



# Applying SMART programme for monitoring biodiversity in the Kon Ka Kinh National Park: a lesson learnt from the field

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# INTRODUCTION OF THE KON KA KINH NATIONAL PARK

## Located in Gia Lai Province, the Central Highlands

- 3 districts: Dak Doa, Mang Yang, Kbang
- Area: 41,780 hectares with 33,500 hectares of natural forest; Altitude: from 570 - 1,748m
- Weather 2 seasons: rainy season (May-Nov), dry season (Dec-April)
- Home of 16 000 people with 80% is the Bahnar ethnic



Nguyen Ai Tany FZS





# INTRODUCTION OF THE KON KA KINH NATIONAL PARK

**Kon Ka Kinh National Park is an area with rich of biodiversity:**

- + Plants: 687 species
- + Animals: there are 428 species,
- + Primates: 6 species
  - Pygmy loris (*Nycticebus pygmaeus*),
  - Stump-tailed macaque (*Macaca arctoides*),
  - Rhesus macaque (*Macaca mulatta*),
  - Pig-tailed macaque (*Macaca leonina*),
  - Northern yellow-cheeked gibbon (*Nomascus annamensis*)
  - Grey-shanked douc langur (*Pygathrix cinerea*)



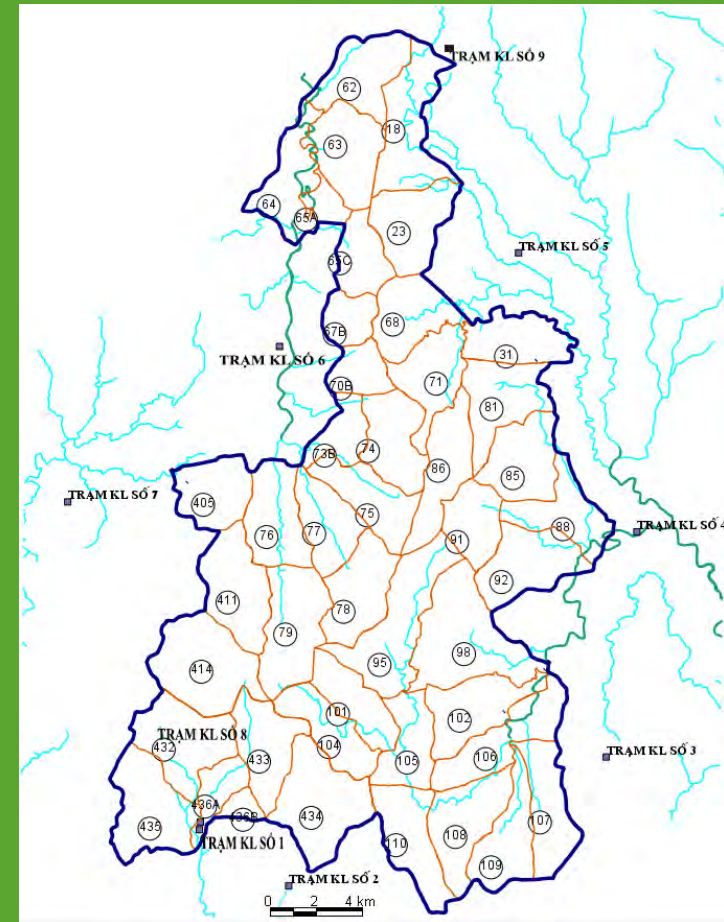
# Apply SMART Programme in Forest Patrol & Biodiversity Monitor

## FZS and the Park applied SMART since 2015

- 62 forest guards of 09 stations
- 18 local villagers participated
- Implement Smart Mobile data collected from 2019 to now.



Team of patrols in ranger station 08



Ranger station in Kon Ka Kinh Park

# Training Course for Forest Guards of the Kon Ka Kinh NP

**Every year, 40-50 forest guards Kon Ka Kinh NP trained to apply the SMART**

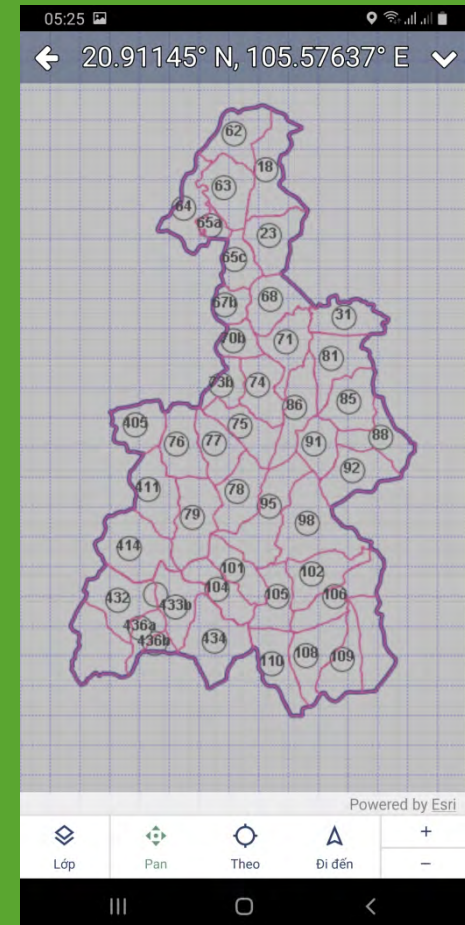
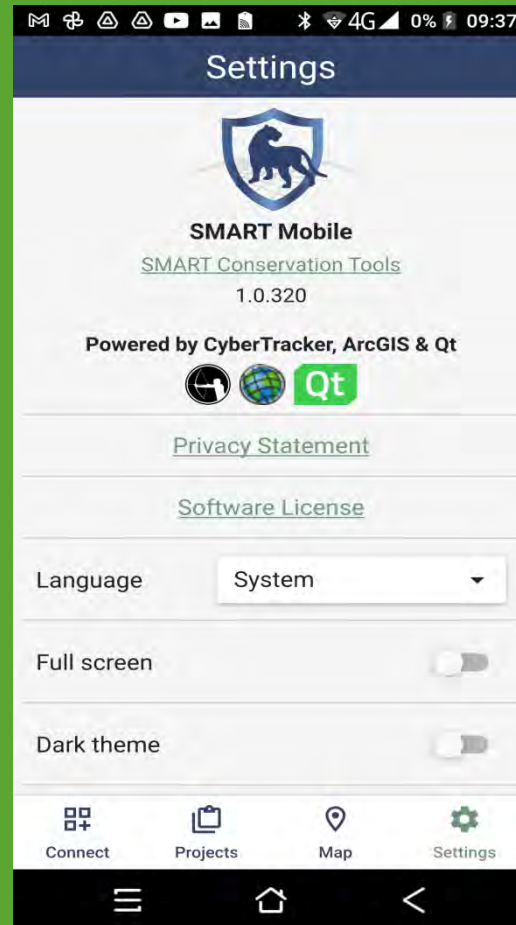
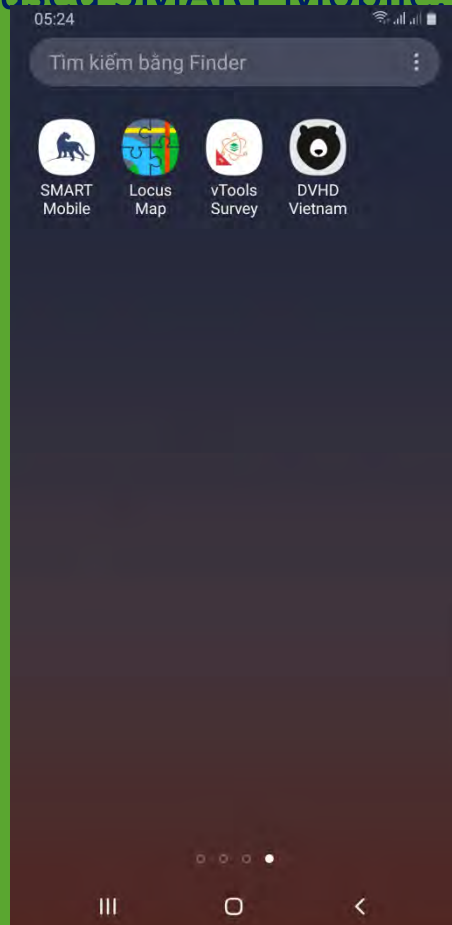
- 95% of trainers could collect data during the forest patrols
- Established a technical team to analyse data using SMART software
- Monthly reports were accomplished using SMART program





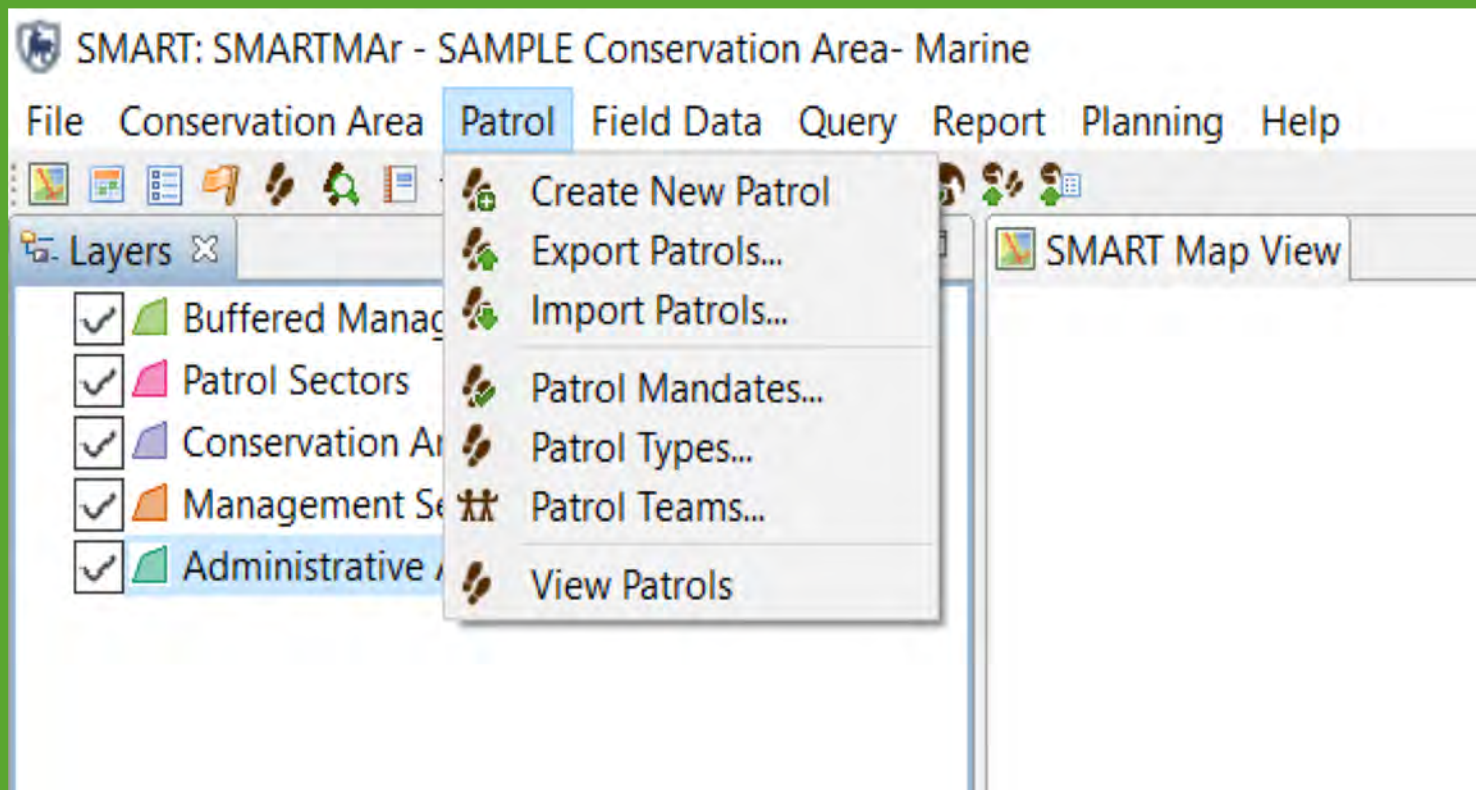
# Training Course for Forest Guards of the Kon Ka Kinh NP

SMART Mobile is a highly configurable app that can be installed on android phones to allow for collection of SMART data. All the forest guards of the Park used SMART Mobile.



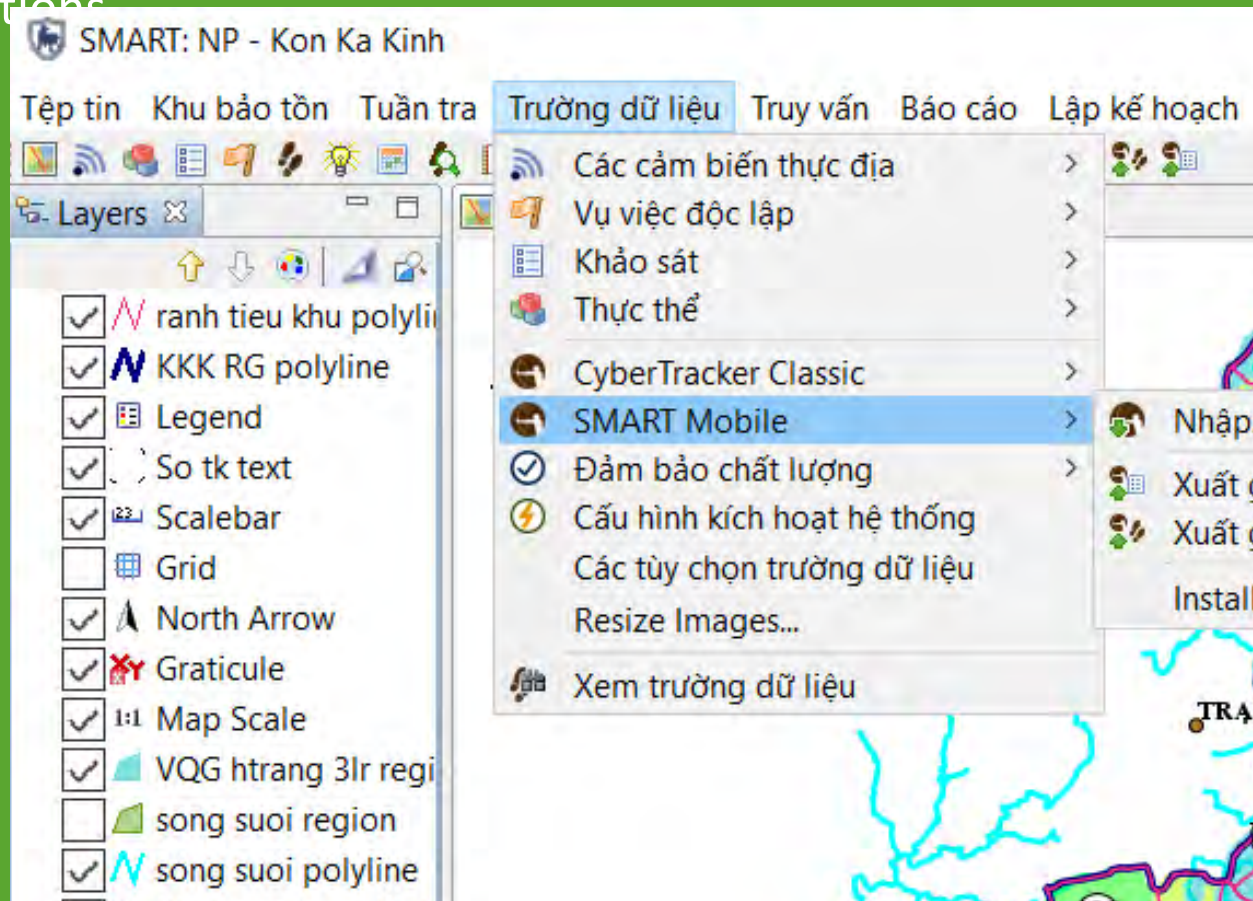
# Data collection & Analyse

The **Patrol** menu shows options for changing patrol parameters such as patrol mandates or patrol teams, as well as shortcuts to many of the patrol screen functions such as creating a new patrol



# Data collection & Analyse

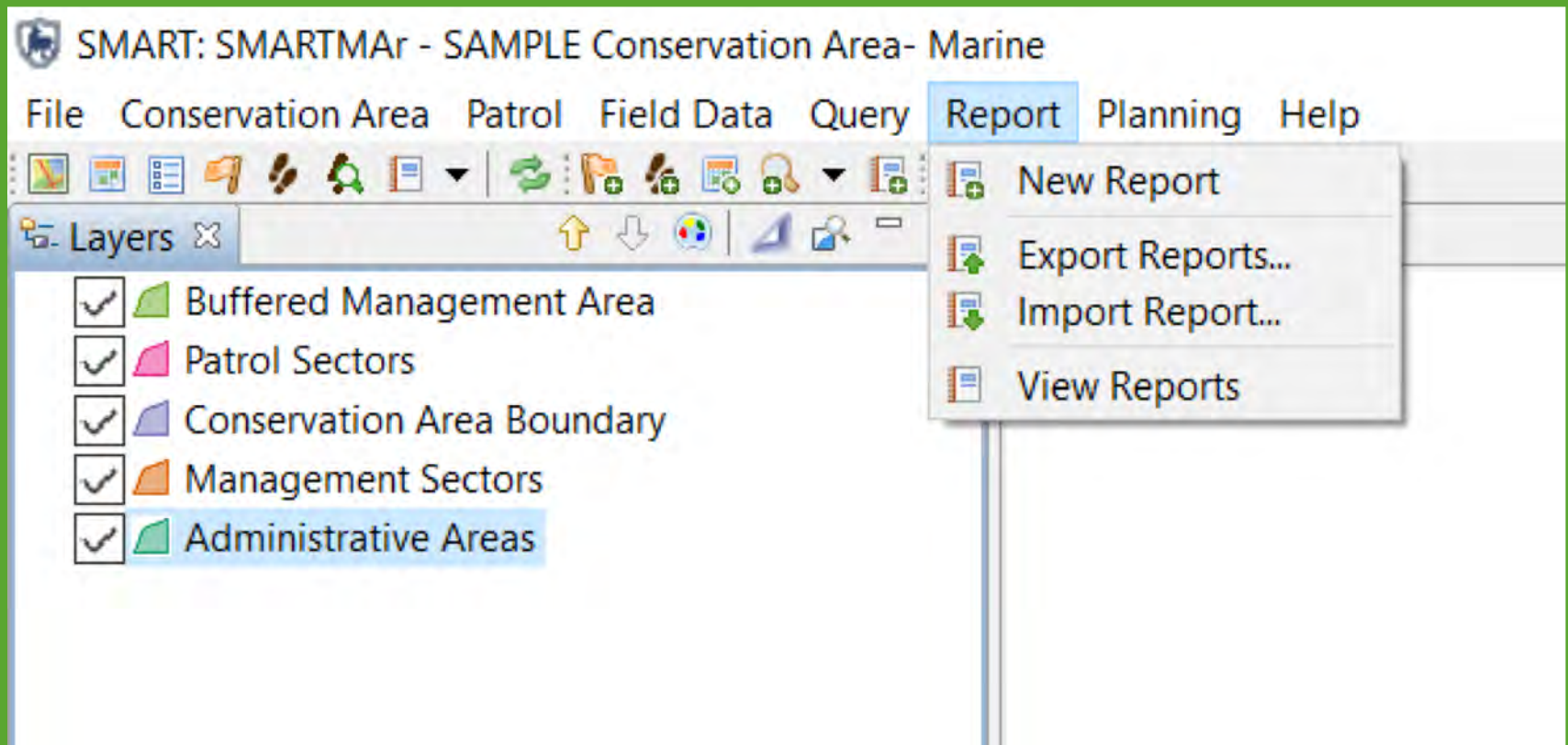
The **Field Data** menu allows changes to field data collection options, such as Smart Mobile field options and configurable data models, and Ecological Survey options.





# Data collection & Analyse

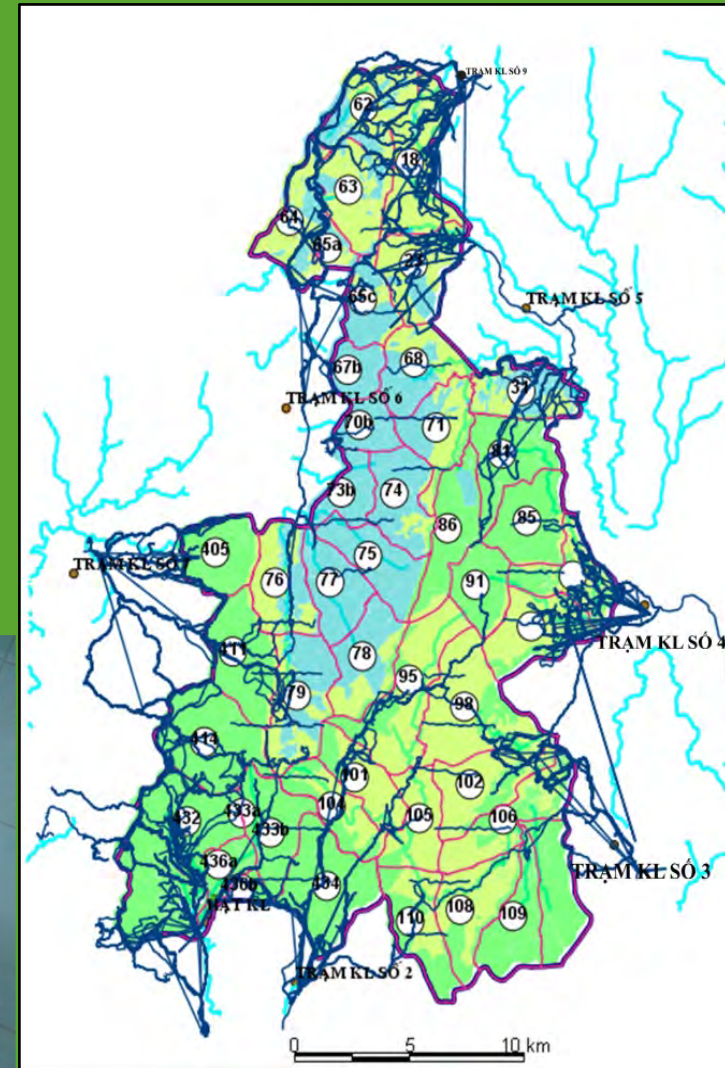
The **Report** menu provides shortcuts to many Reports functions such as exports and creating new reports



# Results

## From January 2019 to December 2021:

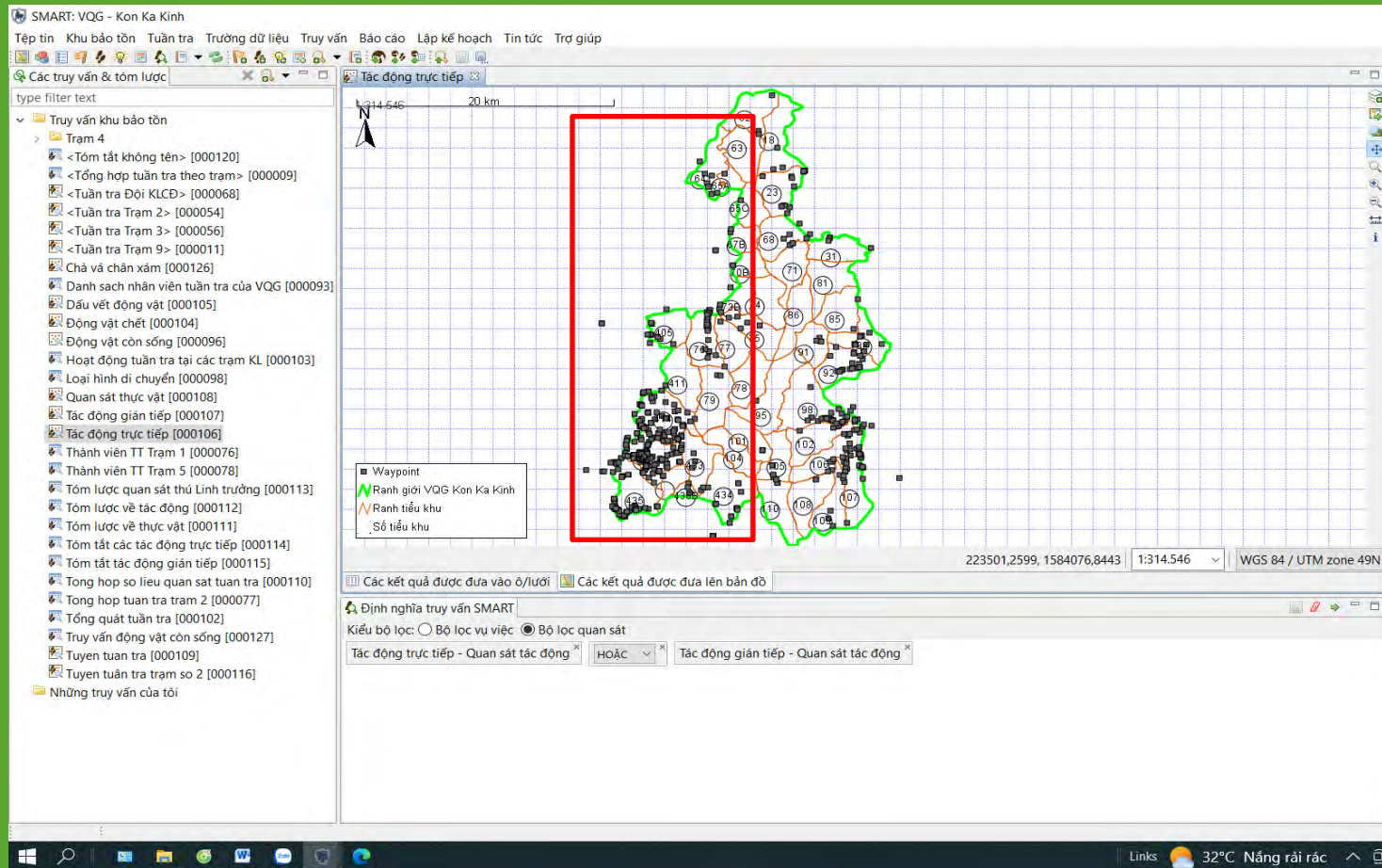
- 1,216 patrols with 1,310 days in the field, covering a total of **7,998** km in length.
- More than **534** local people were detected and expelled out the forest.
- Discovered and removed **1,768** traps of all kinds.
- Confiscated **34** guns of all kinds, including homemade guns and sports guns.



Forest patrol data of 09 stations



# Results



- Impact records and violations are handled more in the western part than in other areas



# Results



General objective	2019	2020	2021
Guard stations	3	9	9
The number of patrols	27	537	652
Days of patrol	121	537	652
Patrol distance (km)	976	2.507	4.515
Number of violators	73	268	193
Number of traps removed	723	272	773
Number of gun confiscation	8	9	17

Field data analysed using SMART Programme



FRANKFURT  
ZOOLOGICAL  
SOCIETY



Violations are detected and handled in Kon Ka Kinh NP





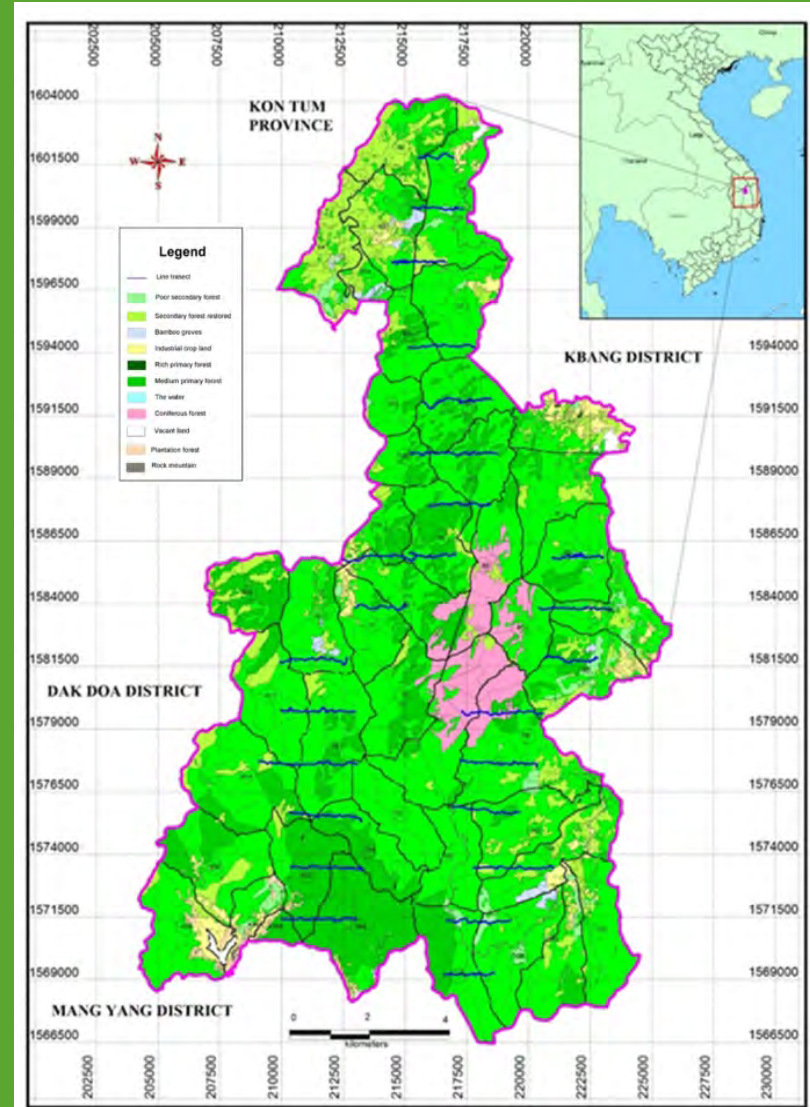
**Removed traps during the forest patrolling in Kon  
Ka Kinh NP**





# Monitoring Grey-shanked douc langur in the Kon Ka Kinh National Park

- From May 12 to June 28, 2020 a survey of a total **24 line transects** across forest was conducted in KKK NP.
- The line transects were designed straight from east to west, the length of each transect was **4km**



# Results

Parameter	Estimate	Estimate	Percent Coef. of Variation	95% Percent Confidence Interval	
<b>Ds</b>	1.1863	0.5112	43.10	0.5120	2.7485
<b>E(s)</b>	6.2381	0.7429	11.91	4.8701	7.9903
<b>D</b>	7.4004	3.3089	44.71	3.1168	17.571
<b>N</b>	1557.0	696.18	44.71	656.00	3698.0

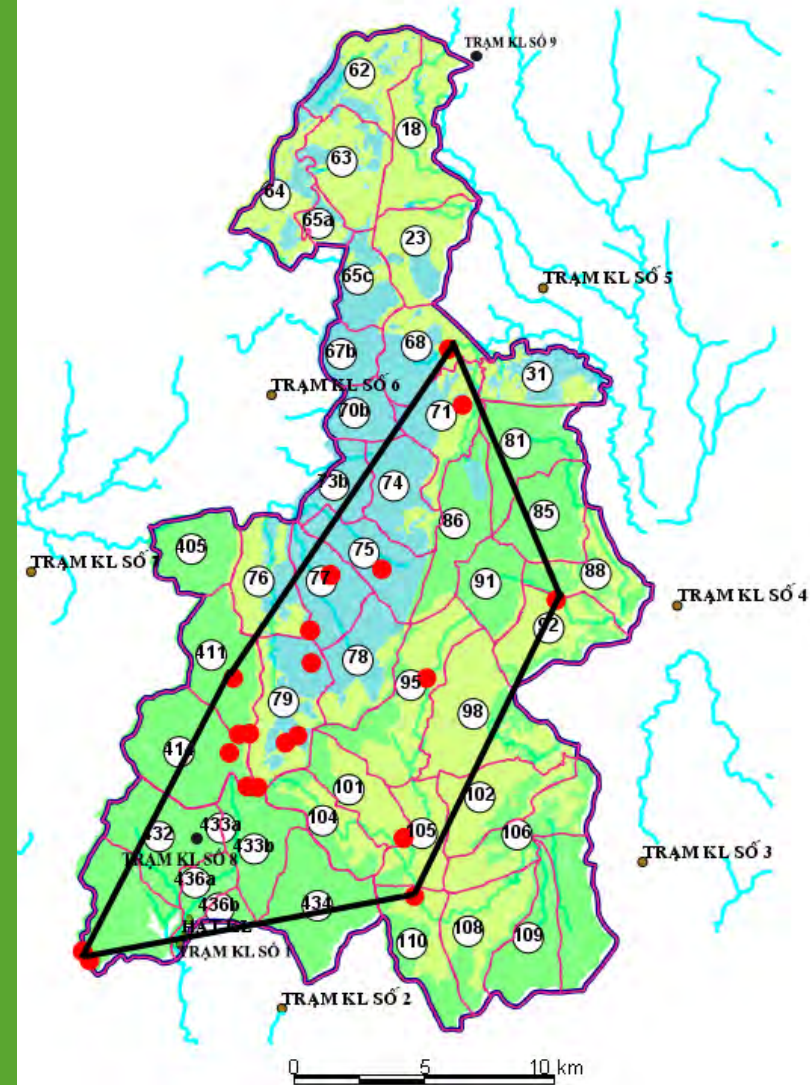
**DISTANCE version 7.3 was used to estimate population density:**

- There were 1.18 ( $\pm 0.51$ ) groups/km<sup>2</sup>.
- The mean group size was 6.23 ( $\pm 0.74$ ) individuals.
- The estimated number of groups in the park is 248.3 ( $\pm 107.3$ ) with about 1,557 ( $\pm 696.2$ ) individuals.



# Results

- 90% of observations (19/21) of the grey-shanked douc langur were made in the core area of the park.
- 71% of observations (15/21) were made in the western part of the park while only 29% (6/21) were in the eastern part

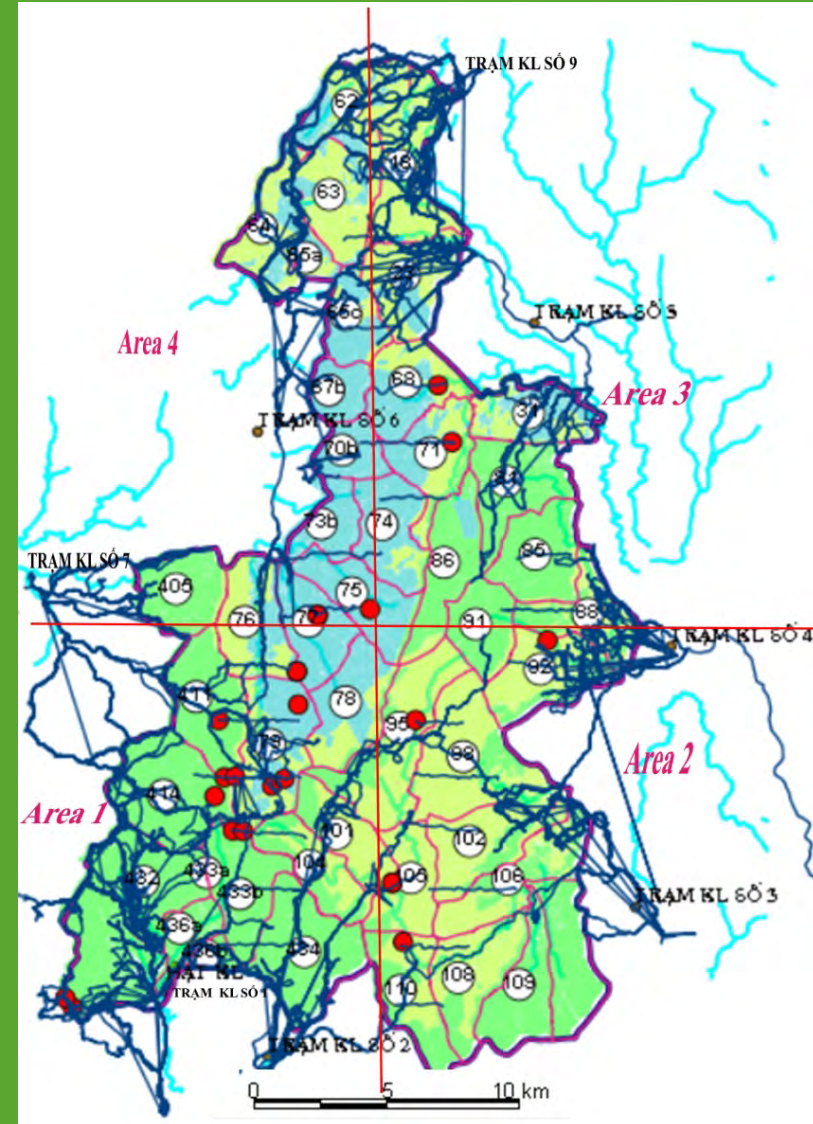




# Results

Area	Number of Patrols			Douc groups observed
	Patrols	Day of patrol	Patrol Distance (km)	
Area 1	379	415	2,936	13
Area 2	340	348	2,253	4
Area 2	295	305	1,135	2
Area 2	202	242	1,674	2
	<b>1,216</b>	<b>1,310</b>	<b>7,998</b>	<b>21</b>

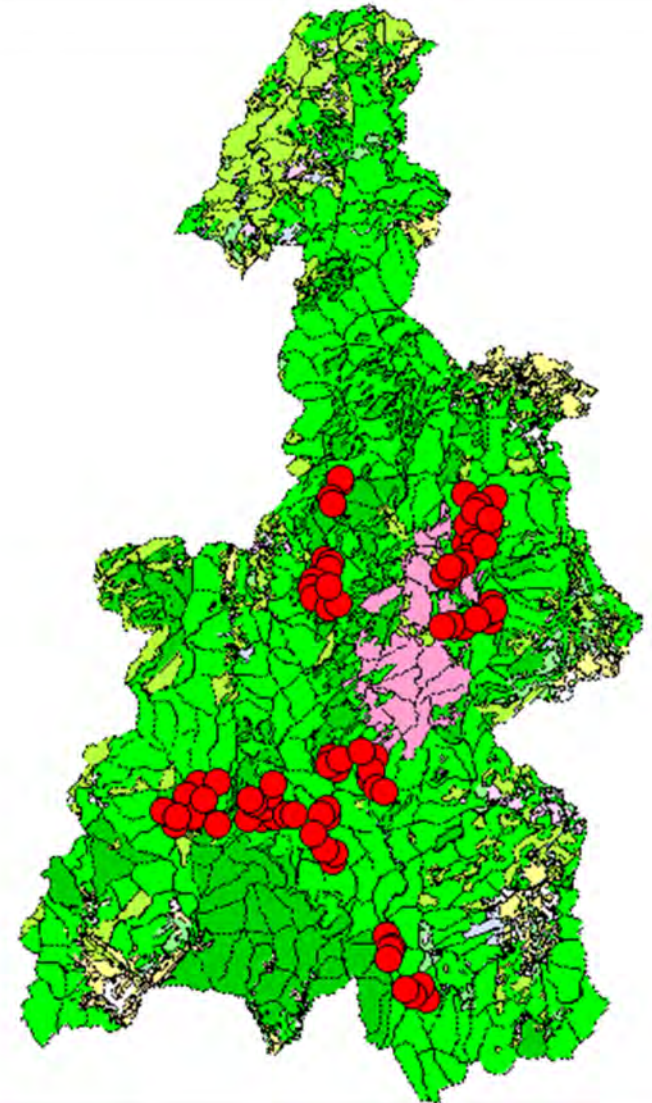
There is a strong correlation between patrolling effort and douc langur groups observed ( $p=0.88$ ).



# Using camera traps for biodiversity monitoring

August to December 2021 and 2022

- Field surveyors: 4 park staffs
- Number of camera traps 15
- Number of camera trap setting up 32 in 2021 and 57 in 2022.
- Number of pictures captured in 2021: 2,171
- Number of pictures captured in 2022:



Map of camera trap set up locations



# Results

- There 12 species of animals were recorded in 2021
- There 17 species of animals were recorded in 2022

*Lophura nycthemera*



*Muntiacus truongsongensis*





# Results

Most of animals were found in the areas with intensive forest patrol areas.

*Prionodon pardicolor*



*Capricornis milneedwar*



# Conclusions

- Applying SMART on forest patrol and biodiversity monitor improved the park management.
- There is a strong correlation between forest patrol effort and wildlife presence in the park.
- Camera trap could be set up during forest patrol trip to provide more data on wildlife presence.
- SMART program enhance capacity of the forest guards of the park in terms of planning patrol trips and submitting monthly report.



Thank you for your  
attention!



Thanks for the collaboration of the  
Management board of the Kon Ka Kinh  
National Park