



# ENVIROFI

“ENVIROfying” the Future Internet

## BRINGING BIODIVERSITY TO THE FUTURE INTERNET

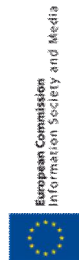
Leveraging the Future Internet for the Environmental Usage Area

Kathi Schleidt

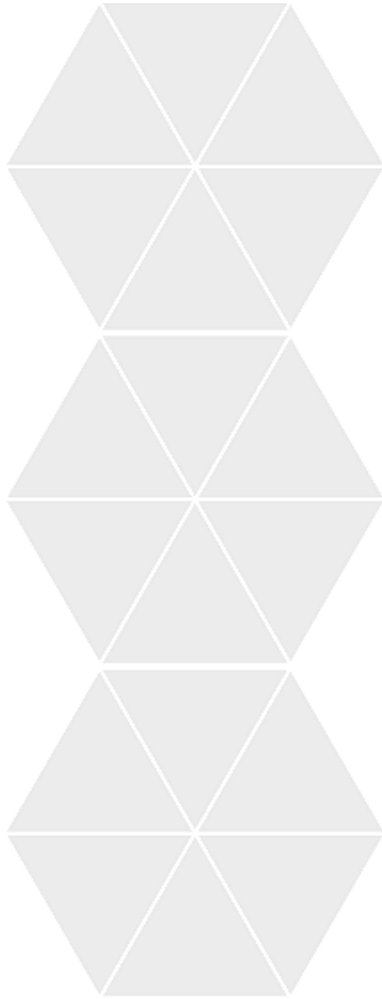
ITAPA 2012

Bratislava, SK, October 25th 2012

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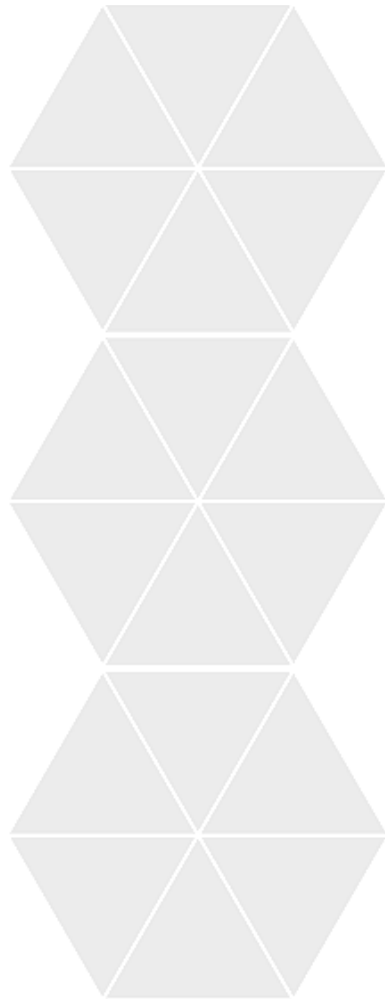


1. The Future Internet Public Private Partnership
  1. Triggers
  2. Expected outcomes
2. ENVIROFI: Environmental Usage Area of the Future Internet
3. WP1 - Bringing Biodiversity to the Future Internet
  1. Goals
  2. Requirements



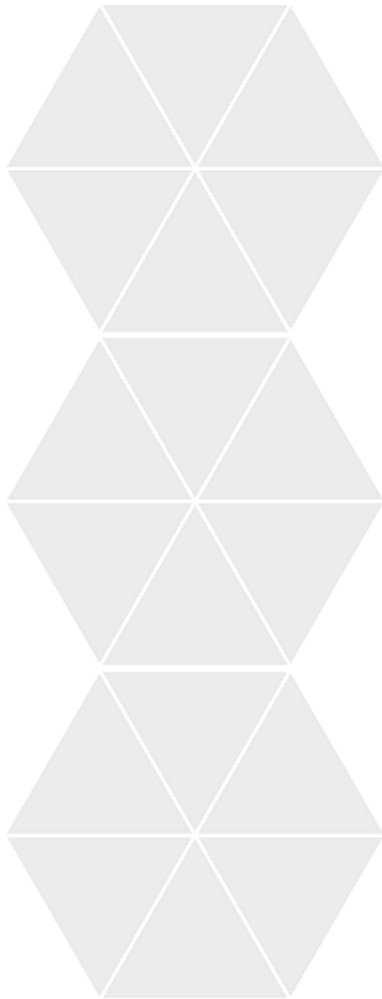
# Future Internet Public Private Partnership

- Following the **call from industry** and the Member States, the Commission looked for ways of implementation
- Future Internet is a **core infrastructure** in society, a backbone for smarter cities and regions
- Novel societal and commercial usages are challenging the original Internet architecture, i.e. the **Internet of Things**
- **Programme notion:** much what used to take place at project level is now transposed one level higher, to the programme level (e.g. IPR, standardisation, KPIs, dissemination,...)



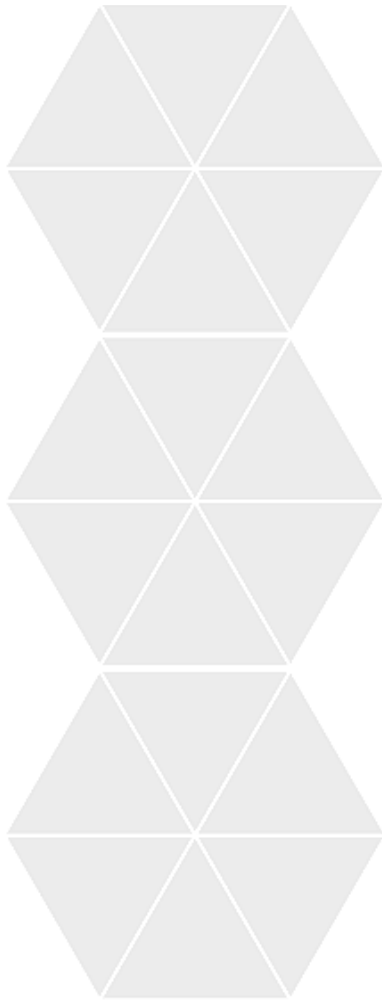
# Future Internet Public Private Partnership

- It's an **in-situ experiment**
  - Integrated programme notion
  - Euro 0.5 billion project
  - Pathfinder for FP8
- **Builds upon** and complement existing efforts in FI research
- **Bridges the gap** between private and public interests
- **Led by industry and driven by users**
- Address regulatory and legal barriers, **drives policy**
- EU wide attention guaranteed
- Global attention assured



## Expected FI-PPP Outcomes (1)

- Identification, definition and up-dating of the **Future Internet requirements**
- Specifications for an **open standardised generic framework** combining the required network, data, computing and services components
- Stock-taking and further **valorization of the results** already achieved through **earlier European research**
- Broad based **SME involvement**



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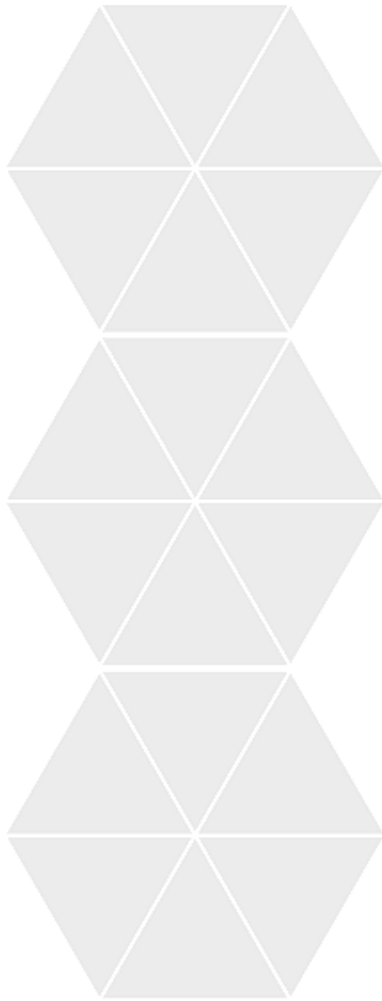


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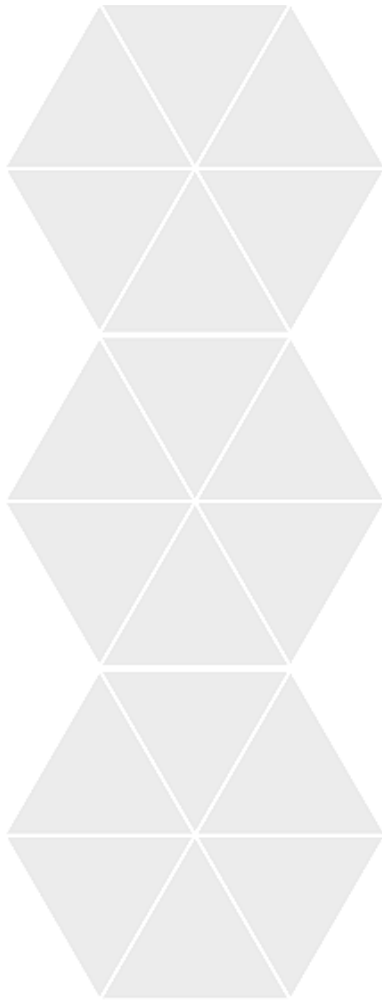
## Expected FI-PPP Outcomes (2)

- **Validated set of the technologies** to support user driven innovation schemes in real application contexts
- Platform validation through **large scale trials**
- Establishment of **standardised interfaces** where feasible
- **Contributions to EC and national policy** and research agendas
- **Alignment with other** ongoing Future Internet research initiatives



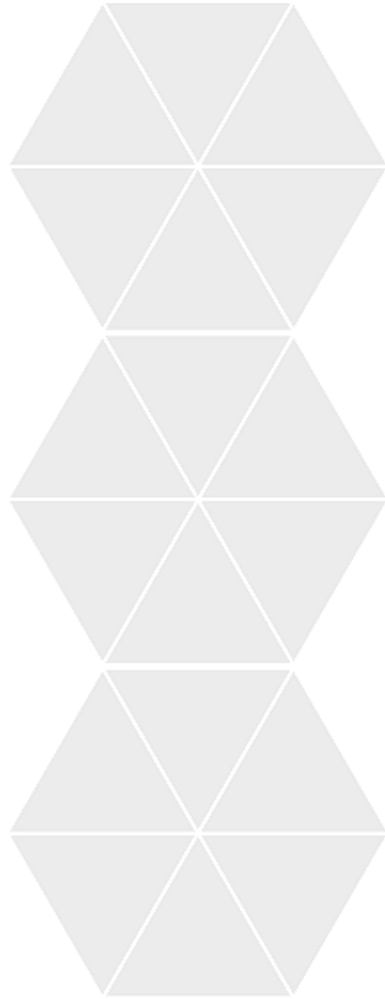
## FI-PPP programme. Phases

- **Phase 1 (2011-2012)**
  - Define the usage area requirements & Identify the common enablers
  - **Identify the scenarios for early trials**
  - Start implementing domain specific functionalities
  - Establish the programme support and coordination structures
- **Phase 2 (2013-2014)**
  - Ensure availability of the necessary test infrastructure for the early trials
  - **Develop the core platform and the use case specific functionalities**
  - **Run early trials** for all use cases
  - **Prepare large scale trials**
- **Phase 3 (2014-2015)**
  - **Run large scale trials**
  - **Involve SMEs at large**



## Facts & Figures

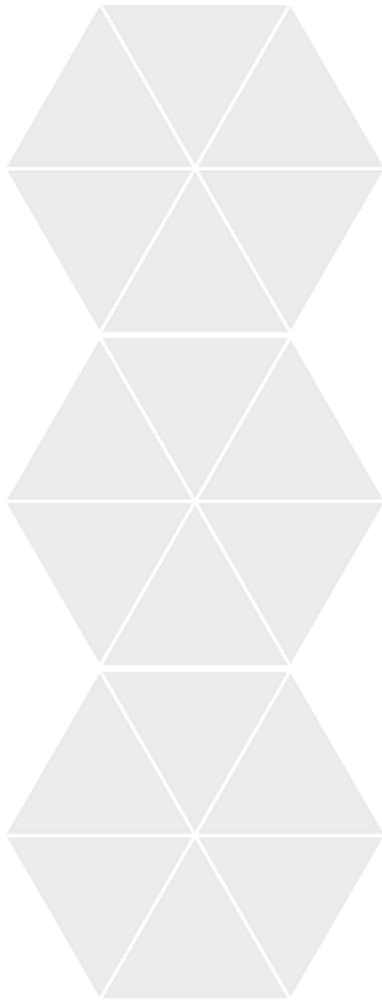
- **Investment** by the  
European Commission €300 million  
Programme Participants €300 million
- Partner **organizations** and companies 158
- Industry share in the programme 68%
- Academic institutions 18
- Countries represented 23





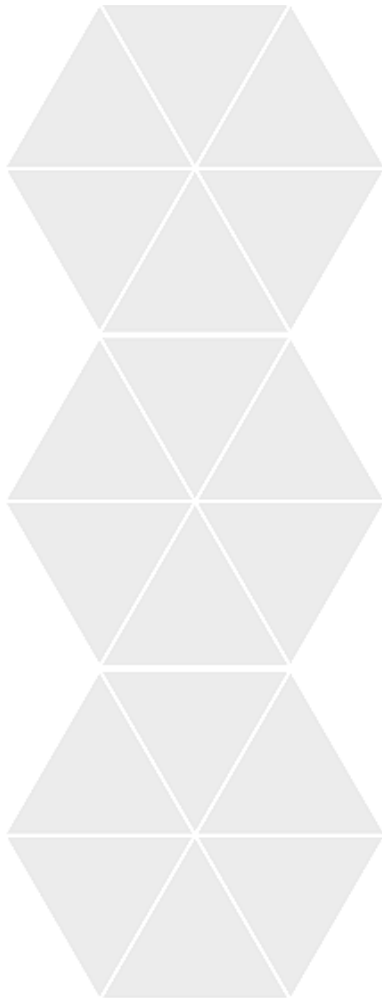
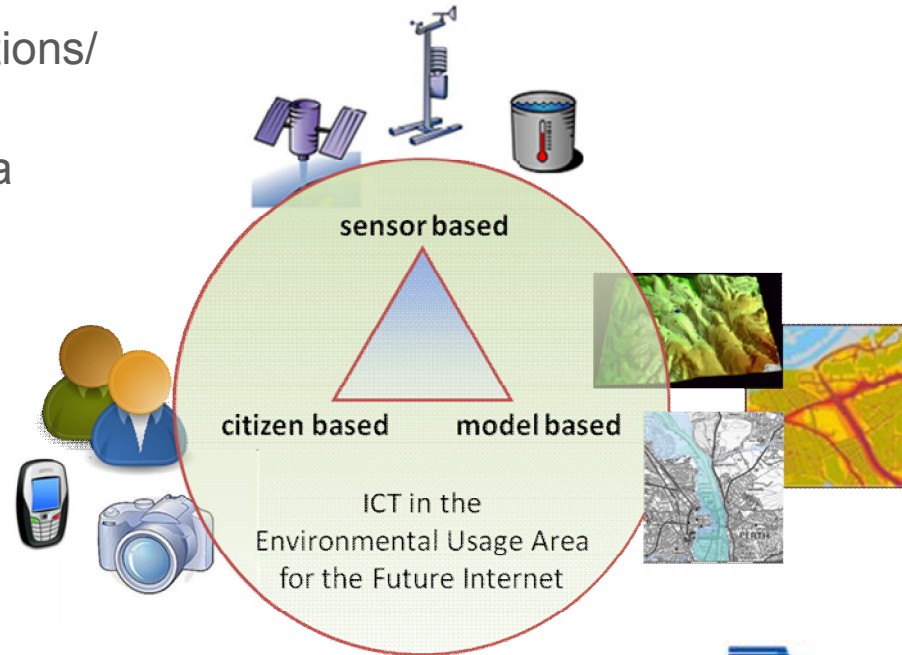
## ENVIROFI Vision

- We envision ...
  - *to establish an Environmental Observation Web in which all environmental data, whether from sensors, citizens, or models, are available anytime anywhere through the Internet in a standardised, usable format*
  - *a system with dynamic understanding of the Earth's atmospheric, marine and terrestrial spheres for the benefit of all European citizens*



# ICT in the Environmental Usage Area

- Focus on observations
- Work based on standards
- Observations can originate from various sources
  - Web-enabled sensors and sensor networks
  - Citizen observations/ human sensors
  - Models and data fusion services





## 1. Bringing Biodiversity into the Future Internet

- Enabled biodiversity surveys with advanced ontologies
- Analysis, quality assurance and dissemination of biodiversity data

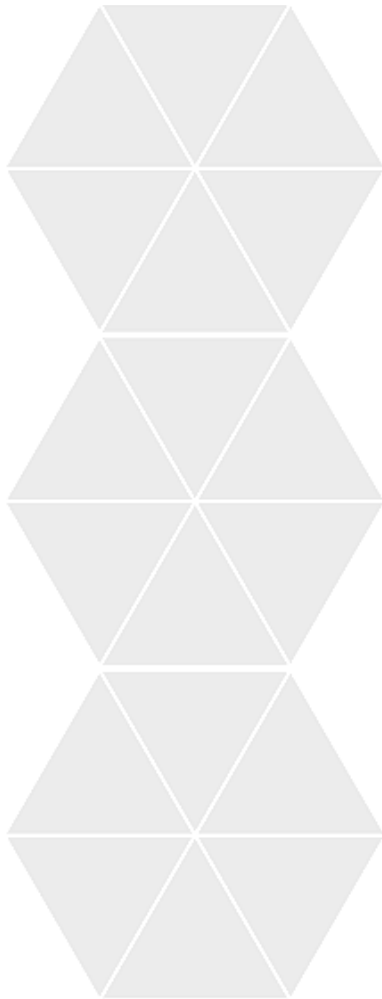
## 2. Personal Information System for Air Pollutants, allergens and meteorological conditions

- Enhance human to environment interaction
- Atmospheric conditions and pollution in “the palm of your hand”

## 3. Collaborative Usage of Marine Data Assets

- Assess needs of key marine user communities
- Selection of representative marine use cases for further trial: leisure and tourism, ocean energy devices, aquaculture, oil spill alert

# Objectives for Biodiversity Scenario



**Trees in Your Vicinity**

- 2003 : Dittmann-gasse
- 1014 : Grillgasse
- 2010 : Grillgasse
- 2001 : Grillgasse
- 2029 : Simmeringer Hauptstrasse
- 1010 : Krausegasse
- 1022 : Geiselbergstrasse
- 1005 : Albin-Hirsch-Platz

**Trees in Your Vicinity**

**Tree Details**

TreelD:	BAUMOGD.18775
Street:	Pretschgasse
GPS (lon,lat):	(16.42539260190;
TreeNumber:	1006
Area:	Strassen
DataProvider:	Datenquelle: Stadt data.wien.gv.at
Height:	7 m
CrownDiameter:	5 m
SpeciesName:	Prunus serrulata '1 Bläutenkirsche)
PlantingYear:	1960
TrunkCircumference:	116 cm

**Tree Observation**

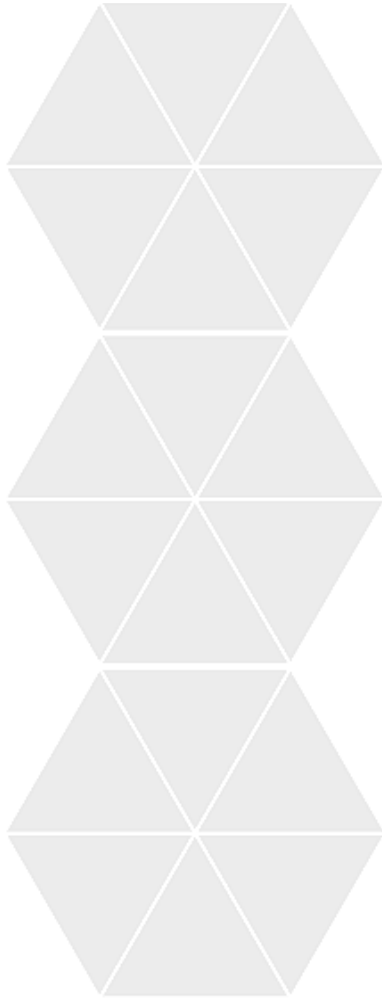
TreelD: BAUMOGD.1909937

User Name: cbg

Comment: What a nice tree!

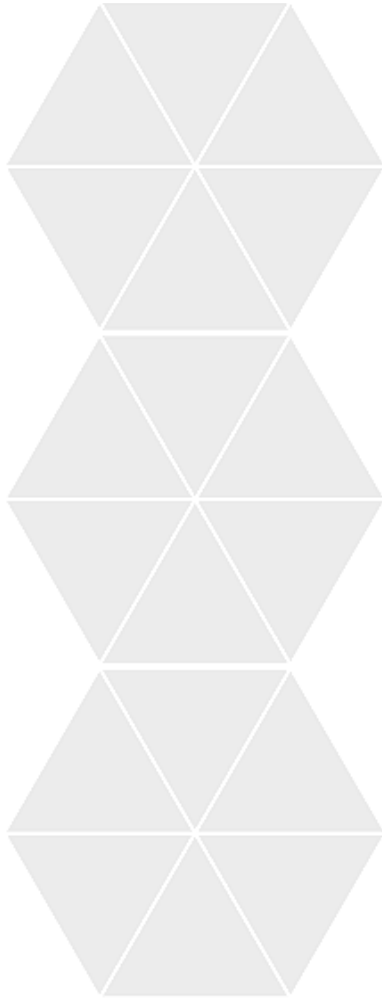
Buttons: Add Observation, Save Observation

# Objectives for Biodiversity Scenario



1. Analyse existing standards based data models for observational data for aptness of use for biodiversity occurrence data, document gaps and propose necessary extensions to existing standards;
  - Define design patterns based on the O&M standard for biodiversity data (both point occurrences and areas)
  - Aligned with INSPIRE O&M Design Patterns
2. Analyse requirements for mobile devices for recording biodiversity occurrence data as well as providing information on local biodiversity;
  - Requires leaner transfer formats
  - How to deal with lack of connectivity in remote areas
  - Determine what types of information are relevant to the users

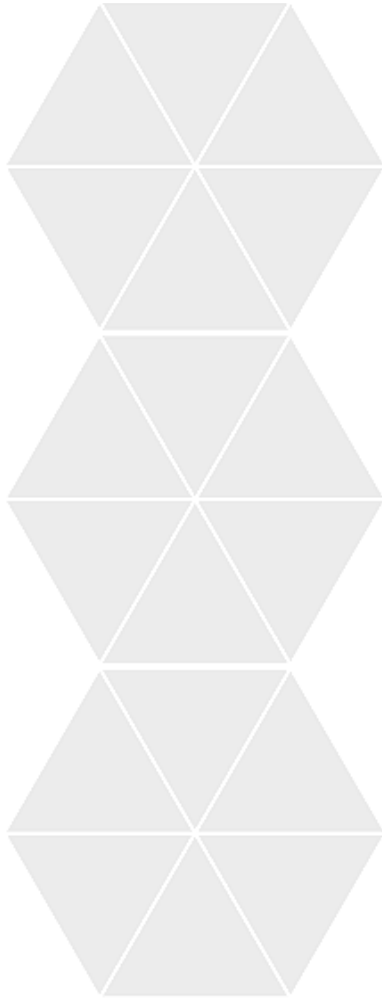
# Objectives for Biodiversity Scenario



3. Create semantic backbone for structuring species information, merging species resources and supporting quality assurance;
  - Provide unique identifiers for species
  - Merge species resources across regions
  - Provide feedback on occurrence probability
4. Define requirements for context aware quality assurance of reported data based on crowd-sourcing and the semantic backbone;
  - Utilize user's trust level as well as their own trust in their identification
  - Provide "preferred identification" with probability metric
  - Abstract Re-Captcha logic for species identification

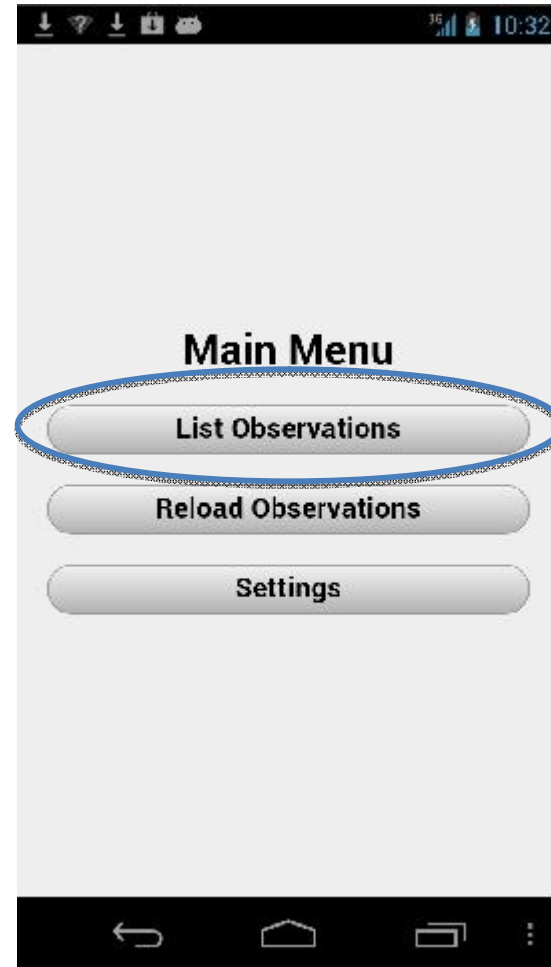
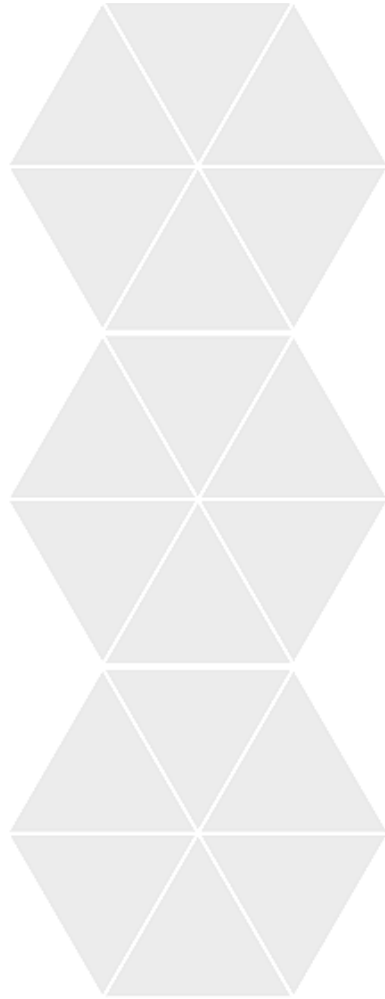
# Objectives for Biodiversity Scenario

5. Define various processing/fusion services as required
  - Automatic leaf recognition for identification support
  - Generation of species and habitat distributions (utilizing outputs of the eHabitats project)





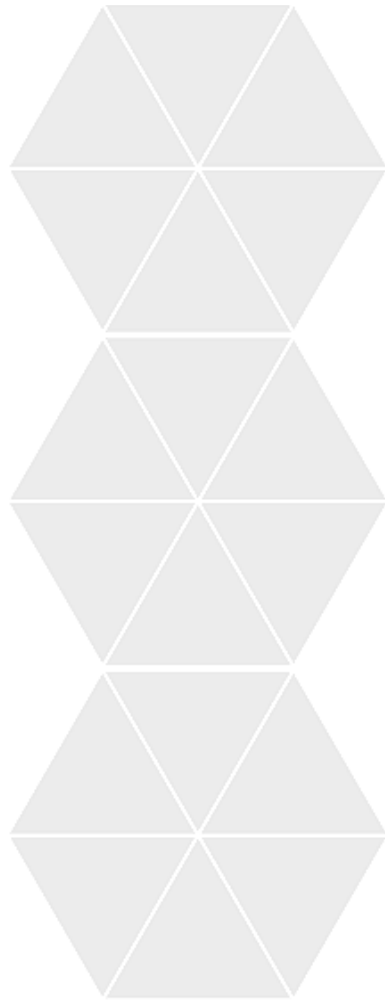
# Biodiversity Application







# Biodiversity Application



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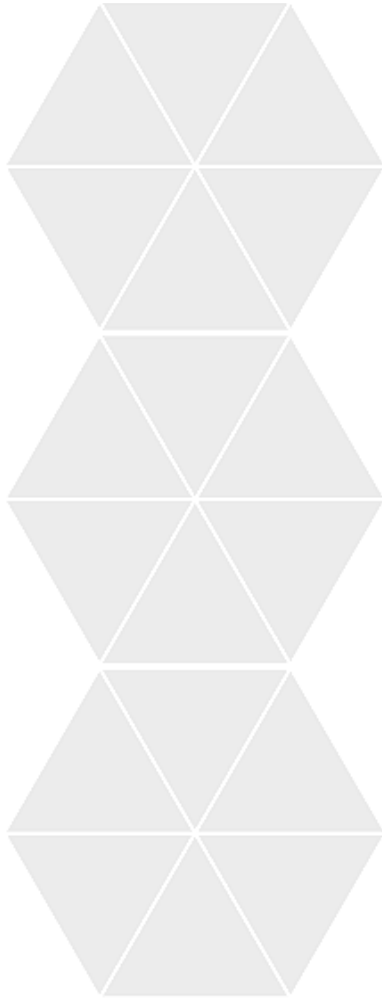
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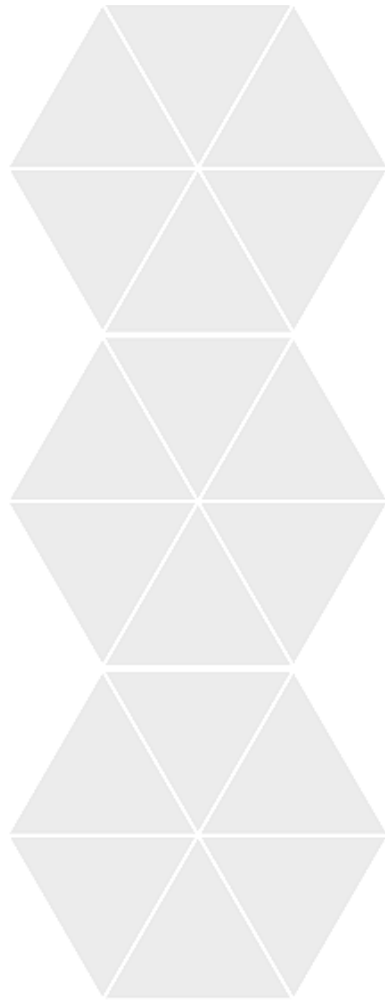


# Biodiversity Application





# Biodiversity Application



Field	Value
Tree ID:	12345
Street:	Via del Castellaccio, 25, 50121 Florenz, Italien
Longitude:	11.253779526405428
Latitude:	43.774289044853645
Altitude:	50.47855377197268
Tree Number:	12345
Area:	Florence
Data Provider:	maria7
Height:	7 m
Crown Diameter:	5 m
Species Name:	Quercus petraea
Common Name:	Farnia
Planting Year:	1995
Trunk Circumference:	98 cm



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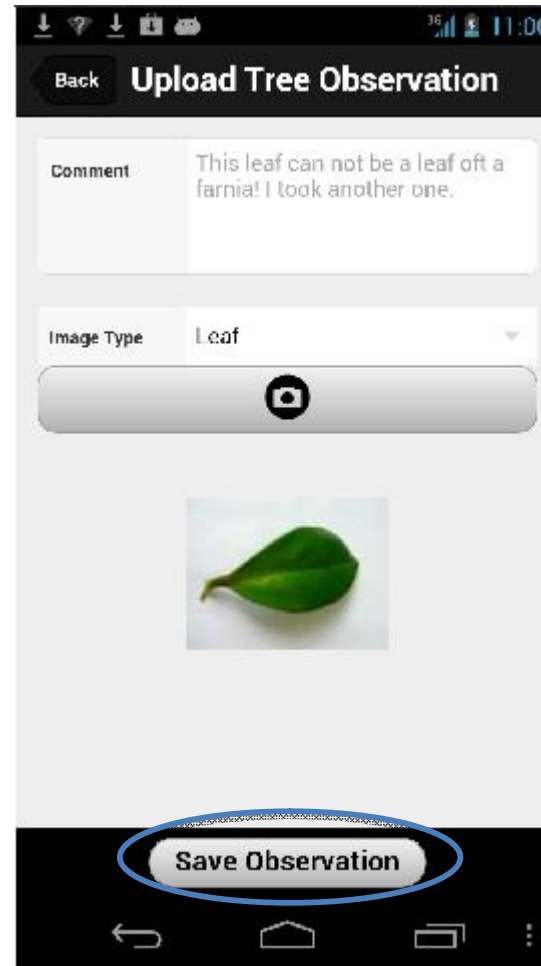
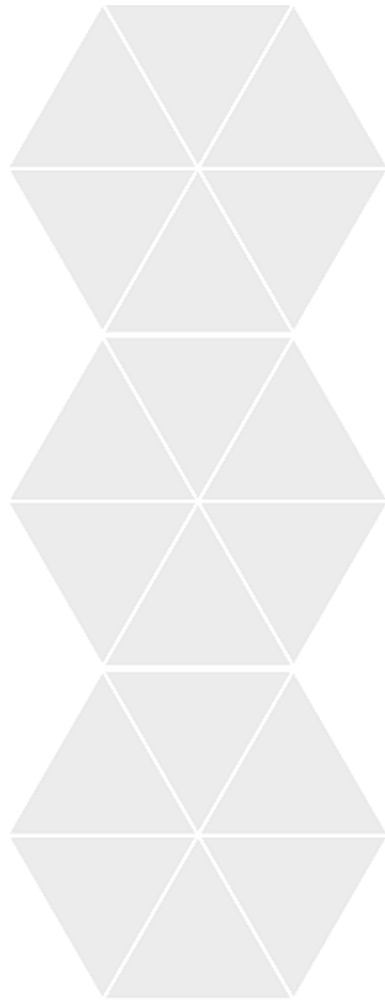
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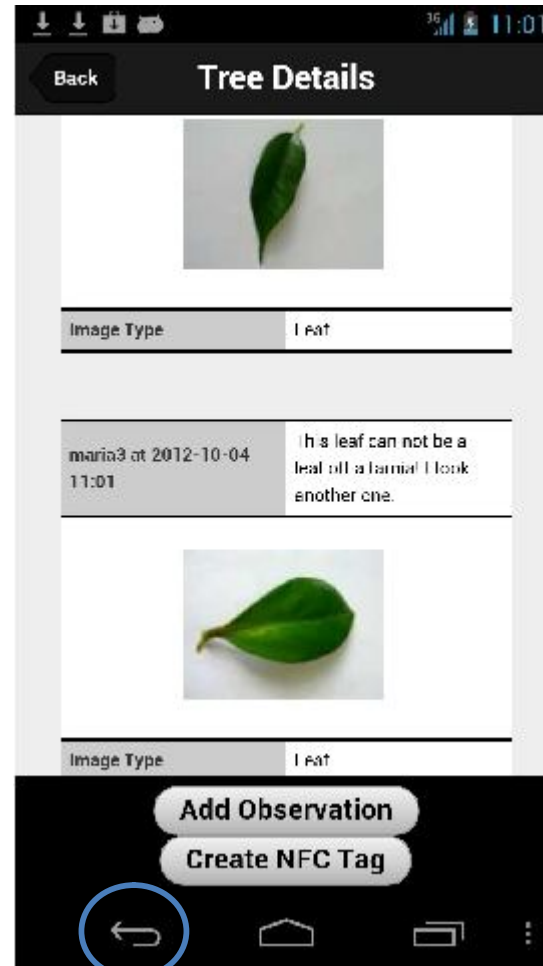
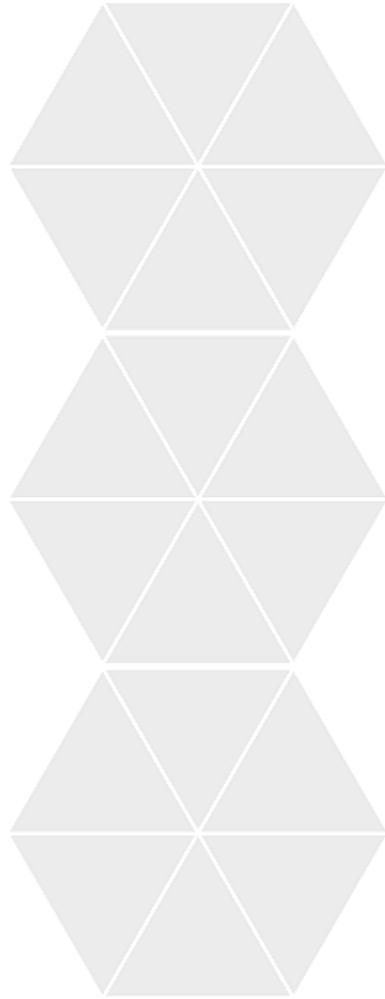


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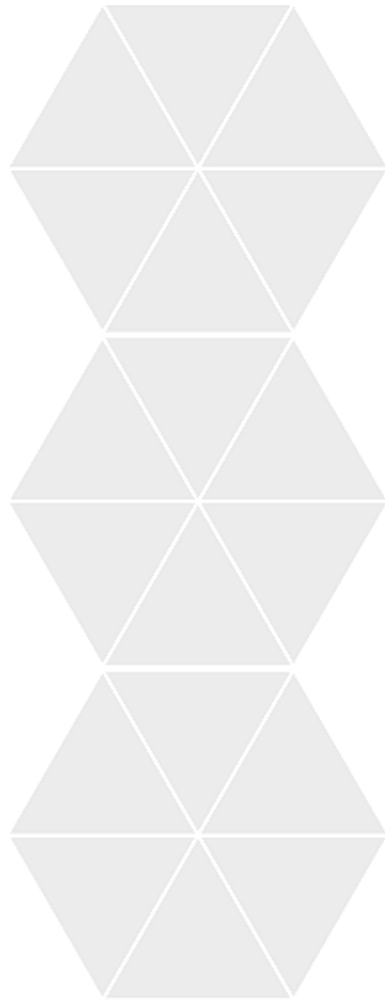


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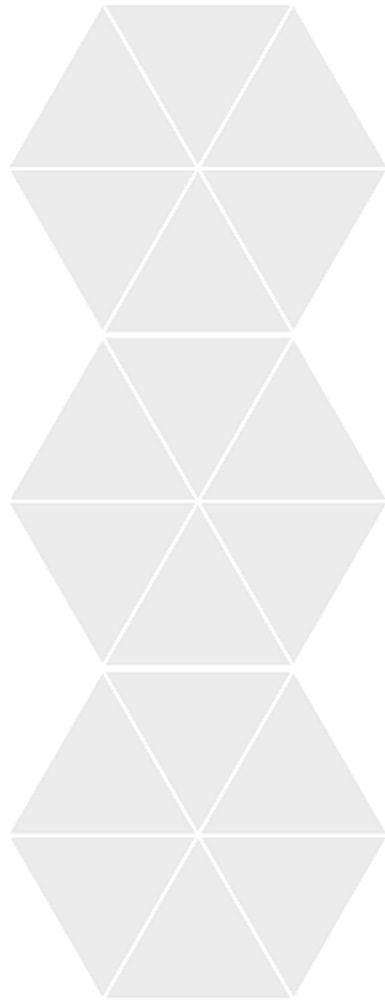
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Tree Number	
Species Name	
Common Name	
Latitude	43.774289044853646
Longitude	11.259779526405428
Altitude	50.47855377197266
Street	Via del Castellaccio, 28, 501
Area	
Height	
Crown Diame...	
Trunk Circum...	
Planting Year	

Upload Tree



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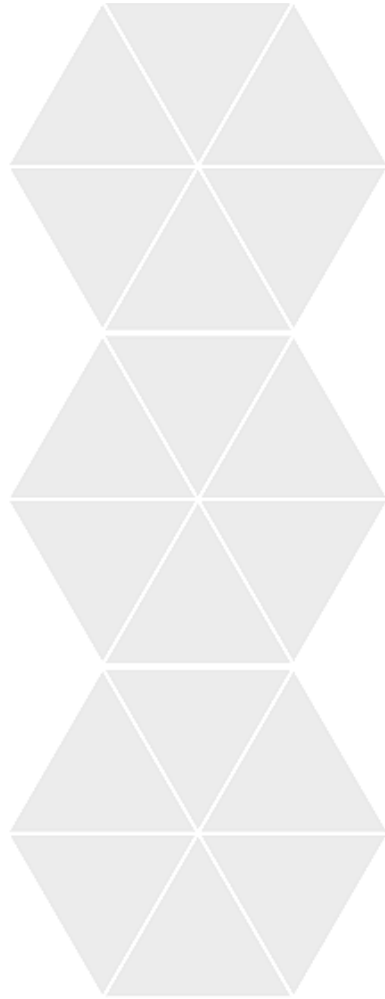
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Tree Number	12345
Species Name	Quercus petraea
Common Name	Fania
Latitude	43.774289044853646
Longitude	11.259779526405428
Altitude	50.47855377197266
Street	Via del Castellaccio, 28, 501
Area	Florence
Height	7
Crown Diame...	5
Trunk Circum...	98
Planting Year	1995

**Upload Tree**



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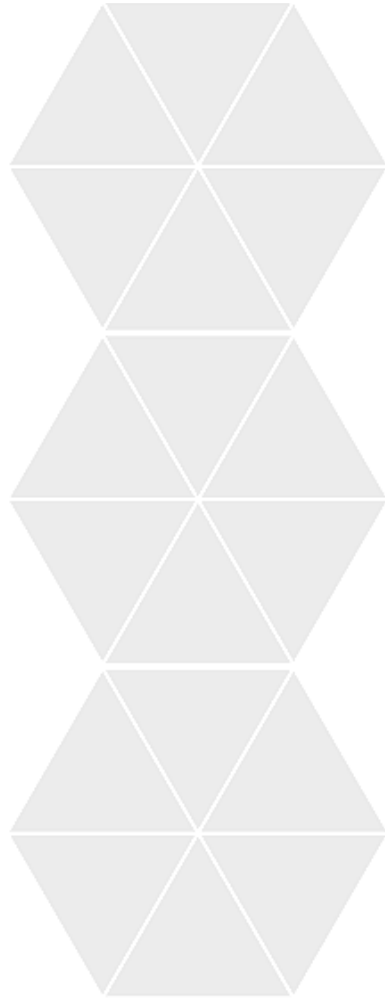


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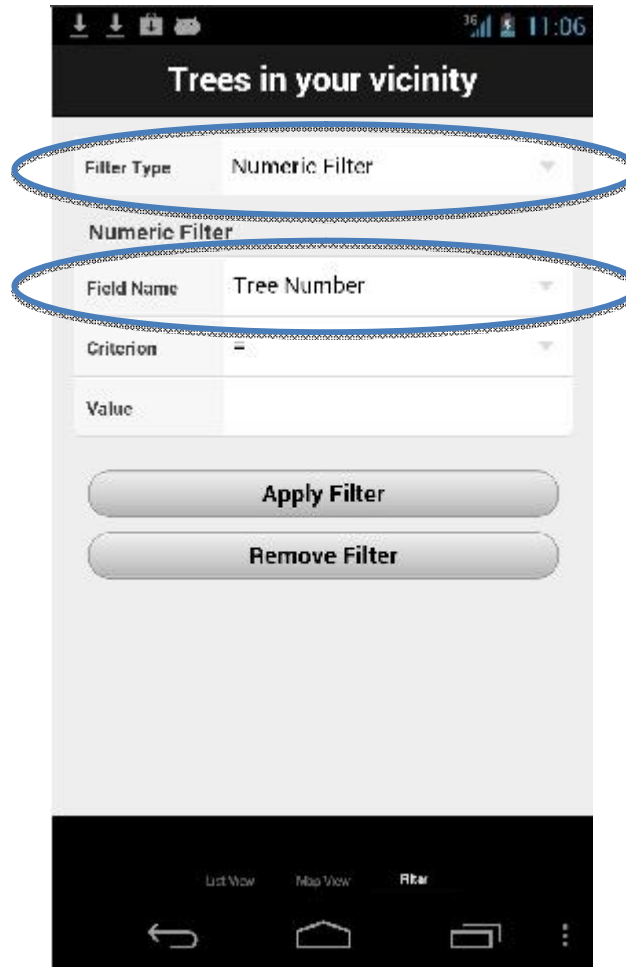
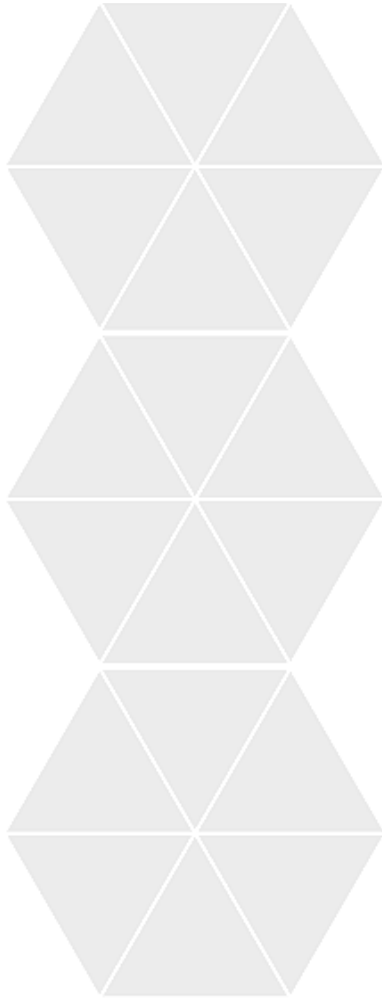
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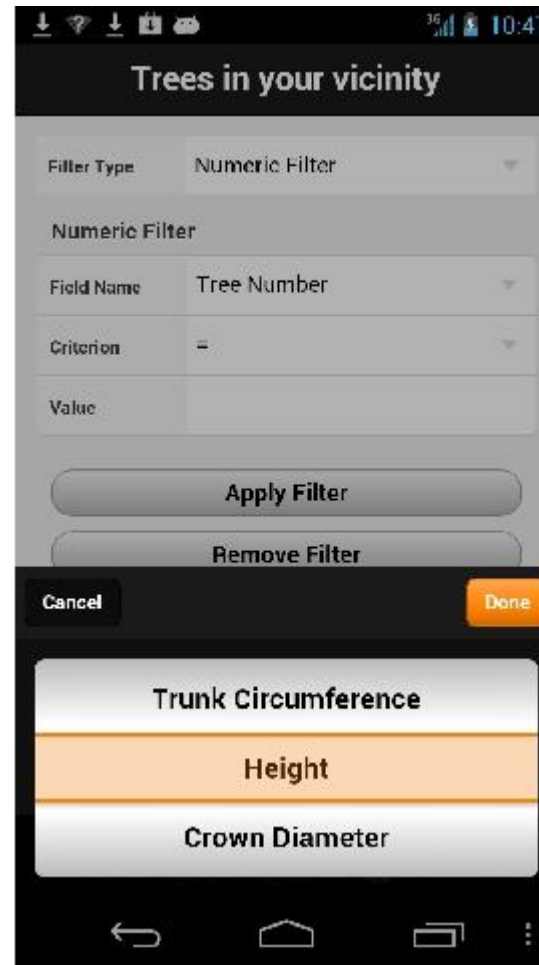
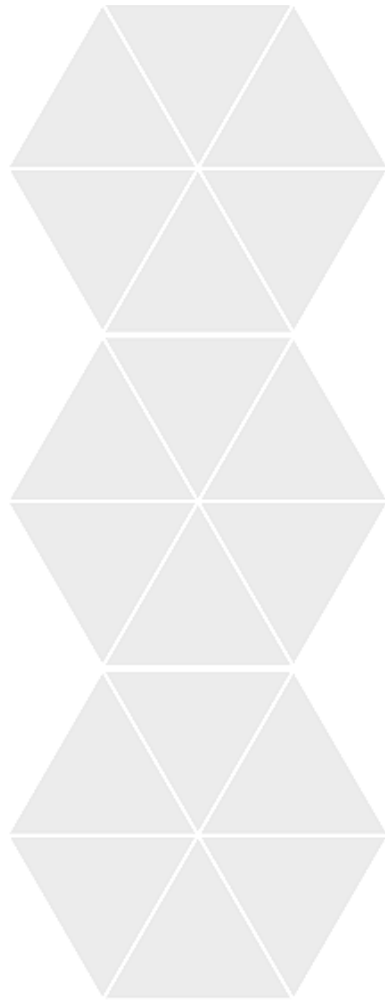


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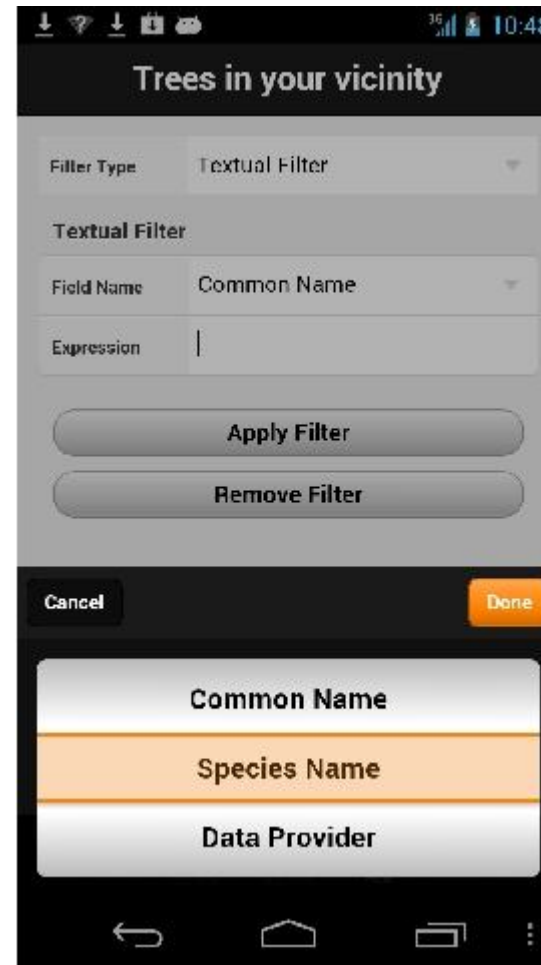
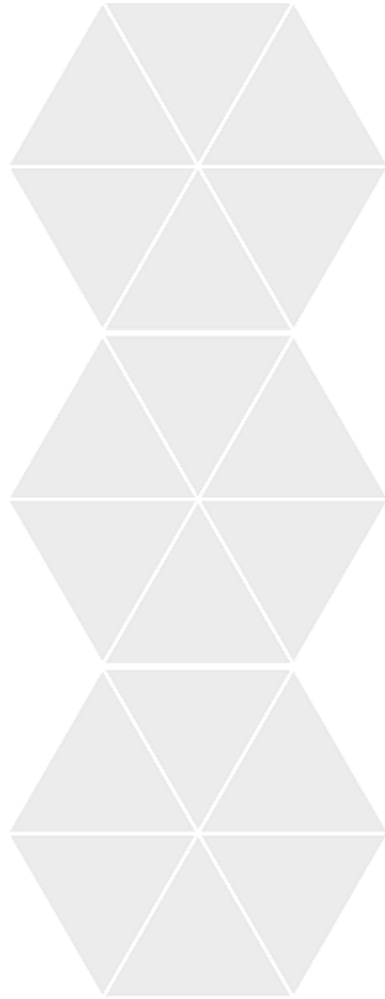


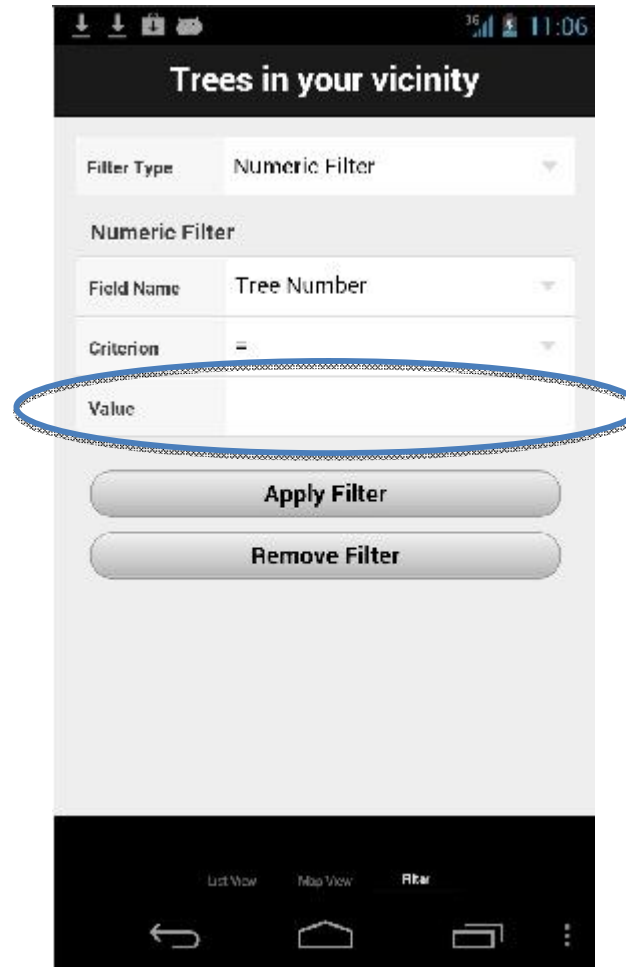
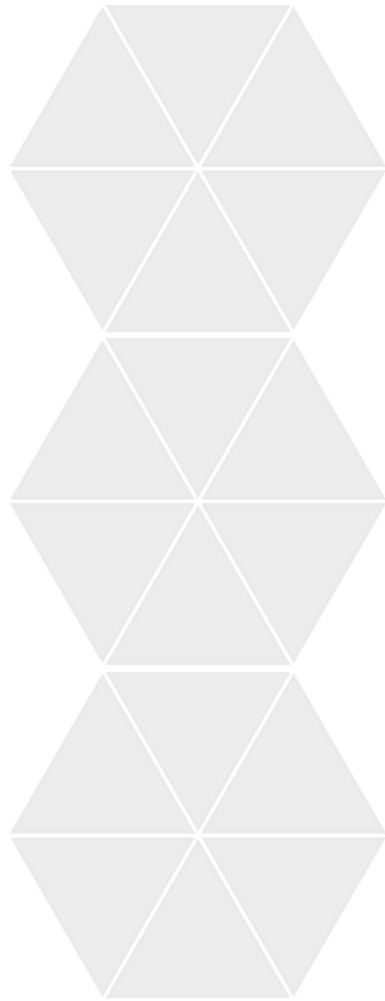
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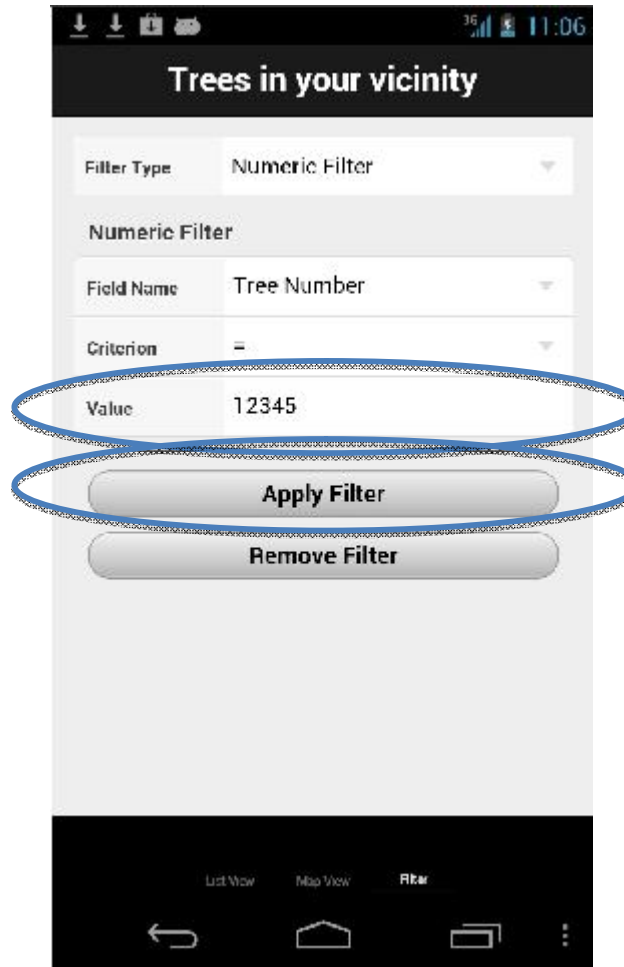
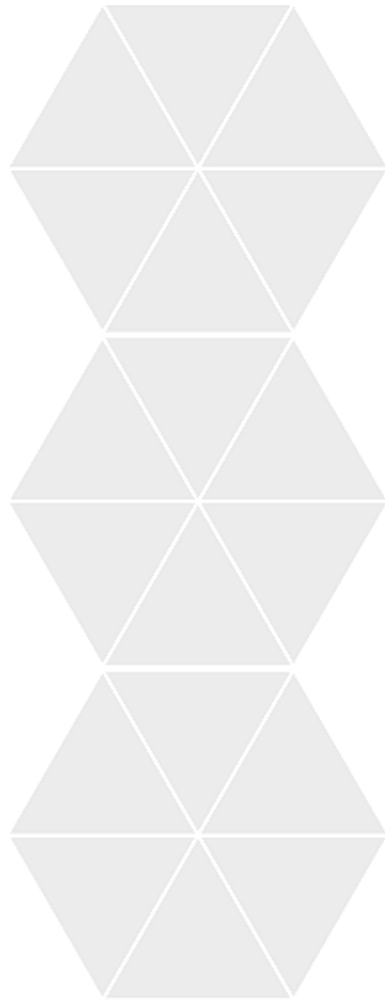


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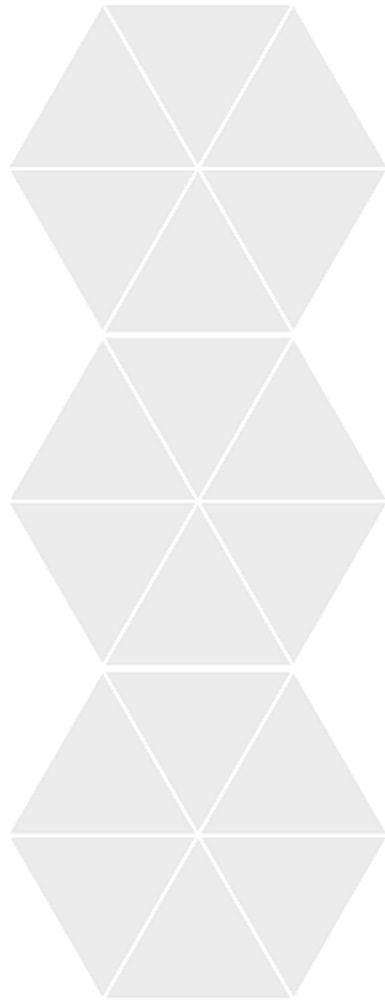


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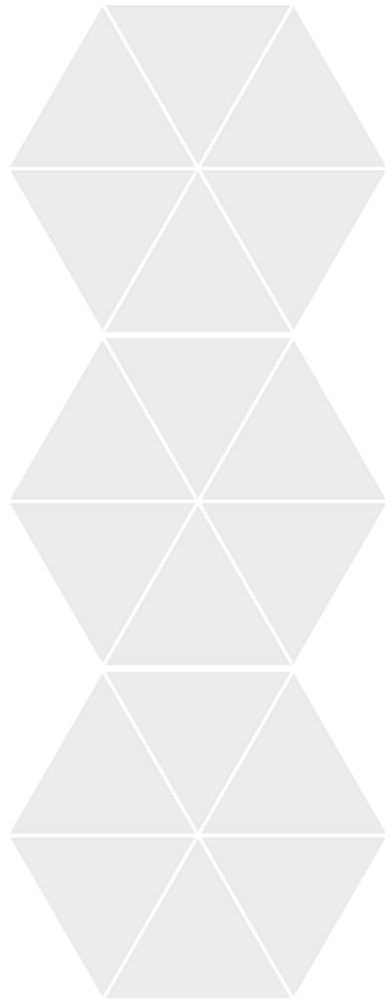
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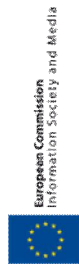
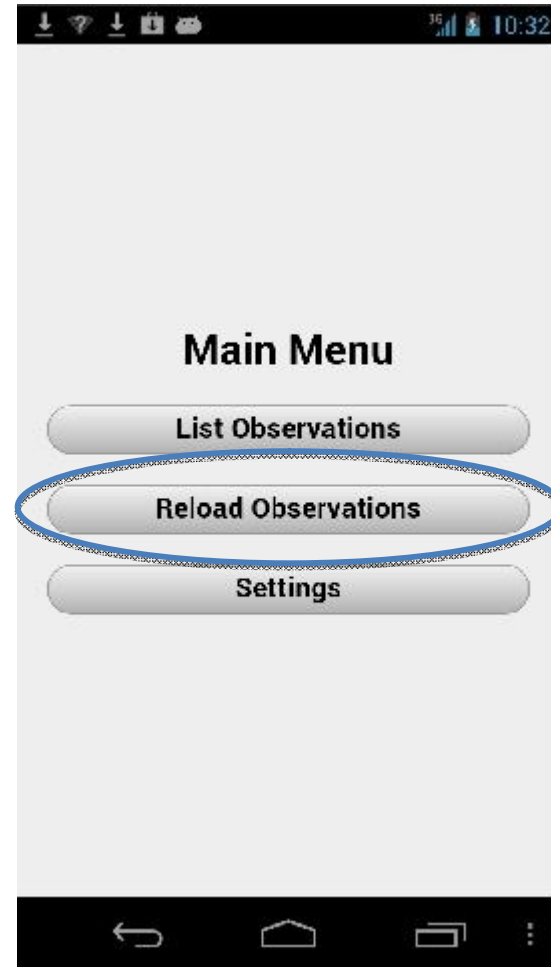
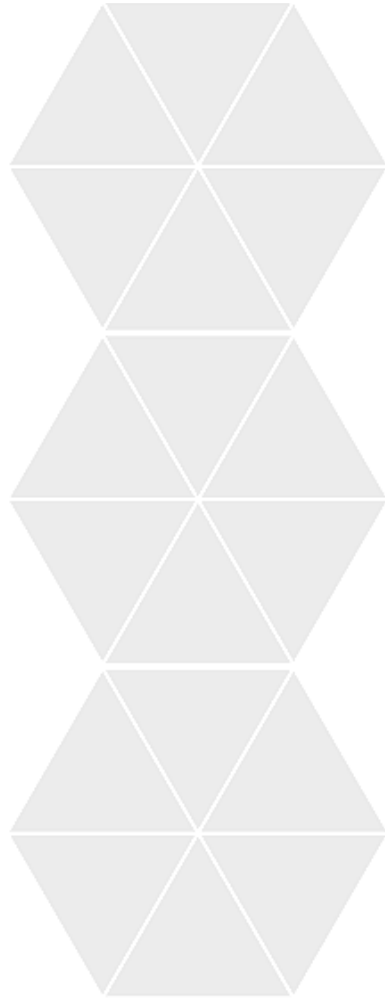
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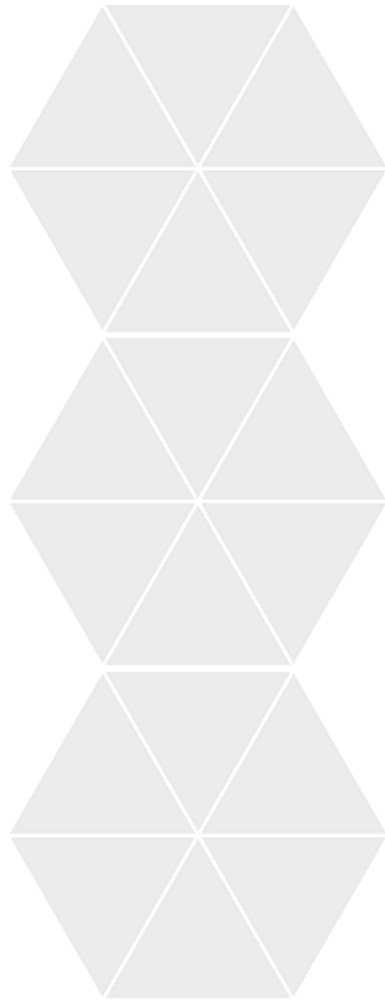


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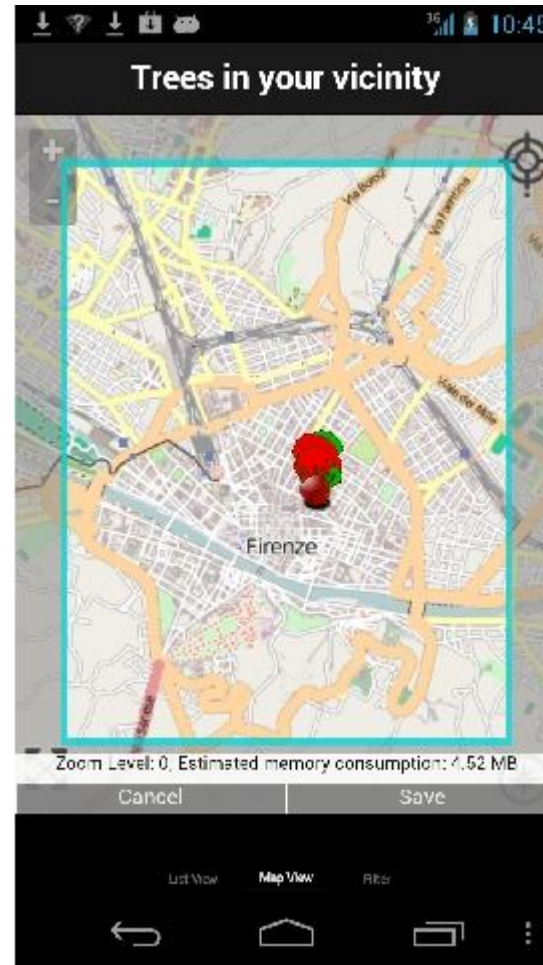
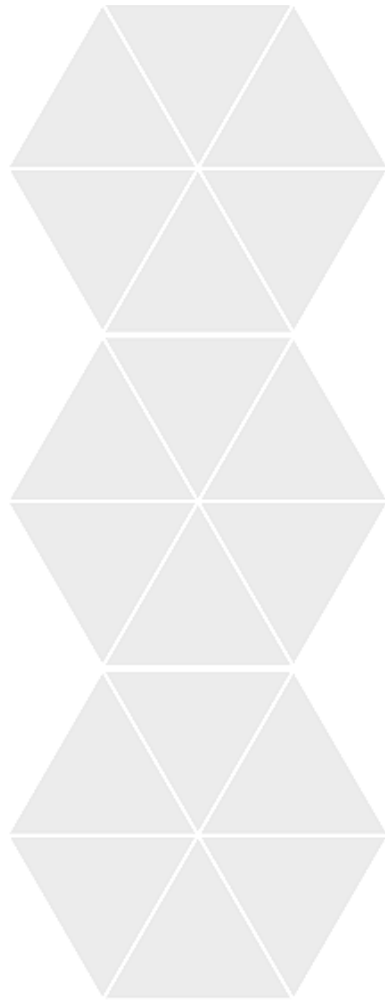


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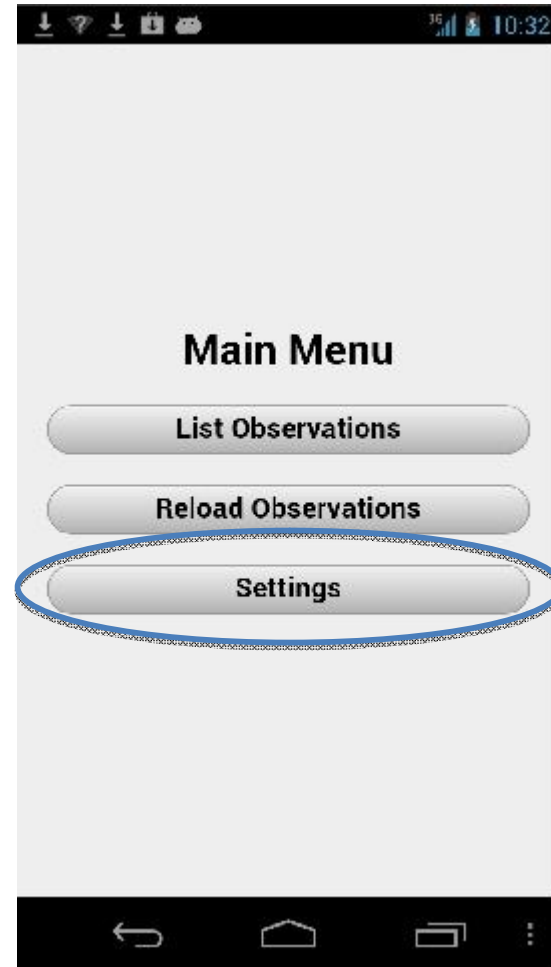
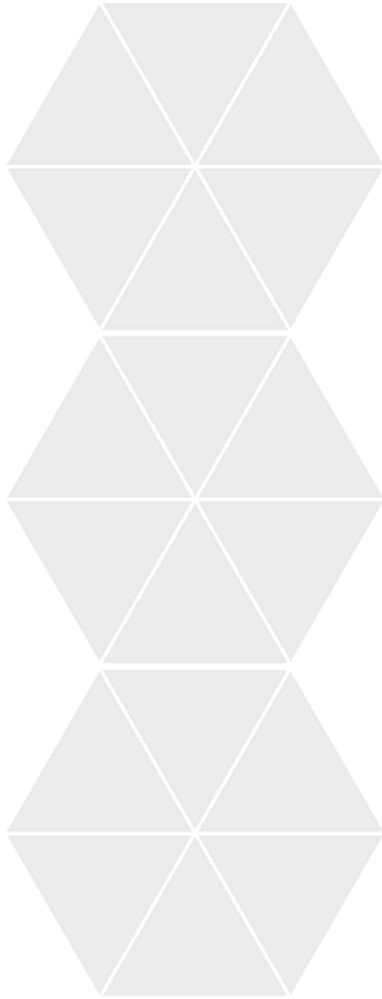
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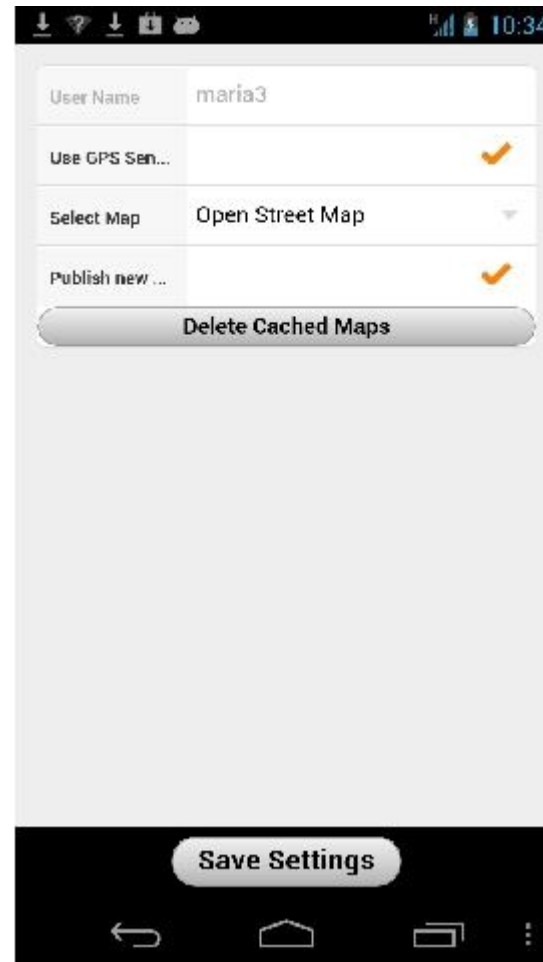
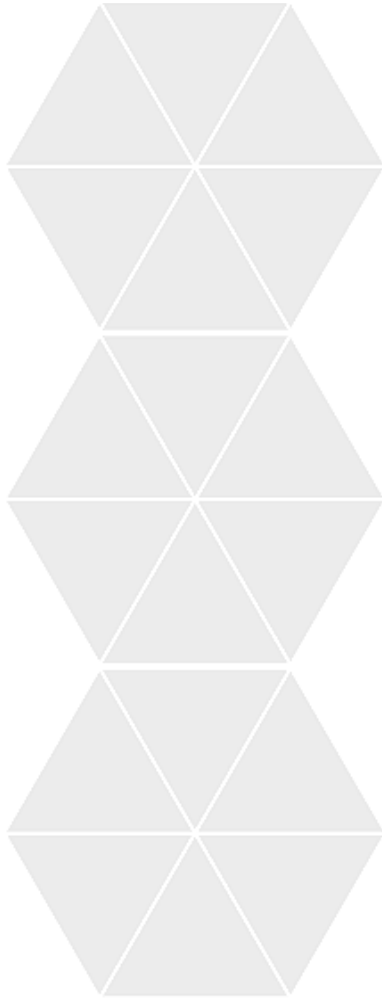


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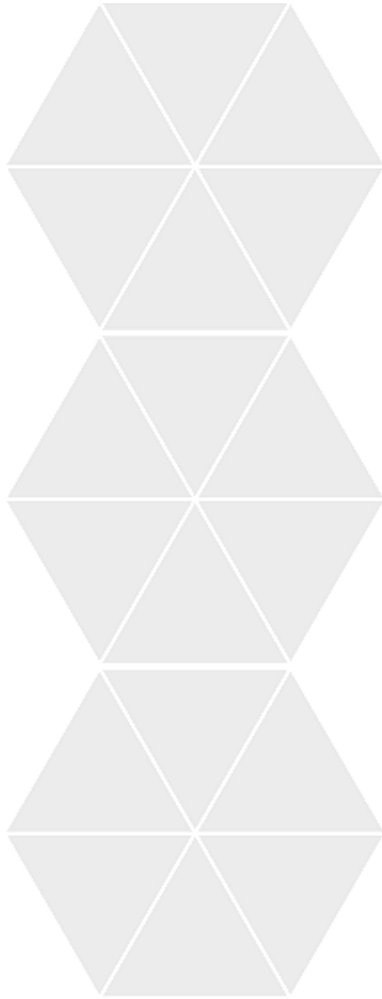


# Biodiversity Application



## Potential Applications

- Survey tool for citizen surveys, either generalised or focused on specific groups such as
  - Invasive species
  - Taxonomic groups such as butterflies or mushrooms
- Data entry tool for researchers
- Citizen feedback tool reporting broken branches to the local administration
- Educational tool





# Thank you for your attention

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The research leading to these results has received funding from the European Community's Seventh Framework Programme (FP7/2007-2013) under Grant Agreement Number 284898

