ESESA Workshop

2 & 3 March 2011
GNSS Application:

Field Monitoring and collection of data using NICK

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1. Introduction to PPF
2. Animal Tracking
    - Habitat Preference Modelling
3. PPF Climate Change REDD+ Projects
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    - Community based monitoring
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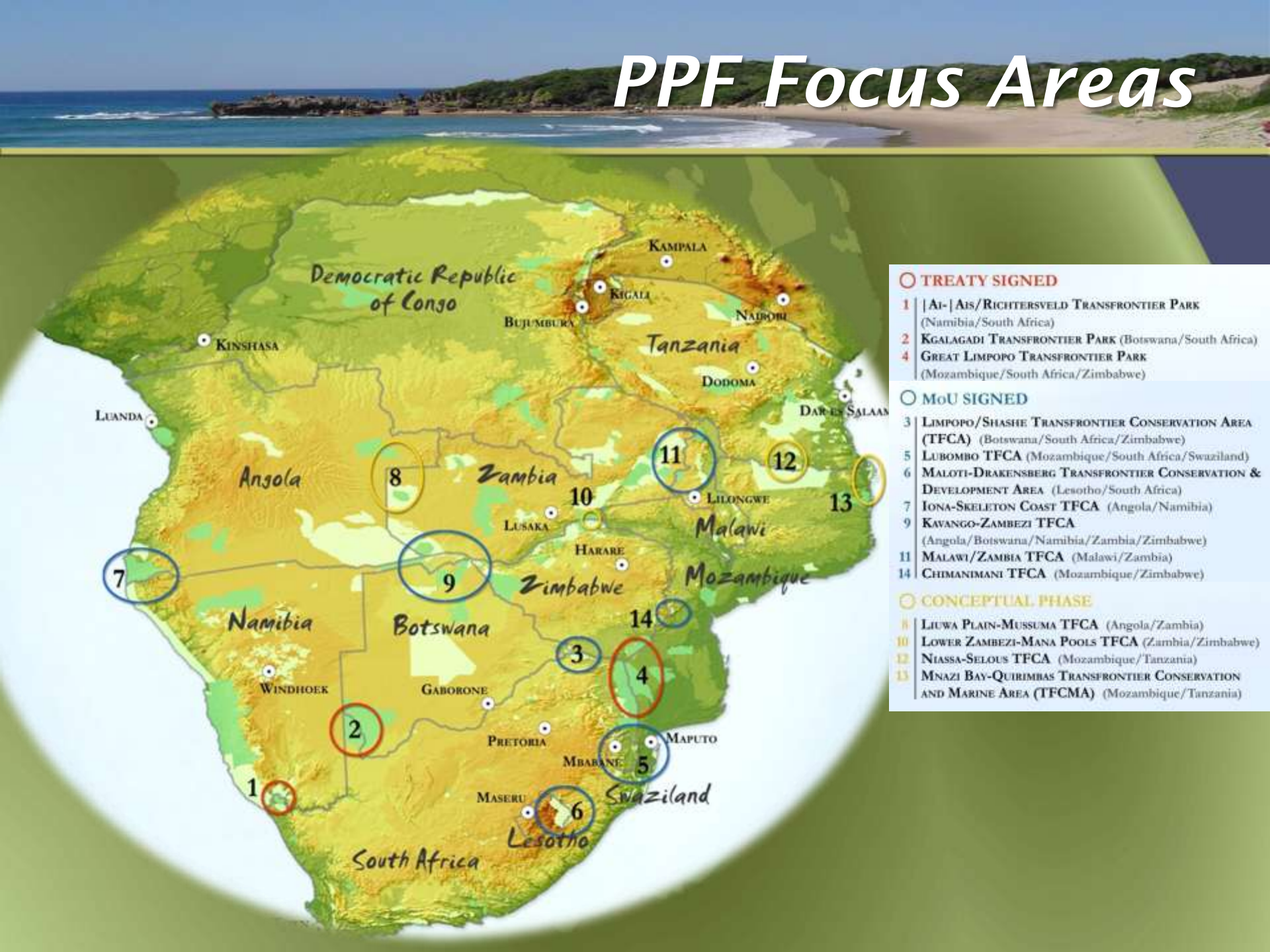
5. Conclusion

Click anywhere except here to play movie

PPF Focus Areas



TREATY SIGNED

1 | |Ai-|Ais/Richtersveld Transfrontier Park (Namibia/South Africa)
2 | Kgalagadi Transfrontier Park (Botswana/South Africa)
4 | Great Limpopo Transfrontier Park (Mozambique/South Africa/Zimbabwe)

MoU SIGNED

3 | Limpopo/Shashe Transfrontier Conservation Area (TFCA) (Botswana/South Africa/Zimbabwe)
5 | Lubombo TFCA (Mozambique/South Africa/Swaziland)
6 | Maloti-Drakensberg Transfrontier Conservation & Development Area (Lesotho/South Africa)
7 | Iona-Skeleton Coast TFCA (Angola/Namibia)
9 | Kavango-Zambezi TFCA (Angola/Botswana/Namibia/Zambia/Zimbabwe)
11 | Malawi/Zambia TFCA (Malawi/Zambia)
14 | Chimanimani TFCA (Mozambique/Zimbabwe)

CONCEPTUAL PHASE

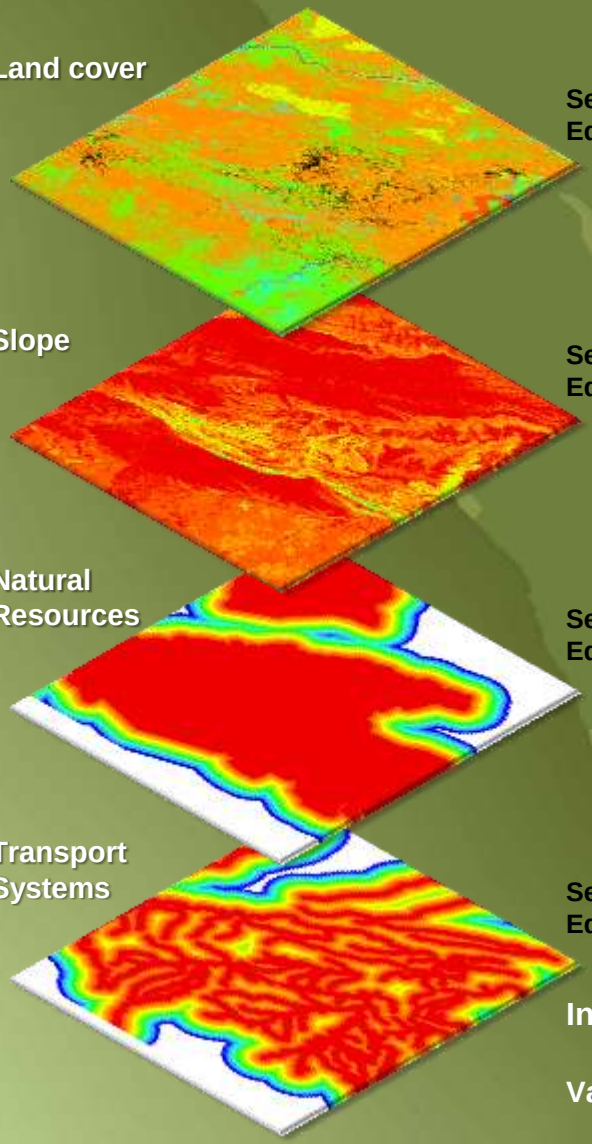
8 | Liuwa Plain-Mussuma TFCA (Angola/Zambia)
10 | Lower Zambezi-Mana Pools TFCA (Zambia/Zimbabwe)
12 | Niassa-Selous TFCA (Mozambique/Tanzania)
13 | Mnazi Bay-Quirimbas Transfrontier Conservation and Marine Area (TFCMA) (Mozambique/Tanzania)

3. Great Limpopo TFCA

Elephant Preference Model

- GLTCA
  - KNP Elephant Numbers
  - PNL Elephant Restocking
  - Animal Movement – 3 Year Monitoring
- Elephant (species) Preference Models
  - Land Cover Mapping
  - Land Use Mapping
  - Hydrology
  - Vegetation
  - Infrastructure

Elephant Preference Model
Spatial Analyses



Set Influence 38 %
Equal Influence 25 %

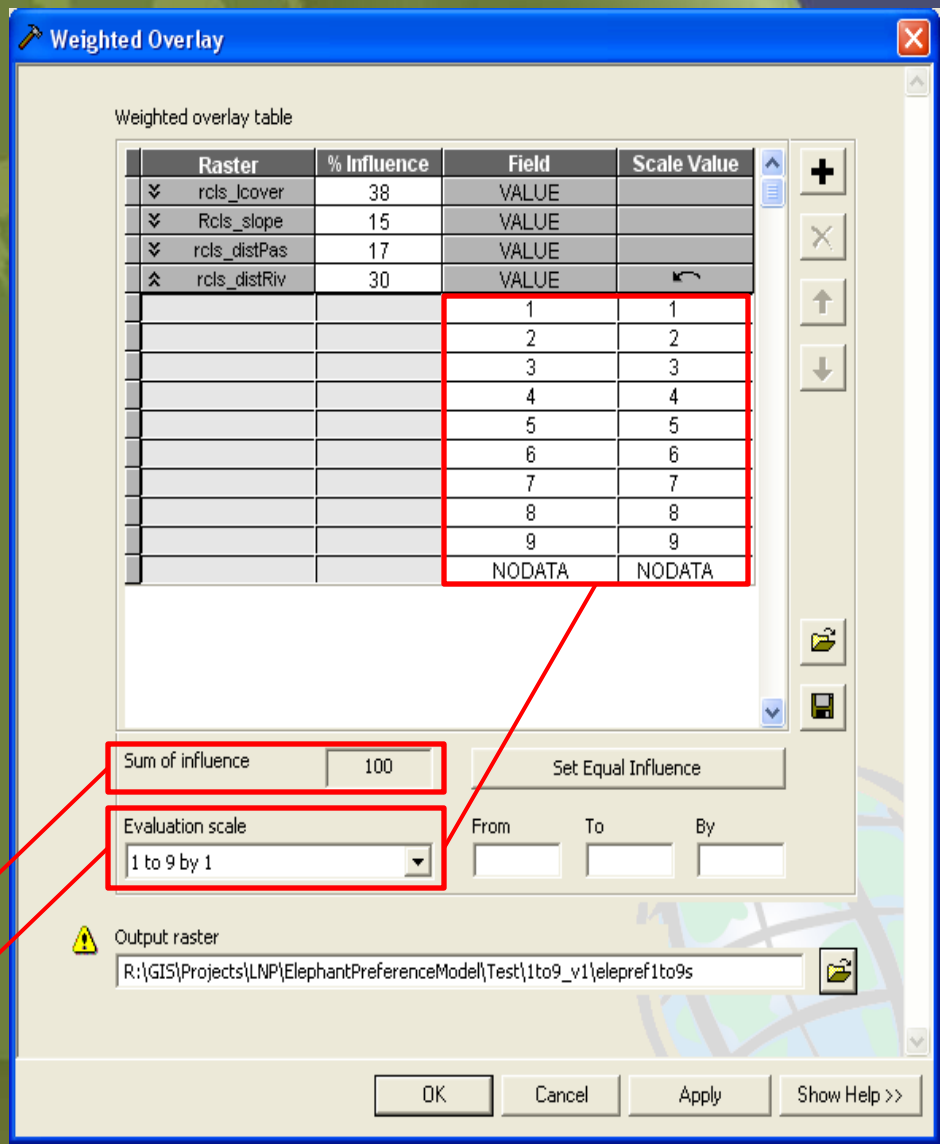
Set Influence 15 %
Equal Influence 25 %

Set Influence 17 %
Equal Influence 25 %

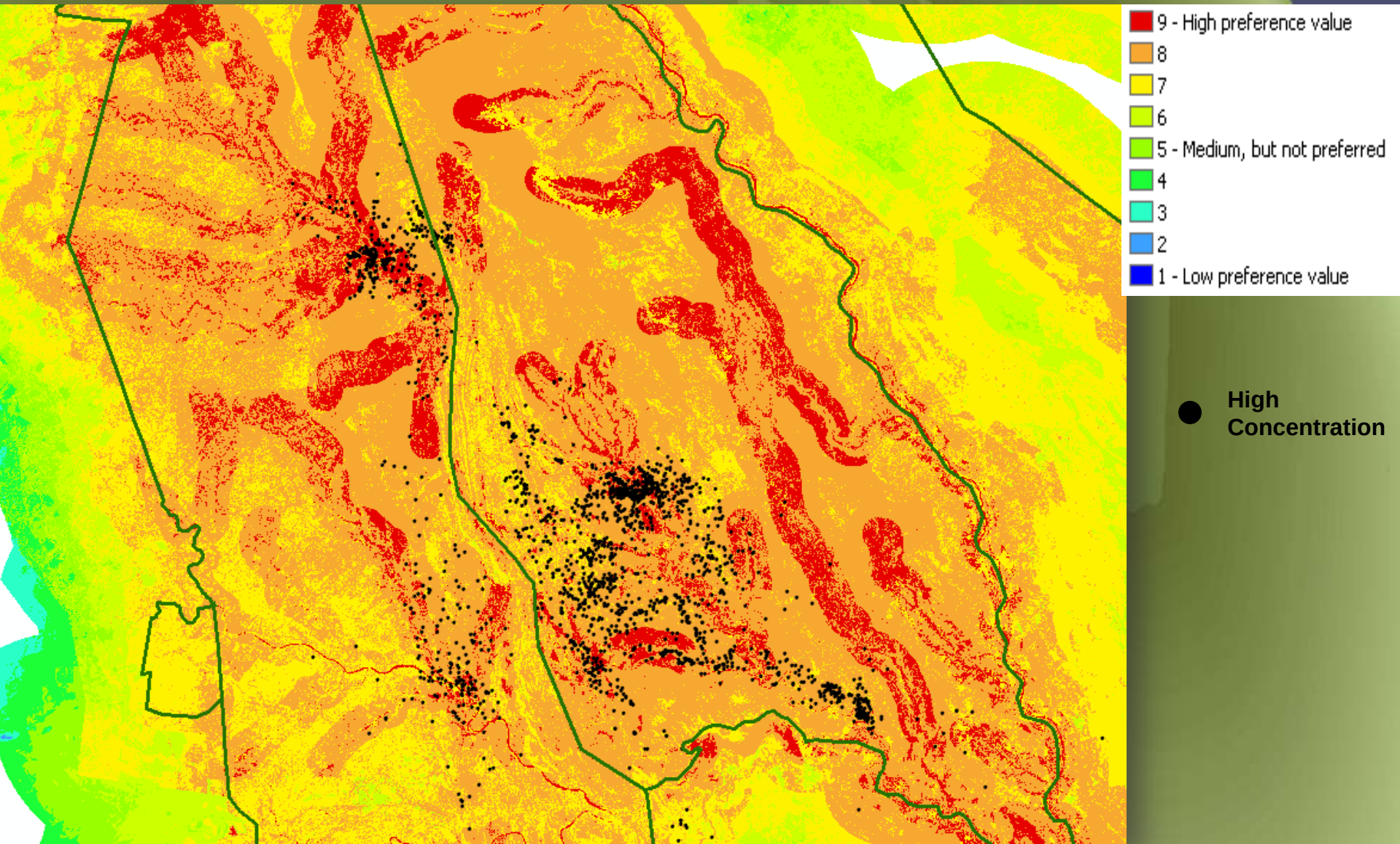
Set Influence 30 %
Equal Influence 25 %

Influence = 100 %

Value classes 1 to 9



Mapping & Monitoring Trends



8. Kavango Zambezi

Biomass Monitoring: Background

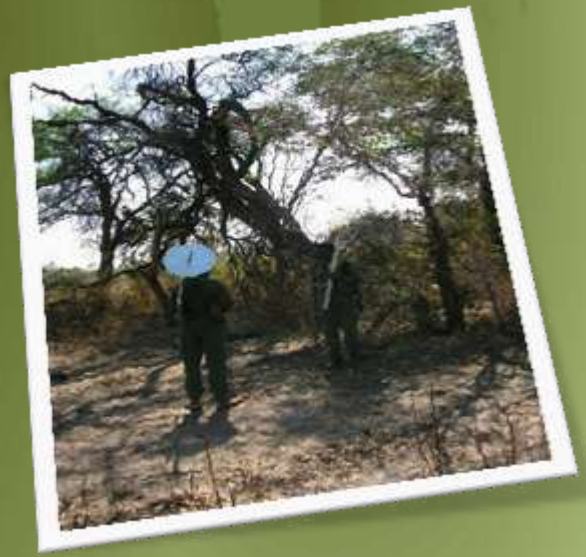
- **Remote sensing**
  - Provide synoptic coverage of wide spatial area
  - Provide blanket coverage
  - Cost effective
  - Timeous data acquisition
- **Field inventory methods**
  - Limited sample size
  - Do not cover inaccessible areas
  - Relatively expensive
  - Time-taking
- **Integrating field inventories and remote sensing techniques in optimal ways**

Objectives

- Establish a Baseline
- Determine Biomass & Carbon
- Monitor Change
- Generate income through:
  - Fire Reduction
  - Avoided Deforestation
  - Additional Sequestration (planting trees)

Steps Involved

- Quantify and map current stock
- Monitor change in stock - can only sell change
- Make sure other sources are not affected
- Avoid shift of deforestation from one to another



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Lidar Survey

- General aim: explore the utility of remote sensing techniques to quantify and monitor forest carbon stock in support of REDD+.

- Specific objectives:
  - Estimate biomass using field survey; RS and lidar data,
  - Assess the possibility of training coarse but large spatial area imagery (e.g. SPOT) using lidar data.

Lidar Flight Path

Legend

- Biomass plot locations
- Lidar survey flight path

N

0 5 10 20 30
Kilometers
Scale 1 : 600 000

Lidar Survey Data Products

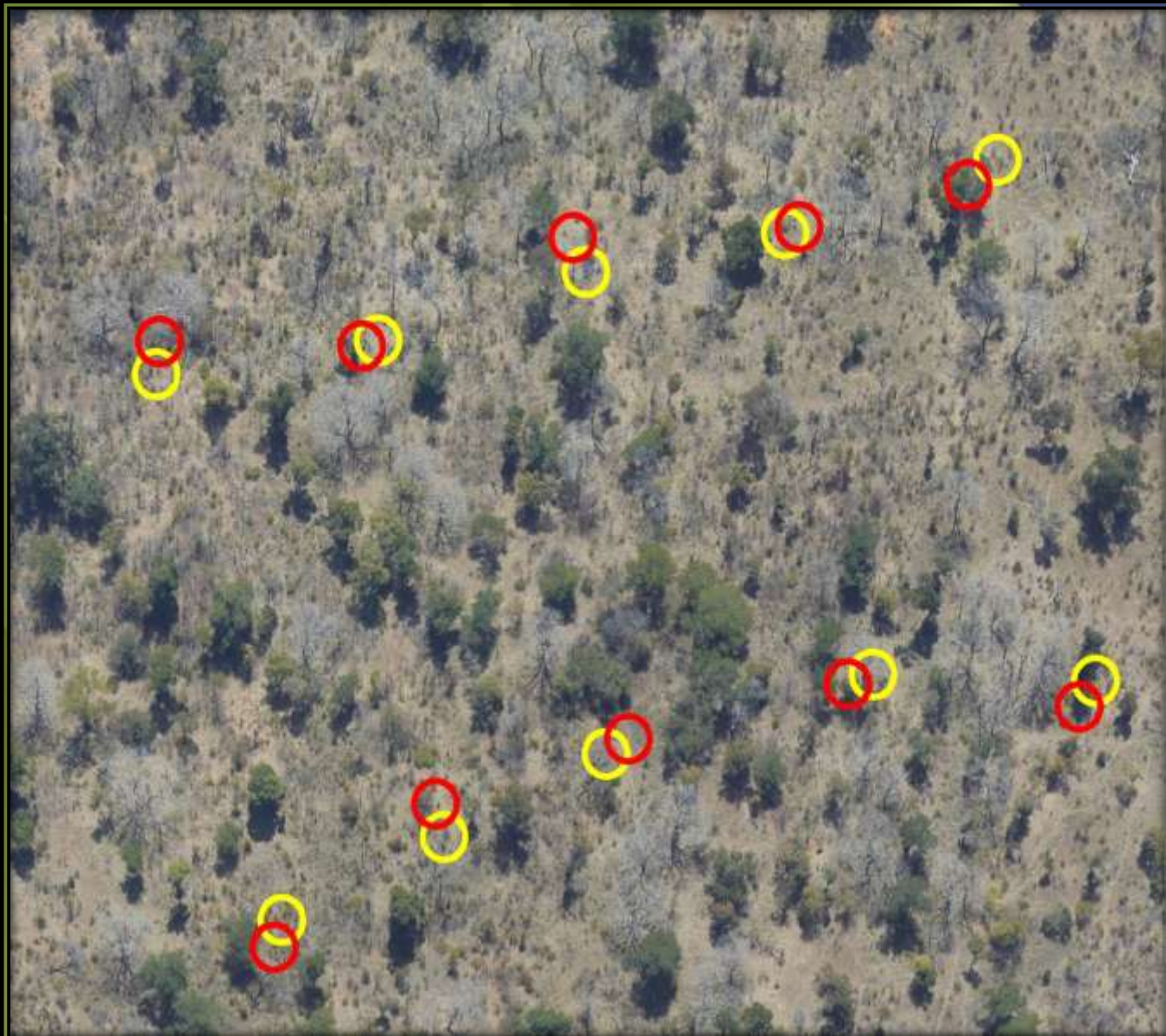
- Flying height = 800m
- High spatial resolution aerial imagery
  - Rectified
  - Red, Green, Blue colours
  - ~10 cm spatial resolution
- Lidar point returns
  - Discrete returns
  - Vertical accuracy 0.014m
  - 1-m average postings
  - Classified as ground or non-ground returns

500m by 500m block of imagery

Poor Accuracy??

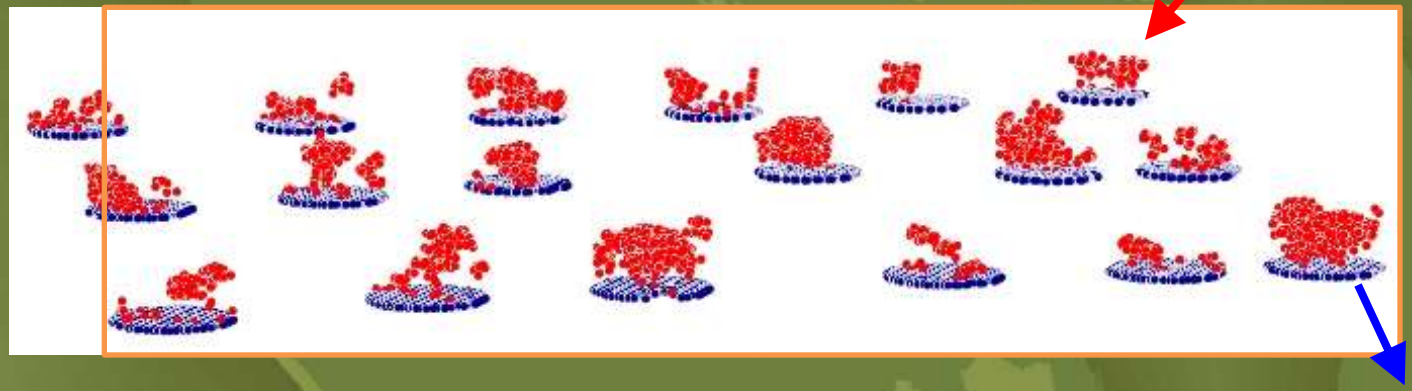
Most likely reason:

- GPS accuracy to locate sub-plot centre was 5 m
- Radius of sub-plot was 5 m
- There could be a significant offset of plot location

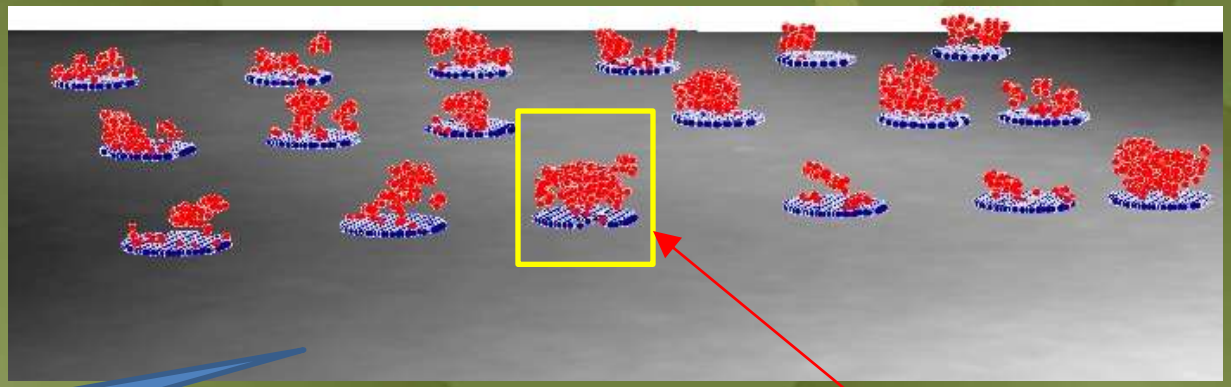


Visualizing Point returns vs Ground Surface

Non-ground returns (red)



Ground returns(blue)



Ground surface

Sub-plot 20 C1

REDD+
Community based Monitoring

- Fire Management
- Socio-Economic Indicators

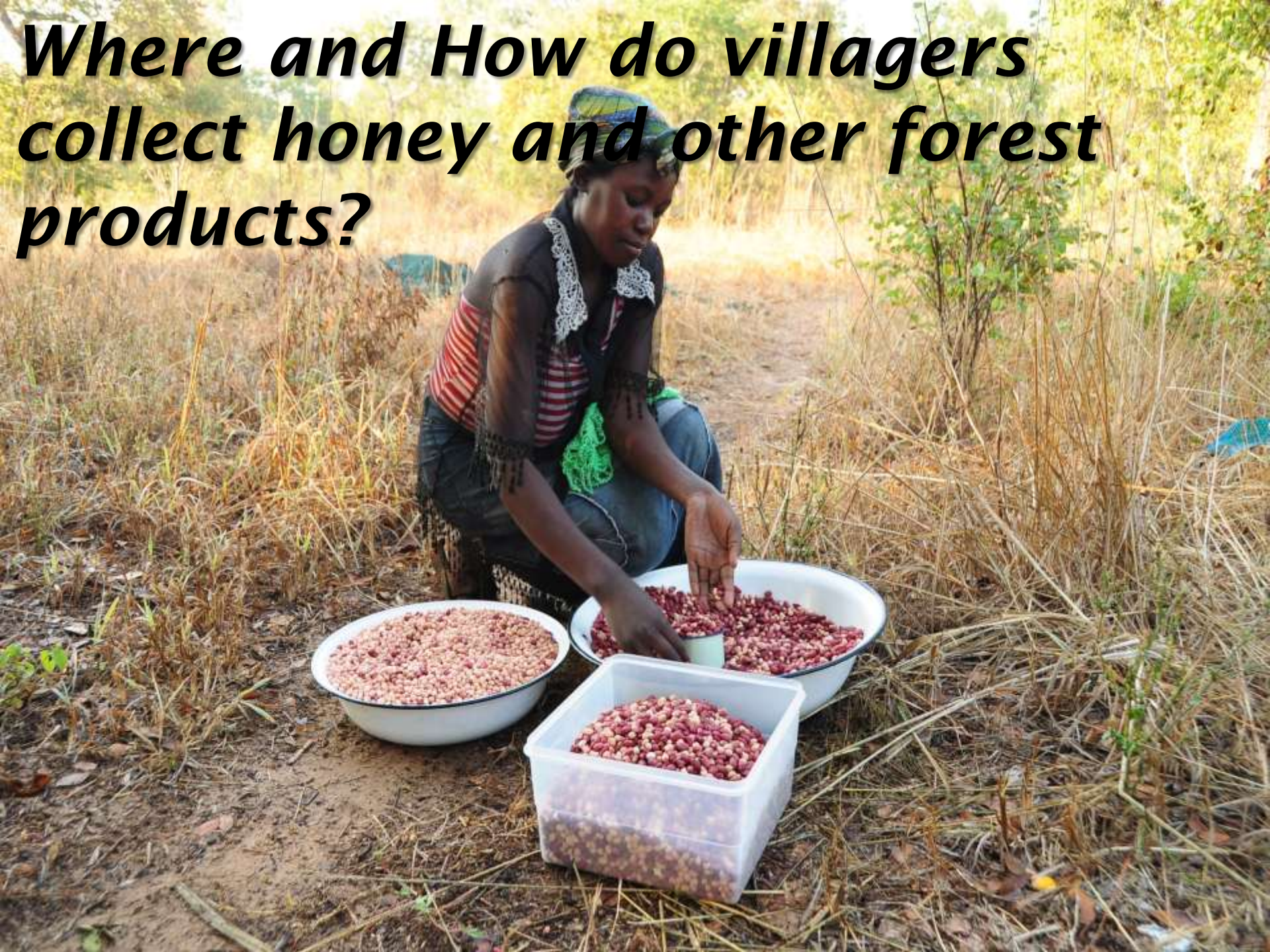
Where has there been fire?


What was the cause, how many hectares burned?


Where and What are the size of fields cleared for agriculture?

What is the crop damage by elephants?

Where and How do villagers collect honey and other forest products?




Which medicinal plants are collected in Dec-Feb?

Please meet NICK

(Natural Information Collection Kit)


NICK de Ployed
Tanzania
Angola
Zambia
Malawi
Mozambique
Zimbabwe
Namibia
Botswana
Swaziland
Lesotho
South Africa
Tropic of Capricorn
Atlantic Ocean
Indian Ocean
1
2
3
4
5
6
7
8
9
10

What is the objective with NICK?

- *Collect Field Information*
  - Culture
  - Human/Wildlife
  - Illegal Activities
  - Management tasks
  - Marine
  - Points of Interest
  - Socio-Economic
  - Species
- *Visualize/Query Field observations*
  - Import GPS data
  - Search based on user defined criteria
  - Visualize data spatially on a customized base map
  - Query mapped information
- *Report*
  - Monitoring; Reporting; Evaluation & Verification
  - Create a report per area, observer, date range
  - Export spatial and tabular data to pdf

- *Database maintenance*
  - Easy backup/restore and e-mail to HO
- *Dynamic Data*
  - Add your own list
  - Once added it will be available as an option to choose
- *File Store*
  - Allow for the storage of multi-media files
  - Includes photo's, movie clips etc.
- *Field capture Forms*
  - User friendly forms are stored within the application
  - Users can update/print as needed

Spatial data/work flow

1. PRE-FIELD WORK

- *Print Field Forms*
- *Setup GPS*
- *Spare batteries, forms, pens*

2. FIELD WORK

- *Save GPS waypoints*
- *Complete Field Form*
- *Take photo's, videos, recordings*

3. POST FIELD WORK

- *Download GPS data to local disk*
- *Hand in Field Forms*
- *Copy photo's, video's and recordings to local disk*
- *General Feedback/ Problems*

Natural Information Collection Kit (N I C K)

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4. NICK: DATA CAPTURE

- *Capture field form data*
- *Upload photo & video files*
- *Keep paper forms as backup*

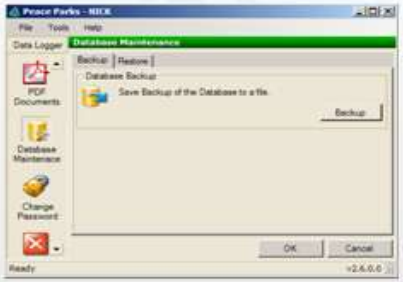
5. NICK: QUALITY CONTROL

- *Check GPS waypoints on map*
- *Filter data on user, date etc.*
- *Check that all data was captured*

6. NICK: REPORT

- *Create user specific report*
- *Data interpretation, actions needed*
- *Feedback to field staff*

7. NICK: DATE BASE MAINTENANCE



- *Backup Database*
- *E-mail to: database@ppf.org.za*
- *Burn photo's, videos to CD*
- *Send CD to PPF*

What about Citizen Science?

- Everyone is a potential data collector
- Observe & Measure
- Data is Data is Data
- Information
- Use your computer, use your mobile; use NICK!

Conclusion

- Field data is often recorded by GPS
- Addressing the GPS accuracy aspect
- Field data is not standardized
- Analyses is often based on this
- Decision Support Tools

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