Know the natural capital

Eeva Furman
Finnish environment institute SYKE

www.OpenNESS-project.eu

www.alter-net.info

25.11.2014

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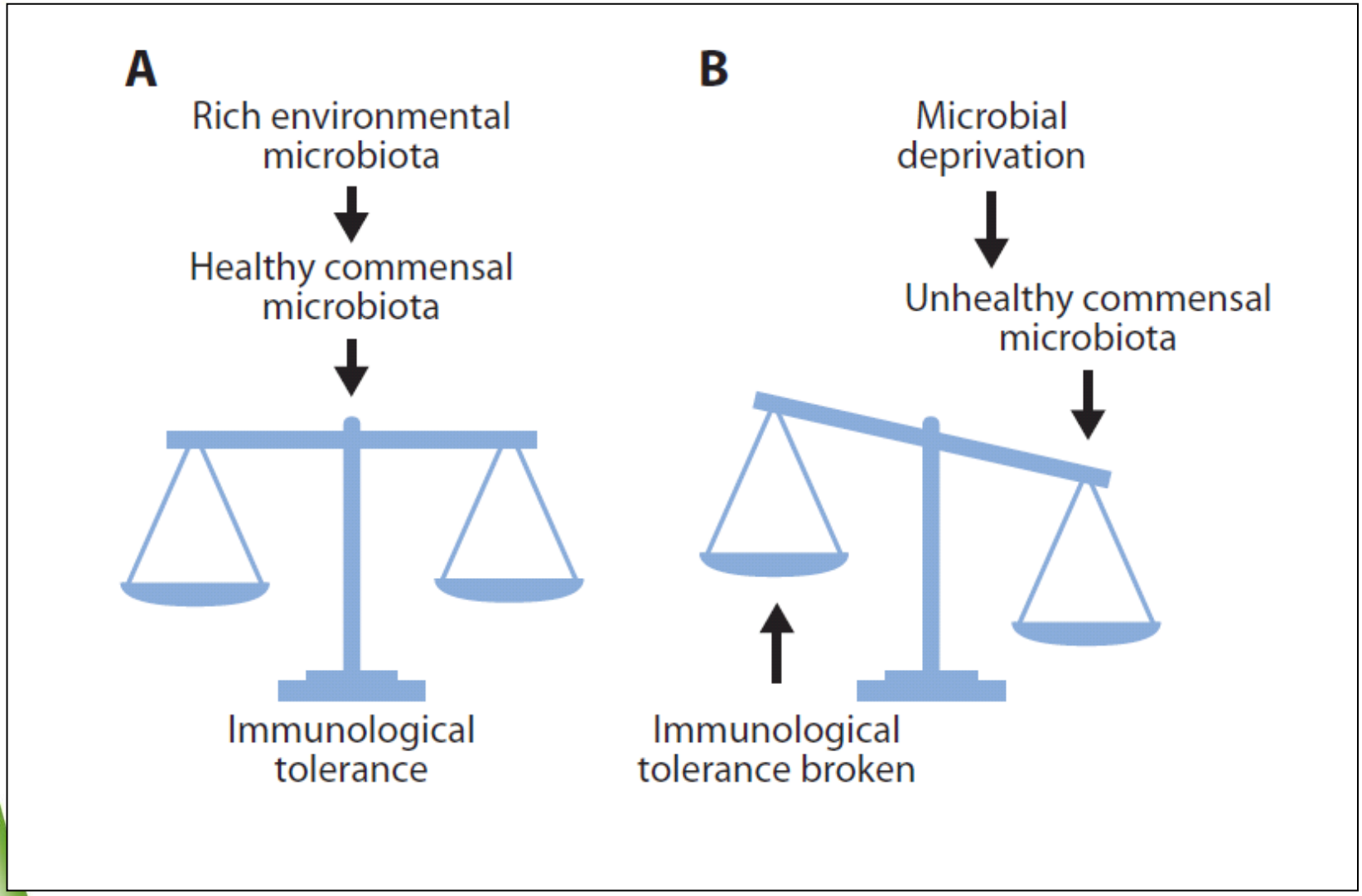
Biodiversity hypothesis



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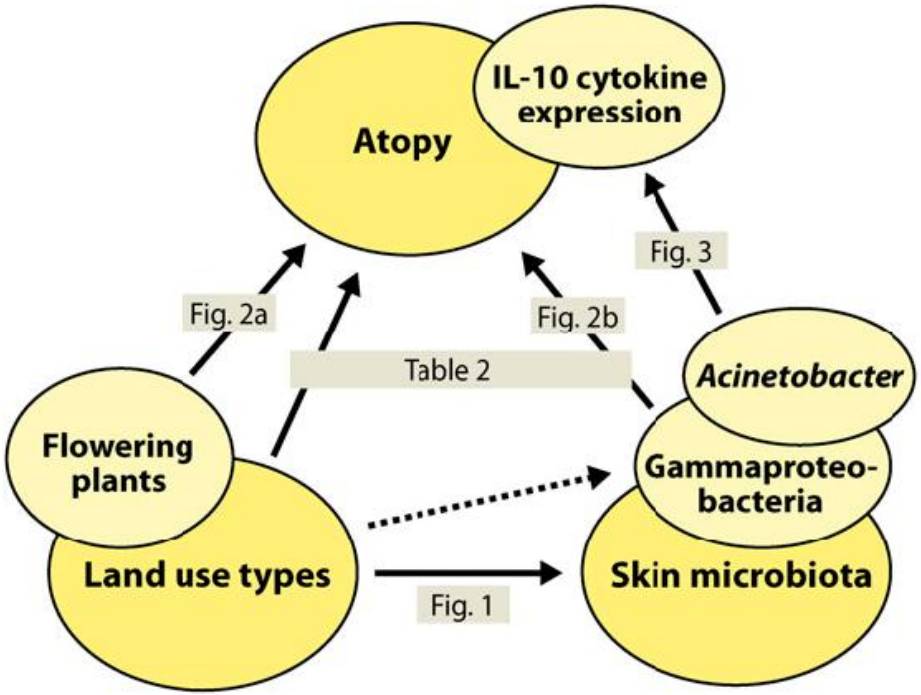
von Hertzen, Hanski & Haahtela 2011 EMBO Reports

The more contacts with natural environments during the 1st year of life, the more diverse microbiota on human body and the better the immunological tolerance on later phases of life.



Hanski et al. PNAS 2012

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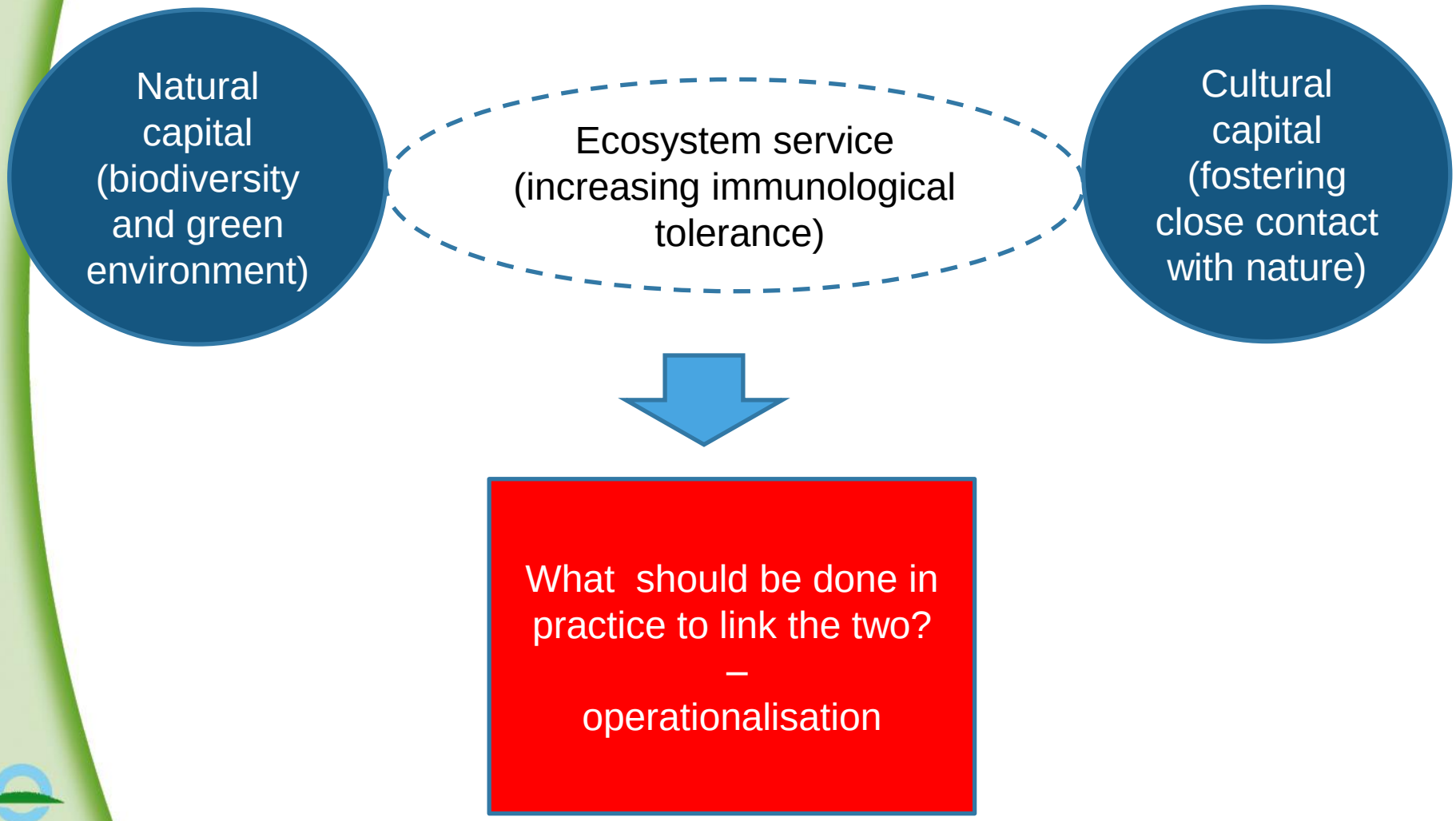
Natural capital (biodiversity and green environment)
Ecosystem service (increasing immunological tolerance)
Cultural capital (fostering close contact with nature)
What should be done in practice to link the two? – operationalisation

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OpenNESS

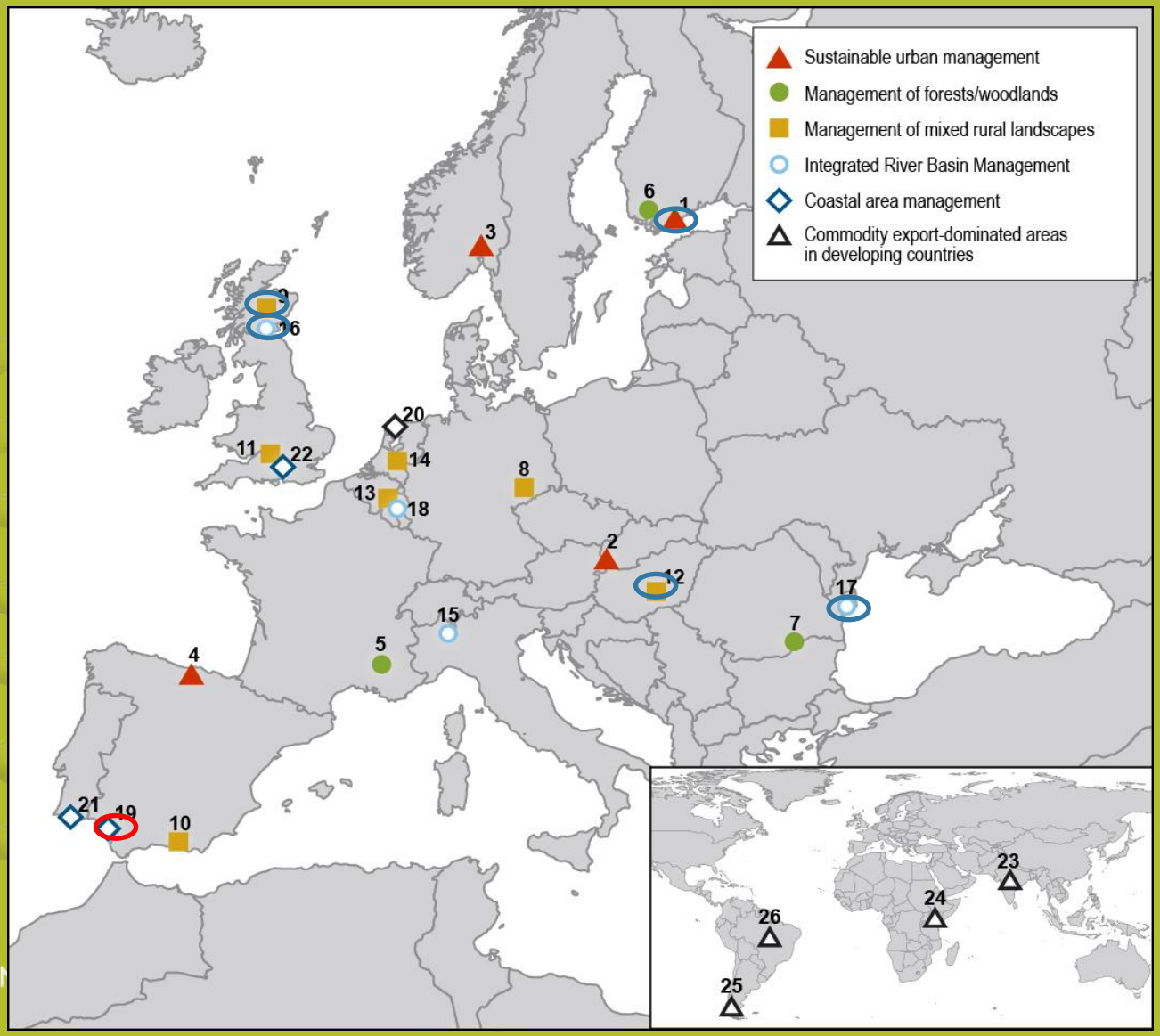
Operationalisation of natural capital and ecosystem services: from concepts to real-world applications

How to translate the ES and NC concepts into operational frameworks?

How the concepts can be embedded in existing practice, or used to transform current management and policy approaches?

- ***www.openness-project.eu***

27 OpenNESS case studies



Iterative working in OpenNESS

WP5

- Setting up the case studies

WS1: Match problems to methods

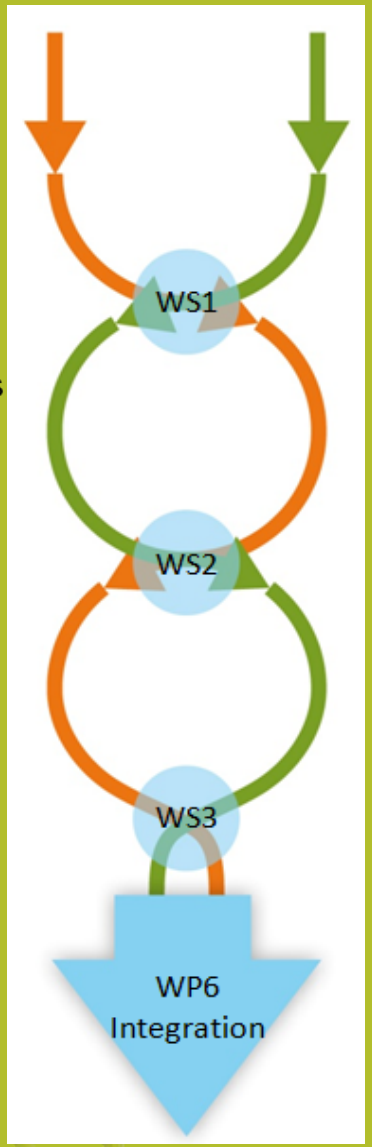
- Preliminary application of methods and conceptual frameworks

WS2: Review interim results

- Further testing of methods and frameworks in case studies

WS3: Review near final results

- Final application
- Overall lessons learned



WP1-4

- Reviews of existing methods and conceptual frameworks
- Define research questions in
- relation to the four key challenges

WS1: Match problems to methods

- Guidelines for method application
- Methods, concepts and tools development

WS2: Review interim results

- Methods, concepts and tools refinement

WS3: Review near final results

- Final refinement
- Final set of methods and frameworks

Some of the methods tested

Spreadsheet/GIS	•Simple, flexible, easy to use •e.g. EXCEL linked to ArcGIS; Greenframe (SYKE)
QUICKScan	•Visualisation and interpretation tool for decision makers •Can quickly explore alternative storylines, synergies and trade-offs
Bayesian Belief Networks (BBNs)	•Graphical tool for decision making under uncertainty •Shows system as a set of relationships and associated probabilities
State and transition models (STMs)	•Assess likelihood of sudden or gradual changes in ecosystems •Based largely on expert knowledge, due to lack of data
ESTIMAP	•Maps ES flows and benefits at continental level, based on cascade model •Can be combined with land use change model (LUMP) for scenario analysis
InVEST	•Tiered set of different models for quantifying, mapping and valuing ES •Suitable for analysing multiple services and objectives
Global and European Modelling	•CLIMSAVE IAP, ESTIMAP, GLOBIO •Provide wider context for the case studies

oppla

A final output from OpenNESS and OPERAs projects

- An interactive platform that includes a central website offering tools, services, advice, best practice, contacts and other assistance from an excellent group of experts across Europe.

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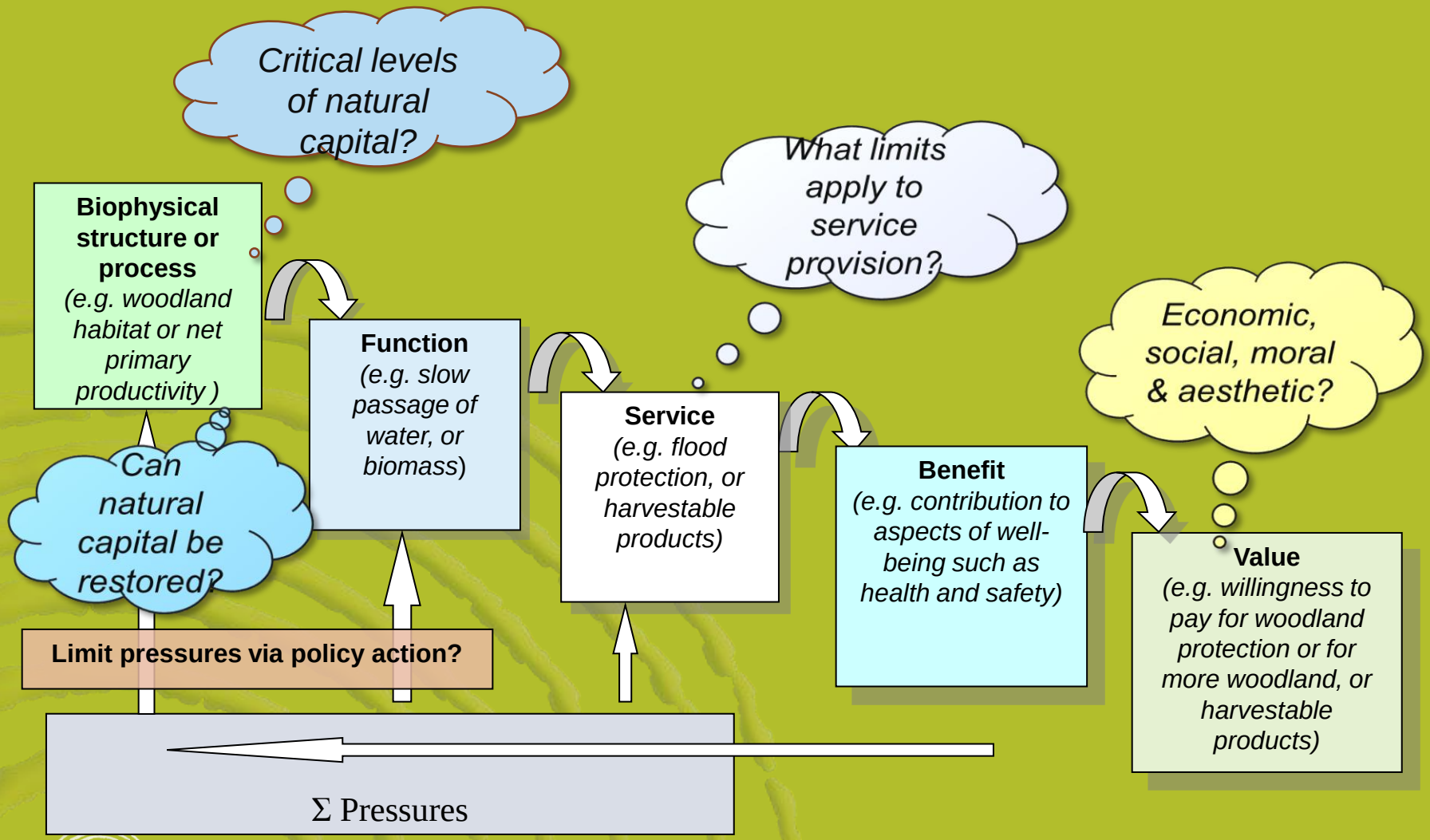
The cascade model: from ecosystems to benefits



Potschin and Haines-Young (2011)

From operationalisation of ecosystem services to nature based solutions

"application of knowledge about the features and processes of nature in work, towards options for future actions that are resilient, resource efficient, and attuned to local conditions and needs"

- using
- copying from
- being inspired by
- assisted by

nature in technical and social terms

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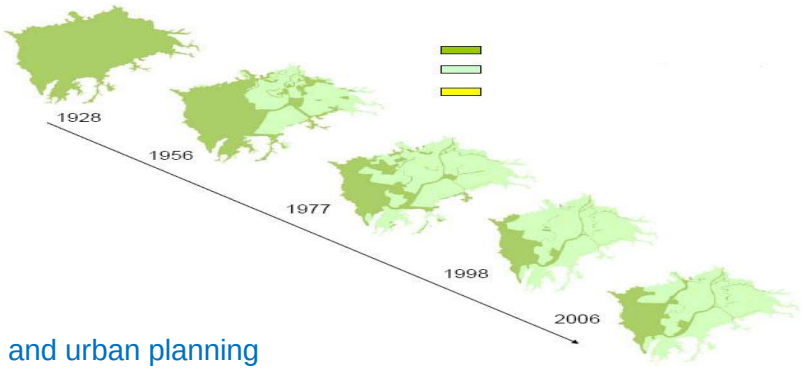
- **EU policies are considered to be amongst the most important drivers for ecosystem change -> OpenNESS plans to develop four EU level scenarios**
  - developments of already existing or currently developed policy instruments,
  - the emergence of new policies,
  - the termination of ‘old’ policies, or
  - even a completely redesigned policy mix/landscape within and across particular policy fields

- Participatory scenario exercise helps to reflect on different future developments of the EU regulatory frameworks: *eg. How CAP will look like in various scenarios in 2030 and 2050?*



Zorrilla et al. 2014. Lanscape and urban planning

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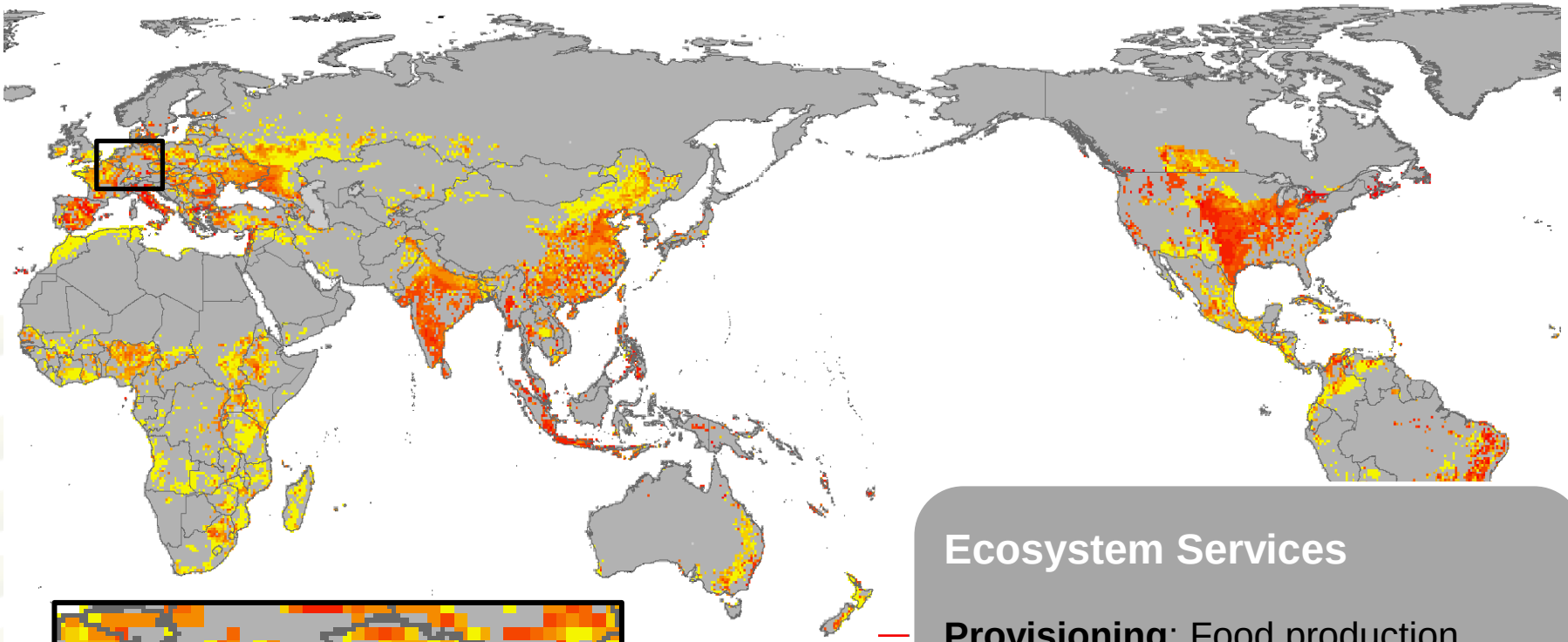
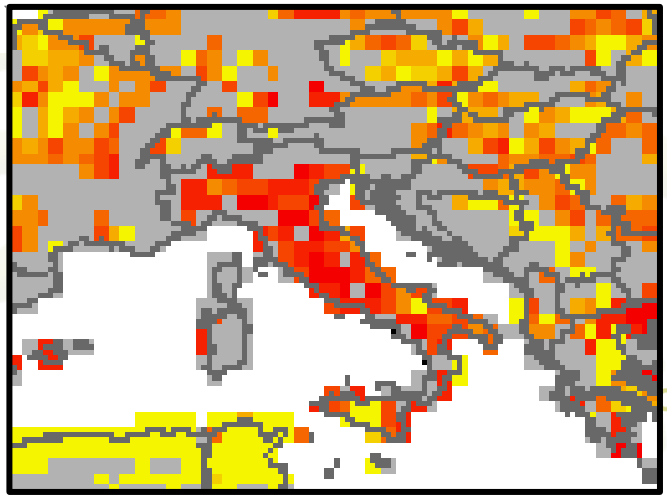
GLOBIO





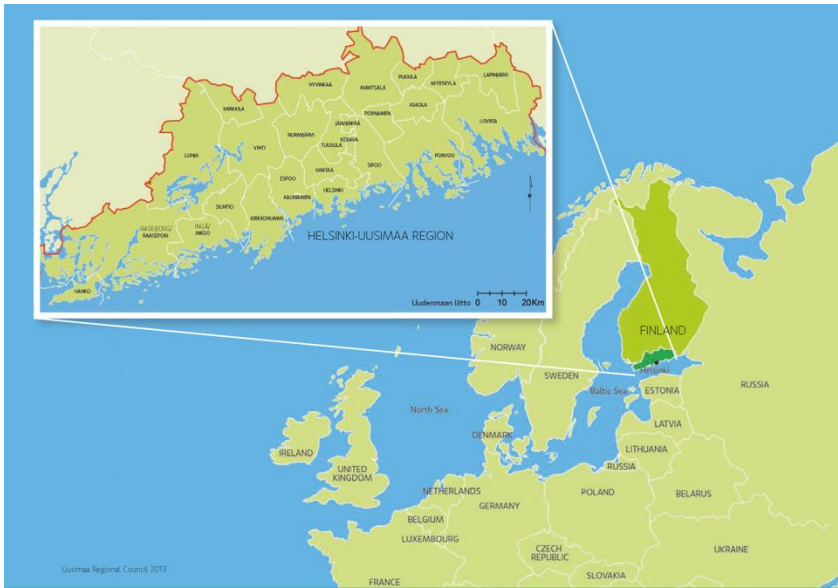
Ecosystem Services

Provisioning: Food production (forage, livestock and crops); Wild Food
Regulating: Climate regulation (carbon sequestration); Air quality*; Erosion protection; Flood protection; Pollination; Pest Control.
Cultural: Tourism

Mapping ecosystem services: case Helsinki-Uusimaa region

- The Regional Plan 4 for the Helsinki-Uusimaa Region is currently under preparation

- The Regional Plan 4 has five themes
  - business and innovation
  - logistics
  - wind energy
  - **green infrastructure**
  - cultural heritage



© Uusimaa Regional Council

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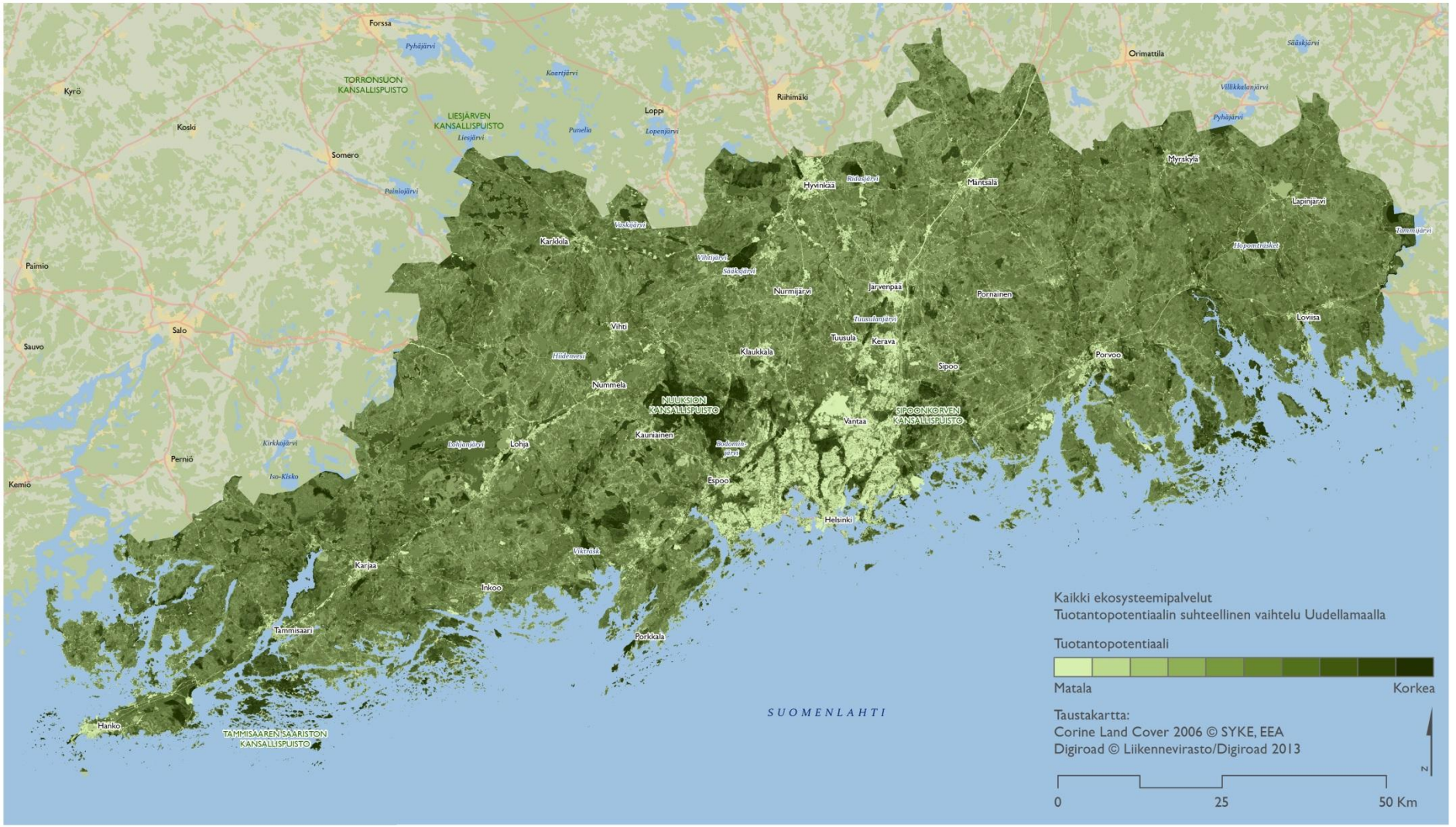

ECOSYSTEM SERVICE PROVISION POTENTIAL – SYNTHESIS INCLUDING ALL ECOSYSTEM SERVICES

GreenFrame method

- Objective to identify the key areas of green infrastructure from the point of view of ecosystem service provision potential

- Analysis based on
  - More than 20 spatial datasets grouped thematically
  - Scoring (-3 - +3) of these spatial datasets by
    - Scientific experts
    - Local experts

- Quantitative spatial datasets were used when available
  - E.g. groundwater yield, bioenergy potential

Kopperoinen, L., Itkonen, P. & Niemelä, J. 2014. Using expert knowledge in combining green infrastructure and ecosystem services in land use planning: an insight into a new place-based methodology. Landscape Ecology. DOI 10.1007/s10980-014-0014-2.

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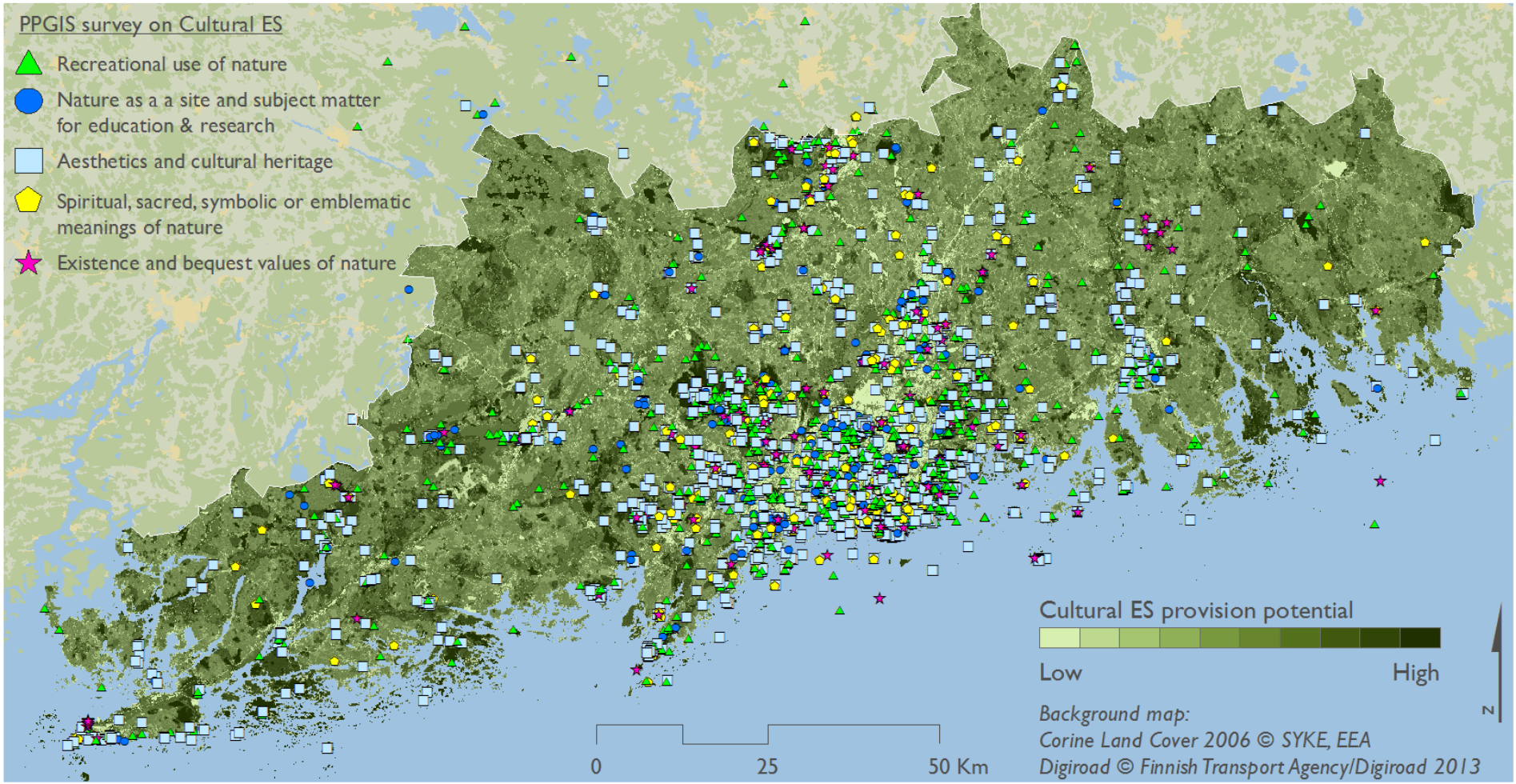
Cultural ecosystem services: the places that have a special meaning to people



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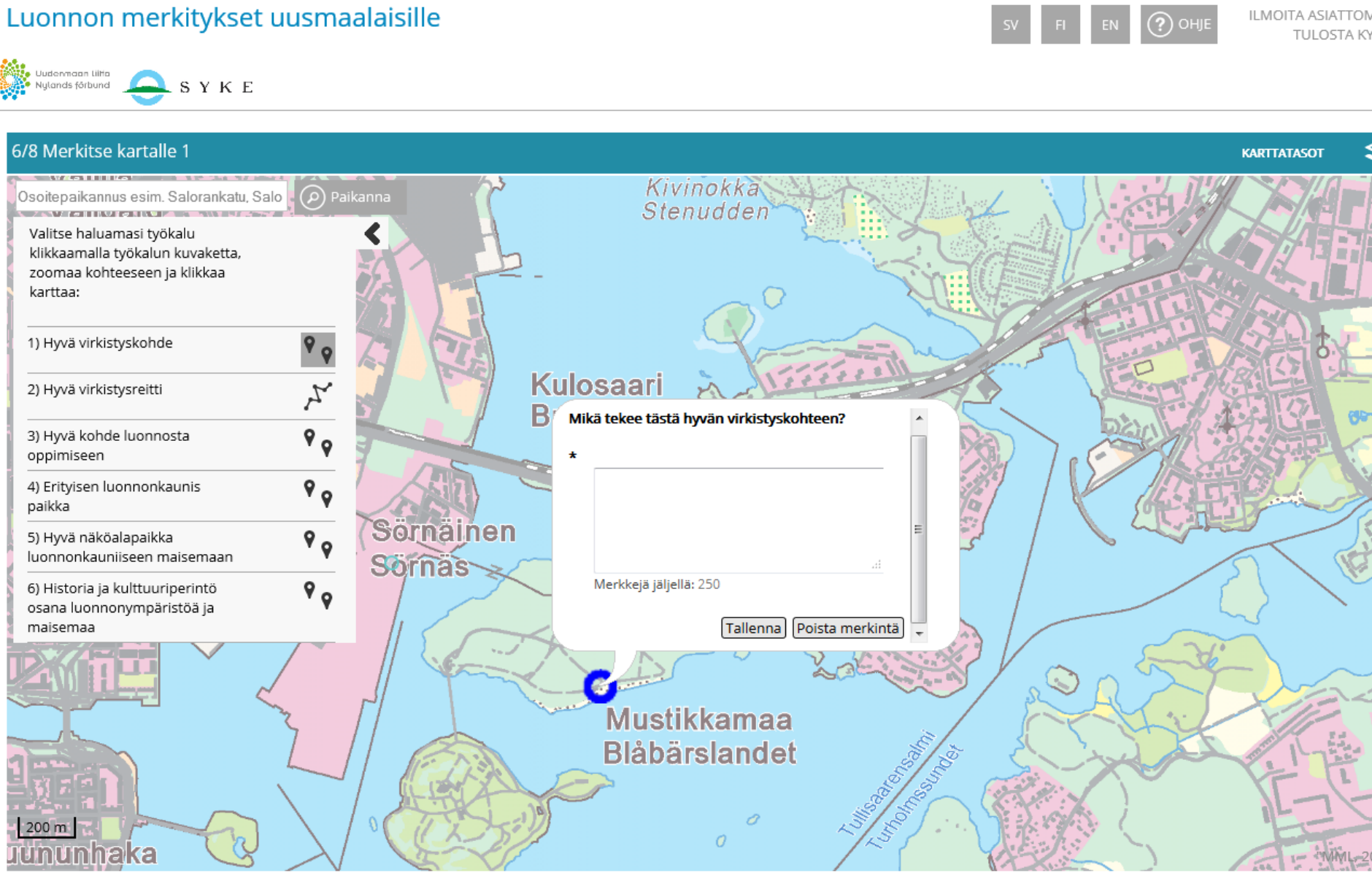
The demand for cultural ES, Harava questionnaire



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Valuation

- Price is the best indicator of market value
- But…most ecosystem services lack markets and have no price
- Does this mean that they do not have a value?

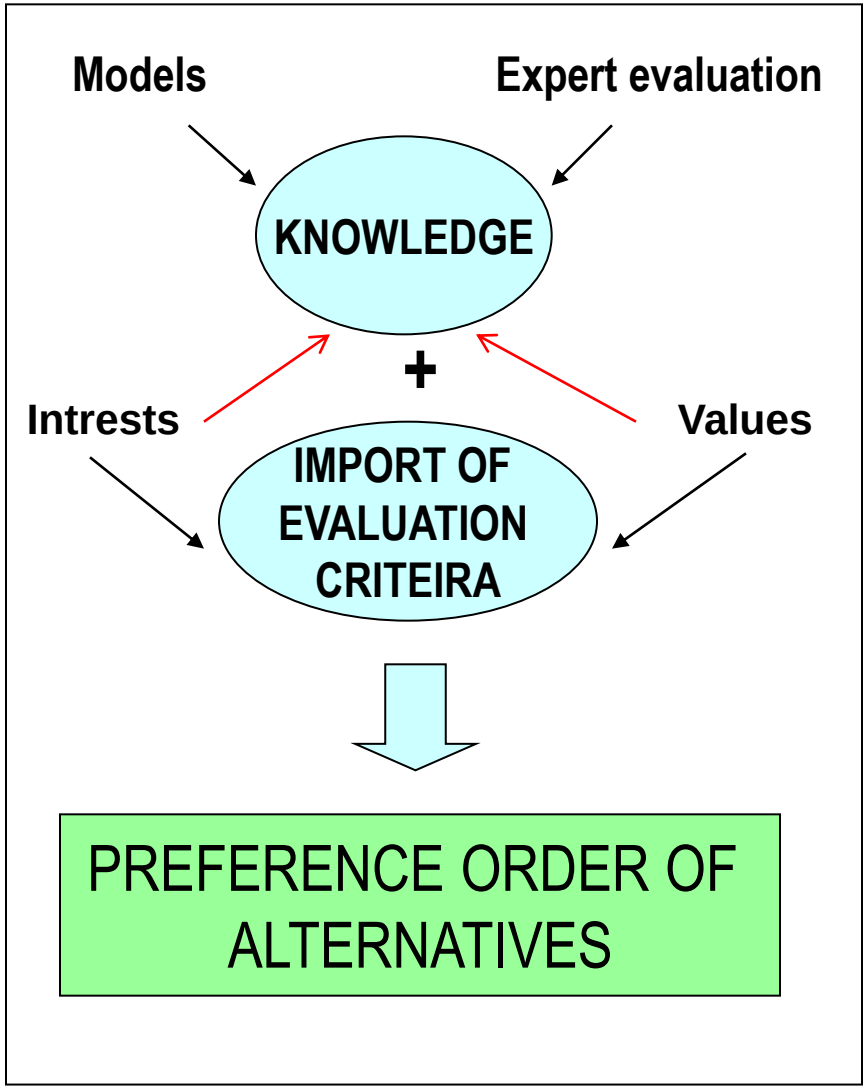
Need for integrated valuation: monetary – social – biophysical

.

Value or not to value? That is not the question.

Necessity to include the domain of money and markets in environment policy.

Integrated valuation by multicriteria analysis (MCA): Scoring and weighing



Heli Saarikoski, SYKE, OpenNESS

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Southern Finland Forest Biodiversity Programme (METSO)

- A voluntary PES scheme on private lands to overcome resistance against centrally designed nature conservation
- Contracted sites are ecologically valuable but low connectivity remains a problem and cost-savings are small

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Primmer, E., Furman, E. 2012.
Primmer, E., Paloniemi, R., Similä, J., Barton, D.N. 2013.

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Ongoing projects funded by European Commission

- **OpenNESS**

Operationalisation of natural capital and ecosystem services

2012-2017

- **OPERAs**

Ecosystem science for policy and practice

2012-2107

- **BESAFE**

Biodiversity and ecosystem services: arguments for our future environment

2011-2015

- **ESMERALDA**

Enhancing ecosystem services mapping for policy and decision making

2014 – 2018

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SYKE

http://quickscan.pro

quickscan

A tool to design and evaluate policy options

quick, easy, transparent

HOME | HOW IT WORKS | CASES | CONTACT

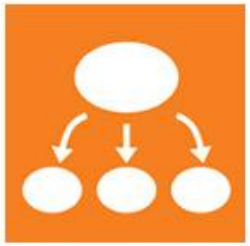
Spatial analysis tool for linking map data and statistical data to expert knowledge

Used in participatory process to support the exploratory dialogue between stakeholders in a facilitated workshop

WHY QUICKSCAN?

Policy questions need to be answered in a short period to fit the time horizon of policy making. Policy makers request an easy to handle research tool that is fast, simple and transparent, requires little data and can be carried out in a multi-actor setting. read more

EXPLORE DATA



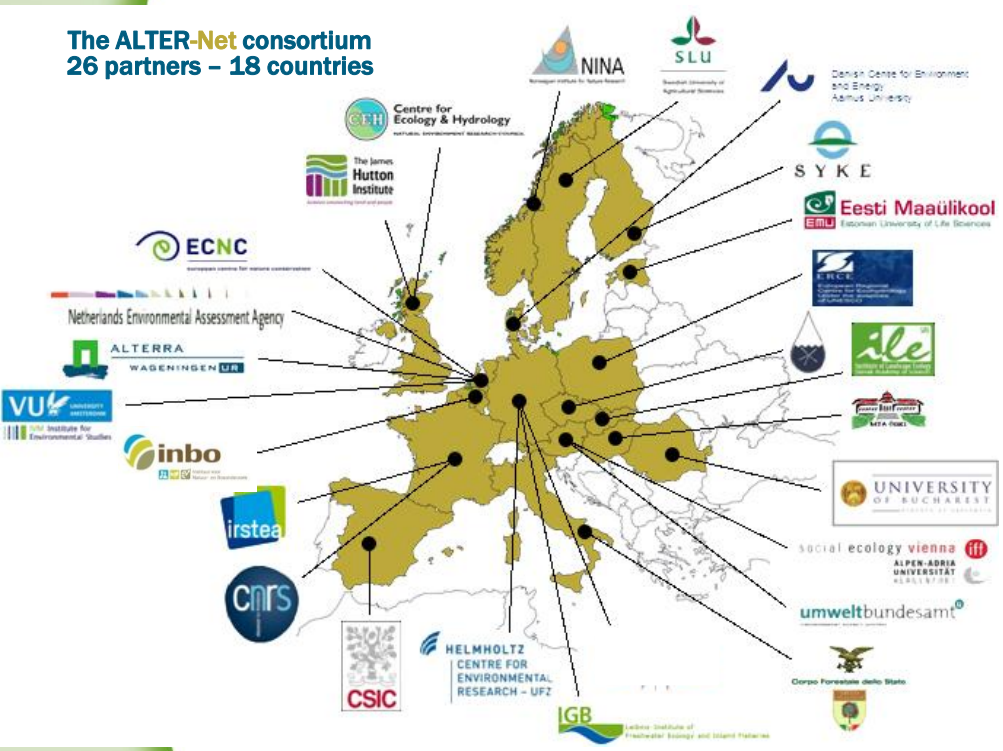
DESIGN OPTIONS

EVALUATE RESULTS

Marta Perez Soba, Alterra

ALTER-Net: Europe's Biodiversity Research Network

- Europe's ecosystem research network



Upcoming Conference:

NATURAL AND URBAN WELL-BEING: Nature Based Solutions To Environmental, Health and Societal Challenges

Thagaste Monastery, Ghent, Belgium, May 18-20 2015

Organised jointly by ALTER-Net and the European Council

SYKE

Thanks to you
and
to colleagues in SYKE, OpenNESS,
OPERAs, Besafe and Esmeralda

www.syke.fi
www.OpenNESS-project.eu

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Additional reading

- Borg, R., Toikka, A., Primmer, E. 2014. Social Capital and Governance: A social network analysis of forest biodiversity collaboration in Central Finland. Forest Policy and Economics. In press. http://dx.doi.org/10.1016/j.forpol.2014.06.008
-
- Saarikoski, H., Åkerman, M., Primmer, E. 2012. The Challenge of Governance in Regional Forest Planning: An Analysis of Participatory Forest Program Processes in Finland. Society & Natural Resources, 25:7, 667-682. http://dx.doi.org/10.1080/08941920.2011.630061
-
- Chan, K.M.A., Satterfield, T., Goldstein, J. 2012. Rethinking ecosystem services to better address and navigate cultural values. Ecological Economics 74, 8–18. http://dx.doi.org/10.1016/j.ecolecon.2011.11.011

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