



**TESS**

Transactional Environmental  
Support System

# Overview, with final remarks and conclusions

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supervisor**

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**ENV.2007.4.2.1.1. Methodologies for scaling down to regional  
& local level the analysis of policy impacts on multifunctional  
land uses & economic activity**



# GANTT-like TESS work-packages

0

**M  
O  
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T  
H**

12

**WP2**  
Central  
Survey  
design

Workshop  
& report

**WP5**

Cases

Pan-Euro  
local &  
central  
survey

Local  
mapping &  
projects &  
report

**WP3**

Local  
Survey  
design

Workshop  
& report

**WP6**

Policy +  
Internet

Survey,  
analysis,

TESS  
internet  
design &  
report

Policy  
document

**WP4**

Models

Audit of  
models

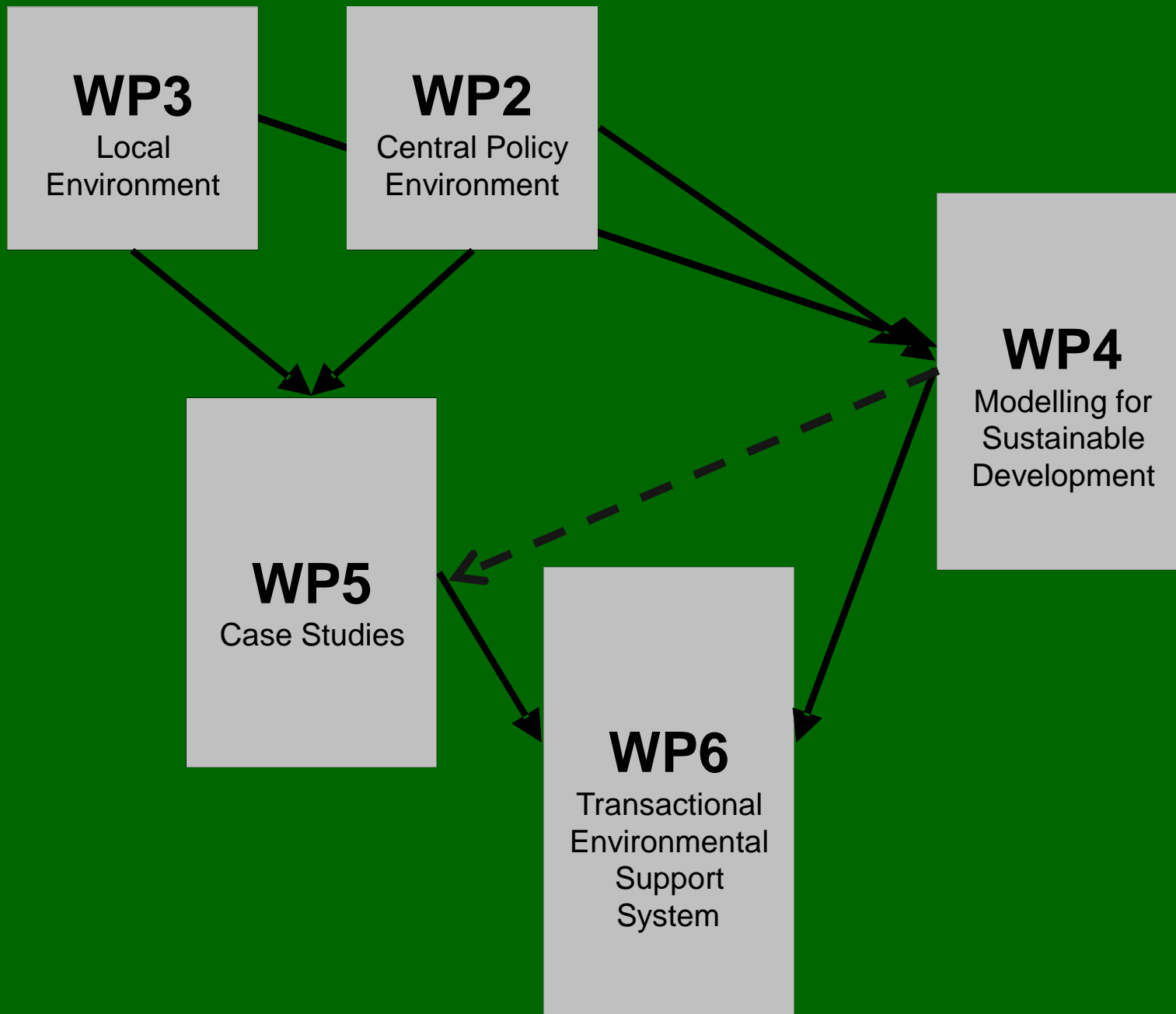
Database  
complete,  
reported

Gap  
analysis

24

33

# Relationship between TESS work-packages



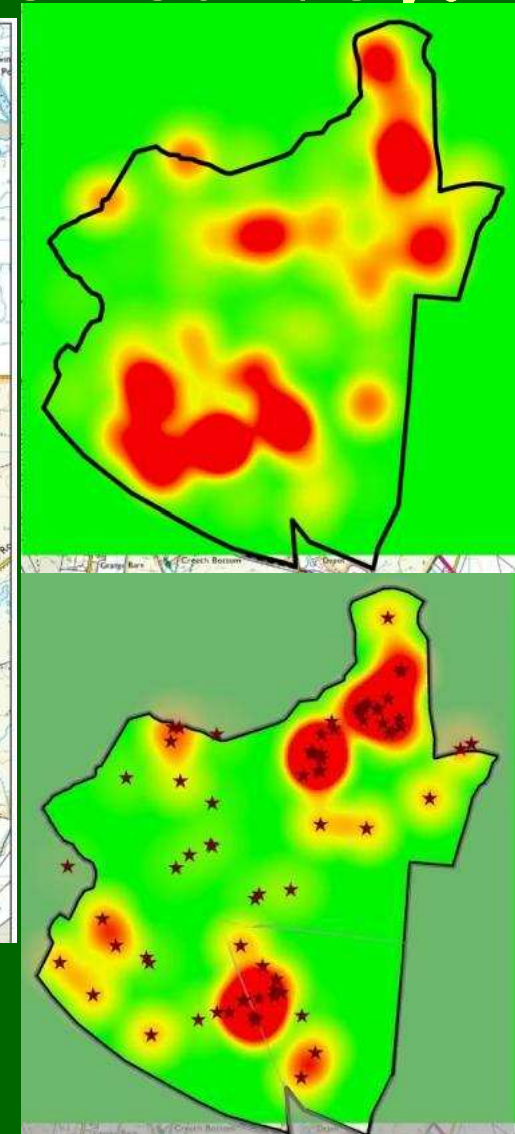
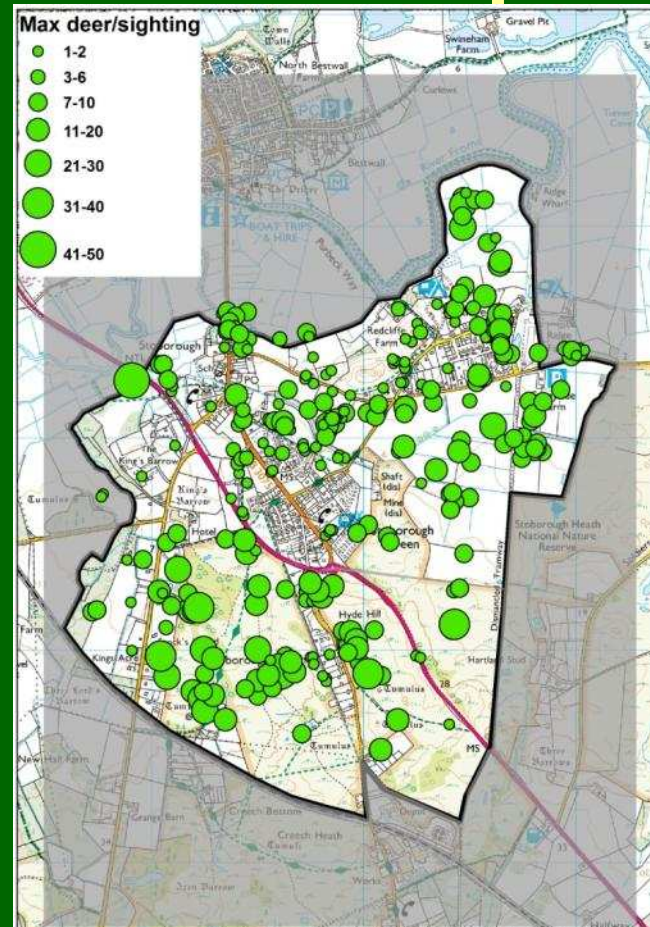
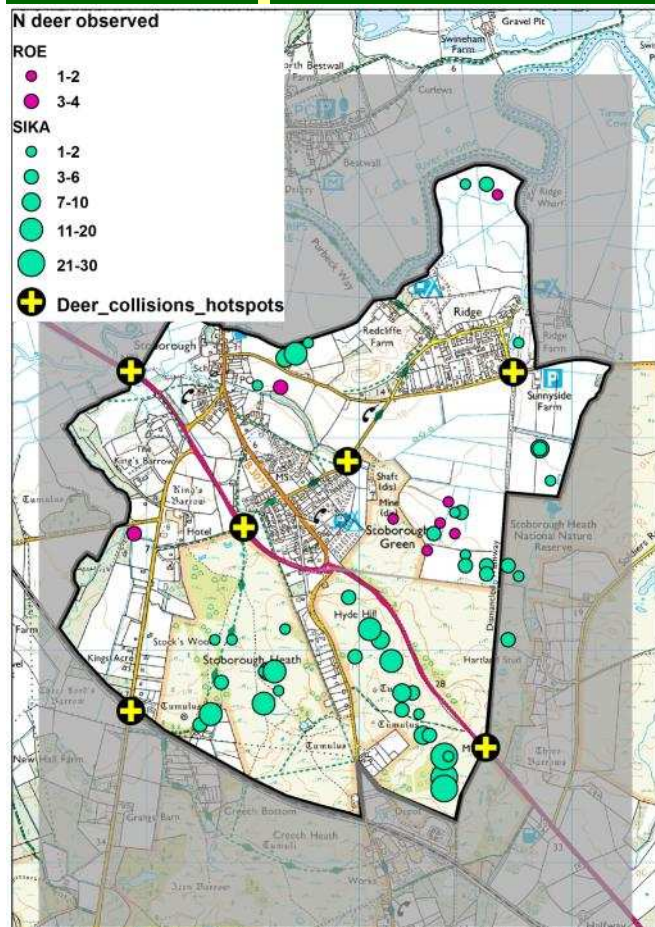
# Convention on Biological Diversity (NB TESS was presented at Nagoya COP10)

**Article 10: Protect & encourage customary use of biological resources in accordance with traditional cultural practices that are compatible with conservation or sustainable use requirements.**

**Article 11: Adopt economically and socially sound measures that act as incentives for conservation and sustainable use of**



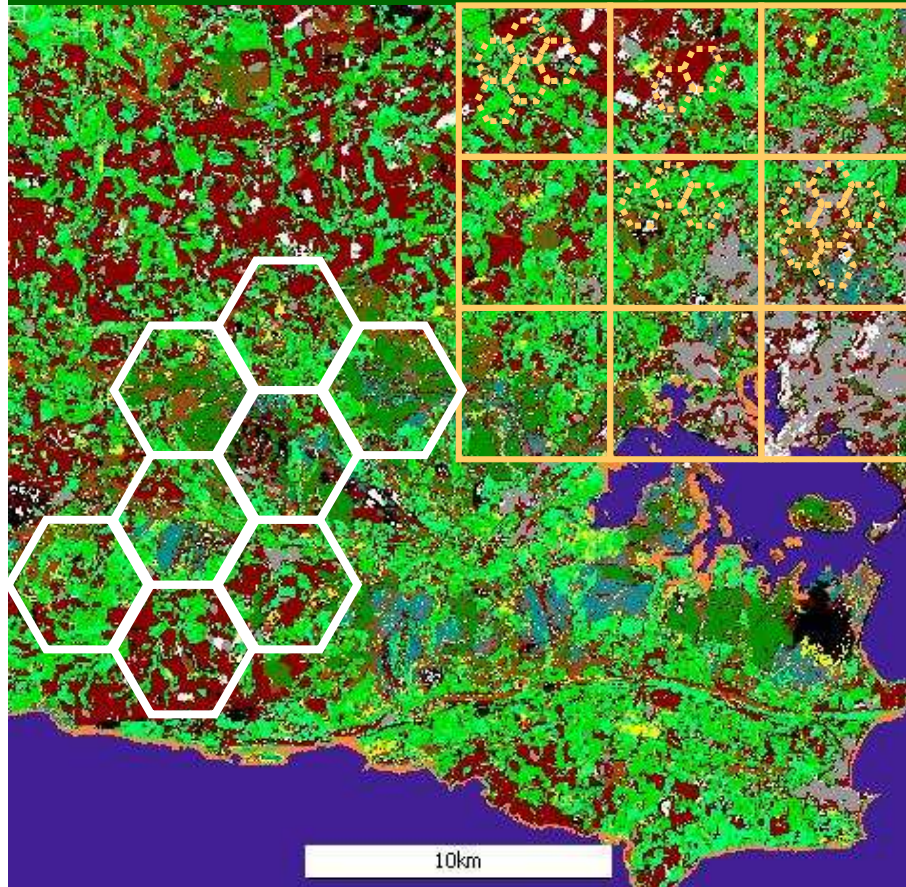
# Arne Parish: citizen science motivated by help from TESS with its parish survey.



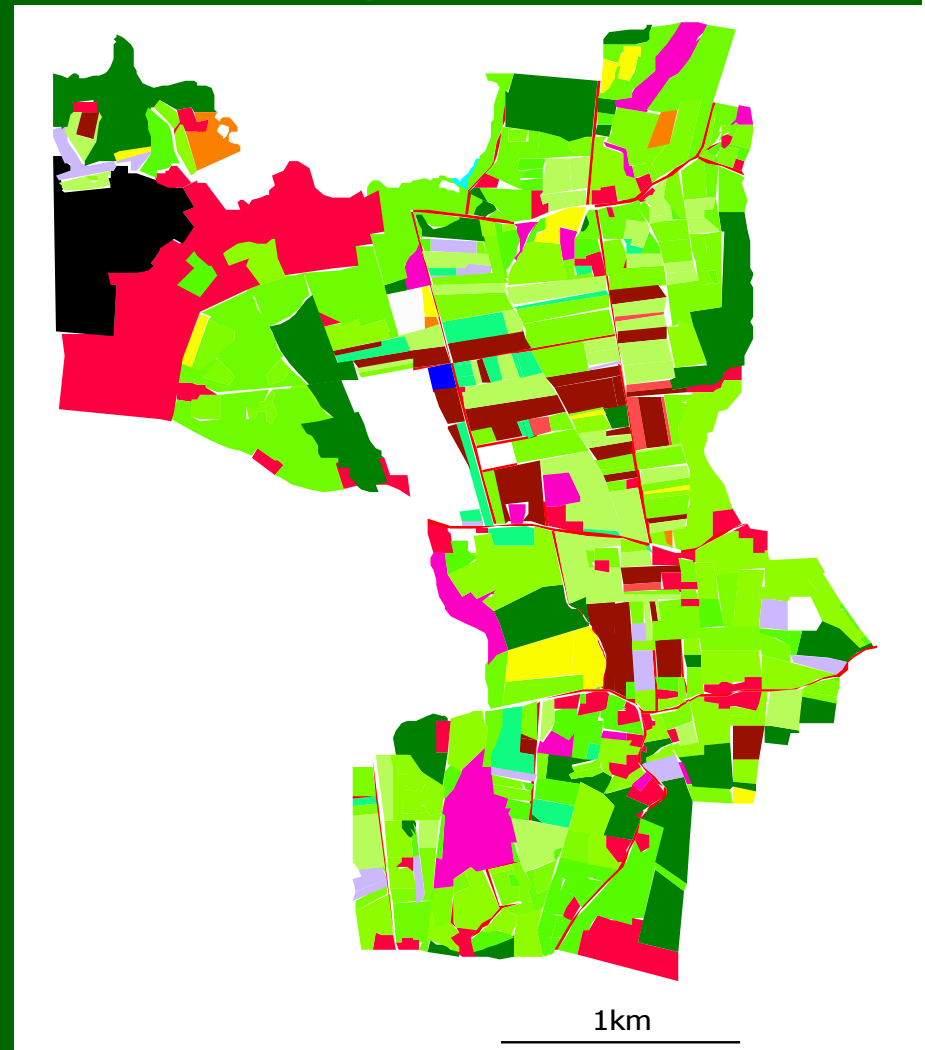
Systematic survey of deer by a post-doctoral biologist.

800 sightings by the public gave better data on density & damage.

# Maintenance and restoration of biodiversity needs mapping at a field, park, garden scale



so is best in combination with local mapping.



Ground-based for detail,  
(by Swedish hunters, 1985)

# Anatrack mapper for TESS with user-friendly principles of Ranges software

<value>Pour agrandir la carte</value>

<comment>Zoom in to the map</comment>

Thanks to editing  
by partners in Excel,  
the mapper is now  
in 10 languages.



TESS Mapper - Garden Cottage, Boxwell - 21 Apr 2010 03:30:37

File Help

Mapping Type

- Deciduous woodland
- Coniferous woodland
- Rough grass
- Buildings
- Grave
- Fresh water

Mapped Objects

- Fresh water
- hole
- Buildings
- Deciduous woodland
- Red fox
- Coniferous woodland

Area Details

Type: Buildings

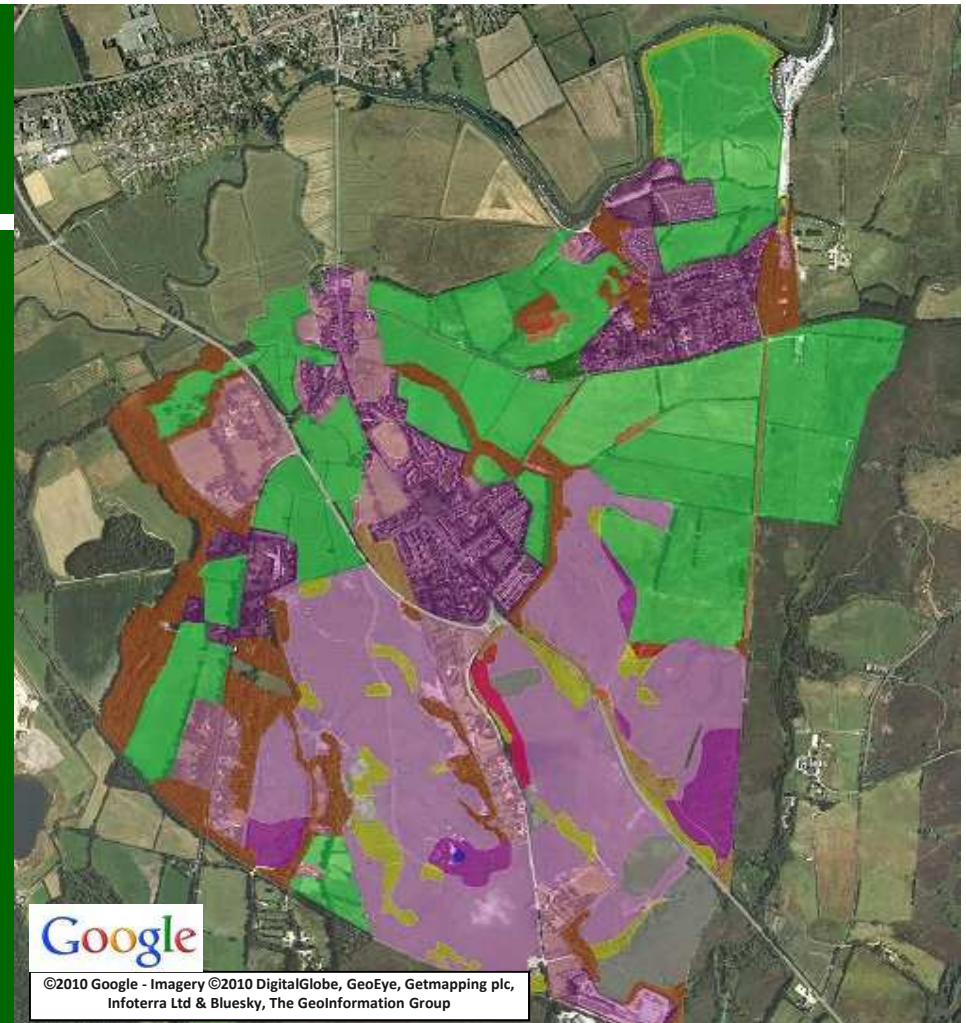
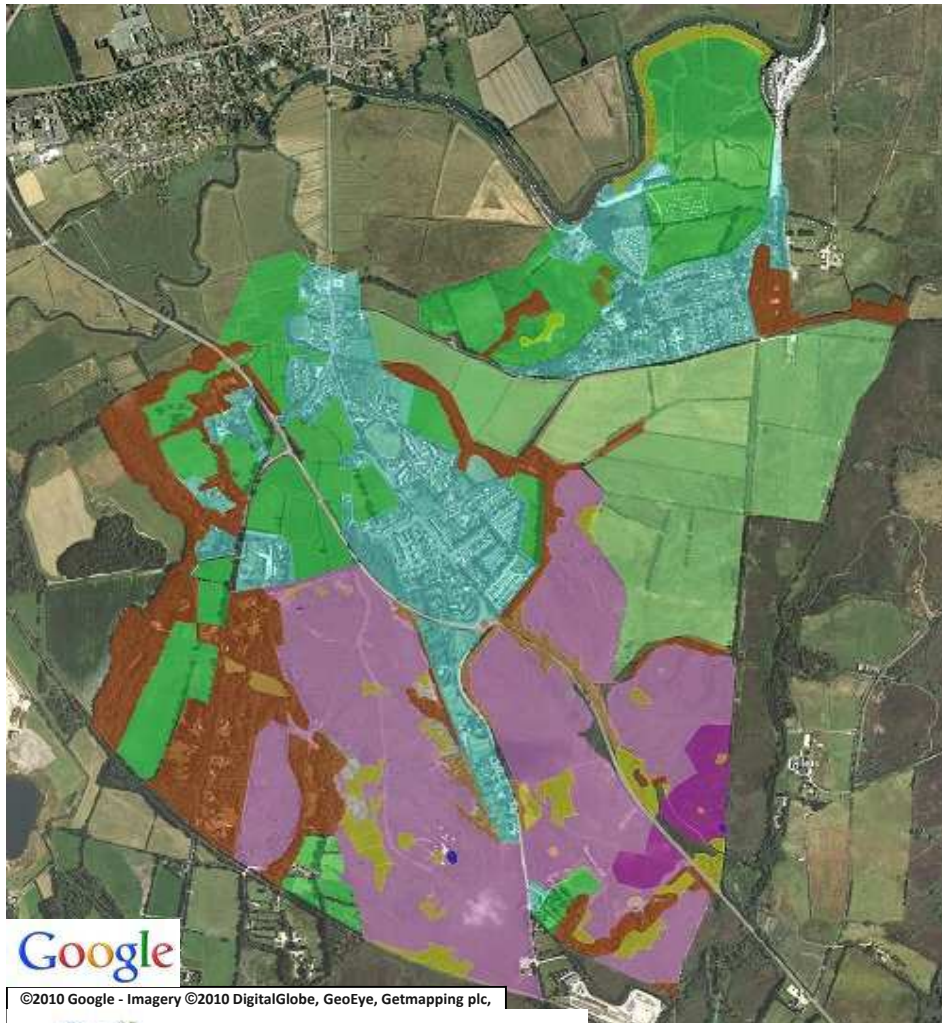
Points: 8

Area: 104.67 m2

Area Points

51°37'58.4" N, 02°16'04.4" W
51°37'58.7" N, 02°16'04.2" W
51°37'58.6" N, 02°16'04.1" W
51°37'58.7" N, 02°16'04.0" W
51°37'58.6" N, 02°16'03.7" W
51°37'58.3" N, 02°16'03.9" W

51°37'58.0" N, 02°16'04.4" W No GPS device Selected point 4 in object 3. Buildings Add, edit or delete mapped objects



Scout Team and Post-doc Biologist  
mapped deer habitats equally well;  
differences in habitat class (colour)  
could easily be resolved by training.



## Hardware

**Needs: Screen readable in sunlight, robust, low weight, GPS, camera, mobile internet, 5 h battery, low cost.**

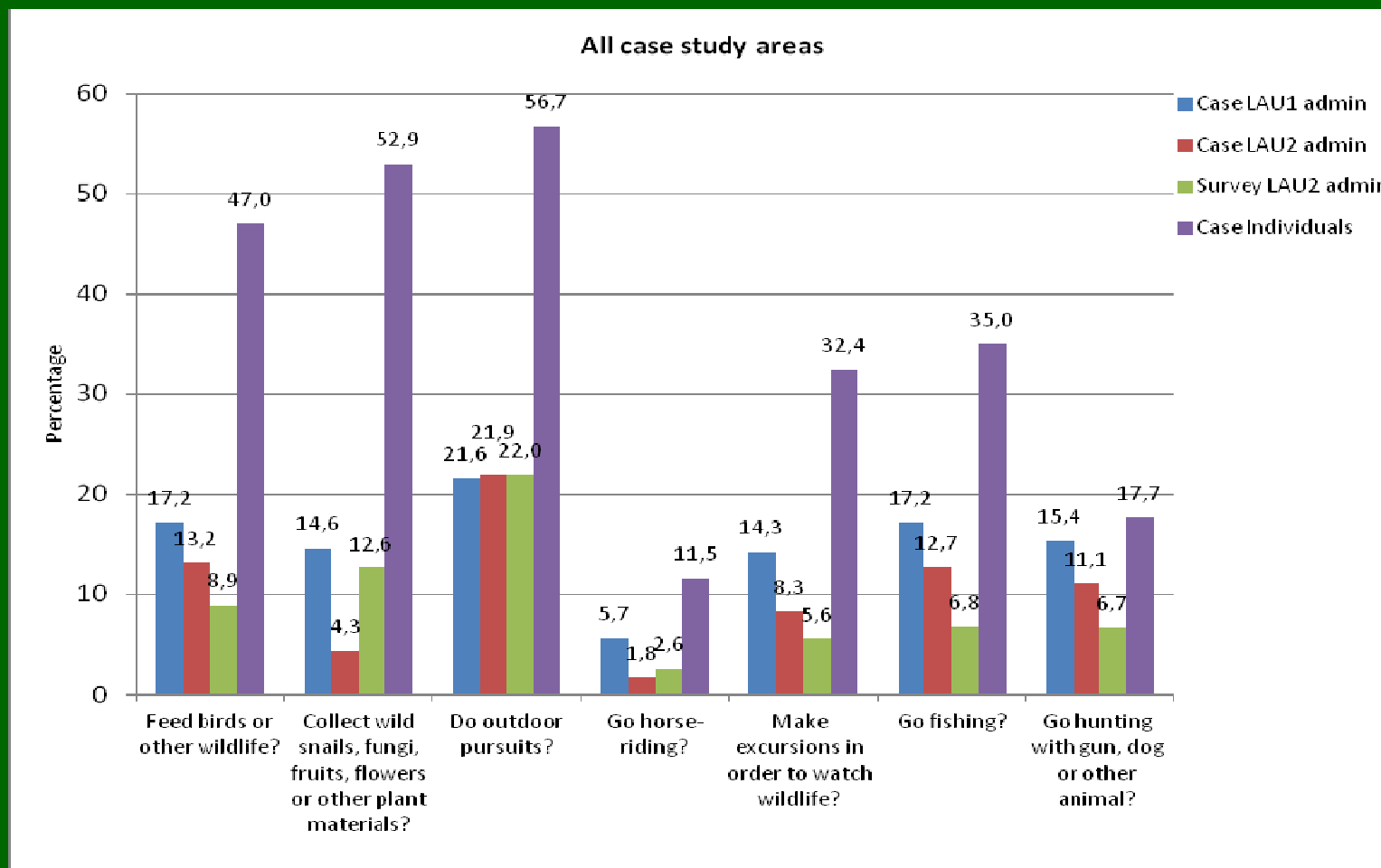
Anatrack provided software support for the Motion J3400 at ca. **€2,200.**

Also used: Algiz 10/7: operating temperature – 10 to +60 ca. **€3,045**

**New on the block: 7" <€1000 tablets for consumers (Samsung Galaxy runs Android)**

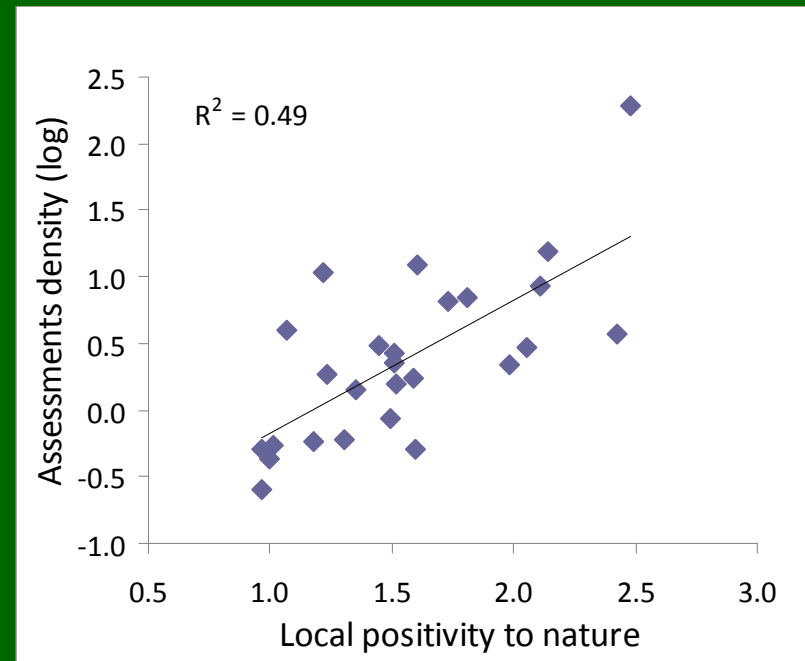
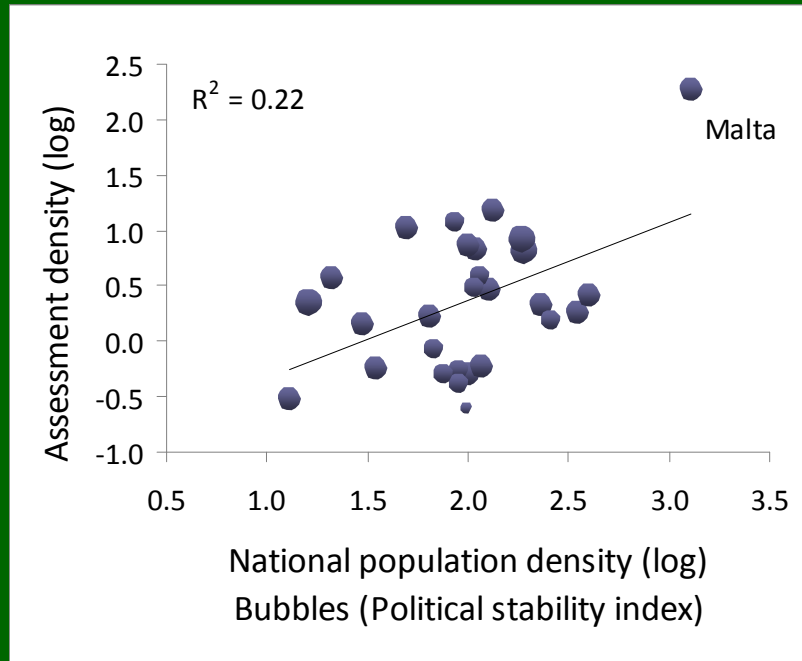


# Authorities under-estimate numbers of private recreational stakeholders



Percentages of people involved in particular activities in all case studies according to estimates from LAU1, LAU2, averaged LAU2 and Individuals

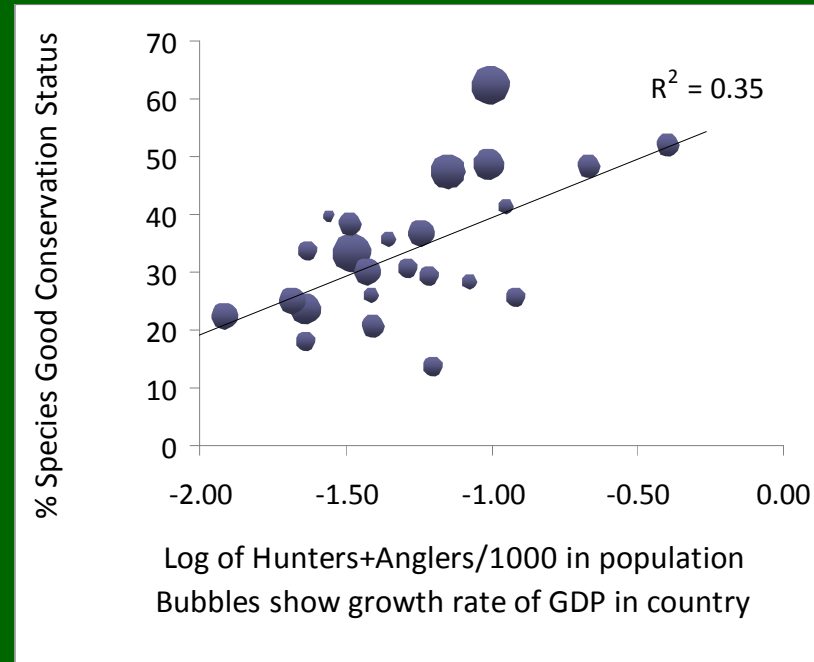
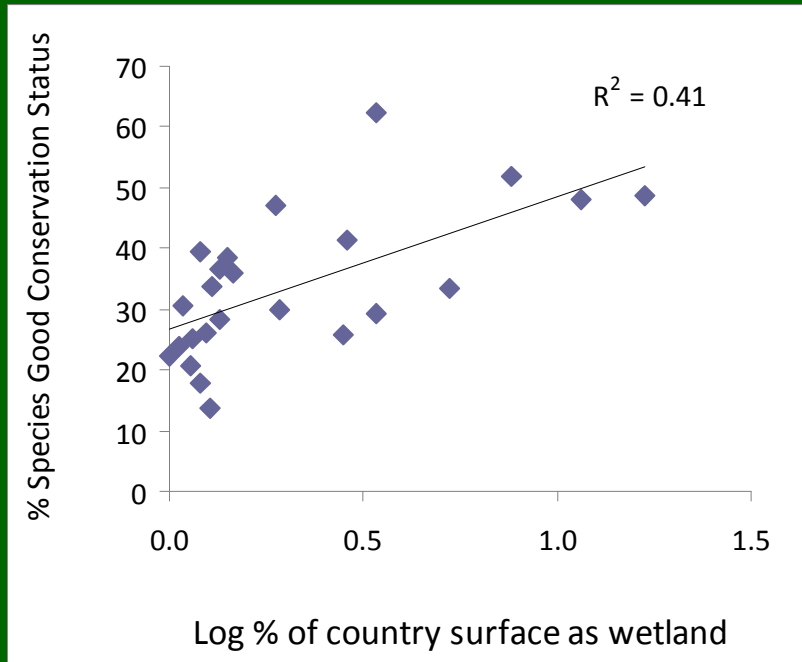
# EIA and SEA



- High population density
- High political stability
- High local positivity to nature

Economic Impact: High density of EIA and SEA assessments

# Species Conservation Status

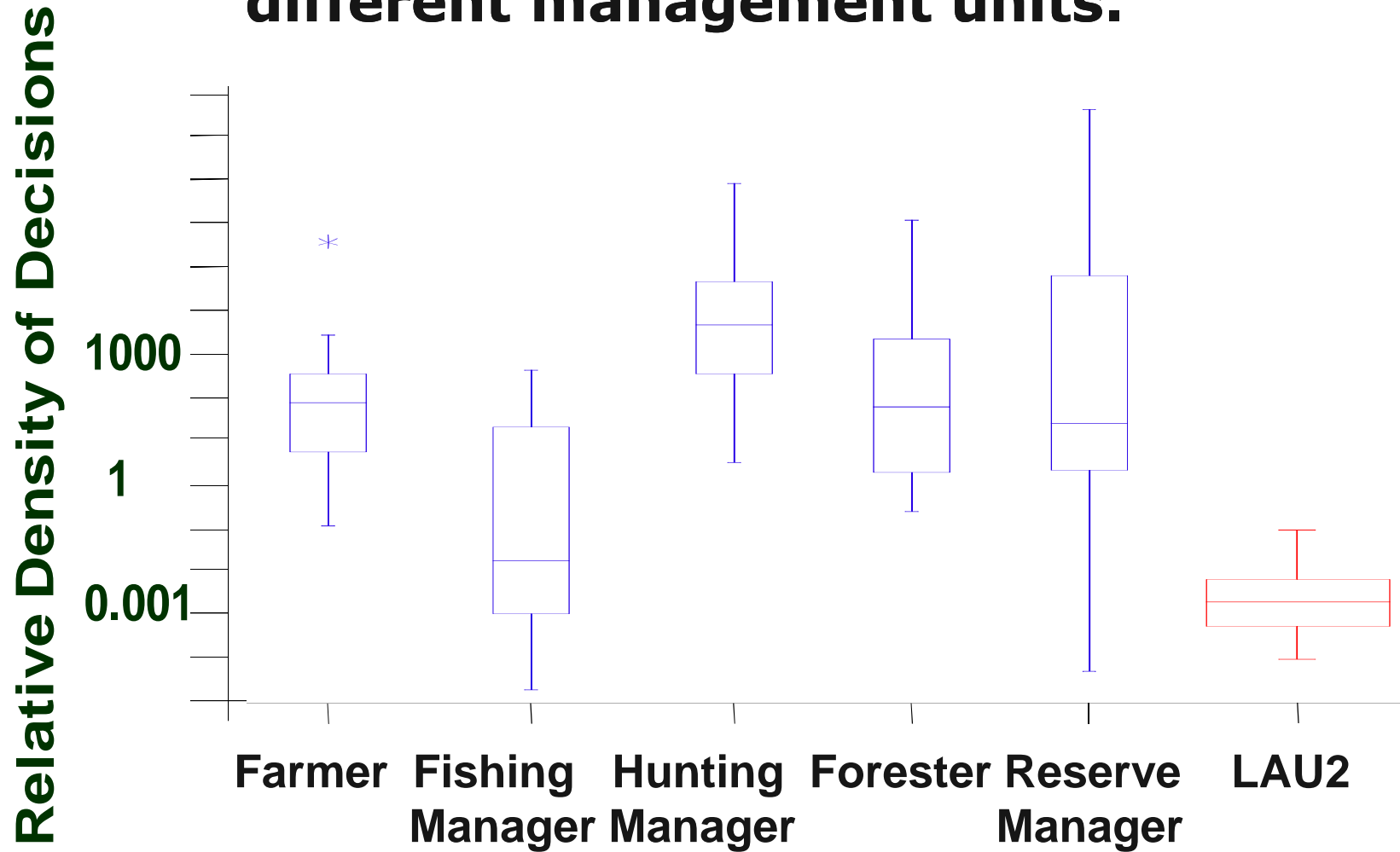


- High percentage cover by wetlands
- High growth rate of GDP
- High density of hunters and anglers

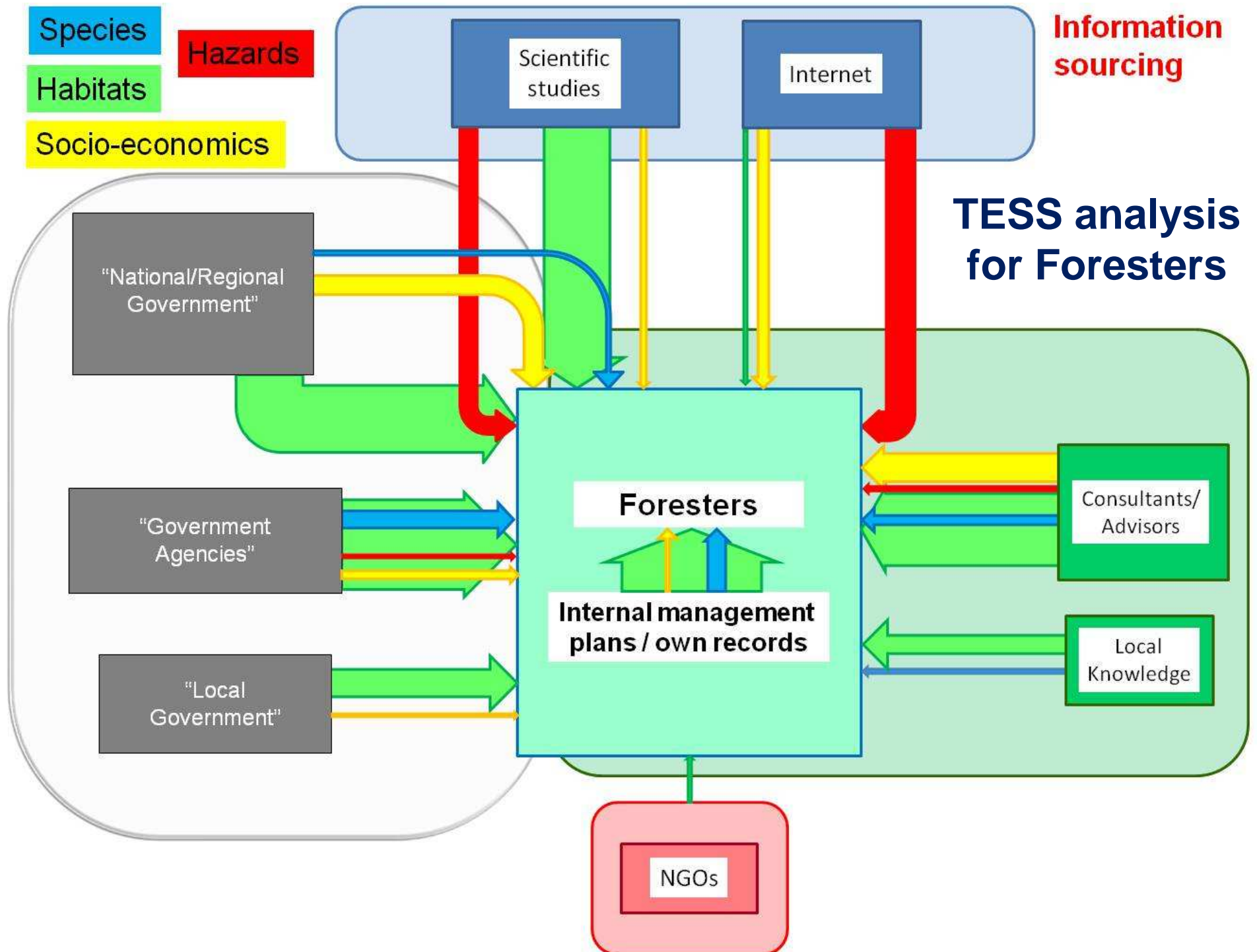


**Ecological Impact:** High proportion of species with favourable conservation status (Art. 17 evaluation)

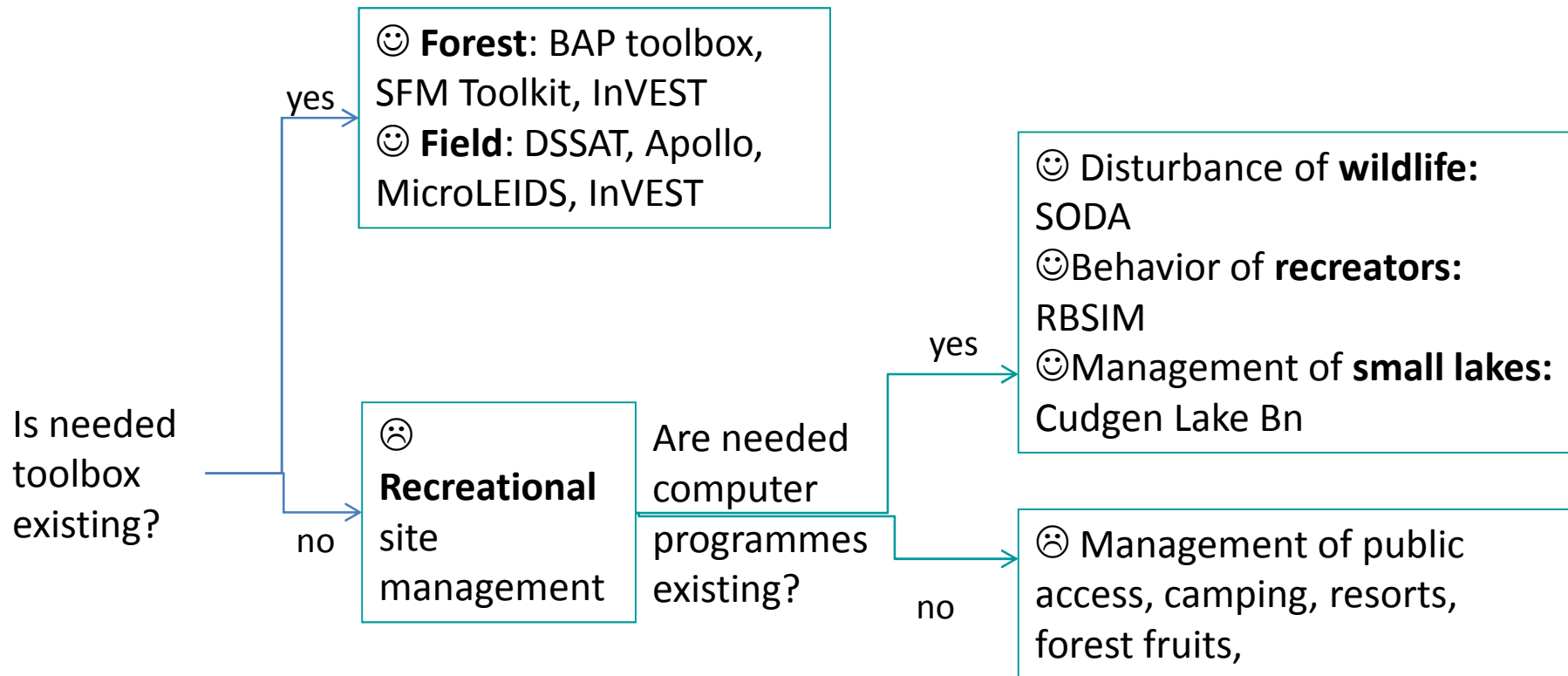
**The decision density, taking account of (a) decision numbers per management unit, (b) area covered by each decision and (c) relative abundance of different management units.**



**Greater prevalence of private than state decisions.**



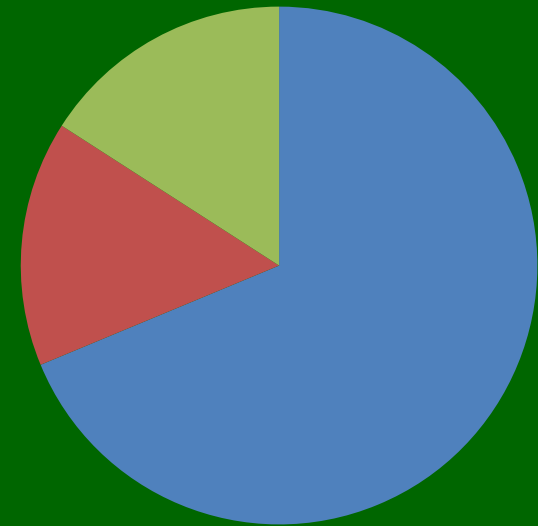
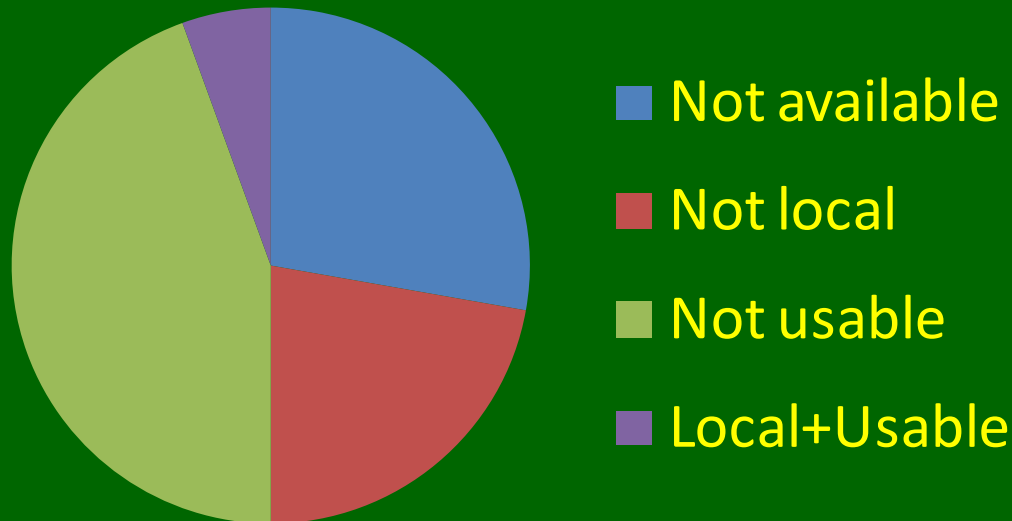
# Gap analysis for toolkits



# Applicability of models for non-expert local stakeholders

- **Database models (198):**  
50% were no longer available or not for local use, with only 6% deemed usable locally by non-experts.

- **Other ECOBAS models (195):**  
84% were no longer available or not for local use; none were deemed usable locally by non-experts.





## Task 6.3

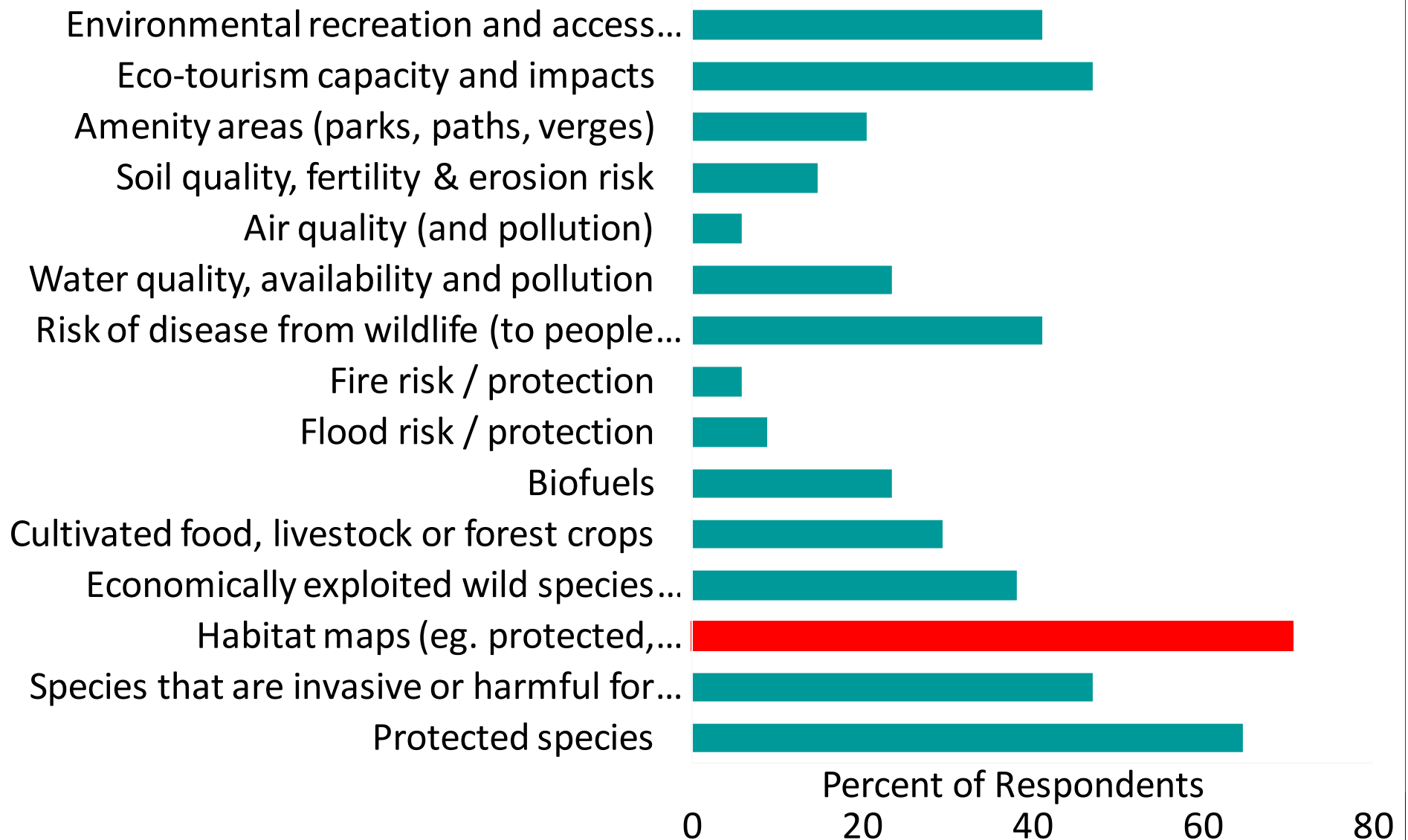
### (i) Technology Design

1. Technology design – need to agree:
  - (a) high level requirements (e.g. inference engine logic, scale, confidentiality, data supplies, ownership & payments etc)
  - (b) specifications for design:
    - Domain Model,
    - Use Cases,
    - cost for building.
  - (c) priority areas for decision support.
- Meetings with CEH Feb, Sept 2009, Sept 2010
- Workshop 13-15 December (Edinburgh)
- Workshop 25 May 2011

# High level requirements

1. The system shall be web based initially, but its architecture must be flexible enough that alternative frontends may be developed (web services, applets, cloud, etc).
2. The system must be able to contain socio-environmental data (spatial data, map images and mathematical models) and models in various formats and for various locations.
3. All data and models used in the system will be tagged by origin, as public or private and with other appropriate meta-data.
4. The system shall also support standardized data-bases on private computers, on which the user can change data, mark it public or private, and use it with appropriate models in personal computers or on the system.
5. Public data will be acquired by the system, but may be changed by system or originator.
6. Models may be acquired by the system for its use on a public or commercial basis.
7. The user and the system must be able to make requests for data and models of third-party databases, providing payment for access where necessary.
8. The user must be able to compare data and models from different sources and otherwise check for validity.
9. The system must be able to verify and check data and models for integrity.
10. The system must be able to accept subscriptions and payments on account for models and data.
11. The system must be able to present itself and interact with the user in many languages.
12. The system must be embeddable into associate partners' websites using a standard frontend.
13. The user must be able to create a user account so that the system remembers the user's details (name, address, subscription and account details) at login.
14. The system shall maintain a list of accounts in its central database.
15. When a user logs in, his/her password must always be matched against the passwords in the master account list.
16. The user must be able to search for data by various search methods - location, type, keyword, date and so on – and then view the data tags.
17. The user and system must be able to apply models and Bayesian analysis in data and produce scenarios.
18. It must be possible for the user to post comments on the data and models.
19. Comments must be moderated – that is to be checked and permitted by a member of staff before they are published on the website.
20. The system must be able to perform vector/raster and coordinate conversion from all projections, and to interact with large external databases (e.g. CORINE).
21. The system shall be scalable, with the following specific requirements:
  - The system must be capable of maintaining user accounts for up to 100,000 users in its first six months and a further 1,000,000 after that.
  - The system must be able to of serving up to 1,000 simultaneous users (10,000 after six months).
  - The system must be capable to accommodate up to 100 search requests per minute (1,000 per minute after six months).
  - The system must be able to accommodate up to 100 data exchanges per hour (1,000/hour after six months).

# On which environmental topics would your members or clients most welcome information?



## Topics

Arable farming & grazing  
livestock

Forestry or other tree cultivation  
for timber/fuel/fibre

Gardening and horticulture,  
including orchards and vineyards

Aquaculture or fishery for food

Fishing in rivers, lakes and the sea

Hunting and game management

Foraging for natural products

Nature watching & photography

Managing nature reserves or  
other culturally important areas

Horse care for work and pleasure

Hounds and dog walking

Managing bees and pollination

Exercise in the countryside

Naturalliance aims to provide the knowledge you need, in your own language, to conserve and restore biodiversity for the benefit of all who use the countryside for work or recreation.

▶ [Find out more about Naturalliance](#)

▶ [Explore the Naturalliance topics](#)

▶ [Investigate tools for monitoring habitats and species](#)

▶ [Register with Naturalliance or login to access premium content](#)

## Topics

Uprawa roślin i wypas zwierząt

Leśnictwo lub inne uprawy drzew  
na drewno / paliwa / włókno

Ogrody i ogrodnictwo, w tym  
sady i winnice

Akwakultura i rybołówstwo

Łowienie ryb w rzekach, jeziorach  
i morzu

Myślistwo i gospodarka łowiecka

Zbiór naturalnych produktów

Obserwowanie i fotografowanie  
przyrody

Zarządzanie rezerwatami  
przyrody lub innymi ważnymi  
kulturowo obszarami

Użytkowanie koni do pracy i dla  
satysfakcji

Psy gończe i spacerowe



About

Topics

Habitats/Sp

## Obserwowanie

W 2010 roku, wiejskie gospodarstwa domowe w ośmiu krajach Europy zostały zapytane o zajęcia, które zależą od bogactwa przyrody. Około połowa karmiła ptaki i inne zwierzęta w celu ich obserwacji, a większość z nich również organizowała wycieczki w celu obserwowania dzikich zwierząt.

Głównym celem Naturalliance jest pomoc w zachowaniu i ochronie dzikich zwierząt, których obserwowanie daje tak wiele satysfakcji, a także by pokazać jak wszyscy zainteresowani mogą wnieść swój drobny wkład, aby przywrócić to co nieświadomie zostało utracone. Zasadą jest, że lokalne społeczności właściciele również powinni korzystać, gdy inni cieszą się bogactwem natury na ich terenach.

**NAJLEPSZA PRAKTYKA.** Przykład korzyści lokalnej społeczności wynikających z obserwowania przyrody.

**PRODUKCJA.** Bogactwo przyrody zależy od tego jak my wszyscy użytkujemy grunty i gatunki. Jak możemy sprawić, by większa liczba osób uzna iż warto wnieść swój wkład?



Dokarmianie może zastąpić utracone siedlisko dla zięby.

Resourc

► Best Prac

# Assessments at the EEA level

- **Elinor Ostrom**
- **Empowering and encouraging local people.**
- **citizen science monitoring air quality with human noses, water quality too**
- **freedom of environmental information too**
- **indicators are critical, need for more driver/pressure indices**
- **EEA would like to become home for TESS network**

# European Forestry

- Forestry is multi-purpose land-use
- Foresters already collect information and have certification
- Confidentiality can be necessary for owners of forests and other land
- Openness can harm conservation too
- Caution is needed about quality and use of information
- Is ecosystem level better than site level?

## CONCLUSIONS

1. There were intensive and extensive surveys at national & local level across Europe to assess
  - i. information requirements for decision-making; and
  - ii. what governance and other factors associate with formal assessments (SEA+EIA) and SEBI-revealed environmental impacts.
2. 1(i) revealed a high level of local informal decisions by managers of land and species, and indicated varying digital competence and considerable requirement for map-based data by local administrations;



## CONCLUSIONS

3. 1(ii) revealed high variability in formal assessments priorities and processes, but little impact of these on assessments compared with socio-ecological capacity factors, notably including numbers of people using land and biodiversity for recreation and public attitudes to benefits and costs of nature.
4. Local rural case studies showing high interest and competence in citizen-science mapping of habitats and species, and a high level of engagement in biodiversity-based recreational activities that could inform & motivate mapping.

# CONCLUSIONS

5. A global survey for modelling software that could provide decision support to local managers and recreational beneficiaries of land and species revealed impressive science in the development of thousands of models, and impressive lack of technology transfer for use by the local stakeholders.

# CONCLUSIONS

6. A design for user interface and business model, informed by a survey of requirements of stakeholder organisations, resulted in external construction of a portal to (i) to conduct a final survey of individual requirements and (ii) continue after TESS as a way to deliver decision support, potentially gain detailed ground-based map data and educate on benefits & costs of nature.

# CONCLUSIONS

7. A series of meetings and workshops resulted in design for a system to transact local mapping and monitoring for decision support and other local information, based on analysis of High Level requirements, a resulting Domain Model and Use Cases that will be costed.
8. Policy recommendations are based on the findings and to support implementation of the TESS concept.

# CONCLUSIONS

9. TESS needs to work even more (i) with stakeholder organisations to ensure data confidentiality concerns are addressed and (ii) with European Environment Agency to provide what is needed to create good environmental governance that encourages, enables and empowers stakeholders.

How can the TESS network help stakeholders best and show society at large that these managers are the solution, not the problem?