Design Implications for an Acoustic Based Bio-Diversity Citizen Science Mobile Application

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Aims and Method

- Novel citizen science smart phone app developed to automatically detect New Forest cicada using microphone

- Explore if app aligns/conflicts with communities of practice

- In-depth Interviews with professional naturalists, observations of real world surveying and public trials with prototype of app

- Propose series of implications for design and app refinements

Alignment and Conflict

The Scientific Method

"It cuts out possibly what might be barrier to somebody taking part in the survey" **[Support collecting data]**

"There could be an element of laziness, that, ya know not gonna take it any further, that you just rely on the app to identify it for you, rather than drilling down into it" **[De-skilling]**

"I wouldn't want to just rely on [the app] because there's always an exception to any rule isn't there" **[Human verification]**

"What I'm not sure of is whether what we've got now would be better or worse in terms of quality and ease of use" **[Data quality]**

Use and Sharing of Information

"You suspect there's an awful lot of useful data out there, but some people umm don't like sharing it" **[Data ownership]**

"It is like a constant battle really isn't it? How do you inspire people, inspire local people but then you have this amazing plant or amazing species that is here but then it is at the risk of people abusing it, so you cant share it with people" **[Sharing information]**

"I suppose the danger with the app is that you are actively encouraging people on to sensitive habitats, which might not be visited in the normal course of their visit" **[Sensitive locations]**

Implications for Design

Educational Content
Improve understanding scientific method and environment
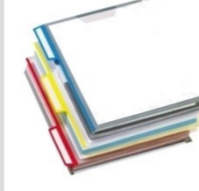
Layered Information
Simple information on the surface, with ability to go deeper

Access Control and Ownership
Ability to blur data, determine access and clear attribution

Guarding Mechanisms
Inform and nudge users to alter direction using GPS

Confidence and Accuracy
On board demonstration of the detection working

Widening the Audience
Cost-effective alternate tech and more detectable species

Supporting Activity and Motivation
Engage with information on local context and environment

Incentive Engineering
Incentivisation through gamificaiton and maps

Incentives and Motivations

"I don't think I'm a sort of insect nerd enough to do this" **[Lack of interest]**

"I've always been interested ever since I was little" **[Life long passion]**

"That would be very useful… maybe too useful, maybe it takes all the excitement out of pouring through your text books" **[De-skilling]**

"To get a report that says nothing found, it just leaves, it could leave people feeling a little cold and empty" **[Negative results]**

"A more general overview, something I've started to get interested in now is birds so something that picks up and tells you what sort of birds are, or all the animals that are around you" **[Beyond the cicada]**
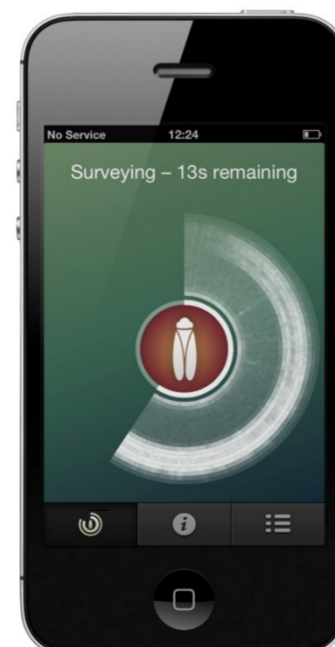
Benefits, Concerns and Proposed Refinements

KEY: | - *Desirable* | - *Undesirable* | ✔ *Proposed refinement* |

Users
- Lack of information
- Easy to use
- Educational tool
- Lack of incentives
  ✔ More educational information
  ✔ Motivation and incentives
  ✔ Layered information

- Lack of 'bigger' picture and sense of community
  ✔ Incentives

Data

- Human verification still needed
- Automated record collection

App
- Automation devalues skill
- Reduces barriers to surveying
- Accuracy of algorithm

- Potential damage to the forest
- Not primary reason for visiting
  ✔ Support main activity
  ✔ Guarding mechanisms

Forest

- Concerns about mis-use of data

WWW
- Public engagement
- Ownership of data
- Availability of sensitive data
  ✔ Access and ownership control

Visitors