Mapping and Assessment of Ecosystems and their Services in support of the EU Biodiversity Strategy

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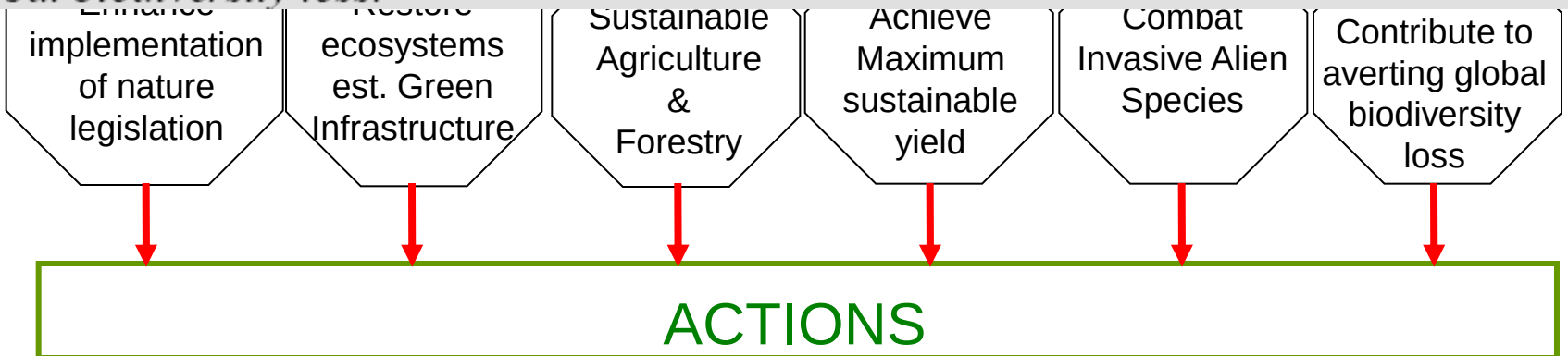
EU Biodiversity Strategy to 2020

2050 vision

By 2050, European Union biodiversity and the ecosystem services it provides — its natural capital — are protected, valued and appropriately restored for biodiversity's intrinsic value and for their essential contribution to human wellbeing and economic prosperity, and so that catastrophic changes caused by the loss of biodiversity are avoided.

2020 headline target

Halting the loss of biodiversity and the degradation of ecosystem services in the EU by 2020, and restoring them in so far as feasible, while stepping up the EU contribution to averting global biodiversity loss.



Target 2 of the Strategy

- *By 2020, ecosystem services are maintained and enhanced through the establishment of Green Infrastructure and the restoration of at least 15% of degraded ecosystems*
  - **Action 5: Improve knowledge about ecosystems and their services in the EU**
  - **Action 6: Establish priorities for restoration and promote the use of Green Infrastructure**
  - **Action 7: Ensure no net loss of biodiversity and ecosystem services**

Importance of Action 5

- *Action 5: 'Member States, with the assistance of the Commission, will* ***Map and Assess the state of Ecosystems and their Services in their national territory by 2014, assess the economic value of such services, and promote the integration of these values into accounting and reporting systems*** *at EU and national level by 2020.'*

- *It* ***underpins all other actions of Target 2***

- *WG-MAES (EC, EEA, Member States, Experts, Stakeholders)*

Implementation of Action 5

- *Biophysical baseline mapping and assessment of the **state of major ecosystems***
- *Biophysical baseline mapping and assessment of **defined ecosystem services***
- *Alignment of ecosystem service assessments with **scenarios of future changes**;*
- ***Valuation** of ecosystem services for baseline and contrasting scenarios and integration into environmental and economic accounting.*

Matrix for mapping, assessment and reporting

Figure 12.1 Trends in the status of European ecosystem services

Services \ Ecosystems	Agro ecosystems	Forests	Grasslands	Heath and scrubs	Wetlands	Lakes and rivers
Provisioning						
Crops/timber	↓	↑			↓	
Livestock	↓	=	=	=	↓	
Wild Foods	=	↓	↓		=	
Wood fuel		=		=		
Capture fisheries					=	=
Aquaculture					↓	↓
Genetic	=	↓	↓	=	=	
Fresh water		↓			↑	↑
Regulating						
Pollination	↑	↓	=			
Climate regulation		↑		=	=	=
Pest regulation	↑		=			
Erosion regulation		=	=	=		
Water regulation		=		↑	↑	=
Water purification					=	=
Hazard regulation					=	=
Cultural						
Recreation	↑	=	↓	↑	↑	=
Aesthetic	↑	=	=	=	↑	=

Status for period 1990–present Degraded; Mixed; Enhanced; Unknown; Not applicable

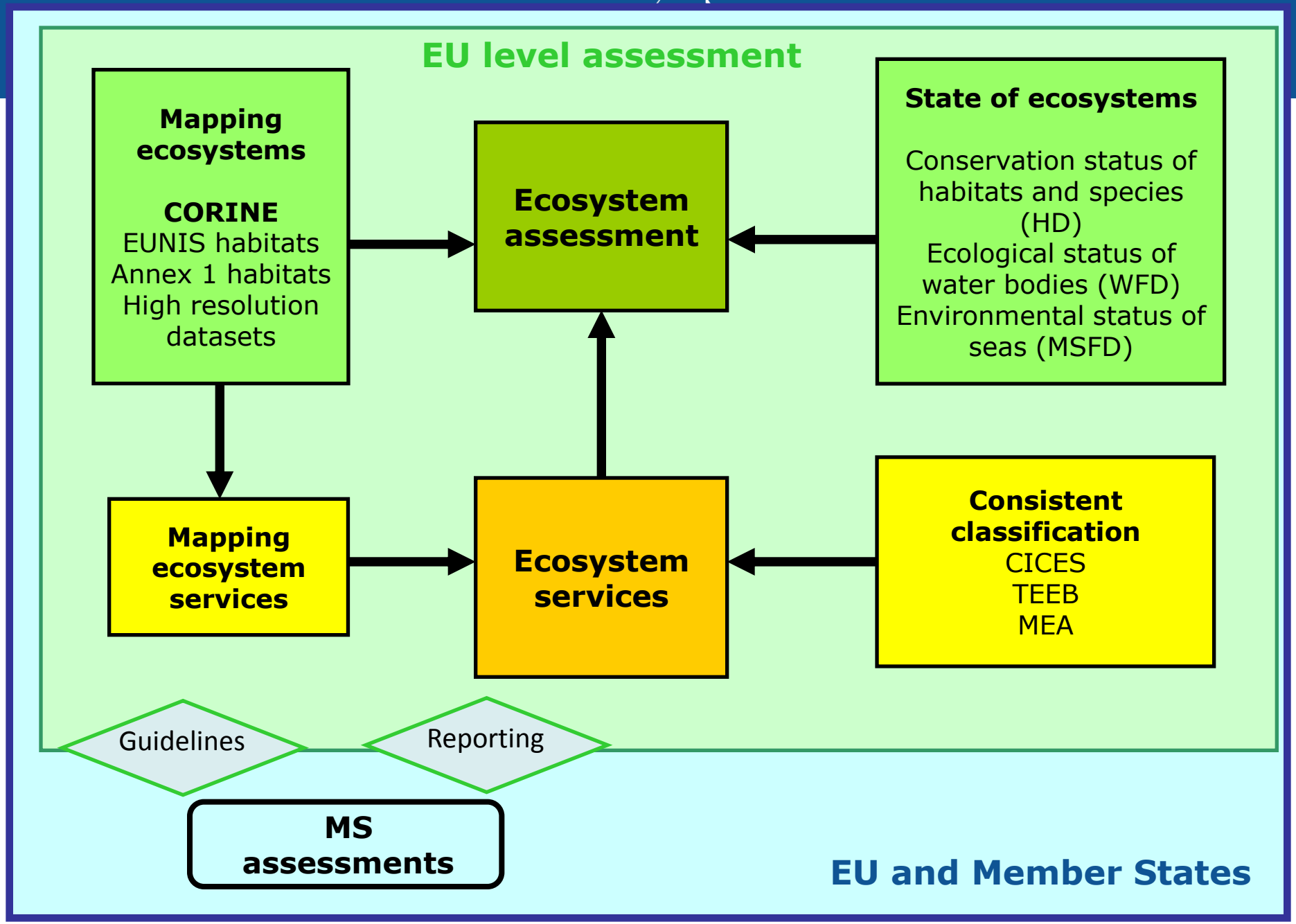
Trend between periods

↑ Positive change between the periods 1950–1990 and 1990 to present

↓ Negative change between the periods 1950–1990 and 1990 to present

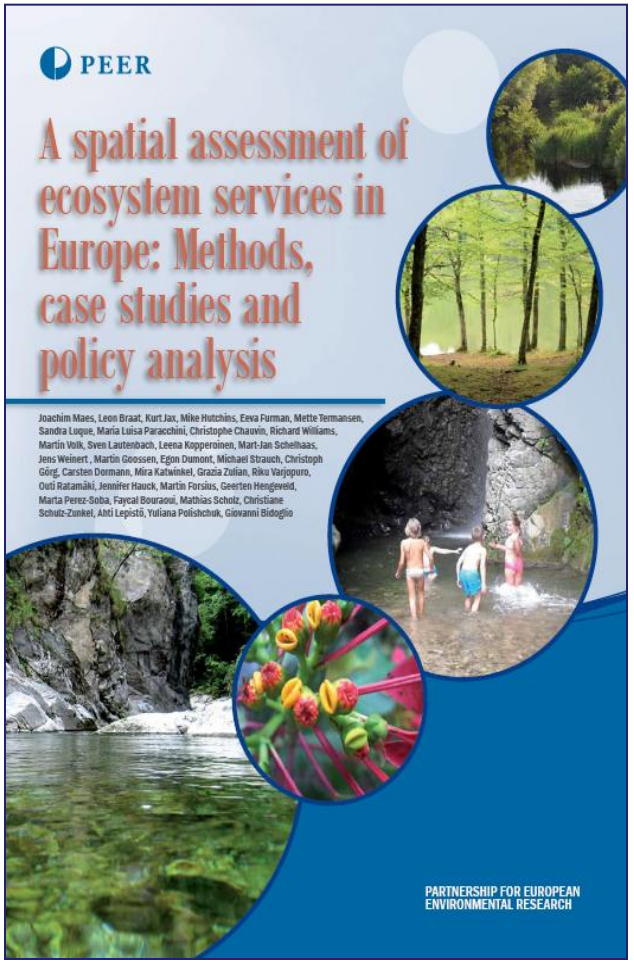
= No change between the two periods

Source: Adapted from Harrison et al., 2010.


EU level assessment
Mapping ecosystems
CORINE
EUNIS habitats
Annex 1 habitats
High resolution datasets
Ecosystem assessment
State of ecosystems
Conservation status of habitats and species (HD)
Ecological status of water bodies (WFD)
Environmental status of seas (MSFD)
Mapping ecosystem services
Ecosystem services
Consistent classification
CICES
TEEB
MEA
Guidelines
Reporting
MS assessments
EU and Member States

Mapping and assessment of ecosystem services at EU level

- Policy scenarios
- Biophysical mapping
- Monetary valuation



EU water policy
Blueprint

Aim
Ensure sufficient availability of good quality water for sustainable and equitable water use

- Manage water demand
- Improve availability of clean water
- Protect and restore aquatic ecosystems

EU agriculture policy
the post 2013 CAP

Greening measures (I)

- Maintain ecological focus area
- Diversify crops
- Maintain pasture

Rural development (II)

- Preserve and enhance ecosystems (Natura 2000, water, soil)
- Delivering public goods
- Reducing GHG (soil, wetland)

EU regional policy
the post- 2013 Cohesion Policy

Objectives

- Supporting the shift towards a low-carbon economy in all sectors
- Promoting climate change adaptation, risk prevention and management
- Protecting the environment and promoting resource efficiency

Impact on the delivery of ecosystem services accross Europe at different spatial scales

Water purification

Europe
River Ouse Catchment (UK)
Odense (DK)
Lepsamanjoki, Ylaneenjoki (FI)

Recreation

Europe
UK
Finland
Copenhagen area
Urban green areas (NL)

Pollination

Europe
Finland
UK

WATER PURIFICATION

European Commission

Policy

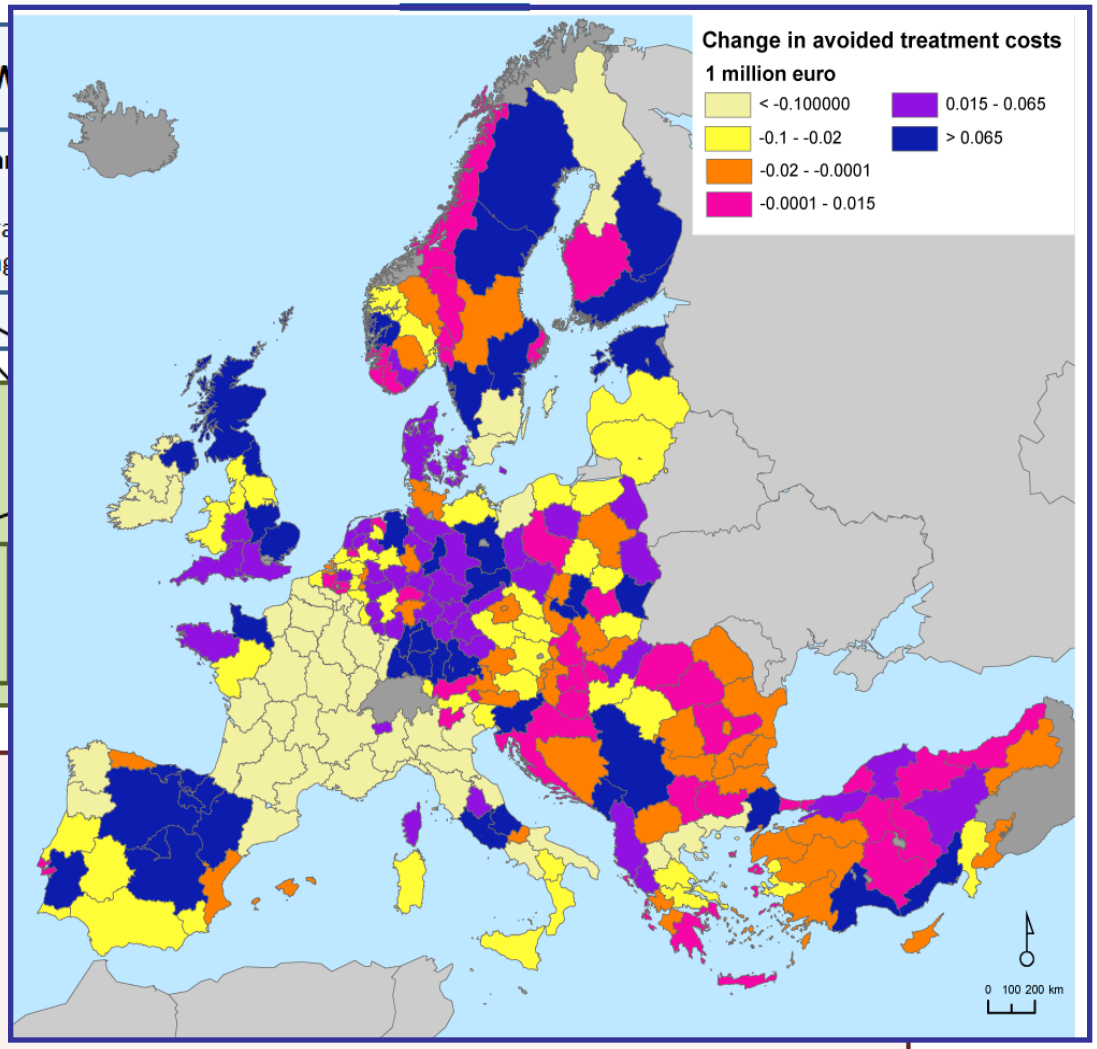
Measures

River and wetla restoration
(Floodplain restora and meandering

Mapping

N retention River Ouse catchment

Valuation



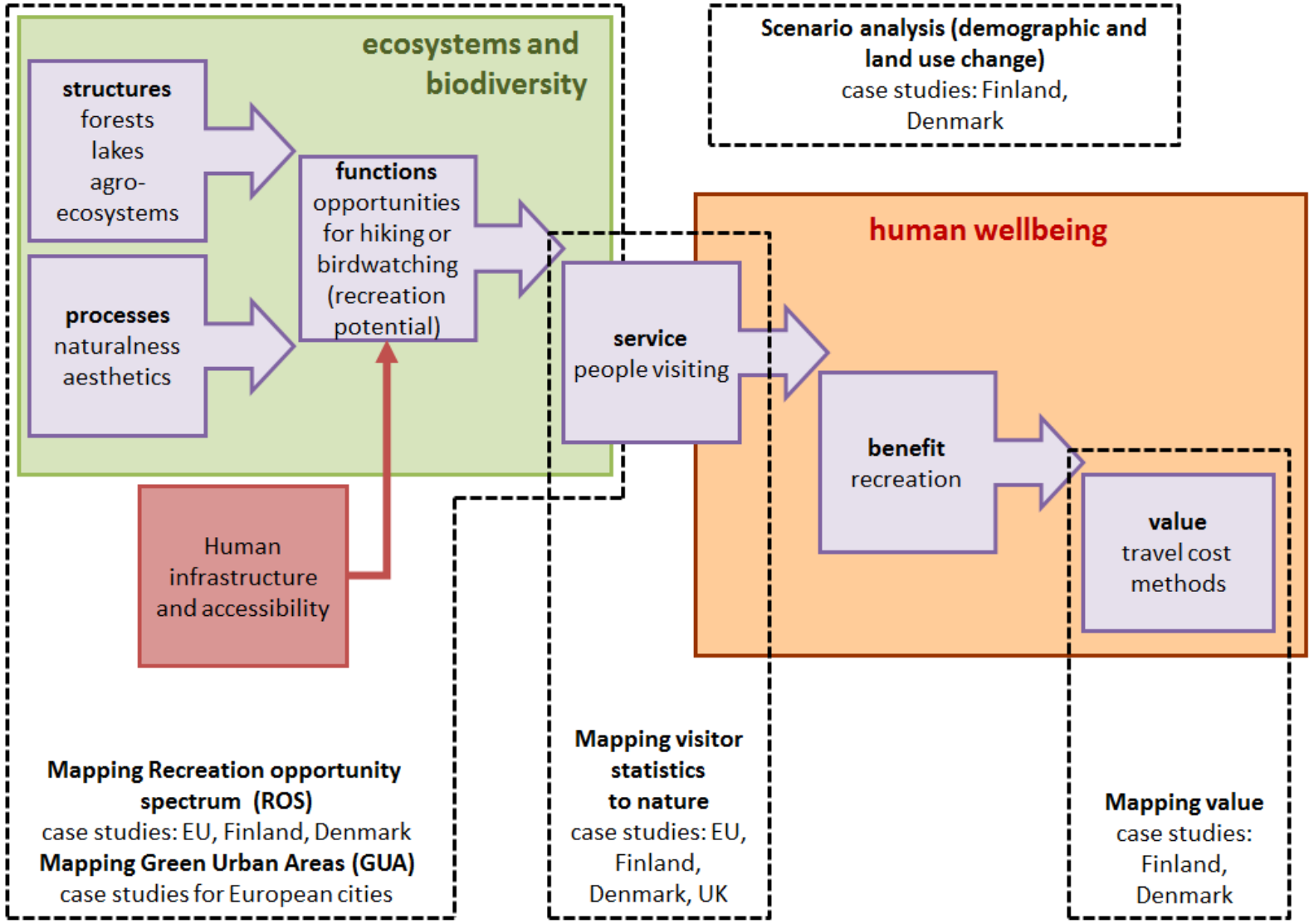
WATER PURIFICATION

Direction of change in water purification following the implementation of different scenarios in four different case study areas.

Scenarios and measures		Europe	UK Ouse catchment	FI Lepsämänjoki Yläneenjoki catchments	DK Odense catchment
Greening direct payments (CAP)	Permanent grassland	→	↗		
	Crop rotation/diversification			↘	
	Ecological set aside (ecological focus areas)		↗	↗	↗
	Green cover			↗	
Reduced fertilizer application				↗	↗
River restoration			→		
Wetland restoration		↗			↗

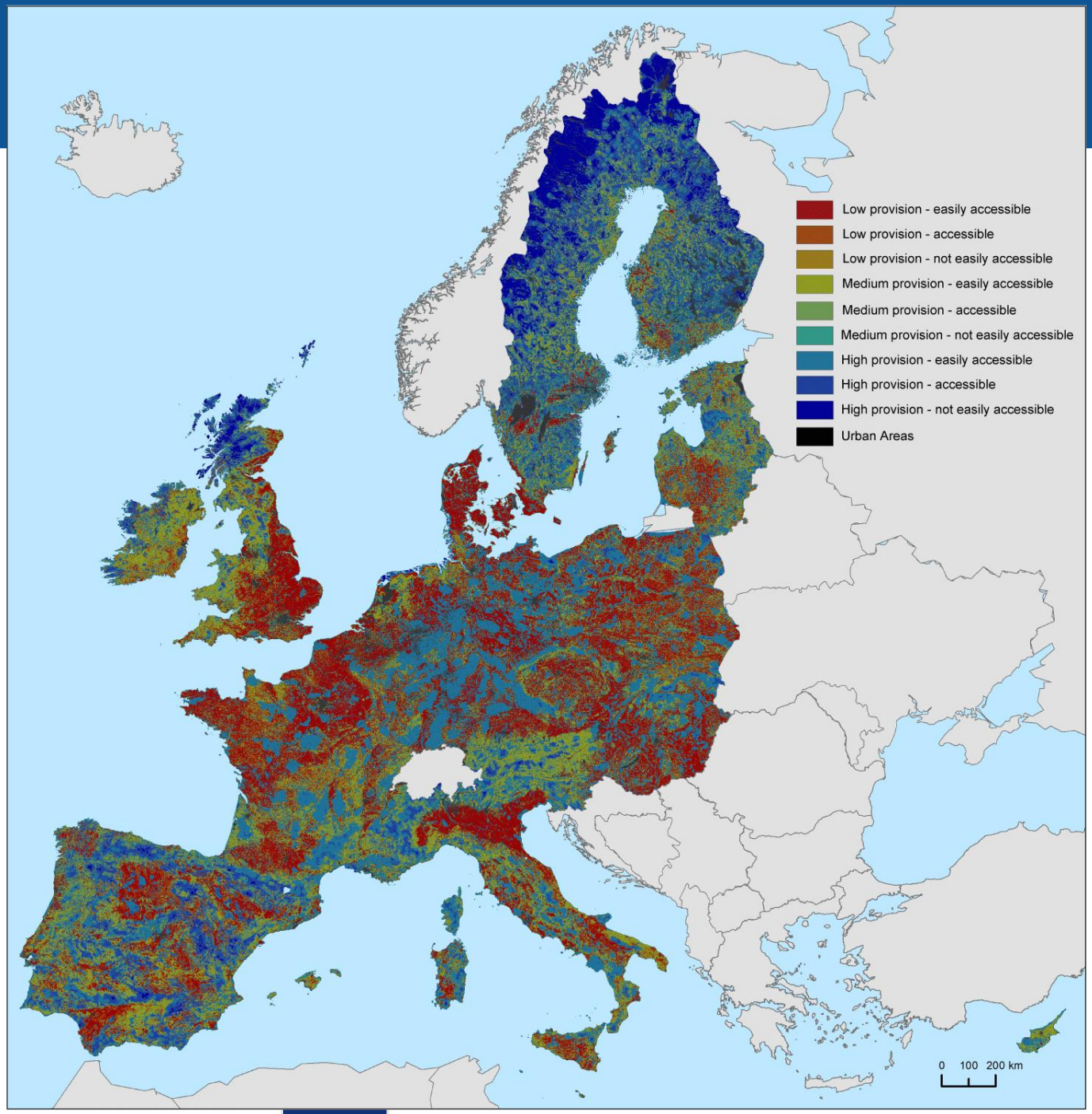
→: change in nitrogen retention less than 5%; ↘: 5% decrease in nitrogen retention; ↗: 5% increase in nitrogen retention

RECREATION


ecosystems and biodiversity
structures
forests
lakes
agro-ecosystems
processes
naturalness
aesthetics
functions
opportunities for hiking or birdwatching (recreation potential)
Human infrastructure and accessibility
Scenario analysis (demographic and land use change)
case studies: Finland, Denmark
human wellbeing
service
people visiting
benefit
recreation
value
travel cost methods
Mapping Recreation opportunity spectrum (ROS)
case studies: EU, Finland, Denmark
Mapping Green Urban Areas (GUA)
case studies for European cities
Mapping visitor statistics to nature
case studies: EU, Finland, Denmark, UK
Mapping value
case studies: Finland, Denmark

RECREATION

Recreation Opportunity Spectrum for the EU*

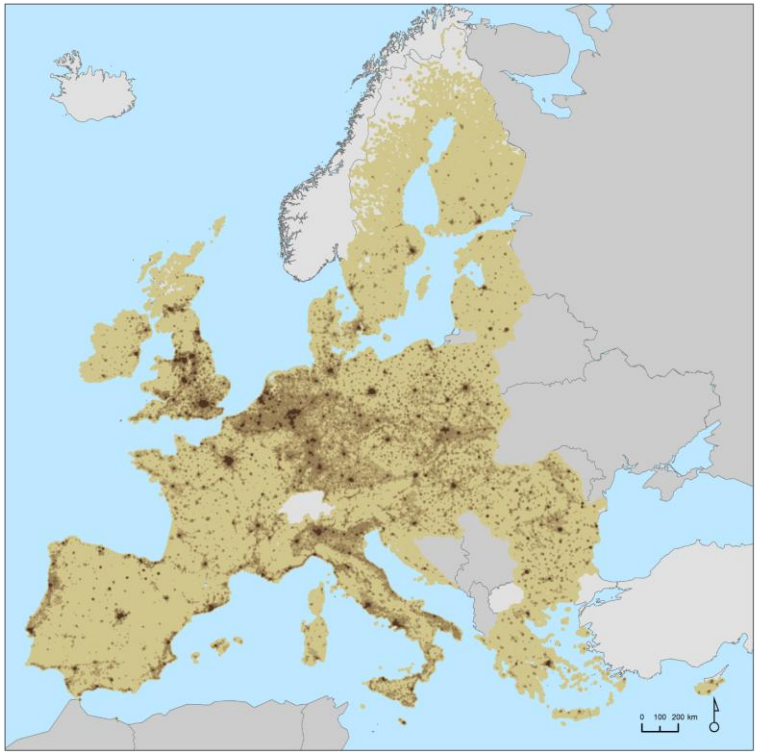


* Romania, Bulgaria and Greece not included because of lacking detail in the road network

RECREATION

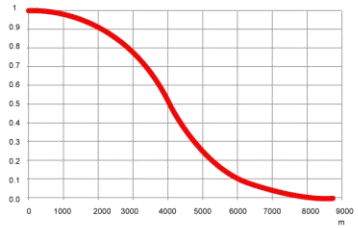
European Commission

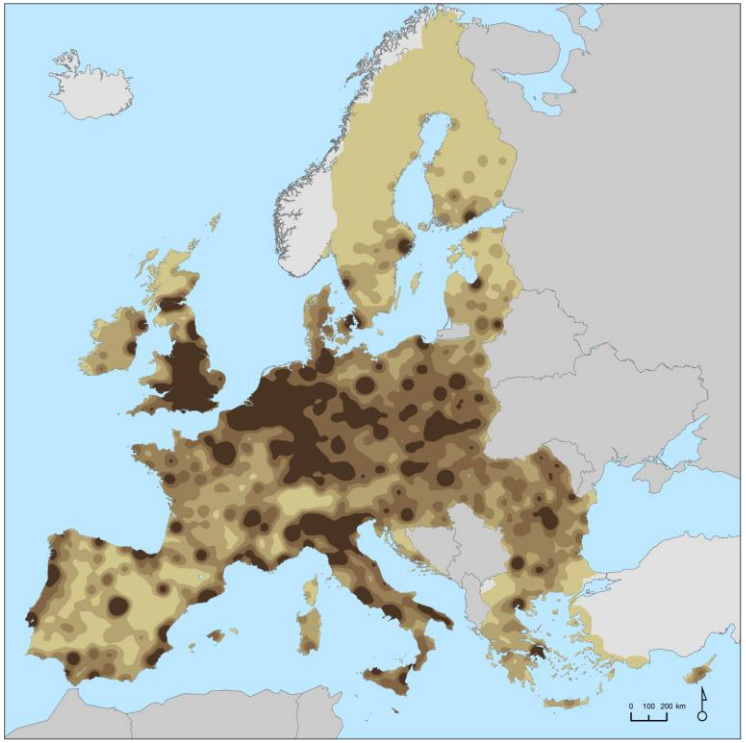
Potential population pressure on ecosystems assuming a 80 km travel for daily trips (by car) and 8 km for short trips (e.g. walking, running, cycling)



Cumulated population
Short distance model

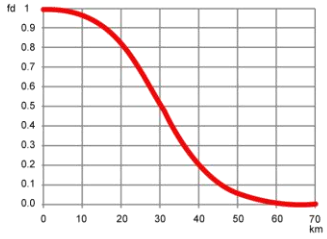
0.00050	60,000 - 130,000
0.00050 - 6,000	> 130,000
6,000 - 15,000	EU Countries
15,000 - 60,000	No EU Countries





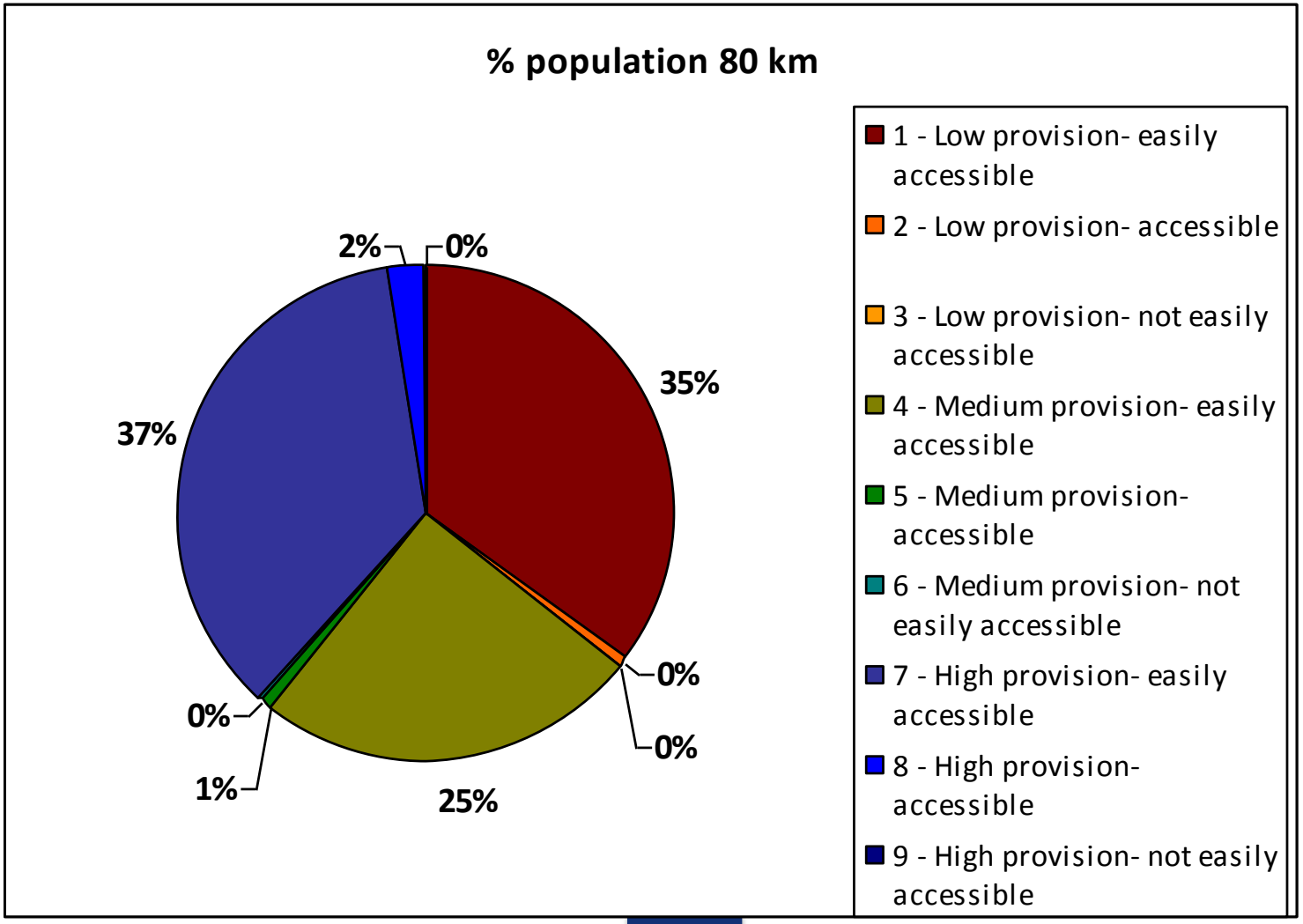
Cumulated population
Long distance model

< 0.000008	300,000 - 550,000
0.000008 - 70,000	> 550,000
70,000 - 170,000	EU Countries
170,000 - 300,000	No EU Countries



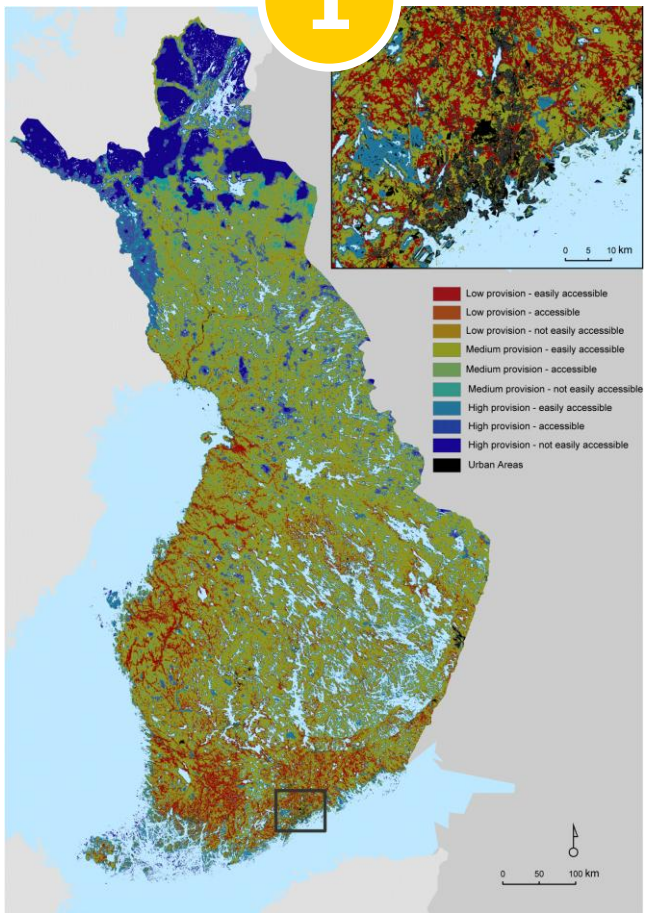
RECREATION

Share of EU population having access at the ROS zones on long recreation travels



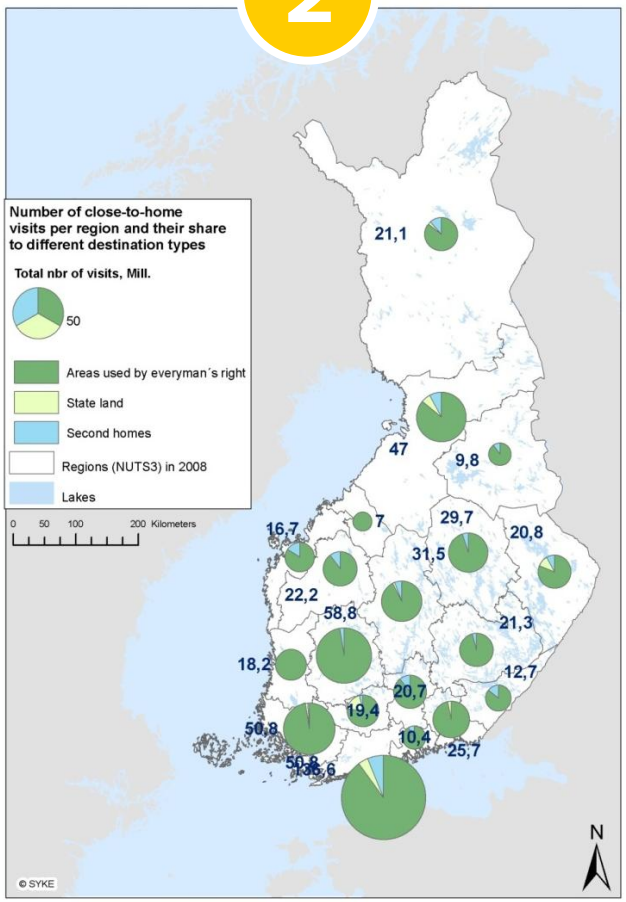
RECREATION

1



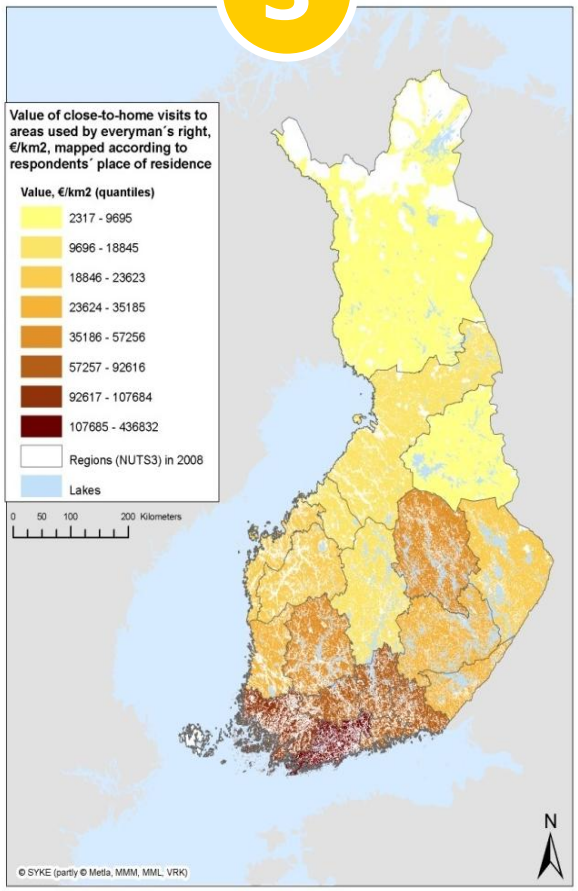
Ecosystem function: potential for recreation based on the ROS for Finland

2



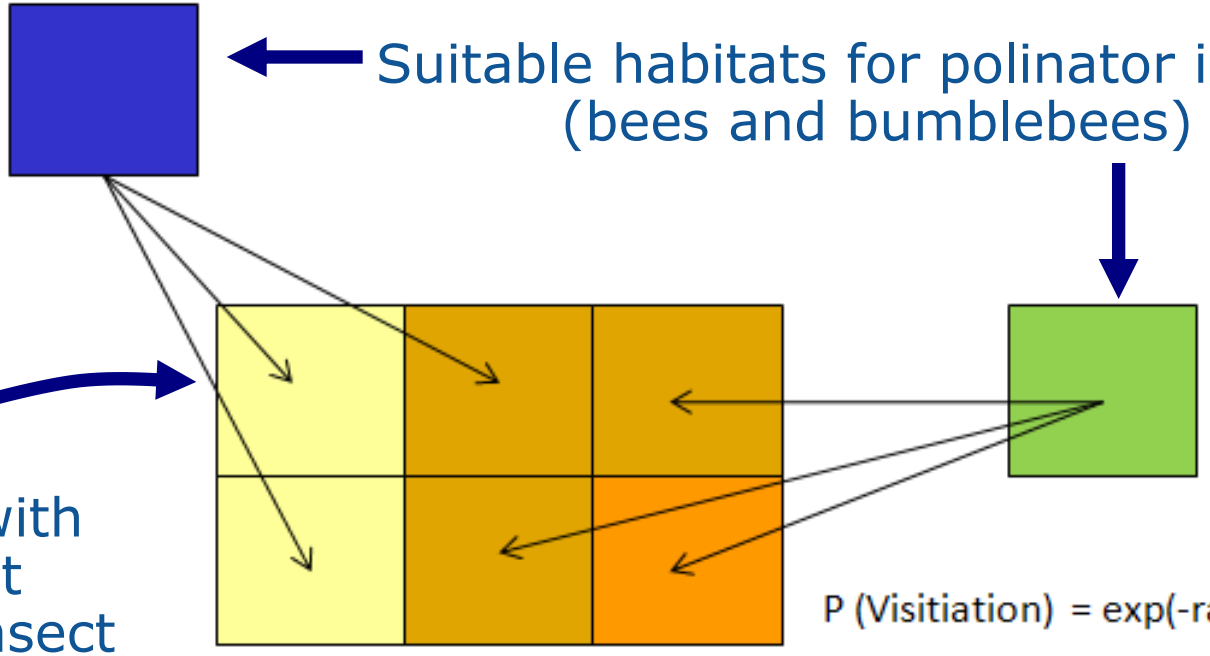
Ecosystem service: Visitor statistics (SYKE, Finish Forest Institute)

3



Ecosystem value: The value (million € km^{-2}) of close-to-home visits (Metla/LVVI2 data)

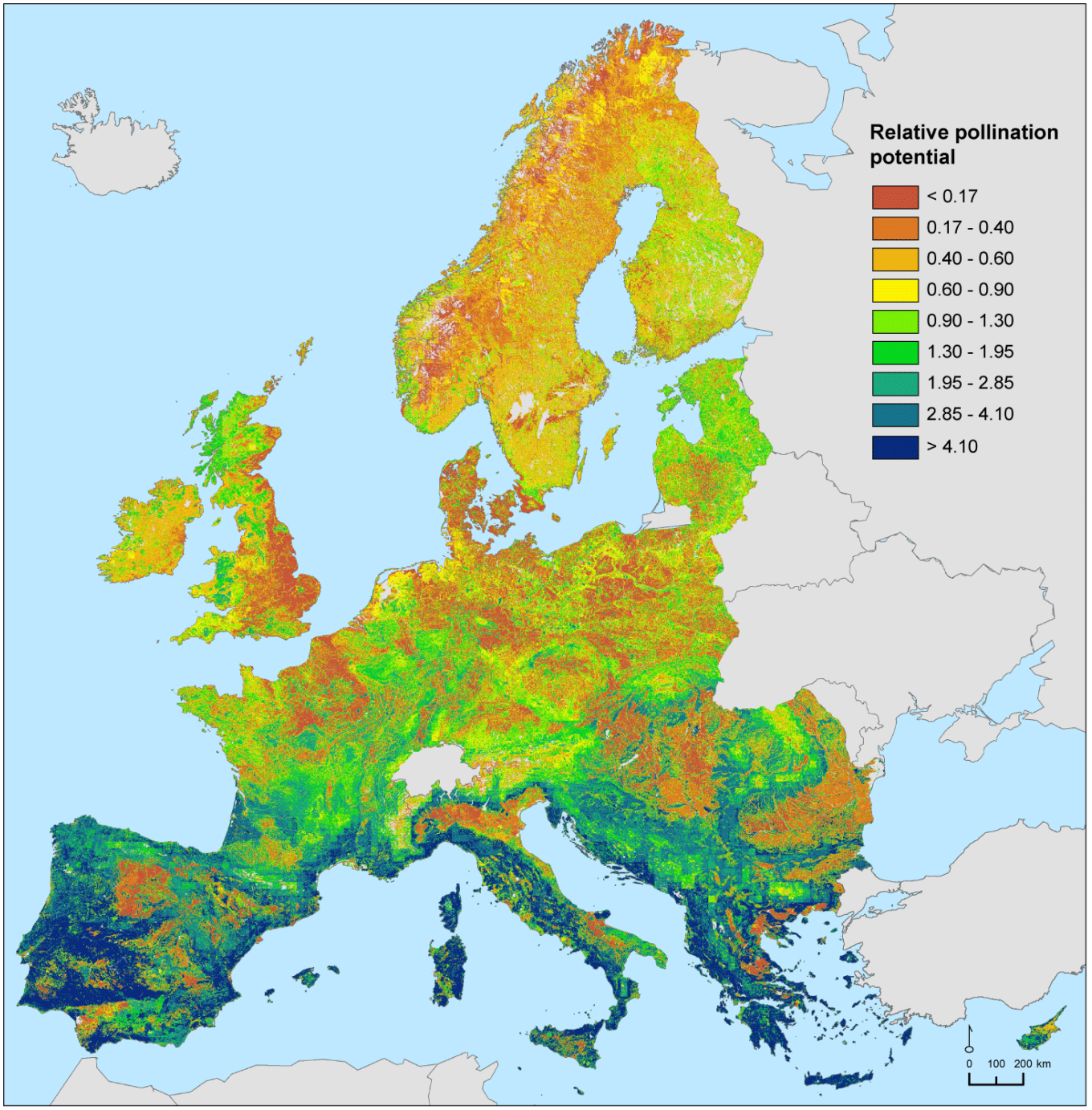
POLLINATION



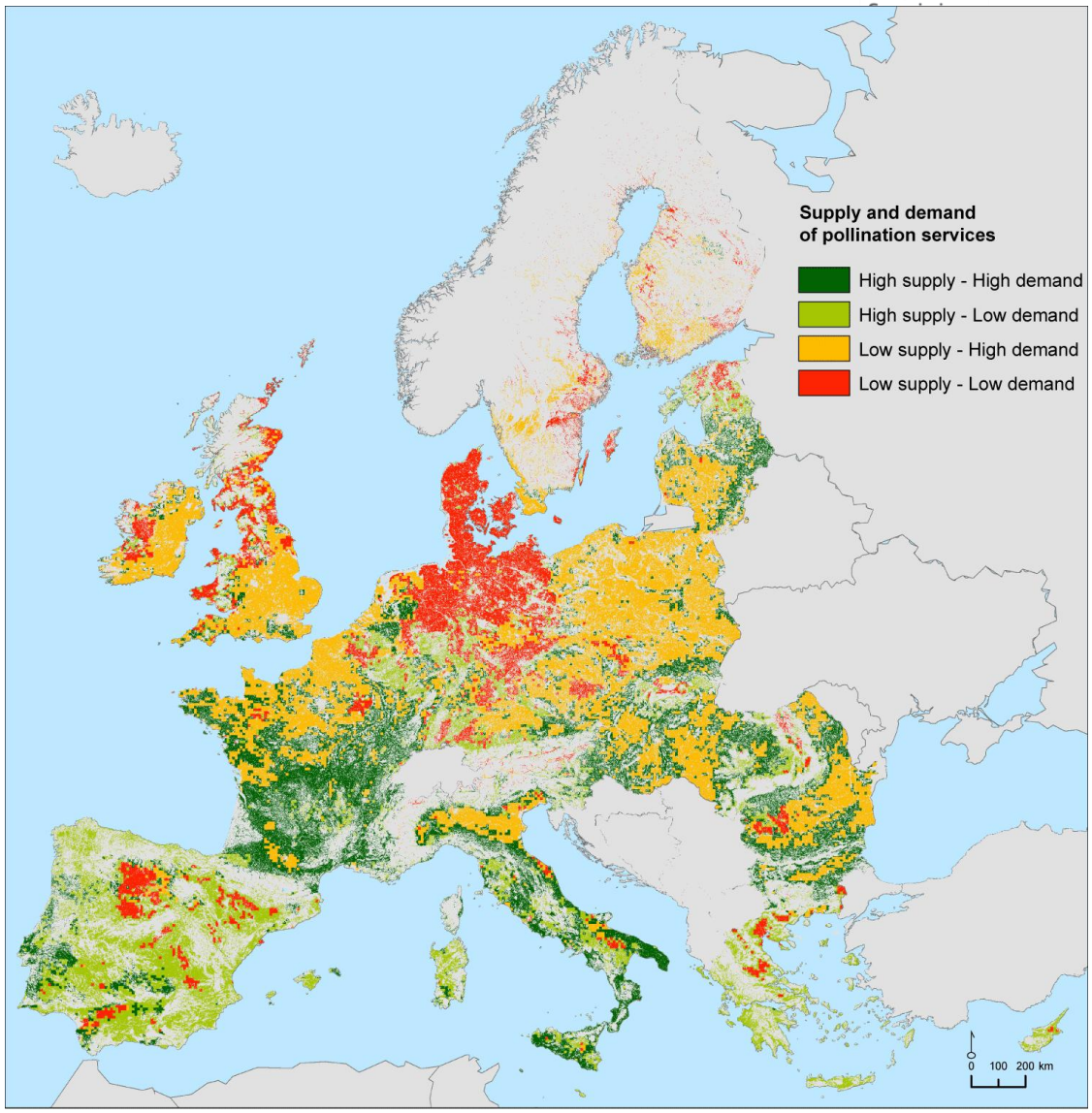
cropland with crops that depend on insect pollination (fruits, rapeseed, certain vegtables)

POLLINATION

Relative pollination potential across Europe (dimensionless, in the 0-10 scale)



POLLINATION



	Contribution to production of crops dependent on pollination
Austria	43.9%
Belgium	29.6%
Bulgaria	22.2%
Cyprus	13.3%
Czech Republic	27.9%
Denmark	14.4%
Estonia	22.4%
Finland	19.7%
France	24.7%
Germany	27.6%
Greece	21.5%
Hungary	33.7%
Ireland	2.9%
Italy	23.6%
Latvia	20.8%
Lithuania	10.6%
Malta	11.8%
Netherlands	31.2%
Poland	31.5%
Portugal	21.1%
Romania	27.5%
Slovak Republic	24.8%
Slovenia	40.5%
Spain	20.2%
Sweden	21.2%
United Kingdom	11.2%
EU27	23.6%

Conclusions (1)

- *Conceptual and methodological framework for MAES that serve the multiple objectives addressed by policies.*
- *Linking maps of ecosystem service supply to monetary valuation enables to analyse the expected impact of policy measures -> mainstraiming ES into decision making by offering the tools for policy impact assessmts.*

Conclusions (2)

- *Use of ES maps to prioritize where investments in nature and ecosystems are needed so that they are cost effective, maintain or enhance the supply of ecosystem services and contribute to the 15% target of restoration.*

European Commission

Thank you!