



WWF

REPORT

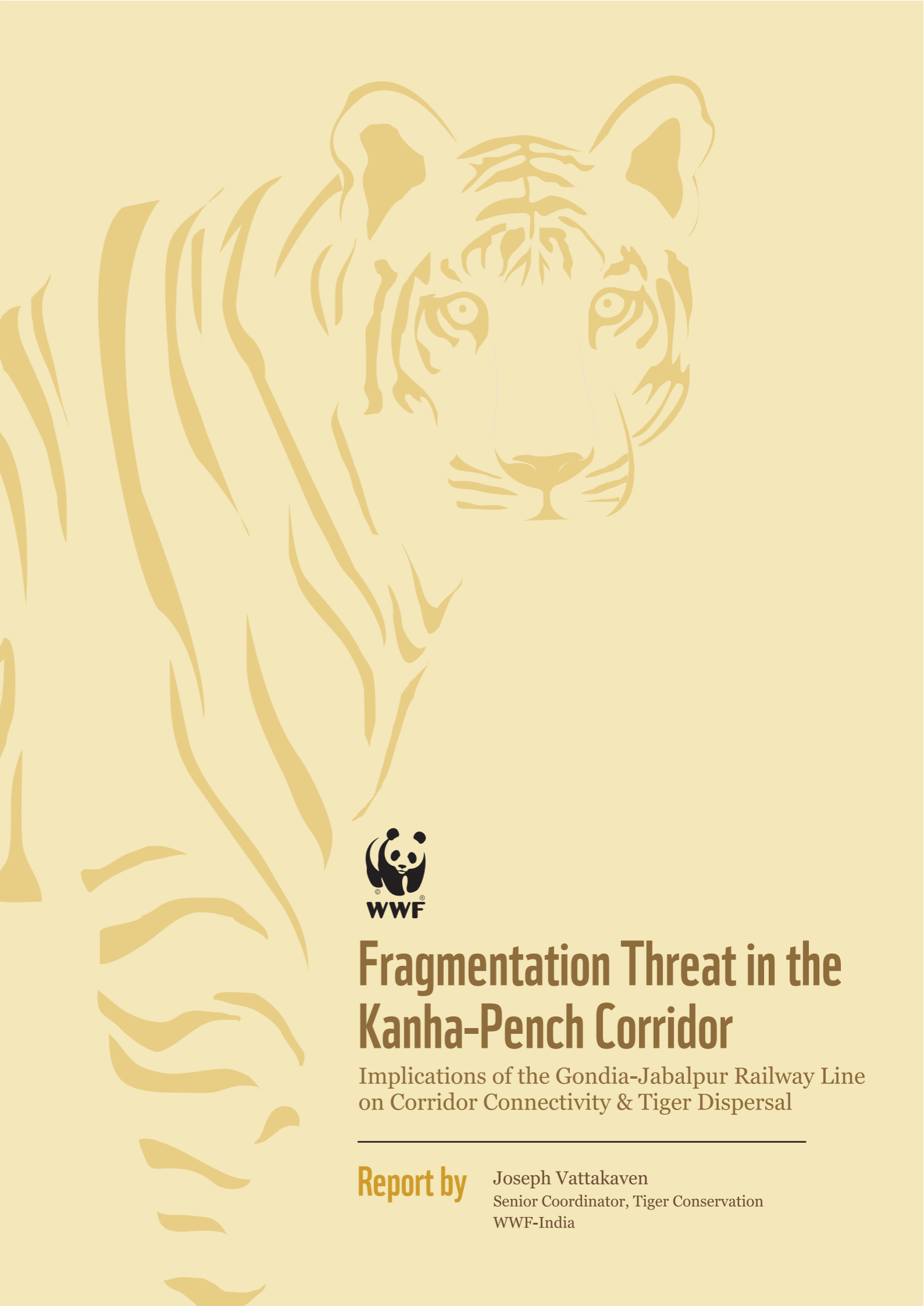
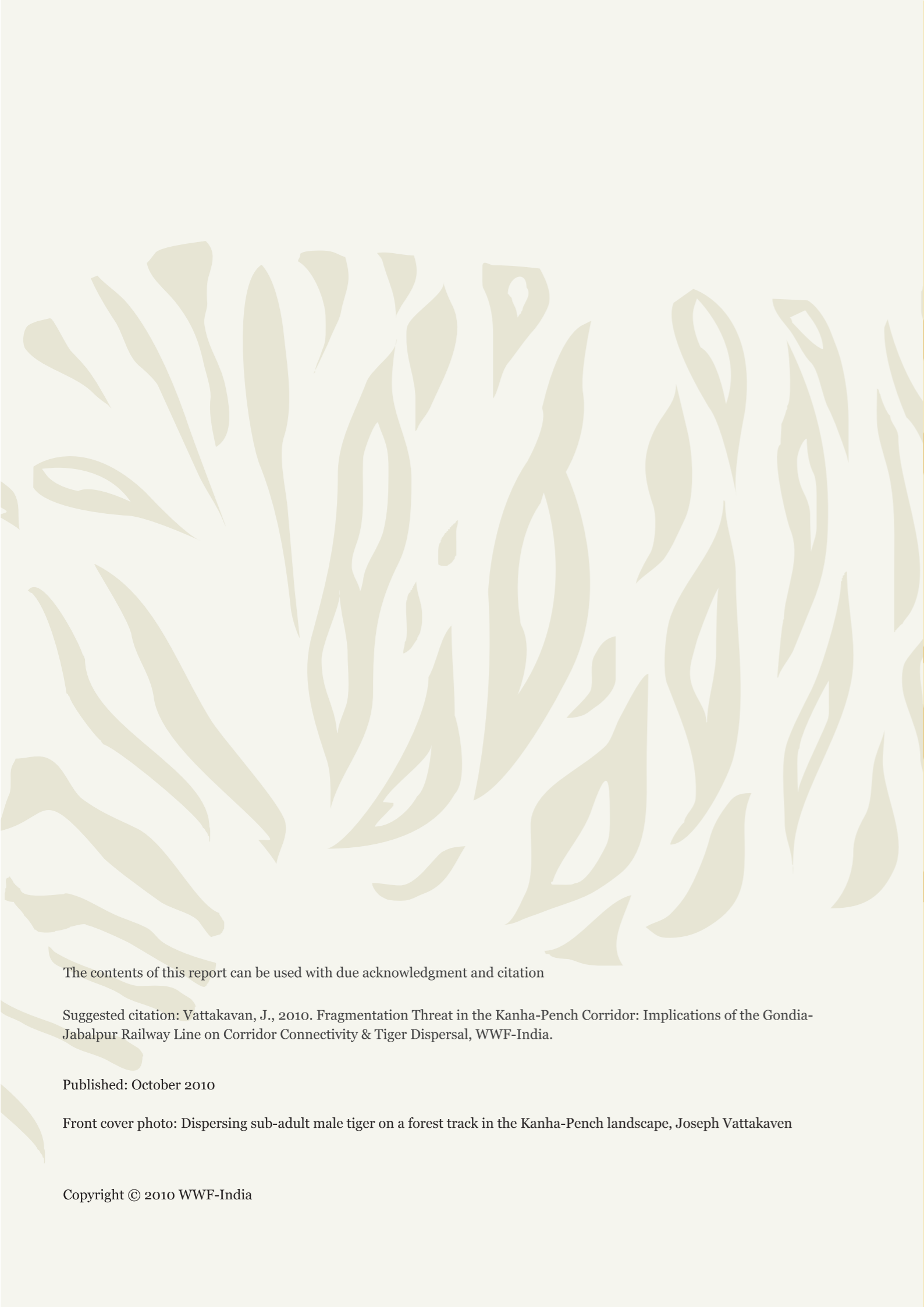
IND

2010



Fragmentation Threat in the Kanha-Pench Corridor

Implications of the Gondia-Jabalpur Railway Line
on Corridor Connectivity & Tiger Dispersal



The contents of this report can be used with due acknowledgment and citation

Suggested citation: Vattakavan, J., 2010. Fragmentation Threat in the Kanha-Pench Corridor: Implications of the Gondia-Jabalpur Railway Line on Corridor Connectivity & Tiger Dispersal, WWF-India.

Published: October 2010

Front cover photo: Dispersing sub-adult male tiger on a forest track in the Kanha-Pench landscape, Joseph Vattakaven

Copyright © 2010 WWF-India



Fragmentation Threat in the Kanha-Pench Corridor

Implications of the Gondia-Jabalpur Railway Line
on Corridor Connectivity & Tiger Dispersal

Report by

Joseph Vattakaven
Senior Coordinator, Tiger Conservation
WWF-India



Subadult tiger in the Kanha Pench landscape © 2010, Joseph Vattakaven

CONTENTS

Acknowledgement	4
Background	5
Existing forest linkages and blocks	7
Issue of railway line & its implications	11
Threat of roads in Kanha-Pench corridor	13
Conservation and management recommendations	18
References	20

ACKNOWLEDGEMENTS

I would like to thank the following individuals and organizations:

Mr Shuboranjan Sen, IFS is thanked for use of maps from his report on corridor linkages and blocks.

Dr Y.V Jhala and Qamar Qureshi, Wildlife Institute of India, Dehradun are thanked for use of corridor maps and WII-NTCA for permission letters for surveys.

South East Central Railways for facilitating site inspection and providing background information.

Pragathesh, JRF, WII is thanked for photographs of road kills of animals on NH-7 in K-P corridor. Outlook India (<http://www.outlookindia.com/images>) is thanked for tiger road kill photograph.

Jyotirmay Jena and Dr Jimmy Borah, and the entire SML team of WWF-India are thanked for discussion on the corridor and their inputs to this report from the Kanha-Pench occupancy survey.

Anil Cherukupalli is thanked for editing and proof reading this report

Copal Mathur, WWF-India is thanked for designing the report at short notice

Mr Ravi Singh, Dr. Sejal Worah and Dr. Diwakar Sharma from WWF-India are thanked for their inputs, help with logistics and coordination.



Background Issue

Diversion of 69.759 hectares of forest land falling within the Kanha-Pench Corridor has been proposed by the South Central Railway for conversion of the current Nainpur-Balaghat narrow gauge section to broad gauge. This proposed conversion is part of the larger Gondia-Jabalpur Broad Gauge project in Central India. There is also a proposed state highway that has come up almost parallel to the railway line. This proposed diversion of forest land for conversion to broad gauge along with the road will have a significant impact on tiger dispersal and viability of the Kanha-Pench corridor.

In order to carry out ground-truthing prior to the preparation of this report, site inspection was carried out by Joseph Vattakaven, WWF-India on 7-7-2010 by inspection carriage on Satpura Express from Nainpur to Balaghat, which is currently running on Narrow Gauge Line and passing through the Kanha-Pench Corridor.

Kanha-Pench Corridor

The Kanha-Pench Corridor, Madhya Pradesh, Central India, is one of the most important forest corridors in India and facilitates tiger dispersal between Kanha and Pench Tiger Reserves. The corridor is an extensive tract of wildlife habitat covering an area of over 16,000 sq km. It also acts as a refuge for several other mammals such as wild dogs, sloth bear, leopard, Indian wolf, hyena, jackal, sambar, gaur, chital etc. Corridors are vital and connect smaller tiger populations e.g. Pench and Achanakmar to larger source populations such as Kanha in this landscape. Without these source linkages, isolated populations face the risk of extinction due to poaching and loss in genetic vigour over generations. The Kanha-Pench landscape contiguity is essential to maintain a viable population of tigers in this landscape. Pench harbours a tiger population of about 30- 40 tigers, but in isolation it is far from viable. The connectivity to Kanha which harbours 73-105 tigers is essential to maintain a healthy population of tigers in this complex. (Fig 1)

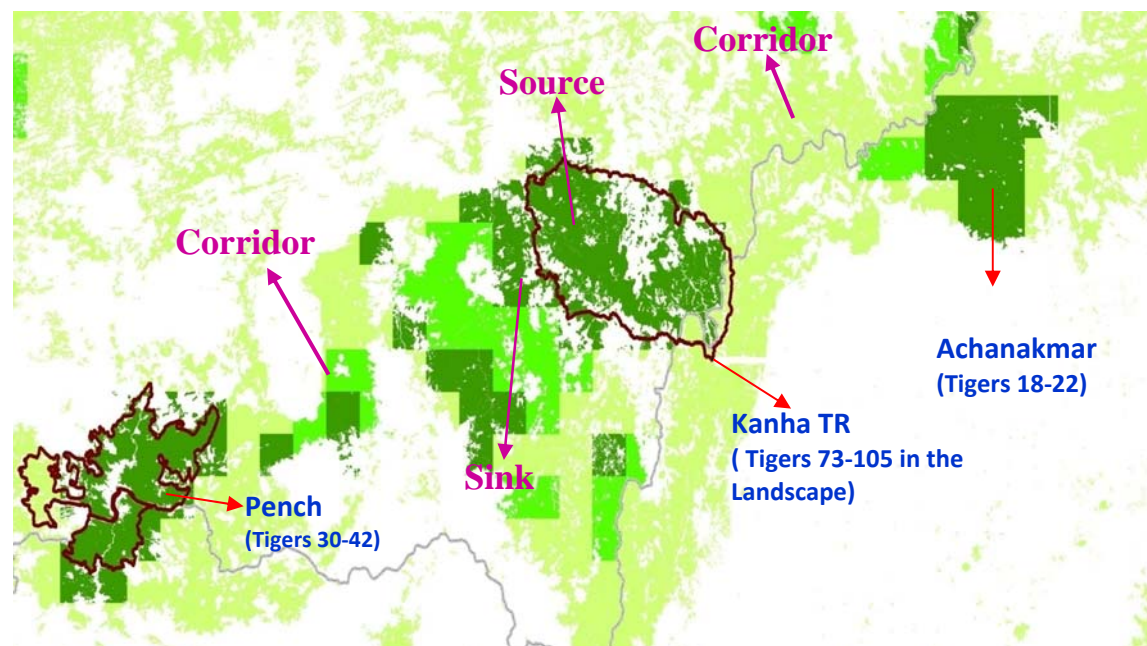


Fig 1: Kanha-Pench landscape showing corridor occupancy and tiger numbers (Source WII-NTCA-2008)



Fig 2: Tiger on gaur kill in Kanha

Photo: © Joseph Vattakaven

The Kanha Pench corridor is also a refuge for Gaur and is known to facilitate their movement. Gaur is an important prey species for tigers (Fig.-2) and when present in the corridor can help prevent killing of cattle by tigers and retaliatory conflict with people.

During the PhD study of the author at the Wildlife Institute of India (2004-2009), supported by NTCA, 10 tigers were radio-collared in Kanha to study their ecology and dispersal. Sub-adult males, governed by the tiger land tenure system are forced to move out of their natal areas and find new territories. These dispersing sub-adult males are often the ones that manage to use a corridor and get to the adjacent protected area. The challenges faced by radio-collared tigers as they try to disperse out of their natal areas via corridors are immense. Corridors are also areas of human-tiger conflict when dispersing tigers kill livestock, as was observed during the study in Kanha. A tiger passing through the corridor has to confront a range of threats such as hostile villagers, retaliatory poisoning of livestock kills, poaching of tigers and prey, electrocution by live wires, apart from road and rail traffic. One of these radio-collared tigers from Kanha (photograph on pg 8-9) faced severe conflict with people in the corridor and had to retreat back into the reserve, where it was eventually killed by another male tiger due to lack of territorial space. It was found that if a tiger survives all the perils in the corridor it would be lucky to reach the adjacent protected area (Pench or Achanakmar). The widening of railway lines and construction and widening of roads in the corridor will result in fragmentation of the corridor and thereby make dispersal all the more difficult for tigers and other animals that use this corridor.

A recent survey by WWF-India along with WII in May-June 2009 also showed that tigers along with their prey continue to use this corridor based on evidence of tiger and prey presence in the corridor, besides direct sighting of a tiger (Fig 3)

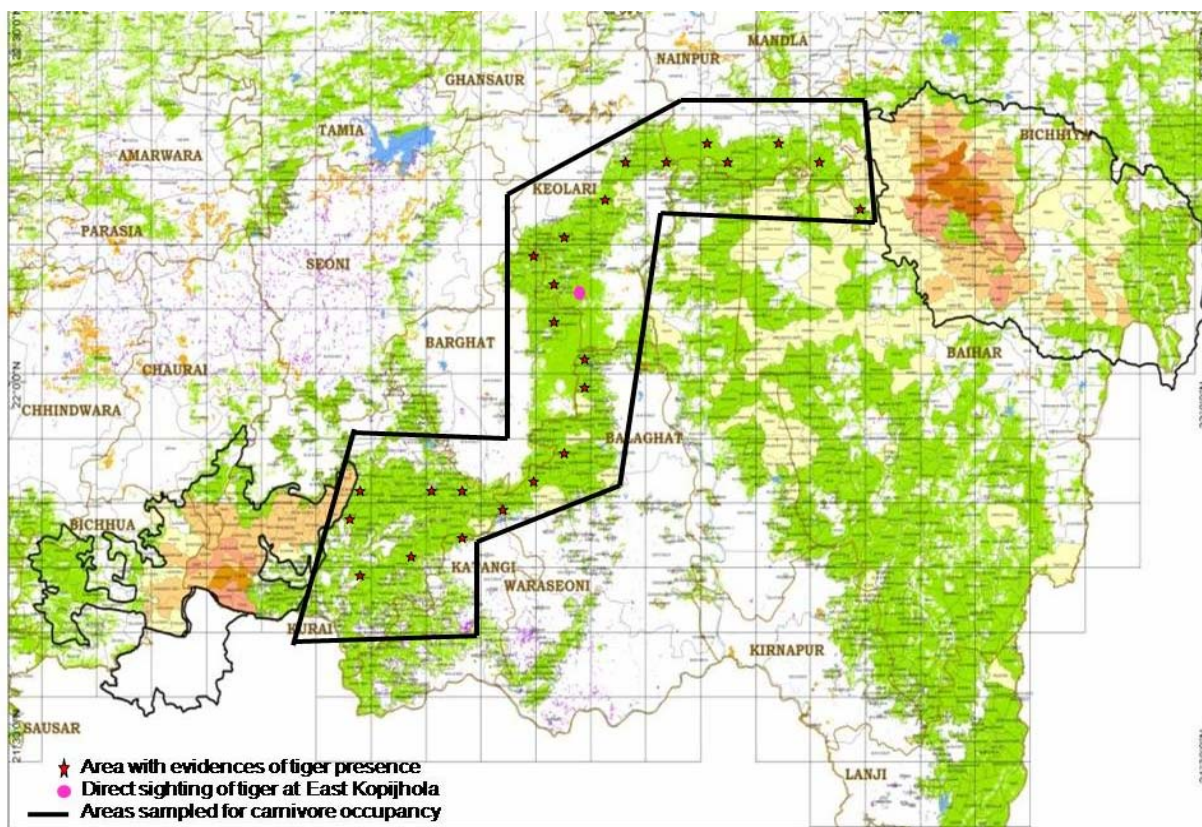


Fig 3: Kanha-Pench corridor with area sampled and evidence of tiger presence. (WWF-India-WII survey in May-June 2010)

The Existing Forest Linkages and Blocks

The existing forest linkages in the Kanha-Pench corridor have been highlighted by Mr. Suboranjana Sen, IFS who has been associated with this landscape complex for several years. An overview of these linkages will be of help in understanding why the proposed broadening of the railway line with the road is a threat to the integrity of the corridor by severing the crucial linkages. The following account on the critical linkages and blocks are from Mr. Sen's account of the corridor and personal communication.

“The present Kanha – Pench landscape shows continuous, if in several places tenuous linkages in the forest corridor, between the two conservation areas. In this forest corridor there are several segments which are extremely narrow or patchy. These segments are areas of concern, being areas with severely reduced connectivity with regard to animal presence and movements.”

The linkages that need to be immediately protected are as follows: (Fig 4, Red Borders)

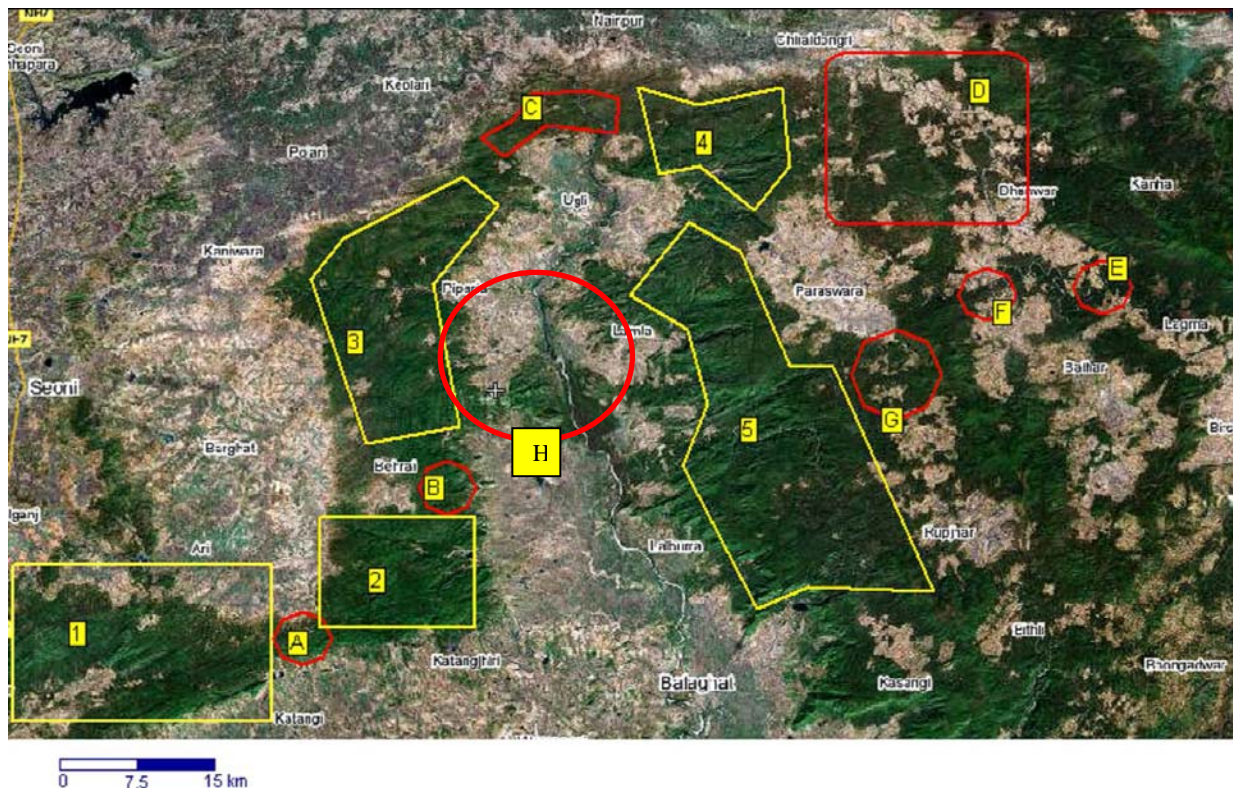


Fig- 4. Forest Linkages and Blocks (Source: Mr. Suboranjana Sen, IFS)

- A. Sarekha Ghat Link
- B. Latgaon Corridor Link
- C. Nainpur Corridor Link
- D. Khatia-Mocha Patch
- E. Boda Link
- F. Khapa Link
- G. Jalgaon –Amwahi Link
- H. Pandiyachhapara Link

These narrow linkages connect the following important forest blocks in the corridor: (Fig 4, Yellow Boundaries)

1. Proposed Rukhad Sanctuary (220 Km²)
2. Sonawani Block (120 Km²)
3. Kopijhola - Sonkhar Block (182 Km²)
4. Kota Block (148 Km²)
5. Tatighat Block (15 Km²)
6. Sarekha Block (67 Km²)
7. Loghat Block (Balaghat ~ 500 Km²)

TIGER DISPERSAL

Sub-adult male tigers, governed by the tiger land tenure system are forced to move out of their natal areas and find new territories. These dispersing sub-adult males are often the ones that manage to use a corridor and get to the adjacent protected area, thereby leading to the exchange of healthy genes between populations.



Railway line in the Kanha-Pench corridor and its implications:

The proposed diversion of 69.759 hectares of forest land for conversion of the Gondia-Jabalpur railway line to broad gauge will have significant impacts on the connectivity and viability of the Kanha-Pench corridor. The current railway line cuts through two of these linkages i.e. the Nainpur section of the corridor and near the Pandiyachapara link, both of which are crucial sections in the corridor (Fig 5).

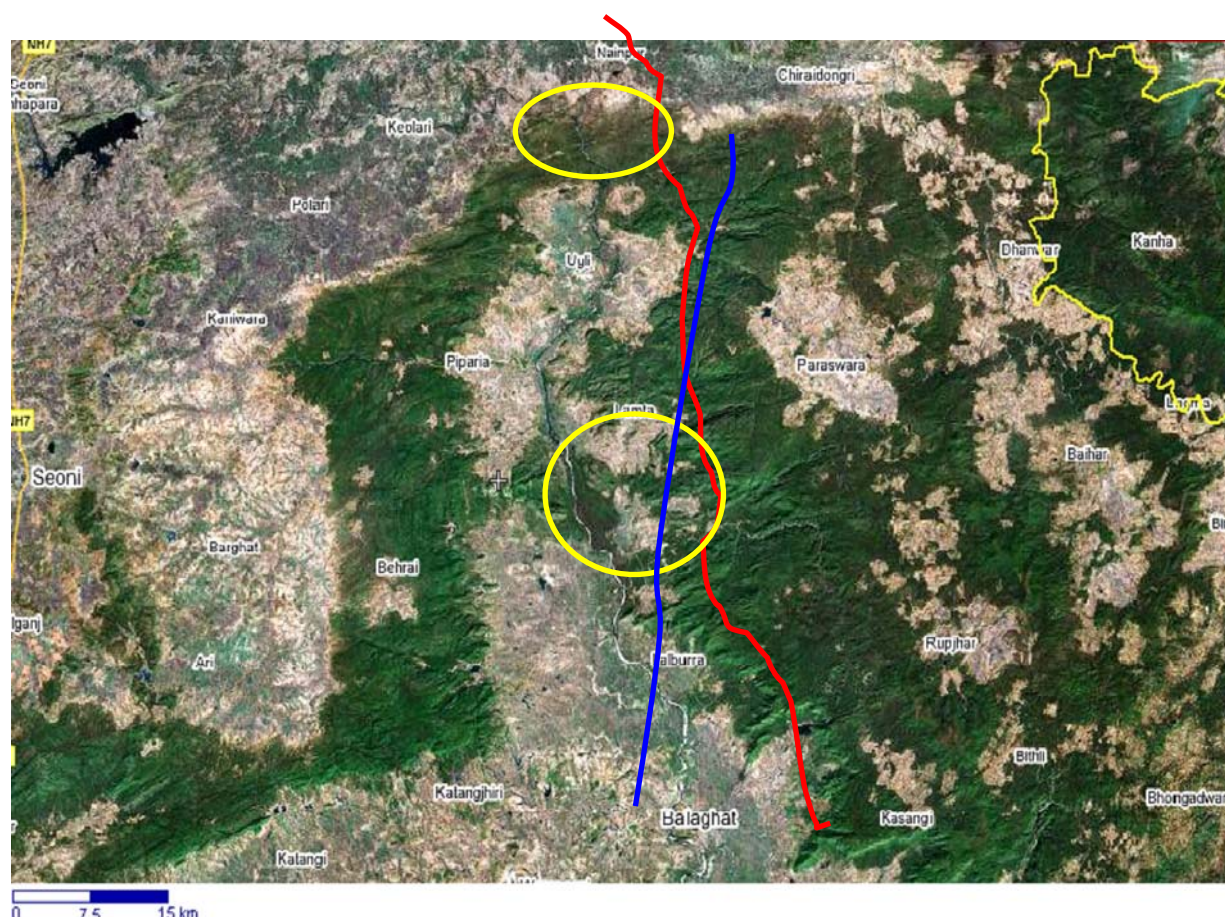


Fig 5: Railway line (approximate representation in Red) passing through the K-P corridor affecting two crucial linkages: Nainpur link and Pandiyachapara link (in Yellow) and the adjoining road from Nainpur to Balaghat (approximate representation in blue).

The line also passes through forest patches in Pardiganj, Lamta, North Balaghat division and South Balaghat division, in the Nainpur-Balaghat section of the railway line. (Fig 6)

Out of the 69.75 hectares of forest land required by the project, 19 hectares are required for straightening of the current railway line at Pardiganj and 50 hectares are required for widening of the narrow gauge line to broad gauge line.

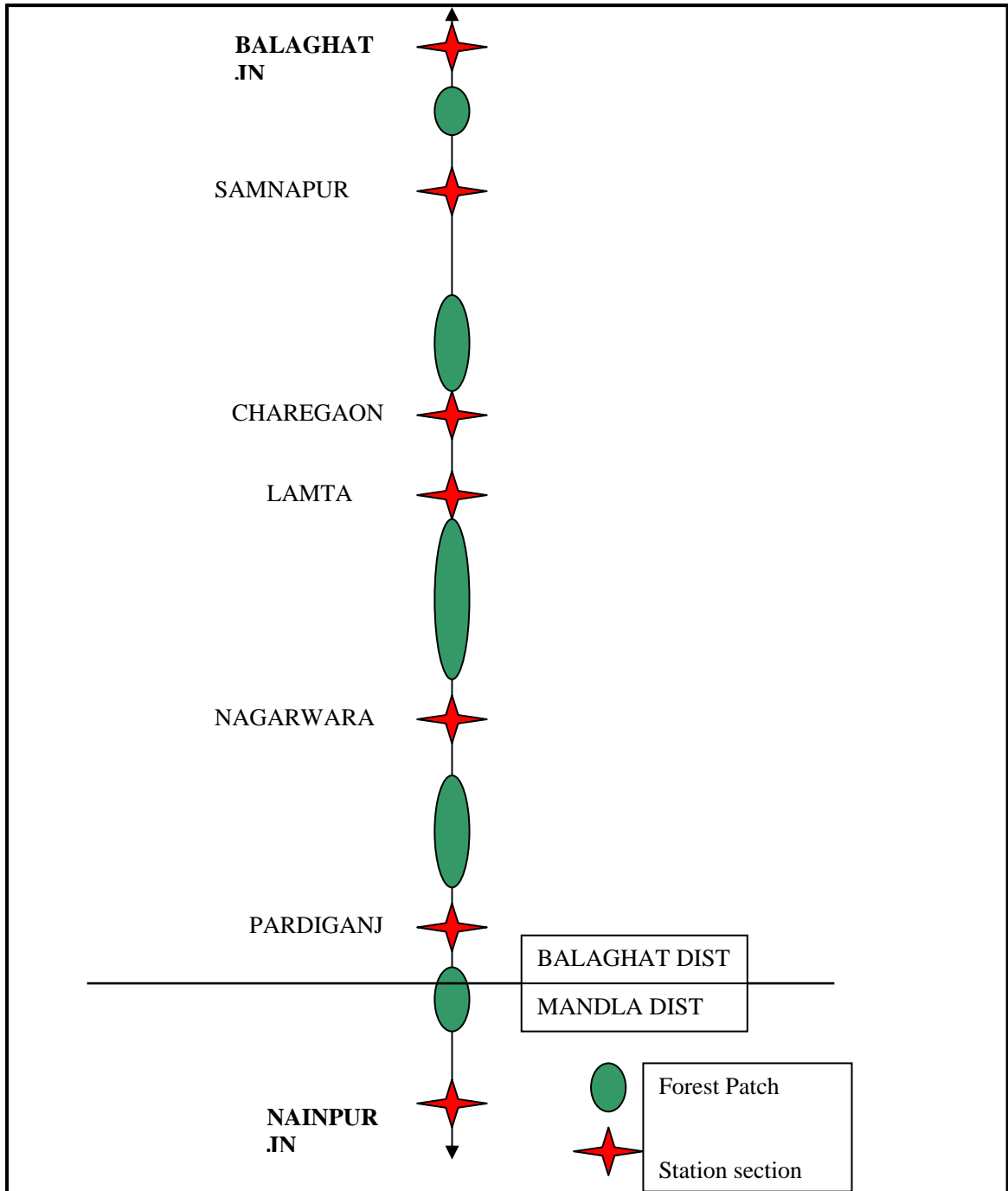


Fig 6: Diagrammatic representation of Railway line passing through different forest patches in the Nainpur-Balaghat section of the Kanha-Pench corridor, within Mandla- Balaghat districts

Underpasses for animal movement and fences have been proposed if the broad gauge line has to be laid, as mitigation measures. However, it is known that underpasses may not necessarily facilitate tiger and other large carnivore movement across such barriers. This has been substantiated in the following section.

Threat of Roads on the K-P corridor

Another major concern and threat, even greater than the railway line, is the Nainpur to Balaghat highway road that has quickly come up alongside the railway line (Fig 5). This road is a proposed state highway and hundreds of vehicles ply on this route at high speeds. There have been no measures taken during road construction to enable animal movement and mitigate casualties.

The other road of national significance that has caught the attention of conservationists is the NH-7 highway near Pench that dissects the corridor towards the Rukad forest patch. Almost 9 km of this Nagpur-Jabalpur road i.e. National Highway No. 7 (NH7), passes along the periphery of the Pench Tiger Reserve, a core critical tiger habitat. Another 47-km-stretch of this road cuts through areas under South Seoni Forest division that serves as a buffer for Pench and as a forest corridor to Kanha. Underpasses have been provided for the NH-7 highway considering the fact that the highway would be an impediment for wildlife. However, these underpasses have not yet recorded tiger or other large wild animal movement as yet even though there has been regular monitoring with camera traps and PIP's (Pressure Impression Pads). The biotic pressure of the road was also seen to extend more than one km into the forest on either side of the road. Besides several animals are killed daily when run over by speeding traffic on this road in the corridor. A total of 1035 road kills were recorded on the 9.2 km stretch of the road passing through Pench Tiger Reserve in 430 days of observation (Fig: 7), despite having underpasses for animal movement (A. Pragatheesh, JRF, ARS- WII). Hence, the broadening of the railway line, despite the proposed mitigation measure of underpasses will become an impediment for animals in the Kanha-Pench corridor. Further, its negative impact is likely to be exacerbated with the adjacent Nainpur- Balaghat highway road.

The Kanha-Pench corridor is one of the few extensive tracts of wildlife habitat covering an area of over 16,000 sq km. This significant corridor should be further protected rather than allowing development projects to fragment and deteriorate its utility. Mitigation measures such as underpasses will not compensate for the fragmentation of a critical corridor and the killing of several animals by traffic on the road, as seen on the NH-7 passing through the corridor. Tigers too can get killed on such roads (Fig 9) and will be deterred from crossing the corridor due to disturbance. Tigers may however, if fortunate, sometimes manage to cross such highways and reach adjacent forest patches.

CHALLENGES FACED BY TIGERS

A tiger passing through a corridor forest has to confront a range of challenges such as hostile villagers, retaliatory poisoning of livestock kills, poaching of tigers and prey, electrocution by live wires, apart from road and rail traffic. The widening of railway lines and construction and widening of roads in such a corridor will result in fragmentation of the corridor and thereby make dispersal all the more difficult for tigers and other animals that use the corridor





Fig 7: Road kills of Jungle cat, Mongoose, Chital and Jackal on NH-7 Highway, Pench
(Source: Pargatheesh, WII)



Fig 8: Tiger killed by speeding vehicle on road (Outlook India image) and Chital killed by traffic on NH-7 Kanha-Pench corridor being removed by forest staff (Source: Pargatheesh, WII)

On a recent visit (8.7.10) to the corridor after the railway line inspection, WWF-India's team sighted and photographed a male tiger in the Rukad patch adjoining PENCH, which is probably the first picture

of a tiger moving across this area (Fig 9). This sub-adult male tiger is likely to have come from Pench, somehow managing to cross the NH-7 highway.



Fig 9: Prospective dispersing male tiger, marking its area, sighted in Rukad, towards Pench side of the Kanha-Pench corridor complex, July, 2010 (Source: Joseph Vattakaven, WWF-India.)

If this dispersing tiger manages to move on in the corridor towards Kanha, the next major hurdles it will face will be the broad gauge railway line together with a road without underpasses in the Nainpur-Balaghat route. While tigers are known to adapt and sometimes manage to cross such hurdles, we would be risking the tiger's fate and that of the corridor with development projects such as the Gondia-Jabalpur broad gauge railway and thereby compromise the dispersal value of the corridor for tigers and other wildlife.

The current railway line, which is narrow gauge, was constructed by the British and has existed for over 100 years. It was built at a time when there was much more forest cover available for tigers, but the situation now is different and further widening will cause damage to the corridor. Although it is a narrow gauge line, express trains such as the Satpura Express are already moving along this line. The narrow gauge line has heritage status and hence may remain in its current form. The main trains passing from the north to south India are currently being diverted away from this area.

Another factor to be noted is that even if the broad gauge line is developed, the difference in duration of travel between Nainpur and Balaghat will be negligible as compared to the current narrow gauge. However, the advantage for the railways will be later, once the broad gauge line comes into place, trains

passing from north to south of India will then be diverted through this line, which saves distance and time. But this will mean that the frequency and speed of trains will also increase in this section, killing wild animals and affecting movement of tigers. This area will then also provide quicker access to other development projects which will sound the death knell for the corridor. It may then also be used by the notorious Bahelia Pardi poaching tribes known to frequent this area. The railway line is also close to the buffer of Kanha tiger reserve (less than 30 km) and shall also involve cutting of trees there. Hence, the issue is clearly a compromise between shorter distances and time duration versus the fragmentation of forest patches in one of the most valued corridors in the country from the perspective of tiger conservation.

Conservation Recommendations for the Kanha-Pench Corridor:

- Nainpur-Balaghat narrow gauge line must remain as it is and not be converted into broad gauge line as this will act as a barrier to animal movement by its passage through two critical linkages of the corridor.
- The proposed Nainpur-Balaghat state highway is a threat to movement of animals in particular because of its location next to the railway line and which will cause more animals to be killed on the road. Frequency and movement of traffic must be regulated and even diverted away from this road without any further widening.
- The diversion of land for construction of tourist resorts adjacent to the Kanha tiger reserve in the Khatia-Mocha area and the Khapa linkage near Mukki poses a grave threat close to the reserve itself, threatening a break in the corridor linkage and preventing animal movement. Resorts construction in the corridor near crucial linkages must be prevented or regulated.
- The cutting down of entire mixed forest plantations in the corridor and their replacement with monocultures currently being undertaken by the forest development corporation is detrimental to tiger and prey presence and their movement in the corridor and should be stopped. Plantations of mixed forest trees and plants suitable for wild ungulates should be taken up instead.
- Timely and adequate compensation of cattle killed in the corridor by tigers and leopards must be made a priority by the forest department and local NGOs to prevent poisoning of tigers, human-tiger conflict and facilitate tiger dispersal. Livestock kills made by tigers in corridor must also be monitored by camera traps to ascertain tiger identity and shared with forest department. If tigers can feed on these livestock kills (instead of kills being burnt) and move on in the corridor, with adequate compensation being provided to those affected, it can be a critical food resource for tigers as they disperse.

- Further radio-collaring studies of sub-adult dispersing male tigers in Kanha, Pench and in the corridor must be undertaken to better ascertain their movement patterns, threats faced and to improve the management of the corridor keeping the tiger's dispersal needs in perspective.
- Alternative and sustainable livelihood options should be provided to local stakeholders in the corridor to reduce fuel wood dependency. Also better cattle grazing practices should be encouraged to prevent conflict. Incentives should be provided to villages that facilitate tiger dispersal and for the cost of living in tiger conflict landscapes. Local stakeholders must be actively involved to reduce biotic pressure with additional benefits for successful conservation in the corridor.
- Anti-poaching exercises, joint patrolling and monitoring of the corridor by forest department, local stakeholders, and NGOs should take place at regular intervals to prevent poaching of tigers, leopards, prey and poisoning of kills.
- The habitat block of Rukad (approx 220 sq.km) should be made a part of the buffer of the Pench tiger reserve immediately. It is a block with good habitat and tiger presence. The NH-7 road and traffic threatens to sever the corridor, killing animals and preventing tiger dispersal. Traffic must be regulated or diverted away from this road especially between dusk and dawn.
- The Logur block of approximately 500 sq.km in Balaghat provides excellent habitat for tigers and is an important connecting forest patch in the corridor. The Naxalite problem in this forest patch must be addressed appropriately and with enhanced protection the area should be declared as a protected reserve.
- The crucial linkages and blocks highlighted in the corridor have to be managed better and detrimental projects such as roads, railways, and tourist resorts prohibited on or near their ecologically sensitive zones.

REFERENCES

Linkages in the Kanha-Pench Landscape- Status with reference to tiger conservation, unpublished report, Shubaranjan Sen, 2007.

Monitoring Tigers, Co-Predators and their Prey base in the Kanha-Pench Corridor, Satpuda Maikal Landscape, Madhya Pradesh, India. Jyotirmay Jena, Jimmy Borah and Joseph Vattakaven, WWF India-WII report (in press) 2010

South East Central Railways unpublished document, July 2010.

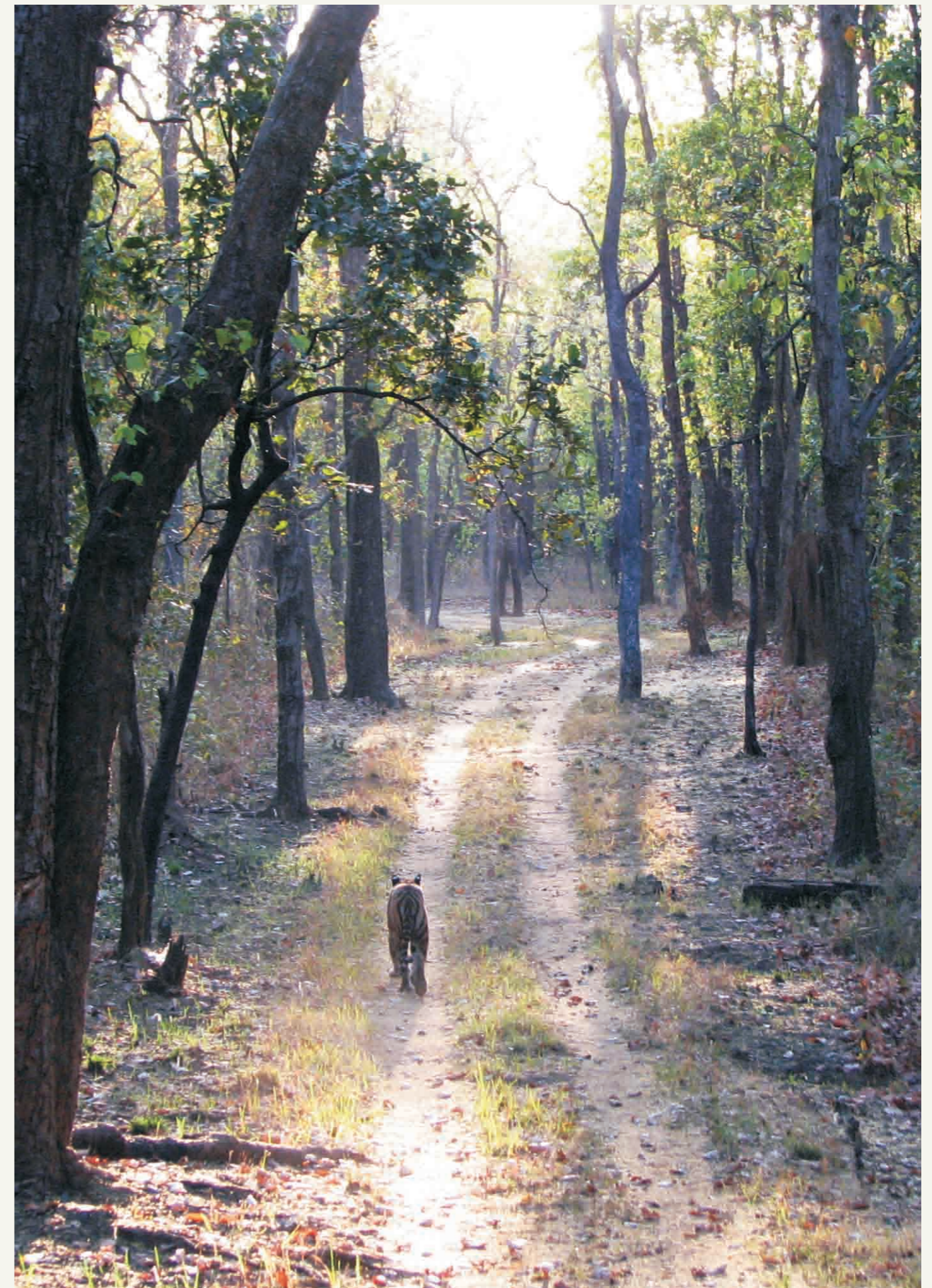
Spatial organization of tigers in Kanha tiger reserve, Joseph Vattakaven, PhD thesis (in preparation) 2004-2009.

Status of tigers, co-predators and prey, Y.V Jhala, Rajesh Gopal, Qamar Qureshi, Eds, WII-NTCA, Technical report, 2008

Surrendering the last frontier, Jay Mazoomdar, Open magazine, January 2010.

Trauma in Central India, Sanctuary Asia report, Vol. XXX No.4, August 2010

Wildlife Institute of India, Annual Research Seminar, A. Paragatheesh, JRF, EIA cell, September 2010.



Tiger on the road in the Kanha-Pench landscape, © 2010 Joseph Vattakaven

WWF in numbers

1961

WWF was founded in 1961

+100

WWF is in over 100 countries,
on 5 continents

+ 5m

WWF has over 5 million
supporters

+ 5,000

WWF has over 5,000
staff worldwide



Why we are here

To stop the degradation of the planet's natural environment and
to build a future in which humans live in harmony with nature.

www.wwfindia.org

WWF-India Secretariat
172-B Lodi Estate
New Delhi 110003
Tel: 011 4150 4814 Fax: 011 4150 4779