I/51138/2023

भारतीय वन्यजीव संस्थान
Wildlife Institute of India
(An Autonomous Institute under Ministry of Environment, Forest & Climate Change, Govt. of India)
पत्रपेटी सं0/Post Box No. 18, चन्द्रबनी, देहरादून/Chandrabani, Dehradun - 248001, उत्तराखण्ड, भारत/ Uttarakhand, INDIA

Azadi Ka Amrit Mahotsav

Date: 17.08.2023

To
Additional Director General (Project Tiger & Elephant)
National Tiger Conservation Authority
Ministry of Environment, Forests and Climate Change
New Delhi
Email: spyadavifs@gmail.com; ms-ntca@nic.in

Sub: Phase II Proposal for Synchronised Elephant estimation - Reg

Ref: F. No. NA-13/14/2021-NA dated 12th June, 2023

Sir,

With reference to the subject cited above, the proposal for Phase II, with additional budget requirement of Rs. 3.69 crores is submitted herewith, for your kind consideration.

Thanking you

Yours Sincerely,

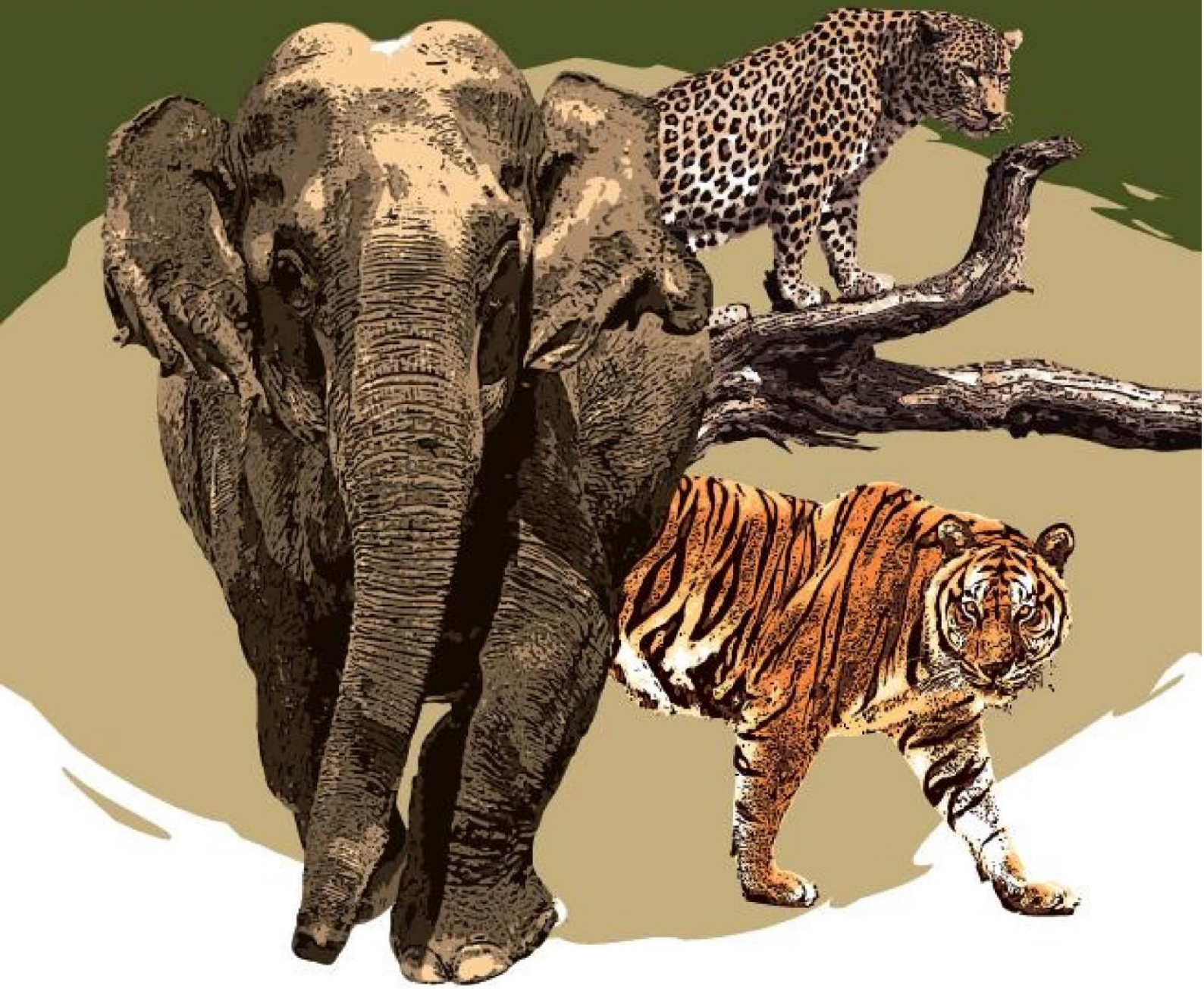
Signed by
Virendra Rambahal Tiwari
Date: 18-08-2023 08:44:19

[Virendra Tiwari]
Director

Copy for information to:

1. Director General of Forests & Special Secretary, Government of India
2. Additional Director General (WL)
3. Inspector General (PE)

ALL INDIA ELEPHANT TIGER AND LEOPARD ESTIMATION



Proposal Phase - II

भारतीय वन्यजीव संस्थान
Wildlife Institute of India

1 Introduction:

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: NA-13/14/2021-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 co-variates 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.

2 Rationale for Phase II Proposal:

Phase II, with additional budget is required because of several caveats. This estimation budget of Phase I, which was submitted to NTCA, was based on the density reported in the last Elephant estimation report, and estimated dung density, and modelled in a small area of Karnataka, wherein density was known, to calculate the number of samples that would be required to be processed. The estimated samples, based on density reported, across several landscapes, was 3000, however, samples received are already over 8000, with more high density sites left to be sampled, and an expected 10,000 samples. This might be due to correlation of elephant density and dung encounter rate. With the increase in samples received, and timeline being short, genetic sampling will be carried out on high throughput sequencing, using next generation platform. While using next generation sequencing has reduced per sample cost of the analysis, the number of samples has increased and this will require additional money. Secondly, as the camera trap data analysis requires additional manpower as the existing manpower is exhausted with the on-going leopard Estimation process. The additional manpower is required to sort photos for camera trap based distance sampling analysis, and more people are required to sample sites post-monsoon. Therefore, additional budget is required to accomplish the task on time.

Based on the suggestions of DGF&SS, wherein it was decided to have a consultative meeting for collaborations with other scientific institutions to have a more inclusive, robust and fast process to estimate the elephant population in the country. IG(PE&PT) decided to have an experimental collaboration with NCBS, to explore the standardisation of Single Nucleotide Polymorphism variation (SNPs), which is cheaper, and standardisation will be helpful in future monitoring of elephant populations in the country. This method has not yet been standardised, as opposed to the microsatellite high throughput next generation sequencing. For this, within each landscape, SNP analysis will be carried out in collaboration with NCBS to validate the method.

3 Budget:

Sno	Budget Head	Details	Phase2
1	Genetic analysis	Lab costs for extraction as well as genomic analysis of 10,000 samples. Including collaborative approach for generating SNP analysis with NCBS.	₹ 2,56,00,000
2	Man power	Research biologists, and Research assistants, interns for processing of data and samples at WII	₹ 41,00,000
3	Equipment	PCR and other equipment needed for large scale extraction and genomic analysis - inhouse	₹ 32,00,000
4	Field sampling	Field logistics for sampling, chemicals for storage and transportation & field genetic kits	₹ 30,00,000
6	contingency	For miscellaneous expense	₹ 10,00,000
7	Grand Total		₹ 3,69,00,000