

# Sign survey: Protocols and Data collection



भारतीय वन्यजीव संस्थान  
Wildlife Institute of India



**NEW OCCUPANCY TRAIL  
F1**



**CONTINUE OLD TRAIL  
F1**



**START TRANSECT F2**



**CONTINUE OLD  
TRANSECT F2**



**HABITAT PLOTS F3 AND  
F4**



**VULTURE / OTHER  
BIRDS F5**



**CHANGE LANGUAGE**



**EXIT**

# Form 1: Carnivore/ Mega herbivore sign survey and analysis

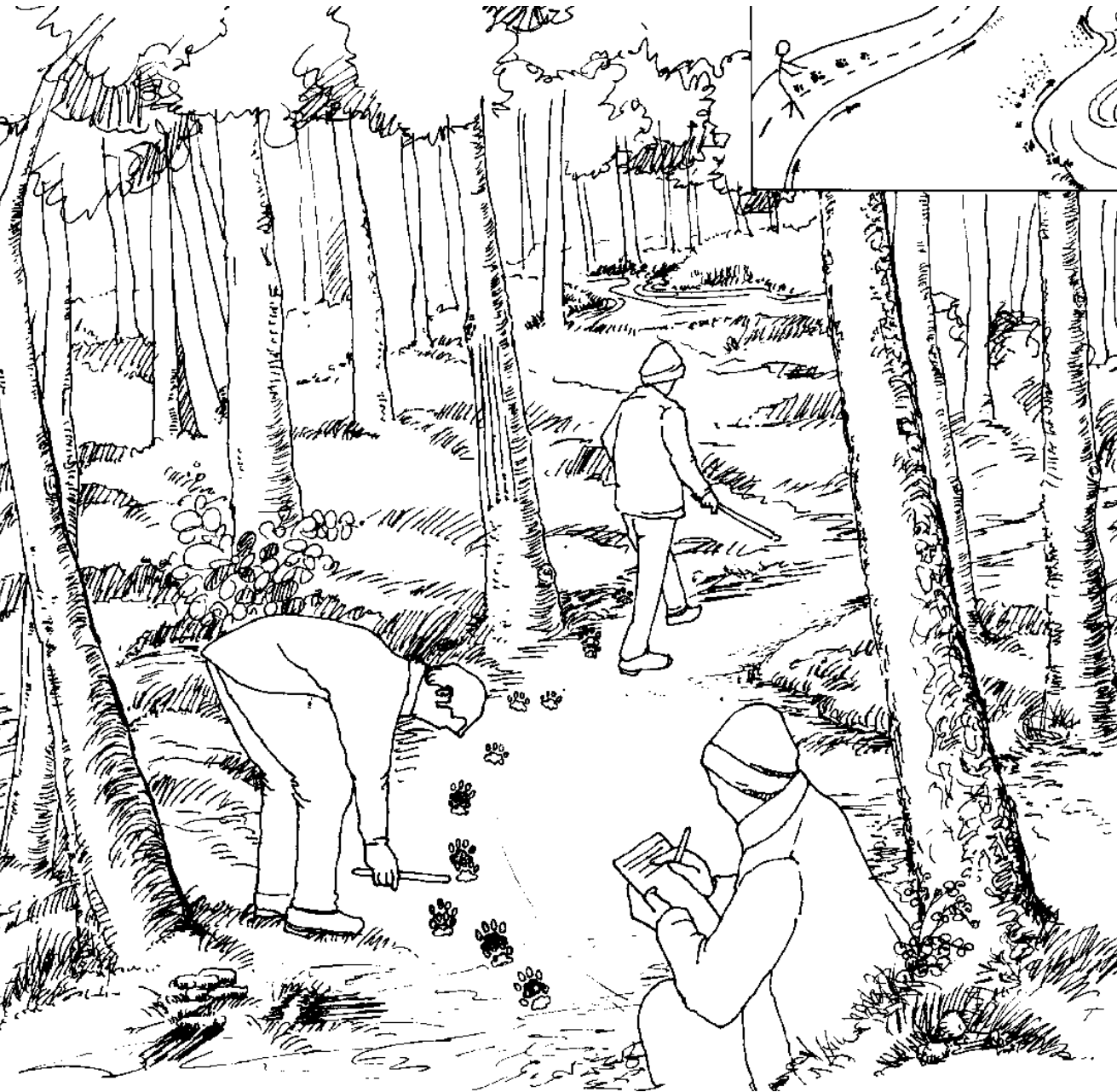


# Carnivore sign survey



- Important sampling protocol of Phase - I survey
- To obtain data on presence, intensity of use and absence of Carnivores and Mega herbivores (Occupancy Survey)
- Areas within the beat which has maximum potential of animal presence should be intensively searched for signs.
- Maximum Potential of animal signs (River beds, Nullah, Dirt Road, and Trails)

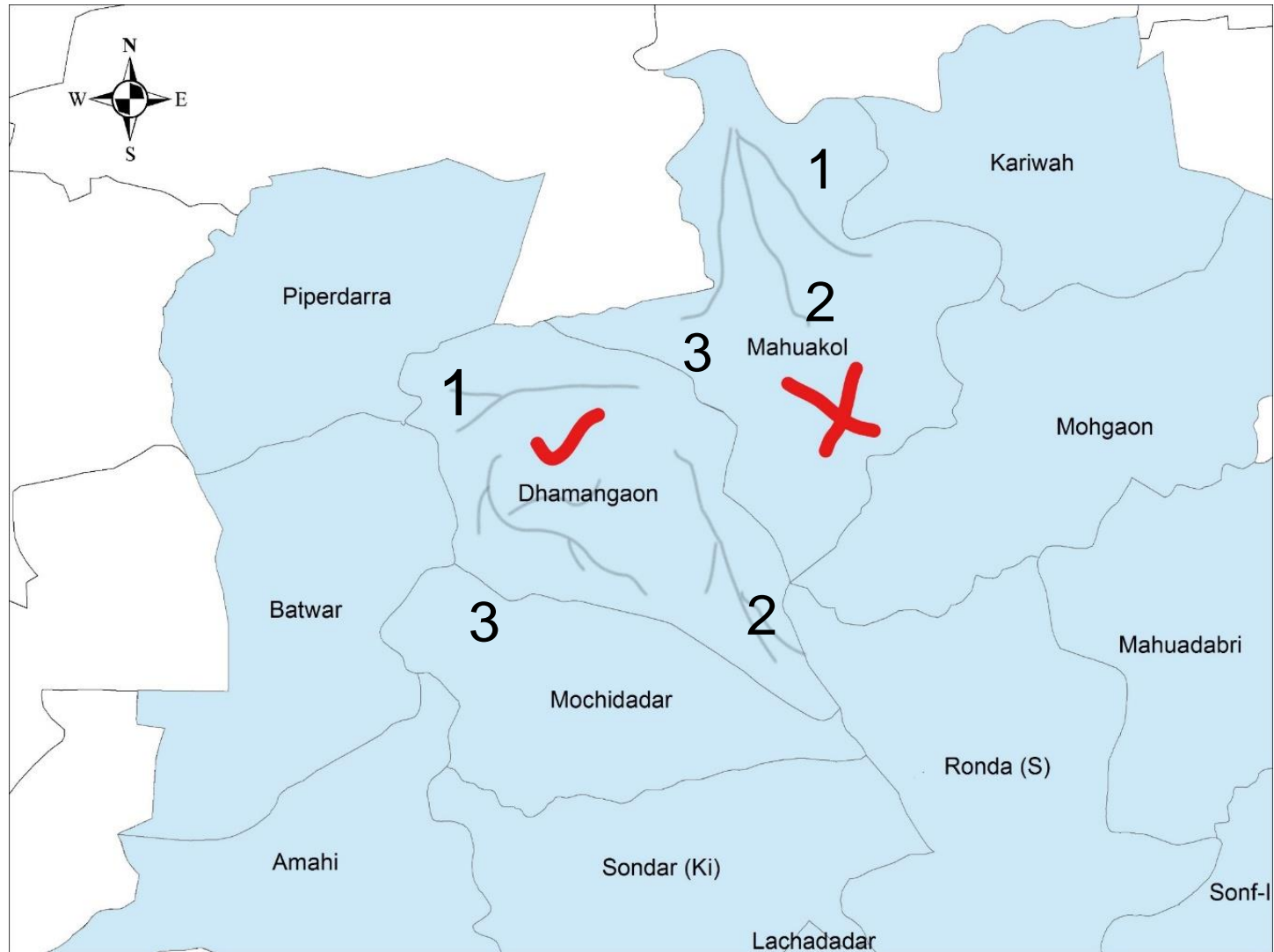
# Carnivore sign survey



- Signs like tracks, scats, scrape, rake, rolling, dung, direct sighting and vocalization should be recorded.
- Minimum 3 searches each of 5 km at least
- Best Location for camera trap placement can be identified during this survey
- Continuous Pugmark track set should be counted as one sign (shall be explained in the field)
- Pugmarks found in opposite direction, scat/dung, scrape, rake and other signs have to be recorded individually



# Issues in sampling design



Try to get a full coverage of the beat/ administrative unit by sign survey tracks

# FORM-1: DATASHEET FOR TIGER, LEOPARD, OTHER CARNIVORE & MEGA HERBIVORE SIGN ENCOUNTER RATE

Forest Division: Range: Beat: Date:  
 Start Time: End Time: Trail Id:  
 Starting Latitude:N Starting Longitude:E  
 End Latitude:N End Longitude:E  
 Total distance covered (km): Time spent in other activities (Resting etc.):

Observers	Name	Designation	Phone No.
1			
2			

Sl. No.	Time	Latitude		Longitude		Sign Type*	Species	Age of track/sign**	Remarks
		Deg.	Min.	Min.	Sec.				
1									
2									
3									
4									
5									
6									
7									
8									
9									
10									
11									
12									
13									
14									
15									
16									
17									
18									
19									

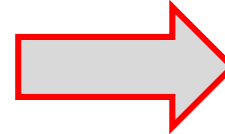
In case of Direct sighting, observer should mention the Age, Sex and Individual number in the Remarks column.

\*Sign types:- Scat/Pellets/Dung-SCT/PLT/DNG, Pugmark-Track-PT, Vocalization-VC, Rake-RK, Scrape-SCR, Rolling-RL, Spray-SPR, Digging-DIG, Kill-K, Scat & Scrape-SS

\*\* Age of Track & Sign: Very Fresh- VF, Fresh- F, Old-O, Very Old- VO

Signs of 4 mega herbivores (Gaur, Elephant, Water buffalo & Rhino) should also be recorded.

Note: 1. If you get more sign than these, then enter it on another datasheet.



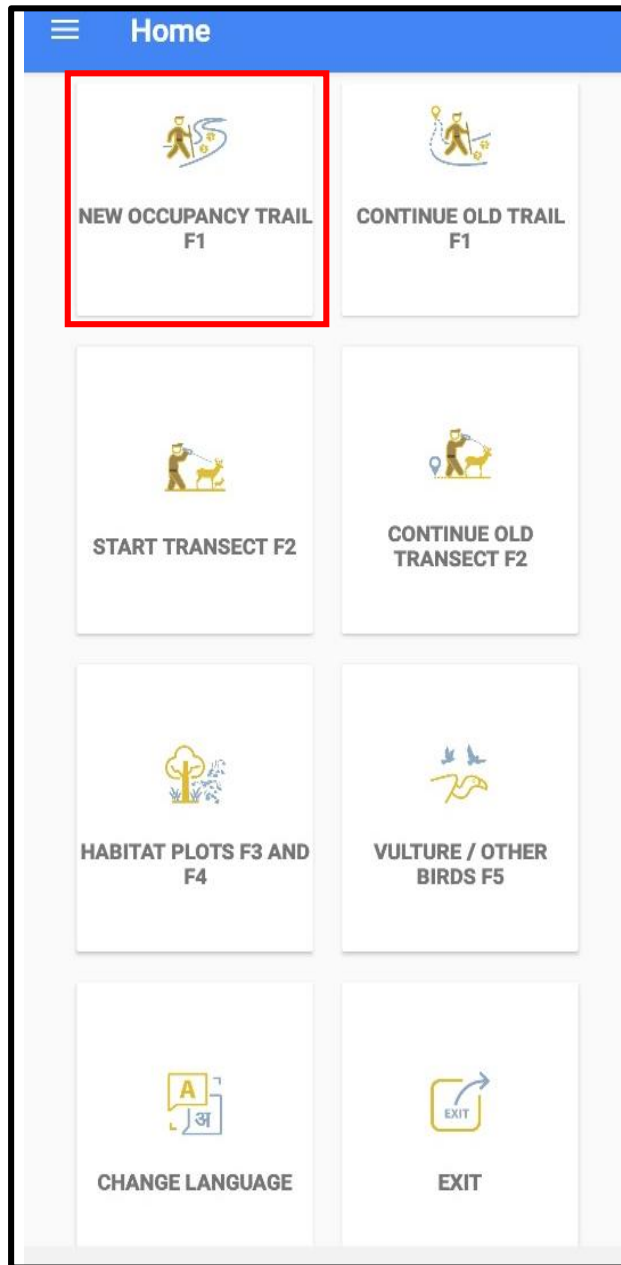
Due to Errors Associated with Manual Data Entry in Forms  
 only Digitally recorded Data will be Analysed Further

## Advantages of using digital software (MSTripes)

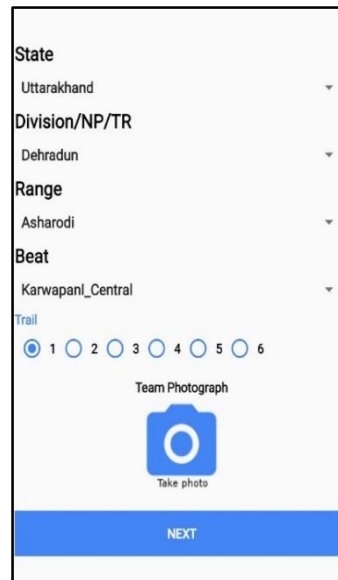
- Ease of data collection
- Data transparency
- Do away with data entry error
- Timely report generation



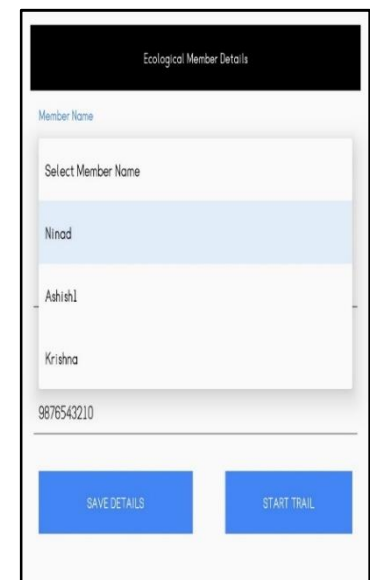
# MSTrIPES ecological app: Form 1



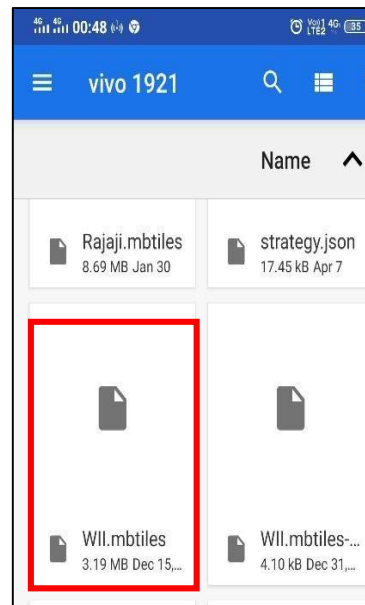
The Home screen of the MSTrIPES app features a blue header with a hamburger menu icon and the text "Home". Below the header, there are eight white cards arranged in a 4x2 grid. The first card, "NEW OCCUPANCY TRAIL F1", is highlighted with a red border. The other cards are "CONTINUE OLD TRAIL F1", "START TRANSECT F2", "CONTINUE OLD TRANSECT F2", "HABITAT PLOTS F3 AND F4", "VULTURE / OTHER BIRDS F5", "CHANGE LANGUAGE", and "EXIT".



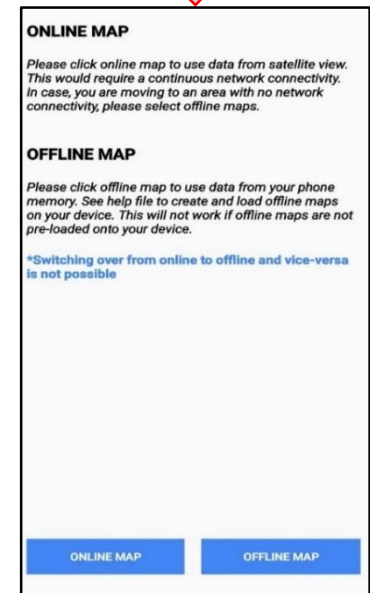
Form 1 is a vertical form with a white background. It contains the following fields: "State" (Uttarakhand), "Division/NP/TR" (Dehradun), "Range" (Asharodi), "Beat" (Karwapanl\_Central), "Trail" (a row of six radio buttons, with the first one selected), and "Team Photograph" (a camera icon with the text "Take photo" below it). A blue "NEXT" button is at the bottom.



Form 2 is titled "Ecological Member Details" and has a black header. It contains a "Member Name" field with a dropdown menu showing "Ninod", "Ashish", and "Krishna". Below the dropdown is a text field with the number "9876543210". At the bottom are two blue buttons: "SAVE DETAILS" and "START TRAIL".

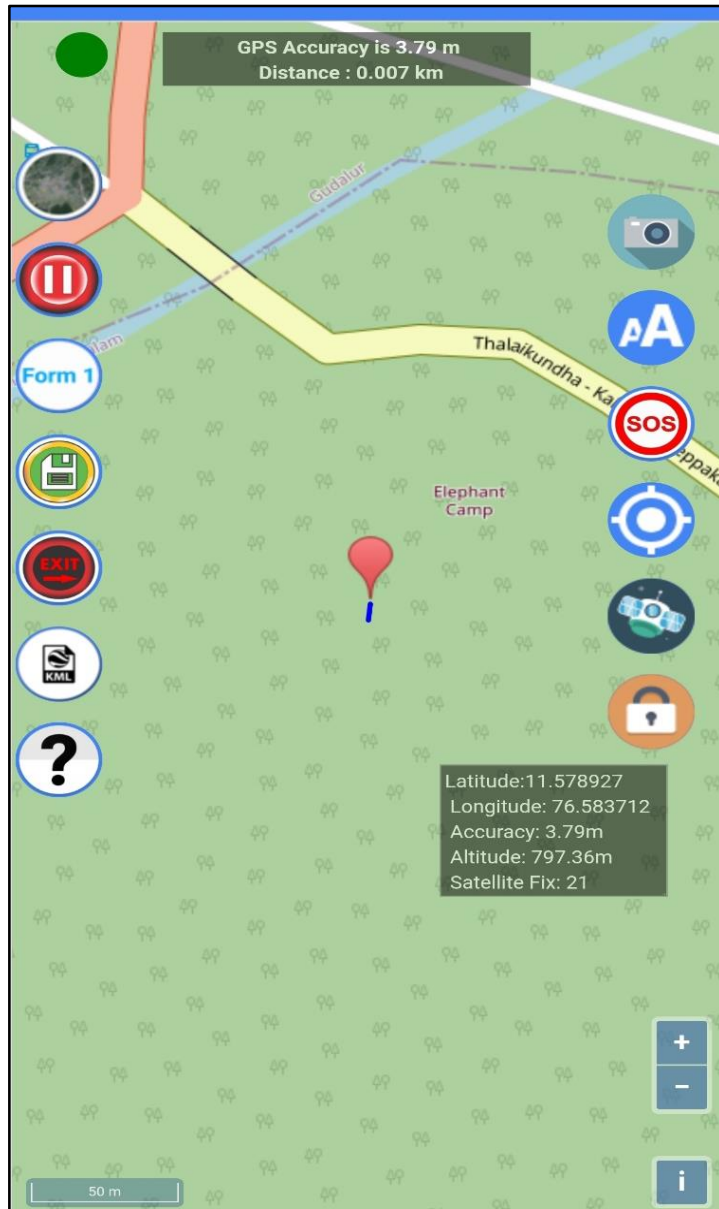


Form 3 is a file selection screen with a blue header showing "vivo 1921". It has a "Name" header and a list of files. The files are: "Rajaji.mbtiles" (8.69 MB Jan 30), "strategy.json" (17.45 kB Apr 7), "WII.mbtiles" (3.19 MB Dec 15), and "WII.mbtiles-..." (4.10 kB Dec 31). The "WII.mbtiles" file is highlighted with a red border.



Form 4 is a map selection screen with a white background. It has a blue header with the text "ONLINE MAP" and a paragraph explaining that online maps require a continuous network connectivity. Below this is a section titled "OFFLINE MAP" with a paragraph explaining that offline maps use data from the phone's memory. At the bottom are two blue buttons: "ONLINE MAP" and "OFFLINE MAP".

# MSTrIPES ecological app: Form 1





# Map Page Options

Status of GPS  
signal

Toggle map view

Pause/ resume

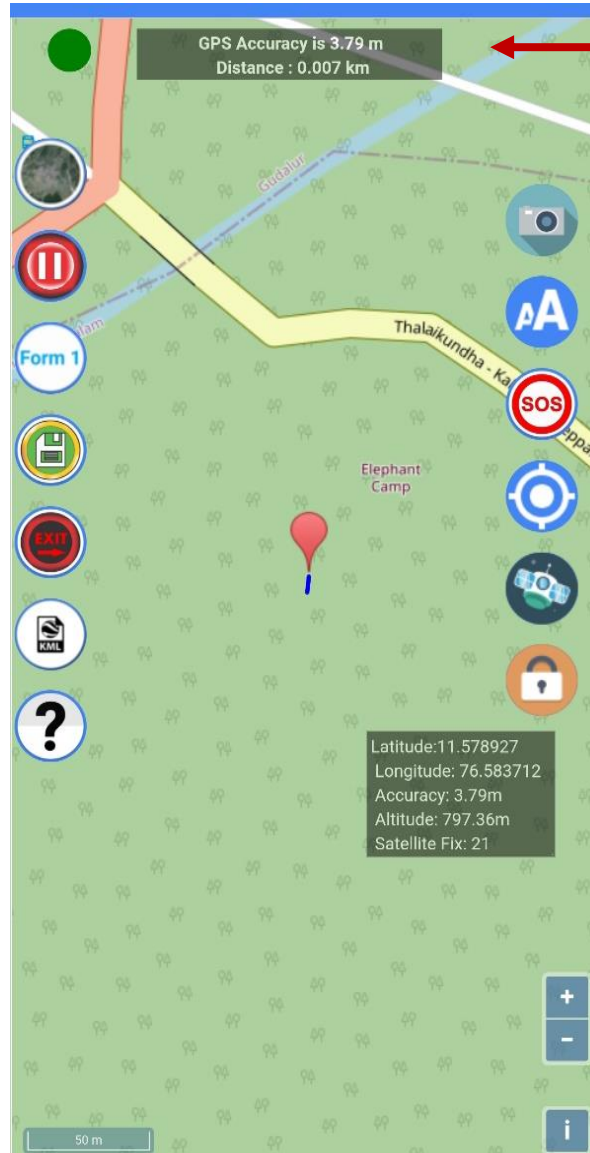
Data form

Save Data form

Exit button

Load .kml file

Questionnaire  
form



GPS accuracy and  
odometer

Camera button

Change language

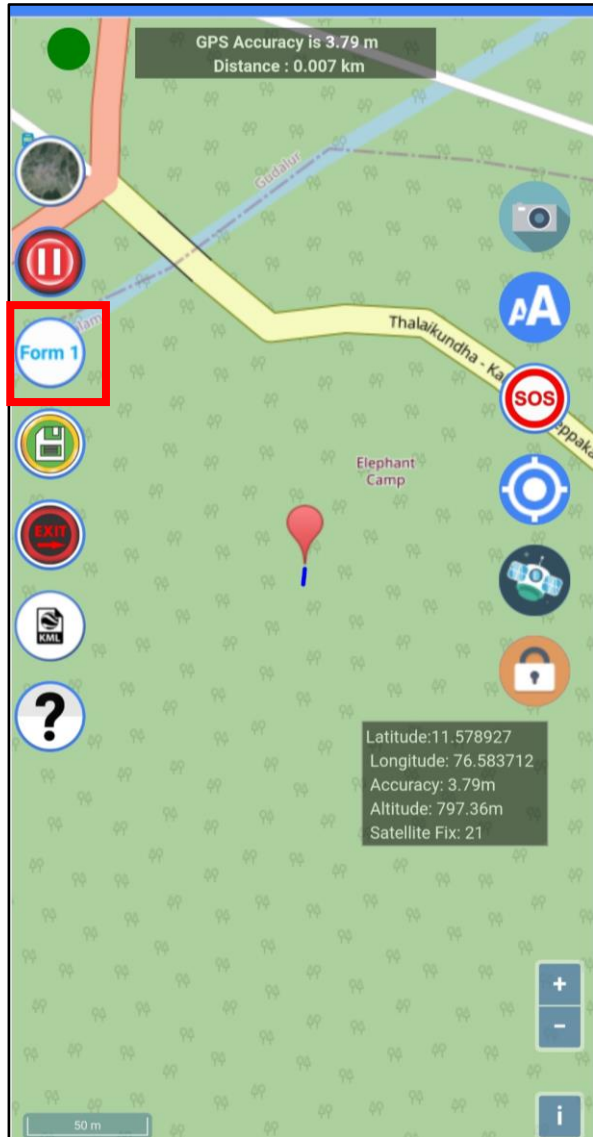
SOS button

Re-centre button

Satellite information


Lock map screen

# MSTrIPES ecological app: Form 1



## Indirect Sighting

Form 1 Details



Sign Type  
Pugmark\_Track

Species  
Dhole Wild Dog


Age of Tracks and Signs  
Very Fresh

Remarks  
Enter Any Remarks Here

SAVE DETAILS

## Direct Sighting

Form 1 Details

  
Take photo

Sign Type  
Direct Sighting

Species  
Tiger

Individual Number  
3

Male \_\_\_\_\_ Female 1

Young 2 \_\_\_\_\_ Unknown

Remarks  
Enter Any Remarks Here

SAVE DETAILS



# MSTrIPES ecological app: Form 1

GPS Accuracy is 4.7 m  
Distance : 1.597 km

Form 1

?

200 m

1) Has any tigress with cubs reported during the past twelve months?  
☒ Yes ☐ No  
Approximate Date  
14-5-2020

☒ A) Seen by Staff ☐ B) Pugmark ☐ C) Reported by Locals  
How Many Cubs?  
2  
Approximate age of cubs? (In Month)  
6

3) Has any leopard with cubs reported during the past twelve months?  
☒ Yes ☐ No  
Approximate Date  
11-4-2021

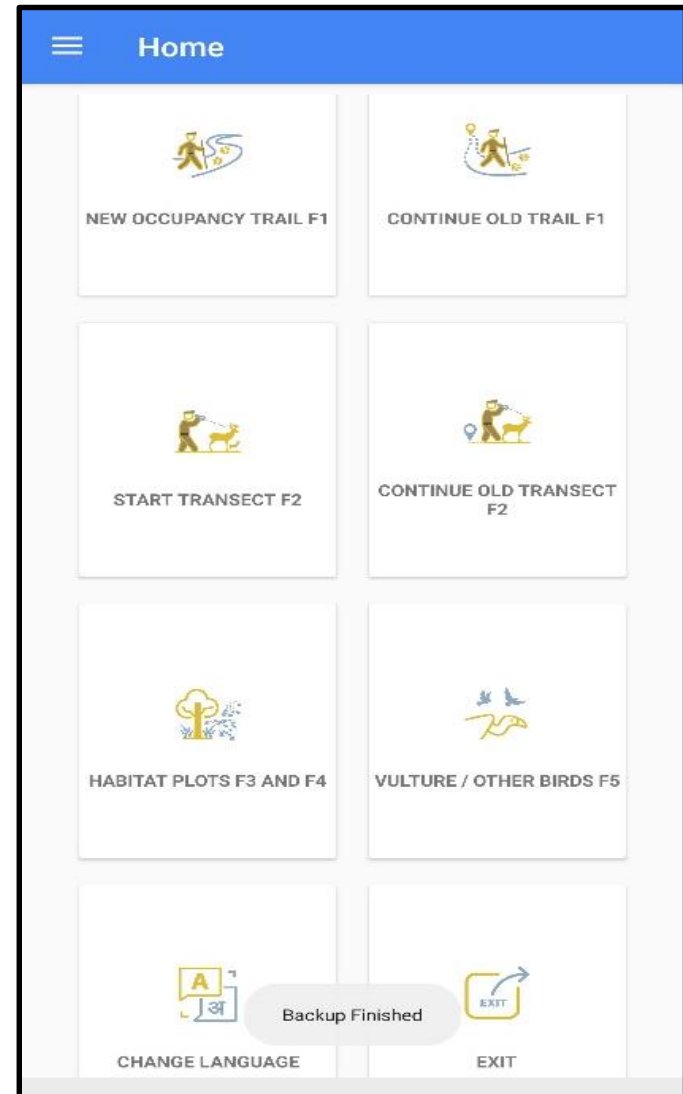
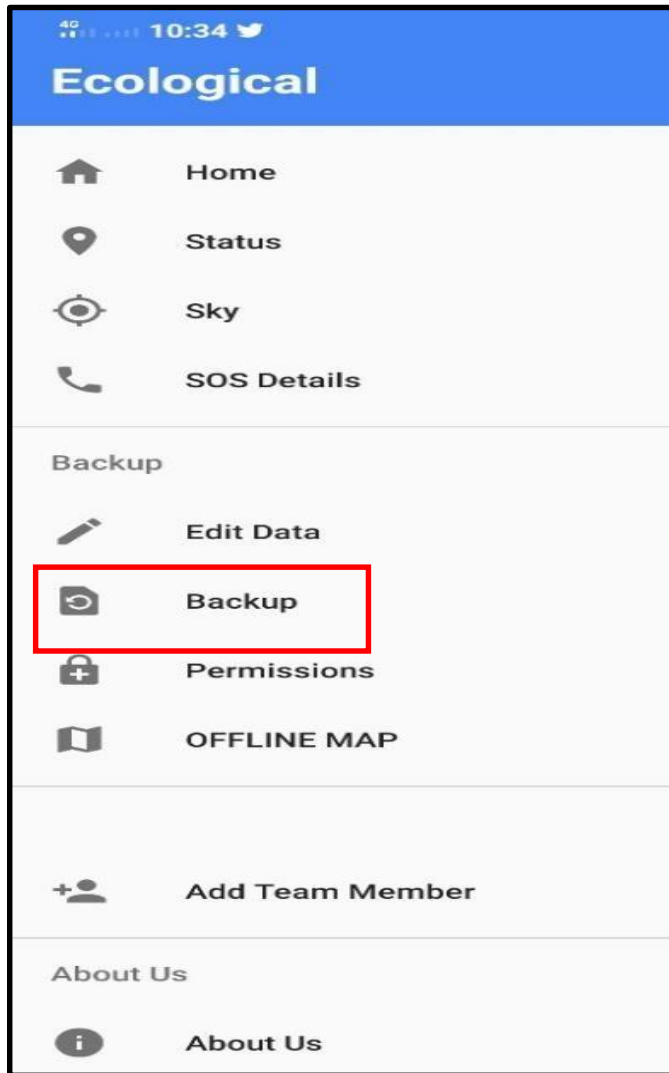
☐ A) Seen by Staff ☒ B) Pugmark ☐ C) Reported by Locals  
How Many Cubs?  
3  
Approximate age of cubs? (In Month)  
10

How many livestock predation events have been recorded in the past three months?  
Tiger 1 Leopard 2 Dhole     Other Carnivore    

Remarks

SAVE DETAILS

# MSTrIPES ecological app: Form 1





# Importing in MStrIPES desktop

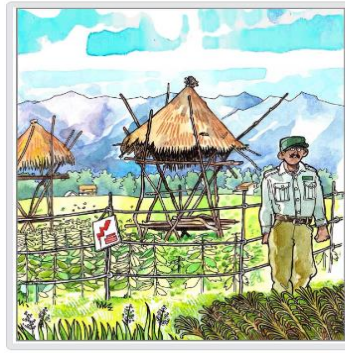
M-StrIPES

Monitoring System for Tigers - Intensive Protection and Ecological Status

? Help X Exit



Administrative Module



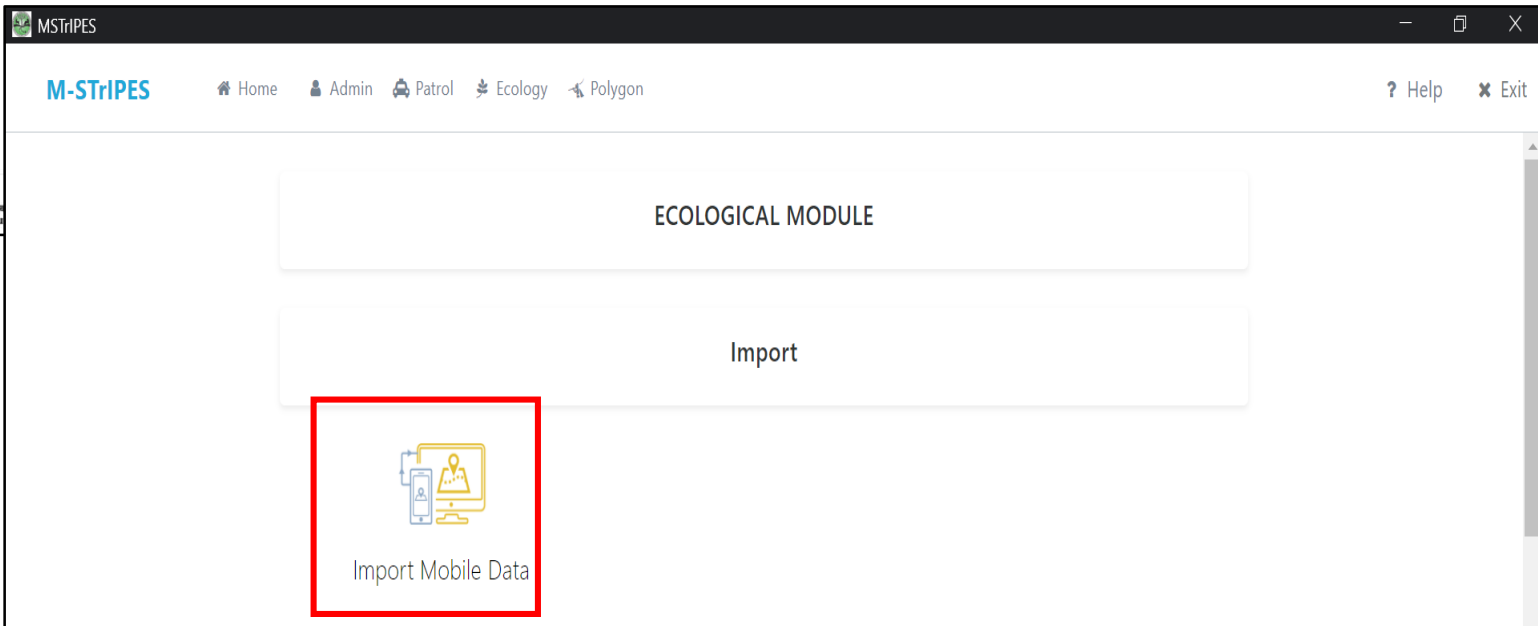
Patrol Module



Ecology Module



Polygon Module



# Importing in MStrIPES desktop

M-StrIPES

Home

Data Entry

Ecology Details

Spatial Analysis

Import Mobile Data

Home

Admin

Patrol

Ecology

Polygon

New mobile data folder

Old mobile data folder

Old mobile data as compressed zip

Select new mobile data folder to import data -

Choose

Upload

Clear

4 TRACKS

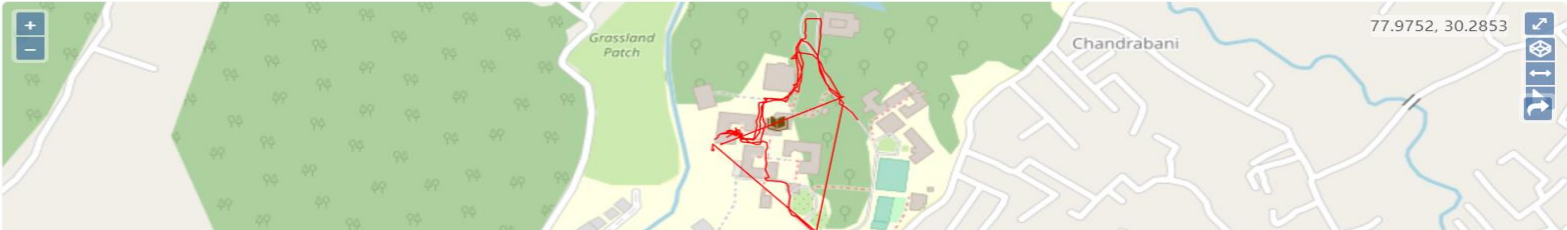
4 BEATS

1 km TRACK LENGTH

2 DAYS

Map View

Tabular View



M-StrIPES

Home

Admin

Patrol

Ecology

Polygon

Help

Exit

Carnivore Details

Select State

Select Division

Select Range

Select Beat

Select User

Select date

Run

Reset

Search

Showing 1 to 10 of 41 rows

10 rows per page

Delete	Team	Map	Track Id	Carnivore Sign	Photo Form	State	Division	Range	Beat	Trail	Season
			77972733028356_1625635170935_M			UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	4	02
			77974503028099_1625561826173_M			UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	1	02
			77972903028360_1625478904541_M			UTTARAKHAND	Dehradun	Asharodi	Unable to find beat!	1	02
			77974563028419_1625480249964_M			UTTARAKHAND	Dehradun	Asharodi	Unable to find beat!	2	02
			012019_014076003014_6			MADHYA PRADESH	Kanha Tiger Reserve	Kanha	KANHARI	6	01

MStrIPES Version 1.8.1, Developed by Kaiinos

# Carnivore distribution

1. The signs are **plotted in the GIS** platform using MStrIPES
2. Encounter rates of different signs for carnivores & mega herbivores are calculated by dividing the number of signs by effort invested for surveying at that scale as encounter rates.





# Pugmarks

7 inch



Sloth Bear भालू

6 inch



3.5 inch



Tiger बाघ



Leopard तेन्दुआ



Hyaena लकड़बग्घा



Dhole सोनकुत्ता




Jackal गीदड़

# Scat/ Dung collection during AITE

- To address the objectives of
  - Estimating minimum number of individuals and CMR estimates.
  - Population genetic structure of tigers in India
  - Prioritizing populations for conservation attention

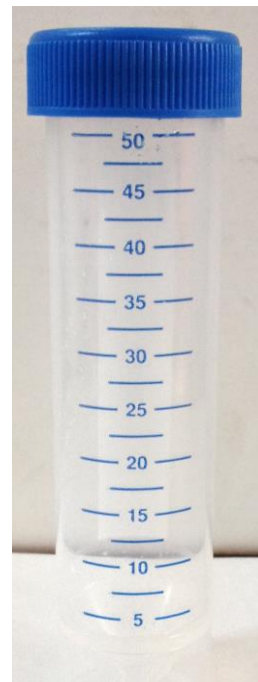
2018



*Status of*  
**TIGERS**  
**COPREDATORS**  
**& PREY IN INDIA**

# Collection Protocol

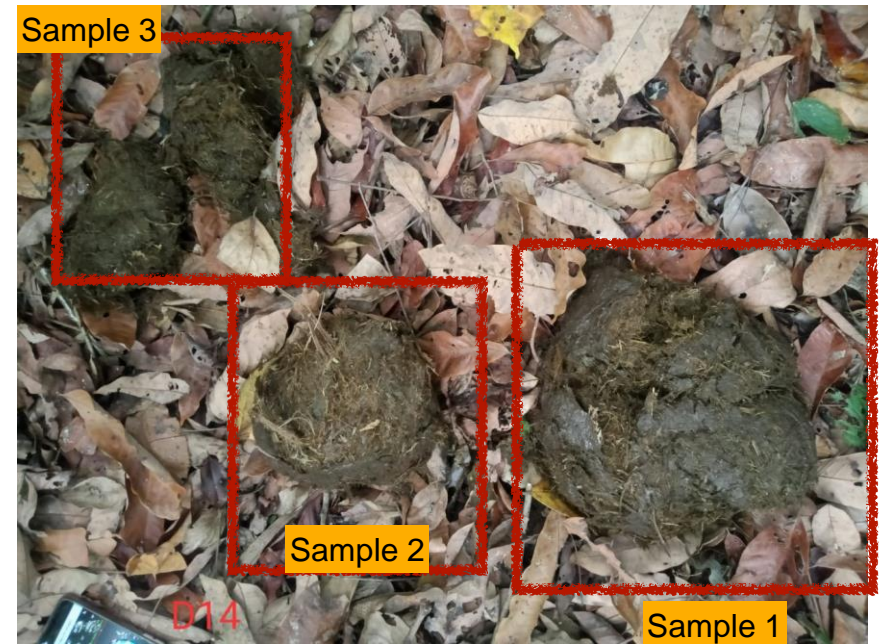
- Very Fresh or fresh scat/dung
- All carnivores and elephants
- Tube/Ziplock with silica gel
  - Preferable - whole scat (zip lock)
- GPS location, and place (state, division, range, beat)





# Elephant (& Mega Herbivore) Dung Collection Protocol for population estimation.

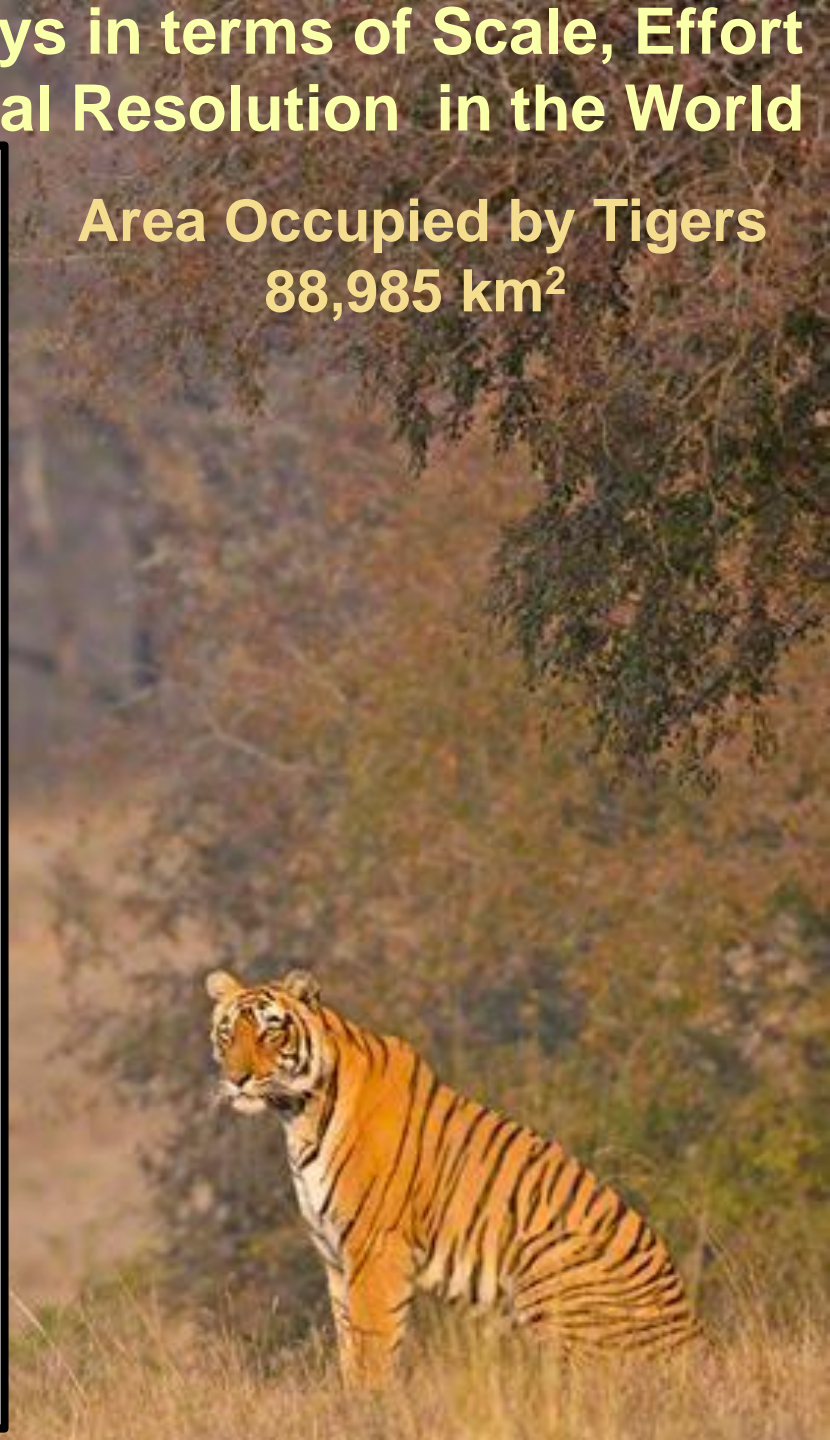
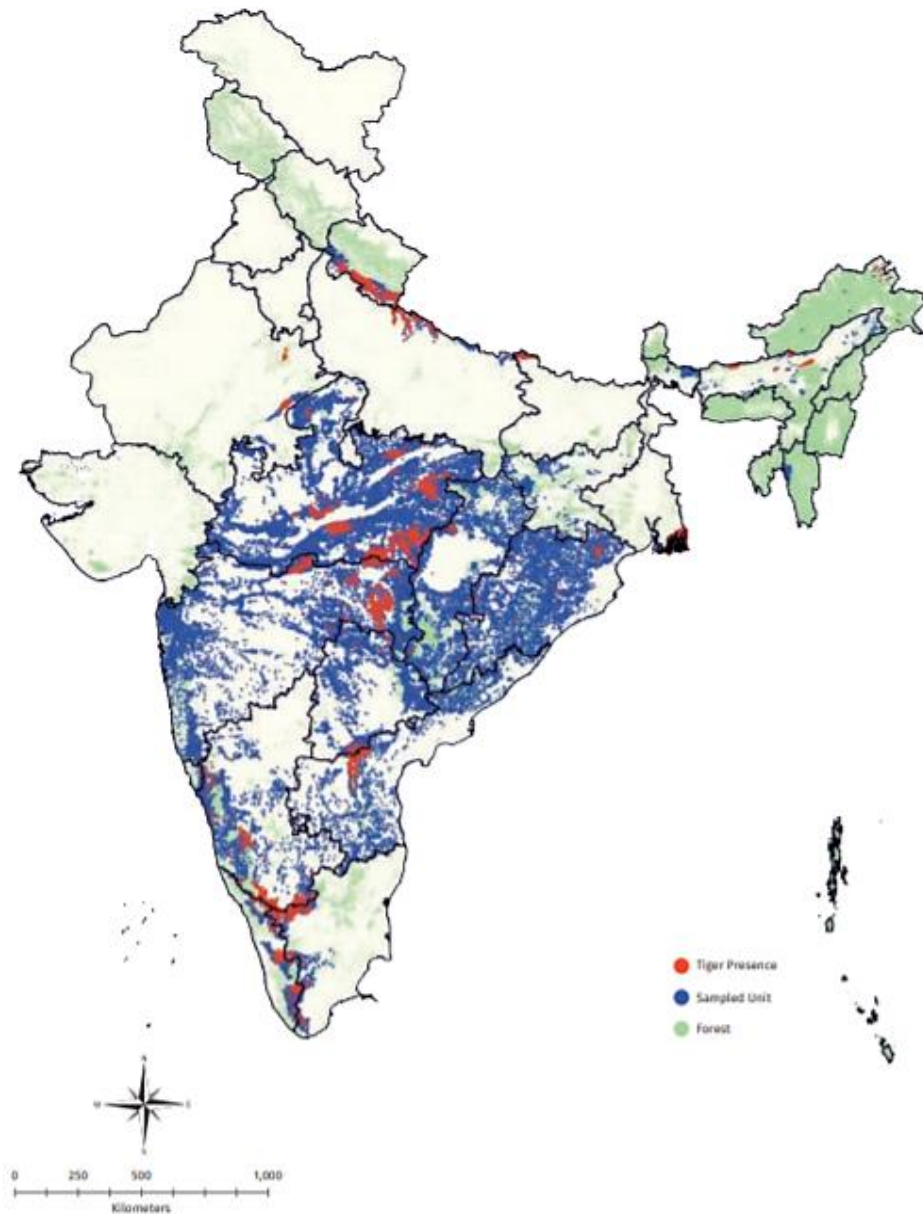
- During Carnivore and Megaherbivore sign survey (Form 1), collect samples of fresh elephant dung whenever encountered.
- Old dung (bolus is broken up and totally dry) should not be collected but just recorded on the MSTRIPES ecological app in form 1.
- Break the fresh dung with a stick or stone or an inverted zip lock bag and collect a sample of about 25 gms from the interior of the bolus.
- If you come across a dung pile from multiple animals (dung boluses of different sizes), collect one sample from each size class bolus.
- Collect fresh dung samples wherever encountered during the sign survey.
- Fill approximately 1/5th of the bag with silica gel
- Seal tightly after putting in the sample
- Record details of the following on the zip lock bag on a paper sticker adhered to the bag. Do not write directly on the plastic bag as it will wear off.
  - Sample ID (Of users choice, but generally includes name of PA, for eg. Sample first sample collected in Bandipur on 23May 2019 would be BND23052019\_1).
  - Date
  - Species (Elephant/Gaur/Wild Buffalo/Rhino)
  - GPS location,
  - Location: Division, Range, Beat.
  - collectors name



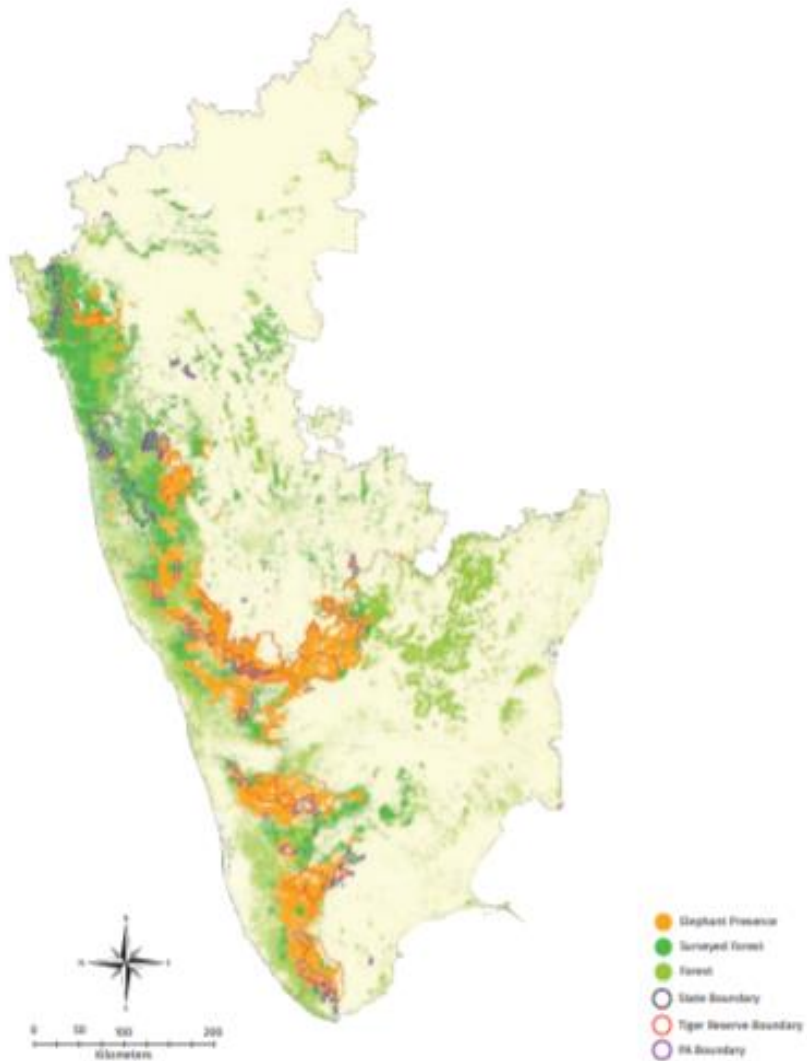


# One of the Largest Wildlife Surveys in terms of Scale, Effort & Spatial Resolution in the World

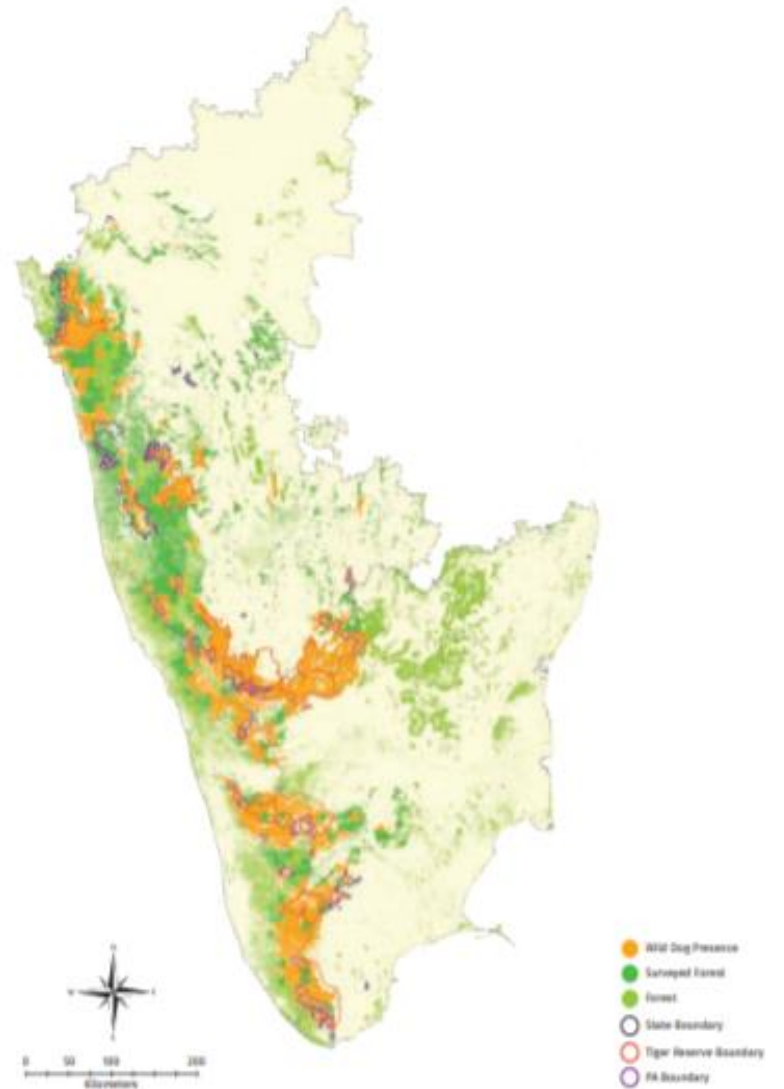
Area Occupied by Tigers  
88,985 km<sup>2</sup>



# Elephant



# Dhole



# Carnivore occupancy

- It is possible that the surveyed beat is having the presence of tigers or other carnivores, however, during the sigh survey no evidence was found.
- In such cases occupancy models allow and correct imperfect detection. Therefore, report actual data as collected from the field and do not worry if it does not show a tiger sign.
- Occupancy models also incorporate covariates, i.e. factors that influence the presence of carnivores (tigers/leopards etc.) in an area, e.g. Human disturbance, prey availability, habitat quality.



# Form 2: Line transect sampling for Prey estimation

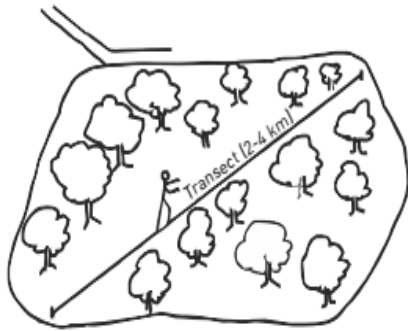


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Wildlife Institute of India



# Line transect (Form 2)

Marking transects in a beat.



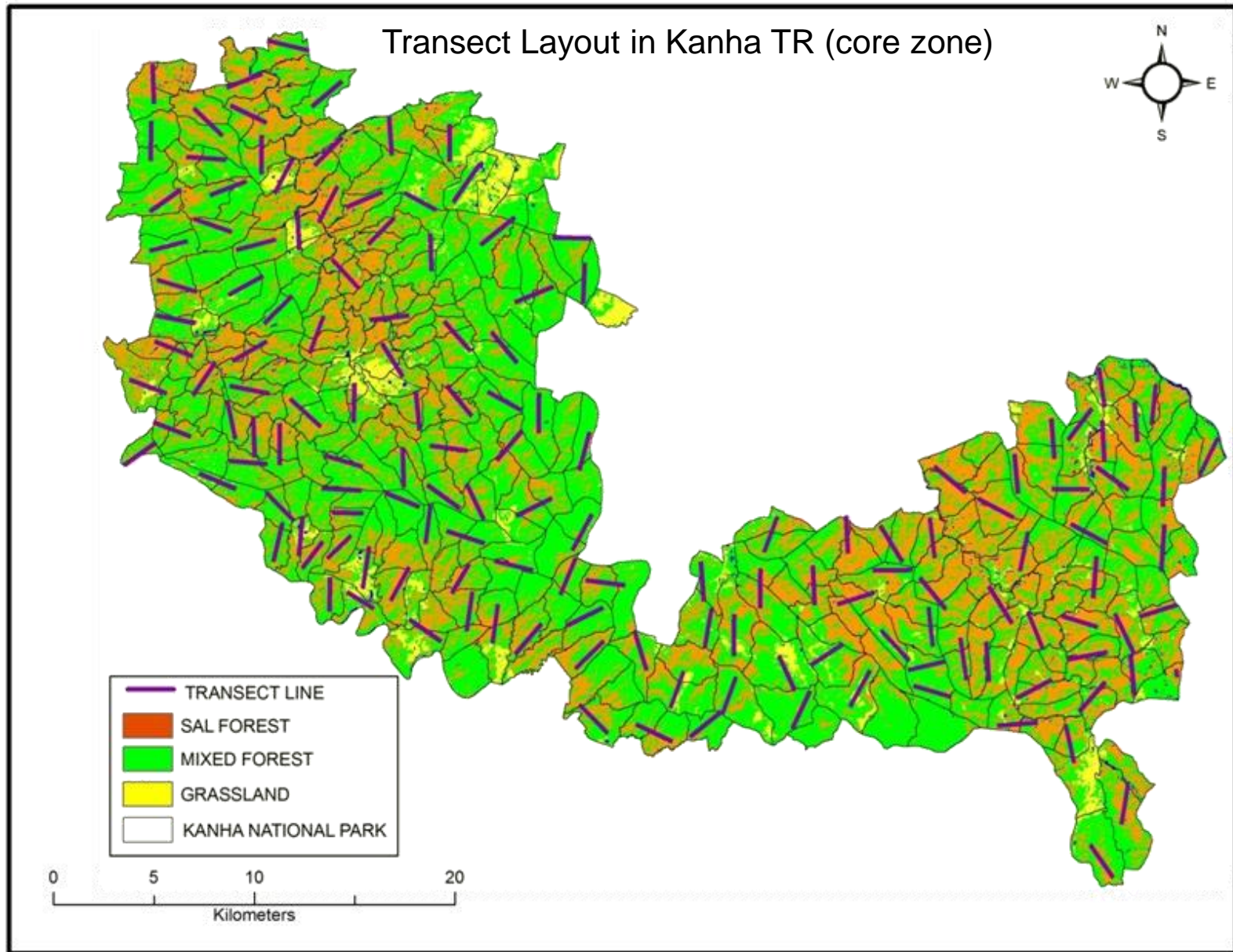
a) Line transect in a beat with similar habitat



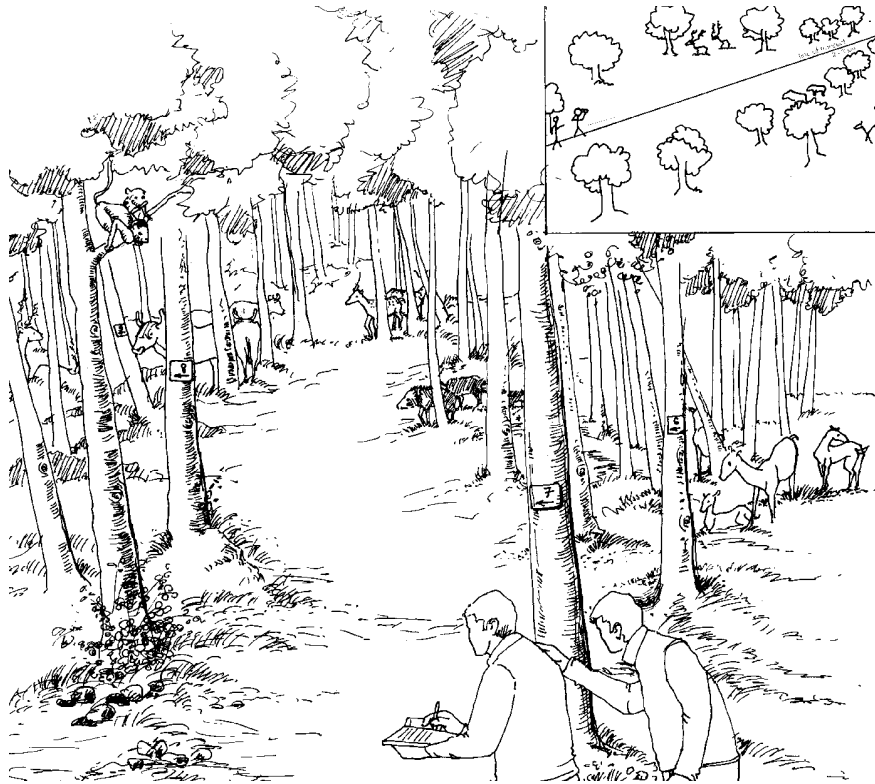
b) Line transect in a beat with 2 habitat types.

- Each Forest Beat would be considered as the unit for sampling.
- Each forest beat (around 15 km<sup>2</sup>), should have at least one transect line, Beats more than 15 km<sup>2</sup> may consider for two transect lines.
- If a forest beat has two or more distinct habitat types (e.g. grassland 40%, deciduous forest 60%), then two habitat specific transects should be laid and sampled.
- Length of transect should preferably be of 2 km (not exceeding 4 km).
- Transect should not be located near busy road nor parallel to the river, road or other features of the landscape which may bias the sighting of ungulates.
- Transect should clearly marked throughout the line so that observers do not deviate from the line of walk.

# Line transect (Form 2)



# Line transect (Form 2)



- Transect should be walked by only 2-3 persons during the early morning hours.
- Before Transect walk, Get well acquainted with use of Range finder, Compass and MStrIPES Ecological Mobile App .
- The observer should minimize the chances of the animal getting disturbed by the noise and presence of the observer during transect walk.
- Each line transect needs to be walked at least on three different mornings (temporal Replicates).
- Record walk bearing, animal bearing, radial distance and count of each species (Adults and Young)
- For each animal sighting, the animals are considered to belong to two different groups if the closest animals from the two groups are separated by a distance of over 30m.

## FORM 2: SAMPLING FOR PREY SPECIES ABUNDANCE

Forest Division: Range: Beat: Date:  
 Transect ID: Transect Replicate: Transect Bearing: Transect length (km):  
 Start time: End time: Habitat type\*: Terrain type\*\*:  
 Start Latitude: N Start Longitude: E  
 End Latitude: N End Longitude: E  
 Weather: Sunny () / Cloudy () / Rain ()

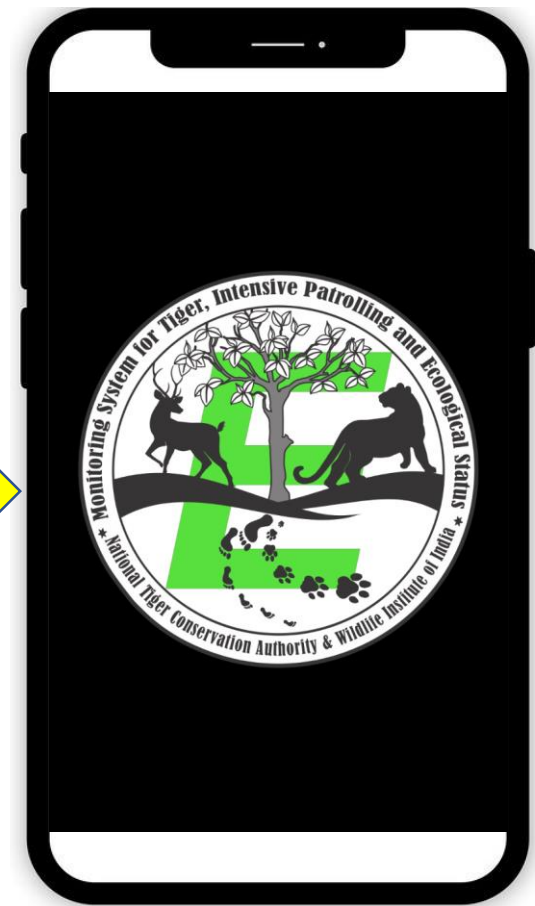
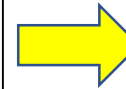
Observers	Name	Designation	Phone No.
1			
2			

S. No.	Time	Latitude			Longitude			Species	Total no. (Adult & young)	Young	Angular Sighting Distance (m)	Compass bearing		Habitat type*	Terrain type**	Remarks
		Deg.	Min.	Sec.	Deg.	Min.	Sec.					Animal	Walk			
1																
2																
3																
4																
5																
6																
7																
8																
9																
10																
11																
12																
13																
14																
15																
16																
17																

Instructions: (1) The start and end time of the transect must be recorded. (2) The format of GPS location should be in degree-minute-seconds. (3) The walk bearing and animal bearing should be written while walking the 2 km transect (the walk bearing and transect bearing can be different if line transect is passing through hill or different terrain).

\*Habitat type should be one of: Agriculture/Plantation, Alpine meadows, Bamboo, Coniferous forest, Desert rocky, Desert sandy, Dhonk forest, Fallow land, Himalayan broad leaved, Hollong forest, Mangroves, Miscellaneous dry deciduous forest, miscellaneous evergreen forest, miscellaneous moist deciduous forest, miscellaneous Semi-evergreen forest, Orchards, Pasture, Riverine & Wetland, Sal forest, Scrub, Shola grassland, Short grassland, Tall grassland, Teak forest, Thorn forest

\*\* Terrain type should be one of: Hilly, Plain, Steep, Undulating, Valley, Very steep.



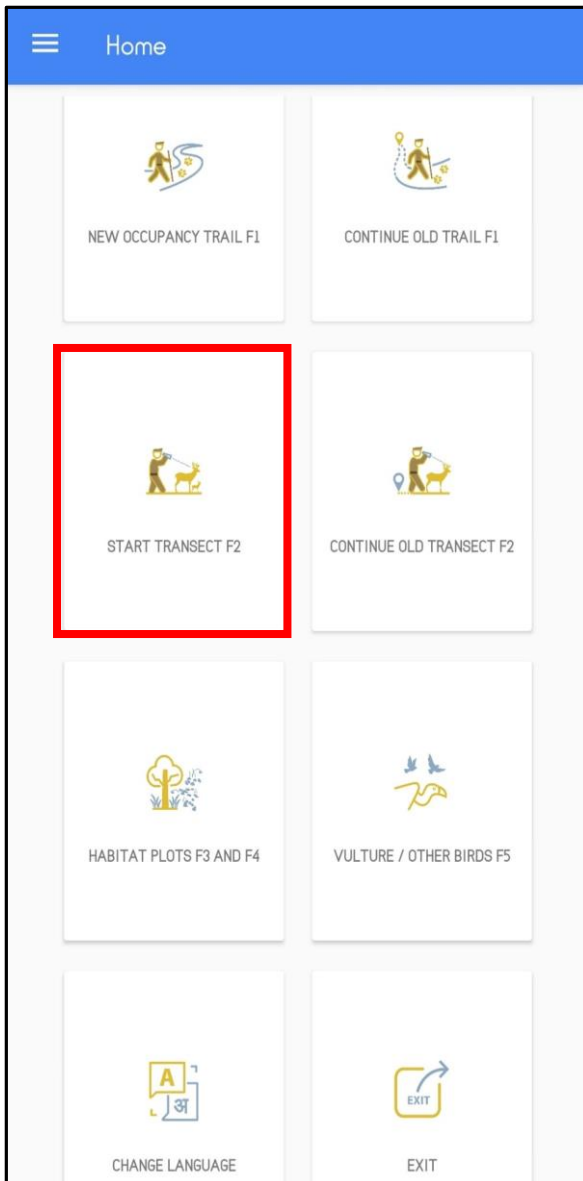
Due to Errors Associated with Manual Data Entry in Forms, only Digitally recorded Data will be Analyzed Further.

## Advantages:

- Ease of data collection
- Data transparency
- Do away with data entry error
- Timely report generation



# MSTripES Ecological app: Form 2



Home

NEW OCCUPANCY TRAIL F1

CONTINUE OLD TRAIL F1

**START TRANSECT F2**

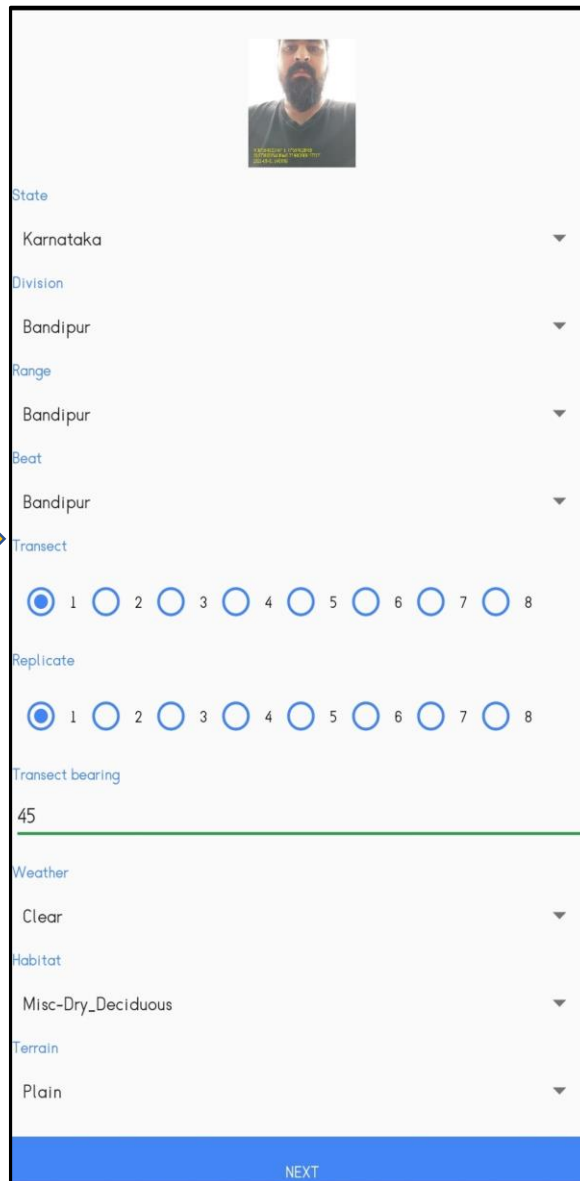
CONTINUE OLD TRANSECT F2


HABITAT PLOTS F3 AND F4

VULTURE / OTHER BIRDS F5

CHANGE LANGUAGE

EXIT





State  
Karnataka

Division  
Bandipur

Range  
Bandipur

Beat  
Bandipur

Transect  
☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

Replicate  
☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7 ☐ 8

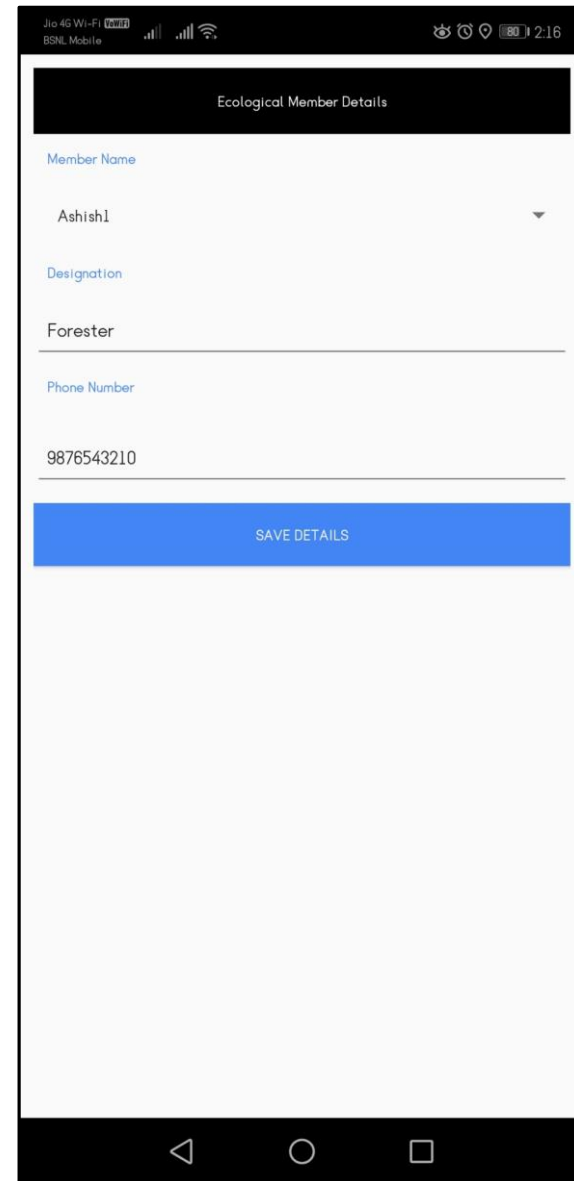
Transect bearing  
45

Weather  
Clear

Habitat  
Misc-Dry\_Deciduous

Terrain  
Plain

NEXT



Ecological Member Details

Member Name  
Ashish1

Designation  
Forester

Phone Number  
9876543210

SAVE DETAILS

# MSTrIPES ecological app: Form 2

## ONLINE MAP

Please click online map to use data from satellite view. This would require a continuous network connectivity. In case, you are moving to an area with no network connectivity, please select offline maps.

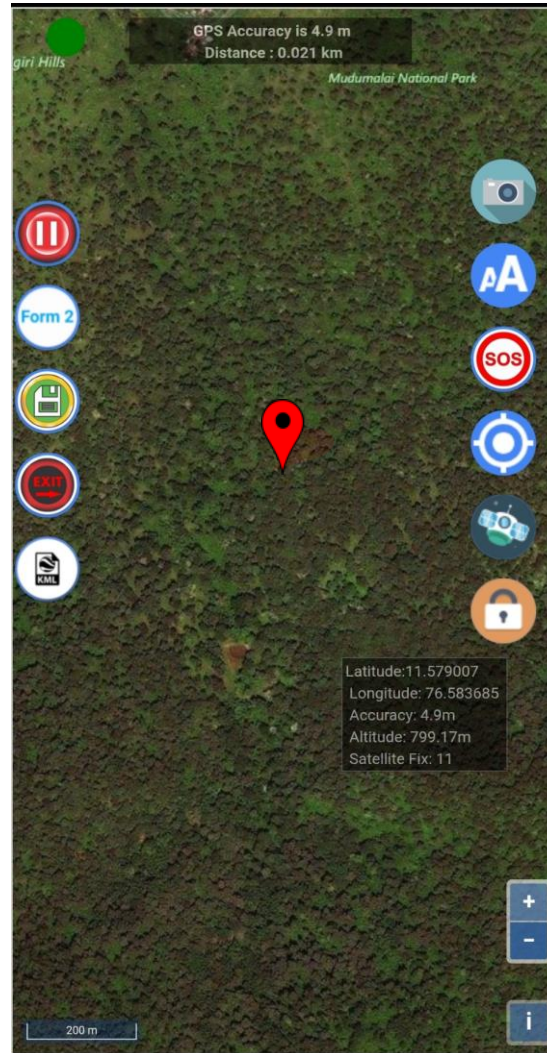
## OFFLINE MAP

Please click offline map to use data from your phone memory. See help file to create and load offline maps on your device. This will not work if offline maps are not pre-loaded onto your device.

\*Switching over from online to offline and vice-versa is not possible

ONLINE MAP

OFFLINE MAP

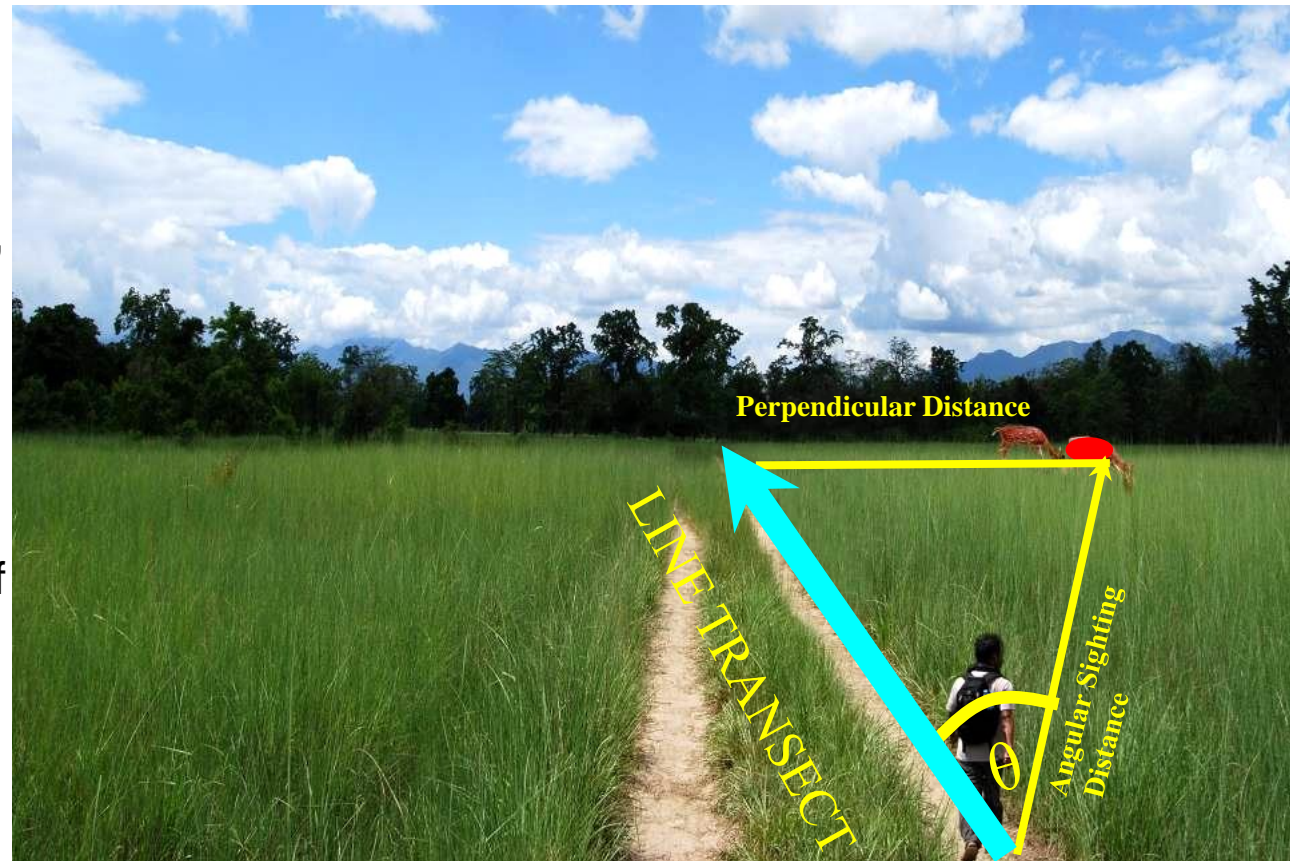




# Line transect (Form 2)

## Walking Line Transects

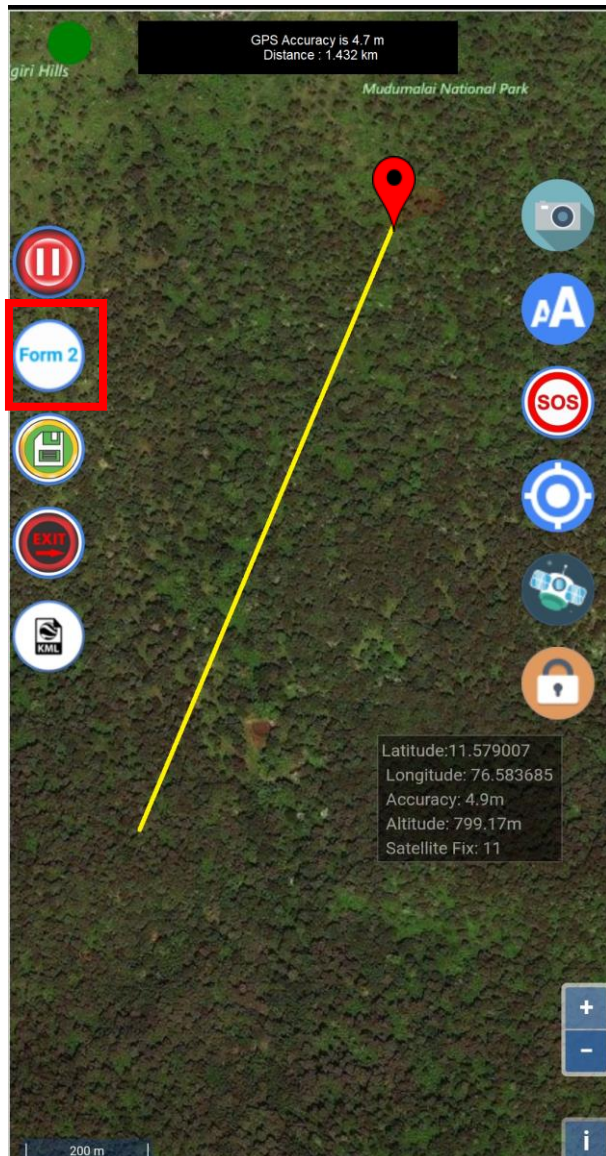
- Record **animal bearing** (suntto compass), **transect bearing** (suntto compass), **GPS location**, **distance of animal** (range finder) at every sighting
- To calculate Perpendicular Distance of the sighted animal from the transect line We record Radial Distance & Sighting Angles




$$\text{Perp. Dist} = \text{Ang. Dist} * \sin \text{Angle}$$

These computations are done automatically by the software.

# MSTrIPES ecological app: Form 2



Ecological Form 2

  
Take photo

Species  
Chital or Spotted Deer

Total Animals  
15

Young Seen  
3

Habitat  
Misc-Dry\_Deciduous

Terrain  
Undulating

Animal Bearing  
45

Walk Bearing  
80

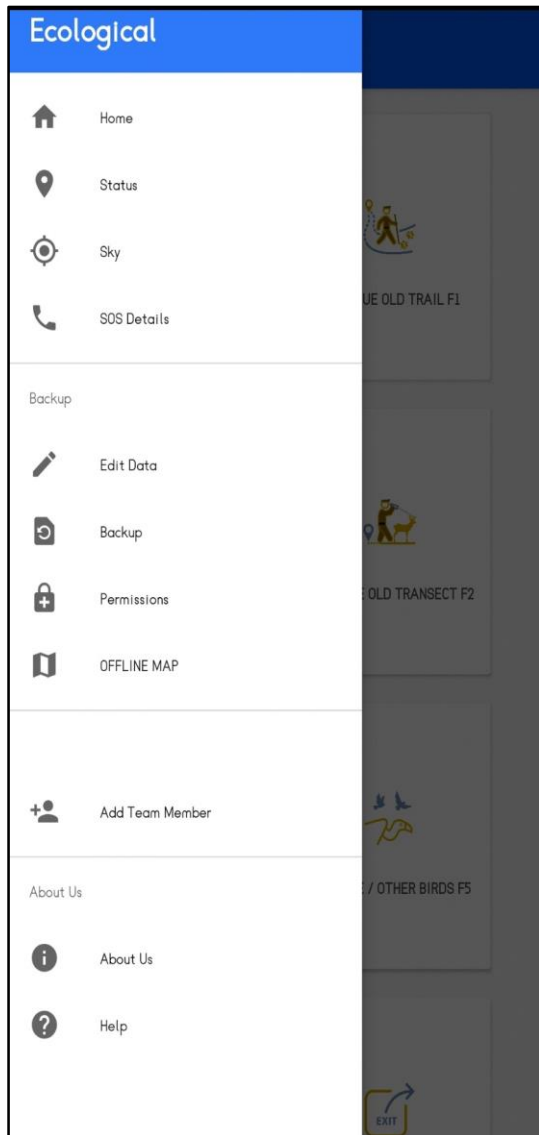
Angular Distance(mtr)  
102

Remarks  
Enter Any Remarks Here

SAVE DETAILS



# MSTrIPES ecological app: Form 2

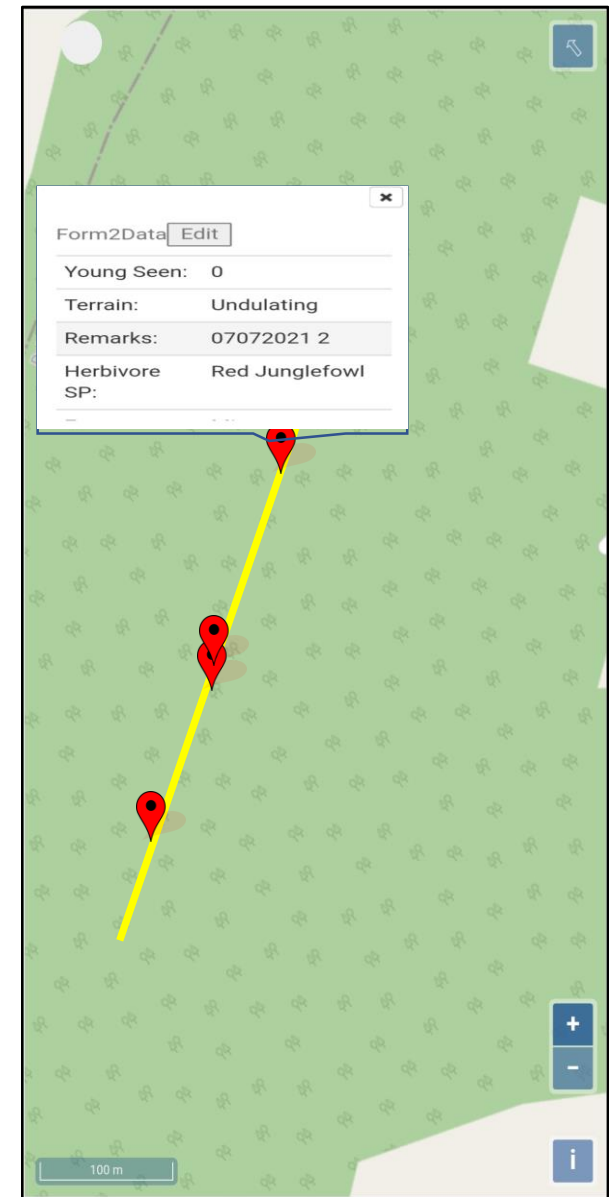


EDIT FORM 1 RECORDS

EDIT FORM 2 RECORDS

CLEAR EXISTING DATA

State	Division	Range	Beat	Transect	Replicate
Uttarakhand	Dehradun	Asharodi	Chandrabani	1	1
Uttarakhand	Chakrata	Molta	Molta	1	1



# Important species to record

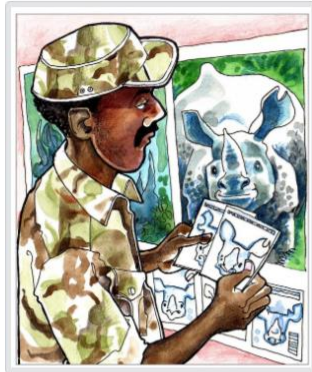




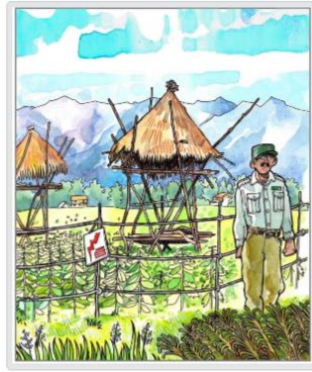
# Important species to record



# Importing in MStrIPES desktop



Administrative Module



Patrol Module



Ecology Module



Polygon Module

M-STripES

Home Admin Patrol Ecology Polygon

Help Exit

ECOLOGICAL MODULE

Import

Import Mobile Data

Data Entry

Carnivore Sign Data Entry

Line Transect & Plot Data Entry

Vulture / Other Birds Data Entry

Ecology Details

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on 1.8.1, Developed by Kaiinos

MSTripES Version 1.8.1, Developed by Kaiinos



# MSTripES Form 2 analysis

Home

Data Entry

Ecology Details

Carnivore Details

Line Transect Details

Plot Details

Vulture/Other Bird Details

Spatial Analysis

Import Mobile Data

MSTripES

HomeAdminPatrolEcologyPolygon

HelpExit

New mobile data folder

Old mobile data folder

Old mobile data as compressed zip

MSTripES\_Ecological uploaded successfully in 18 secs!

Select new mobile data folder to import data -

+ Choose

Upload

Clear

7 TRACKS

2 BEATS

1 km TRACK LENGTH

1 DAYS

Map View

Tabular View

MSTripES

HomeAdminPatrolEcologyPolygon

HelpExit

Herbivore Details

Select StateSelect DivisionSelect RangeSelect BeatSelect UserSelect date

RunReset

Search

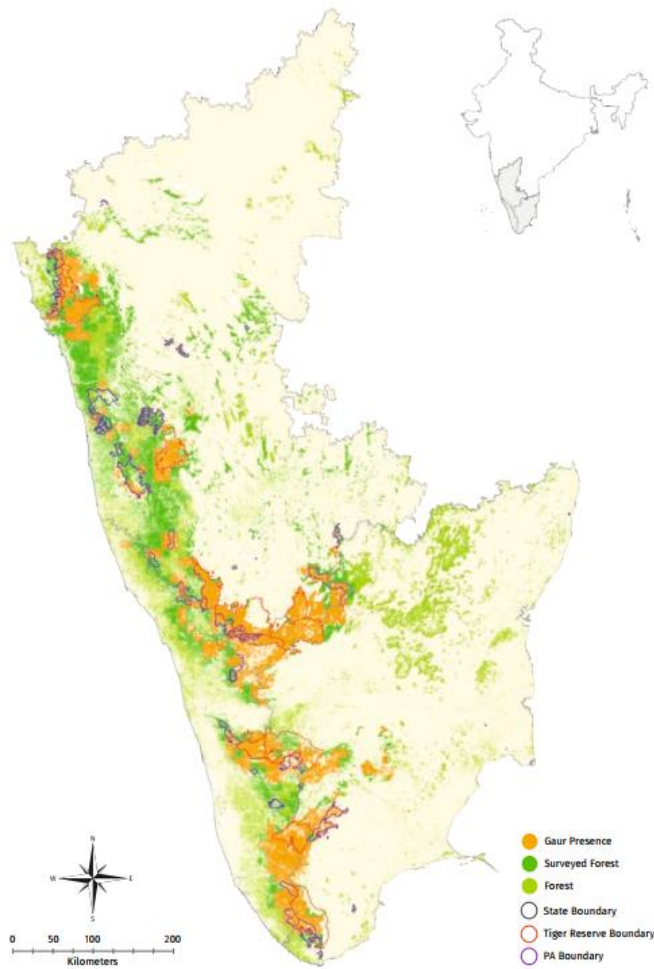
Showing 1 to 10 of 343 rows10 rows per page

Delete	Team	Map	Track Id	Herbivore Sign	Photo Form	State	Division	Range	Beat	Transect	Replicate	Season	User
	No image to display		8091960223200_07292021080000_S			MADHYA PRADESH	Kanha Tiger Reserve	Supkhar	ARMI	1	1	02	ASHISH PRASAD
			77979173028086_1618903313500_M			UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	1	2	01	Ashish Prasad
	No image to display		77980343027788_1618810357386_M			UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	1	1	01	Ashish Prasad
			022019_020059003008_14			ODISHA	Simlipaltr_Rairangpur	Unable to find range!	Unable to find beat!	1	4	02	-

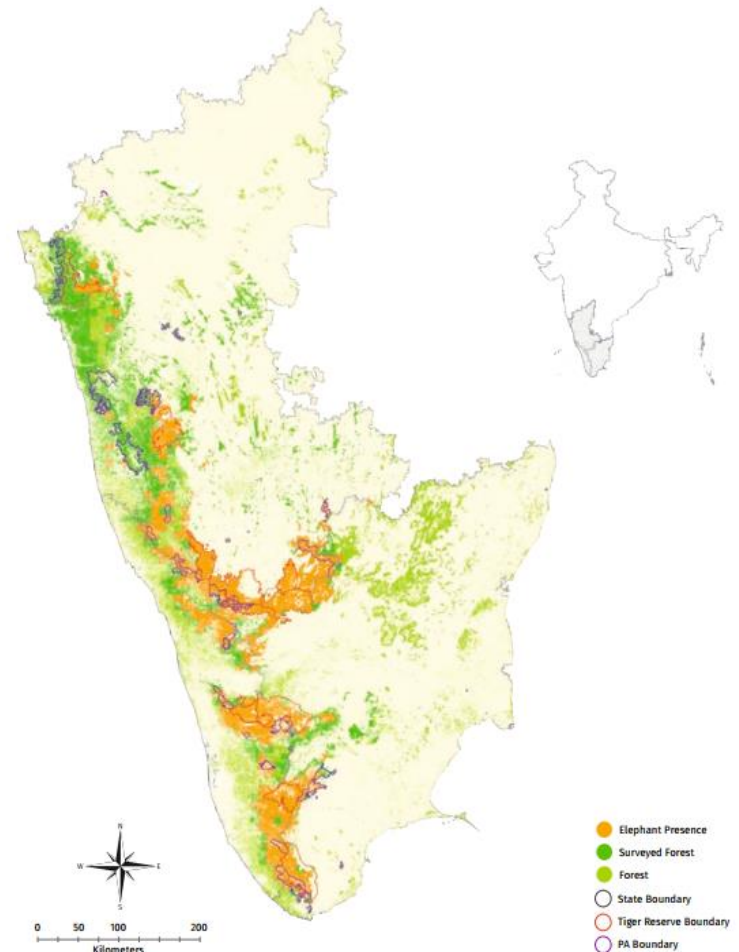
# Prey distribution

The sightings are **plotted in the GIS** platform using MSTRIPES

Gaur



Elephant





# Form 3 (A,B,C) and 4: Habitat and pellet plots





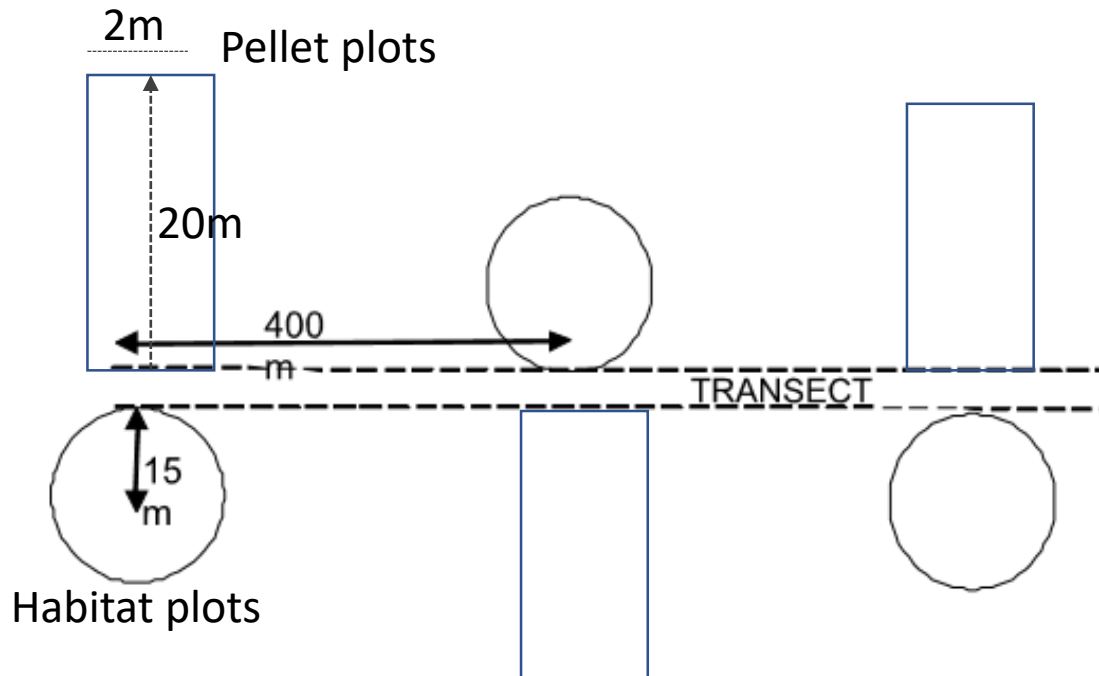
# Habitat and pellet plots



- To quantify the **habitat parameters** and **human disturbance**
- **Sample Plots at every 400m interval** while returning from each transect
- **6 plots on an average on a 2 km transect**
- **Form 3** has (A) **vegetation parameters** (B) **human disturbance signs** and (C) **ground cover**
- **Form 4** to **pellet counts**



# Habitat and pellet plots

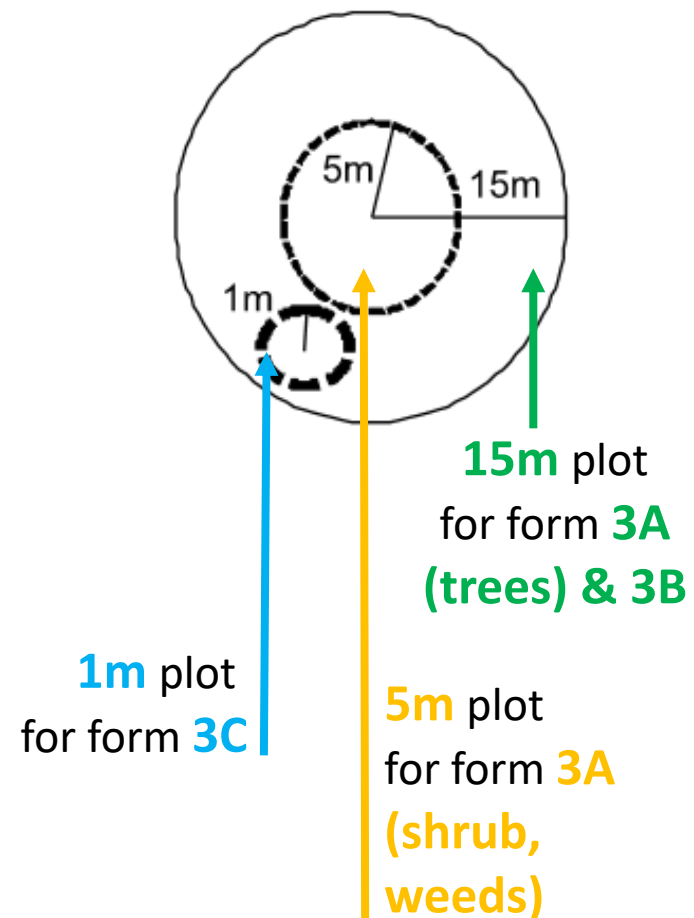


**Form 3A: trees, shrubs and shrubby weeds**

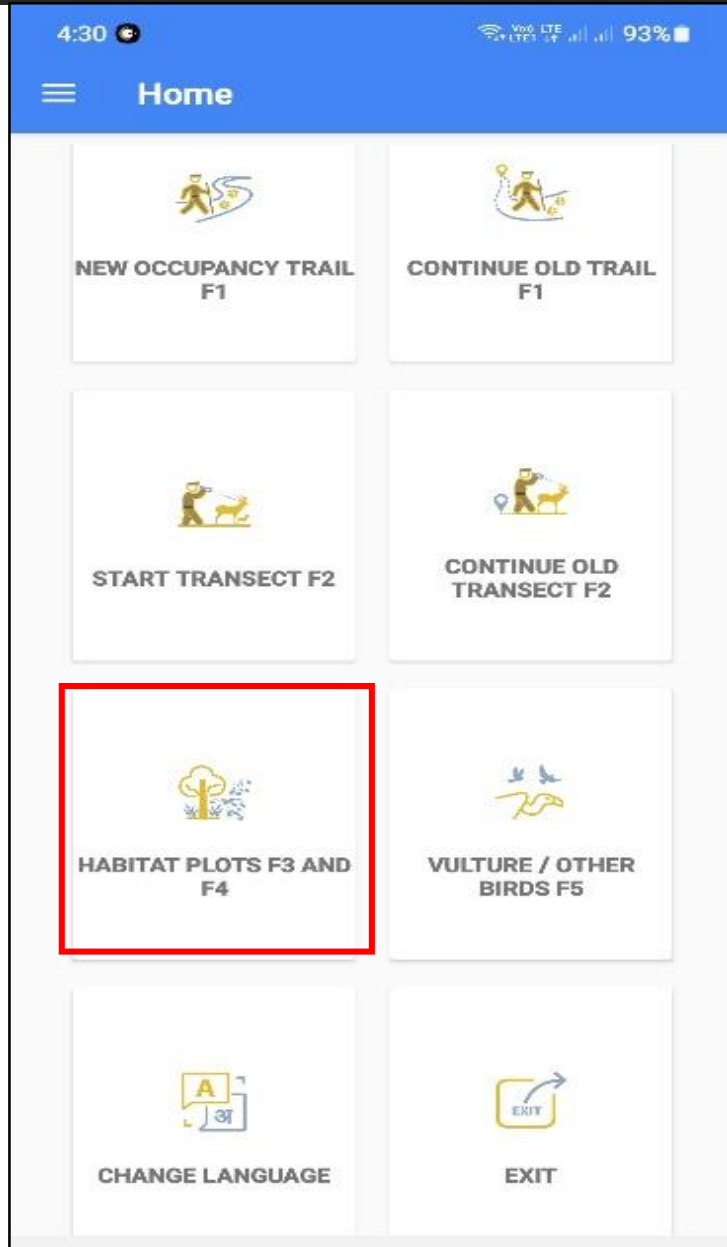
**Form 3B: Human disturbance signs**

**Form 3C: herbs, grass and ground cover**

**Form 4: ungulate pellet count**



# MSTrIPES ecological app: Form 3 & 4



State

Uttarakhand ▼

Division/NP/TR

Dehradun ▼

Range

Asharodi ▼

Beat

Chandrabanl ▼

Transect

☒ 1 ☐ 2 ☐ 3 ☐ 4 ☐ 5 ☐ 6 ☐ 7

NEXT

# MSTrIPES ecological app: Form 3 & 4

Latitude 30.283758 Accuracy 9.94 m  
Longitude 77.972865 Satellite Fix 12/27

PLOT-00	PLOT-01	PLOT-02	PLOT-03
PLOT-04	PLOT-05	PLOT-06	PLOT-07
PLOT-08	PLOT-09	PLOT-10	PLOT-11
PLOT-12	PLOT-13	PLOT-14	PLOT-15
PLOT-16	PLOT-17	PLOT-18	PLOT-19

Latitude 30.283758 Accuracy 9.94 m  
Longitude 77.972865 Satellite Fix 12/27

PLOT-00	PLOT-01	PLOT-02	PLOT-03
PLOT-04	PLOT-05	PLOT-06	PLOT-07
PLOT-08	PLOT-09	PLOT-10	PLOT-11

Select Form to Fill

RECORD PLOT GPS
FORM - 3A
FORM - 3B
FORM - 3C
FORM - 4

Latitude 30.283758 Accuracy 9.94 m  
Longitude 77.972865 Satellite Fix 12/27

PLOT-00	PLOT-01	PLOT-02	PLOT-03
PLOT-04	PLOT-05	PLOT-06	PLOT-07
PLOT-08	PLOT-09	PLOT-10	PLOT-11


Select Form to Fill

RECORD PLOT GPS
FORM - 3A
FORM - 3B
FORM - 3C
FORM - 4




# MSTrIPES ecological app: Form 3A

15 m. radius



Tree Species

5 m. radius



Shrub\_Species

5 m. radius



Weed\_Species

Canopy Cover

Select Category ▼

Habitat

Select Habitat Type ▼

Terrain

Select Terrain Type ▼

Remarks

Enter Any Remarks Here

  
Take photo

SAVE DETAILS

Visual canopy cover. Check with the tree number

Habitat type in the overall plot

Terrain type in the overall plot

Photograph of the overall plot

15 m. radius

Tree\_Species

5 m. radius

Shrub\_Species

5 m. radius

Weed\_Species

In 15m radius circular plot

Species 1	Species Number
Tree Species	
Species 2	Species Number
Tree Species	
Species 3	Species Number
Tree Species	
Species 4	Species Number
Tree Species	
Species 5	Species Number
Tree Species	
Species 6	Species Number
Tree Species	
Species 7	Species Number
Tree Species	
Species 8	Species Number
Tree Species	
Species 9	Species Number
Tree Species	
Species 10	Species Number
Tree Species	

SAVE

CANCEL

15 m. radius

Tree\_Species

5 m. radius

Shrub\_Species

5 m. radius

Weed\_Species

In 5m radius circular plot

Species 1	Percentage Cover
Shrub_Species	
Species 2	Percentage Cover
Shrub_Species	
Species 3	Percentage Cover
Shrub_Species	
Species 4	Percentage Cover
Shrub_Species	
Species 5	Percentage Cover
Shrub_Species	
Species 6	Percentage Cover
Shrub_Species	
Species 7	Percentage Cover
Shrub_Species	
Species 8	Percentage Cover
Shrub_Species	
Species 9	Percentage Cover
Shrub_Species	
Species 10	Percentage Cover
Shrub_Species	

SAVE

CANCEL

15 m. radius

Tree\_Species

5 m. radius

Shrub\_Species

5 m. radius

Weed\_Species

In 5m radius circular plot

Species 1	Percentage Cover
Weed_Species	
Species 2	Percentage Cover
Weed_Species	
Species 3	Percentage Cover
Weed_Species	

SAVE

CANCEL

1. Common and scientific names in the drop down, provided in previous cycles
2. For trees, provide number. For shrubs and weeds, provide percent ground cover.
3. In case no species is present, enter 'No\_species'
4. In case an unidentified species is present, enter 'unidentified species'
5. In case of additional names, please provide the list within a week

# MSTrIPES ecological app: Form 3B

Latitude 30.283758 Accuracy 9.94 m  
Longitude 77.972865 Satellite Fix 12/27

PLOT-00 PLOT-01 PLOT-02 PLOT-03  
PLOT-04 PLOT-05 PLOT-06 PLOT-07  
PLOT-08 PLOT-09 PLOT-10 PLOT-11

Select Form to Fill

RECORD PLOT GPS

FORM - 3A

FORM - 3B

FORM - 3C

FORM - 4

Wood Cutting

Lopping

Human Trail

People Seen

Livestock Seen

Bamboo Cutting

☐ Yes ☐ No

Remarks

Take photo

NEXT

1) Are there any permanent human settlements in the beat?

☒ Yes ☐ No

How Many 000 Human Population 0000

Livestock Population

Cattle 0000 Goat\_Sheep 0000 Other Livestock 0000

2) Is there any NTFP Collection in the beat?

☒ Yes ☐ No

What NTFP is Collected. NTFP1 NTFP2 NTFP3 NTFP4

3) Fire Extent in the beat in past 12 months(0-4)

0-4

SAVE DETAILS

1. Count of the human impacts to be reported.
2. Enter '0' if no signs found
3. Photograph depicting the human disturbance



# MSTrIPES ecological app: Form 3C

Latitude 30.283758      Accuracy 9.94 m  
Longitude 77.972865      Satellite Fix 12/27

PLOT-00   PLOT-01   PLOT-02   PLOT-03  
PLOT-04   PLOT-05   PLOT-06   PLOT-07  
PLOT-08   PLOT-09   PLOT-10   PLOT-11

**Select Form to Fill**



RECORD PLOT GPS

FORM - 3A

FORM - 3B

**FORM - 3C**

FORM - 4

1 m. radius  1 m. radius 

Grass\_Species      Herb Species

Dry Leaf Litter

Dry Grass


Green Grass

Herb

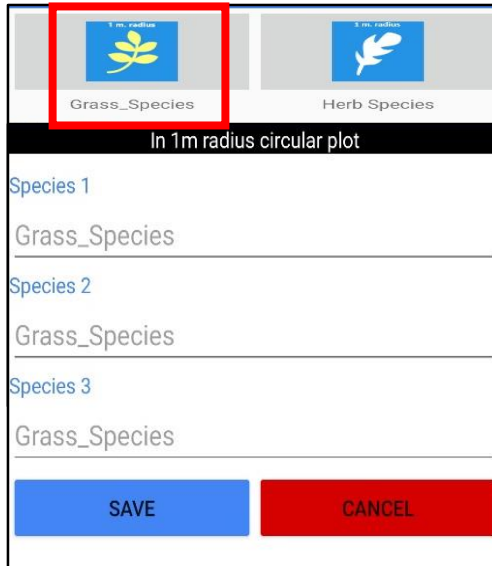
Weed

Bare Ground

Remarks

  
Take photo

Addition, after removing the dry leaf litter should be 100%



1 m. radius

Grass\_Species

1 m. radius

Herb Species

In 1m radius circular plot

Species 1

Grass\_Species

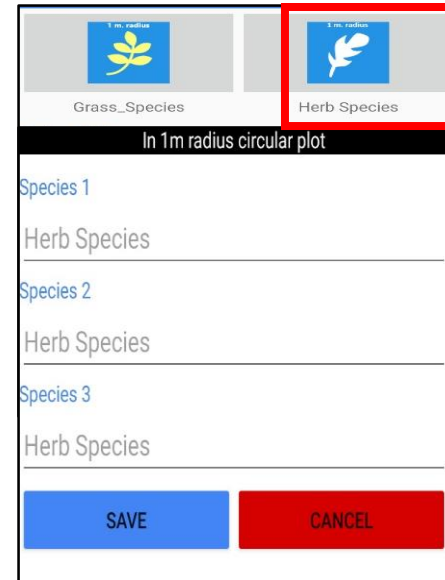
Species 2

Grass\_Species

Species 3

Grass\_Species

SAVE CANCEL



1 m. radius

Grass\_Species

1 m. radius

Herb Species

In 1m radius circular plot

Species 1

Herb Species

Species 2

Herb Species

Species 3

Herb Species

SAVE CANCEL

1. Percent cover of every grass species to be entered
2. Percent cover of every herb species to be entered
3. The total of all herbs/grasses can not exceed 100%
4. It has a check with the grass cover and herb cover of the ground cover form

# MSTrIPES ecological app: Form 4

Latitude	30.283758	Accuracy	9.94 m
Longitude	77.972865	Satellite Fix	12/27

PLOT-00	PLOT-01	PLOT-02	PLOT-03
PLOT-04	PLOT-05	PLOT-06	PLOT-07
PLOT-08	PLOT-09	PLOT-10	PLOT-11

Select Form to Fill

RECORD PLOT GPS
FORM - 3A
FORM - 3B
FORM - 3C
FORM - 4

Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	
Animal Species	Pellet Count
Select Animal Speci..	

1) Do Goat / Sheep Graze the Sampled Area?

☐ Yes ☐ No

**SAVE** **CANCEL**

11:28



Latitude 30.283622

Accuracy 9.97 m

Longitude 77.972855

Satellite Fix 15/27

PLOT-00

PLOT-01

PLOT-02

PLOT-03

PLOT-04

PLOT-05

PLOT-06

PLOT-07

PLOT-08

PLOT-09

PLOT-10

PLOT-11

Select Form to Fill

RECORD PLOT GPS

FORM - 3A

FORM - 3B

FORM - 3C

FORM - 4

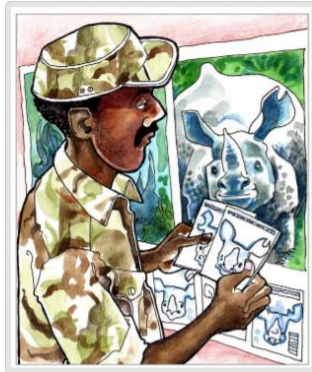
Latitude	30.277886	Accuracy	10.51 m
Longitude	77.980409	Satellite Fix	15/22

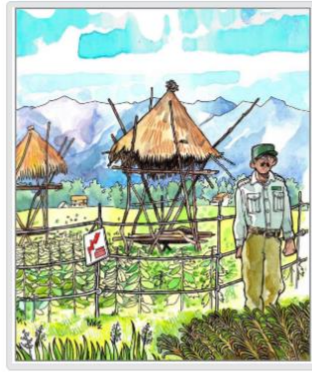
PLOT-00	PLOT-01	PLOT-02	PLOT-03
PLOT-04	PLOT-05	PLOT-06	PLOT-07
PLOT-08	PLOT-09	PLOT-10	PLOT-11
PLOT-12	PLOT-13	PLOT-14	PLOT-15
PLOT-16	PLOT-17	PLOT-18	PLOT-19



# Importing in MStrIPES desktop



Administrative Module



Patrol Module



Ecology Module



Polygon Module

M-STripES

Home Admin Patrol Ecology Polygon

Help Exit

ECOLOGICAL MODULE

Import

Import Mobile Data

Data Entry

Carnivore Sign Data Entry

Line Transect & Plot Data Entry

Vulture / Other Birds Data Entry

Ecology Details

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on 1.8.1, Developed by Kaiinos

MSTripES Version 1.8.1, Developed by Kaiinos

# MSTripES Form 3 analysis

MSTripES

M-STripES

HomeAdminPatrolEcologyPolygon

HelpExit

Select State

Select Division

Select Range

Select Beat

Run

Reset

Search

Download

Showing 1 to 10 of 509 rows 10 rows per page

1

2

3

4

5

...

51

Delete	Track Id	Form3A	Form3B	Form3C	Form4	State	Division	Range	Beat	Transect	Season	Plot No	Plot Value
	012019_014076003004_11					MADHYA PRADESH	Kanha Tiger Reserve	Kanha	BIJADADAR	1	01	Plot-0	0
	012019_014076003004_11					MADHYA PRADESH	Kanha Tiger Reserve	Kanha	BIJADADAR	1	01	Plot-1	400

MSTripES

M-STripES

HomeAdminPatrolEcologyPolygon

HelpExit

Vegetation Plot Map

MADHYA PRADESH

Select Division

Select Range

2017-08-01 - 2021-08-02

Run

Clear

Labels

Export as

Legend

Vegetation Plot

Administrative Boundaries

State

Division

Range

Beat

MSTripES Version 1.8.1, Developed by Kalines

MSTripES

M-STripES

HomeAdminPatrolEcologyPolygon

HelpExit

Canopy Cover Map

Herb Density Map

Grass Density Map

Dry Grass Density Map

Weed Density Map

Bare Ground Map

Tree Density Map

Labels

Export as

Legend

Low

Moderate

High

Shrub Density Map

MADHYA PRADESH

Select Division

Select Range

2017-08-01 - 2021-08-02

Run

Clear

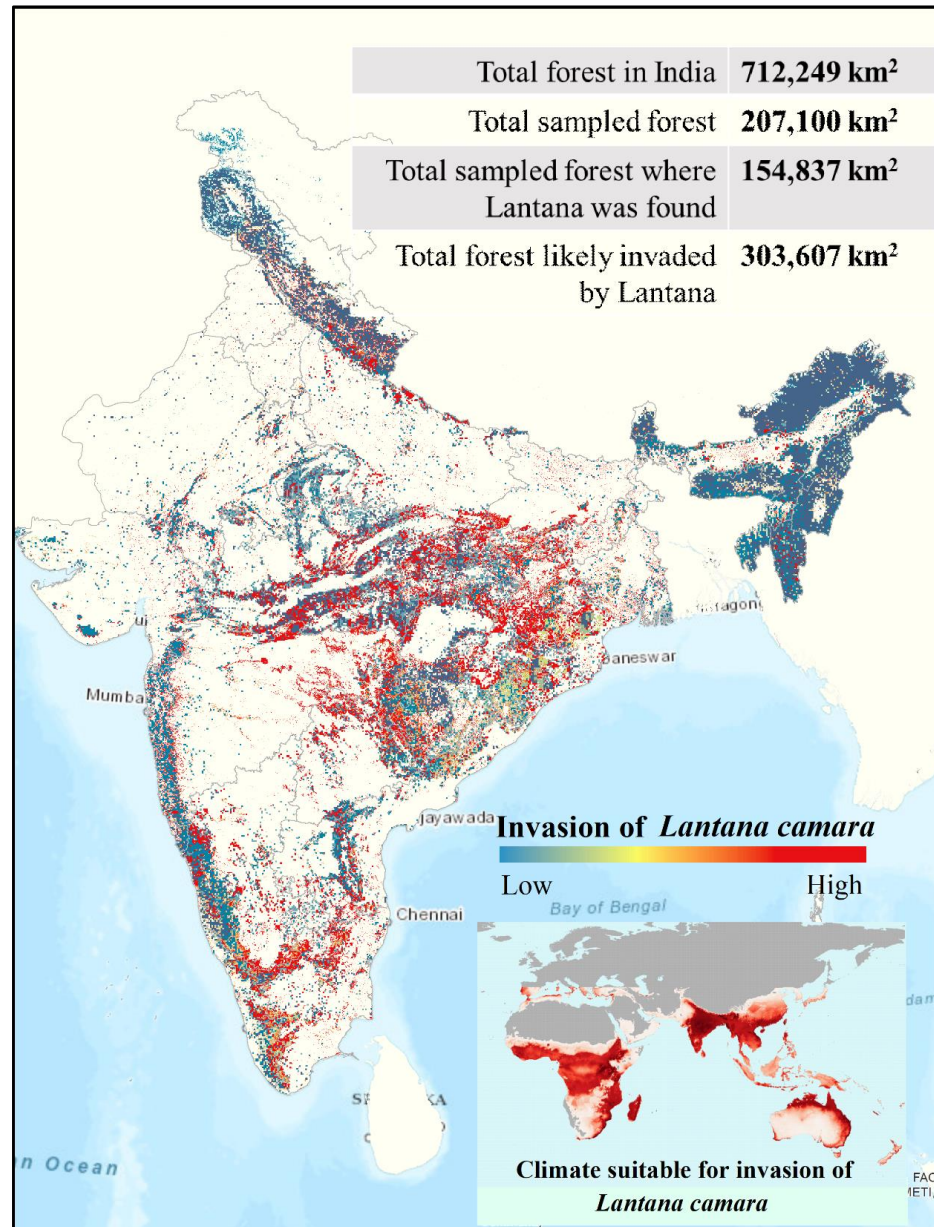
MSTripES Version 1.8.1, Developed by Kalines

# Vegetation and pellets

1. The plants/pellets are **plotted in the GIS** platform using MStrIPES
2. At optimal scale, the densities of different important plants/pellets are calculated by using the efforts invested for sampling at that scale
3. **The densities of palatable plants, invasive weedy plants and grasses serves as a distribution map** of various species at national scale
4. **Pellet** serves as an **index for abundance of ungulates and are important for illusive and hunted** species that are difficult to sight on the line transects
5. The information derived from pellet helps refine the distribution maps of ungulate.



# Invasive weed map



# Habitat covariates

- The information from form 3 and 4 are use as covariates of habitat for estimating the densities of carnivore and herbivore species
- The human disturbance signs serve as an important predictor for tiger and leopard densities
- The grass and other plant species can serve an important covariate for understanding the densities of important ungulate species

# Form 5: Vulture/ Other birds



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Wildlife Institute of India



# MSTrIPES ecological app: Form 5

Home

NEW OCCUPANCY TRAIL F1

CONTINUE OLD TRAIL F1

START TRANSECT F2

CONTINUE OLD TRANSECT F2

HABITAT PLOTS F3 AND F4

**VULTURE / OTHER BIRDS F5**

EXIT



State  
Karnataka

Division/NP/TR  
Bandipur

Range  
Moliyur

Beat  
Cinereous Vulture  
Egyptian Vulture  
**Eurasian Eagle Owl**  
Great Hornbill  
Grey headed Fish eagle  
Griffon Vulture  
Indian Grey Hornbill  
Lesser Adjutant Stork  
Lesser Fish eagle  
**Long Billed Vulture**  
Oriental Pied Hornbill  
Others



Species  
Species

Habitat  
Select Habitat Type

Activity  
☐ Flying ☐ Roosting ☐ Feeding

Vulture / Other Bird number

Observer Name

Remarks  
Enter Any Remarks Here

1) Are you aware of any Vulture Deaths in your beat in the past 3 years?  
☐ Yes ☐ No

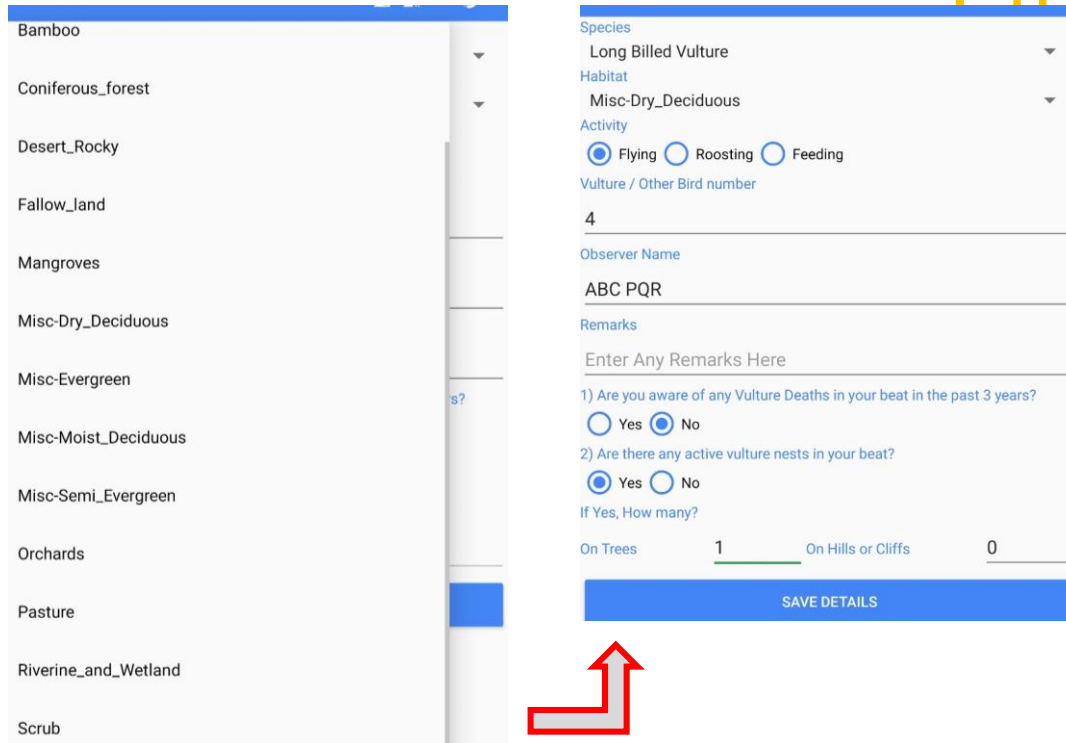
2) Are there any active vulture nests in your beat?  
☐ Yes ☐ No

If Yes, How many?  
On Trees \_\_\_\_\_ On Hills or Cliffs \_\_\_\_\_

SAVE DETAILS



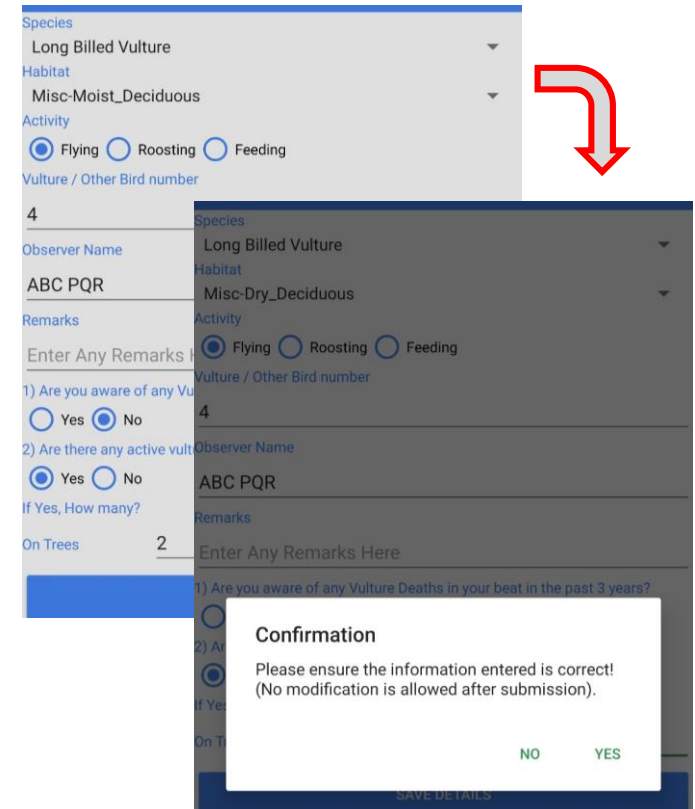
# MSTrIPES ecological app: Form 5



This screenshot shows the MSTrIPES ecological app interface. On the left is a list of habitats: Bamboo, Coniferous\_forest, Desert\_Rocky, Fallow\_land, Mangroves, Misc-Dry\_Deciduous, Misc-Evergreen, Misc-Moist\_Deciduous, Misc-Semi\_Evergreen, Orchards, Pasture, Riverine\_and\_Wetland, and Scrub. The 'Misc-Dry\_Deciduous' habitat is selected. A red arrow points from this selection to the main form area. The form contains the following fields:

- Species:** Long Billed Vulture
- Habitat:** Misc-Dry\_Deciduous
- Activity:** ☒ Flying ☐ Roosting ☐ Feeding
- Vulture / Other Bird number:** 4
- Observer Name:** ABC PQR
- Remarks:** Enter Any Remarks Here
- 1) Are you aware of any Vulture Deaths in your beat in the past 3 years?**  
☐ Yes ☒ No
- 2) Are there any active vulture nests in your beat?**  
☒ Yes ☐ No
- If Yes, How many?**  
On Trees: 1 On Hills or Cliffs: 0
- SAVE DETAILS** button

A red arrow points from the 'SAVE DETAILS' button to the next screenshot.



This screenshot shows the MSTrIPES ecological app interface with the 'Confirmation' dialog box displayed. The form fields are the same as in the previous screenshot, but with some changes: 'Observer Name' is now 'ABC PQR', 'Remarks' is 'Enter Any Remarks Here', and 'On Trees' is now 2. A red arrow points from the 'SAVE DETAILS' button to this screenshot. The 'Confirmation' dialog box contains the following text:

**Confirmation**


Please ensure the information entered is correct!  
(No modification is allowed after submission).

**NO** **YES**

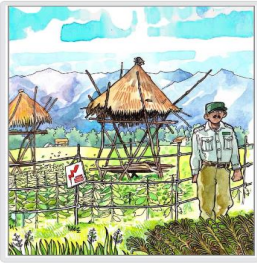
# Importing in MStrIPES desktop

**M-StrIPES** Monitoring System for Tigers - Intensive Protection and Ecological Status


? Help ✕ Exit




Administrative Module



Patrol Module



Ecology Module



Polygon Module


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Developed by Kaiinos

**M-StrIPES** Home Admin Patrol Ecology Polygon ? Help ✕ Exit

ECOLOGICAL MODULE

Import



Import Mobile Data



# Importing in MStrIPES desktop

The screenshot displays the MStrIPES desktop application interface. The top navigation bar includes links for Home, Admin, Patrol, Ecology, and Polygon. A sidebar on the left contains icons for Home, Data Entry, Ecology Details, Spatial Analysis, and Import Mobile Data. The main content area shows a notification for 'MStrIPES\_Ecological uploaded successfully in 16 secs!' and a section for selecting new mobile data folders to import. Below this, there are filters for 4 TRACKS, 4 BEATS, 1 km TRACK LENGTH, and 2 DAYS. A map view shows a geographical area with a red line indicating a track. The bottom section displays a 'Carnivore Details' table with columns for Delete, Team, Map, Track Id, Carnivore Sign, Photo Form, State, Division, Range, Beat, Trail, and Season. The table lists five rows of data, including track IDs and locations like Dehradun and Kanha Tiger Reserve.

**MStrIPES**

Home Admin Patrol Ecology Polygon

Help Exit

New mobile data folder

Old mobile data folder

Old mobile data as compressed zip

Select new mobile data folder to import data -

+ Choose Upload Clear

4 TRACKS 4 BEATS 1 km TRACK LENGTH 2 DAYS

Map View Tabular View

Grassland Patch Chandrabani 77.9752, 30.2853

**MStrIPES**

Home Admin Patrol Ecology Polygon

Help Exit

Carnivore Details

Select State Select Division Select Range Select Beat Select User Select date

Run Reset

Showing 1 to 10 of 41 rows 10 rows per page

Delete	Team	Map	Track Id	Carnivore Sign	Photo Form	State	Division	Range	Beat	Trail	Season
			77972733028356_1625635170935_M			UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	4	02
			77974503028099_1625561826173_M			UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	1	02
			77972903028360_1625478904541_M			UTTARAKHAND	Dehradun	Asharodi	Unable to find beat!	1	02
			77974563028419_1625480249964_M			UTTARAKHAND	Dehradun	Asharodi	Unable to find beat!	2	02
			012019_014076003014_6			MADHYA PRADESH	Kanha Tiger Reserve	Kanha	KANHARI	6	01

MStrIPES Version 1.8.1, Developed by Kalinos

Vulture / Other Bird Details

UTTARAKHAND

DEHRADUN

ASHARODI

CHANDRABANI

Select date

▶ Run

↺ Reset

Run filter

Search

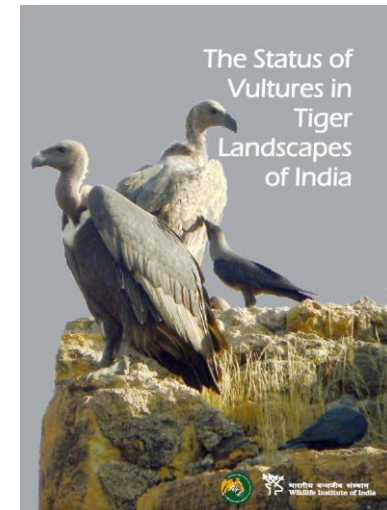
▼

Showing 1 to 2 of 2 rows

Edit	Delete	State	Division	Range	Beat	User	Species	Count	Activity	Forest	Vulture Deaths	Vulture Nests	Nests
		UTTARAKHAND	Dehradun	Asharodi	CHANDRABANI	ABC PQR	Long Billed Vulture	4	Flying	Misc- Moist Deciduous	No	Yes	

# Vulture/ Other birds distribution

1. Observations are mapped to grids/ administrative units using GIS operation in MStrIPES.
2. No. of observations of vultures/ other birds vis-a-vis species mapped to 100 sq. km. grids/ administrative units serve as distribution map of these birds at regional and national scale.





# Thank You

