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**Government of India
Wildlife Institute of India, Dehradun
Wildlife Institute of India
Chandrabani, Dehradun, Uttarakhand**

Dated: 03/09/2019

To

Shri Nripen Teron
Vill- Chakardo
District- Kamrup(M) Assam
PO- Azara
781017

Registration Number : WLIOI/R/2019/50021

Dear Sir/Madam

I am to refer to your Request for Information under RTI Act 2005, received vide letter dated 08/08/2019 and to say that *the information received from concerned authority of the Institute are attached herewith in soft copy (6 pages)*.

In case, you want to go for an appeal in connection with the information provided, you may appeal to the Appellate Authority indicated below within *thirty days* from the date of receipt of this letter.

Dr. V. B. Mathur
FAA & Director
Address: Wildlife Institute of India Chandrabani Dehradun
Phone No.: 01352646101

Yours faithfully

**(Anju Baroth)
CPIO & Scientist-C
Phone No.: 01352646246
Email : anju.baroth@wii.gov.in**

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ACTION HISTORY OF RTI REQUEST No.WLIO/R/2019/50021

Applicant Name Nripen Teron
Text of Application Furnish a copy feasibility study report as carried out by Wildlife Institute of India on Deepor Beel wildlife sanctuary as per National Green Tribunal direction in Rohit Choudhury vs Union of India OA 472/2018 earlier OA 19/2014 EZ
Reply of Application the information received from concerned authority of the Institute are attached herewith in soft copy (6 pages).

SN.	Action Taken	Date of Action	Action Taken By	Remarks
1	RTI REQUEST RECEIVED	08/08/2019	Nodal Officer	
2	REQUEST FORWARDED TO CPIO	09/08/2019	Nodal Officer	Forwarded to CPIO(s) : (1) Anju Baroth
3	REQUEST DISPOSED OF	03/09/2019	Anju Baroth- (CPIO)	

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RTI-27
Disposed of

Bivash Pandav
Scientist - F
Department of Endangered Species Management
Wildlife Institute of India

(A group of wild elephants crossing a railway line in Hosur Forest Division, Tamil Nadu. Photo: Shri. Baskar, Deputy Ranger)



Railway lines in elephant habitats: with specific reference to Assam

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Introduction:

Asian elephants are primarily threatened by habitat-related factors such as loss, degradation and fragmentation, and human–elephant conflict. In particular, habitat fragmentation can isolate the populations in to small subpopulations, which suffer enormous extinction risk. In India, creation and expansion of linear infrastructure such as railway lines, roads, power transmission lines and associated development have been the main cause of fragmentation of elephant habitats and other sensitive wildlife areas. Lately, due to impetus for rapid economic growth, and fast and safe movement of goods and passengers, there is manifold increase in the creation, expansion, up gradation and modernization of railway network in the country, some of which passes through ecologically fragile elephant habitats. It is noteworthy that as part of modernization of Indian Railways, most of the erstwhile meter gauge lines were upgraded in to broad gauge lines, connecting them with main routes resulting in increased speed of trains and steep rise in the traffic volume. In numerous cases, the single lines were doubled and energized as well. While there is no doubt that railways have revolutionized and eased the movement of passengers and freight across the country, thereby significantly contributing to the nation’s economic growth, such development has, in some cases, come at the expense of serious ecological and environmental consequences. As with the case of elephants and their habitats, the impact of railway-lines have been quite alarming and in some cases, even irreparable.

Run-over of elephants by trains:

Railway lines impact elephants and their habitats in myriad ways. The most direct and perceptible impact is the run-over of elephants by trains in the railway tracks. There has been a steep increase in the number of collision-related mortalities of wild elephants due to trains across the country (Figure-1):

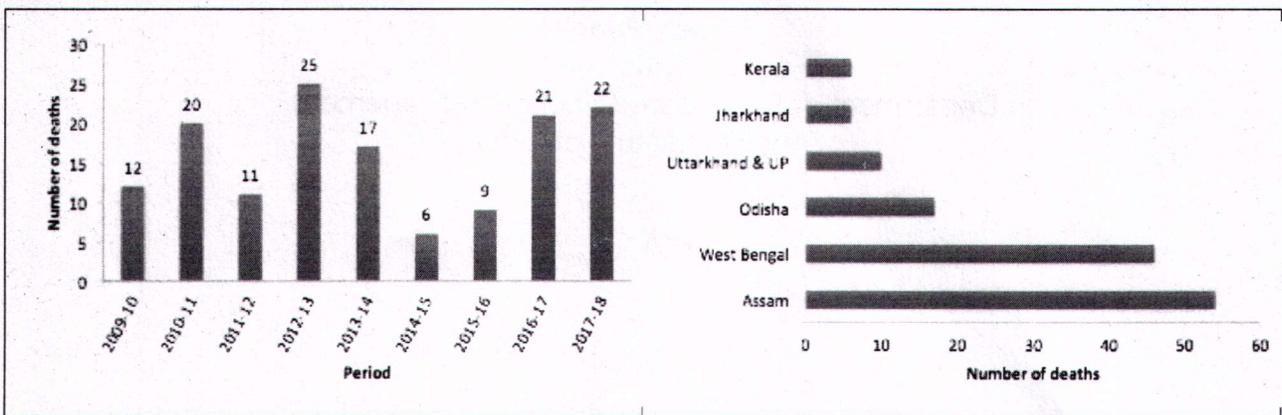


Figure-1(left): Period-wise number of elephant deaths due to trains reported in India. Figure-2 (right), states with highest number of elephant deaths due to trains

On an average, over 25 elephants die each year due to run-over by trains. While elephant habitats across the entire country are threatened by railway lines, the northeastern elephant range comprising of the states of Assam and North Bengal are the

most affected followed by Odisha and Uttarakhand. From the year 2009 to present, over 100 elephants were mowed down by trains in Assam and North Bengal alone.

Permanent effects on the habitat:

In addition to direct collisions, railway lines passing through elephant habitats have multitude other serious effects on the habitat and the elephant populations as well. Creation, expansion and maintenance of railway lines can majorly affect the soil, humus, local microclimate and drainage leading to drastic change in vegetation structure and floristic. Invasive, non-edible weeds may proliferate from the site of linear infrastructure and penetrate in to habitat reducing the natural forage base for elephants and other herbivores thereby reducing the overall carrying capacity of the habitat. While the area cleared for creating railway infrastructure may be minimal (just a few tens of meters), its edge effects, that of degradation of habitat, can penetrate in to surrounding elephant habitats for several kilometers. Thus, in a habitat where there is a honeycomb of different linear infrastructures at varying distances, the resulting effect on the habitat could be colossal.

Abandonment of the habitat by elephants:

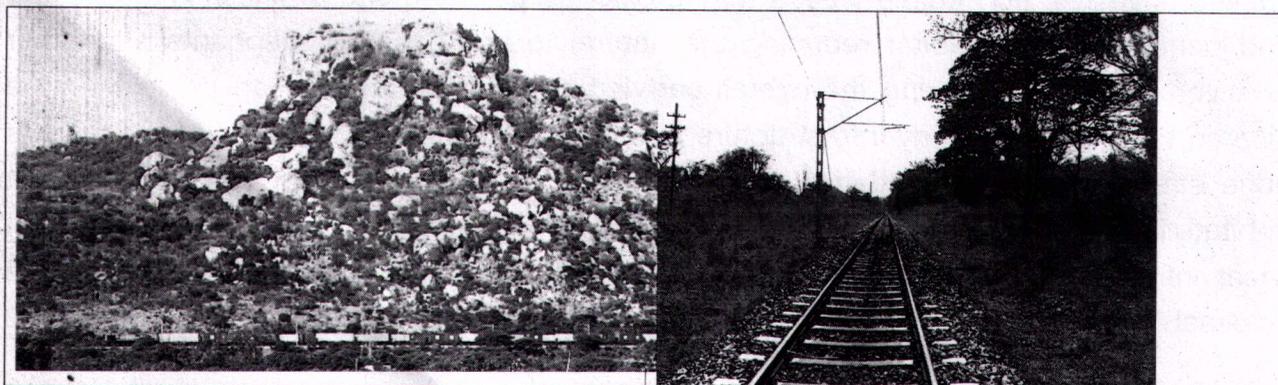
Chronic, multifaceted effects on the habitat can adversely affect the elephants' home range (the area traversed by animals for fulfilling their basic life-history needs) itself. Elephant groups are governed by rank hierarchies. Simply put, in a given habitat not all elephants can operate everywhere and different groups have different seasonal home range patterns to which elephants adhere to steadfastly. Therefore, although we usually assess the impact of railway infrastructure on habitat in terms of the gross extent of forest area lost, it is important to note that different elephant groups operating in the area could be affected differentially with some of them losing only a fraction of their home range, while a few groups could loose a substantial portion of their home range. The groups that loose a substantial portion of their home range may abandon the area itself and get displaced to new areas. In our country, remnant forests are highly limited and therefore, displacement of elephant groups from their well set home ranges lead to conflict in new areas. Thus, it is very much possible that in an intact elephant habitat, creation of railway infrastructure and others could actually trigger long-term conflict between people and elephants with serious ecological, social and political consequences.

Behavioral change and other societal effects in elephants:

A recent seminal paper in Science, a leading scientific journal, has highlighted that rapid increase in human activity has actually caused significant shifts in temporal activity patterns of wild animals with most of them turning nocturnal (refer to Gaynor et al, 2018). Such changes could seriously affect the long-term survival prospects of animals as chronic stress can affect their physiology. Railway lines – both during creation and while being operational are a major source of noise and ancillary disturbance for elephants and other wildlife. While, some of the individuals may get habituated to such stressors,

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especially if the traffic volume is minimal, a vast majority of elephants may suffer range or complications that include significant modifications in their natural behavior. Elephant groups that are generally shy and timid towards people overtime may loose their shyness if they are continuously exposed to human-induced disturbances in their habitat. The change in behavior has long-term ramifications on conflict management as well. Further, if some of the older animals (such as the matriarchs) get killed due to collisions, then the herds can get disoriented due to loss of spatial/ survival knowledge. Such herds can get in to conflict with people by traversing in unfamiliar areas



Picture-1(left): A goods train passing through an elephant habitat in the Eastern Ghats, South India. Picture-2 (right), fully energised broad gauge track cutting through a critical elephant habitat in Rajaji Tiger Reserve, North India

Mitigation the impacts of railways on elephant populations and habitats:

Appreciably, the Ministry of Environment, Forests and Climate Change; the state forest departments and government institutions like the Wildlife Institute of India in collaboration with several institutions and individuals are endeavoring hard to advance a plethora of mitigation measures to reduce the impact of railways on elephant populations and habitats. This, however, is far from easy as any impact on the elephant habitat by the railway infrastructure will be an indelible dent and repair work is seldom possible. The most effective long-term strategy in most cases would be realignment of the infrastructure from the elephant habitats and restoration, wherever feasible.

Increasingly, there is a vociferous demand from the Railways about real-time intimation of elephants in the railway lines so that the trains can be slowed down. This demand, although logical the railways' point of view, is often impractical to serve. In contrast to common perception influenced by high-definition wildlife documentaries from African savannah, Asian elephants occur in dense forests where visibility drops in a few meters. Elephants are also very shy and are potentially dangerous as well and therefore, it is impractical to continuously follow elephant herds and individuals and alert the railways in time. Further, elephants, despite their bulk are incomprehensibly fast and can cover several miles in a matter of few minutes during the phase of "directed movement". Thus, before even the message of elephants approaching the track could reach the authorities concerned, elephants would land in the area! Thus, all-time vigilance in elephant habitats is exigent. Secondly, although elephants usually stick to their well-trodden paths, these

paths are not fixed and they may change their paths from time to time. This is especially the case in flat areas where there are no topographic constraints for elephants to traverse. Thus, it is important to note that elephants can approach the railway tracks from anywhere within their habitat.

The case of railway-related elephant mortalities in Deepor Beel, Assam:

Over the years, 13 elephants have been killed and five injured due to train hit in a relatively small stretch of railway track passing along the southern edge of Deepor Beel Ramsar site, Guwahati. Elephants from Rani Reserve Forest (RF) regularly use Deepor Beel using traditional trails to gain access to water. The railway track and a road cut through all these identified elephant trails leading from Rani RF to Deepor Beel (Figure 3). Besides, rapid urbanization over the years on private lands between Rani RF and Deepor Beel is also blocking several of these traditional elephant trails. This will potentially lead to severe human elephant conflict in near future. While some of these elephant trails near dense human habitations can be blocked through Elephant Proof Trenches (EPT) and electric fences, it is neither desirable nor feasible to do the same along the entire stretch of Rani RF on the edge of Deepor Beel.

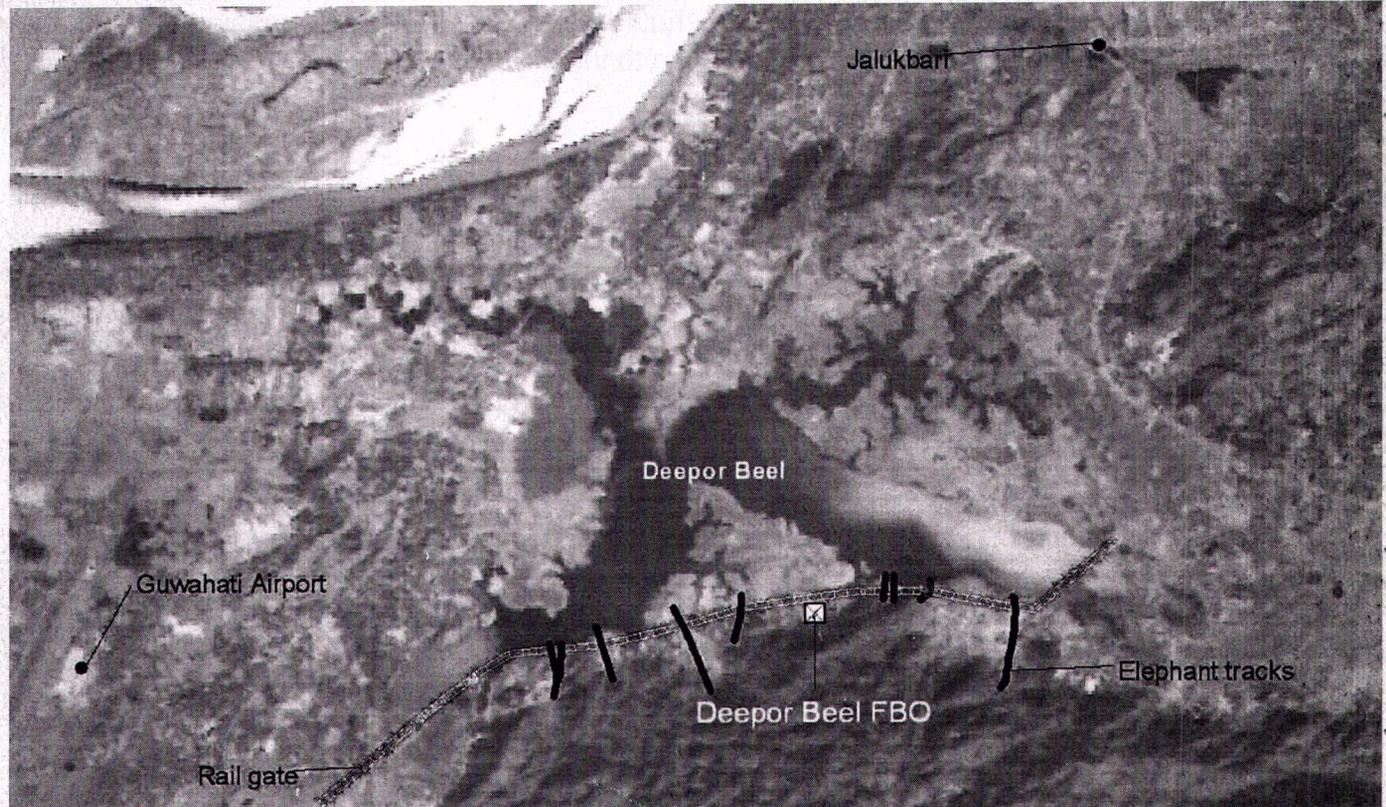


Figure 3. The railway track along Deepor Beel cuts through nine identified elephant trails that are regularly used by elephants to gain access to water from Rani RF to Deepor Beel.

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Mitigation Measures Proposed:

Based on our observation during the field visit and discussion with field staff we recommend the following mitigation measures to reduce elephant mortality on the railway track:

- I. Speed restriction – Restriction of speed of train passing through this stretch should be the immediate measure to prevent collision with elephants on the track. We recommend a speed limit of 30km/hour along this stretch for all the trains passing on this stretch.
- II. Regular patrolling along the railway track – The ongoing efforts of Assam Forest Department need to be continued along this railway track on a regular basis. Designated patrolling team need to actively patrol along this track specifically during night time and upon detection of elephant movement near the track a proper mechanism should be put in place to pass on the information to the locomotive driver.
- III. Construction of a tunnel between Gate No. 273 and 274 – The long term solution to prevent collision with wild elephant lies in construction of a tunnel in the hill tract between railway gate no. 273 and 274. The railway track after bridge no. 738 passes through a bend along the edge of a hill. This stretch of railway track owing to its terrain is most prone to elephant hit. In order to avoid collision with wild elephants, possibility of digging a tunnel through the hill between gate no. 273 and 274 should be explored. A track passing through the tunnel will be the long-term solution to this problem.