Sl. No. 20049
Date 22/11/24

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL

EASTERN ZONE BENCH AT KOLKATA

OA-09/2025/EZ

ORIGINAL APPLICATION NO. /~~2024~~/EZ

(Under Section 18(1) read with Section 14 and 15 of the National Green Tribunal Act, 2010)

IN THE MATTER OF:

Promod Chandra Mahanta & Anr. **: Applicants**

Vs.

The Ministry of Environment, Forests & Climate Change & Ors. **: Respondents**

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Date: 22.11.2024 **Place: Guwahati**

DRAWN & FILED BY:

Vikram Rajkhowa

Vikram Rajkhowa
Advocate for the Applicants

504, Amazing Grace Aptt.,
S.K Bhuyan Road, Dighalipukhuri(E)
Guwahati – 7810001, ASSAM
vikram.rajkhowa@gmail.com
(+91) 9954348258

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SYNOPSIS

That the applicants seek to raise serious and substantial question relating to the environment before the Hon'ble National Green Tribunal, regarding the threat to the Hoolongpar Gibbon Wildlife Sanctuary, in the district of Jorhat, Assam, more particularly in regard to the approval by the Standing Committee of the National Board for Wild Life in its 80th Meeting held on 09.10.2024, granting approval to the proposal for use of 9.0 ha for the 25KV railway electrification of the Lumding–Dibrugarh section of Northeast Frontier Railway, which passes through the Hoolongapar Gibbon Wildlife Sanctuary, located in Jorhat district of Assam. The electrification of the railway track of the said sanctuary, which is the species stronghold of the endangered Western Hoolock Gibbons (India's only ape species) is likely to spell disaster to the arboreal primates, including to seven other primate species. Be it stated that, Hoolongapar Gibbon WLS has the highest primate species diversity recorded for any 'Protected Area' in the country.

The Technical Report of the Wildlife Institute of India gave the conclusion that –

"The current single-track broad gauge railway line at HGS has caused a wide canopy gap of 30-40 metres. Any future plan of doubling the track (and possible electrification of the same) passing through the Sanctuary limits will render the installation of artificial canopy bridges useless by further widening the canopy gap (possibly up to 100 metres accounting for distance between the tracks). Since the railway stretch within HGS is relatively small, the Indian Railway must think long-term and demonstrate its conservation vision by exploring all possibilities to reroute the existing line outside HGS (and its ESZ) limits into the adjoining revenue and non-forest land. This will ensure that a balance between ecology and economy is struck, and allow for the necessary doubling and electrification of such a rerouted line (with structural and other mitigation measures, if needed).

Under such circumstances, the applicants are preferring the present application seeking adequate relief from this Hon'ble Court.

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LIST OF DATE & EVENTS

DATE	EVENTS
23.09.2019	Eco-sensitive Zone notification of Hoolongapar Gibbon Wildlife Sanctuary
07.05.2023	Technical Report prepared by the Wildlife Institute of India
28.05.2024	The news report in 'The Assam Tribune' titled 'Railway electrification may spell disaster for arboreal primates'
27.08.2024	Minutes of the Meeting of Advisory Committee
15.10.2024	DIG Forest (WL) letter
09.10.2024	Minutes of the 80th Meeting of SC-NBWL
16.11.2024	The news report in 'The Assam Tribune' titled 'Rail track electrification through Hoolongapar Gibbon sanctuary sparks ecocide concerns.'

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL,

EASTERN ZONE BENCH AT KOLKATA

MEMORANDUM OF APPLICATION

(Under Section 18(1) read with Section 14 and 15 of the National Green Tribunal Act, 2010)

ORIGINAL APPLICATION NO. OF 2024/EZ

IN THE MATTER OF:

1. **Sri. Promod Chandra Mahanta**
   S/o Late Khagakanta Mahanta
   R/o No. 1 Sonari Gaon, Tarajan
   District – Jorhat, PIN - 785001
   Assam

2. **Sri. Tridib Dutta**
   S/o Late Dewram Dutta
   R/o K.K Hazarika Gaon, P.O - Karanga
   District – Jorhat, PIN - 785008
   Assam

Applicants

Versus

1. **Ministry of Environment, Forests & Climate Change**
   Represented by the Secretary,
   India Paryavaran Bhawan, Jorbagh,
   New Delhi 110003
   Email: secy-moef@nic.in

2. **The Northeast Frontier Railway (NFR)**
   Represented by the General Manager,
   NFR (H.Q), Maligaon, Guwahati 781011
   Assam.
   Email: gm@nfr.railnet.gov.in

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3. **The State of Assam,**
Represented by the Chief Secretary,
Government of Assam
Dispur, Guwahati 781006
ASSAM
Email: cs-assam@nic.in

4. **Department of Environment & Forest**
Represented by the Secretary,
Government of Assam
Dispur, Guwahati 781006
ASSAM
Email: environmentforestassam@gmail.com

5. **The Divisional Forests Officer (Jorhat Territorial Division)**
Department of Environment & Forest
Government of Assam
Atilagaon, Jorhat 785001
ASSAM
Email: dfo.t.jorhat@gmail.com

6. **IRCON International Ltd.**
Represented by the Chairman & Managing Director
C-4, District Centre Saket
New Delhi 110017
Email: cmdsectt@ircon.org

7. **Standing Committee of the National Board for Wild Life**
Represented by the Member Secretary
Indira Paryavaran Bhawan, Jor Bagh Road
New Delhi 110003
Email: digwl-mefcc@gov.in

Respondents

I. The addresses of the Applicants are given above for the service of notices of this application.

II. The addresses of the Respondents are given above for the service of notices of this application.

MOST RESPECTFULLY SHOWETH:

1. That the applicants before Your Lordships are the residents of the above-mentioned locality in the district of Jorhat, Assam, therefore, they are entitled to the rights, protections and privileges guaranteed under the Constitution of India and laws framed thereunder. Furthermore, it is the duty of the applicants as citizens under Article 51-A(g) of the Constitution of India, to protect and improve the natural environment including forests, lakes, rivers, and wild life, and to have compassion for living creatures.

2. That the applicants seek to raise serious and substantial question relating to the environment before the Hon'ble National Green Tribunal, more particularly in regard to the threats to the Hoolongapar Gibbon Wildlife Sanctuary (in short "Sanctuary") from the following:

   (i) **Firstly,** the approval for use of 9.0 ha for the 25KV railway electrification of the Lumding–Dibrugarh section of Northeast Frontier Railway (in short "NFR), which passes through the Hoolongapar Gibbon Wildlife Sanctuary and its Eco-Sensitive Zone, located in Jorhat district of Assam, by the Standing Committee of the National Board for Wild Life (in short "NBWL") in its 80th Meeting held on 09.10.2024 and communicated vide letter dated 15.10.2024 issued by the DIG Forests (WL), Government of India.

   The electrification of the railway track of the said sanctuary, which is the species stronghold of the endangered **Western Hoolock Gibbons (India's only ape species)** is likely to spell disaster to the arboreal primates, among seven other primate species. **The Hoolongapar Gibbon Wildlife Sanctuary has the highest primate species diversity recorded for any 'Protected Area' in the country.**

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(ii) **Secondly,** the proposal for diversion of around 4.4998 ha of land within Disai Valley Reserve forests, falling within the Eco-sensitive zone (in short "ESZ") around the Hoolongapar Gibbon Wildlife Sanctuary for drilling Oil and Gas exploration by M/s Vedanta Limited (Division Cairn Oil & Gas).

The applicants further states that since the aforesaid proposal is yet to receive the final approval of the NBWL and/or Central Government, the applicants herein are highlighting the threat at this stage. However, the applicants seek liberty of this Hon'ble Court to challenge any decision of the NBWL and/or the Central Government, granting approval/clearances in regard to said matter, by preferring appropriate application/s before this Hon'ble Court, if so required.

A copy of the DIG Forests (WL) letter dated 15.10.2024 and Minutes of the 80th Meeting of SC-NBWL dated 09.10.2024 is annexed as **ANNEXURE – A (colly.)**

and

A copy of the Minutes of the Meeting of the Advisory Committee dated 27.08.2024 is annexed as **ANNEXURE – B**.

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Facts of the Case

3. That the Hoolongapar Gibbon Sanctuary was notified by the Government of Assam vide notification No. FRS/37/97/13 dated 30.07.1997, by upgrading the conservation status of the Hoolongapar Reserve Forest declared earlier vide notification No. 8 dated 27.08.1881. The Sanctuary is an important protected area situated in Jorhat district of Assam, covering an area of around 20.98 square kilo meters, with the perennial river Bhogdoi along with its catchment passing through the Sanctuary and making the ecological environment of the Sanctuary unique.

4. That thereafter Respondent No. 1 MOEF&CC vide notification S.O. 3462(E) dated 23.09.2019 issued the Eco-sensitive zone (in short "ESZ") around the Hoolongapar Gibbon Wildlife Sanctuary, in exercise of the powers conferred by sub-section (1) and clauses (v) and (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act 1986 (29 of 1986) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, covering an area of 264.62 sq.k. of ESZ.

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A copy of the Eco-Sensitive Zone notification dated 23.09.2019 is annexed as **ANNEXURE - C**.

5. The aforesaid ESZ notification dated 23.09.2019 states that the floral biodiversity of the sanctuary includes 74 tree species, 17 species of shrubs, 12 species of climbers, and supports 11 species of mammals, 5 species of reptiles and amphibians and 31 species of avifaunal species.

The major fauna of the sanctuary includes Tiger, Asiatic Elephant, Leopard, etc., including seven (7) rare primate species that enrich the biodiversity. It is further stated in the said notification that the heterogenous landscape of the sanctuary is an integral part of a critical elephant corridor along with Disai and Disai Valley Reserve forest, and the adjoining landscape of the State of Nagaland on the south.

6. That according to a Technical Report bearing TR No./2023/07 May 2023 prepared by the Wildlife Institute of India and titled – "Artificial Canopy Bridge Design to facilitate Western Hoolock Gibbon (Hoolock hoolock) crossing over Mariani-Dibrugarh broad gauge single track Railway Line in Hoolongapar Gibbon Sanctuary, Assam" states as follows:

"Habitat loss and habitat fragmentation are two principal threats to most terrestrial biodiversity across ecosystems and geographies. Gibbons are a particularly vulnerable group of primates inhabiting the forests of South and Southeast Asia. Of the 20 gibbon species – all threatened, according to the International Union for Conservation of Nature or IUCN – the endangered Western Hoolock gibbon Hoolock hoolock is the only one found in India inhabiting the forests in the southern bank of the Brahmaputra-Dibang river system. The Hoolongapar Gibbon Sanctuary (HGS) is a small – 21 sq.km. Protected Area (PA) in Jorhat, Assam and is one of the species stronghold supporting around 125 individuals living in more than two dozen family groups. It is also the only PA in India named after a primate species. Apart from the W. Hoolock gibbon, the Sanctuary also harbours six other primate species – capped langur, slump-tailed macaque, northern pig-tailed macaque, Assamese Macaque, rhesus macaque and Bengal slow loris, thereby having the distinction of harbouring the highest primate species diversity for any Indian PA.

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However, a single track – 1.65 route-km long railway line (currently broad-gauge, but un-electrified as yet) has fragmented the Sanctuary since 1887 into two unequal parts. Over time, the Sanctuary has become a 'forest island' having lost connectivity with surrounding forest patches. Since gibbons are exclusively arboreal animals inhabiting the forest upper canopy, they are particularly sensitive to canopy gaps. Gibbon families on both sides of the railway track have, thus, been effectively isolated from each other, thereby compromising their population genetic variability and further endangering their already threatened survival in HGS."

The aforesaid Technical Report further states that –

"In 2015, the North East Frontier Railway (NEFR) authorities along with the Assam State Forest Department (ASFD) had built an artificial canopy bridge (ACB) made of iron at one location across railway track (Figure 3). However, despite their best intentions, the structure remains unused by arboreal mammals due to several of its design aspects not conforming to gibbons specialized for of movement in canopy (brachiation – swinging by arms/forelimbs). A natural canopy bridge (NCB) has developed through long-term plantation activities on both sides of the railway track through joint efforts of Aranyak (a Guwahati-based conservation NGO) and the ASFD. While plantation/reforestation activities began in 2006, the natural canopy bridge was established/used by gibbons only by 2019 (Figure 9). Gibbons and other arboreal animals have been demonstrably using the said bridge (Chetry et al., 2022). However, this natural connectivity remains tenuous at best since the NEFR regularly trims trees and branches – having the Right of Way (RoW) around the railway line – as part of track maintenance activities.

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The Chief Secretary, Govt. of Assam has raised concerns regarding the threat to Hoolock gibbons by the aforementioned railway line in a Committee meeting on 8th July 2022. It was then decided that the AFSD will provide a canopy bridge design to facilitate gibbon (and other arboreal mammals) movement between the forest fragments (compartments 1 & 2 of the HGS)."

The aforesaid Technical Report gave the following conclusion –

"3. The current single-track broad gauge railway line at HGS has caused a wide canopy gap of 30-40 metres. Any future plan of doubling the track (and possible electrification of the same) passing through the Sanctuary limits will render the installation of artificial canopy bridges useless by further widening the canopy gap (possibly up to 100 metres accounting for distance between the tracks). Since the railway stretch within HGS is relatively small, the Indian Railway must think long-term and demonstrate its conservation vision by exploring all possibilities to reroute the existing line outside HGS (and its ESZ) limits into the adjoining revenue and non-forest land. This will ensure that a balance between ecology and economy is struck, and allow for the necessary doubling and electrification of such a rerouted line (with structural and other mitigation measures, if needed).

A copy of the Technical Report prepared by the Wildlife Institute of India is annexed as **ANNEXURE – D**.

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7. That according to a news report published in 'The Assam Tribune' dated 28.05.2024 and titled "Railway electrification may spell disaster for arboreal primates", quotes Primatologist Dr. Dilip Chetry who is a vice-chair of IUCN/SSC Primate Specialist Group of South Asia, as follows:

"This is a rather short-distance track of less than 2 km. It can be easily rerouted outside the sanctuary in the greater interests of wildlife. Since this is a busy railway line, at risk are not just the hoolock gibbons but all other animals which need to move from one part of the forest to the other. The best option is to have the railway line outside the sanctuary."

A copy of the news report published in 'The Assam Tribune' dated 28.05.2024 is annexed as **ANNEXURE – E**

8. That there has been large scale protest by different sections of society in Jorhat district as well as across Assam against the electrification of the railway line passing through the Hoolongapar Gibbon WLS as well as the proposed oil and gas exploration in its Eco-sensitive Zone. According to a news report in 'The Assam Tribune' dated 16.11.2024 titled "Rail track electrification through Hoolongapar Gibbon sanctuary sparks ecocide concerns" states that –

"a section of environmentally conscious local residents has urged the NBWL to reconsider its decision to allow track electrification, reasoning that the single-track railway line, which has already claimed sizeable number of diverse wildlife, including elephants, would trigger an ecocide if it is electrified."

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A copy of the news report published in 'The Assam Tribune' dated 16.11.2024 is annexed as **ANNEXURE – F**.

9. That the Hon'ble Apex Court in T.N Godavarman v. Union of India, (2012) 4 SCC 363 had stated as follows:

"To protect endangered species, decision makers ought to adopt am eco-centric approach over an anthropocentric approach. The eco-centric principle respects the intrinsic value, interdependence and integrity of all forms of life, not just humans. Where a species is endangered, the Court may apply the 'species best interest standard' to test the validity of state action."

10. That the approval for use of 9.0 ha (1.6 ha of forest land from Hollongapar Gibbon Wildlife Sanctuary and 7.4 ha non-forest land from its notified Eco-Sensitive Zone) for 25KV railway electrification of 9 km Lumding–Dibrugarh section of Northeast Frontier Railway in favour of IRCON International Ltd., by the Standing Committee of the National Board for Wild Life in its 80th Meeting held on 09.10.2024, not only goes against the various observations and findings of experts and technical reports but also the directions and observations of the Hon'ble Apex Court to take an 'eco-centric approach, rather than an anthropocentric one', as well as to keep the 'species best interest standard'. That not being the case, this is the fit case for the interference of this Hon'ble Court to protect the endangered Hoolock Gibbons and the other six primate species, including other wildlife.

11. That the decision of the SC-NBWL granting approval for use of 9.0 ha for 25KV railway electrification of 9 km Lumding–Dibrugarh section of Northeast Frontier Railway in its 80th Meeting held on 09.10.2024 is flawed due to the following among other reasons:

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(i) That NBWL has referred to the Technical Report of the Wildlife Institute of India (WII) regarding implementation of mitigation measures. However the said WII technical report in no uncertain terms have stated the risks to the arboreal species of the sanctuary due to electrification and suggested rerouting the railway stretch within the sanctuary to outside its boundary and its ESZ to ensure a balance between ecology and economy.

(ii) That the NBWL have not taken the expert opinion of Primatologist such as Dr. Dilip Chetri who have clearly stated that – "at risk are not just the hoolock gibbons but all other animals which need to move from one part of the forest to the other. The best option is to have the railway line outside the sanctuary".

(iii) That comparing with Buxa Tiger Reserve vis-à-vis Hoolongapar WLS is not the correct approach as the animals primarily found in the former are mostly land dwelling animals unlike the latter wherein there are seven species of arboreal primates, including the endangered Hoolock Gibbons, which are canopy dwellers and are at high risk of electrification.

(iv) That the speed restrictions of the trains passing through the sanctuary has not entirely been successful as there has been number of deaths of wildlife due to train hits, including that of elephants.

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12. That the applicants respectfully seek leave of this Hon'ble Court to further emphasize the deficiencies arising from the decision to grant approval by the SC-NBWL as mentioned above as well as to place on record further materials as and when the same is required before this Hon'ble Court.

13. Therefore, under the facts and circumstances as mentioned herein above, the applicants are filing the instant application upon the grounds given here under:

GROUNDS

That the applicant is filing the present application on the following, among other grounds, which the applicants may take at the time of hearing of the matter:

A. BECAUSE the aforesaid approval of the SC-NBWL goes against the decisions of the Hon'ble Apex Court that – *"Decision makers ought to adopt an eco-centric approach over an anthropocentric approach and where a species is endangered, the Court may apply the 'species best interest standard' to test the validity of state action."*

B. BECAUSE the Chief Secretary, Govt. of Assam has raised concerns regarding the threat to Hoolock gibbons by the aforementioned railway line in a Committee meeting on 8th July 2022.

C. BECAUSE the Wildlife Institute of India in its Technical Report has clearly stated that – "*the Indian Railway must think long-term and demonstrate its conservation vision by exploring all possibilities to reroute the existing line outside HGS (and its ESZ) limits into the adjoining revenue and non-forest land. This will ensure that a balance between ecology and economy is struck, and allow for the necessary doubling and electrification of such a rerouted line (with structural and other mitigation measures, if needed).*"

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D. BECAUSE the SC-NBWL have not taken the expert opinion of Primatologist such as Dr. Dilip Chetri who have clearly stated that – *"at risk are not just the hoolock gibbons but all other animals which need to move from one part of the forest to the other. The best option is to have the railway line outside the sanctuary".*

E. BECAUSE comparison between Buxa Tiger Reserve vis-à-vis Hoolongapar WLS in regard to speed restrictions is not the correct approach as the animals primarily found in the former are mostly land dwelling animals unlike the latter wherein there are seven species of arboreal primates, including the endangered Hoolock Gibbons, which are canopy dwellers and are at high risk of electrification.

F. BECAUSE the Technical Report of Wildlife Institute of India states that "*Habitat loss and habitat fragmentation are two principal threats to most terrestrial biodiversity across ecosystems and geographies. Gibbons are a particularly vulnerable group of primates inhabiting the forests of South and Southeast Asia. Of the 20 gibbon species – all threatened, according to the International Union for Conservation of Nature or IUCN – the endangered Western Hoolock gibbon Hoolock hoolock is the only one found in India inhabiting the forests in the southern bank of the Brahmaputra-Dibang river system. The Hoolongapar Gibbon Sanctuary (HGS) is a small – 21 sq.km. Protected Area (PA) in Jorhat, Assam and is one of the species stronghold supporting around 125 individuals living in more than two dozen family groups. It is also the only PA in India named after a primate species.*"

G. BECAUSE the speed restrictions of the trains passing through the sanctuary has not entirely been successful as there has been number of deaths of wildlife due to train hits, including that of elephants. Furthermore, in the instant case it is also the risk to the arboreal species due to electrification.

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H. BECAUSE the heterogenous landscape of the Sanctuary is an integral part of a critical elephant corridor along with Disai and Disai Valley Reserve forest, and the adjoining landscape of the State of Nagaland on the south.

I. BECAUSE it is against the principle of natural justice not to take and consider the views of the technical experts, technical organizations, including the local people, among others.

J. BECAUSE it is in violation of the Wildlife (Protection) Act, 1972; the Environment (Protection) Act, 1986; the Biological Diversity Act, 2002; the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980; the National Green Tribunal Act, 2010; and rules framed thereunder, among other laws.

K. BECAUSE under Article 48-A of the Constitution of India it states that – *"The State shall endeavour to protect and improve the environment and to safeguard the forests and wild life of the country."*

LIMITATION

That the present application is being filed within the limitation period under the National Green Tribunal Act, 2010, and rules framed thereunder, as the instant application is being filed within a period of six months from the date on which the cause of action of such dispute first arose, i.e., approval for use of 9.0 ha (1.6 ha of forest land from Hollongapar Gibbon Wildlife Sanctuary and 7.4 ha non-forest land from its notified Eco-Sensitive Zone) for 25KV railway electrification of 9 km Lumding–Dibrugarh section of Northeast Frontier Railway in favour of IRCON International Ltd., by the Standing Committee of the National Board for Wild Life in its 80th Meeting held on 09.10.2024.

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INTERIM PRAYER

In view of the above facts and circumstances, it is most respectfully submitted that the applicants have a good *prima facie* case, and in consideration of said facts and circumstances, this Hon'ble Court in the interim, may be pleased to -

(i) to stay the approval granted by the Standing Committee of the National Board for Wild Life in its 80th Meeting held on 09.10.2024 for the use of 9.0 ha (1.6 ha of forest land from Hollongapar Gibbon Wildlife Sanctuary and 7.4 ha non-forest land from its notified Eco-Sensitive Zone) for 25KV railway electrification of 9 km Lumding–Dibrugarh section of Northeast Frontier Railway in favour of IRCON International Ltd., till the final adjudication of the instant matter,

PRAYER

In view of the above said facts and circumstances it is therefore most respectfully prayed by the applicants that this Hon'ble Court may be pleased to -

(i) to set aside and quash the approval granted by the Standing Committee of the National Board for Wild Life in its 80th Meeting held on 09.10.2024 for the use of 9.0 ha (1.6 ha of forest land from Hollongapar Gibbon Wildlife Sanctuary and 7.4 ha non-forest land from its notified Eco-Sensitive Zone) for 25KV railway electrification of 9 km Lumding–Dibrugarh section of Northeast Frontier Railway in favour of IRCON International Ltd., and/or

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(ii) to direct the respondent authorities, more particularly Respondent No. 2 Northeastern Frontier Railways to reroute the railway track proposed for electrification from within the Hoolongapar Gibbon Wildlife Sanctuary to outside it's boundary and/or outside its Eco-sensitive Zone by taking an eco-centric approach over an anthropocentric approach and by applying the 'species best interest standard'.

(iii) to provide any other reliefs deemed fit and proper by this Hon'ble Court to protect the endangered Western Hoolock Gibbons (India's only ape species), including the other six primate species and other wildlife of Hoolongapar Gibbon Wildlife Sanctuary, and/or

(iv) to pass any other such order(s)/direction(s) as this Hon'ble Court seem fit and proper in the facts and circumstances of the present case.

Date: 22.11.2024 **Place: Guwahati**

Drawn and filed by:

Vikram Rajkhowa

Vikram Rajkhowa
Advocate for the Applicants

504, Amazing Grace Apartment,
S.K Bhuyan Road, Dighalipukhuri(E)
Guwahati – 7810001, ASSAM
vikram.rajkhowa@gmail.com
(+91) 9954348258

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BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
EASTERN ZONE BENCH AT KOLKATA

ORIGINAL APPLICATION No. ..... OF 2024/EZ

IN THE MATTER OF:

Sri. Promod Chandra Mahanta & Anr. : Applicants

Vs.

The Ministry of Environment, Forests & Climate Change & Ors. : Respondents

AFFIDAVIT

I, Sri PROMOD CHANDRA MAHANTA son of Late Khagakanta Mahanta aged around 65 years, resident of 1 No. Sonari Gaon, Tarajan, P.O. & P.S.- Jorhat, Pin:- 785001 in the district of Jorhat, Assam, do hereby solemnly affirm and state as under:

1. That I am Applicant No.1 in the present application, and as such I am fully conversant with the facts and circumstances of the case, and I am also authorized by the other applicant of the instant petition,thereforeI am competent to swear this affidavit on their behalf.

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2. That the accompanying application has been drafted by my counsel on my/our instructions and I/we have read and understood the contents of the same and nothing material has been concealed therefrom.

Promod Ch. Mahanta

DEPONENT

VERFIFICATION:

I, the above named, deponent do hereby verify that all the facts mentioned in the affidavit are true to my knowledge and no part thereof is false and nothing material has been concealed therefrom.

Promod Ch. Mahanta

DEPONENT

Identified by
Ankur Jyoti Saharia
Advocate
Enrl. No. 629/2023

22/11/24
Banti Baishya
NOTARY, GOVT. OF ASSAM
KAMRUP (Metro) Guwahati

NOTARY PUBLIC : OATH COMMISSIONER
Solemnly affirmed before me this day, I Certify that I read over and Explained the contents to the declarant and that the declarant seemed perfectly to understand them.

AUTHORIZATION LETTER

I hereby nominate, constitute and appoint Sri PROMOD CHANDRA MAHANTA son of Late Khagakanta Mahanta aged around 65 years, resident of 1 No. Sonari Gaon, Tarajan, P.O. & P.S.- Jorhat, Pin:- 785001 in the district of Jorhat, Assam, as my authorized representative to do the following acts, things or deeds as given below in regard to the protection Hoolongpara Gibbon Wild Life Sanctuary from electrification of railway line and oil exploration and ESZ among others of Assam:

1. To file original application, interlocutory application, miscellaneous application and/or any other application/petition, before the Hon'ble National Green Tribunal and/orGauhati High Court and/or Supreme Court of Indiaand/or any other forum.

2. To engage or appoint any advocate, lawyer, solicitor or counsel to conduct the cases in the National Green Tribunal, Gauhati High Court, Supreme Court of India and/or any other forum.

3. To sign and verify all plaints, pleadings, applications, petitions or documents before the court and to deposit, withdraw and receive documents from the court or from the respondents.

4. To do generally all other acts and things for the conduct of aforementioned case(s) as we could have done the same if we were personally present.

5. I further undertake to jointly bear/pay all expenses towards the aforementioned case(s), including advocates/lawyers fee, travel and accommodation expenses, and all other expenses incidental thereto.

Signed and delivered by the within named on 22.11.2024... (date)

Sl.No.	Name	Signature
1.	TRIDIB DUTTA S/o- Late Dewram Dutta R/o- Karanga Kamar Hazarika Gaon P.O.- Karanga P.S.- Jorhat Dist.:- Jorhat Pin:- 785008, Assam	Tridib Dutta.

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VAKALATNAMA

BEFORE THE HON'BLE NATIONAL GREEN TRIBUNAL
EASTERN ZONE BENCH AT KOLKATA

O.A No. OF 2024/EZ

IN THE MATTER OF:

Sri. Bromod Chandra Mahanta & Anr.

: Applicants

Vs.

The Ministry of Environment, Forests & Climate Change & Ors.

: Respondents

Know all men by these presents that the above, named Bromod Chandra Mahanta and Tridib Dutta

do hereby nominate, constitute and appoint **Santanu Borthakur and Vikram Rajkhowa, Advocates**, as shall accept this Vakalatnama to be his/their true and lawful Advocates to appear and act for him/them in the matter noted above and in connection therewith and for that purpose to do all acts whatsoever in that connection including depositing or drawing money, filing in or taking out papers, deeds of composition, etc., for him/them and on his/their behalf and I/We agree to ratify and confirm all acts to be done by the said Advocates as mine/ours for all intents and purposes. In case of non-payment of the stipulated fee in full, no Advocate will be bound to appear and act on my/our behalf. In witness whereof I/we hereunto set my hand on this day of October 2024.

Received from the executants
Satisfied and accepted as I/We
Hold no brief for the other side.

1. Bromod Ch. Mahanta

2. Tridib Dutta.

Santanu Borthakur Vikram Rajkhowa

Signature of Executant/s

Advocate *Advocate*

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ANNEXURE - A (COLLY.)

F.No.WL-6/115/2024 WL
Government of India
Ministry of Environment, Forest and Climate Change
(Wildlife Division)

2nd Floor, Vayu Wing,
Indira Paryavaran Bhawan,
Jor Bagh Road, New Delhi 110003.

Date: 15th October, 2024

To,

All Members
Standing Committee of NBWL

Sub: Minutes of 80th Meeting of the Standing Committee of National Board for Wild Life-reg.

Sir/Madam,

Kindly find enclosed copy of the Minutes of 80th Meeting of the Standing Committee of National Board for Wild Life held on 9th October, 2024 under the Chairmanship of Hon'ble Minister of Environment, Forest and Climate Change, Government of India.

Yours faithfully,

15.10.24

(Rakesh Kumar Jagenia)
Deputy Inspector General of Forests (WL)
Email: digwl-mefcc@gov.in

Distribution:

1. Secretary, MoEF & CC
2. DGF&SS, MoEF&CC
3. ADGF (WL), MOEF&CC
4. ADGF (FC), MoEF&CC
5. Member Secretary, NTCA
6. Director/IGF, PE Division, MoEF&CC
7. Director, WII, Dehradun
8. Director, GEER Foundation, Gandhinagar
9. Dr. R. Sukumar, Member, NBWL
10. Dr. H.S. Singh, Member, NBWL
11. Secretary, Environment, Forest, Science and Technology Department, Govt. of Andhra Pradesh.

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Copy to:

1. PS to Hon'ble MoEF&CC
2. PS to Hon'ble MoS, EF&CC
3. PPS to Secretary, MoEF & CC
4. PPS to DGF&SS, MoEF&CC
5. PSO to Addi. DGF (WL)/PPS to IGF (WL)
6. **The Additional Chief Secretary/Principal Secretary/Secretary Forest Department, The PCCF and HoFF,** Government of Assam/Andhra Pradesh/ Arunachal Pradesh/Gujarat/ Karnataka/Maharashtra /Manipur/ Uttarakhand /Uttar Pradesh/ Kerala/ Rajasthan /Madhya Pradesh/Haryana /Himachal Pradesh/Telangana UT of Ladakh/UT of Jammu & Kashmir/Odisha.
7. **The Chief Wild Life Warden, The PCCF and HoFF,** Government of Assam/Andhra Pradesh/ Arunachal Pradesh/Gujarat/ Karnataka/Maharashtra /Manipur/ Uttarakhand /Uttar Pradesh/ Kerala/ Rajasthan /Madhya Pradesh/Haryana /Himachal Pradesh/Telangana UT of Ladakh/UT of Jammu & Kashmir/Odisha.
8. **The PCCF and HoFF,** Government of Assam/Andhra Pradesh/ Arunachal Pradesh/Gujarat/ Karnataka/Maharashtra /Manipur/ Uttarakhand /Uttar Pradesh/ Kerala/ Rajasthan /Madhya Pradesh/Haryana /Himachal Pradesh/Telangana UT of Ladakh/UT of Jammu & Kashmir/Odisha.

Copy also to: Sr. Technical Director, NIC with a request to upload the minutes of the meeting on PARIVESH Portal.

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MINUTES OF THE 80th MEETING OF THE STANDING COMMITTEE OF NATIONAL BOARD FOR WILD LIFE HELD ON 9th October, 2024

The 80th meeting of the Standing Committee of the National Board for Wild Life was held on 9th October, 2024 under the chairmanship of Hon'ble Minister for Environment, Forest & Climate Change. The list of participants is placed at **Annexure-I.**

The Member Secretary welcomed the participants to the meeting and informed about the number and type of proposals that were to be taken for discussion in the meeting. He then requested Deputy Inspector General of Forests (WL) to initiate discussions on the Agenda Items.

AGENDA ITEM No.1

80.1. Confirmation of the minutes of the 79th Meeting of the Standing Committee of National Board for Wild Life held on 31st July, 2024.

The Standing Committee was informed that the 79th Meeting of the Standing Committee of National Board for Wild Life was held on 31st July, 2024. The minutes of the meeting were circulated on 28th February, 2024 amongst all the Members.

The Standing Committee was informed that Dr. H. S. Singh, Member, NBWL has given his comments regarding the proposal for use of 0.3501 ha (revised from 0.95 ha) of forest land for Temple from Balaram Ambaji Wildlife Sanctuary for religious purpose in Ukarda Village Survey No. 48 Pt., and Ranpuriya Survey no. 4 Pt in Ta-Palanpur Dist. Banaskantha, Gujarat and requested the Standing Committee to reconsider the recommendations. During the 79th meeting, the Chief Wild Life Warden, Gujarat had informed that the User Agency shall also be submitting application under the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 for regularization.

Dr. H. S. Singh stated that this proposal is for acquiring land of the Balaram Ambaji Wildlife Sanctuary for religious purposes. Dr. Singh mentioned that during the process of notifications of reserve forests and wildlife sanctuaries, rights and claims are enquired into and recognised in the final notifications. The right of the Applicant Agency: Pramukhshri, Mukundpuriji Maharaj Seva Trust, Palanpur on the land has not been recognised or recorded in the forest settlement report or any other government records. This is a first case in which allotment of the sanctuary land has been considered, which may act as precedence regarding demand of the Protected Area lands for the religious or any such purpose. He requested the Standing Committee to reconsider its decision to recommend the proposal in its previous meeting.

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the existing Command Area of Asolamendha Project from 9919 Ha to 70412 Ha. The area required under this project is 243.27 for additional submergence area and 72.47 ha for canal network system.

The proposal has been recommended by Chief Wild Life Warden, the State Board for Wild Life and the State Government. The NTCA has suggested for constitution of a committee comprising of the members of MoEFCC, NTCA, WII, Maharashtra Forest Department and User Agency before granting any statutory clearance to the instant proposal.

Decision Taken: After discussions, the Standing Committee decided that a site inspection committee comprising of representatives of the Ministry, NTCA, WII, Maharashtra Forest Department and User Agency may be constituted for site appraisal and examination of the mitigation plan and therefore decided to defer the proposal.

80.5.35 Proposal for Oil & Gas Exploration Drilling over an area of 4.4998 ha [Well Pad (Plinth): 1.44 ha and Approach Road: 3.0598 ha] reserve forest area at Well Pad SP-1- East-2 in AA- ONHP-2017/4 Block in the Eco- sensitive zone of Hollongapar Gibbon Wildlife Sanctuary, District. Jorhat, Assam.

WL/AS/Others/445754/2023

The Standing Committee was informed that the proposal is for Oil & Gas Exploration Drilling over an area of 4.4998 ha [Well Pad (Plinth): 1.44 ha and Approach Road: 3.0598 ha] reserve forest area at Well Pad SP-1- East-2 in AA- ONHP-2017/4 Block in the Eco- sensitive zone of Hollongapar Gibbon Wildlife Sanctuary, District. Jorhat, Assam.

The proposal has been recommended by Chief Wild Life Warden, the State Board for Wild Life and the State Government.

The proposal falls in the RED category polluting industries As per the ESZ notification of the Hollongapar- Gibbon Sanctuary and the guidelines issued by the Ministry dated 9.2.2011, setting of industries causing pollution (Water, Air, Soil, Noise, etc.) has been placed in the prohibited category.

Dr. H. S. Singh mentioned that the area of the sanctuary is small compared to the area of the Eco-sensitive Zone around the sanctuary. The Hoolock Gibbons are found only in small area of the sanctuary. He therefore suggested for site inspection by a committee.

Decision Taken: After discussions, the Standing Committee decided that a site inspection committee comprising of representatives of the Ministry, WII, State Forest Department and Dr. Sukumar may be constituted for site inspection and therefore decided to defer the

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proposal.

80.5.36 Proposal for Pokhari Urf Pokhani Soapstone Mining Project over an area of 4.494 ha non-forest land in favour of Shri Sandeep Singh S/o Sh. Narendra Singh, 2.10 km away from the Kedarnath Wildlife Sanctuary in its default Eco- Sensitive Zone, District-Chamoli, Uttarakhand.

WL/UK/MIN/QRY/455411/2023

The Standing Committee was informed that the proposal is for use of Pokhari Urf Pokhani Soapstone Mining Project over an area of 4.494 ha non-forest land in favour of Shri Sandeep Singh S/o Sh. Narendra Singh, 2.10 km away from the Kedarnath Wildlife Sanctuary in its default Eco- Sensitive Zone, District-Chamoli, Uttarakhand.

The proposal has been recommended by Chief Wild Life Warden, the State Board for Wild Life and the State Government.

Dr. H. S. Singh mentioned that the proposal shall have been examined from hydrological point of view.

Decision Taken: After discussions, the Standing Committee decided that the officials from the State Mining Department shall be present during the next meeting and therefore decided to defer the proposal.

80.5.37 Proposal for use of 9.0 ha (1.6 ha of forest land from Hollongapar Gibbon Wildlife Sanctuary and 7.4 ha non-forest land from its notified Eco-Sensitive Zone) for 25KV railway electrification of 9 km long Lumiding- Dibrugarh section of Northeast Frontier Railway in favour of IRCON International Limited.

WL/AS/RAIL/464292/2024

The Standing Committee was informed that the proposal is for use of 9.0 ha (1.6 ha of forest land from Hollongapar Gibbon Wildlife Sanctuary and 7.4 ha non-forest land from its notified Eco-Sensitive Zone) for 25KV railway electrification of 9 km long Lumiding- Dibrugarh section of Northeast Frontier Railway in favour of IRCON International Limited.

The proposal has been recommended by Chief Wild Life Warden, the State Board for Wild Life and the State Government.

The Chief Wild Life Warden, Assam mentioned that the railway line exists for about 100 years i.e. prior to the notification of the sanctuary. The Railway Department has proposed to carry out electrification of the railway line.

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Dr. Sukumar taking example from Buxa Tiger Reserve suggested for imposing speed restrictions for the trains passing through this sanctuary.

Decision Taken: After discussions, the Standing Committee decided to recommend the proposal subject to the following conditions:

1. The Forest Deparment shall prescribe appropriate speed restrictions for the trains passing through the sanctuary.
2. The User Agency shall have to implement all the mitigation measures prescribed in the animal passage plan designed by Wildlife Institute of India, Dehradun, simultaneously with execution of the project.
3. The electric wires shall not be energized till the complete installation of mitigation measures for safe movement of Elephants and Hoolock Gibbon across the electrified railway track.
4. No construction activity shall be carried out between sunset and sunrise.
5. The User Agency shall deposit 2% of the project cost as Corpus Fund in favour of CWLW, Assam for preparing and implementing Human Elephant/Wildlife Conflict Mitigation and Wildlife Conservation Plan.
6. An annual compliance certificate on the stipulated conditions shall be submitted by the User Agency to the State Chief Wild Life Warden and an annual compliance certificate shall be submitted by the State Chief Wild Life Warden to Government.

80.5.38 Proposal for use of 0.63 ha of forestland from Shoolpaneshwar Wildlife Sanctuary for construction of New Approach Road (paved road) from Dam (Left Bank) to Jetty (U/ S), Village- Mokhadi, Ta.Grudeshwar, District, Narmada, Gujarat.

WL/ GJ/ ROAD/449002/2023

The Standing Committee was informed that the proposal is for use of 0.63 ha of forestland from Shoolpaneshwar Wildlife Sanctuary for construction of New Approach Road (paved road) from Dam (Left Bank) to Jetty (U/ S), Village- Mokhadi, Ta.Grudeshwar, District, Narmada, Gujarat.

The proposal has been recommended by Chief Wild Life Warden, the State Board for Wild Life and the State Government.

Decision Taken: After discussions, the Standing Committee decided to recommend the proposal subject to the following conditions:

1. The User Agency shall not violate any provision of the Wild Life (Protection) Act, 1972.
2. The User agency shall not harm or destroy wildlife habitat including fauna and flora of the Sanctuary.
3. The User Agency shall not use the area for any other work other

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ANNEXURE - B

PARIVESH 2.0

Minutes of the Meeting of the Advisory Committee (AC) meeting held on 27.08.2024

Agenda No. 1

Online Proposal No. FP/AS/MINOIL/443620/2023

Subject: Proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 in f/o M/s Vedanta Limited(Division Cairn Oil & Gas) for non-forestry use of 4.4998 ha of Reserved Forest land for Oil & Gas Exploration Drilling at Well Pad# SP-1-East-2 in AA-ONHP-2017/4 Block, District Jorhat in the State of Assam. (Online Proposal No. FP/AS/MINOIL/443620/2023) - regarding

1. The agenda item was considered by the AC in its meeting held on 27.08.2024. The corresponding agenda note may be seen at www.parivesh.nic.in.
2. During the meeting, all the facts and background of the proposal, along with examination of the proposal in the DSS were presented and explained by the Member Secretary before the AC for their examination and analysis. Committee was also apprised of the relevant provisions under other Acts, Rules and Guidelines relevant to the proposal and their significance.
3. The DDGF (Central), Regional Office, Shillong and Nodal Officer, Assam attended the meeting. The Advisory Committee (AC) after thorough deliberation and discussion observed the following:
   i. State Government of Assam vide online proposal no. FP/AS/MINOIL/443620/2023, submitted the above mentioned proposal for seeking prior approval of the Central Government under section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 in f/o M/s Vedanta Limited(Division Cairn Oil & Gas) for non-forestry use of 4.4998 ha of forest land for Oil & Gas Exploration Drilling at Well Pad# SP-1-East-2 in AA-ONHP-2017/4 Block, District Jorhat in the State of Assam.
   ii. It is mentioned that the proposed exploratory drilling could possibly result in the commercial discovery of hydrocarbons and in that case, would help in reducing India's dependence on crude petroleum imports. In case of commercially viable discovery of hydrocarbon, Early Production Unit (EPUs)/ Quick Production Unit (QPUs)/Extended Well Testing (EWT) will be setup for early production of hydrocarbons.
   iii. The area proposed for diversion is 4.4998 ha of Reserved Forest and the density of vegetation is 0.4 having Eco-class 1. About 1350 trees are proposed to be felled in the proposal.
   iv. DFO, Jorhat has mentioned in Part- II that the proposed area lies in notified ESZ of Hoollongapar Gibbon Wildlife Sanctuary. The project is in a relatively small area and no major construction is anticipated. Hence the impact will be minimal. Approval of SBWL/NBWL is mandatory. Certificates to this effect has been submitted by DFO concerned.

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v. Further, DFO, Jorhat has also mentioned in Part- II that Elephants, Hoolock gibbons, Leopards etc are present in the area. Further, it is mentioned that the project is in a relatively small area and no major construction is anticipated. Hence the impact will be minimal and if necessary, a wildlife management and mitigation plan shall be prepared and all precautions shall be taken to cause minimal disturbance to the wildlife and to mitigate man-animal conflict. Comments from PCCF (Wildlife) from conservation point of view along with Wildlife Conservation Plan is required.

vi. No violation of provisions under Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 is observed. Certificate to this effect has been submitted by DFO concerned.

vii. Compensatory Afforestation has been proposed over 4.5279 ha non-forest land in Village- Ledo Namdang Gaon, Mouza- Makum, Range- Lekhapani, Digboi Forest Division, District- Tinsukia.CA scheme for 10 years along with site suitability certificate, KML file and DGPS map have been submitted.

viii. As per DSS analysis, the plinth area and the approach road is an active area for wildlife especially wild elephant herds. A kaccha/ un-metalled road is visible in few segments of the Road proposed for diversion and it may be concluded that the a new metalled road is likely to be constructed connecting the site proposed for prospecting. Moreover, width of the Road as per KML file is found varying from 4.18 meters to 5.46 meters. As per latest satellite imagery, a Kaccha Road and a settlement has been erected within the proposed CA land. Further, the proposed CA site is located at a distance of approximately 134 meter away from the Dehing river. However, as per the Survey of India toposheet map, the proposed CA has been shown as located on the River.

ix. Examination of the proposal revealed certain shortcomings as under and the same was communicated to the State Government on 12.04.2024:

a. DFO, Jorhat has mentioned in Part- II that Elephants, Hoolock gibbons, Leopards etc are present in the area. Further, it is also mentioned that the project is in a relatively small area and no major construction is anticipated. Hence the impact will be minimal and if necessary, a wildlife management and mitigation plan shall be prepared and all precautions shall be taken to cause minimal disturbance to the wildlife and to mitigate man-animal conflict. Comments from PCCF (Wildlife)/ CWLW from conservation point of along with Wildlife Conservation Plan is required.

b. As per DSS analysis it is also observed that the plinth area and the approach road is an active area for wildlife especially wild elephant herds. Wildlife conservation/ Wildlife Management plan approved by PCCF (Wildlife)/ CWLW needs to be submitted.

c. As per study of satellite imagery in DSS, kaccha/ un-metalled road is visible in few segments of the Road proposed for diversion and it may be concluded that the a new metalled road is likely to be constructed connecting the site proposed for prospecting. Moreover, width of the Road as per KML file is found varying from 4.18 meters

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to 5.46 meters. The State Govt. may be requested to confirm the width of Road & its KML file.

d. As per study of latest satellite imagery in DSS, a Kaccha Road and a settlement has been erected within the proposed CA land. The State Govt. may be requested to ensure that the proposed CA land is free from all sorts of encroachment and encumbrances.

e. As per study of KML file in DSS, the proposed CA site is located at a distance of approximately 134 meter away from the Dehing river. However, as per the Survey of India toposheet map, the proposed CA has been shown as located on the River. Revised KML file along with correct Soltoposheet needs to be uploaded on Parivesh portal.

x. State Government vide letter dated 14.06.2024 submitted reply in response to Ministry's letter dated 12.04.2024.

xi. The Regional Office, Shillong was requested to carry out site inspection and submit report to the Ministry on 12.04.2024. Accordingly, Site Inspection has been carried out by DIGF (C) and Research Officer, Regional Office, Shillong along with the officials of the State Forest Department and representatives of User Agency. Regional Office has recommended the proposal with the following conditions:

a. The consent of NBWL is to be obtained prior to the Final Approval as the proposed area is located in ESZ of Hollongar Gibbon WLS.

b. The CWLW shall approve the Human Elephant Conflict (HEC) mitigation and Wildlife Conservation Plan with special emphasis on protection measures on Gibbon.

c. The Standing Committee on petroleum & Natural Gas (2022-23) Seventeenth Lok Sabha report, Ministry of Petroleum & Natural Gas report on Safety and Security of Oil Installations of Public Sector oil companies-with specific reference to Baghjan Blow-Out Incident and SOP on compliance status on recommendations of HL.C on Baghjan Blowout shall be strictly implemented in this proposed area.

d. The ONGC shall ensure that Blow Out Preventer (BOP) and other technical precautionary measures are implemented strictly during the drilling and completion stages of operation as per the Directorate General of Mines Safety (DGMS/Oil Industry safety Directorate (OISD), whichever applicable.

e. The muck generated in the earth cutting will be disposed off at the designated dumping sites and in no case the muck/debris will be allowed to roll down the hill slopes.

f. The well wise CSR and CER action plan are to be strictly implemented.

g. To ensure safety measures of the habitat/settlement area around the proposed exploratory drilling location area as per the prescribed relevant guideline.

h. Proper signages with latitude and longitude & name of the proposed exploratory drilling location shall be indicated in the proposed area and follow the strict mitigation measures to avoid oil spillage, etc during the exploratory drilling along with other component like fire extinguisher, ETP, pond etc.

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i. The security fence of the area to prevent from grazing and other unwanted intrusion in the proposed area.

xii. The proposal was placed before Advisory Committee (AC) meeting held on 04.07.2024. The Committee had detailed discussion and deliberation with the DDGF (Central), Regional Office, Shillong and Nodal Officer Assam. After going through the facts of the proposal and submissions made, the Committee decided that the proposal shall be deferred and observed that comments from PCCF (Wildlife)/ CWLW from conservation point of view along with Wildlife Conservation Plan may be obtained by the State Government.

xiii. The above observation of Advisory Committee was communicated to the State Government on 28.07.2024. The State Government has submitted comments of Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Assam along with Wildlife Conservation Plan and Human-Animal Conflict Management Plan with a financial provision of 557 Lakhs on 08.08.2024. Comments of Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, Assam are as under:

The above mentioned project site falls within ESZ of Hollongapar Gibbon WLS in the District of Jorhat, Assam. There is significant movement of wild elephants in the said ESZ area connecting Hollongapar Gibbon WLS with Dessoi Valley Reserve Forest. Conservation and Management of wild animals and their habitat in Hollongapar Gibbon WLS and Dessoi Valley RF including potential areas of the ESZ is crucial for protection of elephants and other animal species. Therefore, appropriate scientific interventions shall have to be undertaken while implementing the above mentioned project in Dessoi Valley RF.

As the Project is of national interest, it may be recommended for granting Forest Clearance subject to the following conditions-

a. *The User Agency shall resort to minimal tree felling.*
b. *No adverse impact shall be caused to the wild animals and their habitat.*
c. *The User Agency shall take adequate measures against all kinds of pollution likely to be generated due to implementation of the project including disasters like oil & gas leakage and explosion of the well.*
d. *2% of the total project cost shall be deposited in the CORPUS fund with the Chief Wildlife Warden, Assam, to be utilized by the CWLW for Wild Life Conservation & Management and Mitigation of Human-Animal Conflict including preparation of the plans.*

xiv. During the AC meeting held on 27.08.2024, the Committee observed that the Chief Wildlife Warden Assam had recommended the project. The Regional Office had also recommended the project with conditions pertaining to the report on Safety and Security of Oil Installations of Public Sector oil companies-with specifie reference to Baghjan Blow-Out Incidenof the Standing Committee on petroleum & Natural Gas (2022-23) SeventeethLok Sabha report, Ministry of Petroleum & Natural Gas.

xv. The Compensatory Afforestation in the extant case is proposed to be carried out on Non-Forest Land.

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xvi. The License for extraction of Oil & Natural gas is also valid till the year 2027.

xvii. Furthermore, 17 trees are proposed to be felled in the proposal with 3.0598Ha out of the total 4.4998Ha used for creating an approach road while the remaining 1.44Ha is proposed for exploration drilling.

4. **Decision of the Advisory Committee:** The Committee after detailed discussion and deliberation with the DDGF (Central), Regional Office, Shillong and Nodal Officer Assam, recommended the proposal for grant of ***'in-principle'*** approval for diversion of 4.4998 ha. of forest land for Oil & Gas Exploration Drilling at Well Pad# SP-1-East-2 in AA-ONHP-2017/4 Block, District Jorhat in the State of Assam in f/o M/s Vedanta Limited(Division Cairn Oil & Gas) subject to the general, standard and following specific conditions:-

   i. The State Government shall ensure compliance of conditions in the report on Safety and Security of Oil Installations of Public Sector oil companies-with specifie reference to Baghjan Blow-Out Incidenof the Standing Committee on petroleum & Natural Gas (2022-23) Seventeenth Sabha report, Ministry of Petroleum & Natural Gas.

Agenda No.2

Online Proposal No. FP/AS/OTHERS/469924/2024

Subject: Proposal for seeking prior approval of the Central Government under Section 2 (1) (ii) of the Van (SanrakshanEvamSamvardhan) Adhiniyam, 1980 in favour of Assam Police Housing Corporation Limited, Assam for non-forestry use of 11.5 Ha. of forest land for establishment of 2nd Commando Battalion Camp at Damchera in Innerline Reserved Forest under Hailakandi Division, Hailakandi District in the State of Assam (Online No. FP/AS/OTHERS/469924/2024) - regarding

1. The agenda item was considered by the AC in its meeting held on 27.08.2024. The corresponding agenda note may be seen at www.parivesh.nic.in.
2. During the meeting, all the facts and background of the proposal, along with examination of the proposal in the DSS were presented and explained by the Member Secretary before the AC for their examination and analysis. Committee was also apprised of the relevant provisions under other Acts, Rules and Guidelines relevant to the proposal and their significance.
3. The DDGF (Central), Regional Office, Shillong, Nodal Officer Assam& representative of the Assam Police attended the meeting. The Advisory Committee (AC) after thorough deliberation and discussion observed the following:

   i. State Government of Assam vide online proposal FP/AS/OTHERS/469924/2024 submitted the proposal for seeking prior approval of the Central Government under Section 2 (1) (ii) of the Van (Sanrakshan Evam Samvardhan) Adhiniyam, 1980 in favour of Divisional Forest Officer, Hailakandi Division, Assam for non-forestry use of 11.5 Ha. of forest land for establishment of 2nd Commando

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ANNEXURE - C

MINISTRY OF ENVIRONMENT, FOREST AND CLIMATE CHANGE

NOTIFICATION

New Delhi, the 23rd September, 2019

S.O. 3462(E).—WHEREAS, a draft notification was published in the Gazette of India, Extraordinary, *vide* notification of the Government of India in the Ministry of Environment, Forest and Climate Change number S.O.1828 (E), dated 7th May, 2018, inviting objections and suggestions from all persons likely to be affected thereby within the period of sixty days from the date on which copies of the Gazette containing the said notification were made available to the public;

AND WHEREAS, copies of the Gazette containing the said draft notification were made available to the public on the 7th May, 2018;

AND WHEREAS, no objections and suggestions were received from persons and stakeholders in response to the aforesaid draft notification;

AND WHEREAS, the Hollongapar-Gibbon Sanctuary was notified by the Government of Assam *vide* notification No. FRS/37/97/13, dated 30.07.1997, by upgrading the conservation status of the Hollongapar Reserve Forest declared earlier *vide* notification No. 8, dated 27.08.1881;

AND WHEREAS, the Sanctuary is an important protected area situated in Jorhat District in the state Assam covering an area of 20.98621 square kilometers; the perennial river Bhogdoi along with its catchment passes through the Sanctuary and makes the ecological environment of the Sanctuary unique, several seasonal small streams comprising of Hollongapar Mouza (Taluka) and Nakachari Mouza (Taluka) of Jorhat District are the main sources of water for the animals in the Sanctuary;

AND WHEREAS, the floral biodiversity of the Sanctuary includes 74 tree species, 17 species of shrubs and 12 species of climbers; the important tree species recorded from the Sanctuary are hollong (*Dipterocarpus retusa*), sam (*Artocarpus chaplasha*), amari (*Amoora wallichii*), sopas (*Michelia spp.*), bhelu (*Tetramelos nudiflora*), udal (*Sterculia villosa*), hingori (*Castanopsis spp.*), nahor (*Musua ferrea*), Bandordima (*Dysoxylum procerum*), Dhuna (*Canarium resiniferum*), Bhomora (*Terminalia belerica*), ful Gomari (*Gmelina Spp.*), bon bogori (*Pterospermum lanceofolium*), morhal (*Vatica lanceofolia*), sassi (*Aquilaria agolacha*), otenga (*Dillenia indica*), ajar (*Lagerstroemia flos-reginae*), bon-am (*Mangifera silvatica*), amora (*Spondias Mangifera*), uriam (*Biscofia javanica*), Selleng (*Sapium baccatum*), mahi thekera (*Garcinia morella*), katholua (*Palequium obovatium*), kumbhi (*Careya arborea*), gahori Sopa (*Magnolia Pealiana*), gomari (*Gmelina arborea*), gohora (*Premna bengalensis*), Gondhsoroi (*Cinnamonium grandiliferum*), Salmugra (*Hydrocarpus kurzil*), poreng (*Elaeocarpus robustus*), sotiona (*Alostonia scholaris*), chom (*Machilus odoratissime*), chewa (*Caryota ureus*), jutuli (*Altingia exulsa*), Jori (*Fiscus benjamine*), titasopa (*Michelia champaka*), pan chopa (*Magnolia sphenocarpa*), bohot (*Artocarpus lakoocha*), fakdema (*Triwea orentalis*), phul sopa (*Magnolia hookari*), borhomthuri (*Talauna Hodgsoni*), Bogi jamuk (*Eugenia kurzii*), Bor jamuk (*Eugenia jambulana*), bagh nola (*Litssea Sebifera*), bhatghilla (*Oroxylum Indicam*), bomora (*Terminalia belerica*), mejangkori (*Litsea citrata*), khokon (*Dubhanga sonneratoides*), rudrakha (*Elaeocarpus ganitrus*), raghu (*Anthocephallus cadamba*), simul (*Bombax ceiba*), leteku (*Baceaurea sapeda*), hilikha (*Terminalic chebula*), houra (*Trophis aspera*), haldu Sopa (*Adine cardifolia*), holokh (*Terminalia myriocarpa*), heloch (*Antidesma ghesaembilla*), bhelkor (*Trewia nudiflora*), Boal (*Cordia oblique*), bonsum (*Phoebe goalparensis*), borpat (*Ailanthus grandis*), dimaru (*Ficus Spp.*), ghora neem (*Melia indica*), hualu (*Litsaea polyantha*), Jalpai (*Elaeocarpus varunna*), kanchan (*Bauhinia purpurea*), keseru (*Heteropanax fragrams*), koroi (*Albezzia procera*), moj (*Albezzia lucida*), morolia (*Mallotus albus*), nagabhe (*Schima wallichii*), paroli (*Sterospermum chelonoides*), poma (*Cedrela toona*) and tepor tenga (*Garcinia spp.*);

AND WHEREAS, the shrubs and climbers species include Harpagondha (*Rawolfia serpentina*), Guphul (*Lantena camera*), Jarmoni (*Eupotorium odoratum*), Jetuli poka (*Rubus mulucanus*), Tora (*Alpinea allughus*), Dhopattita (*Phloganthus crriviflorus*), Nal (*Arundodonax*), Khogori (*Phragmites karka*), Nilaji bon (*Mimosa pudica*), Patidoi (*Elinogyne dichotoma*), Pochotia (*Buddliria asiatica*), Phutuka (*Osbeckia rastrata*), Bioni Habota (*Desmodium labornifolium*), Bahok tita (*Adhatoda spp.*), Kaupat (*Phrynium spp.*), Makhioti (*Fleminzia stricta*), Mejenga (*Viburnum colebookianum*), Amoilota (*Menispernum glabrum*), Harjura lota (*Cissus quadrangularis*), Akashilota (*Trachelospermum fragrans*), Panilota (*Dilina sermentosa*), Kolialota (*Merremia umbellata*), Pipoli (*Piper longum*), Latumoni (*Abrus Precatorious*), Mekuri chali (*Combretum decundrum*), Jengu bet (*Calamus erectus*), Jati bet (*Calamus tenewise*), Raidang bet (*Calemus flagellum*) and Lejai bet (*Calemus floribundus*), etc.

AND WHEREAS, the important rare species found in the Hollongapar-Gibbon Sanctuary are *Dipterocarpus retusus* (hollong), *Ficus* spp. (fig), *Artocarpus chaplasha* (Sam-goch, Chamkathal), *Litsea citrate* (Mejangkori), *Aquilaria agallocha* (Aloewood), etc.

AND WHEREAS, the Sanctuary supports 11 species mammals, 5 species of reptiles and amphibians and 31 avifaunal species; the major fauna of the Sanctuary includes Tiger (stray) (*Panthera tigris*), Asiatic elephant (*Elephus maximus*), leopard (*Panthera pardus*), pangolin (*Manis crassicaudata*), jungle Cat (*Felis chaus*), Indian civet (*Viverridae*), wild pig (*Sus spp.*), giant squirrel (*Retufa bicolor*), barking deer (*Muntiacus muntjak*), sambar deer (*Cervus unicolour*),

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scorfa), five-striped palm squirrel (*Funambulus pennanti*), Indian python (*Genus python*), common monitor lizard (*Varanus grisus*), Indian tent turtle (*Kachuga tecta tecta*), geacko (*Caloductyloids aureus*), common cobra (*Naja spp.*), white winged wood duck (*Cairina scutulata*), horn bill (*Ptilolaemus tickali austeni*), Indian pied horn bill (*Anthracoceros malabaricus*), osprey (*Pandion haliatetus*), hill myna (*Gracula religiosa indica*), kalij pheasant (*Lophurs leucomala*), babblers (*Timaliinae spp.*), barbets (*Capitonidae spp.*), bitterns (*Ardeidae spp.*), kingfisher (*Alcedinidae*), orioles (*Oriolidae*), bulbuls (*Pycnonotidae spp.*), owls (*Strigidae*), egrets (*Arideidae*), cormorants (*Phalacrocoracidie*), mynah (*Sturnidae*), cuckoos (*Cuculidae*), magpies (*Corvidae*), pigeons (*Columbidae*), darters (*Phalacrocoracidae*), droves (*Columbidae*), blue jays (*Coraciidae*), teals (*Anatidae*), tree Pies (*Corvidae*), bayas (*Ploceidae*), jungle fowl (*Phasianidae*), minivets (*Campephagidae*), munias (*Estrildinae*), parakeets (*Psittacidae*), wood peckers (*Picidae*) and tits (*Paridae*), etc., and the Sanctuary also protects (7) seven rare primate species that enrich the biodiversity;

AND WHEREAS, heterogeneous landscapes of the Sanctuary is an integral part of a critical elephant corridor along with Disai and Disai Valley reserved forests, and the adjoining landscape of the State of Nagaland on the south;

AND WHEREAS, the Sanctuary is situated about 3 kilometers from Mariani Mouza (Taluka) and 18 km from Jorhat city and due to the fast urbanisation it may have adverse affect on birds, animals of the Sanctuary in the long run and railway line and road also pass through the Sanctuary opening it to vehicular traffic and causing damage to the ecosystem of the Sanctuary;

AND WHEREAS, the Sanctuary is home to a variety of flora, fauna and avifauna, and provides protection to rare and endangered species of wildlife endemic, hence, it is necessary to conserve and protect the area, the extent and boundaries of which are specified in paragraph 1, around the Hollongapar-Gibbon Sanctuary as Eco-sensitive Zone from ecological, environmental and biodiversity point of view and to prohibit industries or class of industries and their operations and processes in the said Eco-sensitive Zone;

NOW, THEREFORE, in exercise of the powers conferred by sub-section (1) and clauses (v) and (xiv) of sub-section (2) and sub-section (3) of section 3 of the Environment (Protection) Act 1986 (29 of 1986) (hereafter in this notification referred to as the Environment Act) read with sub-rule (3) of rule 5 of the Environment (Protection) Rules, 1986, the Central Government hereby notifies an area to an extent varying from 0 (zero) kilometer (sharing inter-State boundary with the State of Nagaland) to 22.54 kilometers around the boundary of Hollongapar-Gibbon Sanctuary, in Jorhat District in the State of Assam as the Hollongapar-Gibbon Sanctuary Eco-sensitive Zone (hereafter in this notification referred to as the Eco-sensitive Zone) details of which are as under, namely: -

1. **Extent and boundaries of Eco-sensitive Zone. –** (1) The Eco-sensitive Zone shall be to an extent of 0 (zero) kilometer (sharing interstate boundary with the State of Nagaland) to 22.54 kilometers around the boundary of Hollongapar-Gibbon Sanctuary and the area of the Eco-sensitive Zone is 264.62 square kilometres.

   (2) The boundary description of Hollongapar-Gibbon Sanctuary and its Eco-sensitive Zone is appended in **Annexure-I.**

   (3) The maps of the Hollongapar-Gibbon Sanctuary demarcating Eco-sensitive Zone along with boundary details and latitudes and longitudes are appended as **Annexure-IIA** and **Annexure-IIB.**

   (4) List of geo-coordinates of the boundary of Hollongapar-Gibbon Sanctuary and Eco-sensitive Zone are given in Table **A** and Table **B** of **Annexure-III.**

   (5) The list of villages falling in the Eco-sensitive Zone along with their geo co-ordinates at prominent points is appended as **Annexure-IV.**

2. **Zonal Master Plan for Eco-sensitive Zone.-** (1) The State Government shall, for the purposes of the Eco-sensitive Zone prepare a Zonal Master Plan within a period of two years from the date of publication of this notification in the Official Gazette, in consultation with local people and adhering to the stipulations given in this notification for approval of the competent authority in the State.

   (2) The Zonal Master Plan for the Eco-sensitive Zone shall be prepared by the State Government in such manner as is specified in this notification and also in consonance with the relevant Central and State laws and the guidelines issued by the Central Government, if any.

   (3) The Zonal Master Plan shall be prepared in consultation with the following Departments of the State Government, for integrating the ecological and environmental considerations into the said plan:-

   (i) Environment;
   (ii) Forest and Wildlife;
   (iii) Agriculture and Horticulture;

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(iv) Revenue;
(v) Urban Development;
(vi) Tourism;
(vii) Rural Development;
(viii) Irrigation and Flood Control;
(ix) Municipal;
(x) Panchayati Raj;
(xi) Public Works Department; and
(xii) Assam State Pollution Control Board

(4) The Zonal Master Plan shall not impose any restriction on the approved existing land use, infrastructure and activities, unless so specified in this notification and the Zonal Master Plan shall factor in improvement of all infrastructure and activities to be more efficient and eco-friendly.

(5) The Zonal Master Plan shall provide for restoration of denuded areas, conservation of existing water bodies, management of catchment areas, watershed management, groundwater management, soil and moisture conservation, needs of local community and such other aspects of the ecology and environment that need attention.

(6) The Zonal Master Plan shall demarcate all the existing worshipping places, villages and urban settlements, types and kinds of forests, agricultural areas, fertile lands, green area, such as, parks and like places, horticultural areas, orchards, lakes and other water bodies with supporting maps giving details of existing and proposed land use features.

(7) The Zonal Master Plan shall regulate development in Eco-sensitive Zone and adhere to prohibited and regulated activities listed in the Table in paragraph 4 and also ensure and promote eco-friendly development for security of local communities' livelihood.

(8) The Zonal Master Plan shall be co-terminus with the Regional Development Plan.

(9) The Zonal Master Plan so approved shall be the reference document for the Monitoring Committee for carrying out its functions of monitoring in accordance with the provisions of this notification.

3. **Measures to be taken by State Government**.- The State Government shall take the following measures for giving effect to the provisions of this notification, namely:-

(1) **Land use.–** (a) Forests, horticulture areas, agricultural areas, parks and open spaces earmarked for recreational purposes in the Eco-sensitive Zone shall not be used or converted into areas for commercial or residential or industrial activities:

Provided that the conversion of agricultural and other lands, for the purpose other than that specified in clause (a) above, within the Eco-sensitive Zone may be permitted on the recommendation of the Monitoring Committee, and with the prior approval of the competent authority under Regional Town Planning Act and other rules and regulations of Central Government or State Government as applicable and *vide* provisions of this notification, to meet the residential needs of the local residents and for activities such as-

(i) widening and strengthening of existing roads and construction of new roads;

(ii) construction and renovation of infrastructure and civic amenities;

(iii) small scale industries not causing pollution;

(iv) cottage industries including village industries; convenience stores and local amenities supporting eco-tourism including home stay; and

(v) promoted activities given in paragraph 4:

Provided further that no use of tribal land shall be permitted for commercial and industrial development activities without the prior approval of the competent authority under Regional Town Planning Act and other rules and regulations of the State Government and without compliance of the provisions of article 244 of the Constitution or the law for the time being in force, including the Scheduled Tribes and Other Traditional Forest Dwellers (Recognition of Forest Rights) Act, 2006 (2 of 2007):

Provided also that any error appearing in the land records within the Eco-sensitive Zone shall be corrected by the State Government, after obtaining the views of Monitoring Committee, once in each case and the

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correction of said error shall be intimated to the Central Government in the Ministry of Environment, Forest and Climate Change:

Provided also that the correction of error shall not include change of land use in any case except as provided under this sub-paragraph.

(b) Efforts shall be made to reforest the unused or unproductive agricultural areas with afforestation and habitat restoration activities.

(2) **Natural water bodies.-**The catchment areas of all natural springs shall be identified and plans for their conservation and rejuvenation shall be incorporated in the Zonal Master Plan and the guidelines shall be drawn up by the State Government in such a manner as to prohibit development activities at or near these areas which are detrimental to such areas.

(3) **Tourism or Eco-tourism.-** (a) All new eco-tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be as per the Tourism Master Plan for the Eco-sensitive Zone.

(b) The Tourism Master Plan shall be prepared by the State Department of Tourism in consultation with State Departments of Environment and Forests.

(c) The Tourism Master Plan shall form a component of the Zonal Master Plan.

(d) The Tourism Master Plan shall be drawn based on the study of carrying capacity of the Eco-sensitive Zone.

(e) The activities of eco-tourism shall be regulated as under, namely:-

(i) new construction of hotels and resorts shall not be allowed within one kilometre from the boundary of the Wildlife Sanctuary or upto the extent of the Eco-sensitive Zone, whichever is nearer:

Provided that beyond the distance of one kilometre from the boundary of the Wildlife Sanctuary till the extent of the Eco-sensitive Zone, the establishment of new hotels and resorts shall be allowed only in pre-defined and designated areas for eco-tourism facilities as per Tourism Master Plan;

(ii) all new tourism activities or expansion of existing tourism activities within the Eco-sensitive Zone shall be in accordance with the guidelines issued by the Central Government in the Ministry of Environment, Forest and Climate Change and the eco-tourism guidelines issued by the National Tiger Conservation Authority (as amended from time to time) with emphasis on eco-tourism, eco-education and eco-development;

(iii) until the Zonal Master Plan is approved, development for tourism and expansion of existing tourism activities shall be permitted by the concerned regulatory authorities based on the actual site specific scrutiny and recommendation of the Monitoring Committee and no new hotel, resort or commercial establishment construction shall be permitted within Eco-sensitive Zone area.

(4) **Natural heritage.-** All sites of valuable natural heritage in the Eco-sensitive Zone, such as the gene pool reserve areas, rock formations, waterfalls, springs, gorges, groves, caves, points, walks, rides, cliffs, etc. shall be identified and a heritage conservation plan shall be drawn up for their preservation and conservation as a part of the Zonal Master Plan.

(5) **Man-made heritage sites.-** Buildings, structures, artefacts, areas and precincts of historical, architectural, aesthetic, and cultural significance shall be identified in the Eco-sensitive Zone and heritage conservation plan for their conservation shall be prepared as part of the Zonal Master Plan.

(6) **Noise pollution.** - Prevention and control of noise pollution in the Eco-sensitive Zone shall be carried out in accordance with the provisions of the Noise Pollution (Regulation and Control) Rules, 2000 under the Environment Act.

(7) **Air pollution.-** Prevention and control of air pollution in the Eco-sensitive Zone shall be carried out in accordance with the provisions of the Air (Prevention and Control of Pollution) Act, 1981 (14 of 1981) and the rules made thereunder.

(8) **Discharge of effluents.-** Discharge of treated effluent in Eco-sensitive Zone shall be in accordance with the provisions of the General Standards for Discharge of Environmental Pollutants covered under the Environment Act and the rules made thereunder or standards stipulated by State Government whichever is more stringent.

(9) **Solid wastes.-** Disposal and management of solid wastes shall be as under:-

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(i) the solid waste disposal and management in the Eco-sensitive Zone shall be carried out in accordance with the Solid Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number S.O. 1357 (E), dated the 8th April, 2016; the inorganic material may be disposed in an environmental acceptable manner at site identified outside the Eco-sensitive Zone;

(ii) safe and Environmentally Sound Management (ESM) of solid wastes in conformity with the existing rules and regulations using identified technologies may be allowed within Eco-sensitive Zone.

(10) Bio-medical waste.– Bio-medical waste management shall be as under:-

(i) the bio-medical waste disposal in the Eco-sensitive Zone shall be carried out in accordance with the Bio-Medical Waste Management, Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number G.S.R 343 (E), dated the 28th March, 2016.

(ii) safe and Environmentally Sound Management of bio-medical wastes in conformity with the existing rules and regulations using identified technologies may be allowed within the Eco-sensitive Zone.

(11) Plastic waste management.- The plastic waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the Plastic Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number G.S.R. 340(E), dated the 18th March, 2016, as amended from time to time.

(12) Construction and demolition waste management.- The construction and demolition waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the Construction and Demolition Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change *vide* notification number G.S.R. 317(E), dated the 29th March, 2016, as amended from time to time.

(13) E-waste.- The e - waste management in the Eco-sensitive Zone shall be carried out as per the provisions of the E-Waste Management Rules, 2016, published by the Government of India in the Ministry of Environment, Forest and Climate Change, as amended from time to time.

(14) Vehicular traffic.– The vehicular movement of traffic shall be regulated in a habitat friendly manner and specific provisions in this regard shall be incorporated in the Zonal Master Plan and till such time as the Zonal Master Plan is prepared and approved by the competent authority in the State Government, the Monitoring Committee shall monitor compliance of vehicular movement under the relevant Acts and the rules and regulations made thereunder.

(15) Vehicular pollution.- Prevention and control of vehicular pollution shall be in compliance with applicable laws and efforts shall be made for use of cleaner fuels.

(16) Industrial units.– (i) On or after the publication of this notification in the Official Gazette, no new polluting industries shall be permitted to be set up within the Eco-sensitive Zone.

(ii) Only non-polluting industries shall be allowed within Eco-sensitive Zone as per the classification of Industries in the guidelines issued by the Central Pollution Control Board in February, 2016, unless so specified in this notification, and in addition, the non-polluting cottage industries shall be promoted.

(17) Protection of hill slopes.- The protection of hill slopes shall be as under:-

(a) the Zonal Master Plan shall indicate areas on hill slopes where no construction shall be permitted;

(b) construction on existing steep hill slopes or slopes with a high degree of erosion shall not be permitted.

4. List of activities prohibited or to be regulated within Eco-sensitive Zone.- All activities in the Eco sensitive Zone shall be governed by the provisions of the Environment Act and the rules made thereunder including the Coastal Regulation Zone, 2011 and the Environmental Impact Assessment Notification, 2006 and other applicable laws including the Forest (Conservation) Act, 1980 (69 of 1980), the Indian Forest Act, 1927 (16 of 1927), the Wildlife (Protection) Act 1972 (53 of 1972), and amendments made thereto and be regulated in the manner specified in the Table below, namely:-

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TABLE

S. No. (1)	Activity (2)	Description (3)
	A. Prohibited Activities	
1.	Commercial mining, stone quarrying and crushing units.	(a) All new mining (minor and major minerals), stone quarrying and crushing units shall be prohibited with immediate effect except for meeting the domestic needs of bona fide local residents including digging of earth for construction or repair of houses and for manufacture of country tiles or bricks for housing and for other activities; (b) The mining operations shall be carried out in accordance with the order of the Hon'ble Supreme Court dated the 4th August, 2006 in the matter of T.N. Godavarman Thirumulpad Vs. UOI in W.P.(C) No.202 of 1995 and dated the 21st April, 2014 in the matter of Goa Foundation Vs. UOI in W.P.(C) No.435 of 2012.
2.	Setting of industries causing pollution (Water, Air, Soil, Noise, etc.).	New industries and expansion of existing polluting industries in the Eco-sensitive Zone shall not be permitted: Provided that non-polluting industries shall be allowed within Eco-sensitive Zone as per classification of Industries in the guidelines issued by the Central Pollution Control Board in February, 2016, unless otherwise specified in this notification and in addition the non-polluting cottage industries shall be promoted.
3.	Establishment of major hydro-electric project.	Prohibited (except as otherwise provided) as per the applicable laws.
4.	Use or production or processing of any hazardous substances.	Prohibited (except as otherwise provided) as per the applicable laws.
5.	Discharge of untreated effluents in natural water bodies or land area.	Prohibited (except as otherwise provided) as per the applicable laws.
6.	Setting up of new saw mills.	New or expansion of existing saw mills shall not be permitted within the Eco-sensitive Zone.
7.	Setting up of brick kilns.	Prohibited (except as otherwise provided) as per the applicable laws.
8.	Commercial use of fire wood.	Prohibited (except as otherwise provided) as per the applicable laws.
	B. Regulated Activities	
9.	Commercial establishment of hotels and resorts.	No new commercial hotels and resorts shall be permitted within one kilometer of the boundary of the protected area or upto the extent of Eco-sensitive Zone, whichever is nearer, except for small temporary structures for eco-tourism activities: Provided that, beyond one kilometer from the boundary of the protected area or upto the extent of Eco-sensitive Zone, whichever is nearer, all new tourist activities or expansion of existing activities shall be in conformity with the Tourism Master Plan and guidelines as applicable.
10.	Establishment of large-scale commercial livestock and poultry farms by firms, corporates and companies.	Regulated (except otherwise provided) as per the applicable laws except for meeting local needs.
11.	Construction activities.	(a) New commercial construction of any kind shall not be permitted within one kilometer from the boundary of the protected area or upto extent of the Eco-sensitive Zone,

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S. No. (1)	Activity (2)	Description (3)
		whichever is nearer: Provided that, local people shall be permitted to undertake construction in their land for their use including the activities mentioned in sub-paragraph (1) of paragraph 3 as per building bye-laws to meet the residential needs of the local residents: Provided further that the construction activity related to small scale industries not causing pollution shall be regulated and kept at the minimum, with the prior permission from the competent authority as per applicable rules and regulations, if any. (b) Beyond one kilometer it shall be regulated as per the Zonal Master Plan.
12.	Small scale non polluting industries.	Non polluting industries as per classification of industries issued by the Central Pollution Control Board in February, 2016 and non-hazardous, small-scale and service industry, agriculture, floriculture, horticulture or agro-based industry producing products from indigenous materials from the Eco-sensitive Zone shall be permitted by the competent authority.
13.	Felling of trees.	(a) There shall be no felling of trees in the forest or Government or revenue or private lands without prior permission of the competent authority in the State Government. (b) The felling of trees shall be regulated in accordance with the provisions of the concerned Central or State Act and the rules made thereunder.
14.	Collection of Forest Produce or Non-Timber Forest Produce.	Regulated as per the applicable laws.
15.	Erection of electrical and communication towers and laying of cables and other infrastructures.	Regulated under applicable laws (underground cabling may be promoted).
16.	Infrastructure including civic amenities.	Shall be done by taking measures of mitigation as per the applicable laws, rules, regulations and available guidelines.
17.	Widening and strengthening of existing roads and construction of new roads.	Shall be done by taking measures of mitigation as per the applicable laws, rules, regulations and available guidelines.
18.	Undertaking other activities related to tourism like flying over the Eco-sensitive Zone area by hot air balloon, helicopter, drones, microlites, etc.	Regulated as per the applicable laws.
19.	Protection of hill slopes and river banks.	Regulated as per the applicable laws.
20.	Movement of vehicular traffic at night.	Regulated for commercial purpose under applicable laws.
21.	Ongoing agriculture and horticulture practices by local communities along with dairies, dairy farming, aquaculture and fisheries.	Permitted as per the applicable laws for use of locals.
22.	Discharge of treated waste water or effluents in natural water bodies or land area.	The discharge of treated waste water or effluents shall be avoided to enter into the water bodies and efforts shall be made for recycle and reuse of treated waste water. Otherwise the discharge of treated waste water or effluent shall be regulated as per the applicable laws.

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S. No. (1)	Activity (2)	Description (3)
23.	Commercial extraction of surface and ground water.	Regulated as per the applicable laws.
24.	Open well, bore well, etc. for agriculture or other usage.	Regulated as per the applicable laws and the activity should be strictly monitored by the appropriate authority.
25.	Solid waste management.	Regulated as per the applicable laws.
26.	Introduction of exotic species.	Regulated as per the applicable laws.
27.	Eco-tourism.	Regulated as per the applicable laws.
28.	Use of polythene bags.	Regulated as per the applicable laws.
29.	Commercial sign boards and hoardings.	Regulated as per the applicable laws.
	C. Promoted Activities	
30.	Rain water harvesting.	Shall be actively promoted.
31.	Organic farming.	Shall be actively promoted.
32.	Adoption of green technology for all activities.	Shall be actively promoted.
33.	Cottage industries including village artisans, etc.	Shall be actively promoted.
34.	Use of renewable energy and fuels.	Bio-gas, solar light, etc. shall be actively promoted.
35.	Agro-forestry.	Shall be actively promoted.
36.	Plantation of horticulture and herbals.	Shall be actively promoted.
37.	Use of eco-friendly transport.	Shall be actively promoted.
38.	Skill development.	Shall be actively promoted.
39.	Restoration of degraded land/ forests/ habitat.	Shall be actively promoted.
40.	Environmental awareness.	Shall be actively promoted.

5. **Monitoring Committee.-** For effective monitoring of the provisions of this notification, the Central Government hereby constitutes a Monitoring Committee, comprising of the following, namely:-

S. No.	Constituent of Monitoring Committee	Designation
(i)	Deputy Commissioner, Jorhat	Chairman, ex officio;
(ii)	Senior Town Planner of the area	Member;
(iii)	A representative of non-Governmental organisation working in the field of nature conservation (including heritage conservation) to be nominated by the Government of Assam	Member;
(iv)	Regional Officer, Assam State Pollution Control Board, Sibsagar	Member;
(v)	One expert in Ecology from reputed institution or university of the State	Member;
(vi)	Member Secretary, State Biodiversity Board, Assam	Member;
(vii)	District Industries Officer, Jorhat	Member;
(viii)	District Agriculture Officer, Jorhat	Member;

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(ix)	District Fishery Officer, Jorhat	Member;
(x)	Divisional Forest Officer, Jorhat Division, Jorhat	Member-Secretary.

6. Terms of reference. – (1) The Monitoring Committee shall monitor the compliance of the provisions of this notification.

(2) The tenure of the Monitoring committee shall be for three years or till the re-constitution of the new Monitoring Committee by the State Government and subsequently the Monitoring Committee shall be constituted by the State Government.

(3) The activities that are covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forests number S.O. 1533 (E), dated the 14th September, 2006, and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the Central Government in the Ministry of Environment, Forest and Climate Change for prior environmental clearances under the provisions of the said notification.

(4) The activities that are not covered in the Schedule to the notification of the Government of India in the erstwhile Ministry of Environment and Forest number S.O. 1533 (E), dated the 14th September, 2006 and are falling in the Eco-sensitive Zone, except for the prohibited activities as specified in the Table under paragraph 4 thereof, shall be scrutinised by the Monitoring Committee based on the actual site-specific conditions and referred to the concerned regulatory authorities.

(5) The Member-Secretary of the Monitoring Committee or the concerned Deputy Commissioner shall be competent to file complaints under section 19 of the Environment Act, against any person who contravenes the provisions of this notification.

(6) The Monitoring Committee may invite representatives or experts from concerned Departments, representatives from industry associations or concerned stakeholders to assist in its deliberations depending on the requirements on issue to issue basis.

(7) The Monitoring Committee shall submit the annual action taken report of its activities as on the 31st March of every year by the 30th June of that year to the Chief Wildlife Warden in the State as per proforma appended as **Annexure V.**

(8) The Central Government in the Ministry of Environment, Forest and Climate Change may give such directions, as it deems fit, to the Monitoring Committee for effective discharge of its functions.

7. Supreme Court, etc. orders.- The Central Government and State Government may specify additional measures, if any, for giving effect to provisions of this notification.

8. Additional measures.- The provisions of this notification shall be subject to the orders, if any passed or to be passed by the Hon'ble Supreme Court of India or High Court or the National Green Trib.

[F.No. 25/55/2017-ESZ]

Dr. SATISH C. GARKOTI, Scientist 'G'

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ANNEXURE- I

BOUNDARY DESCRIPTION FOR ECO-SENSITIVE ZONE OF HOLLONGAPAR-GIBBON SANCTUARY IN THE STATE ASSAM

East:- From GPS Point No. 1 (94° 23' 14.681" E & 26° 41' 29.920" N) the boundary runs along the Tea Garden crossing the GPS Point No.2 till it meets the GPS Point No. 3 (94° 22' 16.632" E & 26° 40' 17.275" N). From GPS Points No.3 the boundary runs towards south along the road till it meets the GPS Points No.4 (94° 22' 27.612" E & 26° 40' 3.979" N). From GPS Points No.4 again the boundary runs along the Tea Garden boundary crossing the GPS Point No.5 till it meets the GPS Points No.6 (94° 23' 9.328" E & 26° 39' 47.632" N). From GPS Points No.6 again the boundary runs towards south along the road till it meet the GPS Points No.7 (94° 23' 36.674" E & 26° 39' 15.625" N). From GPS Points No.7 the boundary runs along the Tea Garden till it meets the GPS Points No.8 (94° 23' 54.414" E & 26° 38' 45.600" N). From GPS Point No. 8 the boundary runs towards east along the reserve forest boundary of Disai Reserve Forest crossing the GPS Point No. 9 & 10 till it meets the GPS Point No.11 (94° 27' 10.359" E & 26° 39' 16.601" N). From GPS Point No.11 the boundary runs along the reserve forest boundary (Assam Nagaland Inter-State Boundary) till it meet the GPS Point No.12 (94° 27' 57.392" E & 26° 38' 0.138" N).

South:-From GPS Point No. 12 (94° 27' 57.392" E & 26° 38' 0.138" N) the boundary runs towards west along the reserve forest boundary of Disai & Disai Valley reserve forests (Assam Nagaland Inter-State Boundary) crossing the GPS Point No. 13,14,15,16,17,18,19,20,21,22,23,24,25,26,27,28 & 29 till it meets the GPS Point No. 30 (94° 18' 59.946" E & 26° 27' 32.039" N).

West:-From GPS Point No. 30 (94° 18' 59.946" E & 26° 27' 32.039" N) the boundary runs towards north along the reserve forest boundary of Disai Valley reserve forest (Assam Nagaland Inter-State Boundary) crossing the GPS Points No. 31,32,33,34 & 35 till it meets the GPS Point No. 36 (94° 17' 4.305" E & 26° 33' 44.203" N). From GPS Point No. 36 the boundary turn towards east along the Disai Valley reserve forest boundary crossing the GPS Points No. 37,38,39,40 & 41 till it meets the GPS Point No. 42 (94° 23' 6.610" E & 26° 37' 57.755" N). From GPS Point No. 42 the boundary runs towards north along the right bank of river Bhogdai or Disai river crossing the GPS Points No. 43,44,45,46,47,48,49 & 50 till it meets the GPS Point No.51 (94° 16' 48.306" E & 26° 43' 59.786" N). 23' 24.281" E & 26° 44' 18.300" N). From GPS Point No. 56 the boundary runs towards south along the road crossing the GPS Point No.57 till it meets the GPS Point No. 58 (94° 24' 2.960" E & 26° 41' 18.688" N). From GPS Point No. 58 the boundary runs towards west along the road till it meets the GPS Point No. 59 (94° 23' 16.032" E & 26° 40' 50.899" N).

North:-. From GPS Point No. 59 the boundary runs towards north along the road till it meet the GPS Point No. 1 (94° 23' 14.681" E & 26° 41' 29.920" N). The Western boundary of the Sanctuary share inter-state boundary with Nagaland and hence is 0.0 km of Eco-Sensitive Zone is being proposed. The extent of Eco-Sensitive Zone varies from 0.0 Km (interstate boundary with Nagaland) to 22.54 km.

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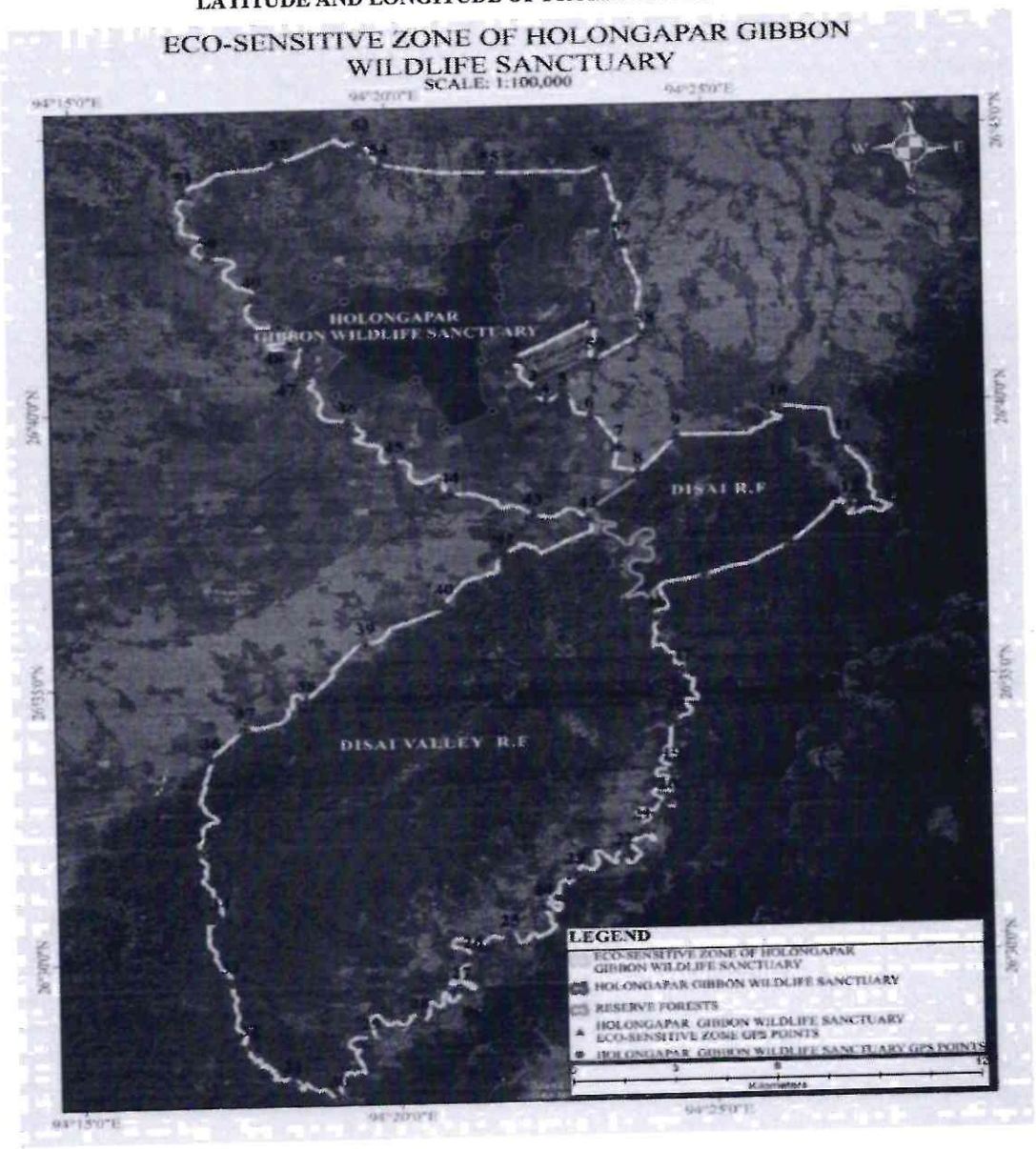
ANNEXURE- IIA

GOOGLE MAP OF ECO-SENSITIVE ZONE OF HOLLONGAPAR-GIBBON SANCTUARY ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS



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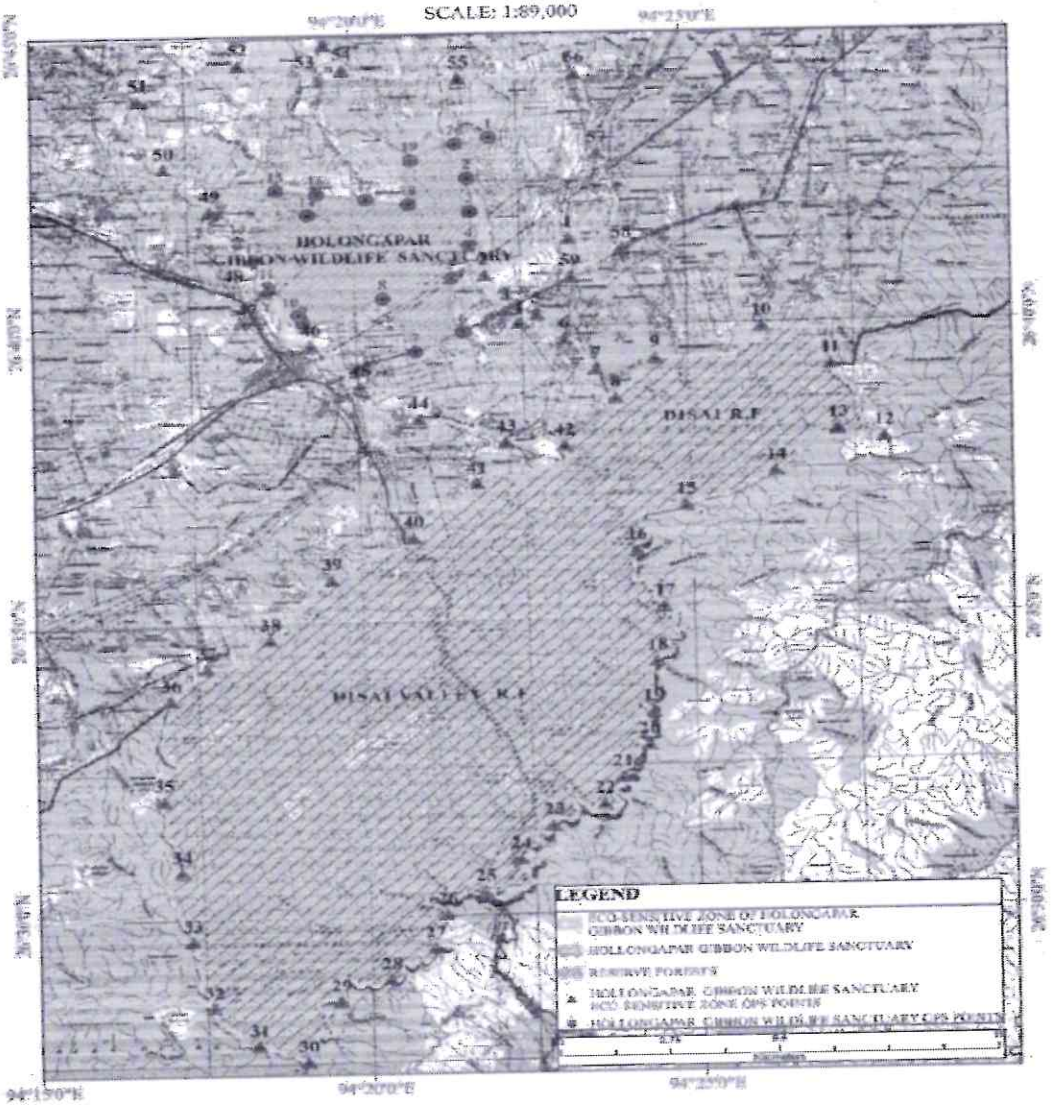
ANNEXURE- IIB

MAP SHOWING LANDUSE PATTERN OF ECO-SENSITIVE ZONE OF HOLLONGAPAR-GIBBON SANCTUARY ALONG WITH LATITUDE AND LONGITUDE OF PROMINENT LOCATIONS

ECO-SENSITIVE ZONE OF HOLONGAPAR GIBBON WILDLIFE SANCTUARY

SCALE: 1:89,000



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ANNEXURE-III

TABLE A: GEO- COORDINATES OF PROMINENT LOCATIONS OF HOLLONGAPAR-GIBBON SANCTUARY

GPS POINTS	LONGITUDE	LATITUDE
1	94° 22' 5.369" E	26° 43' 14.526" N
2	94° 21' 44.154" E	26° 42' 33.281" N
3	94° 21' 45.902" E	26° 41' 59.451" N
4	94° 21' 44.588" E	26° 41' 24.186" N
5	94° 21' 28.134" E	26° 40' 51.434" N
6	94° 21' 37.449" E	26° 39' 56.337" N
7	94° 20' 54.065" E	26° 39' 37.576" N
8	94° 20' 25.370" E	26° 40' 32.105" N
9	94° 19' 13.121" E	26° 40' 8.556" N
10	94° 19' 8.815" E	26° 40' 17.324" N
11	94° 18' 41.036" E	26° 40' 46.645" N
12	94° 18' 30.120" E	26° 41' 14.195" N
13	94° 18' 15.841" E	26° 41' 32.983" N
14	94° 19' 18.964" E	26° 41' 59.067" N
15	94° 18' 50.889" E	26° 42' 24.862" N
16	94° 19' 27.784" E	26° 42' 19.920" N
17	94° 20' 12.239" E	26° 42' 13.733" N
18	94° 20' 50.712" E	26° 42' 7.986" N
19	94° 20' 53.612" E	26° 42' 52.873" N
20	94° 21' 34.283" E	26° 43' 8.484" N

TABLE B: GEO-COORDINATES OF PROMINENT LOCATIONS OF ECO-SENSITIVE ZONE

GPS POINTS	LONGITUDE	LATITUDE
1	94° 23' 14.681" E	26° 41' 29.920" N
2	94° 21' 58.733" E	26° 40' 54.190" N
3	94° 22' 16.632" E	26° 40' 17.275" N
4	94° 22' 27.612" E	26° 40' 3.979" N
5	94° 22' 44.856" E	26° 40' 13.435" N
6	94° 23' 9.328" E	26° 39' 47.632" N
7	94° 23' 36.674" E	26° 39' 15.625" N
8	94° 23' 54.414" E	26° 38' 45.600" N
9	94° 24' 31.095" E	26° 39' 26.119" N
10	94° 26' 8.448" E	26° 39' 56.055" N
11	94° 27' 10.359" E	26° 39' 16.601" N
12	94° 27' 57.392" E	26° 38' 0.138" N

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13	94° 27' 15.774" E	26° 38' 9.378" N
14	94° 26' 18.451" E	26° 37' 27.401" N
15	94° 24' 55.909" E	26° 36' 53.720" N
16	94° 24' 9.908" E	26° 36' 8.385" N
17	94° 24' 33.452" E	26° 35' 10.842" N
18	94° 24' 25.974" E	26° 34' 15.262" N
19	94° 24' 21.288" E	26° 33' 23.163" N
20	94° 24' 16.844" E	26° 32' 49.680" N
21	94° 23' 51.958" E	26° 32' 17.464" N
22	94° 23' 34.682" E	26° 31' 50.761" N
23	94° 22' 47.947" E	26° 31' 30.131" N
24	94° 22' 16.926" E	26° 30' 55.641" N
25	94° 21' 44.231" E	26° 30' 23.364" N
26	94° 21' 9.009" E	26° 30' 0.605" N
27	94° 20' 57.257" E	26° 29' 26.790" N
28	94° 20' 17.557" E	26° 28' 55.367" N
29	94° 19' 31.392" E	26° 28' 33.835" N
30	94° 18' 59.946" E	26° 27' 32.039" N
31	94° 18' 16.389" E	26° 27' 49.605" N
32	94° 17' 36.034" E	26° 28' 29.485" N
33	94° 17' 18.566" E	26° 29' 38.238" N
34	94° 17' 10.442" E	26° 30' 48.756" N
35	94° 16' 55.540" E	26° 32' 2.181" N
36	94° 17' 4.305" E	26° 33' 44.203" N
37	94° 17' 37.623" E	26° 34' 16.571" N
38	94° 18' 35.813" E	26° 34' 44.390" N
39	94° 19' 32.812" E	26° 35' 44.785" N
40	94° 20' 47.911" E	26° 36' 26.203" N
41	94° 21' 46.973" E	26° 37' 20.167" N
42	94° 23' 6.610" E	26° 37' 57.755" N
43	94° 22' 13.726" E	26° 38' 2.520" N
44	94° 20' 55.265" E	26° 38' 27.840" N
45	94° 20' 3.032" E	26° 39' 2.789" N
46	94° 19' 19.293" E	26° 39' 46.253" N
47	94° 18' 39.098" E	26° 40' 41.041" N
48	94° 18' 27.490" E	26° 41' 15.839" N
49	94° 17' 51.098" E	26° 42' 4.516" N
50	94° 17' 9.801" E	26° 42' 49.134" N
51	94° 16' 48.306" E	26° 43' 59.786" N

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52	94° 18' 19.472" E	26° 44' 33.213" N
53	94° 19' 37.013" E	26° 44' 52.619" N
54	94° 19' 53.855" E	26° 44' 26.751" N
55	94° 21' 38.543" E	26° 44' 15.740" N
56	94° 23' 24.281" E	26° 44' 18.300" N
57	94° 23' 42.683" E	26° 42' 56.295" N
58	94° 24' 2.960" E	26° 41' 18.688" N
59	94° 23' 16.032" E	26° 40' 50.899" N

ANNEXURE-IV

LIST OF VILLAGES COMING UNDER ECO-SENSITIVE ZONE OF HOLLONGAPAR-GIBBON SANCTUARY ALONG WITH GEO-COORDINATES

Sl. No.	Name of Villages	Taluka/ Mouza	GPS Co-ordinates	
			Latitude	Longitude
1	Part of Marongial Gaon	Nakachari	26°40'23.56"N	94°24'19.47" E
2	Western Part of Deberapar Chariali	---do---	26°41'15.5"N	94°23'58.2"E
3	Nagakata Gaon	---do---	26°39'10.3"N	94°23'49.3"E
4	Na-pam Gaon	---do---	26°39'16.0"N	94°24'11.1"E
5	Dihingia Gaon	---do---	26°40'13.5"N	94°23'11.2"E
6	Chinatoli Gaon	---do---	26°40'01.56"N	94°23'43.05"E
7	Mautjuli Gaon	---do---	26°39'36.1"N	94°23'23.3"E
8	Khatisona Gaon	---do---	26°40'33.4"N	94°22'12.6"E
9	Tirual Bheta Gaon	Nakachari	26°41'46.12"N	94°23'0.27"E
10	Ratanpur Gaon	---do---	26°40'45.1"N	94°22'58.5"E
11	Karatipar Gaon	---do---	26°40'36.7"N	94°22'31.0"E
12	Afalamukh Gaon	---do---	26°41'04.3"N	94°22'54.7"E
13	Kalia Gaon	---do---	26°40'49.6"N	94°22'2.54"E
14	2 No. Darikial Rajabari	---do---	26°42'20.8"N	94°23'19.7"E
15	Weastern Part of Nagadera	---do---	26°43'31.1"N	94°23'39.4"E
16	Jotokia Gaon	---do---	26°43'58.09"N	94°20'54.39"E
17	Neemati Gaon	Nakachari	26°40'54.8"N	94°22'52.6"E
18	Fesual Gaon	---do---	26°43'48.6"N	94°20'55.6"E
19	Kari Gaon	---do---	26°44'11.3"N	94°20'25.9"E
20	Bhugpur Gaon	---do---	26°42'21.1"N	94°20'28.1"E
21	Gobinpur Gaon	---do---	26°42'15.58"N	94°20'14.58"E
22	Madhupur Gaon	---do---	26°42'18.2"N	94°20'14.7"E
23	Tunimukh Gaon	---do---	26°42'32.2"N	94°20'06.9"E
24	Gospuria Gaon	---do---	26°43'44.3"N	94°20'28.4"E
25	Hindubari Gaon	---do---	26°43'39.5"N	94°18'40.3"E
26	Meleng Lakhipur Gaon	---do---	26°40'56.4"N	94°21'37.7"E

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ANNEXURE –V

Performa of Action Taken Report:

1. Number and date of meetings.
2. Minutes of the meetings: (Mention noteworthy points. Attach minutes of the meeting as separate Annexure).
3. Status of preparation of Zonal Master Plan including Tourism Master Plan.
4. Summary of cases dealt with rectification of error apparent on face of land record (Eco-sensitive Zone wise). Details may be attached as Annexure.
5. Summary of cases scrutinised for activities covered under the Environment Impact Assessment Notification, 2006 (Details may be attached as separate Annexure).
6. Summary of cases scrutinised for activities not covered under the Environment Impact Assessment Notification, 2006 (Details may be attached as separate Annexure).
7. Summary of complaints lodged under section 19 of the Environment (Protection) Act, 1986.
8. Any other matter of importance.

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ANNEXURE-D
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Artificial Canopy Bridge Design to facilitate Western Hoolock Gibbon (*Hoolock hoolock*) crossing over Mariani-Dibrugarh broad gauge single track Railway Line in Hollongapar Gibbon Sanctuary, Assam

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

Technical Report: TR No./2023/07
MAY 2023

PRINCIPAL INVESTIGATOR

Dr. G.V. Gopi, Scientist-F & Nodal Officer, EIA Cell, Wildlife Institute of India

WII RESEARCH TEAM

Mr. Rohit R.S. Jha, Senior Project Associate

Ms. Stanzin Zangmo, Research Intern

Project Advisors:

Sh. Virendra R. Tiwari, Director, WII

Dr. S. P. Yadav, Former Director, WII

Dr. Ruchi Badola, Dean, FWS, WII

Dr. Yadvendradev V. Jhala, Former (Retd.) Dean, FWS, WII

Front Cover: A female capped langur *Trachypithecus pileatus* with its young crossing the canopy gap introduced by the single-track broad gauge railway line from Compartment-I to Compartment-II within the Hollongapar Gibbon Sanctuary, Assam.
© Rohit R.S. Jha/WII

Back Cover: A male Western Hoolock gibbon *Hoolock hoolock* in the upper canopy alongside the railway track in Compartment-II within the Hollongapar Gibbon Sanctuary, Assam.
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Note: All photographs and maps shown in this report are credited to the WII research team unless specified otherwise.

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We are grateful to Sh. Mahendra Kumar Yadava, Principal Chief Conservator of Forests & Head of Forest Force, Assam Forest Department and Sh. N. Nandha Kumar, Divisional Forest Officer, Jorhat (Territorial) for providing us with the opportunity to undertake this study with an overarching objective to conserve and protect the only ape species found in India – the globally endangered Western Hoolock gibbon *Hoolock hoolock* – in the Hollongapar Gibbon Sanctuary (HGS), Assam. We are thankful to the comprehensive field support (logistics and accommodation) kindly extended by the DFO, Jorhat (T) and various field officers and staff of HGS during the course of this short study. Sh. N. Nandha Kumar also very kindly shared all relevant information required from the Assam Forest Department's side to help compile this report, and deserves praise for helming this positive conservation intervention to conserve gibbon and other arboreal mammals at HGS. We also thank Sh. Animesh Kalita, Range Forest Officer, Mariani Range, Jorhat (T) Division for coordinating the research team's stay and helping with fieldwork-related requirements. We are extremely grateful to field staff Sh. Suchen Borah and Sh. Deben Borah who actively participated and helped the research team in field data collection due to their local knowledge and vast experience. We are also grateful to other field staff who accompanied the research team – Sh. Sanjib Neog, Sh. Parag Jyotidutta, Sh. Herimba Bhuyan, Sh. Digvijay Doley and Sh. Mukibur Rahman. We thank Dr. Dilip Chetry (Vice President, Aaranyak, Guwahati) and Dr. Divya Vasudev (Co-founder & Senior Scientist, Conservation Initiatives, Guwahati) for useful discussions and for sharing their insights regarding the installation of artificial canopy bridges for Hoolock gibbons in HGS. We thank representatives of the North East Frontier Railway and various Railway-related bodies such as IRSEE, IRCON etc. for sharing their valuable insights in a stakeholders' meeting organised by the DFO, Jorhat (T) on November 29, 2022 at Meleng/HGS. We thank Mr. Vabesh Tripura (Project Assistant, WII) for the graphical illustrations. We also acknowledge the support of Administrative Assistants Mr. Karan Kumar and Mr. Vijay Joshi at WII's EIA Cell. The WII research team sincerely thank the Dean, Registrar and Director of WII for their continuous support and encouragement.

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EXECUTIVE SUMMARY

Habitat loss and habitat fragmentation are two principal threats to most terrestrial biodiversity across ecosystems and geographies. Gibbons are a particularly vulnerable group of primates inhabiting the forests of South and Southeast Asia. Of the 20 gibbon species – all threatened, according to the International Union for Conservation of Nature or IUCN – the endangered Western Hoolock gibbon *Hoolock hoolock* is the only one found in India inhabiting the forests in the southern bank of the Brahmaputra-Dibang river system. The Hollongapar Gibbon Sanctuary (HGS) is a small ~21 sq.km Protected Area (PA) in Jorhat, Assam and is one of the species' stronghold supporting around 125 individuals living in more than two dozen family groups. It is also the only PA in India named after a primate species. Apart from the W. Hoolock gibbon, the Sanctuary also harbours six other primate species – capped langur *Trachypithecus pileatus*, stump-tailed macaque *Macaca arctoides*, northern pig-tailed macaque *M. leonina*, Assamese macaque *M. assamensis*, rhesus macaque *M. mulatta*, and Bengal slow loris *Nycticebus bengalensis*, thereby having the distinction of harbouring the highest primate species diversity for any Indian PA.

However, a single track ~1.65 route-km long railway line (currently broad-gauge, but un-electrified as yet) has fragmented the Sanctuary since 1887 into two unequal parts. Over time, the Sanctuary has become a 'forest island' having lost connectivity with surrounding forest patches. Since gibbons are exclusively arboreal animals inhabiting the forest upper canopy, they are particularly sensitive to canopy gaps. Gibbon families on both sides of the railway track have, thus, been effectively isolated from each other, thereby compromising their population genetic variability and further endangering their already threatened survival in the HGS. Worldwide, and even in India, several conservation initiatives have attempted bridging such canopy gaps in forests through artificial canopy bridge (ACB) structures to facilitate arboreal species' movements. The Wildlife Institute of India, Dehradun was approached by the Divisional Forest Officer, Jorhat (Territorial) Division of the Assam State Forest Department (ASFD) to provide specific design inputs towards the installation of such canopy bridges at the HGS. In this context, this report provides design guidelines and considerations as well as specific location-wise details of seven (07) potential sites within HGS for such canopy bridges installation, following thorough literature survey, field data collection and interaction with stakeholders such as ASFD officials and field staff, railway officials and consultants, and local conservationists.

We recognise and emphasise that the design, successful installation and post-installation monitoring of canopy bridges require the involvement of several individuals with professional expertise in fields such as forestry, ecology/primatology, engineering and mountaineering/climbing. Post-installation monitoring of the canopy bridge structures – both behavioural observations of animals around canopy gaps and installed structures as well as through arboreal camera traps to assess bridges' use – is one of the most important

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aspect of this project. As is clear, the present un-electrified single-track ~1.65 route-km railway line passing through the HGS has caused distress and posed significant conservation issues to arboreal animals. Hence, a future doubling of the line (if planned) will increase the canopy gap to a large extent and render any conservation interventions (such as ACB installations) futile.

Over the longer period of time, it will be best if the status quo is maintained, although electrification of the existing single track may be permitted subject to necessary statutory approvals with appropriate mitigation and compensation measures implemented after detailed investigation of its ecological impacts. Forest regeneration on both sides of the existing track through afforestation activities to gradually enable natural canopy connectivity, adherence of trains to speed limits when passing through HGS and its Eco-Sensitive Zone/wildlife corridors, ensuring landscape connectivity of the isolated 'forest island' HGS with neighbouring patches of forests, and rerouting of the existing railway line outside Sanctuary limits, and establishing and supporting low-impact home-stay based ecotourism facilities are some of the longer-term interventions necessary to ensure that W. Hoolock gibbons and other canopy-dwelling species persist and thrive within HGS and in the immediate larger landscape.

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I. INTRODUCTION

1. Background

The Hollongapar Gibbon Sanctuary (HGS) is located in the Jorhat district of Assam and is spread across an area of 20.98 sq.km. It is bifurcated into two unequal parts by the Mariani-Dibrugarh railway line since 1887, of which ~1.65 route-km (currently single track, broad gauge, un-electrified) passes through HGS (Figure 1). Gibbons are apes in the mammalian family Hylobatidae with four extant genera and 20 species. They are shy, territorial, exclusively arboreal and mostly canopy-dwelling animals, residing in the dense forests of South and Southeast Asia. Adapted to the arboreal way of life, they tend to avoid open spaces and rarely, if ever, come down on the ground where they may become particularly vulnerable to threats such as predation.

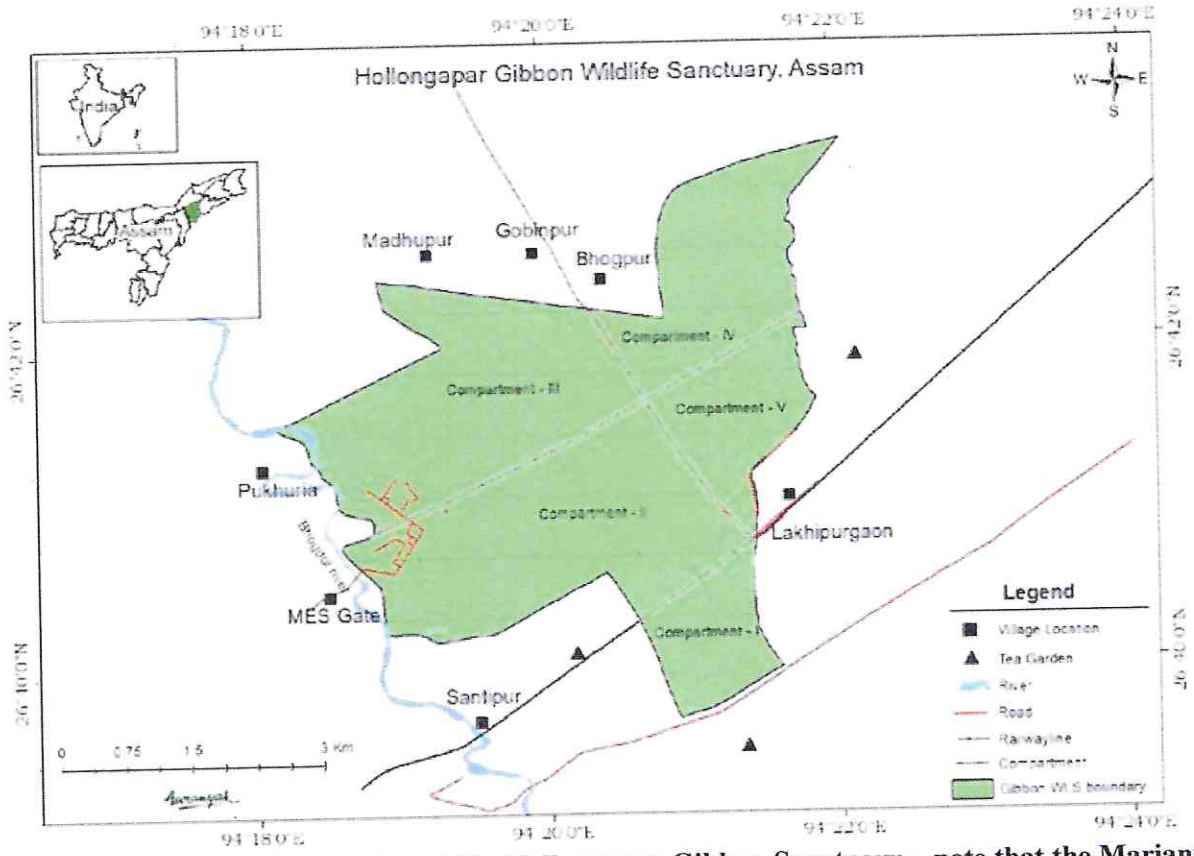

Figure 1: Map depicting location of the Hollongapar Gibbon Sanctuary – note that the Mariani-Dibrugarh railway line (running along a general southwest-northeast direction) cuts across the Sanctuary dividing it into two unequal parts; Hoolock gibbon families residing in Compartment-I (~4-5) have become almost completely isolated due to the rail track-imposed canopy gap and hard forest-human use boundary/ interface (reproduced from Chetry *et al.*, 2022)

The Western Hoolock gibbon *Hoolock hoolock* (EN, Brockelman *et al.*, 2019) (also interchangeably referred to as 'Hoolock gibbon' in this report) is the only gibbon/ ape species found in India and is accorded the highest legislative protection (placed in Schedule I) under the Wild Life (Protection) Act, 1972. Many studies carried out in India have identified habitat loss, habitat fragmentation, and hunting as some of the most serious threats for this species throughout their entire distribution (Chetry *et al.*, 2007). Hoolock gibbons are primarily

monogamous and live in small family groups of up to six closely related individuals. Their population at the HGS, Jorhat (around 125 individuals, in 26 groups) is fragmented by the aforementioned railway linear infrastructure (Figure 2) without any effective or substantial canopy connectivity at present. Gibbon families on either side of the railway line – especially the 4-5 gibbon families in the much smaller Compartment-I – remain effectively isolated from each other. The Sanctuary itself has over time become a 'forest island' due to land-use transformation and human-use of surrounding areas. Further plans towards rail track doubling and railway electrification within gibbon habitats thus pose an existential threat to gibbon conservation efforts at HGS.

Figure 2: The single track broad gauge (yet un-electrified) ~1.65 route-km railway line (part of the Mariani-Dibrugarh route) passing within the Hollongapar Gibbon Sanctuary in Assam has created a break in canopy; 12-13 pairs of trains pass through daily in this stretch

In 2015, the North East Frontier Railway (NEFR) authorities along with the Assam State Forest Department (ASFD) had built an artificial canopy bridge (ACB) made of iron at one location across the railway track (Figure 3). However, despite their best intentions, the structure remains unused by arboreal mammals due to several of its design aspects not conforming to gibbons' specialised form of movement in the canopy (brachiation – swinging by arms/forelimbs). A natural canopy bridge (NCB) has developed through long-term plantation activities on both sides of the railway track through joint efforts of Aaranyak (a Guwahati-based conservation NGO) and the ASFD. While plantation/reforestation activities began in 2006, the natural canopy bridge was established/ used by gibbons only by 2019 (Figure 9). Gibbons and other arboreal animals have been demonstrably using the said bridge (Chetry *et al.*, 2022). However, this natural connectivity remains tenuous at best since the NEFR regularly trims trees and branches – having the Right of Way (RoW) around the railway line – as part of track maintenance activities.

Figure 3: The iron structure constructed by the NEFR/ASFD in 2015 as a 'canopy bridge' suffers from several design flaws vis-à-vis the target species Hoolock gibbon's preferred mode of locomotion (brachiation) and habits making it unusable for them

The Chief Secretary, Govt. of Assam had raised concerns regarding the threat to Hoolock gibbons by the aforementioned railway line in a Committee meeting on 8th July 2022. It was then decided that the ASFD will provide a canopy bridge design to facilitate gibbon (and other arboreal mammals') movements between the forest fragments (compartments 1 & 2 of the HGS). On 17th October 2022, the Additional Divisional Railway Manager (ADRM), Tinsukia Division, NEFR also requested the Principal Chief Conservator of Forests (PCCF), ASFD to provide designs for canopy bridges. Subsequently, the Divisional Forest Officer (DFO), Jorhat (Territorial) had approached the Wildlife Institute of India, Dehradun (WII) and organised an all stakeholders' meeting – including gibbon conservationists, Railway officials and engineers, and representatives from WII – with the Forest Department on 29th November 2022 at Meleng, HGS to discuss the most appropriate ACB design incorporating domain-specific knowledge of and concerns raised by various agencies (Figures 5 & 6).

On the request of the ASFD (Appendix 1), WII is hereby submitting this detailed report with design inputs towards the implementation of the aforementioned ACBs along with proposed locations for the same, following a field and consultation visit made during November 27-December 02, 2022. The findings and recommendations in this report are expected to be appropriately and urgently acted upon by the ASFD to conserve the threatened Hoolock gibbon population at HGS.

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Figure 4: A male Western Hoolock gibbon in Compartment-II of the H. Gibbon Sanctuary

Figure 5: A stakeholders' meeting organised under the chairpersonship of Sh. N. Nandha Kumar (DFO, Jorhat Territorial) with the presence of representatives from Indian Railways/ railways-related consultant organisations, Aaranyak (Dr. Dilip Chetry) and WII, Dehradun (Dr. G.V. Gopi and Sh. Rohit Jha) on November 29, 2022 at Meleng, HGS to discuss design considerations and deliberate on Hoolock gibbon/wildlife conservation aspects

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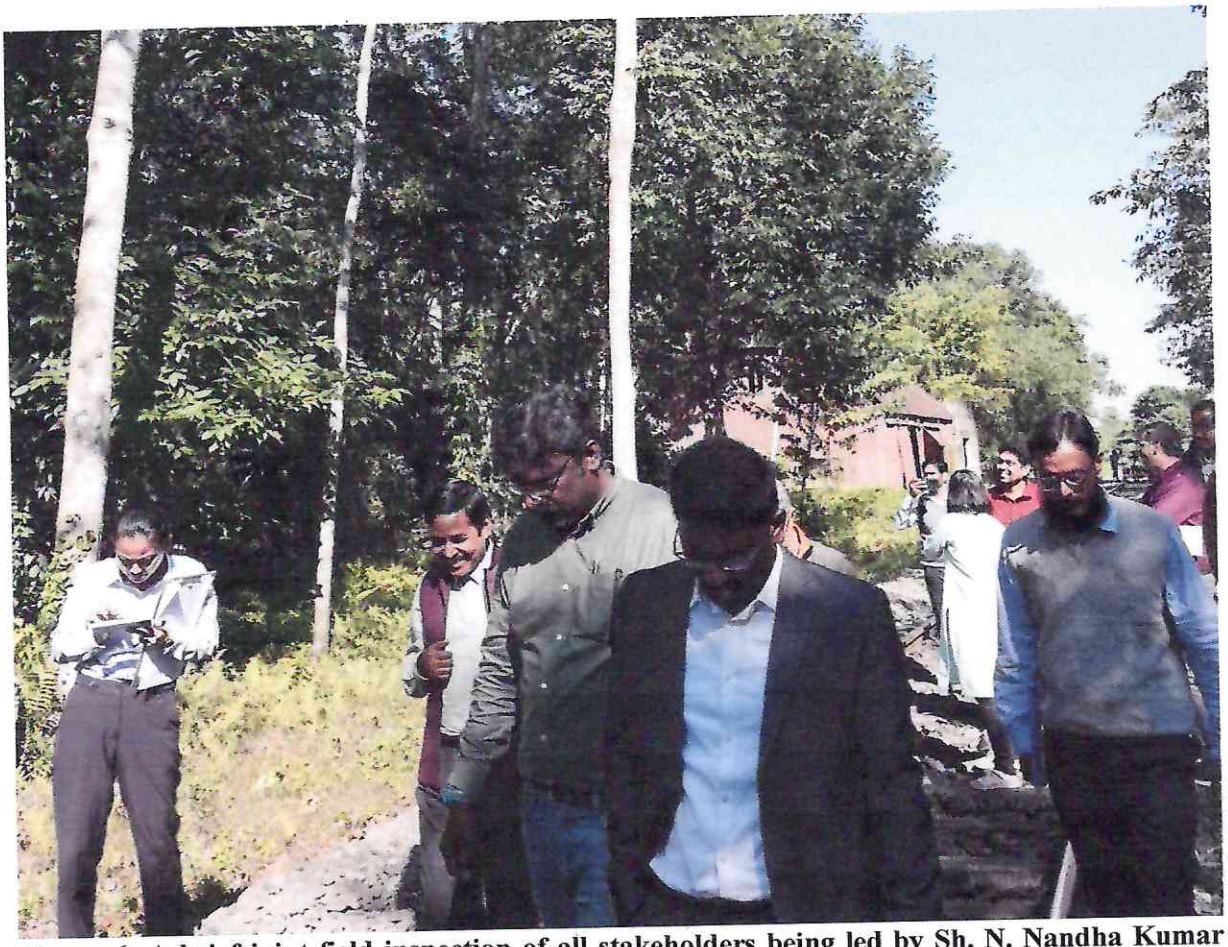

Figure 6: A brief joint field inspection of all stakeholders being led by Sh. N. Nandha Kumar (DFO, Jorhat Territorial) and Dr. G.V. Gopi (Scientist, WII, Dehradun)

2. *Objectives & Methodology*

The geographical scope of this report is limited to the Western Hoolock gibbon population in the Hollongapar Gibbon Sanctuary (HGS). The objective of this report is to provide a complete guidance towards installing multiple artificial canopy bridge (ACB) crossing structures along the railway stretch passing through the Sanctuary to encourage movement of Hoolock gibbons and other arboreal mammals across the railway track-imposed break in forest canopy. For this, we spent five days during November 28-December 02, 2022 surveying the entire stretch of the railway track passing through the HGS. With the help of experienced field staff, we identified locations where ACB structures could be installed. We also identified 'Post trees' and secondary/web trees (details in Section III) to be used in installing the ACB structures, as well as collected basic details such as their height (visually estimated or through a laser rangefinder, whenever possible), girth at breast height (GBH) (through a measuring tape) and precise locations (through a hand-held GPS device). While formulating the ACB design guidelines and considerations, we have also incorporated concerns shared by Indian Railway and allied agencies during a stakeholders' meeting organised on November 29, 2022 (Figure 5 & 6), and thoroughly read and reviewed available literature on the subject.

3. *Hollongapar Gibbon Sanctuary*

Hollongapar Gibbon Sanctuary (HGS) is located in Jorhat district of Assam state in India. It was initially a forest reserve called Hollongapar Reserved Forest which was upgraded to the status of a Sanctuary (under the Wild Life Protection Act, 1972) in 1997 as 'Gibbon Wildlife Sanctuary' – named after India's only ape, the Western Hoolock gibbon (Chetry & Chetry, 2011) (Figure 1). HGS is situated near the Naga hills and Mariani town between 26°40' to 26°45' north latitude and 94°20' to 94°25' east longitude (Chetry, 2011; Bhattacharjee, 2012; Saikia *et al.*, 2017) at an elevation of 100-120 m above mean sea level (Sarkar & Devi, 2017). HGS falls under the globally recognised Indo-Burma Biodiversity Hotspot (Chetia & Kalita, 2012), and is located in the Northeast biogeographic zone of India (North East Brahmaputra Valley biogeographic province – 9A) (Rodgers & Panwar, 1988). HGS receives an average rainfall of about 2490 mm (Ghosh, 2007) while the average temperature ranges between 5°C to 38°C (Chetia & Kalita, 2012). HGS has a total geographical area of 20.986 sq.km. The forest type in the Sanctuary is 'Tropical Semi-Evergreen' with subtype 'Assam Plains Alluvial Semi-Evergreen' forests (2B/C1a) harbouring patches of wet evergreen forests (Champion & Seth, 1968; Chetry 2002) (Figure 8). HGS is completely surrounded by tea gardens/ estates (established during 1880-1920) and few villages at its fringes such as Madhupur, Gobindpur and Bhogpur (Verma *et al.*, 2012). Major water course of the Sanctuary is one of the tributaries of Brahmaputra called Bhogdoi River, flowing in the general southeast to northwest direction (Bhattacharjee, 2008).

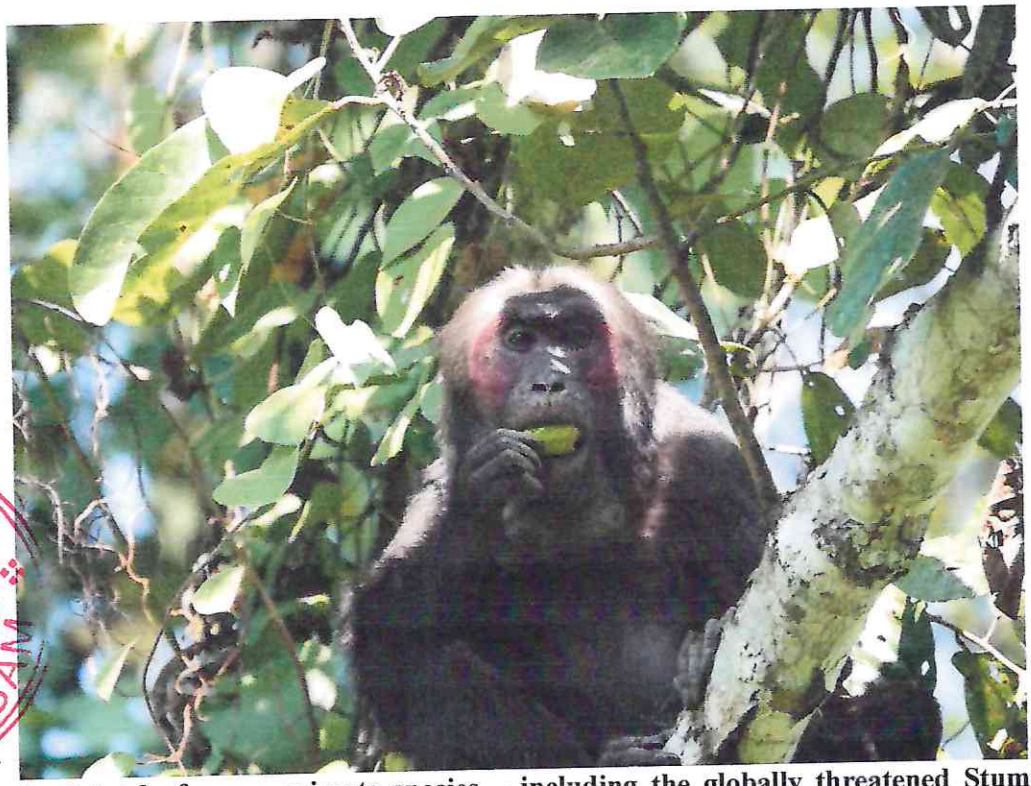

Figure 7: A total of seven primate species – including the globally threatened Stump-tailed macaque *Macaca arctoides* – inhabit the Hollongapar Gibbon Sanctuary, the highest primate species diversity recorded for any Protected Area in India

Apart from the Hoolock gibbon, HGS also shelters the Bengal slow loris *Nycticebus bengalensis* (EN, Nekaris *et al.*, 2020a) – the only nocturnal primate found in northeastern

India. Other primates residing in the Sanctuary are stump-tailed macaque *Macaca arctoides* (Figure 7), northern pig-tailed macaque *M. leonine*, eastern Assamese macaque *M. assamensis*, rhesus macaque *M. mulatta* and capped langur *Trachypithecus pileatus* (Chetry *et al*., 2022). Other arboreal mammals found in the HGS dependent on the dense canopy of its semi-evergreen and evergreen forests include Malayan giant squirrel *Ratufa bicolor* and the parti-colored flying squirrel *Hylopetes alboniger*.

HGS is also home to some unique and rare plant species like Hollong *Dipterocarpus macrocarpus* (also Assam's State tree) which dominate the upper canopy of the forest. It is a tall tree that reaches around 12-30 m height with a straight trunk (Borah *et al*., 2015). Some of the other important trees in the Sanctuary from the perspective of arboreal animals include Sam kothal *Artocarpus chama*, Pan sopa *Michelia montana*, Phul hingori *Castonopsis indica*, Ajhar *Lagerstroemia speciose*, Kenglo *Trewia nudiflora*, Otenga *Dillenia indica* etc. HGS is also home to a broad diversity of vertebrate and invertebrate species. More than 200 species of butterflies (Neog, 2015) and 95 species of spiders (Kalita, 2013) have been documented here, along with as many as 250 species of birds, including the endangered White-winged Duck *Asarcornis scutulata* (also Assam's state bird). 41 mammal species such as Asian elephant *Elephas maximus*, tiger *Panthera tigris*, leopard *P. pardus*, leopard cat *Prionailurus bengalensis*, sambar *Rusa unicolor*, barking deer *Muntiacus vaginalis*, wild pig *Sus scrofa*, Chinese porcupine *Hystrix brachyura*, Chinese pangolin *Manis pentadactyla* among others have also been recorded from the Sanctuary (Chetry *et al*., 2001).

Figure 8: Evergreen and semi-evergreen elements populated by very tall trees (with network of climbers and lianas) and a generally connected/closed canopy are some of the distinct flora/vegetation features of the Hollongapar Gibbon Sanctuary, Assam

II. CANOPY BRIDGES FOR PRIMATES

Increasing human population over the last few decades has necessitated an increase in land acquisition as well for various human-use purposes. Many human settlements occur near or surrounding forest areas which create a demand for building infrastructure through these forests to connect different settlements. Many such infrastructures are linear in nature such as roads, railways and pipelines, which create wide forest gaps that fragment natural forest habitats and act as barriers to animal movement. Other anthropological activities such as mining, maintaining agricultural fields and even natural calamities like landslides have contributed towards formation of forest gaps. These barriers affect access to resources such as food and potential mates, thereby restricting gene flow and leading to population declines over time.

Arboreal animals – including many primate species groups like gibbons, guenons, macaques, lorises and lemurs – are especially affected by these linear infrastructures as they break the natural canopy cover and fragment their forest habitat. Since arboreal animals are adapted to life on trees, their body type can support limited types of locomotion including climbing, leaping, brachiating and clinging. Primates like gibbons are known as "*true brachiators*" (Cheyne, 2010). Their extended forelimb, stiff ribcage, presence of long thumb away from the other hook-like fingers (Figure 8) and relatively small body size allows them to use natural substrates like tree branches and trunks for brachiation – a type of suspensory movement using only the forelimbs while propelling the body forward. Given the physical limitations of these species as well as their preference to move in dense canopy cover amongst high trees, it is unnatural for them to climb down and move on ground with open canopy for crossing wide forest gaps like roads, railways, pipelines etc. In addition to the risk of vehicle collision, primates like gibbons also fear the increased chances of predation on ground.

Figure 9: Photos of wild gibbons showing difference in length between the thumb and other fingers, allowing them to get stronger grip on substrates like tree branches (reproduced from Cheyne, 2010)

Since crossing forest gaps like roads and railway lines cause stress to such species adapted to arboreal living, one effective mitigating measure taken around the globe is the construction of canopy bridges across such forest gaps to mitigate damage. Canopy bridges are bridges or connections through high rise trees in order to allow tree-dwelling animals to cross forest/canopy gaps to meet their different purposes including dispersal, foraging (access to resources), mating etc. They may be of the following main three types.

1. *Natural Canopy Bridge (NCB)*

These bridges are made out of naturally occurring components or materials such as bamboo (Das *et al.*, 2009; Linden *et al.*, 2020) and tree branches (Chetry *et al.*, 2022). In a study conducted by Linden *et al.* (2020) in South Africa, two types of bridges were constructed to facilitate the movement of Samango monkey *Cercopithecus albogularis* across a forest gap created by a road. Of the two designs, the species was clearly observed using the natural single bamboo pole bridge more than the semi-artificial ladder-rope bridge made of nylon and wood. This could be a matter of familiarity with the substrates used. Their behaviour such as running, especially in the juveniles – alluding to their level of caution – was also found dependent on the extent of canopy cover (more urgent under open canopy). Thus, preserving the natural canopy cover during road/linear infrastructure construction is recommended wherever possible. Otherwise, building single (or network of multiple) pole(s) across canopy gaps using bamboo has been found to be effective, for e.g. as documented by Das *et al.* (2009) at Bherjan Borajan Podumoni Sanctuary, Assam for the Western Hoolock gibbon. Gibbons were documented regularly using these bridges on which they either brachiated or walked bipedally for crossing the forest gap. It is generally found that the habituation period of animals/target species to NCBs is almost immediate.

While installing such bamboo poles may be convenient, certain natural bridges such as those made using tree branches may take longer time to establish. One such bridge has gradually established in the HGS itself, as mentioned above. In 2006, >3000 saplings of trees were planted, particularly consisting of 71 species known to serve as food sources and sleeping trees of gibbons. After 13 years of this plantation drive, in 2019, branches of three trees along the railway track grew and formed overlaps among them, building a natural canopy bridge across the track (Figure 10). Gibbons were thereafter documented using the bridge almost as soon as it was established (Chetry *et al.*, 2022). Other arboreal species that benefitted from this conservation intervention included squirrel *Sciurus sp.*, rhesus macaque, capped langur and Assamese macaque (Das *et al.*, 2009; Linden *et al.*, 2020; Chetry *et al.*, 2022).

Figure 10: NCB connecting two forest compartments in the HGS, Assam – A. Tree branches starting to overlap with each other across the railway line barrier (2019); B. Mature tree branches have formed strong overlaps across the railway line and continue to grow (2021) (reproduced from Chetry *et al.*, 2022); however our field visit in November 2022 revealed that this canopy connection has thinned recently due to one of the trees constituting the NCB being significantly damaged by a recent storm event

2. *Semi-Artificial Canopy Bridge (SACB)*

Semi-artificial canopy bridges (SACB) are made using a combination of natural and man-made materials or components such as a rope-ladder made using wood and nylon rope (Linden *et al.*, 2020) and liana plants secured to trees using nylon hitch (Balbuena *et al.*, 2019). An SACB structure was established by Balbuena *et al.* (2019) in the Peruvian Amazon across a natural gas pipeline Right of Way using a single liana to allow arboreal animals to cross the gap (Figure 11). Animals such as kinkajou *Potos flavus*, black-headed night monkey *Aotus nigriceps*, brown-eared woolly opossum *Caluromys lanatus*, eastern lowland olingo *Bassaricyon alleni* and few other species were found successfully using the bridge after seven days of its installation (Figure 11). Thus, the habituation period to SACB is relatively short. In addition, its construction saves time and energy given that, in this example, one bridge took only 20 man-hours to get completed. According to a study conducted by Linden *et al.* (2020) in South Africa, a semi-artificial bridge using nylon and wood was constructed specifically for Samango monkey *Cercopithecus albogularis*. However, its use was not found as efficient as natural canopy bridge made up of a single bamboo pole. It could be due to unfamiliarity of the species with the substrate used in the SACB design.

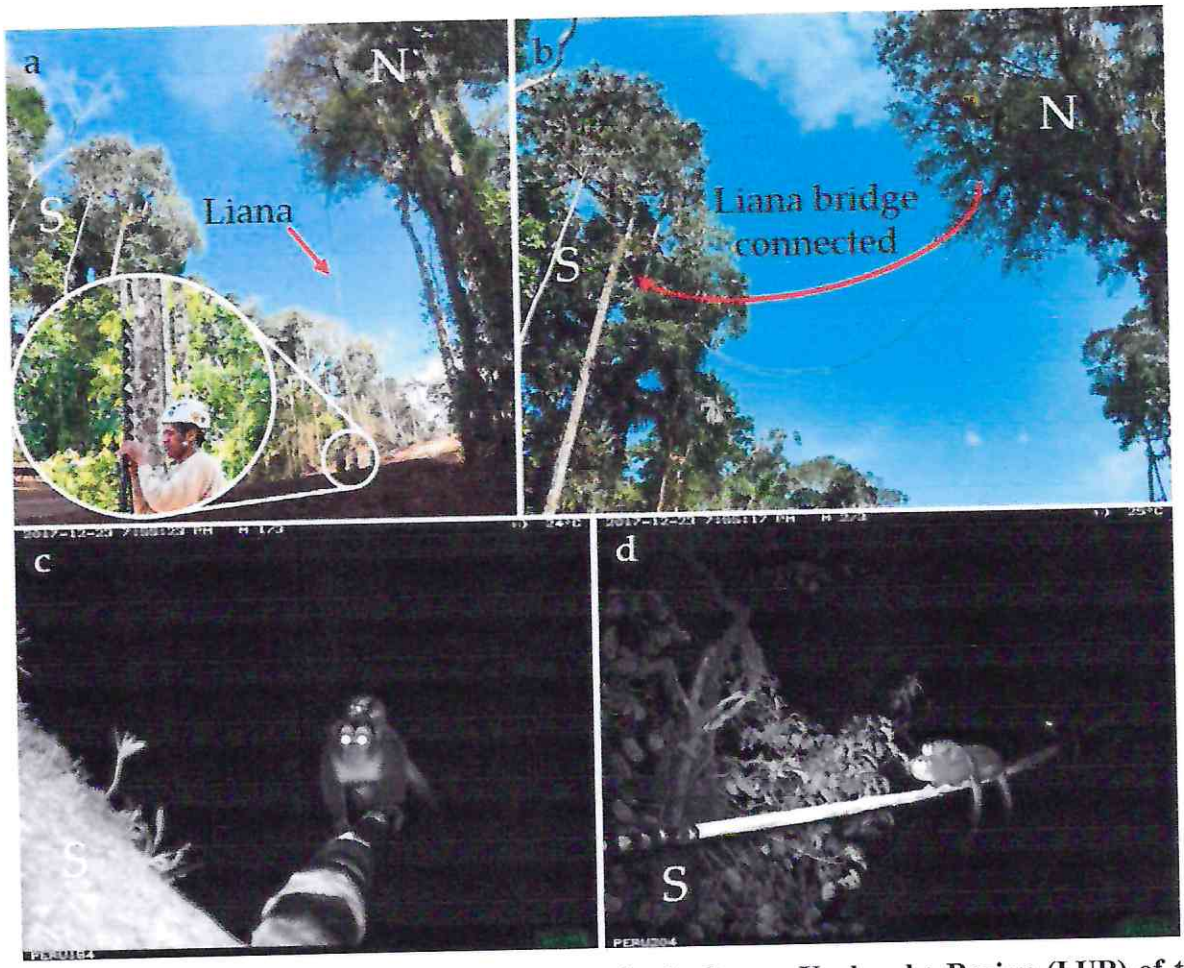

Figure 11: Installation of SACB made of liana in the Lower Urubamba Region (LUR) of the Peruvian Amazon – a. securing the braided nylon webbing hitch at the tip of the liana; b. suspending the liana by pulling down the paracord line attached to the webbing (red arrow shows the final location of the liana); c. & d. camera showing the liana bridge, capturing a crossing by a family of night monkeys (reproduced from Balbuena *et al.*, 2019)

3. *Artificial Canopy Bridge (ACB)*

These bridges are made using artificial or man-made materials/ components such as water-pipe (Birot *et al*., 2020), mountaineering grade ropes (Chan *et al*., 2020), wood and cable (Mass *et al*., 2011), PVC conduit pipe, pressure pipe, galvanised wire and turnbuckles (Cunneyworth *et al*., 2022), fire hose pipes (Yapa *et al*., 2022), synthetic polypropylene rope (Flatt *et al*., 2022) etc. Habituation period for ACBs are slightly longer as compared to both NCB and SACB. In West Java, Indonesia, the Javan slow loris *Nycticebus javanicus* got habituated to both waterline and wire (wrapped with rubber) bridges within 12.9 days on an average after their installation (Birot *et al*., 2020), while Hainan gibbon *Nomascus hainanus* in Hainan Bawangling National Nature reserve of China took around 176 days to habituate to the installed double-rope bridge (Chan *et al*., 2020). In another study from West Java, Indonesia, Nekaris *et al*. (2020b) reported that Javan slow loris took around 10 days to get habituated to the installed waterline bridges, whereas the Javan palm civet *Paradoxurus musanga javanicus* took around 36 days. In addition, ACBs are relatively expensive to install with establishment cost ranging from 157 to 5000 USD (Mass *et al*., 2011; Chan *et al*., 2020; Cunneyworth *et al*., 2022).

Figure 12: Photos showing two types of ACBs made of waterpipe (left) and a 1.5 cm width wire wrapped with rubber (right) for Javan slow loris use in Cipaganti, West Java, Indonesia (reproduced from Birot *et al.*, 2020)

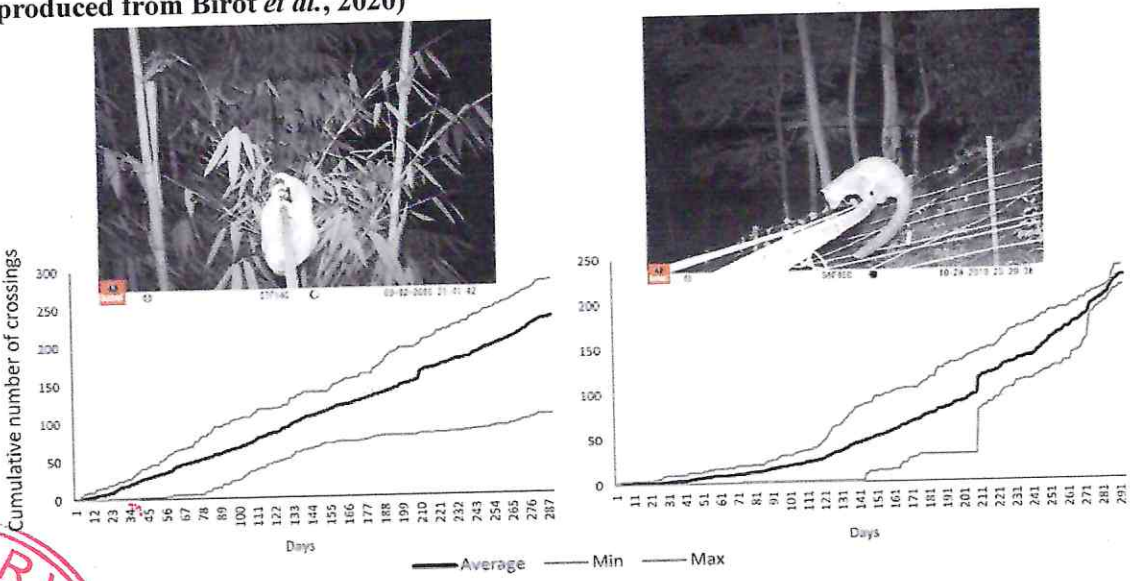

Figure 13: Mean (in black) and range (in gray) cumulative number of crossings on rubber bridges (left) by Javan slow loris and on waterline bridges (right) by Javan palm civet in Cipaganti, West Java, Indonesia during 2017-2019 (reproduced from Nekaris *et al.*, 2020b)

Figure 14 : The endangered Lion-tailed macaque *Macaca silenus* – endemic to India's Western Ghats – using a rope-lattice type ACB (made of rubberised canvas from used fire hosepipes) installed over a road in the Anamalai Hills of Tamil Nadu (photograph: Dhritiman Mukherjee)

Figure 15: Use of ACB (double-rope bridge) in China by the world's most critically endangered primate, the Hainan gibbon *Nomascus hainanus* showing four modes of locomotion on it – a. climbing (hand-railing), b. climbing (underneath); c. walking, and d. brachiation (reproduced from Chan *et al.*, 2022); the design guidelines in this report for ACB installation at HGS to facilitate W. Hoolock gibbon movements across forest canopy gaps is based largely upon this successful example

ACBs have been found to be successful for other primate and non-primate arboreal species such as Pallas's squirrel *Callosciurus erythraeus*, small flying squirrel *Hylopetes sp.*, lemur sp. (Lemuriformes), squirrel glider *Petaurus norfolcensis*, sugar glider *Petaurus breviceps*,

Common brushtail possum *Trichosurus vulpecula*, feathertail glider *Acrobates pygmaeus*, common ringtail possum *Pseudocheirus peregrinus*, Angolan Colobus monkey *Colobus angolensis*, Sykes' monkey *Cercopithecus mitis albogularis* and Vervet monkey *Chlorocebus pygerythrus* (Goldingay *et al.*, 2012; Chan *et al.*, 2020; Nekaris *et al.*, 2020b; Cunneyworth *et al.*, 2022).

4. *Summary*

We summarise some of the available literature (indicative) and various canopy bridge structure installations to facilitate arboreal mammals' movements in the following three tables.

Bridge type	Context/ Use case scenarios	Pros	Cons
Natural Canopy Bridge (NCB)	NCB is used to connect shorter distances between forest gaps where the use of natural materials for the bridge construction is possible.	• Habituation period for NCB is short due to the use of natural bridge materials such as bamboo, liana and tree branches. • NCB maintains the natural canopy connectivity. • Provides better camouflage to the animal species through the forest, thereby reducing stress and other behavioral changes. • NCB in combination with other natural substrates like lianas and vines can provide additional source of food to the animals (Das et al., 2009). • Cost-efficient than SACB and ACB.	• Duration of constructing a NCB can be longer than SACB and ACB depending on the material. For e.g. more than 3000 saplings of trees were planted along a 1-km stretch of the railway track in Hollongapar Gibbon WLS by the local community/ NGO and Assam State Forest Department with the aim to achieve mature trees with overlapping branches across the track, providing natural crossing opportunities for the residing gibbons. It took 13 years to form natural canopy bridges after the plantation drive. • Strength of NCB is less reliable than a well-constructed SACB and ACB, by which it is preferred only for shorter forest gaps.
Semi-artificial Canopy Bridge (SACB)	SACB is utilised when using natural materials (e.g. liana, climbers etc.) enhance the quality of the artificially built bridge.	• In SACB, the artificial material provides better durability and strength to the bridge while the natural material helps to reduce the habituation period by providing a familiar substrate to the animals for their movement. For e.g., habituation to a single liana bridge by eastern lowland olingo *Bassaricyon alleni* in the Peruvian Amazon was only 7 days after installation.	• Establishment cost is relatively higher than NCB. • In a study done by Balbuena *et al.* (2019), the liana used to make SACB remained intact only for 7 months, after which it broke as it became excessively dry and brittle. Thus, the natural component of the bridge may not last long.

Bridge type	Context/ Use case scenarios	Pros	Cons
Artificial Canopy Bridge (ACB)	ACB constructed where forest gaps are large and availability of natural canopy is less. Such areas need bridges with greater strength and durability to prevent crossing accidents. ACB also preferred when canopy regrowth cannot occur in an area after the construction of a linear infrastructure.	• Establishment duration of the bridge shorter than NCB, given that the design is not too complex. For e.g., a single rope bridge using synthetic polypropylene rope was established in 30 minutes and installed in 4 hours as recorded by Flatt *et al.* (2022) in Costa Rica. • ACB can be used to serve other purposes as well. For e.g. waterpipes are used in West Java, Indonesia as canopy bridges, which is also used by farmers for irrigation purposes in the nearby agricultural fields.	• Habituation period is longer in ACB as animals take time to explore the new substrate of the bridge in their natural habitat. • Establishment cost is relatively higher. A ladder bridge made using PVC pipes and zip-line cost around 937 USD (Flatt *et al.*, 2022). • More chances of making human error while constructing the bridge leading to a direct impact on the physical ability of the animals using them. • Uncertainties are involved with introducing unnatural substances in the wild.

Table 1: Summary describing use-case scenarios and various pros/cons of the three main types of canopy bridges – natural, semi-artificial and artificial – used to facilitate arboreal animal movements and connect habitat patches

Sr. no.	Target arboreal species; Location/ Country	Type of canopy bridge; Bridge design & materials used	Barrier/ Gap & Habituation period	Reference/ Source
1	Lemur *sp.* (Lemuriformes) – Madagascar, Africa	ACB – Suspension bridge made of wood; plank bridge made of wood & cables	Road & pipeline; habituation period not available	Mass *et al.*, 2011
2	Javan slow loris *Nycticebus javanicus* – West Java, Indonesia	ACB – Rigid water pipe tied to a wire; rubber wrapped around a wire	Agricultural fields; 12.9 days habituation period (on average)	Birot *et al.*, 2020
3	Samango monkey *Cercopithecus albogularis* – northern South Africa	NCB and SACB – Single pole bamboo trunks and ladder rope bridge using nylon and wood	Road; habituation period not available	Linden *et al.*, 2020

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Sr. no.	Target arboreal species; Location/ Country	Type of canopy bridge; Bridge design & materials used	Barrier/ Gap & Habituation period	Reference/ Source
4	Angolan Colobus monkey *Colobus angolensis palliates*, Sykes' monkey *Cercopithecus mitis albogularis*, Vervet monkey *Chlorocebus pygerythrus*, Yellow Baboon *Papio cynocephalus cynocephalus* – Kenya, Africa	ACB – Horizontal ladder-style bridge	Road; habituation period not available	Cunneyworth *et al.*, 2022
5	Dusky langur *Trachypithecus obscurus* – Teluk Bahang, Penang, Malaysia	ACB – Firehose bridge (single and double rope bridge)	Road; eight (08) months habituation period after installation	Yap *et al.*, 2022
6	Dusky langur *Trachypithecus obscurus* – Thailand	ACB – Electric and telecommunication cables	Not accessible	Aggimarangsee *et al.*, 2022
7	Mantled howler monkey *Alouatta palliata palliate* – Costa Rica	ACB – Not accessible	Not accessible	Rojas & Gregory, 2022
8	Primates, especially black Sumatran langur *Presbytis sumatrana* – north Sumatra, Indonesia	ACB – Ladder canopy bridge (material not known due to accessibility limitations to the paper)	Not accessible	Prasetyo *et al.*, 2022
9	Possum *sp.* – Wet Tropics of Queensland, Australia	ACB – Three rope bridge designs: single rope, ladder-like bridges and rope tunnel-shaped bridges; materials include marine-grade nylon rope, plastic spacers and steel cables.	Road; Rope tunnel – 5-17 months after installation (according to different species); Ladder-like bridge – 7 months after installation; Single rope – habituation period not available	Weston *et al.*, 2011
10	Arboreal wildlife, in general (5 mammals and 3 bird species observed using structures) – Osa, Costa Rica	ACB – Single-rope and double-rope using synthetic polypropylene ropes; ladder bridge used PVC pipe and zip-lines.	Road; Single-rope bridge – 31 days for woolly opossum *Caluromys derbianus*; Double-rope bridge – 26 days for kinkajou *Potos flavus*; Ladder bridge – 170 days by woolly opossum	Flatt *et al.*, 2022

Table 2: Indicative examples summarising information regarding canopy bridge structures installed successfully for arboreal species (mostly primates) around the globe

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Sr. no.	Target arboreal species; Location/ Country	Type of canopy bridge; Bridge design & materials used	Barrier/ Gap & Habituation period	Reference/ Source
1	Hoolock gibbon *Hoolock hoolock* – Bherjan Borajan Podumoni WLS, Assam, India	NCB – single/ multiple bamboo poles	Canopy gap due to selective logging/ deforestation; 14 days habituation period	Das *et al.*, 2009
2	Hoolock gibbon *H. hoolock* – HGS, Assam, India	NCB – Overlapping tree branches after reforestation, mainly by sleeping and feeding tree species used by gibbons	Railway; used almost immediately after formation of NCB	Chetry *et al.*, 2022
3	Hainan gibbon *Nomascus hainanus* – Hainan Bawangling National Nature reserve, China	ACB – two-pronged, double-rope bridge	Canopy gap induced by landslide due to typhoon; 176 days habituation period	Chan *et al.*, 2020
4	White-handed or Lar gibbon *Hylobates lar* – Khao Yai National Park, Thailand	ACB – two single-rope bridges (manila ropes), one nylon rope bridge and a ladder bridge made up of polypropylene rope with PVC tubing rungs	Road; 10 weeks habituation period	Saralamba *et al.*, 2022

Table 3: Indicative examples summarising information regarding canopy bridge structures installed successfully for various gibbon species

III. ACB DESIGN FOR HOOLOCK GIBBON AT HGS

1. Design guidelines and considerations

Learnings derived from experiences of installation of canopy bridges (specifically, artificial canopy bridges) around the world, and from inputs received from the NEFR (Indian Railway) authorities with electrification of the line planned soon (subject to statutory approvals), the following design guidelines and considerations are suggested towards installation of ACBs for arboreal mammals' use (specifically for Hoolock gibbons) at the HGS.

1. The most practical and cost-effective ACB design for Hoolock gibbons may be installing double-rope bridges (following Chan *et al.*, 2020) over the railway line by tying mountaineering-grade nylon static (low stretch) rappling ropes complying to the EN1891 standard (Type A, diameter 12 mm) on two sturdy, tall, mature and undamaged trees (called "post trees") preferably used by Hoolock gibbons for purposes such as feeding, lodging etc. with a large primary branch axis – one on either side located closest to the railway track. As much as possible, there should be no physical impediment along the bridge that might obstruct gibbons' typical brachiating movements. The suspended ropes themselves must have a natural elasticity, making movement along them easy and comfortable.

2. Since the height of the canopy bridge has to account for both sufficient slack and a minimum safety distance from the contact/live wire (to be constructed at maximum 7.2 m height from the railway track), the minimum distance between any ACB component

structure (for e.g., a safety net described below) from the railway track must be at least 11.5 m accounting for slightly more than 4 m safe distance. Since gibbons are group-living animals, the height and potential rope sagging computations must factor in for the bridge usage of multiple individuals (at least 50-60 kg). The post trees, thus, must be chosen accordingly.

3. Since there is always a non-zero probability of an animal accidentally falling off the installed ACB (due to various reasons) and getting either electrocuted or exposing itself to other dangers such as increased predation risk on ground, installation of safety nets below the main twin-rope bridge/span as a fail-safe mechanism may be tried. Such a safety net may measure 2 m in width and be about 3.5 m below the main bridge itself (but at least 4 m above the live/contact wire), and tightened in such a manner so as to be able to bear weight of around 50-60 kg without significant sagging while maintaining a safe distance from the railway overhead equipment/infrastructure.

4. To encourage the use of the main span/canopy bridge, and help gibbons/other arboreal mammals get habituated to the same, as well as to ensure that lateral canopy gaps (if any) around the post trees are also connected, a web-design around the post trees with a single rope connection to 2-4 sufficiently strong/sturdy and mature "secondary" trees (as required) on both sides is recommended. Along such secondary trees/connections, 'stepping-stone' knots could be tied to sturdy branches on any suitable intermediate tree(s) as well. The height (from forest floor/ground) of such secondary connections may ideally be between 11-15 m, while the span is dependent on finding suitable trees.

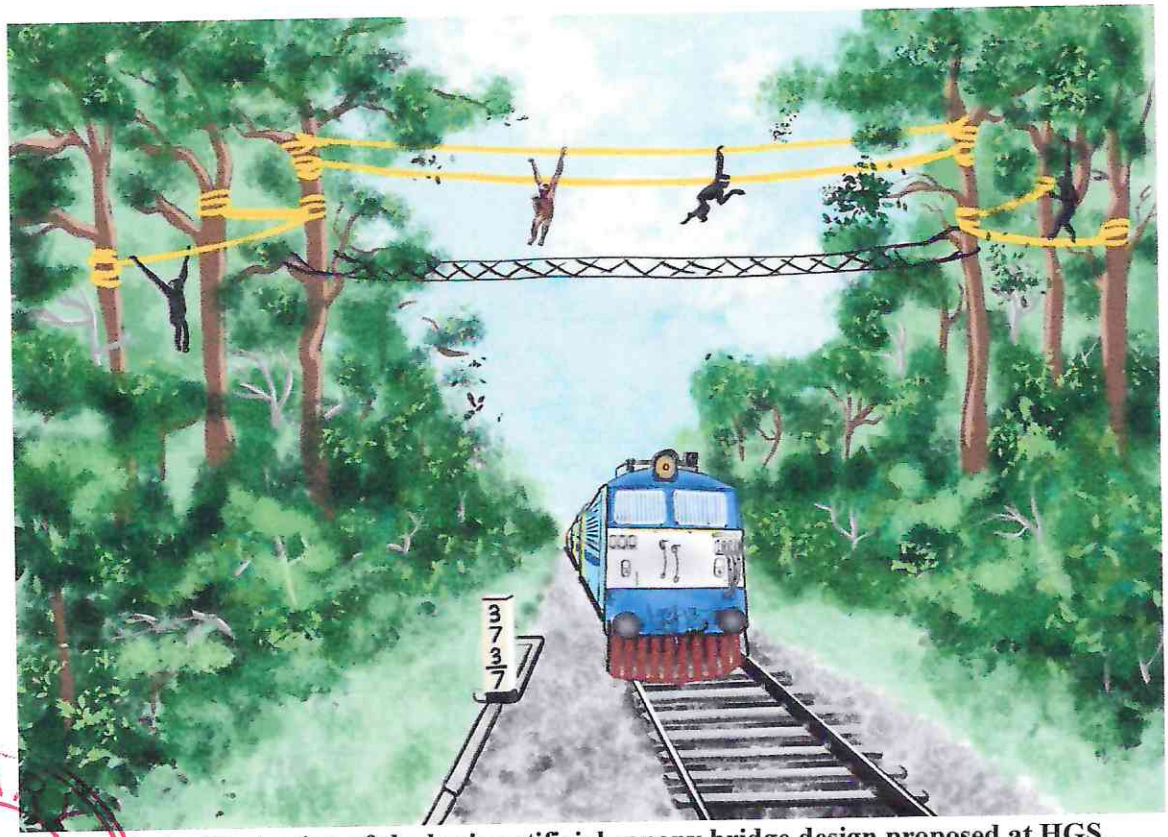

Figure 16: An illustration of the basic artificial canopy bridge design proposed at HGS, Assam (illustration by Vabesh Tripura)

5. Over the longer term, it might be suitable to incorporate natural elements into the ACB structure/design. Lianas and creepers may be 'guided' along the rope bridges so as to help them intertwine and form part of a hybrid (or semi-artificial) design centred around the artificial rope bridge. Such an incorporation will encourage gibbon acceptability of the artificial structures and improve their durability and stability.

Figure 17: An illustrative example of an artificial canopy bridge (distances depicted here are not to scale) design at HGS incorporating concerns shared by Railway authorities factoring in the near-future electrification prospects of the railway line (illustration by Vabesh Tripura)

Certain additional considerations besides the above broad guidelines are as follows –

i. The implementation of ACBs is a technical, collaborative and multi-stakeholder exercise. Accordingly, a committee of diverse and relevant experts comprising of ecologists/primatologists (both government and non-government agencies), foresters along with engineers and expert mountaineers may be constituted to further fine-tune the design and execute/install the structures in the field, and regularly monitor (subsequent to installation) them to assess gibbon and other arboreal mammals' usage. Such a committee will regularly meet (with meeting minutes recorded) to deliberate among themselves and, based on field data, suggest any appropriate modifications and course-corrections. A dedicated maintenance/upkeep and pre-emptive damage control subcommittee may also be setup with clear and fixed responsibilities to ensure all ACB structures are regularly checked for damage and routine maintenance tasks carried out.

ii. Ends of the canopy bridges as well as knots must be secured and well clamped/tightened using appropriate and high-grade fastening materials and techniques. Caution must be

exercised to ensure that ropes are tied in a manner that allows trees to grow in girth. Care must be taken to ensure that components and equipment used are durable enough to last several years (given regular maintenance and upkeep) under harsh outdoor environments. It may be feasible to execute the implementation of ACBs at two suggested sites (nos. 4 & 7, see details below) on an experimental basis, assess challenges experienced (if any) and target species' responses post installation, and thereafter install ACBs at other suggested sites from learnings thus derived.

iii. Other than monitoring gibbon/other arboreal mammals' actual use of installed canopy bridges (through camera traps), it may be extremely important to regularly collect behavioural data of arboreal animals in and around canopy clearings and on/over the installed structures, as well as institute longer term population and genetic monitoring programme/studies, to help infer the utility of such structures towards enhancing animal populations and maintaining genetic diversity. Regular training programs for field staff and providing a detailed log/data sheet (in local language) and data collection protocol will help in collecting crucial information in a scientific manner.

iv. It is imperative that the speed of trains themselves passing through the HGS, its ESZ and elephant corridors is regularly monitored using available technology, so that applicable speed restrictions are adhered to and regular feedback given to NEFR officials, in case of speed violations, for necessary action.

v. It is important to afforest railway/linear infrastructure edges, over the longer term, by taking relevant agencies with the RoW (in this case, NEFR) into confidence so that forest regeneration efforts to create natural canopy bridges do not go in vain and natural canopy bridges are eventually established over canopy gaps.

2. *Suggested ACB locations at HGS and allied data*

Following broad guidelines detailed above, and based on our field surveys at HGS during November 28-December 02, 2022, the following three tables detail seven (07) suitable ACB installation locations along the railway track, post trees' locations and allied details, as well as those of secondary/web trees.

ACB Site no. (from Kothalguri Tea Estate/ western side)	Railway chainage	Site latitude (N)	Site longitude (E)	Main (double-rope) canopy bridge span (m)
1	372/7 - 372/8	26.674144°	94.348467°	36.63
2	372/8 - 372/9	26.674557°	94.349180°	63.40
3	373/0 - 373/1	26.675624°	94.350972°	60.75
4	373/1 - 373/2	26.675829°	94.351315°	54.31
5	373/3 - 373/4	26.676869°	94.353022°	67.69
6	373/4 - 373/5	26.677698°	94.354385°	69.10
7	373/6 - 373/7	26.678849°	94.356263°	41.24
TOTAL				**393.12**

Table 4: Suitable artificial canopy bridge installation sites at the Hollongapar Gibbon Sanctuary

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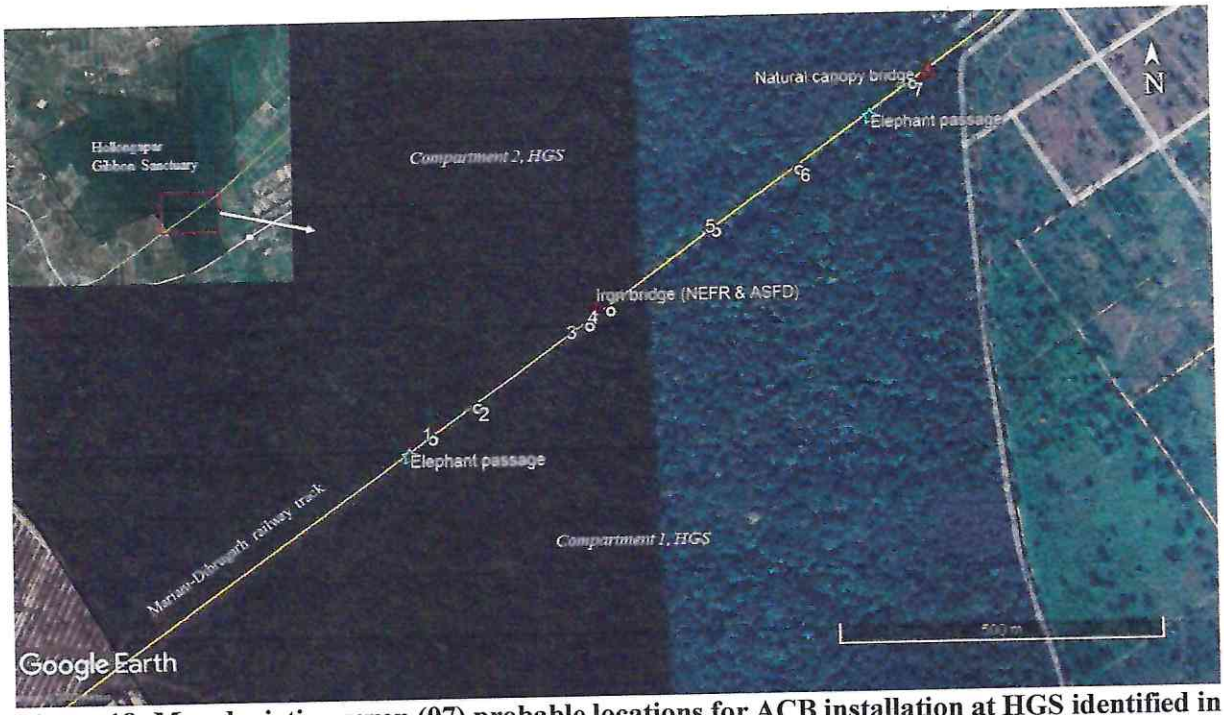

Figure 18: Map depicting seven (07) probable locations for ACB installation at HGS identified in this study; note that locations 4, 7 are near the existing ACB (made of iron) and NCB, respectively

ACB Site No., HGS Compt. No.	Post tree identity (local & scientific names)	Post tree location (lat/ long)	Tree GBH (m)	Total tree height from base (m)	Tree height from rail track level (m)	Tree height (from rail track level) to knot points 1, 2, etc. (m)
1, 1	Sam kothal (*Artocarpus chama*)	N 26.67400, E 94.34850	3.27	26.00	24.25	13.25, 15.75
1, 2	Phul hingori (*Castonopsis indica*)	N 26.67432, E 94.34843	3.65	25.50	23.50	15.0, 16.0
2, 1	Phul hingori (*Castonopsis indica*)	N 26.67438, E 94.34939	3.00	28.00	26.25	16.25, 17.25
2, 2	Phul hingori (*Castonopsis indica*)	N 26.67478, E 94.34893	4.75	28.50	26.50	19.0, 21.0
3, 1	Pan sopa (*Michelia montana*)	N 26.67538, E 94.35110	2.80	28.00	28.00	20.0, 20.0
3, 2	Sam kothal (*Artocarpus chama*)	N 26.675875, E 94.35084	3.35	33.00	31.50	21.5, 22.5, 25.5
4, 1	Sam kothal (*Artocarpus chama*)	N 26.67562, E 94.35147	1.80	25.00	25.00	20.0
4, 2	Sam kothal (*Artocarpus chama*)	N 26.67602, E 94.35116	2.25	34.00	33.00	21.0, 22.0
5, 1	Gonsoroi (*Cinnamomum glanduliferum*)	N 26.67659, E 94.35308	2.00	36.50	35.00	22.5, 23.5
5, 2	Hal (*Terminalia myriocarpa*)	N 26.67719, E 94.35295	3.20	37.50	36.00	21.5, 22.5
6, 1	Pan sopa (*Michelia montana*)	N 26.67734, E 94.35471	3.40	35.50	33.50	14.0, 16.0

ACB Site No., HGS Compt. No.	Post tree identity (local & scientific names)	Post tree location (lat/ long)	Tree GBH (m)	Total tree height from base (m)	Tree height from rail track level (m)	Tree height (from rail track level) to knot points 1, 2, etc. (m)
6, 2	Sam kothal (*Artocarpus chama*)	N 26.67782, E 94.35427	4.10	37.50	36.50	24.0, 25.0
7, 1	Sam kothal (*Artocarpus chama*)	N 26.67863, E 94.35643	2.54	29.00	29.00	22.0, 24.0
7, 2	Mango (*Mangifera indica*)	N 26.67894, E 94.35620	3.00	26.00	26.00	22.0, 24.0

Table 5: Location, identity and other necessary details of 14 'post trees' at the seven probable ACB installation sites along the railway track in HGS (note that scientific names of all trees may not be accurate)

Figure 19: Identified 'post trees' in this study are strong, sturdy and mature individuals with multiple available branching/knot points at appropriate heights; all post trees have been physically marked in the field by a red ribbon tied around their main trunks; experienced field staff Mr. Suchen Borah (left) and Mr. Deben Borah (right) helped the WII research team in tree identification and in general conducting fieldwork at HGS, Assam

ACB Site No.	HGS Compt. No.	Secondary tree name (local)	Secondary tree name (scientific)	Secondary tree location (lat/ long)	Total tree height from base (m)	Dist. from Post tree (m)
1	1	Kenglo	*Trewia nudiflora*	N 26.67399, E 94.34870	22.0	19.860
		Ajhar	*Lagerstroemia speciosa*	N 26.67381, E 94.34841	13.0	23.325
		Hollong	*Dipterocarpus macrocarpus*	N 26.67368, E 94.34862	25.0	37.458
	2	Kenglo	*Trewia nudiflora*	N 26.67456, E 94.34841	17.5	25.770
		Lewa	*Engelhardtia spicata*	N 26.67445, E 94.34860	17.5	22.160
		Seleng	*Sapium baccatum*	N 26.67454, E 94.34858	17.5	28.542
2	1	Kenglo	*Trewia nudiflora*	N 26.67456, E 94.34951	18.0	22.965
		Ajhar	*Lagerstroemia speciosa*	N 26.67434, E 94.34930	16.0	9.521
		Bandordima	*Dysoxylum sp.*	N 26.67422, E 94.34948	15.0	15.187
	2	Kenglo	*Trewia nudiflora*	N 26.67479, E 94.34905	22.5	12.103
		Kadam	*Neolamarckia cadamba*	N 26.67486, E 94.34906	24.5	15.950
		Ajhar	*Lagerstroemia speciosa*	N 26.67496, E 94.34896	15.0	20.369
3	1	Jamuk	*Syzygium cumini*	N 26.67547, E 94.35122	14.0	16.343
		Amari	*Aglaia spectabilis*	N 26.67528, E 94.35120	14.5	14.562
		Phul hingori	*Castanopsis indica*	N 26.67514, E 94.35107	25.5	26.575
	2	Ajhar	*Lagerstroemia speciosa*	N 26.67584, E 94.35070	14.0	13.859
		Ajhar	*Lagerstroemia speciosa*	N 26.67599, E 94.35073	15.5	16.125
		Ajhar	*Lagerstroemia speciosa*	N 26.67604, E 94.35093	17.5	20.001
4	1	Sam kothal	*Artocarpus chama*	N 26.67556, E 94.35156	25.0	10.664
		Kenglo	*Trewia nudiflora*	N 26.67552, E 94.35137	24.0	15.152
		Seleng	*Sapium baccatum*	N 26.67575, E 94.35165	25.0	22.605
	2	Bohot	*Artocarpus lacucha*	N 26.67601, E 94.35109	14.5	7.528
		Ajhar	*Lagerstroemia speciosa*	N 26.67614, E 94.35108	18.5	15.442
		Otenga	*Dillenia indica*	N 26.67603, E 94.35125	13.5	8.770

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ACB Site No.	HGS Compt. No.	Secondary tree name (local)	Secondary tree name (scientific)	Secondary tree location (lat/ long)	Total tree height from base (m)	Dist. from Post tree (m)
5	1	Bandordima	*Dysoxylum sp.*	N 26.67672, E 94.35314	16.0	15.492
		Sam kothal	*Artocarpus chama*	N 26.67647, E 94.35319	36.0	16.782
		Kenglo	*Trewia nudiflora*	N 26.67663, E 94.35289	22.0	19.401
	2	Unidentified	NA	N 26.67735, E 94.35302	17.5	19.028
		Ajhar	*Lagerstroemia speciosa*	N 26.67728, E 94.35280	13.5	18.366
		Tita sopa	*Michelia oblonga*	N 26.67723, E 94.35315	25.5	19.957
6	1	Morhal	*Vatica lanceaefolia*	N 26.67719, E 94.35472	17.5	16.104
		Pan sopa	*Michelia montana*	N 26.67745, E 94.35449	24.0	25.539
		Gahori sopa	*Magnolia griffithii*	N 26.67750, E 94.35476	16.5	18.466
	2	Kenglo	*Trewia nudiflora*	N 26.67797, E 94.35414	31.0	20.624
		Jamuk	*Syzygium cumini*	N 26.67808, E 94.35421	26.0	29.412
		Sashi	*Aquilaria agallocha*	N 26.67792, E 94.35442	26.0	18.720
7	1	Sam kothal	*Artocarpus chama*	N 26.67853, E 94.35647	27.0	11.798
		Morhal	*Vatica lanceaefolia*	N 26.67863, E 94.35627	17.0	15.736
		Morhal	*Vatica lanceaefolia*	N 26.67845, E 94.35637	20.0	21.610
	2	Borpat	*Ailanthus integrifolia*	N 26.67928, E 94.35602	34.5	41.170
		Ajhar	*Lagerstroemia speciosa*	N 26.67936, E 94.35628	23.5	47.271
		Borpat	*Ailanthus integrifolia*	N 26.67882, E 94.35601	28.0	23.059
TOTAL						**839.371**

Table 6: Location, identity and other necessary details of 42 probable 'secondary/web trees' (three web trees each for 14 post trees) at the seven suitable ACB installation sites in HGS (note that scientific names of all trees may not be accurate)

From field data collected in the Hollongapar Gibbon Sanctuary, the average "post tree" height from the seven suggested ACB sites (total 14 trees) is 30.71 m (range: 25.5-37.5 m). The chosen post trees have an average girth at breast height (GBH) of 3.08 m (range: 1.8-4.75 m) signifying their sturdiness and maturity. The average height (measured from the rail track) at which knot points on post trees (1-3 each, total 28 to choose from) are available is sufficiently high at 19.55

m (range: 13.25-25.0 m), while the average main (double-rope) bridge span over the canopy gap/railway track (post-post tree connections) is 56.16 m (range: 36.63-69.1 m, total length 393.12 m). On an average, a secondary/web tree (total 42, three for each of 14 post trees at the seven sites) is situated 19.98 m (range: 7.528-47.271 m) away from its post tree for which single-rope bridge/connections could be provided (total length 839.371 m), while an average secondary tree's height is 20.63 m (range: 13.0-36.0 m).

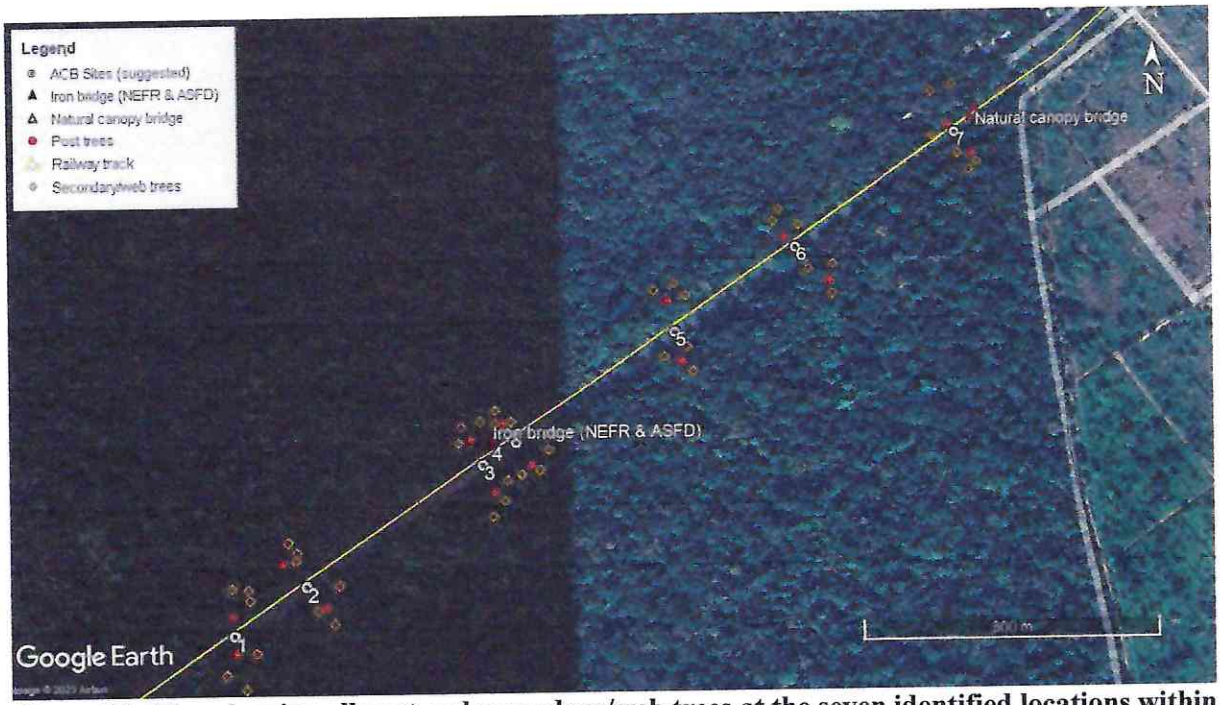

Figure 20: Map showing all post and secondary/web trees at the seven identified locations within HGS where artificial canopy bridges may be installed

IV. CONCLUSION

The state of Assam has been a pioneer in positive conservation action as the people of Assam have demonstrated and conveyed (to their representatives) their resolve to save species from various anthropogenic impacts, even from the brink of extinction (Greater one-horned rhinoceros is a case in point). It is, thus, along expected lines that the Assam Forest Department and the State Government has initiated the task of installing artificial canopy bridges to secure the long-term future of primarily the Hoolock gibbon, but also of other arboreal animals', from the threat imposed by the canopy gap due to the existing railway track.

While the installation of artificial canopy bridges is one of the solutions and an important first step, it is important that other more long-term interventions, with the support of stakeholders such as local communities and Indian Railways, are also carried out, some of which include (but are not limited to):

1. Efforts to establish/ reforest ecological/ wildlife corridors and 'stepping-stone' habitats around Hollongapar Gibbon Sanctuary so that the immense biodiversity value of the Sanctuary is conserved and wildlife has space to occupy and move in the larger forested landscape of the region.

2. The Indian Railways has set a target of becoming a 'Net Zero' entity by 2030 through complete electrification of its network. In this respect, work on the electrification of the Dibrugarh-Mariani railway line is currently underway in a phase-wise manner. However, since electrification will impose further costs on HGS's arboreal wildlife (through the additional danger of being accidentally electrocuted), it is necessary that any such modification is carefully thought through and relevant mitigation and compensation measures implemented.

3. The current single-track broad gauge railway line at HGS has caused a wide canopy gap of 30-40 metres. Any future plan of doubling the track (and possible electrification of the same) passing through the Sanctuary limits will render the installation of artificial canopy bridges useless by further widening the canopy gap (possibly up to 100 metres accounting for distance between the tracks). Since the railway stretch within HGS is relatively small, the Indian Railways must think long-term and demonstrate its conservation vision by exploring all possibilities to reroute the existing line outside HGS (and its ESZ) limits into the adjoining revenue and non-forest land. This will ensure that a balance between ecology and economy is struck, and allow for the necessary doubling and electrification of such a rerouted line (with structural and other mitigation measures, if needed).

4. Since natural canopy bridges is the most effective way of connecting forest canopy gaps, it is necessary that appropriate reforestation activities (including protecting the saplings until they are established) is carried out along both sides of the existing railway track. This is especially urgent along the latter half of the railway track through HGS (towards Kothalguri Tea Estate) where the canopy gap is very wide at present.

5. Establishment of and supporting (through incentives and forward marketing-linkages) small-scale and regulated homestay-based ecotourism activities with its economic benefits directly accruing to members of local communities and towards supporting wildlife conservation and basic village development activities will help firmly establish people as direct stakeholders in the Sanctuary's and its inhabiting wildlife's conservation.

As far as the installation of ACB structures within the HGS is concerned, it must be urgently executed with the active involvement of professionals and experts with domain knowledge from the fields of ecology/primatology, engineering, forestry, mountaineering and such other. Representatives of the Indian Railways should also be involved to ensure smooth coordination and ensure their support as well. For this purposes, under the leadership and stewardship of the Assam State Forest Department, a 'Steering Committee' may be formed with representation from local conservation organisations such as Aaranyak, Conservation Initiatives and from the WII. Additional representation from Indian Railways/ its consultant organisations (as necessary) and from a reputed mountaineering institute such as the Himalayan Mountaineering Institute, Darjeeling (to provide specific inputs regarding fine-tuning the ACB design outlined in this report, material/equipment procurement and making professional climbers/mountaineers available) will be crucial to the success of this initiative. A well-established post-installation monitoring protocol and associated research activities are a must to document learnings from this initiative for other landscapes, and towards effecting necessary course corrections.

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APPENDIX 1 – DFO (Territorial), Jorhat letter to Director, WII dated 08.08.2022 requesting inputs into designing a canopy bridge over railway line inside Hollongapar Gibbon Sanctuary

(3)

GOVERNMENT OF ASSAM
DEPARTMENT OF ENVIRONMENT & FORESTS
OFFICE OF THE DIVISIONAL FOREST OFFICER
JORHAT DIVISION: JORHAT

Ph: 03762950090 E-mail: dfo.t.jorhat@gmail.com

Letter No.FJT/B/Canopy Bridge/34/ Date: 08th Aug 2022

To

The Director
Wildlife Institute of India,
Dehradun

Sub: Request for designing canopy bridge over railway line inside Hollongapar Gibbon Sanctuary – reg.

Sir,

With reference to subject cited above, I would like to mention that Hollongapar Gibbon Sanctuary is located in Jorhat Division of Assam state. This is the only sanctuary in India harbouring 7 (seven) primate species and hoolock gibbon (*Hollock hoolock*) is the flagship species of this sanctuary. Hoolock gibbon which is an endangered species as per IUCN category is a frugivorous, arboreal and monogamous primate species.

Inside the Hollongapar Gibbon Sanctuary, a railway line from Mariani to Dibrugarh passes through it. This has resulted in a wide canopy gap, which has divided the sanctuary into 2 (two) parts. This is restricting the movement of the hoolock gibbon and has resulted in isolation of them on either side. This long isolation is restricting the gene flow between the hoolock gibbon families and is also posing threat of inbreeding depression.

In this context, it is proposed to construct a canopy bride across the railway line which will enable the movement of the hoolock gibbons on either side of railway line. Hoolock gibbon being a very shy and arboreal primate, it is required to consider parameters like - animal behaviour, animal safety, materials preferred by the primates for brachiation so on. In this regard, inputs from the wildlife experts are required, so that, a gibbon friendly canopy bridge is built inside the sanctuary.

Since, Wildlife Institute of India, is a premier institute with expertise in diverse wildlife matters, it is hereby kindly requested to help us in designing a canopy bridge, which will be used by the gibbons for locomotion over the canopy gap created by the railway line inside the Hollongapar Gibbon Sanctuary. Your cooperation in this matter is highly solicited.

This is for your kind consideration and necessary action.

Yours truly.

Divisional Forest Officer,
Jorhat Division, Jorhat.

WII OFFICE
DIARY 2684
DATE 16/8/2022

Dr Gopi
Please discuss
We need to communicate
canopy connecting bridges
16/8/22

NOTARY
Banti Baishya
KAMRUP (M) Ghy
Regd. No. KAM-22
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APPENDIX 1 – DFO (Territorial), Jorhat letter to Director, WII, dated 08.08.2022 requesting inputs into designing a canopy bridge over railway line inside Hollongapar Gibbon Sanctuary

Memo No: FJT/A/Canopy Bridge/34/ [illegible]

08th Aug 2022

Copy to:

1. The Principal Chief Conservator of Forests & Head of Forest Force, Assam, Aranya Bhavan, Panjabari, Guwahati – 37 for favour of his kind information and necessary action.
2. The Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, O/o PCCF & HoFF, Assam, Aranya Bhavan, Panjabari, Guwahati – 37 for favour of his kind information and necessary action.
3. The Conservator of Forests, Eastern Assam Circle, Jorhat – 1 for favour of his kind information

Divisional Forest Officer,
Jorhat Division, Jorhat.

NOTARY
Banti Baishya
KAMRUP (M) Ghy
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APPPENDIX 1- DFO (TERRITORIAL), Jorhat letter to Director, WII, dated 08.08.2022 requesting inputs into designing a canopy bridge over railway line inside Hollongpar Gibbon Sanctuary

GOVERNMENT OF ASSAM
DEPARTMENT OF ENVIRONMENT & FORESTS
OFFICE OF THE DIVISIONAL FOREST OFFICER
JORHAT DIVISION : JORHAT

Letter No. FJT/B/Canopy Bridge/34/3527 Date: 08th Aug 2022

To,
The Director
Wildlife Institute of India.
Dehradun

Sub: request for designing canopy bridge over railway line inside Hollongapar Gibbon Sanctuary- reg.

Sir,

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Since, Wildlife Institute of India, is a premier institute with expertise in diverse wildlife matters, it is here by kindly requested to help us in designing a canopy bridge, which will be

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This is for your kind consideration and necessary action.

Yours truly,
Divisional Forest Officer
Jorhat Division, Jorhat

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APPPENDIX 1- DFO (TERRITORIAL), Jorhat letter to Director, WII, dated 08.08.2022 requesting inputs into designing a canopy bridge over railway line inside Hollongpar Gibbon Sanctuary

Memo No: FJT/A/Canopy Bridge/34/2147-49 **08th Aug 2022**

Copy to:

1. The Principal Chief Conservator of Forests & Head of Forest Force, Assam. Aranya Bhavan, Panjabari, Guwahati-37 for favour of his kind information and necessary action.
2. The Principal Chief Conservator of Forests (Wildlife) & Chief Wildlife Warden, O/o PCCF & HoFF, Assam, Aranya Bhavan, Panjabari, Guwahati-37 for favour of his kind information and necessary action.
3. The conservator of Forests, Eastern Assam Circle, Jorhat – 1 for favour of his kind information.

Sd/- Illegible
Divisional Forest Officer
Jorhat Division, Jorhat

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APPENDIX 2 – Dean, WII response letter to DFO (Territorial), Jorhat, dated 04.10.2022

भारतीय वन्यजीव संस्थान
Wildlife Institute of India
(An Autonomous Institute under Ministry of Environment, Forest & Climate Change, Govt. of India)
Post Box No. 18, Chandrabani, Dehradun - 248001, Uttarakhand, INDIA

Azadi ka Amrit Mahotsav

04 October 2022

WII-EIA/Canopy Bridge/HGS 147

To,

Divisional Forest Officer (Jorhat Territorial Division)
Department of Environment & Forests, Government of Assam
Atilagaon, Jorhat 785001, Assam
Email: [illegible]

Sub: Request for designing canopy bridge over railway line inside Hollongapar Gibbon Sanctuary reg.

Ref: Your letter no. FJT/B/Canopy Bridge/34/3527 dated 08 August 2022

Sir/Madam,

You may already be aware that the only long-term solution towards meaningfully connecting populations and habitats of highly arboreal species such as gibbons, monkeys, lemurs, lorises, civets, squirrels among other mammals fragmented by linear intrusions such as roads, railways, canals etc. is to reforest areas along the said linear gap with fast-growing native trees preferred by the target species/taxa. However, as a short-term and inexpensive conservation measure, constructing well-designed and suitably sited artificial or semi-artificial canopy bridges across linear intrusions at frequent intervals may reduce the barrier effect and help in connecting isolated groups/populations, besides mitigating the risk of accidental collisions and vulnerability to predators during ground movements.

The utility of canopy bridges in this context has been successfully demonstrated for various primate species around the world utilising various designs and materials. In India, canopy bridges made of used fire-hose pipes are facilitating lion tailed macaque *Macaca silenus* movements and helped reduce their accidental road fatalities in the Valparai plateau of Tamil Nadu. Horizontal ladder bridges made of bamboo and simple nylon ropes installed in Chakrashila Sanctuary (Assam) and Chinnar Sanctuary (Kerala) over roads are being used by species such as golden langur *Trachypithecus geei*, tufted gray langur *Semnopithecus priam* and grizzled giant squirrel *Ratufa macroura* among others.

All gibbon species are globally threatened, particularly shy, and are exclusively arboreal (usually in the middle canopy), thereby making both the design and construction of artificial canopy bridges a challenging exercise. Moreover, the effectiveness of artificial canopy bridge as a conservation tool for wild gibbons has not been widely experimented, and the results are rarely published. A simple bamboo canopy bridge in the Borajan reserve of Assam demonstrated limited success in the early 2000s for western hoolock gibbons *Hoolock hoolock*, and rope bridges over roads in Thailand have proven useful for lar gibbons *Hylobates lar*. Most recently, pairs of mountaineering grade ropes tied to sturdy trees were shown to be successful for the critically endangered Hainan gibbons *Nomascus hainanus* in China.

A few pre-requisites towards designing the best-suited canopy bridge for gibbons in Hollongapar Gibbon Sanctuary fragmented by the Mariani Dibrugarh railway line is the availability and careful perusal of data on animal crossings/sightings to site the intervention at most suitable location(s), local consultative meetings with all stakeholders (including Indian Railways) and gibbon experts/conservationists along with a joint site-evaluation visit. The following conservative budget is hence proposed for a site-evaluation visit tentatively during November 10-20, 2022, subsequent to which the most appropriate and gibbon friendly canopy bridge design(s) could be finalised and later executed in the field on an experimental basis with detailed follow up studies.

Travel to field site and back (Dehradun-Jorhat-Dehradun) via air-rail - INR 75,000/-
Local travel & Accommodation (10 days/nights) - INR 1,00,000/-
Meetings & Discussions with stakeholders and primate experts to deliberate and finalise canopy bridge design – INR 10,000/-
Contingency & Miscellaneous costs - INR 15,000/-
Professional faculty charges @ INR 5,000/day for 10 days - INR 50,000/-

ई-मेल/Email: wii@wii.gov.in वेब/ Website www.wii.gov.in Twitter: @wiienvis1

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Banti Baishya
KAMRUP (M) Ghy
Regd. No. KAM-22
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APPENDIX 2 – Dean, WII response letter to DFO (Territorial), Jorhat, dated 04.10.2022

Hence, a total of INR Two lakh fifty thousand only (Rs. 2,50,000/-) is kindly sought from the Department of Environment and Forests, Government of Assam to facilitate the field visit along with necessary logistical and accommodation support, and all other assistance as required. During the field visit, it is also requested that WII be kindly provided with all the required data from the concerned Division such as geographical coordinates of animal movements primate crossing spots, divisional boundaries (including beat and range), LS/ boundaries, PFs and RFs in the surrounding areas, incidents of accidental animal fatalities (road/rail) etc. Soft copies of Divisional Working Plans and Sanctuary Management Plan, PS/ Notification etc. pertaining to the Gibbon Sanctuary and adjoining forested areas will also be very useful.

Yours sincerely,

(Dr. Yadvendradev V. Jhala)
Dean, FWS

Copy to:

1. Principal Chief Conservator of Forests (Wildlife) & Chief Wild Life Warden, Govt. of Assam, Panjabari Road, Batahguli, Guwahati 781037. Email: pccf.wl.assam@gmail.com
2. Dr. G. V. Gopi, Scientist 'F' & Head, Department of Endangered Species Management & Nodal Officer, EIA Cell, WII. Email: gopigv@wii.gov.in, eia@wii.gov.in

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APPENDIX 2- DEAN, WII response letter to DFO (Territorial), Jorhat, dated 04.10.2022

WII-EIA/Canopy Bridge/HGS_147

04th October 2022

To,

Divisional Forest Officer (Jorhat Territorial Division)
Department of Environment & Forest, Government of Assam
Atilagaon, Jorhat 785001, Assam
Email: dfo.t.jorhat@gmail.com

Sub: Request for designing canopy bridge over railway line inside Hollongapar Gibbon Sanctuary reg.

Ref: Your letter no. FJT/B/ Canopy Bridge/34/3527 dated 08 August 2022

Sir/Madam,

You may already be aware that the long term solution towards meaningful connecting populations and habitats of highly aboral species, such as gibbons, monkeys, lemurs,lorises, civets, squirrels, among other mammals fragmented by linear intrusions such as roads, railways, canals,etc. is to reforest areas along the set linear gap with fast growing native trees preferred by the target species/taxa. However, as a short term in expensive conservation, measure, constructing well designed and suitably sited artificial or semi artificial canopy bridge across linear intrusions at frequent intervals may reduce the barrier effect and help in connecting isolated groups/populations, besides mitigating the risk of accidental collision and vulnerability to predators during ground movements.

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All gibbon species are globally threatened, particularly shy, and are exclusively arboreal (usually in the middle canopy) , thereby making both the design and construction of artificial canopy bridges,a challenging exercise. Moreover, the effectiveness of artificial canopy bridges as a conservation tool for wild gibbons has not been widely experimented, and the results are rarely published. As simple bamboo canopy bridge in the Borajan reserve of

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A few pre-requisites towards designing the best – suited canopy bridge for gibbons in Hollongapar Gibbon Sanctuary fragmented by the Mariani– Dibrugarh railway line is the availability and careful perusal of data on animal crossing/sightings to site the intervention at most suitable locations, local consultative meetings with all Stakeholders (including Indian Railways) and gibbon experts/conservationists along with a joint site– evaluation visit. The following conservative budget is hence proposed for a site – evaluation visit tentatively during November 10–20, 2022, subsequent to which the most appropriate and friendly cannopy bridge design(s) could be finalised and later executed in the field on an experimental basis with detailed follow-up studies.

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Local travel & accommodation (10 days/nights) – INR 1,00,000/-
Meetings & discussions with stakeholders and primate experts to deliberate and finalise canopy bridge design – INR 10,000/-
Contingency & Miscellaneous costs- INR 15,000/-
Professional faculty charges @ INR 5000/day for 10 days – INR 50,000/-

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APPENDIX 2- DEAN, WII response letter to DFO (Territorial), Jorhat, dated 04.10.2022

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Yours sincerely,
Sd/- Illegible
(Dr. Yadvendradev V. Jhala)
Dean, FWS

Copy to:

1. Principal Chief Conservator of Forests(Wildlife) & Chief Wild Life Warden, Govt. of Assam, Panjabari Road, Batahguli, Guwahati 781037. Email: peef.wl.assam@gmail.com
2. Dr. G.V. Gopi, Scientist 'E' & Head, Department of Endangered Species Management & Nodal Officer, EIA Cell, WII, Email: gopigv@wii.gov.in, eia@wii.gov.in

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Contact details:

Nodal Officer, EIA Cell
Wildlife Institute of India
Dehradun - 248001
Uttarakhand, India
Email: eia@wii.gov.in

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The Assam Tribune

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GUWAHATI, TUESDAY, MAY 28, 2024

confident of Cong's cts in LS polls

p7 Cyclone Remal: Air service disrupted in Manipur

p8 Some schools in Morigaon now promoting Vedic maths

Railway electrification may spell disaster for arboreal primates

SIVASISH THAKUR

GUWAHATI, May 27: A railway track that cuts through the heart of Assam's one of the most biologically-diverse forests has always posed a hazard to its wildlife, especially arboreal ones like hoolock gibbon. The recent electrification of the railway track without putting in place mitigation measures has multiplied the danger.

Hoolock gibbon, which is India's only ape species, is accorded the highest legislative protection (placed in Schedule I) under the Wild Life (Protection) Act, 1972.

While consultations are on how best to ease the situation for the wildlife in Hollongapar Gibbon Wildlife Sanctuary at Mariani in Jorhat district, experts believe that rerouting the 1.65-km-long broad-gauge railway line that has fragmented the sanctuary into two disproportionate parts is the best option for its wildlife to thrive.

There have also been suggestions and recommendations from conservation bodies including the Wildlife Institute of India (WII) for erecting artificial canopy bridges at strategic locations for arboreal creatures to cross over from one part of the forest to the other. Even then, most conservationists feel that shifting the small railway track outside the sanctuary will end the problem once and for all.

"This is a rather short-distance track of less than 2 km. It can be easily rerouted outside the sanctuary in the greater interest of wildlife. Since this is a busy railway line, at risk are not just the hoolock gibbons but all other animals which need to move from one part of the forest to the other. The best option is to have the railway line outside the sanctuary," Primatologist Dr Dilip Chetry who is a vice-chair of IUCN/SSC Primate Specialist Group of South Asia, told *The Assam Tribune*.

One may recall that the earlier exercise of artificial canopy bridge (ACB) at the sanctuary was a failure because the structure remains unused by arboreal mammals due to deficiencies in design which did not conform to the gibbons' specialized form of movement in the canopy – brachiation – swinging by arms/forelimbs.

The dissection of the sanctuary by the train track has rendered it a 'forest island' bereft of connectivity with surrounding forest patches.

» SEE PAGE 6

A hoolock gibbon crosses the rail track dangerously at Hollongapar.

Experts believe rerouting the rail track that has bifurcated Hollongapar Gibbon Wildlife Sanctuary is best option for its wildlife to thrive

ANNEXURE - E

94.

Railway electrification ...

(Contd from page 1)

"Animals like gibbons which are exclusively arboreal inhabiting the forest upper canopy have been the worst-hit, as they are particularly sensitive to canopy gaps. Disturbingly, the genetic variability of the gibbon population has thus been adversely affected, worsening their already threatened survival in the sanctuary," Dr Chetry said.

Arboreal animals rarely hit the ground as they tend to avoid open spaces. If ever they come down to the ground, they become particularly vulnerable to threats such as predation and collision with vehicles.

Gibbon families on either side of the railway line – especially the 4-5 gibbon families in the much smaller Compartment-I – remain effectively isolated from one another.

The Wildlife Institute of India, which recently suggested setting up seven artificial canopy bridges to ease the situation, also warned that any doubling of the railway line (a distinct possibility) would completely negate the prospects of artificial canopy bridge installation.

"... As is clear, the present unelectrified single-track 1.65-km-route railway line passing through the sanctuary has caused distress and posed significant conservation issues to arboreal animals. Hence, a future doubling of the line (if planned) will increase the canopy gap to a large extent and render any conservation interventions (such as ACB installations) futile," WII said in its report, which was made before the track electrification.

The sanctuary spread across an area of just 20.98 sq km shelters as many as seven species of primates, including the western hoolock gibbon – the highest in Assam. Their population at the sanctuary is around 125 individuals in 26 groups.

On the issue of canopy bridges, the WII emphasized that the design, successful installation and post-installation monitoring of canopy bridges required the involvement of several individuals with professional expertise in fields such as forestry, ecology/primatology, engineering and mountaineering/climbing.

"Post-installation monitoring of the canopy bridge structures – both behavioural observations of animals around canopy gaps and installed structures as well as through arboreal camera traps to assess bridge use – is one of the most important aspects of this project," it noted.

ANNEXURE - F

The Assam Tribune

86 years of service to the nation

ASSAM

Rail track electrification through Hollongapar Gibbon sanctuary sparks ecocide concerns

The sanctuary spread across an area of just 20.98 square km at Mariani in Jorhat district and shelters as many as eight species of primates—the highest in Assam—including the western hoolock gibbon. Hoolock gibbon, India's only ape, has a population of around 125 individuals in 26 groups in the sanctuary.

By **The Assam Tribune** - 16 Nov 2024 11:39 AM

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US Embassy team visits BT explores potential partners in key...

Renault showroom in Goalp sealed despite compliance statutory...

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Guwahati, Nov 16: A trending image on social media of a capped langur walking on the exposed (not yet electrified) power lines of the railway track inside the Hollongapar Gibbon Wildlife Sanctuary has triggered dissenting voices from conservationists and nature lovers alike, calling for a halt to the track electrification project. "This is an open invitation to an ecocide," has been the common refrain of the conservation circles.

Also Read – US Embassy team visits BTR, explores potential partnerships in key sectors

While the project has already been cleared by the National Board for Wildlife (NBWL) pending some mitigation measures to safeguard primates and other wildlife that regularly cross the track, conservationists and local stakeholders are sceptical about the 'safe guards' and assert that re-routing the short track outside the sanctuary offers the best solution to the problem. Even the Wildlife Institute of India (WII), while terming the un-electrified 1.65-km single track line as posing a grave danger to arboreal species like monkeys, had warned that any doubling of the railway line (a distinct possibility) would completely negate the prospects of artificial canopy bridge installation as a mitigation measure. "As is clear, the present un-electrified single-track 1.65-km-route railway line passing through the sanctuary has caused distress and posed significant conservation issues to arboreal animals. Hence, a future doubling of the line (if planned) will increase the canopy gap to a large extent and render any conservation interventions (such as ACB installations) futile," the WII had mentioned in its report, which was made before the track electrification.

Also Read – Renault showroom in Goalpara sealed despite compliance with statutory norms

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The sanctuary spread across an area of just 20.98 square km at Mariani in Jorhat district and shelters as many as eight species of primates—the highest in Assam—including the western hoolock gibbon. Hoolock

gibbon, India's only ape, has a population of around 125 individuals in 26 groups in the sanctuary.

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Meanwhile, a section of environmentally conscious local residents has urged the NBWL to reconsider its decision to allow track electrification, reasoning that the single-track railway line, which has already claimed a sizeable number of diverse wildlife, including elephants, would trigger an ecocide if it is electrified.

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"It is an open invitation to ecocide. As per the estimates of the Forest Department, annually 3-4 elephants have been crushed by speeding trains passing through the above-mentioned stretch. The existence of the railway line has affected the ecosystem of the entire forest area. The electrification with 25,000 volts will disrupt the existence of the already declining Hoolock Gibbon population," local stakeholders

Numal Chawra, Pinak Borthakur, Pinaki Sengupta, and Prarthana Bordoloi mentioned in their memorandum to the NWLB.

Moreover, the much-hyped canopy bridges, too, are no guarantee to provide safety to the gibbons and other arboreal species. This is corroborated by the fact that, as per the WII report, the lone artificial canopy bridge had never been utilised by any animal trying to cross the railway track.

"In 2015, the North East Frontier Railway authorities, along with the Assam State Forest Department, had built an artificial canopy bridge made of iron at one location across the railway track. However, despite their best intentions, the structure remains unused by arboreal mammals due to several of its design aspects not conforming to gibbons' specialised form of movement in the canopy (brachiation-swinging by arms/forelimbs)," the WII report noted.

The petitioners reasoned that as the mitigation strategies to contain the impact of the un-electrified railway track have not worked in protecting the wildlife, the electrification of the track is a sure recipe for disaster. "Since the railway stretch within HGS is relatively small, the Indian Railways must think long-term and demonstrate its conservation vision by exploring all possibilities to reroute the existing line outside HGS (and its ESZ) limits into the adjoining revenue and non-forest land. This will ensure that a balance between ecology and economy is struck and allow for the necessary doubling and electrification of such a rerouted line (with structural and other mitigation measures, if needed)," the WII report noted.

By-

Sivasish Thakur

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