From Jess to TESS and beyond: THE BACKGROUND TO CEM-SUME

Robert Kenward,
IUCN Sustainable Use & Management of Ecosystems

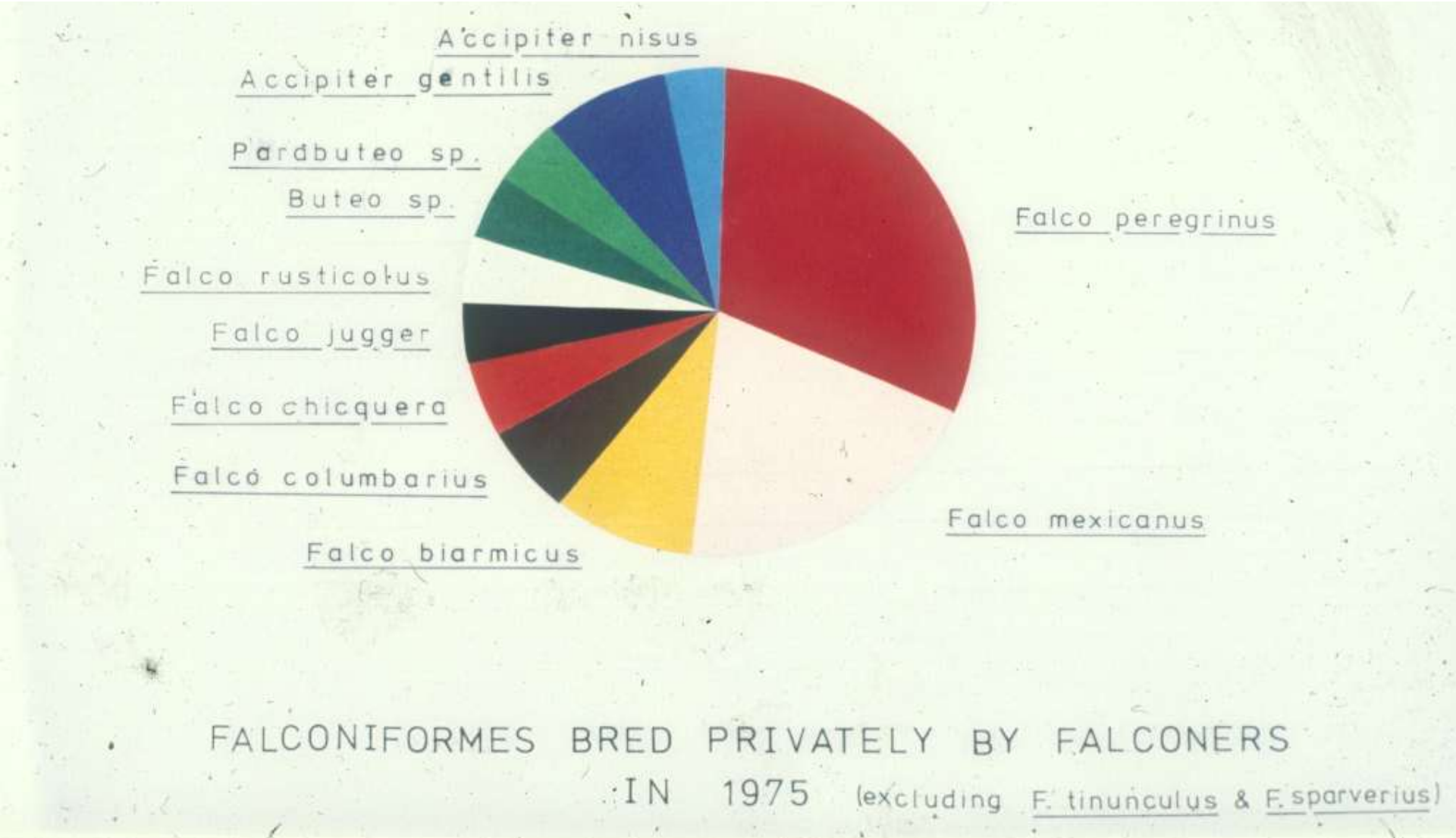
Workshop for South America,
Lima, Peru, 26 October 2017.

CEM

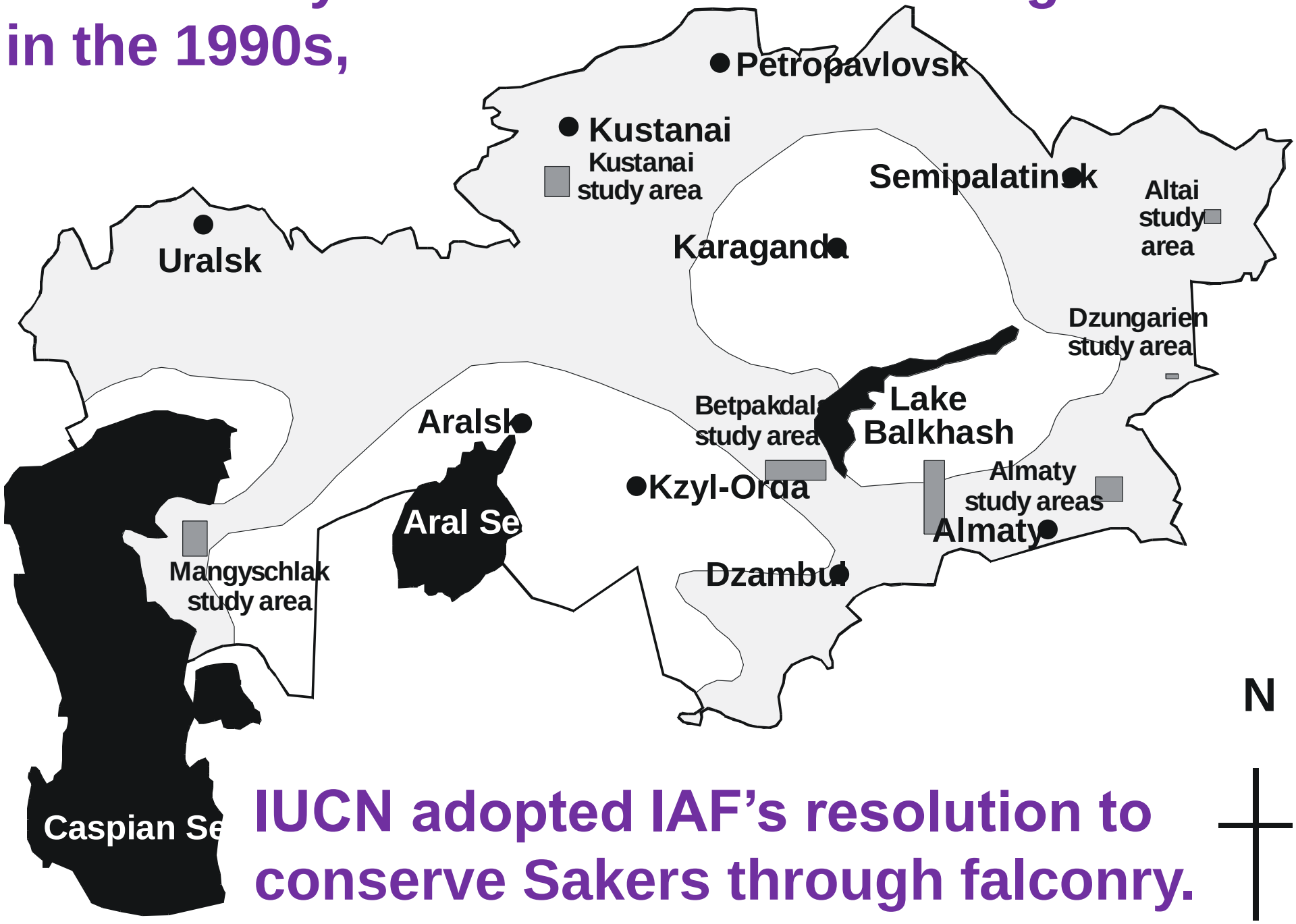
SUME: Sustainable Use and Management of Ecosystems

IUCN

Falconers have been restoring raptors for 40 years: IAF used this at International Council for Bird Preservation's conference in 1975.



After survey of Kazakh Saker breeding in the 1990s,



IUCN adopted IAF's resolution to conserve Sakers through falconry.

IAF: 2nd World Conservation Congress of IUCN in Amman, Jordan, 4-11 October 2000:

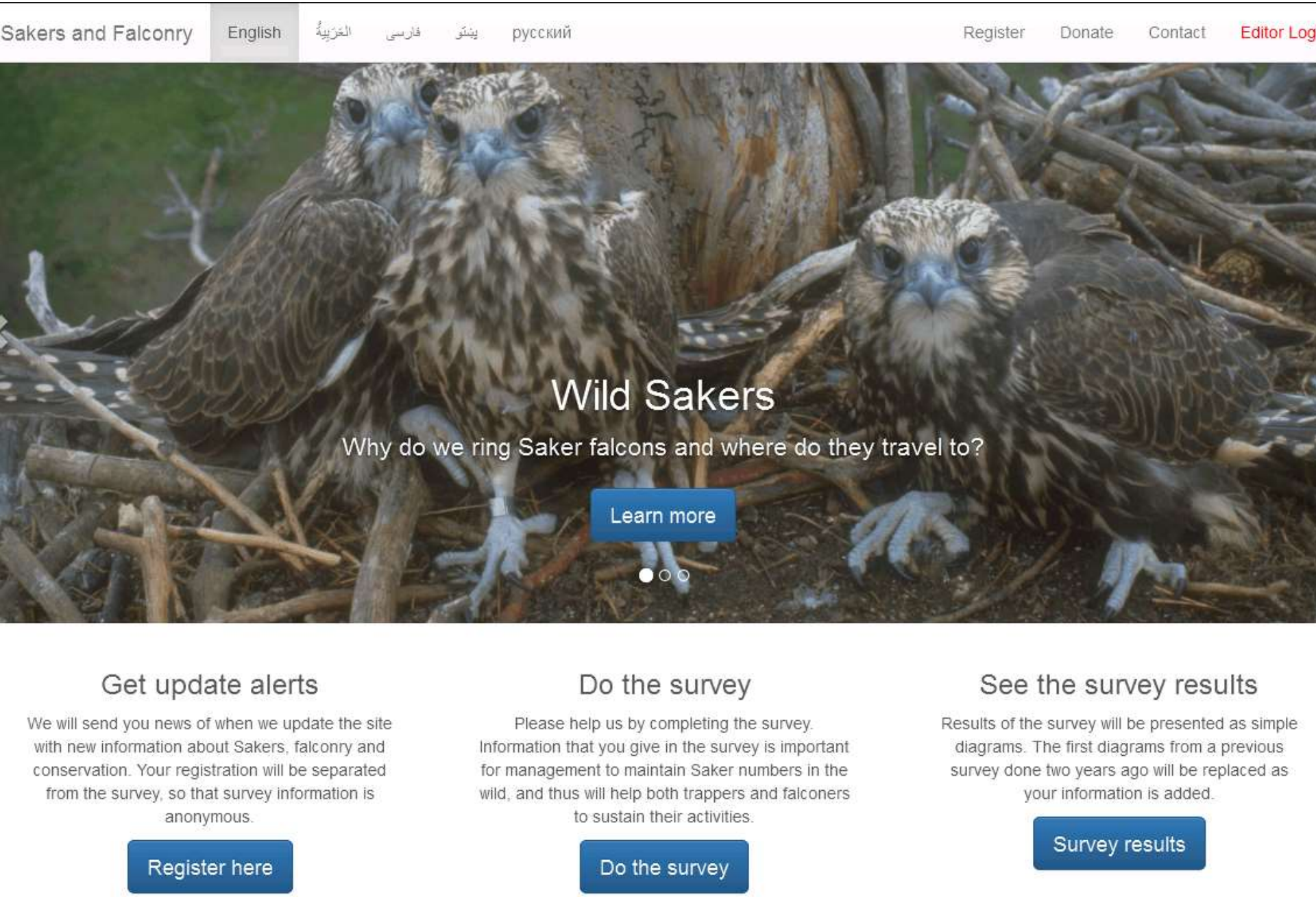
REQUESTS that Saker range states and falconers work with CITES and other international regulatory authorities to develop an internationally recognized system, initially for this species but applicable for other wildlife, that combines wildlife research and modern marking technologies to:

(a) monitor populations, estimate sustainable yields;

(b) regulate procurement and international movements with minimal administrative costs; and

(c) motivate conservation of the species and its habitats throughout its range.

now being implemented through a Sakernet portal



As a farmer's son in research for government, my interest was to solve pest problems, eg hawks for doves on crops

... and invasive grey squirrels as pests in woodland and for native red sqirrels, and even raptors as pests on gamebirds.

It led to developing radio-tags & tracking methods & analytic software & models & books, but also an interest encouraging those who consume wild resources to conserve them.

HAVE YOU EVER GATHERED WILD FLOWERS/FRUIT/ FUNGI? HAVE YOU FISHED/HUNTED?

For children in the countryside, a first really rewarding experience of nature and its riches (biodiversity), is to gather or fish with Dad or pick flowers with Grandma.

1992: Convention on Biological Diversity

Three pillars ▸ Conservation ▸ Sustainable use ▸ Equitable distribution of benefits

Defines Sustainable Use: of components of biodiversity in a way and at a rate that does not lead to the long term decline of biological diversity, thereby maintaining its potential to meet the needs and aspirations of present and future generations.

SU in 13 of 19 substantive articles.

Parties agreed principles for conservation through local folk:

- ✔ Malawi(’98): Ecosystem Approach (humans are included)
- ✔ Addis Ababa(’04): Sustainable Use (adaptive management)
- ✔ Nagoya(’10):Local Capabilities (tradition & local knowledge)

2004: CBD adopted the Addis Ababa Principles & Guidelines for Sustainable Use

(Short version) Sustainability of use of biodiversity will be enhanced if there is:

- Supportive & linked governance **at all levels**
- Empowerment & accountability of **local users**
- Adaptive management using science, **monitoring**, **local knowledge** and timely feedbacks
- Equitable sharing of benefits for **local people**
- Transparency & **international co-operation**
- **Public awareness of the benefits**

Very similar to Ecosystem Approach, as similar authors

2004: Millennium Assessment

Ecosystem Services from Land Use

Supporting

Regulating

Primarily public goods, regulated and public funded. Biodiversity needed?

Provisioning

Extensively private goods; but livestock & intensive crops have impacts on biodiversity.

Cultural

Recreational use of biodiversity, if sustainable, can be a tool and incentive to conserve (IUCN 2000

How do YOU view Sustainable Use?

A PROBLEM?

"If people must use wildlife, we should at least make sure that the use is sustainable."

A RIGHT?

"At last some conservationists understand that our right to use wildlife is justified."

A SOLUTION?

"A way of helping wild resources to compete economically with other uses of land."

Competing economically: who pays?

Voluntary (e.g. NGO membership, eco-labels)

State (taxation e.g. EU reformed CAP)

- taxation outside N. America & Europe?
- long-term sustainable in those areas?

Private (e.g. sustainable use of flora & fauna)

- conserves large areas in Africa – livestock vs hunting

- but can it conserve much land in Europe?
- is it worth much in Europe anyway?

IUCN recognises that biodiversity loss is caused mainly by intensified use of farmed, forested & aquatic ecosystems.

e.g. for 30 declining bird species in UK, Prof. **Ian Newton** (2004, **Ibis 146:579-600**) identified:

(i) weed control, (ii) early ploughing, (iii) grassland management, (iv) intensified stocking, (v) hedgerow loss & (vi) predation as problems.

All can be addressed, in many cases by de-intensification measures that have low cost

However, is de-intensifying too COMPLEX ?

also, someone has to pay: WHO PAYS ?

De-intensification

If income from use of land in euros/hectare is

I **from Intensive production, but**

C **from Conservative cropping enables**

U **from sustainable Use of wild resources**

(e.g. from fees for access, parking, licences, subscriptions, taxes on equipment and tourism)

Then suitable management can give $C + U \geq I$ **,**
especially if aided by agri-environment payments,

such that $C + U + S \gg I$

(NB: EU Common Agriculture gave $C+U \ll I+S$ **)**

Maybe not too complex for Decision Support Models

The Dual Approach Vision

"a much more biodiversity friendly mosaic of land uses driven by the livelihoods that are derived from the sustainable use of wild living resources, instead of landscapes with small islands of biodiversity in a sea of agriculture"

Jon Hutton & Nigel Leader-Williams (2003) Sustainable use & incentive-driven conservation …. **Oryx 37:215-226**.

So, ecology & economics & CBD suggested A Second Pillar for Conservation

Protection (sticks)

- ➢ Laws for Species
- ➢ Habitat Reserves

- Educational
- Polarising
- 12% of land (17%?)

Incentives (carrots)

- ➢ State subsidy
- ➢ Conserve-by-use

- Culture-friendly
- Complex
- everywhere?

Conserving=Protecting **BARELY STARTED!**

Moreover, the question remains, who pays?

From secondment with IUCN, back to Centre for Ecology & Hydrology as Technology Transfer Director

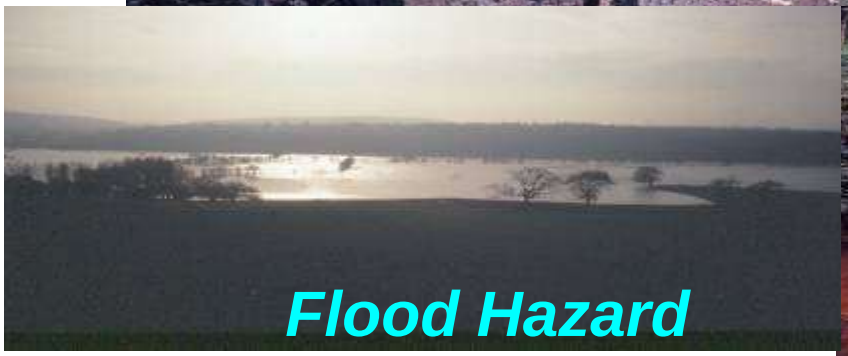
The secondment indicated that conservation through sustainable use on cultivated land would challenge scientists: with few experts, internet-based decision support was needed.

However, of 115 ideas in CEH suitable for external exploitation, 41 were software with decision support potential. Moreover …

CEH was already working with British Geological Survey & Nottingham University on Decision Support for Urban Planners.

e.g. Environmental Information System for Planners

A prototype demonstrator that provided Complex Knowledge to help planners apply environment data and understanding in the planning process.



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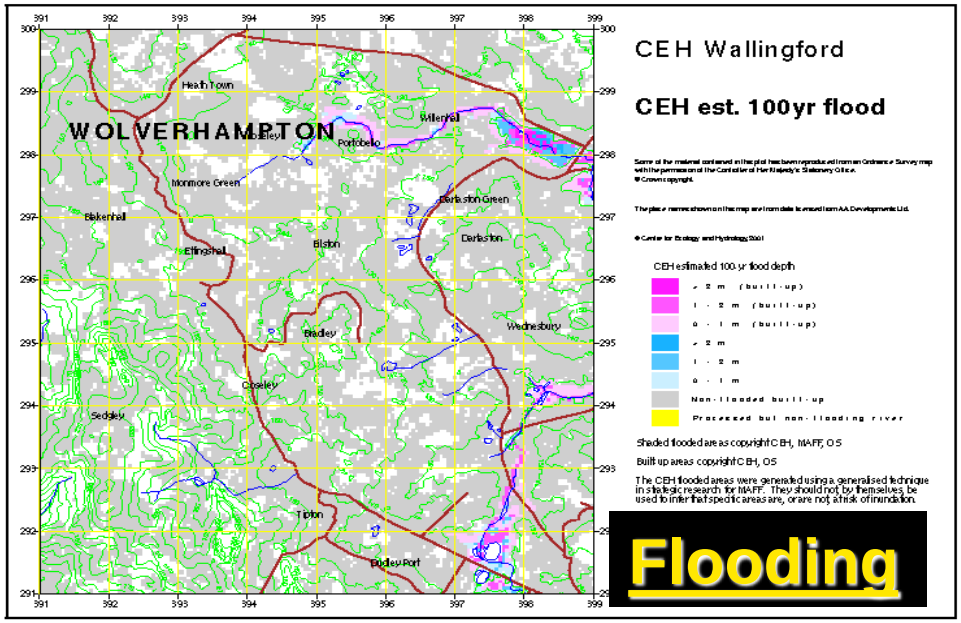
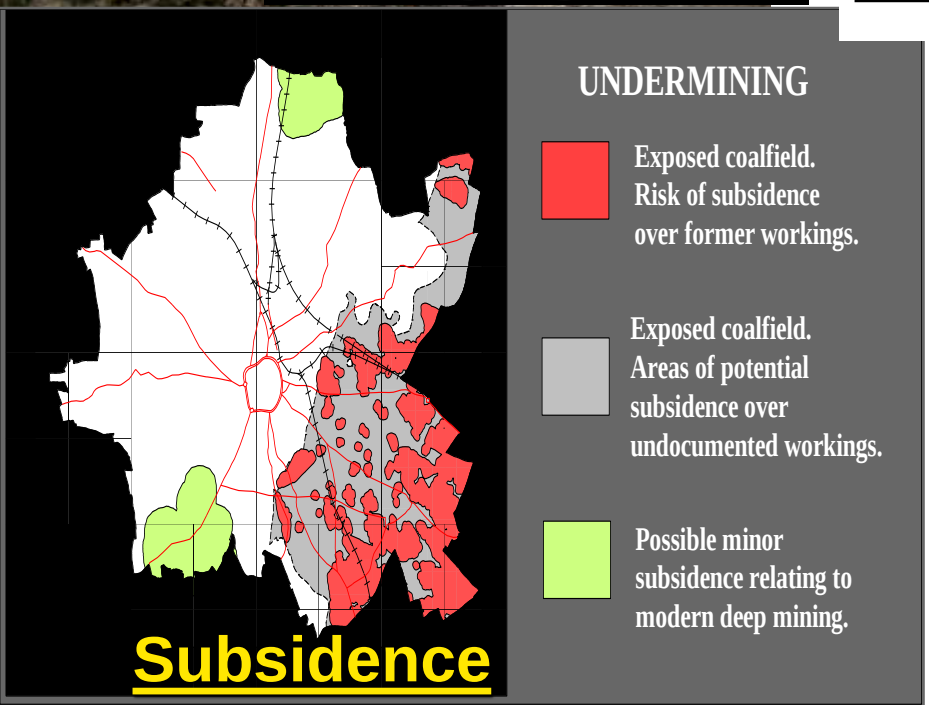
Some capabilities

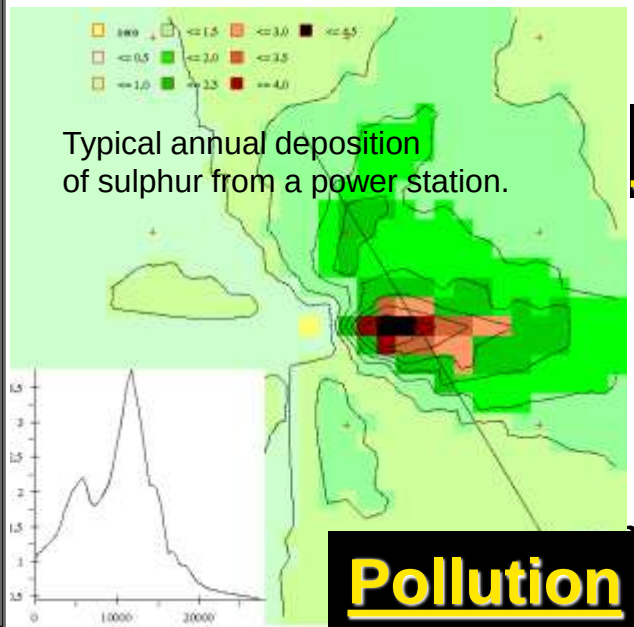
Managing Waste



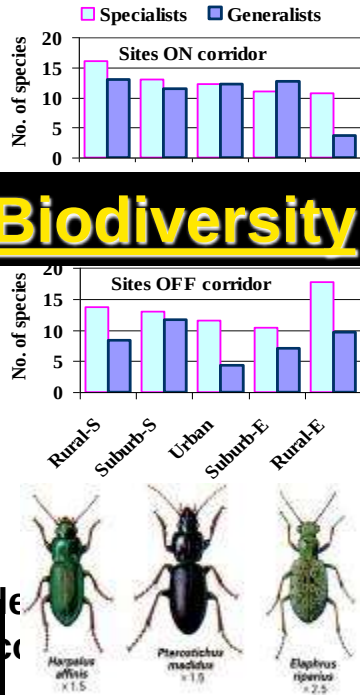
Flooding



Subsidence



Pollution



Biodiversity

Sadly, bids in UK to build "Decision Support for Rural Economies" (DESIRE) were compromised by politics. However …

European Sustainable Use (Specialist) Group (of IUCN) won funding from European Commission, by developing projects on:

1. Governance and Ecosystem Management for Conservation of Biodiversity (GEMCONBIO), which raised awareness of the value of wild resources across Europe for employment & conservation (aka Private Payments for Ecosystem Services);
2. Transactional Environmental Support System (TESS) designed knowledge tools to encourage & enable local benefits by conserving species & ecosystems, with central policy benefit from local knowledge.

1: GEMCONBIO raised awareness of participation and spending on biodiversity dependent activities (NGO survey)

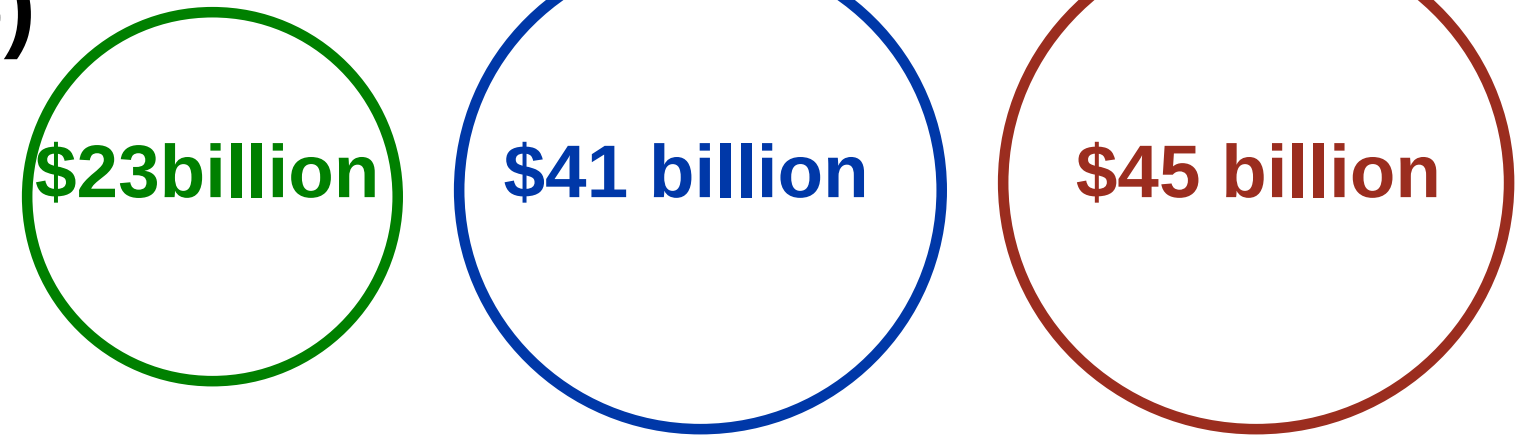
	Proportion of EU population surveyed	Participants grossed up millions	Annual spend € billions
Hunting	96-100%	6.6	16
Angling	64-94%	23	19
Collecting: Fungi	42%	[45][1]	
Plant Products	7%	[135][1]	
Bird-Watching	81%	6.2	{8}[2]

[1,2]unreliable due to [low survey%][1] {few spend data}[2]

Estimated annual spend on Hunting, Angling & Bird-watching was at least €40 billion in EU.

SPEND: Hunting Angling Watching
(in 2006)

USA



US government survey of wildlife-related activity:
87 million adults (38% population) spend $120 billion

European Union

GEMCONBIO survey of hunting, angling, watching:
34 million adults (7% population) spend >€40 billion.

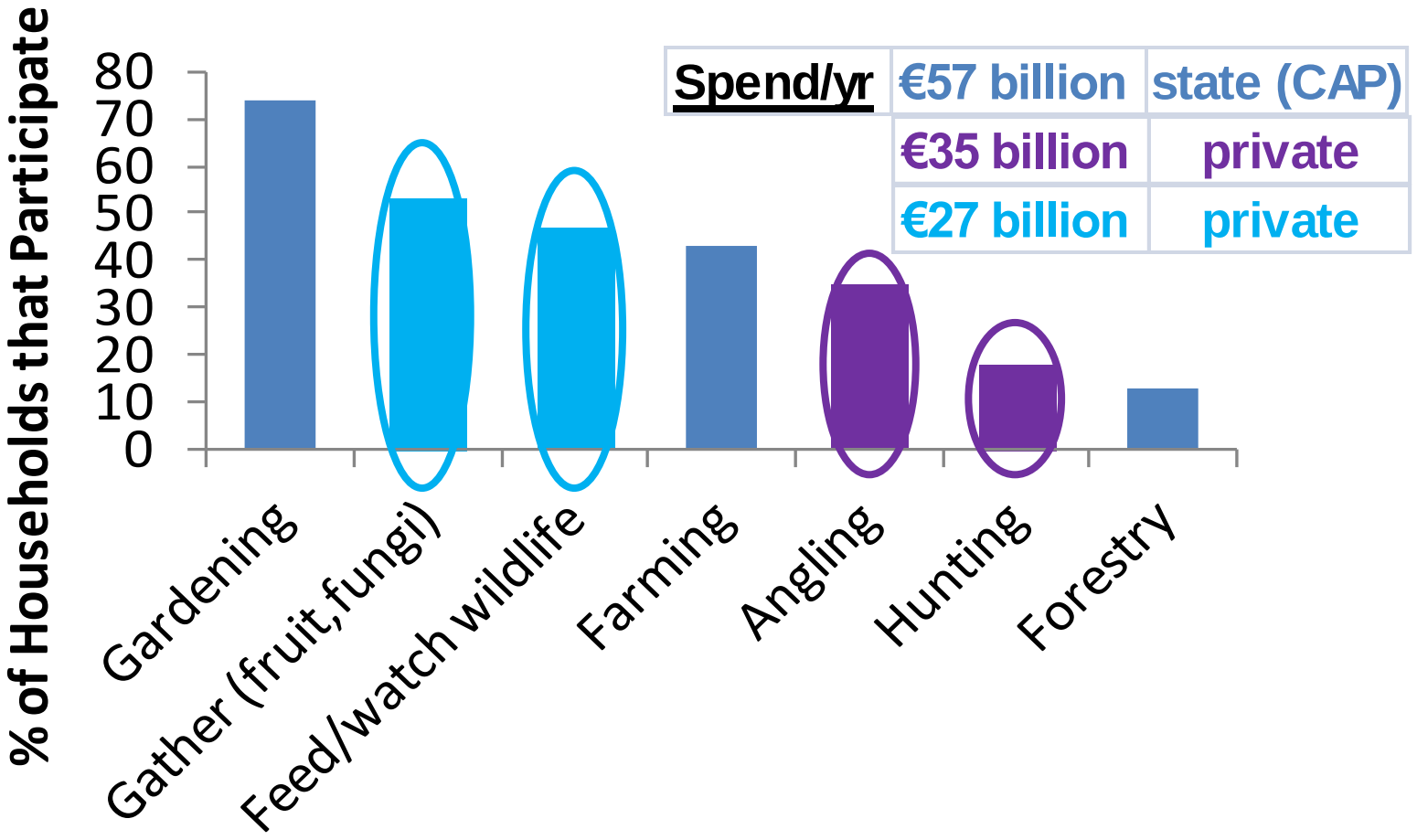
2: to design a transactional support system

TESS surveyed all EU states plus Norway, Switzerland, Turkey & Ukraine, to discover what environmental information was needed at highest government level, where Statutory Environmental Assessments (e.g. on Environmental Impacts) were a main concern, but also at most local level.

Five communities in each of the 30 countries were approached at random to survey local government, farmers, foresters and managers of areas for hunting, angling and nature protection.

In 8 communities across Europe, the whole population was surveyed about biodiversity-dependent activities, and mapping projects run.

There are 120,000 local communities in the EU. How do rural citizens use their environment?



- **Ca 100 million citizens, spending >€60 billion p.a.**
- **Scope for conservation from this resource through: Restoring, Mapping & GIS, Nature Ambassadors**

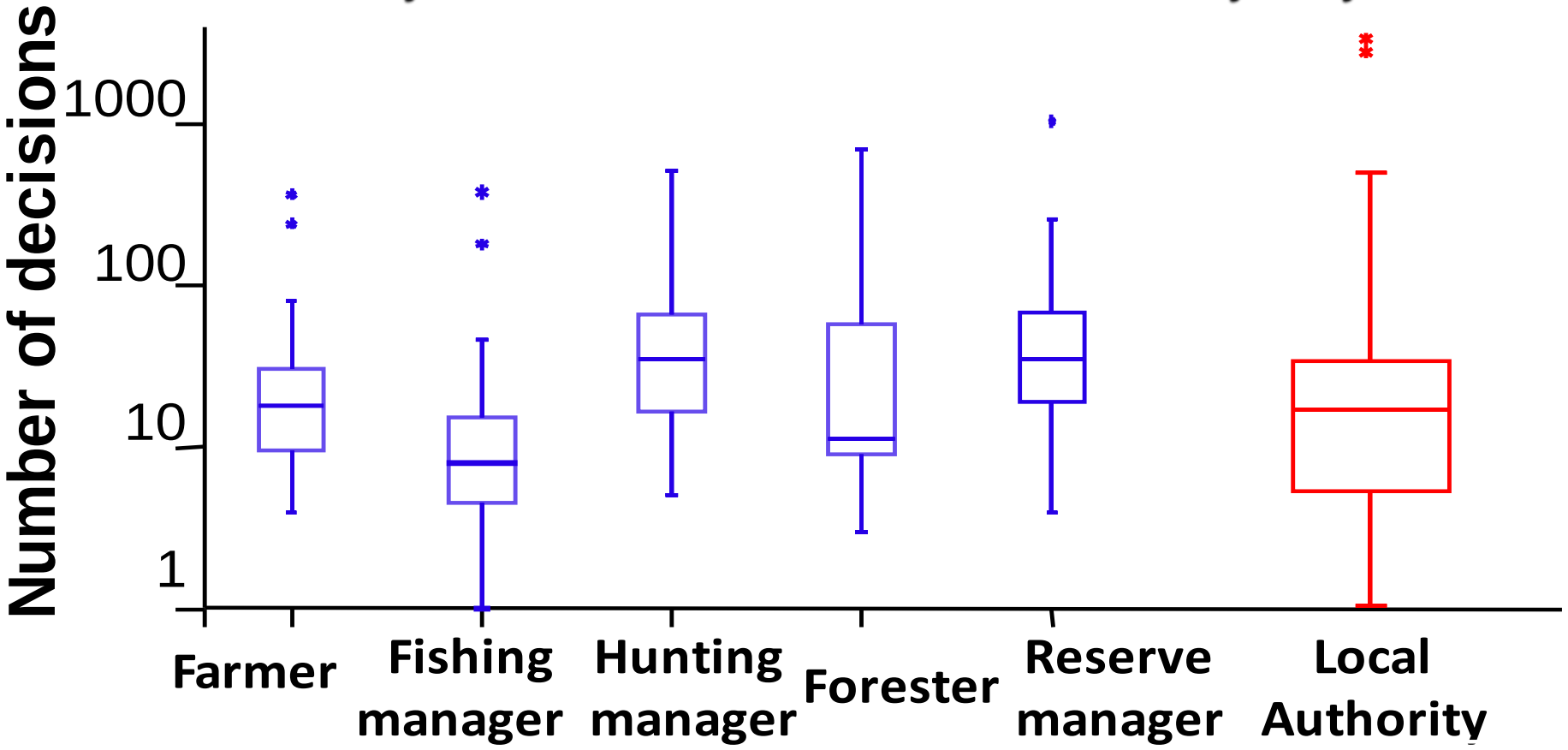
TESS (+GEMCONBIO) findings:

More than 100 million European citizens depend on wild biodiversity resources for recreation (e.g. watching, gathering, angling, hunting) and spend more than €60 billion annually; (CAP <€60 billion)

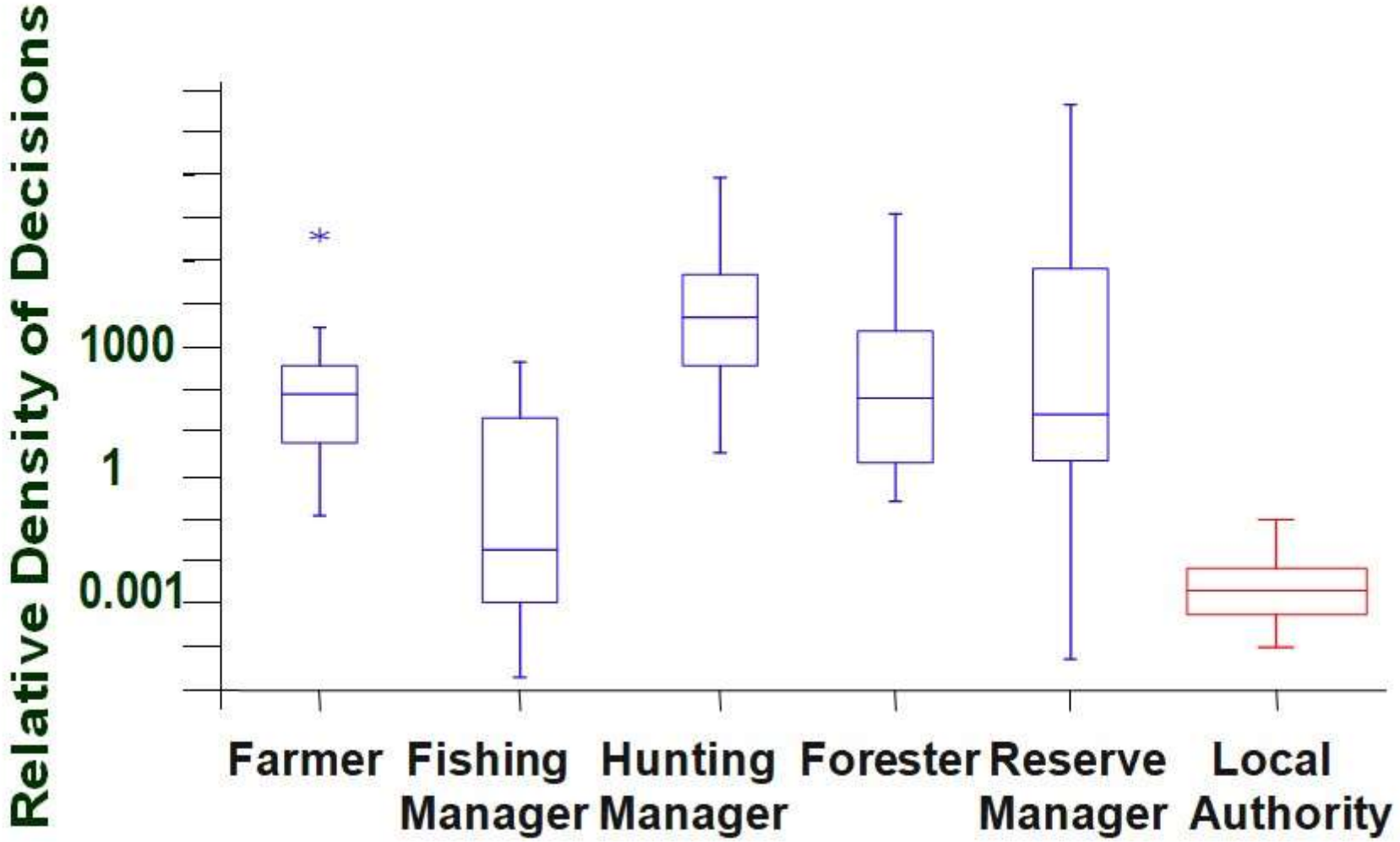
Those managing farms, forests, gardens and wild resources make informal decisions (which summate to change the environment) at a density 4-5 orders of magnitude greater than decisions through the formal Environmental Assessments (SEA and EIA).

Local decision making

Approximately how many management decisions, on average, do you (or people you represent) make annually that affect the environment in any way?



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.



There is far greater prevalence of private than state decisions

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Local biodiversity and ecosystem services were sustained best where knowledge leadership and adaptive management informed decisions.

Governance & Ecosystem Management for Conservation of Biodiversity (FP6)

Status of:	Tenure System	Regulation Strength	Adaptive Managed	Knowledge Leadership
Biodiversity	-	✔	✔ ✔	✔ ✔
Sustainability	-	-	✔ ✔	✔ ✔
Ecosystem Services	-	✘	✔ ✔	✔ ✔

In a Science article “Can we defy nature’s end”, Pimm et al. (2001) noted “Paradoxically we are not limited by lack of knowledge but failure to synthesis and distribute what we know.”

For an exchange between local stakeholders & central policymakers

Decision support for managers of land and species:

Councils, Farmers, Foresters, Reserve managers, Anglers, Hunters, Access Interests

1. **What does central policy and planning have?**
   Capability to produce complex knowledge.

2. **What does central policy and planning need?**
   Local knowledge and local actions.

3. **What do local managers of land & species have?**
   Local knowledge & capabilities (skill, cash, time).

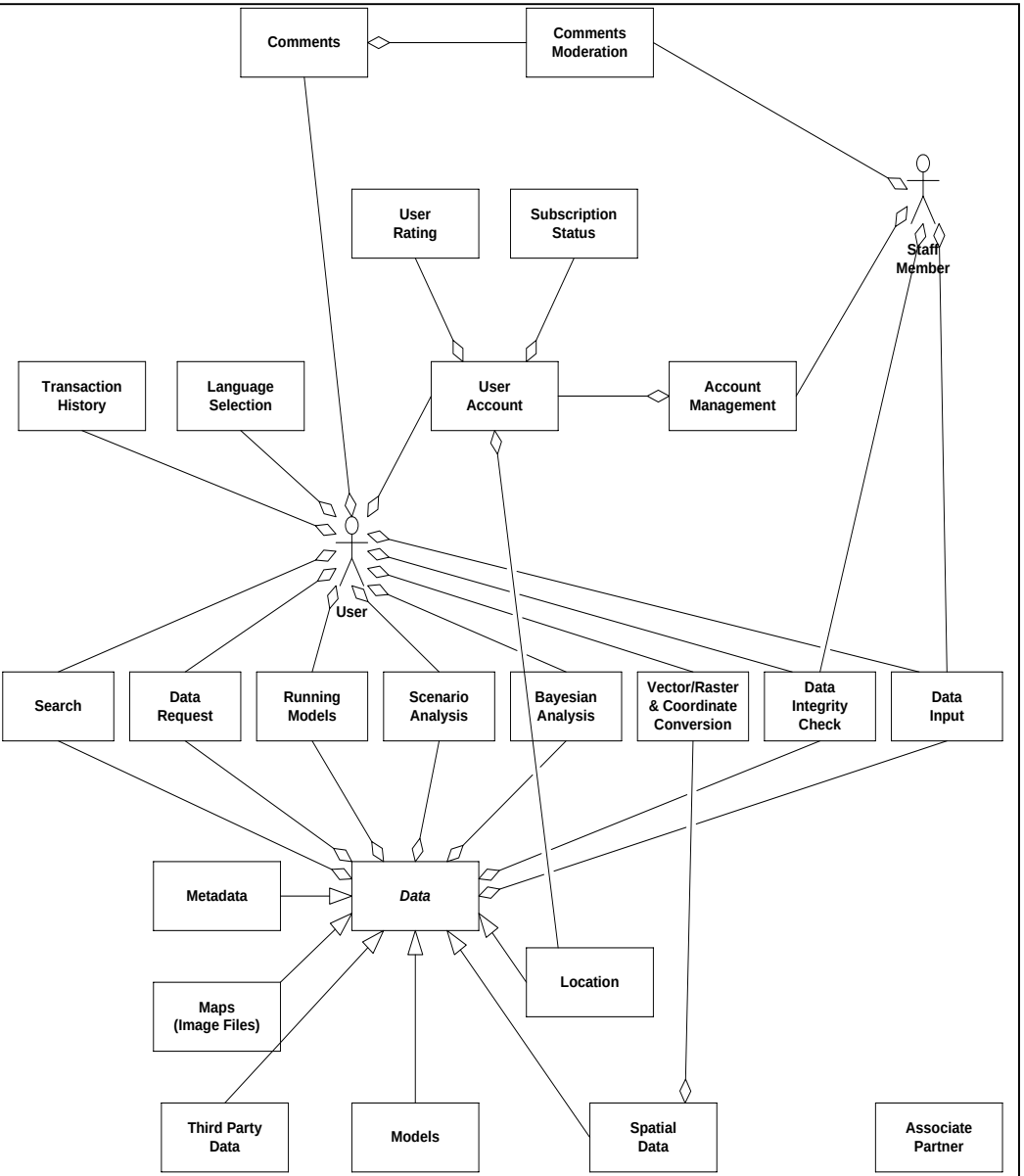
4. **What do local managers of land & species need?**
   Complex knowledge to guide their actions.

Exchanging decision-support for local knowledge and actions

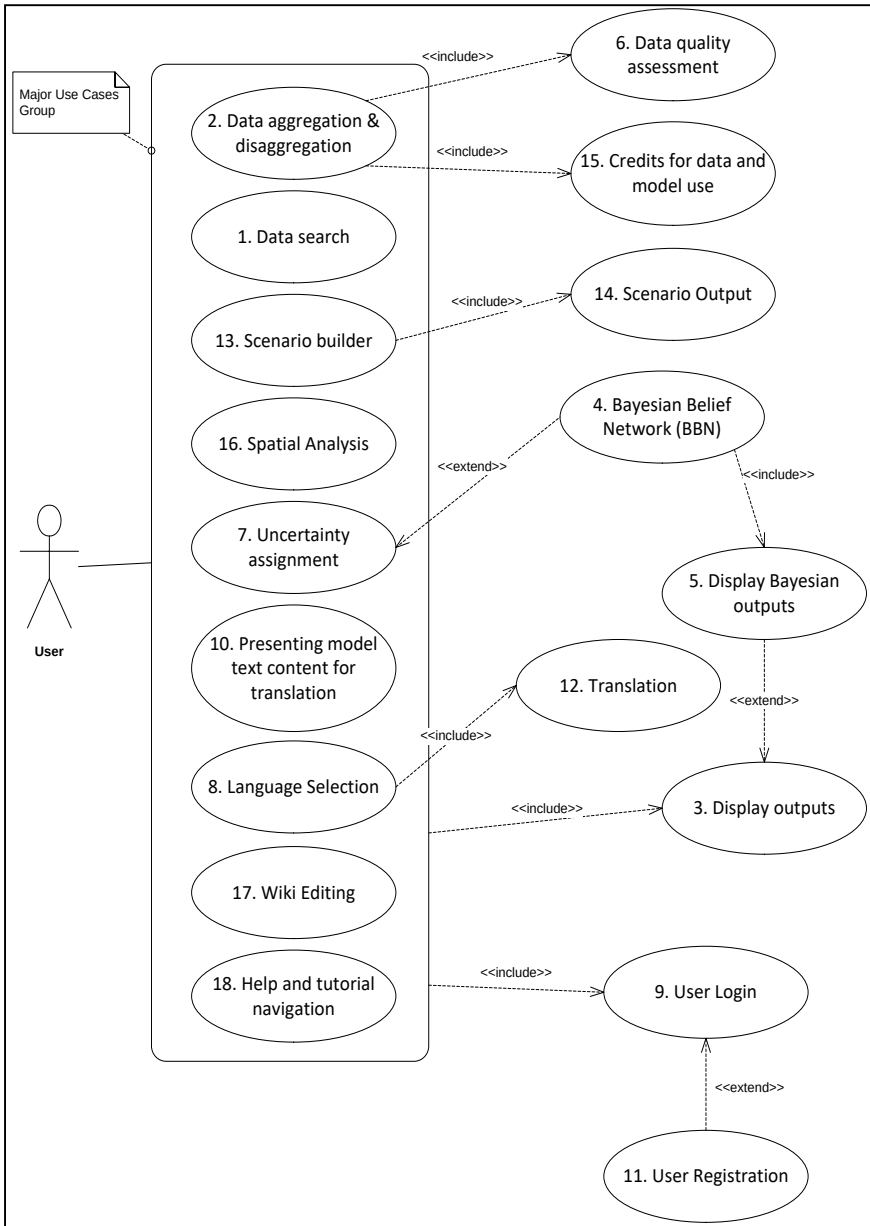
SCALE	CONTEXT / QUESTION	OPERATION MODE
Field individual	! BEEP ! HARRIER NEST AHEAD	**Satnav diverts harvester for 20 meters.**
Garden individual	Is it too soon for the Nyphalid butterflies if I cut the nettles now?	**Intelligent GIS on tablet**
Farm individual	If I use my land like this in future, what happens to my income, game bags and nitrate run-offs?	**Auto-guides on farm plan: optimizing game, fishing and farm income.**
Parish community	How do we route this path to optimise views while minimising erosion and wildlife disturbance?	**Headland mapping GIS: walking (pay-parking), horse-riding (licence).**
Higher govern-ment	If trends in land-use continue for 20 years, how can we still meet planned biodiversity targets?	**Scenario: model subsidy payments for leveraging sustainable use activities.**

Technical Design:

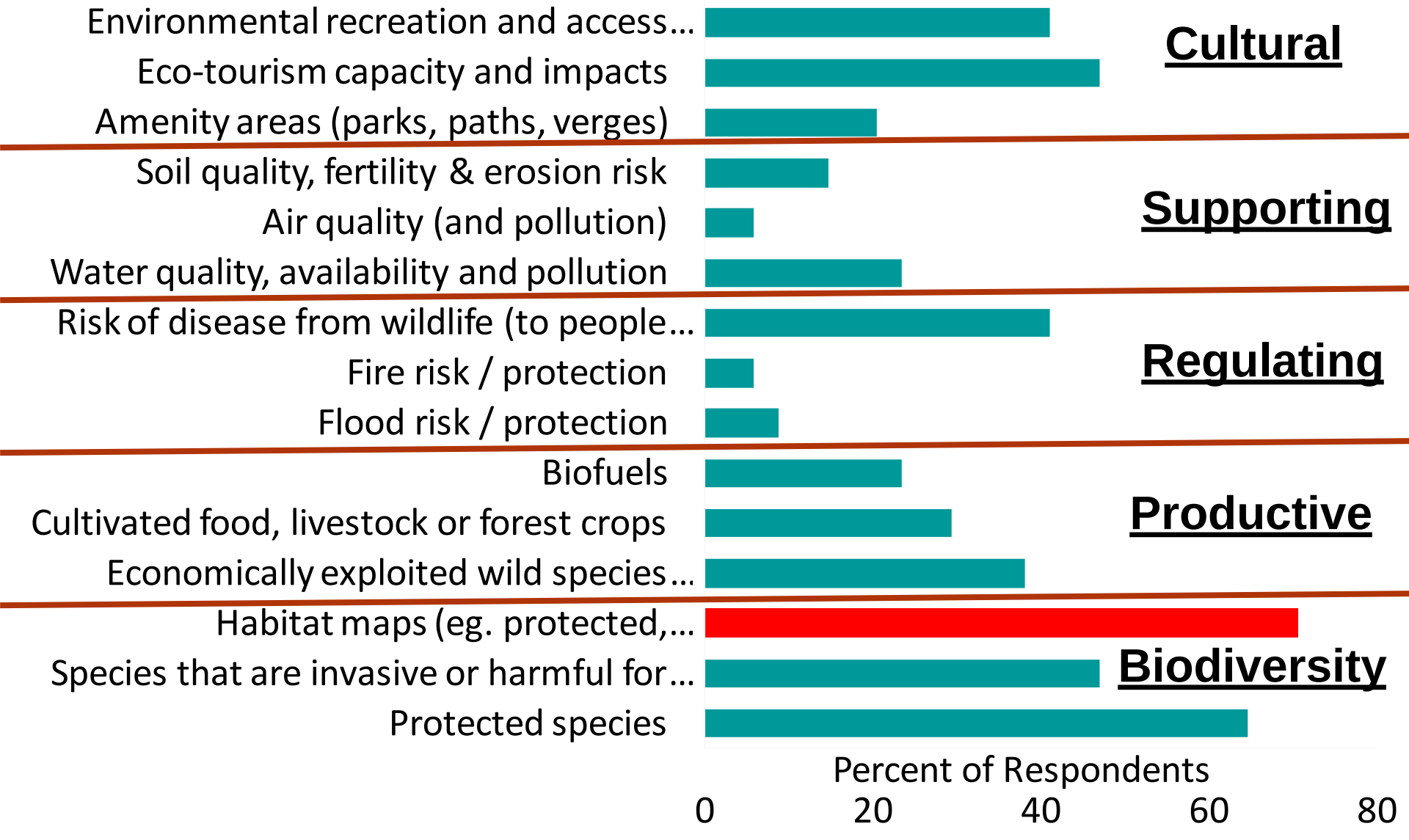
Domain Model



Use Cases



In which environment issues/ecosystem services would decision support be most useful? We asked NGOs what their members would like.



Survey of stakeholder organisations: what would your members like on a site?

Q6. Which of the following services are on your web-site? *Least present is large bold italic underlined.* Q7. How would you prioritise services for members on an ideal site? Deep blue is most desired.	6. Rank Present	7. Rank Priority	Aspired	Provide on site	Provide as links
Examples of best practice in Conservation from Use of Biodiversity & Ecosystem Services	12	12	0	**Now**	**Now**
Decision support systems and management advice for such Conservation or links to it	8	11	3	**Later**	**Now**
A user-edited collation (wiki) of management advice for such Conservation or a link to one	1	3	2	**Later**	
Systems for monitoring wild animals/plants, including specimens or quantities harvested, or link to one	7	10	3	**Soon**	**Now**
Supporting advice for production from land or finding wild resources, or links to this	4	8	4	**Later**	**Now**
A service for mapping areas/routes managed or of conservation interest, or link to one	2	5	3	**Now**	
News feeds on biodiversity and its conservation	11	9	-2		**Later**
Shopping or advertising for equipment, accommodation or travel	5	1	-4		

Hence a multilingual site to explain & seek funds

Was this the way to gain stakeholder interest?

Select your country and language

België | Belgique | Беларусь | България

Deutschland | Eesti | España | Ελλάδα

Eire | Italia | Κύπρος | Latvija

Magyarország | Nederland | Norge | Österreich

Slovenija

Not exactly.

Silvicultura o el cultivo de otros árboles para madera/leña/ fibra

La jardinería y la horticultura, incluyendo los huertos y viñedos

La acuicultura o la pesca destinadas a la alimentación

La pesca en ríos, lagos y el mar

La caza y la gestión de la caza

La recolección de productos naturales

Observación y fotografía de la naturaleza

Gestión de reservas naturales y otras áreas de importancia cultural

Cuidado del caballo para

Agricultura: Buenas Prácticas

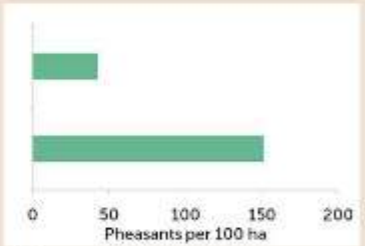
El Proyecto Allerton

Game & Wildlife Conservation Trust

El Proyecto Allerton se creó en 1992 como una empresa mixta de tierra cultivable y ganadería (280 ovejas) en 333 hectáreas de suelo arcilloso. Los cultivos son principalmente de trigo de invierno y avena (que se venden certificados como "Conservation Grade"), de semillas oleaginosas y legumbres de primavera. La granja es una prueba de la conservación. La contabilidad, incluidos los gastos de conservación, se publica en la revisión anual del "Game and Wildlife Conservation Trust".

Gestión de la Caza y Conservación de Vida Silvestre

Se estableció una situación inicial de referencia relativa a la abundancia de poblaciones cinegéticas y fauna salvaje. La cobertura de anidación, los insectos para la alimentación de los pollos y los alimentos y la cobertura en invierno se incrementaron. Los depredadores de nidos fueron controlados, fue distribuida la alimentación en invierno, pero no hubo liberación de caza de cría.



Número de faisanes comunes por cada 100 hectáreas en el otoño antes de la gestión (arriba) y con la gestión del hábitat más montería (abajo).

... but we realised that multilingual sites can network to national language sites for project work. So did IAF, hence Sakernet & Perdixnet.

Naturalliance

Connectez-vous s'inscrire

aller

A propos Sujets Habitats/espèces Faire un Don Contactez-nous

Sujets

- Un système pour la communication locale
- Restaurer la Nature
- La gestion des espèces non indigènes
- Cueillette des champignons, des fruits et d'autres produits naturels
- Les grandes cultures et l'élevage
- Sylviculture ou l'arboriculture pour le bois / le combustible / les fibres
- Jardinage et horticulture, y compris les vergers et les vignobles
- L'aquaculture ou de pêche pour la nourriture
- Pêche dans les rivières, les lacs et la mer.

Communication Locale

Les richesses naturelles (biodiversité) et les services qu'elles procurent (services écosystémiques) sont les meilleurs là où la gestion locale est adaptée et où il existe un réel partage des connaissances. C'est pourquoi, le projet qui est à l'origine de Naturalliance a demandé aux différentes autorités européennes ce qui leur manquaient comme connaissances pour gérer l'environnement. Les autorités locales ont mis en avant leur volonté d'obtenir des conseils sur la gestion des problèmes socio-environnementaux ainsi que sur la cartographie fine des habitats et des espèces. Les associations représentatives du monde rural ont exprimé quant à elles leur souhait d'être aidées dans la prise de décision locale en matière de production et de conservation, et sur les outils de cartographie susceptibles de faciliter cela. Elles ont également hiérarchisé les exemples de meilleure pratique.

Le premier site britannique construit avec un Système pour la Communication Locale (cliquez sur l'image pour l'agrandir et sur Meilleure Pratique pour en apprendre plus)

Ressources

- Meilleure Pratique
- Bonnes Idées

Naturalliance a été construit pour fournir des exemples de meilleures pratiques pour les

Conclusions:

- Biodiversity is a recreational ES for 100 million people in EU, spending >€60 Billion on it pa, more in USA.
- National level makes protection laws and enforces EAs, but most decisions for managing biodiversity are local.
- Adaptive management (associated with key knowledge) at local level conserves biodiversity and ES (NB CBD).
- Conservation through sustainable use is potentially an important complement to protection of species/habitats.
- However, to apply CSU widely in cultivated landscapes needs decision support, ideally on the internet.
- Governments have not supported this approach, but web-systems promoting best-practice may help start it.