TANZANIA NATIONAL PARKS

A Report on training workshop on camera trapping for monitoring terrestrial mammals and birds

Held at Udzungwa Mountains National Park from 11th to 14th January 2017

1.0 Introduction

The Udzungwa Ecological Monitoring Centre (UEMC) is a facility of the Udzungwa Mountains National Park (UMNP), Tanzania, established in 2006 as a partnership between Tanzania National Parks and Trento Science Museum of Italy. Its aim is to promote and facilitate biological research and monitoring in order to increase our understanding and conservation of the Udzungwa Mountains. The centre is better placed to equip participants with field experience by conducting practical training in the adjacent areas. The workshop on camera trapping for monitoring terrestrial mammals and birds was for three days from 11th to 14th January 2017.

The workshop provided the participants with basic concepts and practical field experience. Udzungwa Ecological Monitoring Centre coordinated the training in partnership with TANAPA Ecological Monitoring Department and the GIS Unit facilitated and instructed by Dr Francesco Rovero (UEMC and MUSE – Science museum), Mr. Richard Mbilinyi (TANAPA) and Mr. Aggrey Uisso (UEMC).

1.1 Objective

To train assistant park ecologists in designing and implementing a standardized protocol for assessing and monitoring terrestrial mammals and birds with camera trapping, including GIS, data management and the basic statistical routines for analyzing data and produce reports.

1.2 Participation to the training

Assistant park ecologist attended the training from 12 National Parks. The list of participants is as shown in table 1 below:

Table 1: A list of TANAPA Assistant Park Ecologists who attended Camera trapping training at Udzungwa Mountains National Park

S/N	PARTICIPANT'S NAME	NATIONAL PARK
1	Christina Kibwe	Udzungwa Mountains
2	Agnes Mwakapila	Kilimanjaro
3	Anifa John	Gombe
4	Amani Maresi	Lake Manyara
5	Calvin Lyakurwa	Mkomazi

6	Daniel Mathayo	Ruaha
7	Germanus Hape	Mikumi
8	David Magesa	Tarangire
9	Peter Mathew	Rubondo Island
10	Clara Manase	Arusha
11	Hellen Mihayo	Saadani
12	Kelvin Mollel	Serengeti

1.3 Training workshop programme

Table 2: summarizes the training session, key areas covered and field activities conducted during the training period

11 January	Participants arrive at UEMC in the evening
12 January	Morning (9:00-12:30) Workshop opening and programme presentation. Lecture (FR): Introduction to camera trapping and main applications to wildlife research; use of camera trapping for monitoring purposes, principles of sampling design, presentation of the TEAM protocol; example of its application in the Udzungwa Mountains NP; presentation of key camera trap models and their use. Afternoon (14:30-18:00): GIS practical to design the monitoring grid in each park represented at the workshop (GIS Unit), and uploading waypoints to GPS (using TEAM Udzungwa camera trap sites as example).
13 January	Morning: field practical in the NP on setting and retrieving camera traps including forms for recording meta-data (UEMC field technicians), including navigation to points by GPS (GIS Unit). Afternoon: (1) practical on presentation of Wild.ID (software for managing camera trapping data), and brief training on its use. (2) practical on analyses of data with exercises in Excel with example data-set.

14 January	Morning: practical on analyses of data with exercises in Excel with example data-set (continued). Afternoon: example of integrated GIS and ecological analysis: how to present results in reports in both numeric and GIS form; results interpretation. Workshop closure: recommendations from ecologists to implement the protocol at each park; way forward; workshop evaluation.
15 January	Participants depart from UEMC

2.0 Lesson Learnt

- Main applications of camera trapping for wildlife research
- Procedures of sampling design
- Application of GIS in ecological monitoring
- Use of GIS software to design the monitoring grids where to set the camera traps
- Uploading waypoints to GPS (using TEAM Udzungwa camera trap sites as example).
- How to join spatial and non-spatial data using ArcGIS software.
- Performing analysis by showing graduated symbols events of animals captured by the camera trap using ArcGIS software
- Introduction to wild ID software for camera trap data processing
- Data analysis using Pivot table in Microsoft excel
- Site selection and camera setting in the field

3.0 Achievements

1) Managed to design a sampling grids for some of the parks for 60 camera trap site, 3 arrays, sampled for 30 days in the dry season. Also naming system of the camera

trapping was taught, example CT-XXX-1-01 which means XXX= park name abbreviation; 1= array (1-3); 01 =camera site (01-20)

2) Installation of ArcGIS Software and Windows Mobile projects to participants laptop Computers

3) Imparting knowledge on the Application of GIS on Ecological monitoring activities

4) Trained Assistance Park Ecologist managed to set camera traps on the field under the supervision of Mr. Aggrey Uisso (UEMC).

4.0 Training Output

Participants have learnt new skills regarding the ArcGIS technology and knowledge on the use of Trimble GPS and ArcGIS software as well as Camera trapping settings.

4.1 Outputs Produced

By the end of this training all participants were proficiently capable of setting camera traps on the field . Also managed to design a sampling grids for all parks and only two parks (Tarangire and Mahale) which has two zones were not designed. At the end the team came out with the sample budget for implementing the camera trap project for each park.

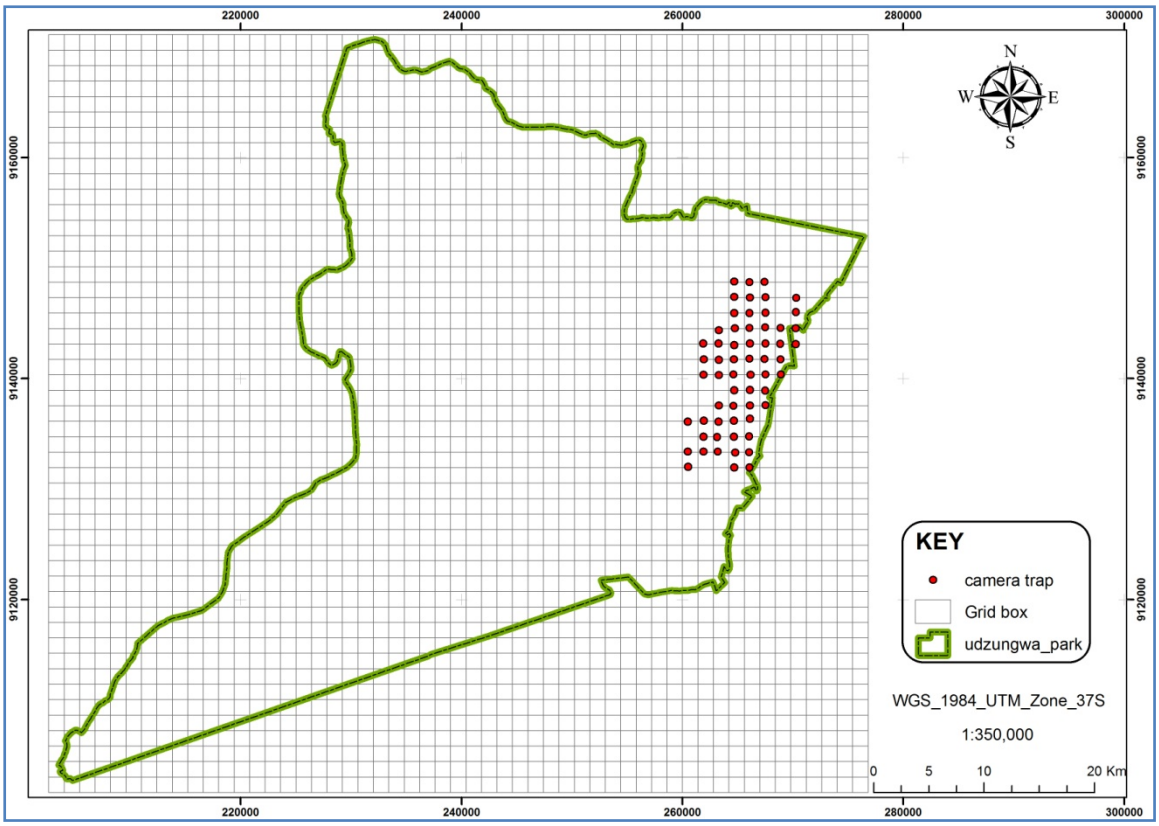

Figure 1: A sample of Map showing grids and camera traps used by participants during exercise sessions

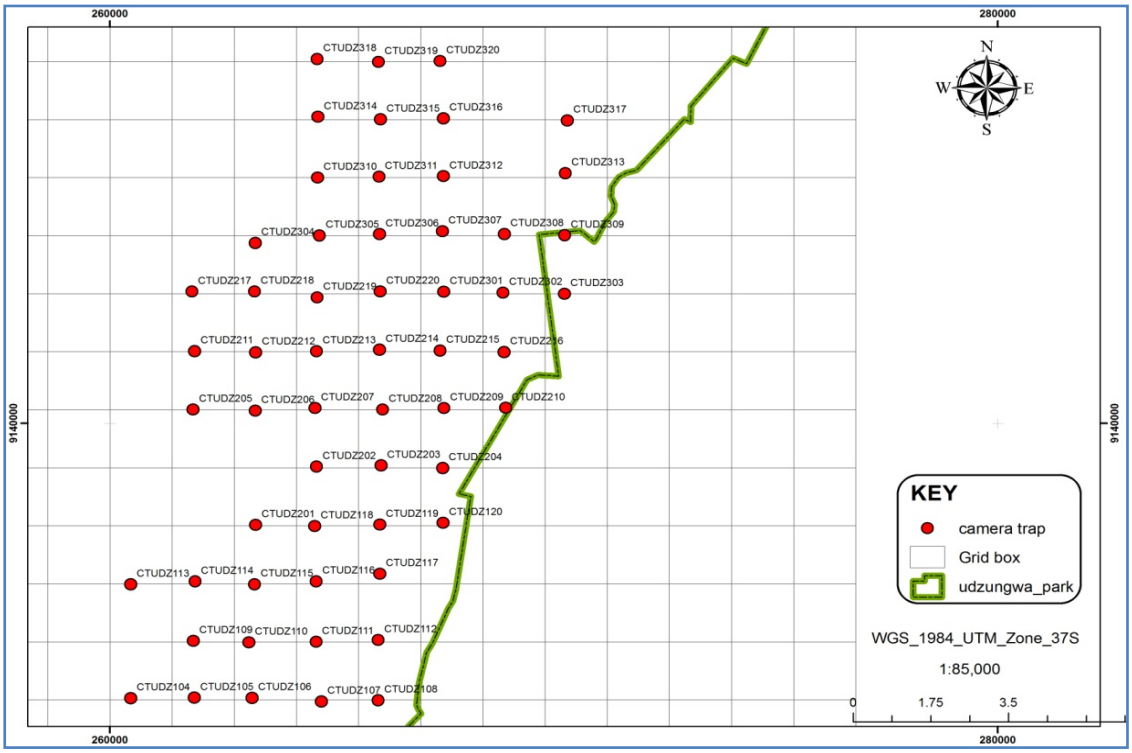

Figure 1: A sample of Map showing a random Camera traps of 3 arrays and 60 camera.

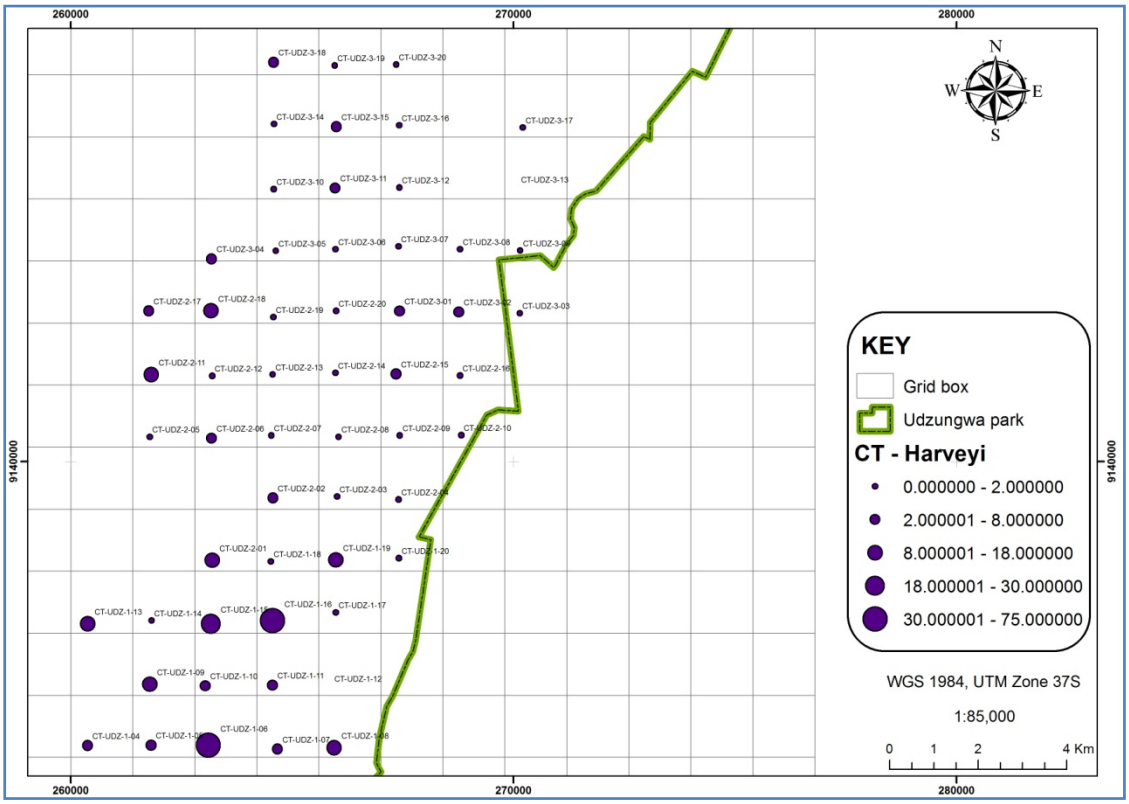

Figure 3: A sample of Map showing a distributions of Harveyi trapped by camera at Udzungwa National Park.

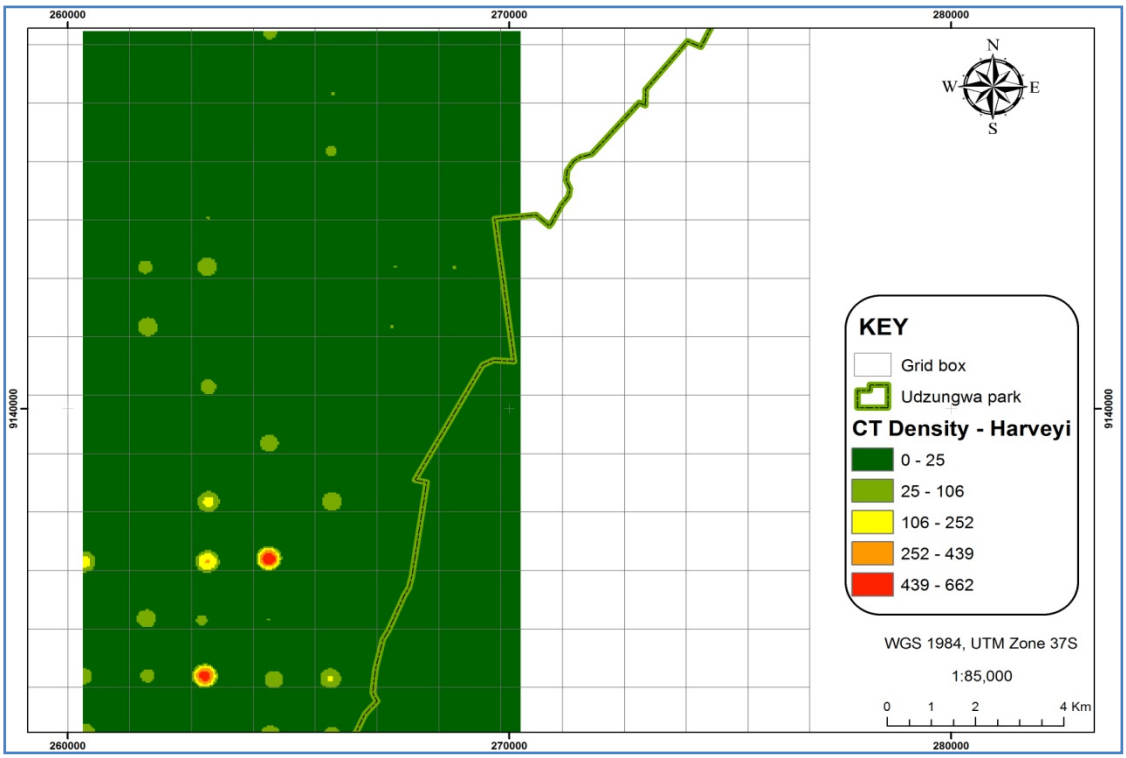

Figure 4: A sample of Map showing a kernel density of camera traps of Harveyi at Udzungwa mountains.

Figure 5: Instructor demonstrating to participants on GIS application on ecological monitoring

Table 3: summarizes the budget for establishing standardized camera trapping (each park to fine tune budget depending on logistic and placement of sampling grid).

Item	Unit cost ($)	Total cost	notes
Equipment (only first year)			
Camera traps Reconyx HC 500 (imported from US)	450	9.000	Bushnell, Cuddeback
Batteries and lock and SD card	50	1.000	rechargeable batteries
GPS Units (Garmin map64)	300	300	
		10.300	
Annual implementation costs:			
Travel cost (diesel/petrol) - 6 trips each 50 Lt	50	300	
Allowance of driver - 30$ per trip	30	180	
Allowance of rangers - min 30 dd (30$/dd)	30	900	
Porters and camp attendants - 200$ per array	200	600	
Park ecologist - min 10 dd (40$/dd)	40	400	
Assistant ecologists - min 30 dd (30$/dd)	30	900	
Field supplies (food and other materials) - per trip	100	600	
Unforeeen		500	
Implementation		**4.380**	
Total (US$)		**14.680**	
Total (TSH)		**31.562.000**	

5.0 Recommendations

- To set out budgets within the park for buying at least 60 digital cameras and setting out budget for implementation of the project within the park. Table 4 describes the sample budget for implementing camera trap project to the parks.

- Participants should be provided with to have handouts of analyses steps in Excel to summarize data that will be helpfully to revise their own. This is because the time for training was very short for the participants to understand all the two concepts of GIS and camera traps.

- TANAPA should procure more GIS software (ArcGIS) to cater the needs for ecology department

- To set out budgets within the park for buying at least one Trimble GPS with its accessories like car charger, downloading cables and chargers, so that Park ecologist should be able to collect data and use it to navigate random points designed on paper.

- Regular refresher trainings on GIS and Camera traps are encouraged in future to equip park ecologist with basic pre-requisite concepts in GIS, the use of Trimble GPS and designing camera traps as well as being able to perform research methods and analyses for ecological monitoring .

- Compiled maps and projects showing sampling grids and camera traps of three arrays and sixty camera traps should be designed for every park and submit them on 15th February, 2017 to Dr Francesco Rovero (UEMC and MUSE – Science museum) for assistance.

6.0 Conclusion

The training was well done and the intended aim for camera traps and GIS are well understood by the participants. The park management should work on recommendations to improve the functioning of this system so as to increase productivity and efficiency in the collection of data, reporting, strengthening and monitoring of park resources.

Finally, I would like to thank the **Director General (DG)** for granting permission to execute this task at Udzungwa Mountains National Park, also to the Park management for hosting and assisting us to perform our tasks smoothly. Also I would like to extend my heartfelt gratitude the **Director of Conservation, Manager for Ecological Monitoring and Chief Park Wardens** for granting permission to all participants as well as thanking **Dr Francesco Rovero** from **UEMC and MUSE** – Science museum and UEMC management for organizing and funding of this training workshop.

Kindly Submitting,

Richard Mbilinyi.
GIS Officer-TANAPA HQ

cc:

Director of Conservation - TANAPA Headquarter
Manager Ecology - TANAPA Headquarter
Chief Park Warden - Udzungwa Mountain National Park (UMNP)