

# Progress Report

Project: Elephant Estimation

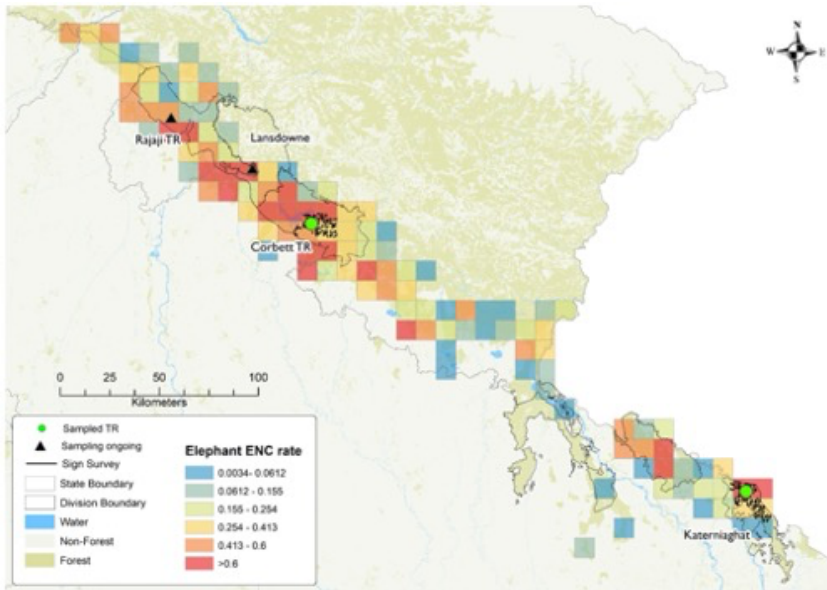
Duration of progress report: May, 2023 – October, 2023

Funds released: 3.0 Crore

Funds to be released: 3.0 Crore

In India, where elephants are an integral part of the ecosystem and a cultural symbol, several methods have been used to estimate their population. Nationwide elephant population estimation has been conducted every five years by the forest department of elephant range states. All elephant range states, except Southern Indian states, conduct population estimation through direct count method. Southern states use dung based population estimation, which was introduced in 2002. The total/direct count method has no scientific basis for large landscapes and elephant population, hence it was modified to sample block counts with restricted areas, to maximise the probability of detection of elephants with small team of trained personnel (Project Elephant, August 2017). In 2017, total of 27,312 elephants were counted, of which 11,960 were in Western Ghats, 3,120 in Central India, 2,085 in Shivalik Terai landscape and 10,139 in Northeast India. It was recognised that total count and dung decay based counts are providing unreliable results and thus, new methodology should be adopted to ensure robust population estimation, like line transect, camera trapping, DNA based mark recapture and occupancy models. Though mentioned in Rangarajan et. al (2010), a combination of genetic identity along with modern approach to capture-mark-recapture has yet to be successfully demonstrated for elephants. In 2021, after discussions it was realised that robust scientific approach, i.e., dung based mark recapture and camera trap based distance sampling estimation will be feasible and robust methods to enumerate elephant population. Further, by combining the efforts during All India Tiger Estimation, as the sampled area overlap for elephant and tiger presence is maximal, it would result in a prudent use of resources while hastening the process of estimation for tiger, leopard and elephant. Therefore, on 10th March, 2021 Project Elephant (PE) invited to submit a project proposal for a synchronised tiger and elephant population estimation. A project proposal from WII was submitted to PE in April, 2021, of Rs. 3.00 crore, which was sanctioned in July, 2022 and funds released in August, 2022 vide File no: NA13/14/2021-NA. The elephant enumeration is divided into several phases, which involve ground surveys including dung collection, and camera trap sampling. Subsequently, remotely sensed data collection of habitat covariates that influence animal distribution (e.g., human disturbance, forest loss, protection, etc.) is collated. A sample area of 200 sq. km block is chosen for collection of dung samples, to carry out genetic mark recapture, and camera trapping for distance sampling

## **Progress:**



## Shivaliks Hills & Gangetic Plains

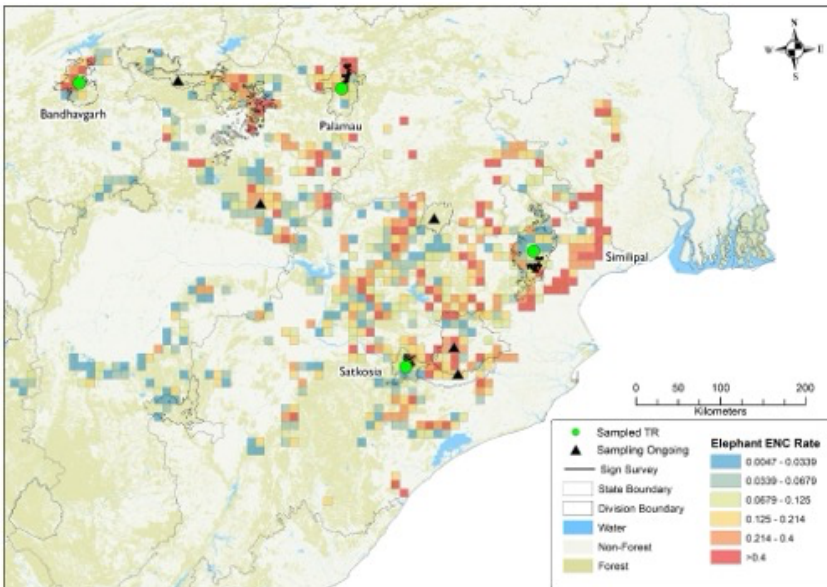
### FIELD DATA

**No. of Sites surveyed- 2**  
(Corbett TR, Dudhwa TR)  
**No. of Polygon Trails walked- 141**  
**No. of Dung samples collected- 1943**

### CAMERA DATA PROCESSING

1. Species segregation- Corbett
2. CTDS completed- Dudhwa

**FIELD SAMPLING ONGOING- 2**  
(Rajaji TR, Lansdowne FD) work started 23.10.2023



## Central India & Eastern Ghats

### FIELD DATA

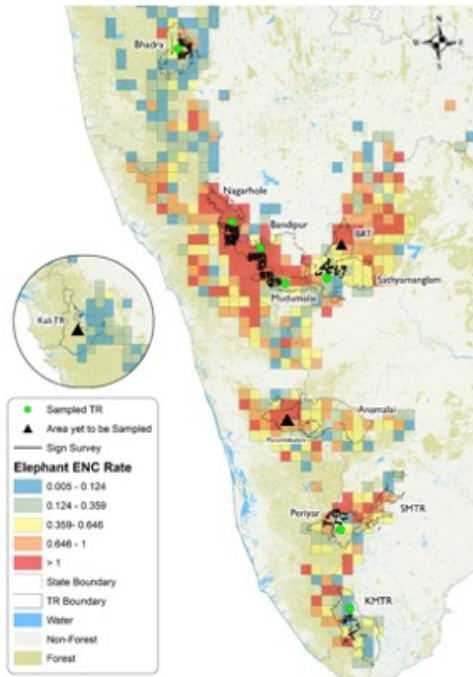
**No. of Sites surveyed- 4** (Bandhavgarh, Palamau, Satkosia, & Simlipal TR)  
**No. of Polygon Trails walked- 194**  
**No. of Dung samples collected- 1435**

### CAMERA DATA PROCESSING

1. Data restructuring- 4 (Bandhavgarh, Palamau, Satkosia, & Simlipal TR)

**FIELD SAMPLING ONGOING-** Dalma WLS, Saranda FD, Singhbhum Divisions, Guru Ghasidas NP, Tamor Pingla WLS, Surajpur Division, Athagarh FD, Chandaka WLS

## Western Ghats



### FIELD DATA

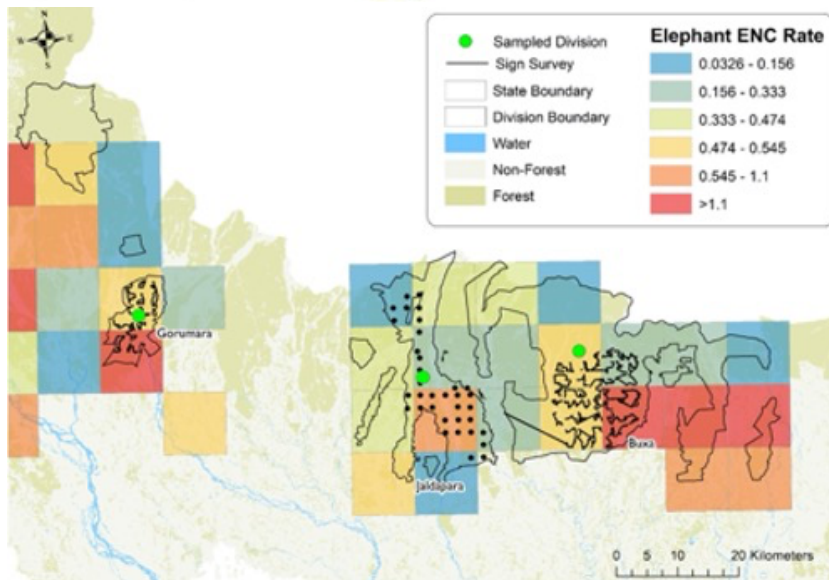
No. of Sites surveyed- 7 (Bandipur TR, Nagarhole TR, Mudumalai TR, Sathyamangalam TR, Bhadra TR, Kalakad-Mundanthurai TR and Periyar TR)  
 No. of Polygon Trails walked- 345  
 No. of Dung samples collected- 4197

### CAMERA DATA PROCESSING

1. Data restructuring- 4 completed, 2 ongoing
2. Geotagging- 3 completed, 1 ongoing
3. Species segregation- 2 completed, 1 ongoing

### FIELD SAMPLING ONGOING

Kali & BRT Hills TR Survey will start from 1<sup>st</sup> November  
Parambikulam TR- Permission awaited from Kerala FD



## North Bengal

### FIELD DATA

No. of Sites surveyed- 3  
 No. of Polygon Trails walked- 68  
 No. of Dung samples collected- 480

### CAMERA DATA PROCESSING

1. Data restructuring- 2 (Buxa TR and Jaldapara NP)

## All India Elephant Estimation Project Permission Letters Details

S.No.	State Name	Date of Letter	Date of reminder letter	Date of Permission received
1	Uttar Pradesh (Dudhwa)	18.09.2023	NONE	18.10.2023
2	Uttarakhand (Rajaji, Lansdowne)	18.09.2023	09.10.2023	10.10.2023
3	Karnataka (BRT, Kali)	18.09.2023	06.10.2023	16.10.2023
4	Kerala (Parambikulam)	18.09.2023	06.10.2023	Not received as of 27 <sup>th</sup> October 23
5	West Bengal	18.09.2023	04.10.2023	10.10.2023
6	Odisha	06.10.2023		(work is ongoing)
7	Chhattisgarh	06.10.2023		10.10.2023
8	Jharkhand	06.10.2023		(work is on-going)- Letter sent to DFO, not to WII

### Field Summary

Landscape	Site Sampling completed	Sampling ongoing currently
Shivaliks	Corbett, Katerniaghat	Rajaji, Lansdowne
Central	Bandhavgarh, Simlipal, Satkosia, Palamau	Dalma WLS, Saranda FD, Singhbhum Divisions, Guru Ghasidas NP, Tamor Pingla WLS, Surajpur Division, Athagarh FD, Chandaka WLS
Western Ghats	Bandipur, Nagarhole, Sathyamangalam, Bhadra, KMTR, Periyar	Kali, BRT Hills
North Bengal	Buxa, Jaldapara, Gorumara	-

### Genetic Summary

- Total of 8055 samples received, have been processed, DNA extracted and libraries prepared at WII, and have been sent for sequencing.
- Sequencing Data for 4923 samples has been received, checking of data \_ scoring, null alleles, allelic drop outs and size polymorphism, allelic range is on-going
- There was need to change in approach due to low quality of sample and some samples may need to be rerun at higher coverage
- Individual id, and recapture will be assigned to data that has been received so far
- Data of remaining samples is in process
- Data for samples that are being collected will be processed as soon as it has been received