Project Update: January 2020

Following are the work initiated with which are presented with brief progress:

1. **Preliminary field visit**

A preliminary field visit was carried out in five different representative areas along the landscape study area. This activity was carried out to scan pocket area of elephant movements, conflict hotspots area, sharing of project objectives and develop general comprehension of people's attitude towards elephant conservation. We identified Jhapa, Koshi, Chitwan-Parsa and Bardiya complex as four major conflict hotspots and Sindhuli complex as an emerging conflict hotspot. Based on the information collected from field visit and stakeholder consultation meeting we have started an occupancy study, community-based conservation awareness programmes and human-elephant conflict field survey and assessment.

We carried out five stakeholder consultation meetings with park staff, DFO staff, community people, buffer zone management and with local conservation stakeholders.

Figure 1: Glimpse of community consultation meeting

2. **Landscape level habitat analysis and occupancy study**

2.1 Elephant Sign survey for occupancy study

We have started a second season elephant sign survey proceeding from west (Kanchanpur district) to east of Nepal. To date we have covered occupancy study in 10 districts and the rest of the work is ongoing. We used spatially explicit patch occupancy models (Hines et al., 2010). First of all, we stratified the potential elephant habitat based on land-cover types and defined as a sampling frame. We, then determined the grid size as per home range size (Williams, 2016) and 15 x 15 km grids were superimposed on the map.

We had used forest roads, trails, rivers as spatial replicates and 12 trained naturalists were mobilised under my direct direction to discover the presence absence signs of elephant data were recorded for the first season in the summer of 2018 and was completed within 58 days. Nine replicates of 5 km distance were sampled per grid. Elephant presence absence signs were collected along with covariates.

Second season occupancy work is targeted for the winter season to understand elephant's distribution through the landscape. This is the continuation of first season occupancy work and is expected to be completed by last of February 2020.

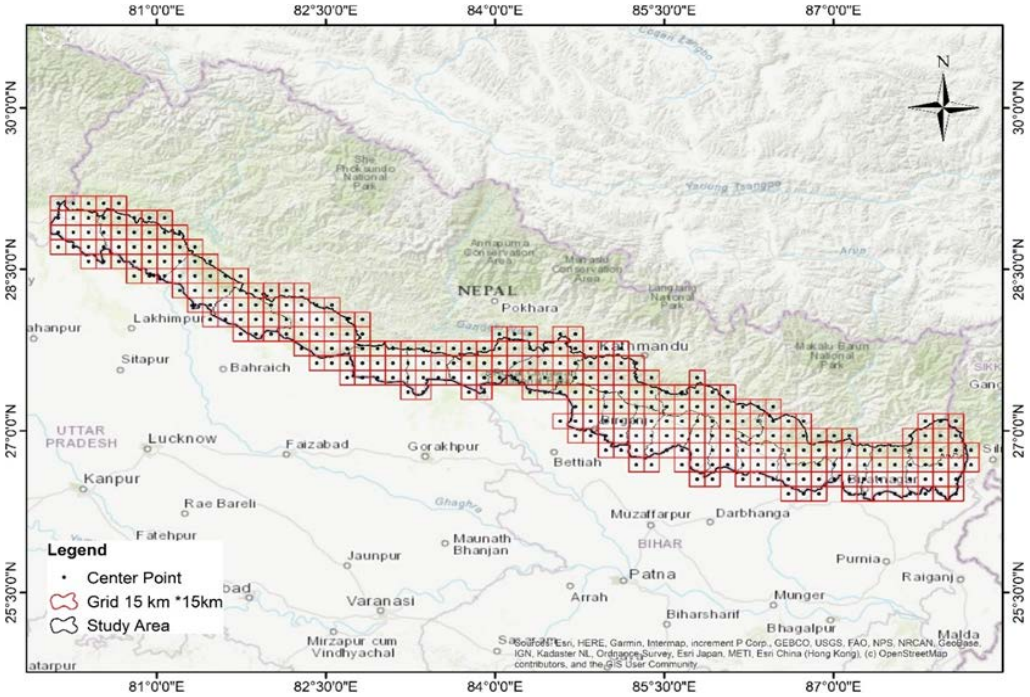

Figure 1: Map of occupancy grids of 15*15 sq. km. used for elephant presence survey.

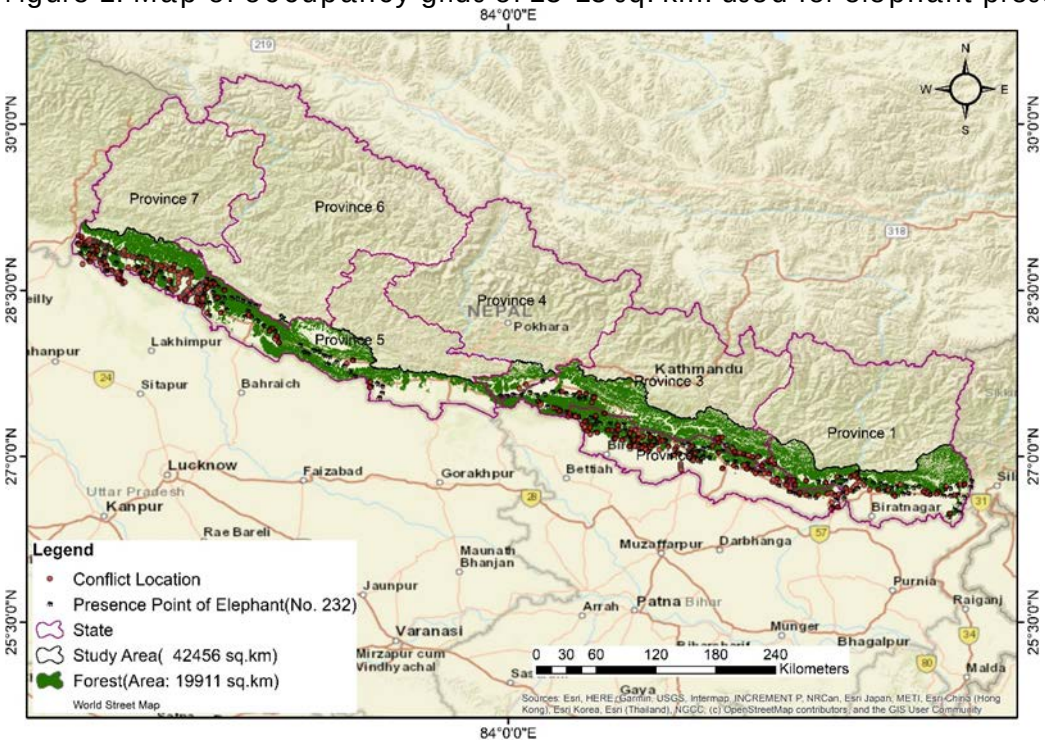

Figure 2: Map showing Elephant presence signs recorded along with conflict signs

2.2 Landscape level habitat fragmentation and corridor connectivity analysis of Asian Elephant:

For habitat analysis, we selected all the 24 districts of Terai and Siwalik which have elephant presence, as a study area. We used remote sensing and GIS technology along with cloud computing Google Earth Engine (GEE) platform for assessment of Land use Land Cover (LULC) change analysis, habitat suitability, habitat fragmentation, corridor and connectivity analysis at landscape level. This study also covers habitat analysis instead of assessing population structure, age, and sex estimation.

We used land use land cover (LULC) of four different times series i.e. 1990, 2000, 2010 and 2019. The land cover data of 1990, 2000 and 2010 data were downloaded from ICIMOD portal (http://rds.icimod.org/). While, GEE was used to prepare landcover map of 2019 using ground training sample. Ground truthing was done for accuracy assessment. Land Change Modeler (LCM) in IDRISI Taiga software from Clark Labs (Eastman, 2009) was used for LULC modeling and analyse three basic elements: change analysis, transition potential modeling, and change prediction. Similarly, Shuttle Radar Topography Mission (SRTM) 30m Digital Elevation Model (DEM) (http://srtm.csi.cgiar.org/), Worldclim current and future global climatic data (https://www.worldclim.org/) were downloaded for habitat suitability mapping. We had used python-based SDM toolbox of ArcGIS, R-studio and Frag-stat for computing species distribution models (SDMs), analysis of least-cost paths and corridors and also generate habitat fragmentation status. I have inserted here a habitat suitability map and are progressing to develop habitat fragmentation and habitat connectivity.

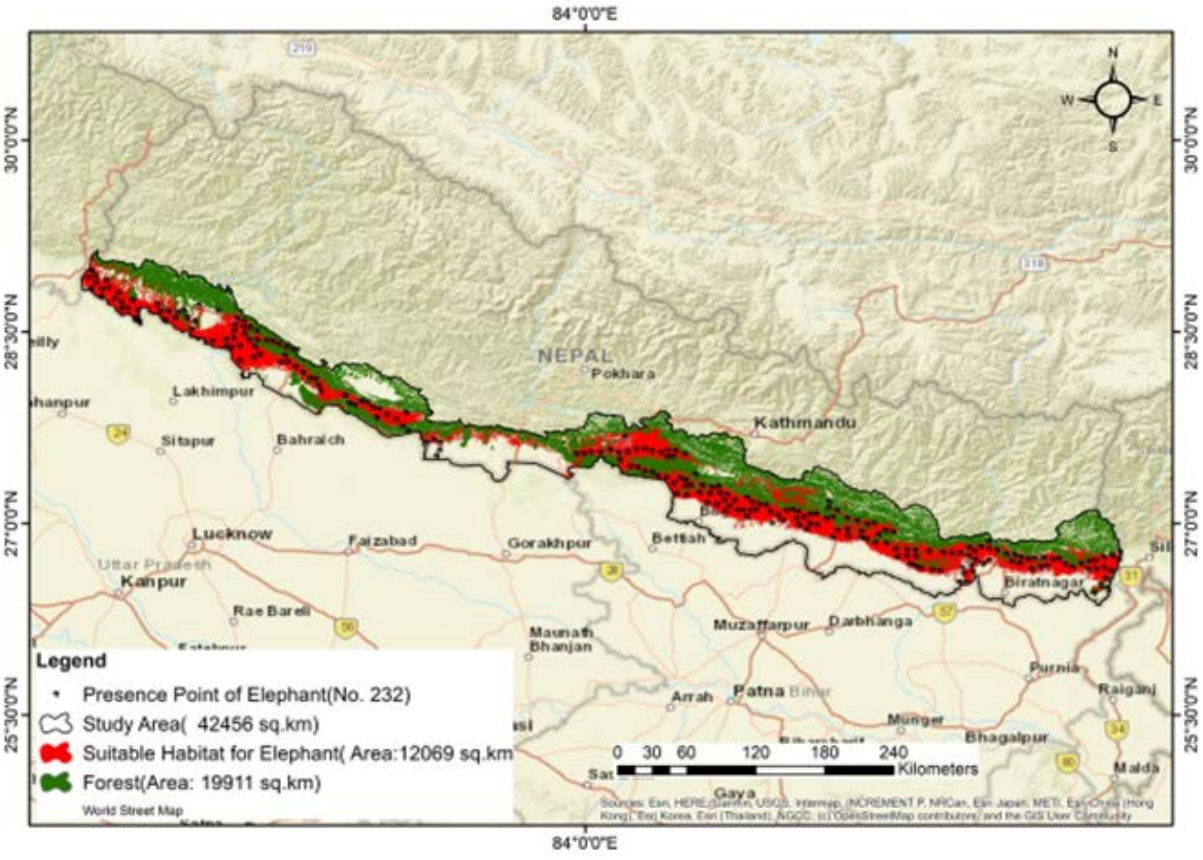

Figure 4: Habitat Suitability Map

3. Telemetry for home range estimation

Previously, we had collared six elephants to understand home range and distribution of elephants. After initiating this project, we had collared one more elephant with a GPS collar (satellite collar, Africa Wildlife Tracking, Inc, Pretoria, South Africa) from Chitwan National Park. I have attached here some photographs of recent collared elephant from Chitwan National Park.

Figure 5: Collared Elephant in Chitwan National Park

4. Community based conservation awareness activities

We had also initiated community-based conservation awareness program focusing on two target groups viz. school students and community-based RRTs and CBAPOs. We initiated conservation classes with local eco-clubs and carried out 24 conservation classes to secondary levels (8, 9 and 10 class) in schools of Bara and Parsa district. Furthermore, we had sensitized 60 RRTs members from six Rapid Response Teams (RRT) and five CBAPOs. Rest of the work is under progress and will be completed soon.

Figure 6: Glimpse of school teaching program on elephant conservation


Figure 7: Conservation awareness programs to RRTs and CBAPOs

5. Save the Elephants Radio program

We have done a three-party agreement with local Radio Samarpan, PI and Sunakhari CBAPO for conducting 12 episodes of Save the Elephant radio programme. PI and sunakhari CBAPO will help to prepare monthly episode for broadcasting Save the Elephant radio programme. The fund supported by Rufford Small Grant will be mobilised through CBAPO for conducting radio programme.

6. Publication of postures and calendars

After the intense study of the literatures related to human elephant conflict and coexistence, we have prepared a draft of calendar, brochures and postures which are already in process for printing. Calendar and posture will be distributed in communities, user groups, and other stakeholders for information dissemination and raising conservation awareness.