Capstone Project 159.356 2016

Original Group Members

Jessica Braddon-Parsons - Team leader & mobile development
Cameron Dykstra - Server & website development
Umesh Ravji - Mobile development
James Rumbal - Server & website development

Project Description

The task for this year's project is to design, implement and deploy a mobile application to helps volunteers working for the department of conservation (DOC) to manage predator trap lines. The system is to be configured for the Stoat Trap Line in the Manawatu Gorge.

The Manawatu Gorge trap line consists of 100 box traps that use eggs as bait. The traps operate since 2009, and have removed hundreds of predators (stoats and rats) from the fragile eco-system. This has resulted in a significant increase in bird life in the gorge and adjacent areas. The trap lines are frequently (depending on the season, monthly or fortnightly) checked and re-baited by volunteers. Several similar projects exist within the regions, including the traplines in the Oroua valley to protect the local blue duck population.

At the moment, data is captured manually by volunteers and then transferred into spreadsheets.

A mobile app could facilitate data capture, including the capture of maintenance-related data. The attachment of photos to data collected could also be useful, for instance to assist with identifying what type of rat was caught. One of the main benefits of a mobile app however would be the location of the traps. The traps are marked with a yellow marker with a number, and this marker is often overgrown and easy to miss. It is on the other hand sometimes practical to hide traps a bit in order to avoid that traps are being set off by kids for fun. The traps are also expensive, so hiding traps could sometimes be useful to avoid that traps are being stolen or damaged.

Requirements

1. The mobile app should work on ios and android
2. The mobile app should support older devices / os (from 2013 versions, i.e. ios 7, Android kitkat)
3. The mobile app can be used to locate traps using acoustic and visual signals.
4. The master data for a particular trap line can be configured.
5. An instance of the app configured for a particular trap line can be protected by password.
6. The app can be used to capture data, this data can be synchronised with a central data store. Free online services should be used to store data (e.g., shared Google spreadsheets).
7. Captured data can be exported into a spreadsheet (Excel, CSV or similar).
8. Optional: photos can be attached to captured data.
9. Optional: a web page or app can be used to see aggregated data, and to generate charts.
10. Optional: the app can capture bird sightings.

Resources

1. CatchIT: https://www.stat.auckland.ac.nz/~fewster/CatchIT/ - a project with similar goals, try whether you can interface with this project.
2. Cross-platform mobile development kits:
    a. http://phonegap.com/ - JS based, open source
    b. http://gluonhq.com/ - Java-based, one of the developers / owners is Massey ex-student living in Palmy, can provide support and help with licensing
    c. https://www.xamarin.com/platform - based on C#
3. Information on predator control in the region:
    a. https://blog.doc.govt.nz/tag/oroua-river/ and http://www.irongates.co.nz/the-oroua-blue-duck-project.html has information about the project to protect the blue ducks in the Oroua valley
    b. Manawatu Standard article on predetor control in the Manawatu Gorge: http://www.stuff.co.nz/manawatu-standard/news/4560623/Track-wars-Predators-versus-trappers
4. About stoats and rats:
    a. http://www.doc.govt.nz/nature/pests-and-threats/animal-pests/animal-pests-a-z/stoats/
    b. http://www.doc.govt.nz/nature/pests-and-threats/animal-pests/animal-pests-a-z/rats/