Ecosystems and Land Use Stakeholders Engagement Group (ELSEG)
Forest monitoring via mobile data collection – notes and presentation

Monday 21ˢᵗ January 2019, Victoria Quay, Edinburgh

Forest monitoring via mobile data collection

Chen Wang presented on Forest monitoring using mobile data collection. He described the Open Data Kit which is a suite of tools to help data organizations and can be custom-designed for specific purposes. It is designed to work on any mobile system and a wide range of data can be entered such as text, photos, video, historic records and updates. This has been trialled at two study sites to date and will be publicly available following publication. Further work will explore another pilot site and move to 3D visualisation, e.g. looking at other habitats/environments such as buildings, 3D scenarios under woodland expansion and what would the landscape look like.

The discussions that followed explored potential users of the technology and overlap with other mobile recording apps.

Participants could see that this technology might be useful for local community groups, people reporting problems such as pathways, broken gates, fungal infections. Vice versa, land owners could communicate management plans for the forest, e.g. clear-fell. Other uses identified were forestry workers, general public, estate agents (3D scanning of buildings), botanic gardens to spot plant health problems and to collect data over time. Potential for scientists to use it to collect data to save on data entry, or to take automated measurements e.g. light measurements, vegetation cover.

Given that there is already a wide variety of mobile recording apps (e.g. inaturalist, irecord, ispot, myforest), participants discussed possible integration and questioned whether anyone was using EU citizen observations to do something similar that could be tapped into.

Appendix 1 - Presentations

The following pages show forest monitoring presentation slides
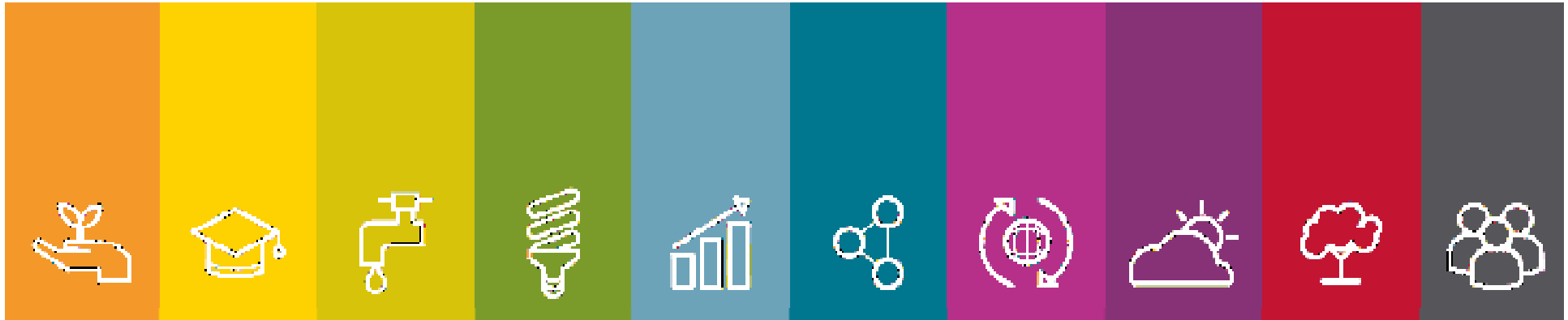
Forest Monitoring via Mobile Data Collection

Chen Wang and Alessandro Gimona

Introduction

- Introduction
- Creating and Designing ODK Monitoring Form
- Collect Data Through Mobile Device
- Visualizing Geographic data
- Implement in Pilot Sites: Tyrebagger and Cambus o'May
- Conclusion
- Demo

Introduction

Community based monitoring have covered a wide range of applications, ranging from forest condition survey, natural disaster assessment and public health surveillance.

There are many arguments that lack of data to study how ecosystems work is an issue.

Compared with traditional data analysis through printed questionnaires, we propose a new method for forest data collections by use of mobile devices.

ODK

- Open Data Kit (ODK) is a suite of tools to help data organizations, including data collecting, aggregation and visualization.

GeoODK Collect, https://play.google.com/store/apps/developer?id=GeoODK

ODK Components

- **ODK-Build**

ODK Build is a drag-and-drop form designer for ODK XForms.

- **ODK-Collect**

ODK Collect is an Android app for filling out forms. It's been used to collect billions of data points in challenging environments around the world.
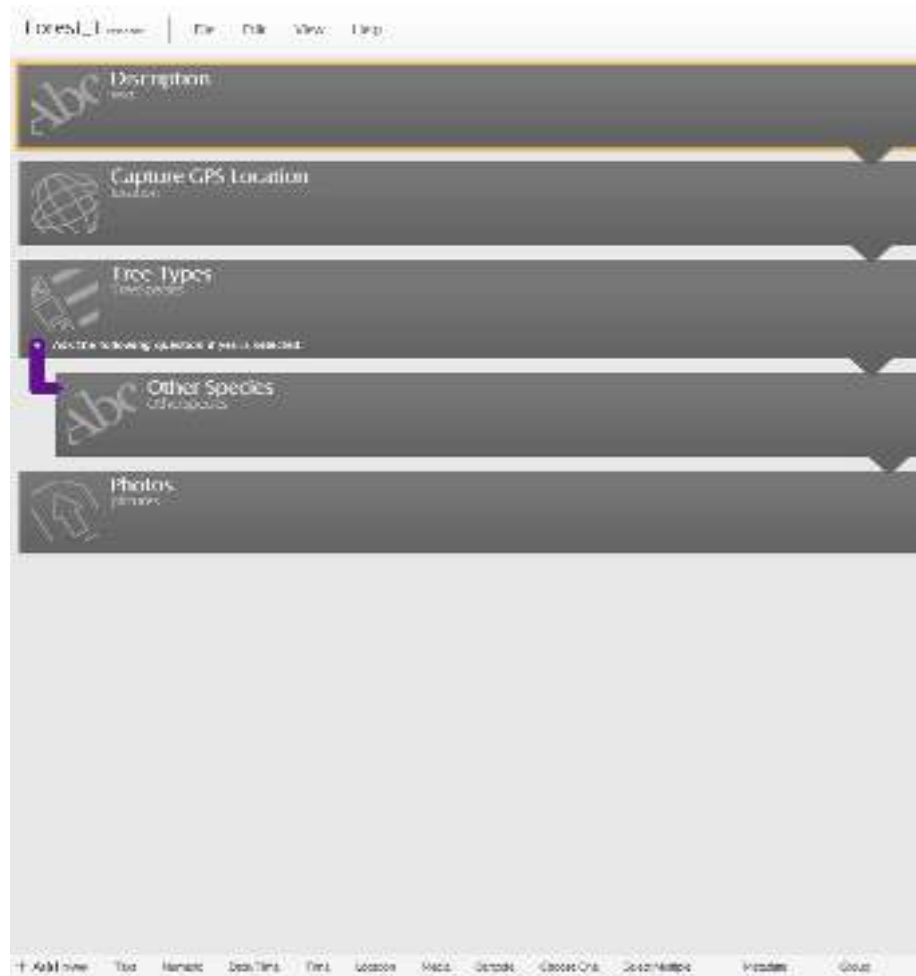
- **ODK-Aggregate**

ODK Aggregate is a Java server that stores, analyzes, and presents survey data collected using ODK Collect.

Creating and Designing ODK Monitoring Form

The form contains location, audio, images, video, barcodes, signatures, multiple-choice, free text, and numeric answers.

Collect Data Through Mobile Device

- It provides offline/online mapping functionalities, the ability to have custom map layer, as well as new spatial widgets, for collecting points and polygons.

Data Collection & Mapping

Collect Data

Edit Data

Delete Data

Send Data

Map Data

Settings

GeoODK Collect > Forest Structure Form

Land Cover/Use Description

Vegetation

○ Forest
○ Woodland
○ Shrub/Bushland
○ Grassland
○ Forested Wetland (swamp)
○ Nonforested Wetland (papyrus, phragmites)
○ Clearing
○ Bamboo
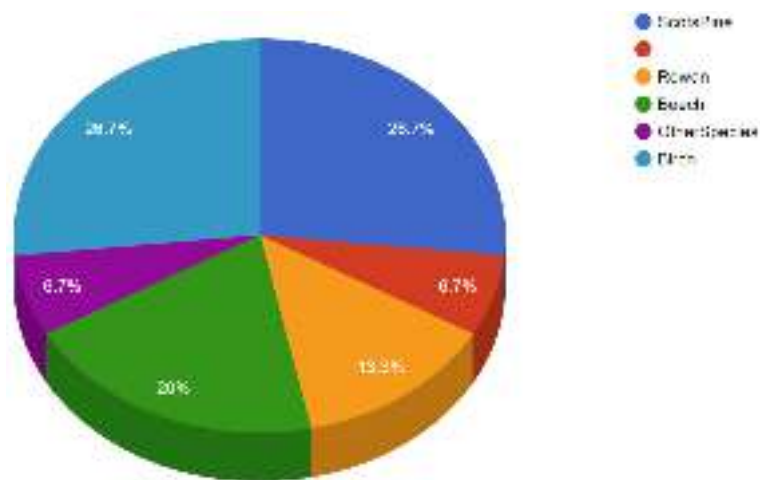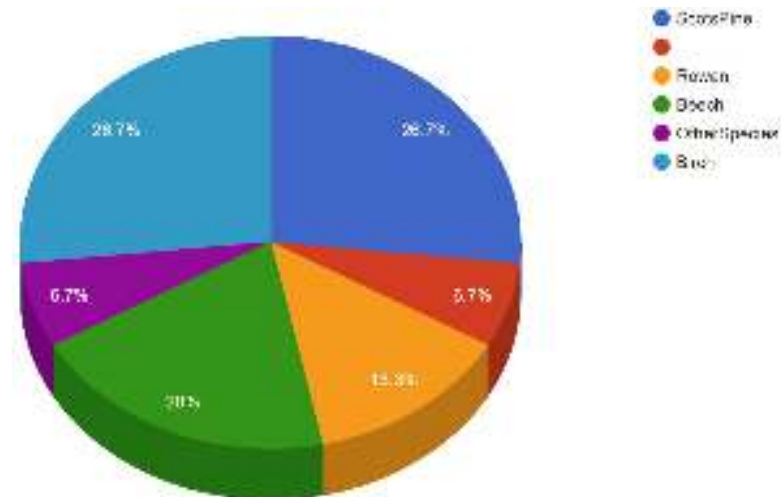○ Bare soil (beach, dry salt flat)
○ Bare rock
○ Other

Visualizing Geographic data

Geographic data has been presented on a custom map using Google My Maps, visualized through bar graph and pie chart, annotating by google earth.
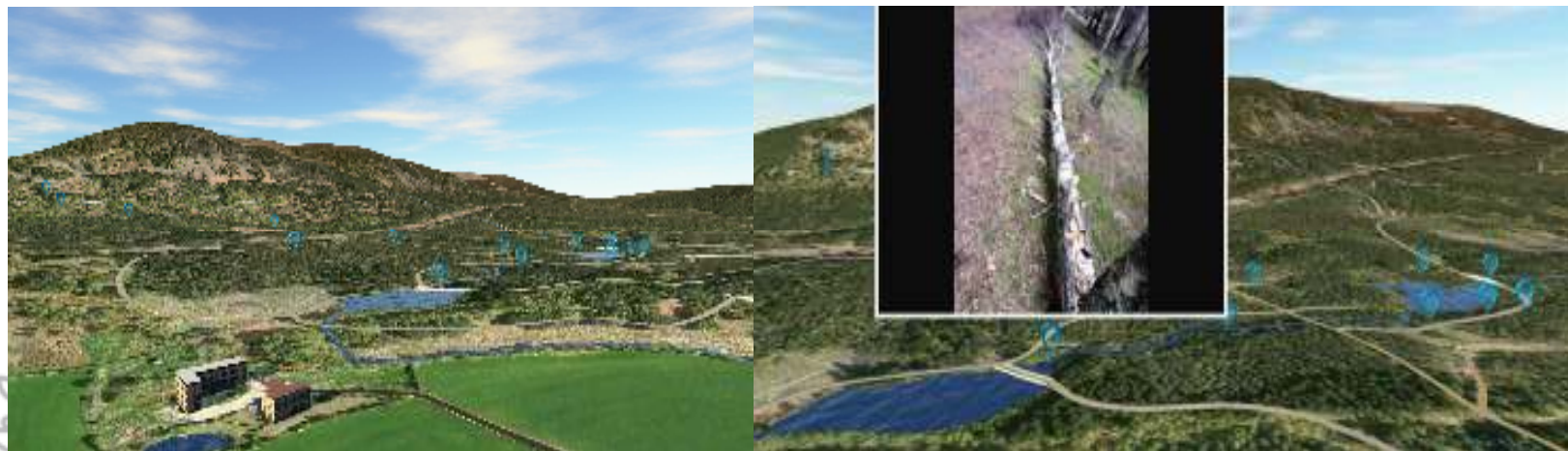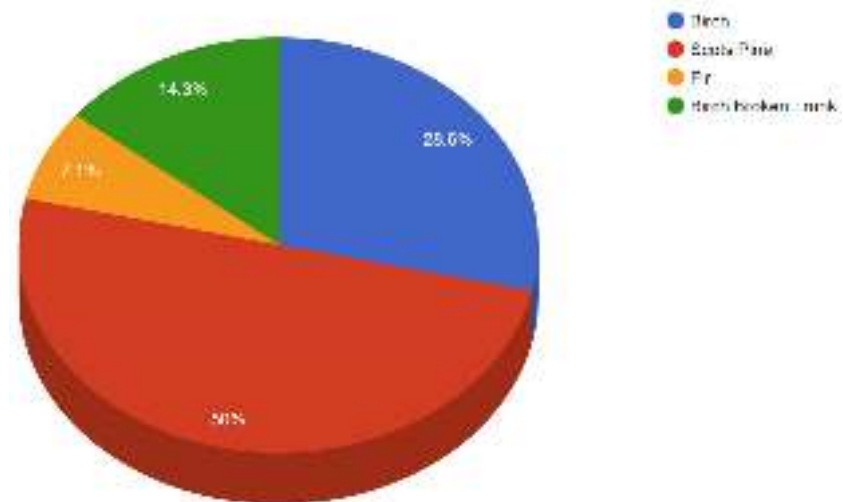
Implement in Pilot Site: Tyrebagger

- Tyrebagger is a mature forest with its broadleaves and conifers.

Implement in Pilot Site: Cambus o'May

- Cambus O'May is on the north side of Dee River between Ballater and Dinnet with mixed conifer and birch wood.

Conclusion

- We have tested the mobile application in Tyrebagger and Cambus o'May forests which contain different woodland types. Useful date related to tree species have been collected. Geo-reference ground photographs will be taken in other pilot sites which can help validate land-cover and soil maps. Further work can also focus on capturing forest activities such as small scale degradation, deforestation and reforestation.

Conclusion

- The findings have potential implications for the monitoring and assessment of woodland to increase the effectiveness of their use, and contribution to wider forest management. This has the potential to significantly change forest monitoring system which can provide local communities with information on indicators of forest loss, changing land-use practices and socioeconomic realities.

Demo

- Forest Cambus o'May

- https://drive.google.com/open?id=19M8m6wE8geY_kk6hspP296k7wHqCgvlX&usp=sharing

- Forest Tyrebagger

- https://drive.google.com/open?id=1U9HEx6AoGWiKFFVx-DkSuKW8iNilC0Nq&usp=sharing

Acknowledgements

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