

- Protected Area
- District Boundary
- State Boundary
- Existing Road Network
- Existing Railway Network
- Proposed Road
- Proposed Irrigation Project

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@AnishAndheria, WCT

Rajasthan
Uttar Pradesh
Bihar
Gujarat
Madhya Pradesh
West Bengal
Chhattisgarh
Odisha
Maharashtra
Telangana
Andhra Pradesh
Karnataka

Wildlife Conservation Trust

Legend

- Towns
- Protected Area
- State Boundary

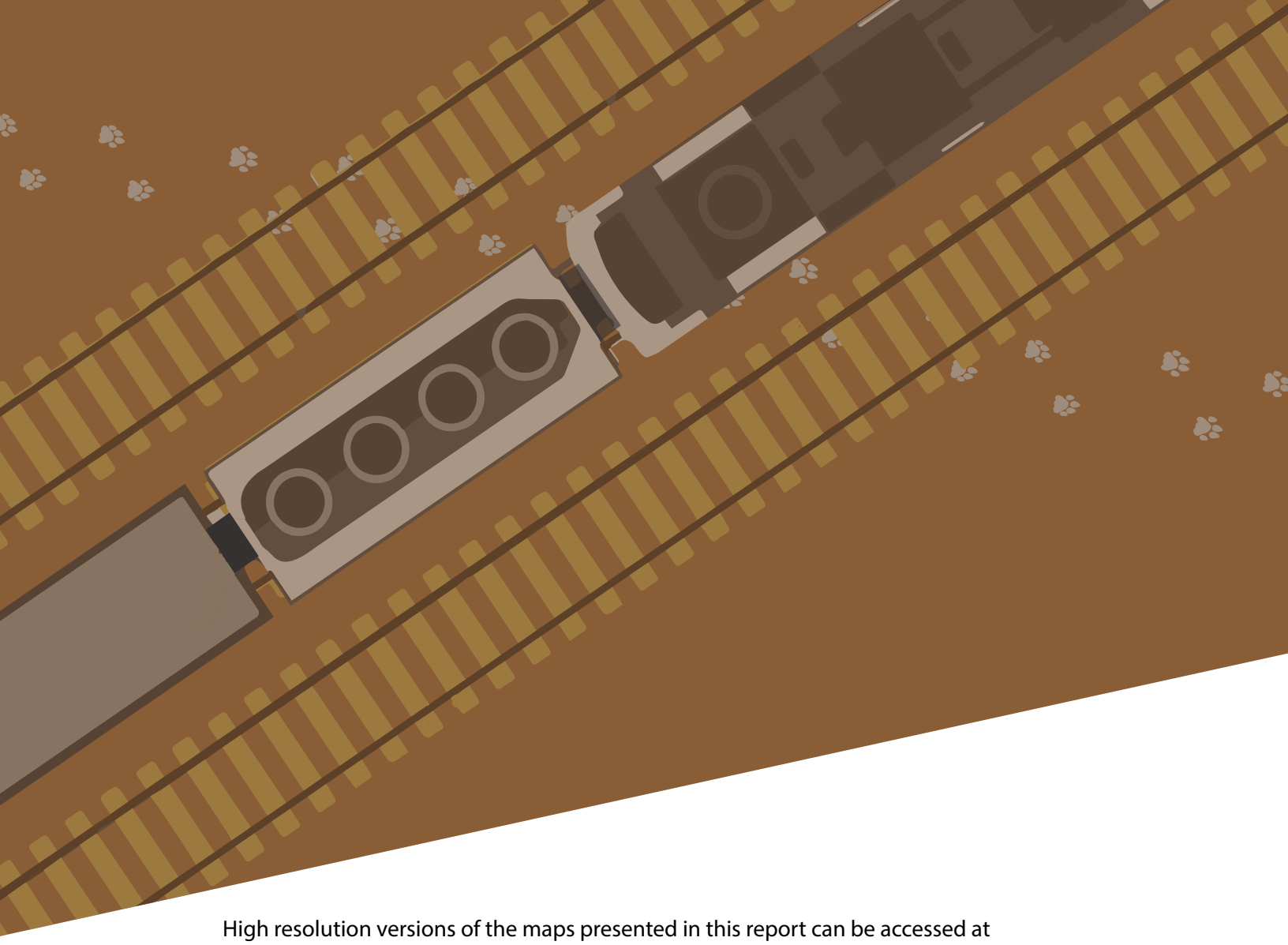
Tiger Connectivity

High

Low

0 62.5 125 250 375 500 km

MAP 11 A Policy Framework for Connectivity Conservation and Smart Green Linear Infrastructure Development in the Central Indian and Eastern Ghats Tiger Landscape



High resolution versions of the maps presented in this report can be accessed at
www.connectivityconservationindia.org

Wildlife Conservation Trust

Using the tiger as a metaphor for all of nature, the Wildlife Conservation Trust (WCT), a not-for-profit, was envisioned to preserve and protect India's rich natural heritage. WCT works closely with the government for the conservation of forests and wildlife in over 160 Protected Areas (PAs) and in forests outside the PA network, in 23 states. The organisation is involved in improving the protection mechanism of national parks and sanctuaries, in enforcement training, habitat and species conservation, mitigation of human-wildlife conflict, introducing innovative technologies in conservation and monitoring of large carnivores, and in providing healthcare to the frontline forest staff. Having understood the acute need for sustainability of both natural resources and humans, the organisation lays equal emphasis on conservation of ecosystems and rural development. Hence, creating better livelihood options for local communities and enhancing the quality of education in rural schools are important areas of intervention for the organisation.

Roadkills

Roadkills.in is a Citizen Science Initiative to collect data on mortality of wild animals on roads or railway lines in India. This Citizen Science Project endeavours to engage with concerned citizens across the country. We hope that the data collected will be useful to researchers and road planners across the country to help in reducing wildlife mortality, install wildlife crossing structures and also improve passenger safety whenever a road is planned or upgraded. Roadkills.in is an initiative by the Wildlife Conservation Trust (WCT) and which hopes to democratise data collection.

www.wildlifeconservationtrust.org

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