

Trap Tracker

Capstone 2016

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Trap Lines

- Predators endanger the population of native species
- Catch predators to protect native and endangered species
- Trap lines set up all throughout NZ which are maintained by groups

Trap Lines

Manawatu Gorge

- Since 2009
- 100 traps that span over 10 km
- Primarily catch rats and stoats

Oroua Valley

- 400 traps
- Protects the Blue Duck(Whio)

Problem

Help volunteers manage trap lines

- Traps are sometimes difficult to find
- Catch data is recorded manually



Solutions

- Mobile app for doing walks
- Server to store data
- Website for trap line creation, administration, and to export data to spreadsheets

Project Timeline

- Requirements
- Documentation
- Development
- Testing
- Deployment

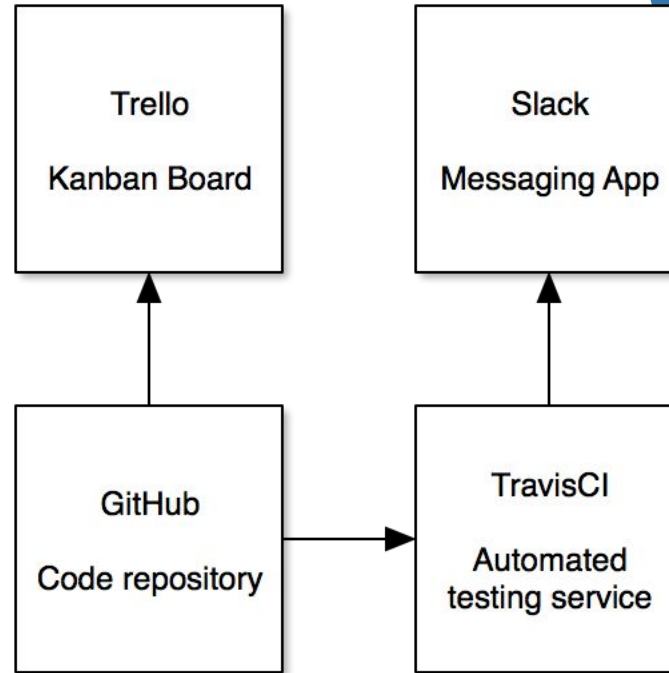
Project Methodology

Kanban

- Manage the flow of work through stages
- Team members pull work to do
- Flexible process that can accommodate for change while developing

Tools

- Trello
 - Github
 - TravisCI
 - Slack
-
- Tools integrated with each other



A large blue geometric shape, resembling a parallelogram or a large triangle, occupies the right half of the image. It is composed of two shades of blue, with a darker blue border or shadow effect along its left edge.

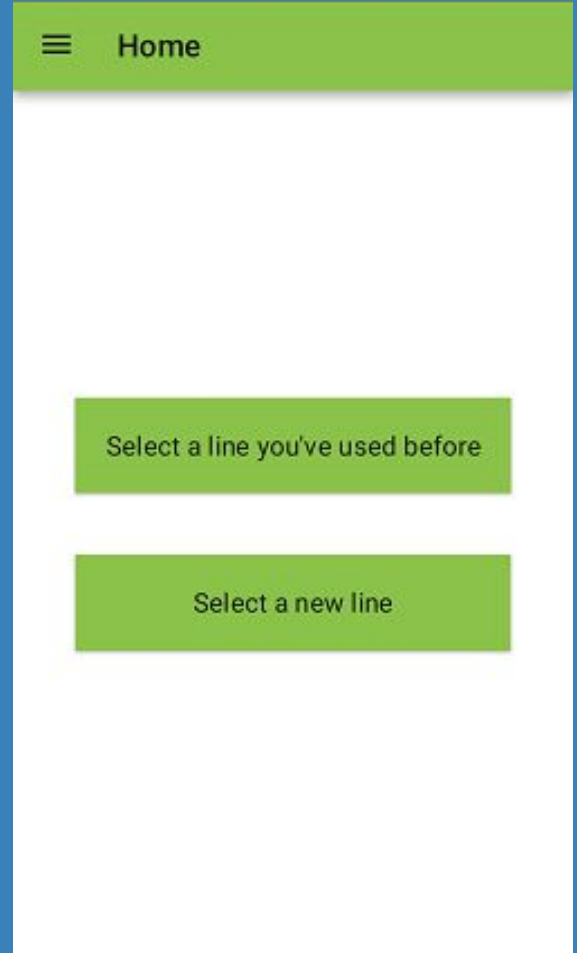
Product

App

- Requirements
 - Locating of traps
 - Record catch data
- Additional priorities
 - Suitable controls

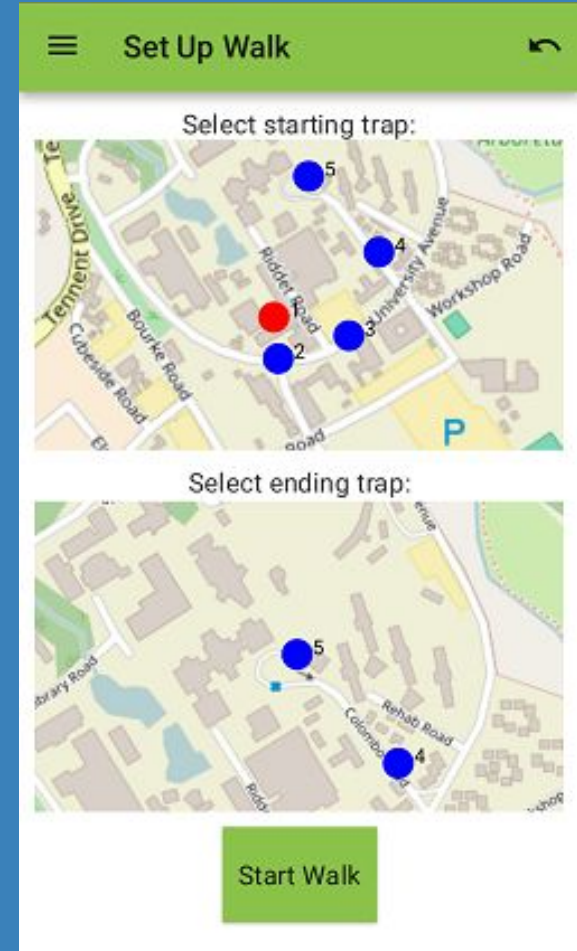
Selecting Lines / Favourite Lines

- Selecting lines
- Search
- Password



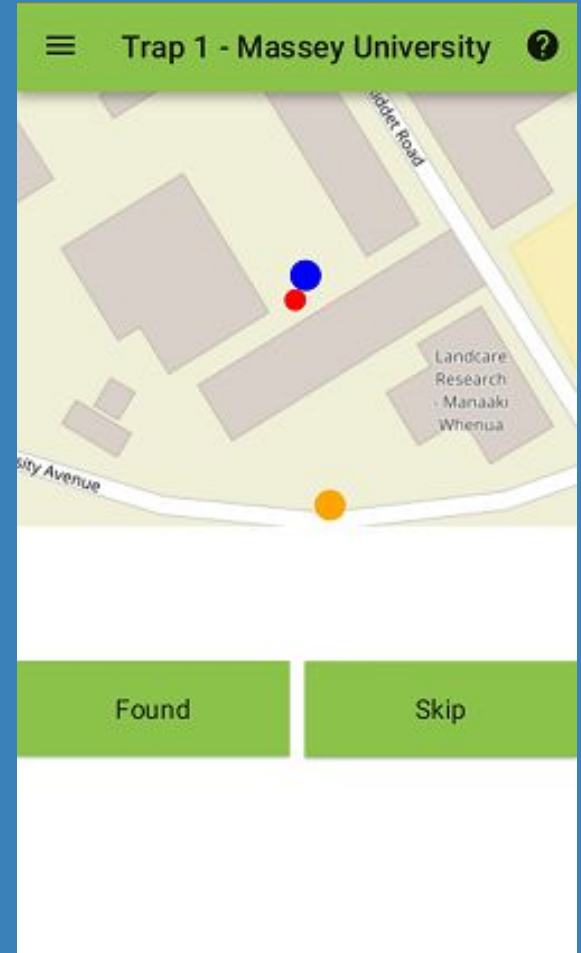
Selecting Start & End Points

- Partial walks through the trap line



Finding Traps

- Map
- Legend
- Moved or broken



Adding Catches / Maintenance

- Top buttons
- Other animals
- Maintenance

The image shows a mobile application interface for a trap. At the top, there is a green header bar with a hamburger menu icon and the text "Trap #1". Below the header, the main content area is white and contains several green buttons. The buttons are arranged in a grid: two buttons in the first row ("Empty" and "Other"), two buttons in the second row ("Stoat" and "Hedgehog"), a single button in the third row ("Other"), a single button in the fourth row ("DONE" with a small icon), and a single button in the fifth row ("Trap Maintenance").

Trap #1	
Empty	Other
Stoat	Hedgehog
Other	
DONE	
Trap Maintenance	

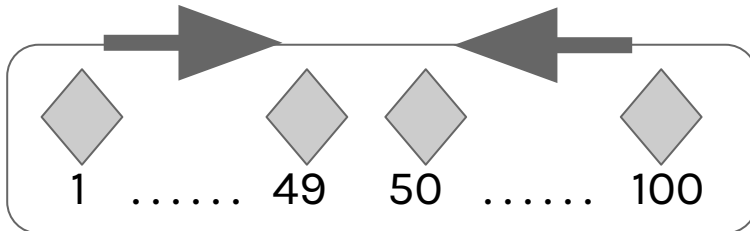
Adding New Traps

- Supplying coordinates
- Trap number
- Side of path

The image shows a mobile application interface for creating a new trap. At the top is a green header bar with a hamburger menu icon, the text 'Create New Trap', and a question mark icon. Below the header is a map view showing a street with a blue 'P' parking sign and a blue bus icon. A red dot and an orange dot, both labeled with the number '5', are placed on the street. Below the map are two green buttons: 'Use current location from map' and 'Manually enter longitude and latitude values'. Under these buttons are two text input fields. The first is labeled 'Enter Trap number:' and the second is labeled 'Side of path:'. At the bottom are two green buttons: 'Left' and 'Right'.

Sending Data

- Send direct to server
 - Password
- Set up walk



Finished: Massey University

Once there is an internet connection, click the below to send the data to the server and return to the home page. If you want to complete more traps on this line before you send data to the server, click the button to set up the next part of your walk.

Send to server

Set up walk

Website

- Requirements
 - Exporting data
 - Line administration
- Additional priorities
 - Simple for user
 - Minimise admin work

Home Page

Trap Tracker

[Home](#)[Create Line](#)[About](#)

Trap Tracker

Show EntriesSearch:

Trap Line Name ▲			
Belgium Demo	Traps	Catches	Settings
Kaimais	Traps	Catches	Settings
Manawatu Gorge	Traps	Catches	Settings
Massey University	Traps	Catches	Settings
Massey Walkway	Traps	Catches	Settings
Pohangina Valley	Traps	Catches	Settings

Showing 1 to 6 of 6 entries

Previous

Next

Create New Line

- Name
- Passwords
- Animal preferences
- reCaptcha

Trap Tracker

[Home](#)[Create Line](#)[About](#)

Create New Line

Name

User Password

Admin Password

Animal Preference

☐ I'm not a robot

Viewing Traps

- Edit trap
- Shows traps on a map of the area

Trap Tracker[Home](#)[Create Line](#)[About](#)

Traps in Manawatu Gorge

[Delete](#)

Show Entries

Number	Latitude	Longitude	Path Side	Broken	Moved
1	-40.311121	175.777068	Right	No	No
2	-40.311694	175.778506	Right	No	No
3	-40.312443	175.779098	Right	No	No
4	-40.312435	175.780965	Left	No	No

Showing 1 to 4 of 4 entries [Previous](#) [1](#) [Next](#)

[Add New](#)

Viewing Catches

- Catches made on a line
- Exporting catch data

Trap Tracker[Home](#)[Create Line](#)[About](#)

Catches for Manawatu Gorge

[Delete](#)

Show Entries Search:

Date	Trap Number	Animal
26/Sep/2017	1	Rat
26/Oct/2016	1	Empty
18/Oct/2016	1	Cat
18/Oct/2016	1	Stoat
18/Oct/2016	1	Bird
18/Oct/2016	1	Duck
18/Oct/2016	1	Other
18/Oct/2016	1	Other
18/Oct/2016	2	Empty
18/Oct/2016	3	Empty

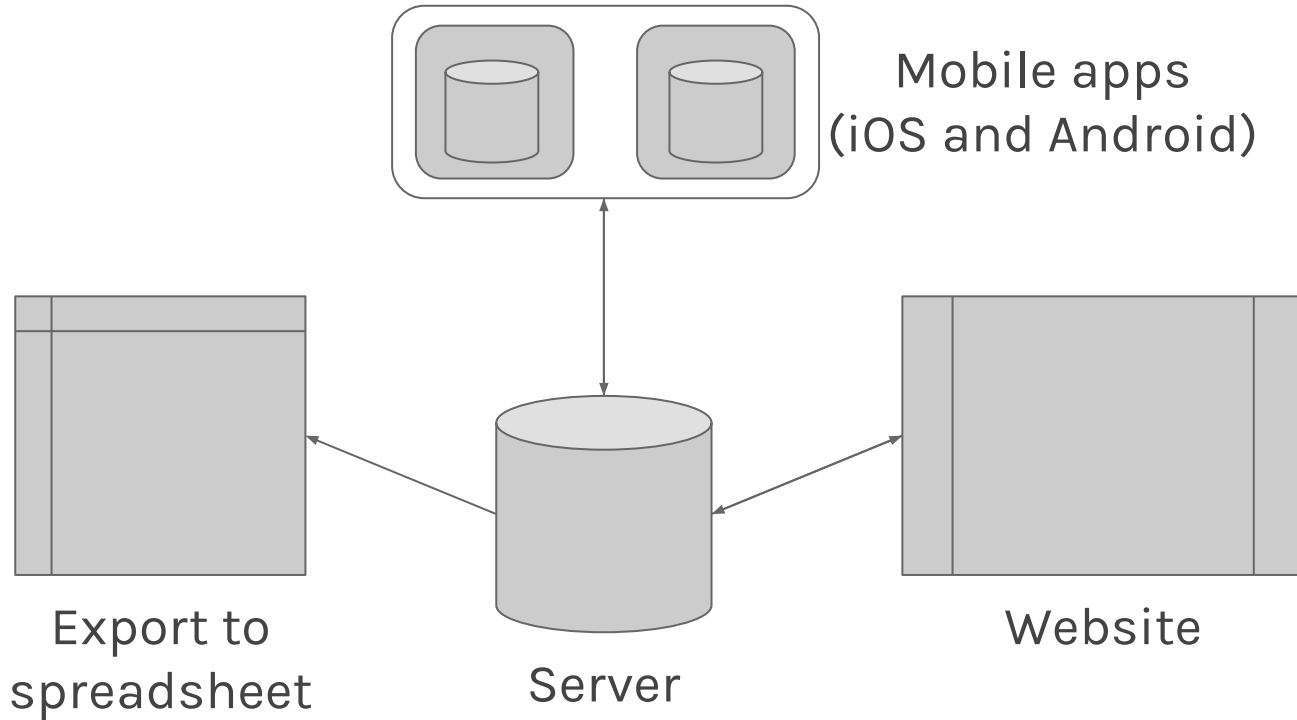
Showing 1 to 10 of 61 entries Previous 1 2 3 4 5 6 7 Next

[Export data](#)

A large blue geometric shape, resembling a parallelogram or a large triangle, occupies the right half of the image. It is composed of two shades of blue, with a darker blue border or shadow effect along its left edge where it meets the white background.

Technical

Component Diagram



A large blue diagonal graphic that starts from the top right and extends towards the bottom left, creating a split background of white and blue.

Technical

Mobile App

Gluon Mobile API

- Write one app to run on iOS and Android
- Java based
- Student licenses

Local Storage

- SQLite database
 - Catch data
 - Maintenance data
- Settings file
 - App state
 - Line passwords

GPS

Testing accuracy

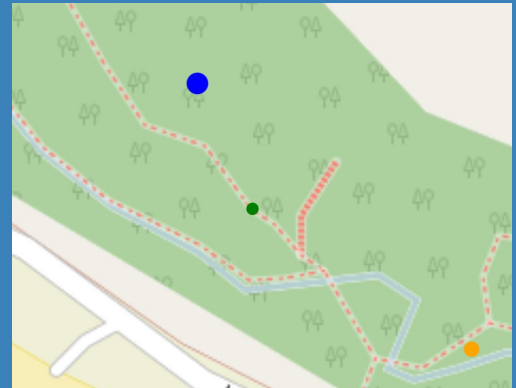
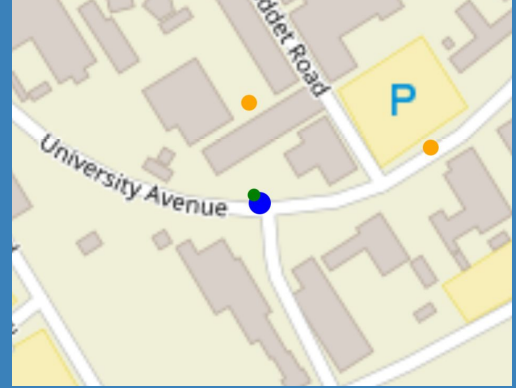
- Phones
- Walks

Open Area

- Accurate to 5-10m

Enclosed Area

- Accurate to 10-20m



Gluon/Open Street Maps

- Gluon/Open Street Maps
 - Data from Land Information NZ
 - Shows forest walks
 - Free to use
- Caching map tiles
 - Map tiles you have seen are saved locally for future use

Technical

Server

Server Technology

- Hosted on pythonanywhere.com
- Built on Python Flask
- SQLite database
- Website based on Jinja2
- Data updated with AJAX calls to the API

Authentication

- Line-based authentication with two levels:
 - User: View traps; Add catches
 - Admin: Edit line; Add/remove traps
- Each line has a user and admin password
- Initial creation of a line only requires proof of humanity (via reCAPTCHA)

Web API Endpoints

- Lines
- Traps
- Catches
- Animals
- Authentication Check

Testing

App

- Unit tests
 - Evosuite
 - Manual
- UI manual checklists
- User tests

Server

- API unit tests run through Travis CI
- Selenium browser testing
- UI manual checklists

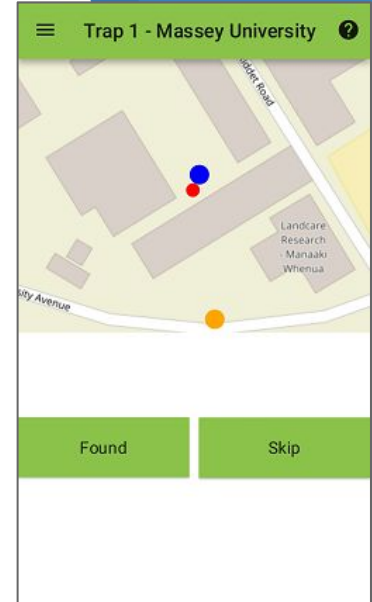
Project Future

Project Continuation

- Open source
- Groups who could pick up the project:
 - Department of Conservation
 - Oroua Blue Duck Project
 - Predator Free NZ

Future Developments

- Sound and vibration when near traps
- Loading screens
- Detecting network connectivity
- Map caching
- Scaling UI to screen
- Upload images
- Online graphs for captures
- XLSX file support



Future Expansion

- New server host
- Support new iOS/Android OS/browsers
- New features supported by Gluon

Reflection

Good

- Good teamwork
- Tools

Change

- Research & test tools more
- Speak to users & capture requirements
- Develop earlier
- Build earlier

The background of the slide is split diagonally from the top-left to the bottom-right. The upper-left portion is white, and the lower-right portion is a solid blue color. The word "Demonstration" is positioned in the white area.

Demonstration