



## **Refresher Training of MECA and QECA field staff in SMART and CyberTracker**



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## **Introduction**

Wildlife Conservation Society (WCS) in partnership with Uganda Wildlife Authority (UWA) conducted a refresher training in Spatial Monitoring and Reporting Tool (SMART) for senior staff from all conservation areas and field staff in Murchison Falls Conservation Area (MFCA) and Queen Elizabeth Conservation Area (QECA). The senior staff training was conducted at Green Valley Hotel in Kampala on November 2-3<sup>th</sup>, 2016 with a focus on analysis of SMART data by performing queries to generate reports that could be used by UWA's top management to evaluate the effectiveness of law enforcement strategies and use it to improve law enforcement. The 28 UWA senior staff selected from various departments namely security and law enforcement unit, monitoring and research, and law enforcement drawn from all conservation areas were trained in performing simple analysis, generating reports, including maps to identify illegal activity hotspots, ranger effort in terms of patrolled sites within the park and use the results to plan law enforcement activities. For both MFCA and QECA, a total of 60 senior rangers attended the training conducted at MFNP Student's center located on the northern bank on November 4-5<sup>th</sup> 2016 and Mweya peninsular in the northern sector of QENP on November 7-8<sup>th</sup>, 2016 respectively. This training was designed for field rangers, patrol commanders, law enforcement warden, research and monitoring department staff, prosecutors and intelligence officers operating at the park level. The park-level staff training focused on the use of SMART tool and the CyberTracker to implement patrols in the field. In addition, assess the use of SMART data to plan ranger patrols, and share lessons and experiences of using SMART technology to conduct law enforcement.

## **Objectives of the training**

The overall purpose of conducting the refresher training was to ensure that SMART is effectively used to improve law enforcement and justify continued investment in this technology. The specific objectives were:

- 1) Conduct a refresher training on data collection using CyberTracker to ensure that data is collected well, entered in the computer database for use by the park and head office staff to plan anti-poaching and combat other illegal activities in Uganda's national parks and wildlife reserves.
- 2) To demonstrate to the park management and head office staff that SMART provides has the capabilities to integrate data from other data platforms, including the online offender's database, WILD LEO and if properly analyzed and reports generated, results can be used to target ranger patrols well, cause arrests and increased prosecution of wildlife crime offenders.
- 3) Use this opportunity to receive feedback on the successes and challenges of using SMART in conducting law enforcement
- 4) Identify limitations in the data modules that needed improvement to enable the rangers to collect and transmit data to UWA senior management head office in an efficient way.



### **Senior wardens and ranger training (November 2-3<sup>rd</sup>, 2016)**

A total of 28 senior wardens, rangers, intelligence officers and monitoring and research staff drawn from 17 conservation areas attended the refresher training on SMART data analysis and reporting, integration of online offender's data in SMART as well as reports. SMART data analysis training covered the following components:

- I. Patrol Observation Query – This type of query helps to generate a report of where observations in the field were made during the ranger patrol.
- II. Patrol Incident Query – This query produces results similar to the observation query, except incidents only are recorded, e.g. observation = every sighting of something, Incident = where several things seen at same point are grouped in one incident such as Camp, fireplace, timber, loggers arrested. Both Observation and Incident queries generate point locations on a map showing where observations of activities or animals were made.
- III. Patrol Query – this type of query only gives the list of patrols where an observation was recorded.
- IV. Summary Query – are performed with the intention of calculating the numbers of sightings of different types of observations, which can be produced and presented in form of tables or graphs, e.g. Number of snares per km walked per year.
- V. Gridded Query – Gridded queries are done to calculate the number of sightings per grid cell and can be corrected for effort e.g. patrol days or km walked and compute the relative intensity of sightings where patrols have occurred.

UWA senior staff were also taught to import and export queries from other source device or computer program into SMART in the following file formats: a) comma separated value (csv) file, which can easily be opened in Ms Excel program, b) Xml File, c) shapefiles for Quantum GIS or ESRI ArcGIS, and d) Geotiff or ascii files for grid outputs. The training was structured in such a way that staff were given practical exercises to do using real field data they have been collecting, giving them an opportunity to familiarise themselves with their own data and learn to meaningfully interrogate the data with the help of in-built queries discussed above. Participants were also taken through the process of data backing up, storage and received links to free or open source software and resources e.g. tutorial for QGIS: <https://fossgeo.org/free-qgis-courses/>

### **Murchison Falls Conservation Area ranger training (4th – 5th November 2016)**

The training was opened by the Ag. Chief Conservation Area Manager (CAM)/Law Enforcement Warden Mr. Julius Obwona who highlighted the need to collect SMART data and its importance in planning of park management activities. Julius implored the rangers to take serious the activity of collecting quality data. After his speech, a presentation was given by Dr. Andrew Plumtre showing the results from previous SMART data and how it's been useful in identifying and showing the trends of illegal activities where patrols are done. Results of the SMART data analysis for MFCA also showed large sections of the park, particularly the southern part, which had not been patrolled over the past 15 years. The ranger patrol data was used by to produce probability of illegal activities in MFPA (Figure 1)

### Probability of illegal activities in Murchison Falls Protected Area

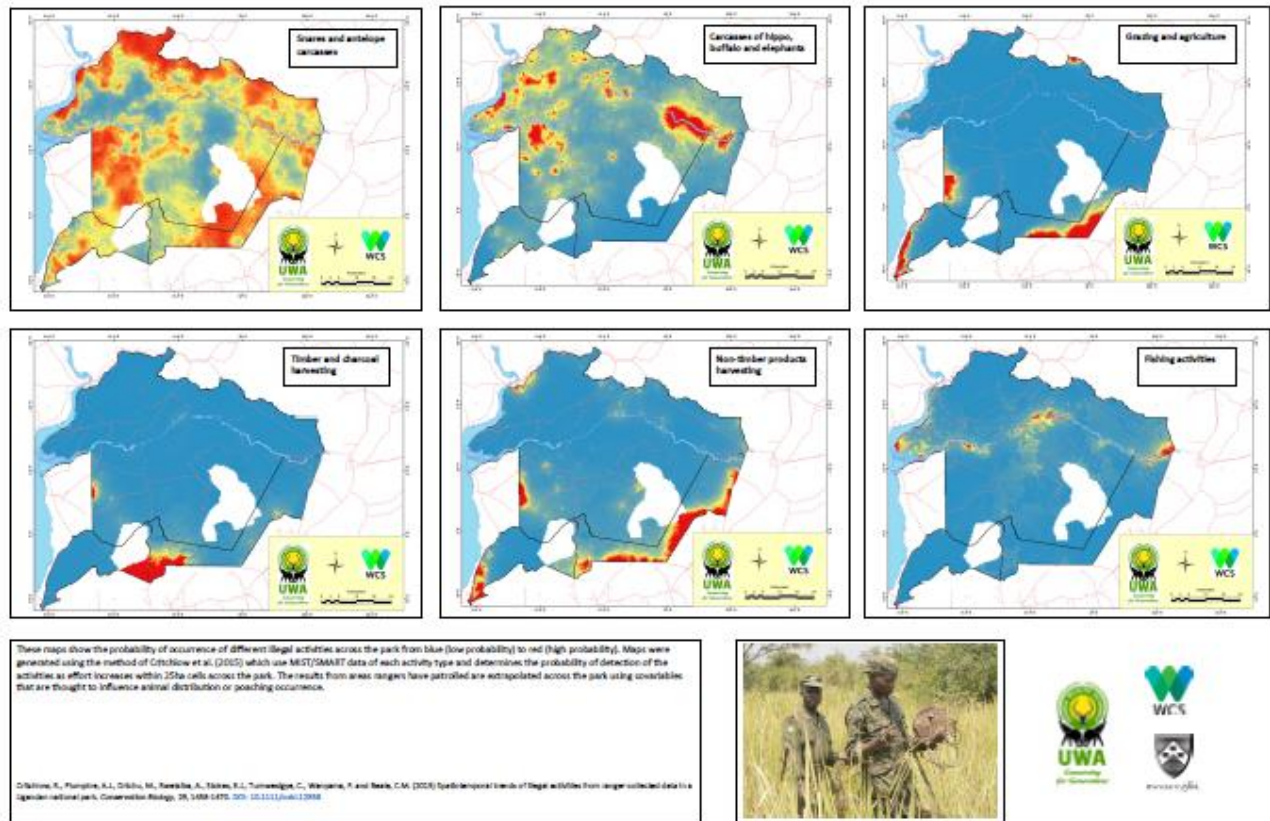


Figure 1. Probability of activities in MFPA

A refresher session on the use of Cybertracker in data collection was conducted by Mustafa Nsubuga. Rangers were trained on how start a patrol and enter data into a Smart Phone using the CyberTracker application. Mustafa shown staff where to put the different forms of data encountered when on Patrols and emphasized the importance of starting and ending patrols. The following data modules were covered during the training:

1. Human Activity
2. Wildlife
3. Features
4. Position

Each of these component was intensively explained and participants were coached on what data fits in a specific data module, including previously ignored data input components such as Individual Suspect Data and Problem Animal data module. The rangers highlighted the lack of an option for Injured or Sick animals since the data model was not configured to take in such records. This was promptly updated and uploaded to the phones. Given that



some ranger posts lack hand held GPS devices, a new navigation application called Polaris Navigation was installed on the SMART phones and participants were trained on how to use it to mark coordinates and navigate to the marked points (way points). Unfortunately, this app has a limitation on the number of coordinate points that it can accept, but with possibilities for upgrade, if a limitless version is purchased at a cost of \$10 for each SMART phone. UWA has to raise extra funds to purchase the unlimited version of Polaris app. A practical session was conducted where the participants collected data on the following aspects:

1. Animal Observation
2. Carcass of Animal
3. Arrest Someone – Take Photo and details
4. Snare Line
5. Farming in the Park
6. Cattle in the Park

Dr. Simon Nampindo led the session on using SMART for planning law enforcement as well as assessing staff performance. The monitoring and research ranger in charge of managing SMART data explained how the data is used in producing quarterly and annual work plans. At every end of the month, ranger post commanders deliver the SMART phones to the SMART data manager for download at the park office. After downloading the data, a map showing patrol coverage, illegal activity hotspots and animal sightings is produced and discussed with the ranger post commander. These maps are produced to enable rangers plan patrols for the next month based on patrols coverage and the level of illegal threats at within the sector. Participants were asked to share their experiences with using SMART. Three head rangers voluntarily agreed to share their practical experiences in using SMART to conduct patrols. The rangers, however, raised the issue of lack of proper boundaries between patrol sectors hence hindering efforts to plan patrols in a proper manner. They also sighted the lack of feedback from senior management and limited availability of SMART phones to cover the entire park ranger posts. There was also an issue with limited staff capacity to operate SMART phones, leaving it to only one ranger to use and whenever such a ranger is out of station, the SMART phone is not used during the patrols.

Specifically, head ranger from Semanya Sector noted the following:

- I. Names of rangers are repeated in the SMART database causing confusion during data entry.
- II. Few Rangers knew how to use SMART since training had been done for a few selected rangers.
- III. There is lack of feedback on the reports submitted to the law enforcement warden as well as the Conservation Area Manager.

The head ranger made the following recommendations namely a) asked senior management to recognize and reward good performance by some rangers, b) Patrol Coverage map should be shared and results interpreted to the Rangers whenever they are produced because they are unable to make sense out of the maps, and c) quarterly planning of patrols for every park sector should be made and shared among the sector commanders to ensure that all areas are patrolled.





Head ranger from Chobe and Karuma Sector noted the following:

- i. SMART is a very important tool in park management and has immense benefits, however, there is poor feedback on reports produced from the sector. Map interpretation should be done for all ranger posts.
- ii. There is a conflict between Intelligence and Law Enforcement Rangers. Law enforcement rangers do not fully understand the role of intelligence officers. In addition, they do not get a chance to receive intelligence officers reports to understand whether intelligence information provided results in any arrests.
- iii. Tourism rangers are reluctant to collect SMART data because it is time consuming and tourist operate on a tight schedule.

#### Recommendations

- a) SMART should be used in planning Tourism, Intelligence, Monitoring and Research activities and not only emphasized for law enforcement.
- b) There is a need to improve communication between Monitoring and Research and Law Enforcement staff.
- c) The sector needs more Smart Phones and Power Banks.
- d) Tourism patrols should be done by other rangers other than the tourist guides.

Head ranger from East Madi shared his experience and note the following

1. The Data model structure (names of species) is too long when entering data in CyberTracker.
2. The wildlife reserve has few SMART phones and asked WCS to prioritize this area when a new batch of phones are purchased.
3. The reserve received tools very late (Laptop and SMART phones delivered in August)
4. Most Rangers in the reserve don't know how to enter data.
5. Power banks are needed as the nearest power source is far away.
6. The reserve has a Solar Panel but doesn't have a Battery.
7. Safety of equipment (Laptop) is not guaranteed.
8. There is no feedback on reports written.

#### Recommendations

- a) There is a need to include a Problem animal query and report in the SMART database.
- b) There is a need to setup PA reports in the database.

Head ranger from Kololo Sector made the following recommendations

1. SMART Knowledge among rangers needs to be improved to enable more persons use it.
2. There is a need to receive verbal feedback on the data collected in Cybertracker.

3. There is a need to provide ranger patrol effort maps to visualize work done.

The following action points were agreed upon;

1. Allan, the SMART data manager at the park office was requested to work with Fred Wanyama to develop patrol sector boundaries to be embedded into SMART.
2. Management should give feedback to sector managers on the monthly and quarterly reports submitted to them. GPS coordinates of unpatrolled areas should be produced and given to the sector commanders to plan and deploy rangers to patrol those areas.
3. WCS modify the data modules to incorporate the changes as well as create an elaborate problem animal data module

### Queen Elizabeth National Park (7th - 8th November 2016)

The training was opened by Ag. CAM / Warden In-charge of Kyambura Wildlife Reserve Mr. Musana Yoweri who highlighted the importance of the training and how it's going to enable rangers collect better data using SMART. A similar presentation the one given at MFCA was given by Dr. Andrew Plumptre, except that the results presented were those of QECA. Andy discussed the results of the test patrol data and use of predictive models to test the detection of illegal activities in test sites compared to the sites where conventional patrols are done. By using probability models developed by the University of York, they were able to show that test sites showed high success of finding illegal activities compared to control sites. The technique has produced good results showing increased detection of illegal activities (Figure 2) hence making patrols more efficient.

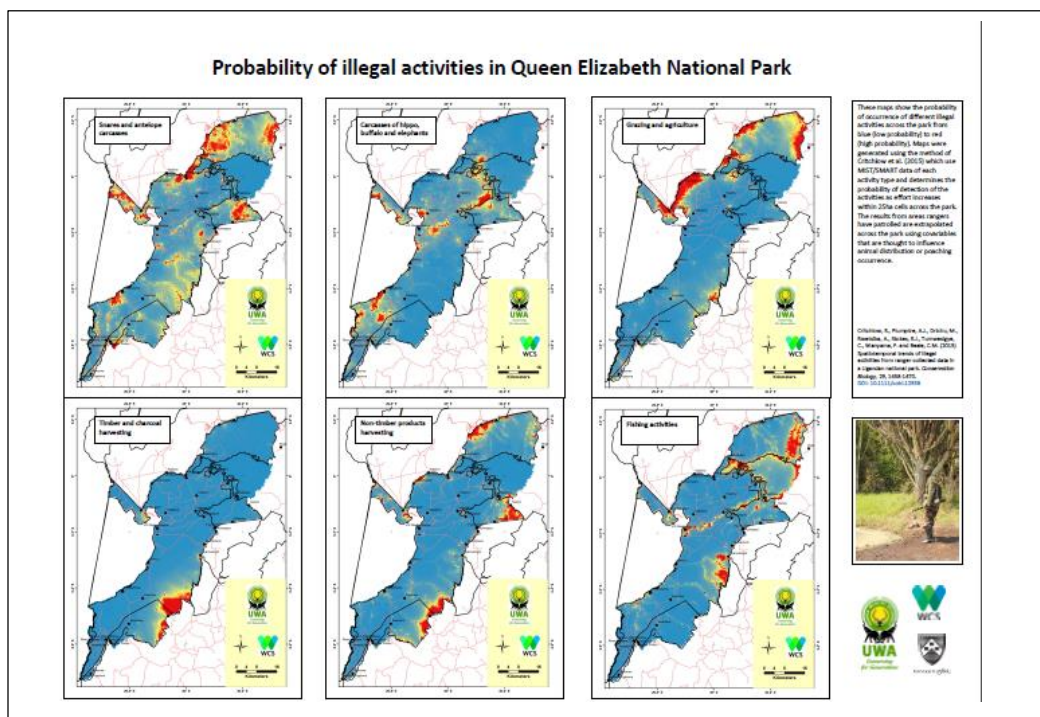


Figure 2. Probability of illegal activities in QENP



More coordinates were given out to Ranger posts where test sites were identified and mapped for this type of patrols.

A refresher session on Cybertracker for data collection was done by Mr. Mustafa Nsubuga including the use of Polaris Navigation and GPS essentials navigation applications. The participants had a practical session on CyberTracker where they collected data on:

1. Wildlife Sighting
2. Elephant carcass
3. Arrested Hunter with Meat
4. Destroyed a camp of loggers
5. Illegal grazing – Arrest Cows
6. Crop Raiding damage by Elephants

Similarly, staff at QECA were asked to share their experiences and challenges of using SMART and suggest ways to improve the application of the technology to do a better job. The following feedback was received from participants who attended the training:

1. There is limited sightings of Lions, Hyeana, Leopard.
2. Double counting of carcasses is possible and these need to be marked or flagged after entering in Cybertracker.
3. There is a confusion in the use of multiple devices, e.g. Smart phones, Handheld GPS, and Digital camera.
4. Documentation of the scene of crime is still a problem.
5. Ranger posts are not provided with maps.
6. There is still limited knowledge of use of SMART at ranger post and there is need to increase training of Rangers.
7. Supervisors don't give feedback on Reports submitted at the end of the month or quarter.
8. There is poor management of equipment due to abrupt transfers.
9. Most ranger posts don't have power and need more power banks.
10. Smart phones are still not enough.
11. There is friction / disharmony among Monitoring and Research, Law Enforcement and Intelligence staff.

#### Recommendations

- a) Tourism teams therefore need to be given Smart Phones to record these sightings.
- b) There is need to Delineate Ranger Post Patrol boundaries and zones





- c) There is a need to provide Navigation applications for posts without GPS.
- d) The Problem Animal data model needed to be edited from “Killed Vermin” to just “Killed” to avoid confusion during data entry.
- e) Other livestock such as Pigs need to be added to the Problem Animal data model.
- f) Quarterly Reports and discussions of results should be done and used for planning
- g) Provide more SMART phones and power packs
- h) There is need to develop equipment issue forms to facilitate orderly transfer of equipment and proper handover (WCS to share forms with CAM)

In both QECA and MFCA, the above mentioned activities were followed by a session on Illegal Activity threats analysis and prioritization of patrols to address key threats. The idea was to encourage the participants to think about their priorities when dealing with illegal activities amidst limited resources (i.e. financial, tools, human and time). Presentations were given by Mr Fred Wanyama (Monitoring and Research Coordinator, UWA HQ) and Mr John Okot (Head of Intelligence, UWA HQ) on the history of SMART and how data is used by management. Fred emphasized the importance of SMART and asked the park staff to take it seriously. Fred noted that SMART data is used by senior management to plan, prosecute wildlife crime offenders, produce reports for the ministry showing the state of illegal activities within the parks and wildlife reserves. Fred went ahead to demonstrate the importance of SMART results by showing the map of East Madi in 2005 and its current state showing a lot of human encroachment, rendering the reserve irredeemable.

John Okot, Ag. Head of intelligence Unit talked about the evolution of the wildlife crime unit leading to the creation of the Security and Law Enforcement Unit (SLEU). John presented the objectives of the unit and the steps being taken to develop the unit while linking it to other departments such as monitoring and research, legal unit, and conventional ranger force, including the SWIFT from UPDF. John also noted that there are still restructuring processes taking place within the SLEU and more staff are recommended for recruitment to join this unit and internal recruitment is highly considered. John introduced Sandra from Maisha Consulting Ltd as the mentor and intelligence expert recruited to build the capacity of the unit, develop systems and procedures for collecting, transmitting, storing and analyzing intelligence information and reporting. At the moment, John, Amos, and Sandra are developing a universal database and reviewing intelligence data collection forms with the aim of standardizing the system of managing intelligence information. As such, the unit's understanding of how SMART, online offender's database, WILD LEO and other databases work as well as the type of information collected was very important for them.

In summary, UWA staff appreciate the importance of using SMART technology to improve law enforcement. MFCA, to some degree is trying to use SMART data for planning and improve law enforcement. UWA head quarter staff, however, need to demand the SMART reports as the only constructive way to ensure that SMART data is collected. In addition, the challenges raised by the field staff, which are both administrative and technical in nature need to be addressed. Feedback on reports submitted by field staff needs to be given and where action is required,



such action should be done in a timely manner. On-site technical backstopping that WCS are providing in both conservation areas are very key to the successful application of SMART tool. The online offender's database was noted to have very little information entered in the past one year and the question of ownership or oversight at UWA headquarter needs to be resolved. In our opinion, SLEU should be allowed to manage the online offender's database, but information can be collected by both the law enforcement rangers, intelligence officers at the park and in urban centers, including Entebbe International Airport. The SLEU should work toward integrating all sources of intelligence information, including information and exhibits from detection dogs stationed at Entebbe Airport to demonstrate the importance of this information in combating illegal activities, IWT and trafficking in Uganda. WCS's aim is to support UWA conduct an assessment of the effectiveness of its law enforcement strategies and recommend improvements to be done as well as support processes and interventions to address them.

### **Acknowledgement**

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