

# **National Assessment of the Economics of Ecosystem Services in Finland (TEEB Finland)**

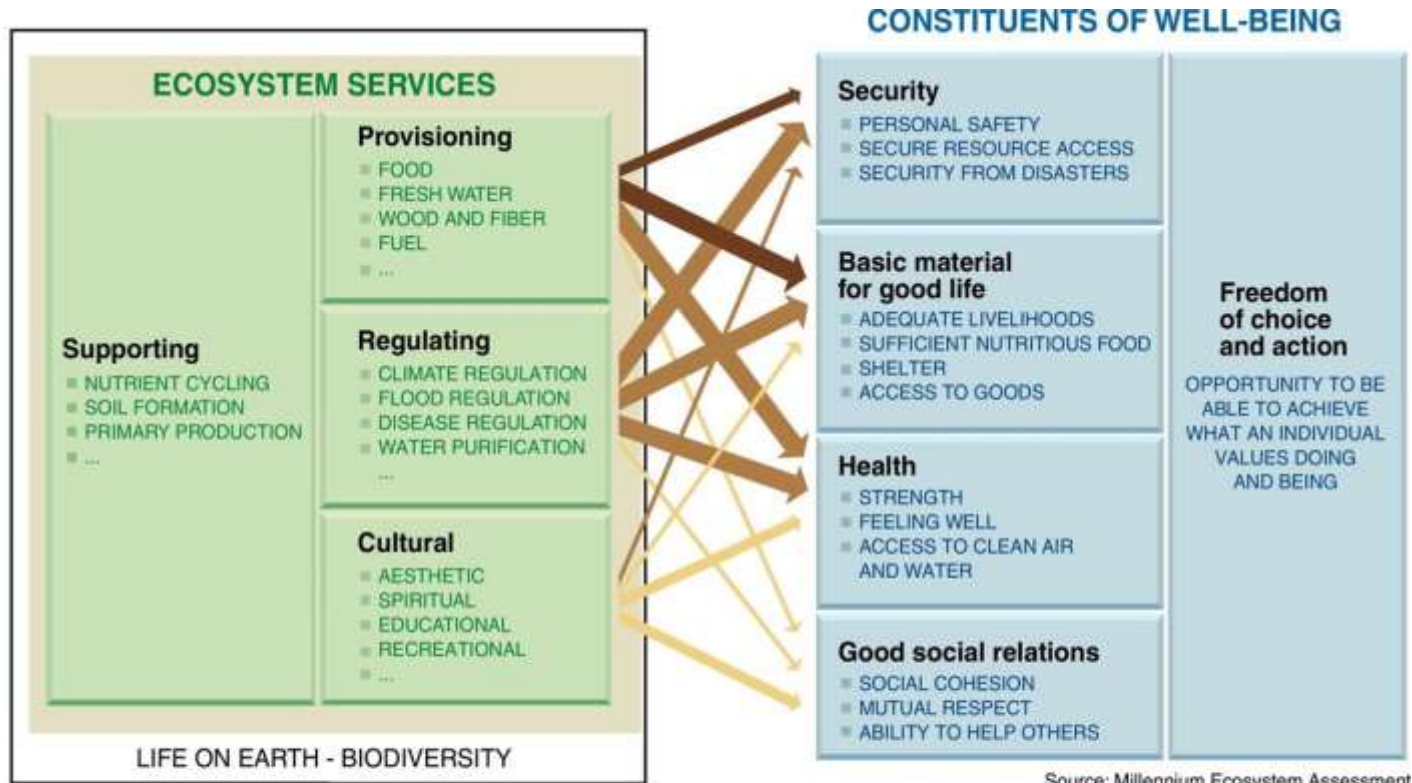
Jukka-Pekka Jäppinen, Finnish Environment Institute  
Connecting People and Nature – The Promise of  
Ecosystem Services?  
Hanasaari, Espoo, 3.12.2013

# Structure of presentation

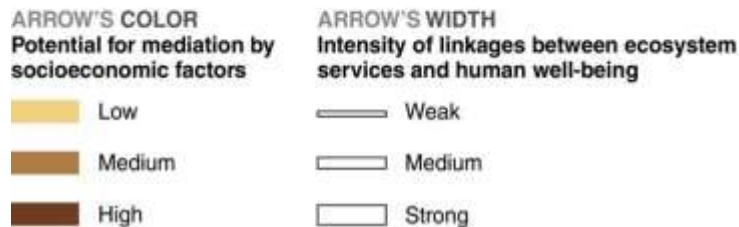
- Background: Some definitions & Need to identify and safeguard Biodiversity and Ecosystem Services
- Valuing Nature in Economic Decision Making
  - Global initiative: The Economics of Ecosystems and Biodiversity (TEEB)
  - Regional initiative: TEEB Nordic
  - National initiative: TEEB Finland
    - Structure, goals, tasks and products



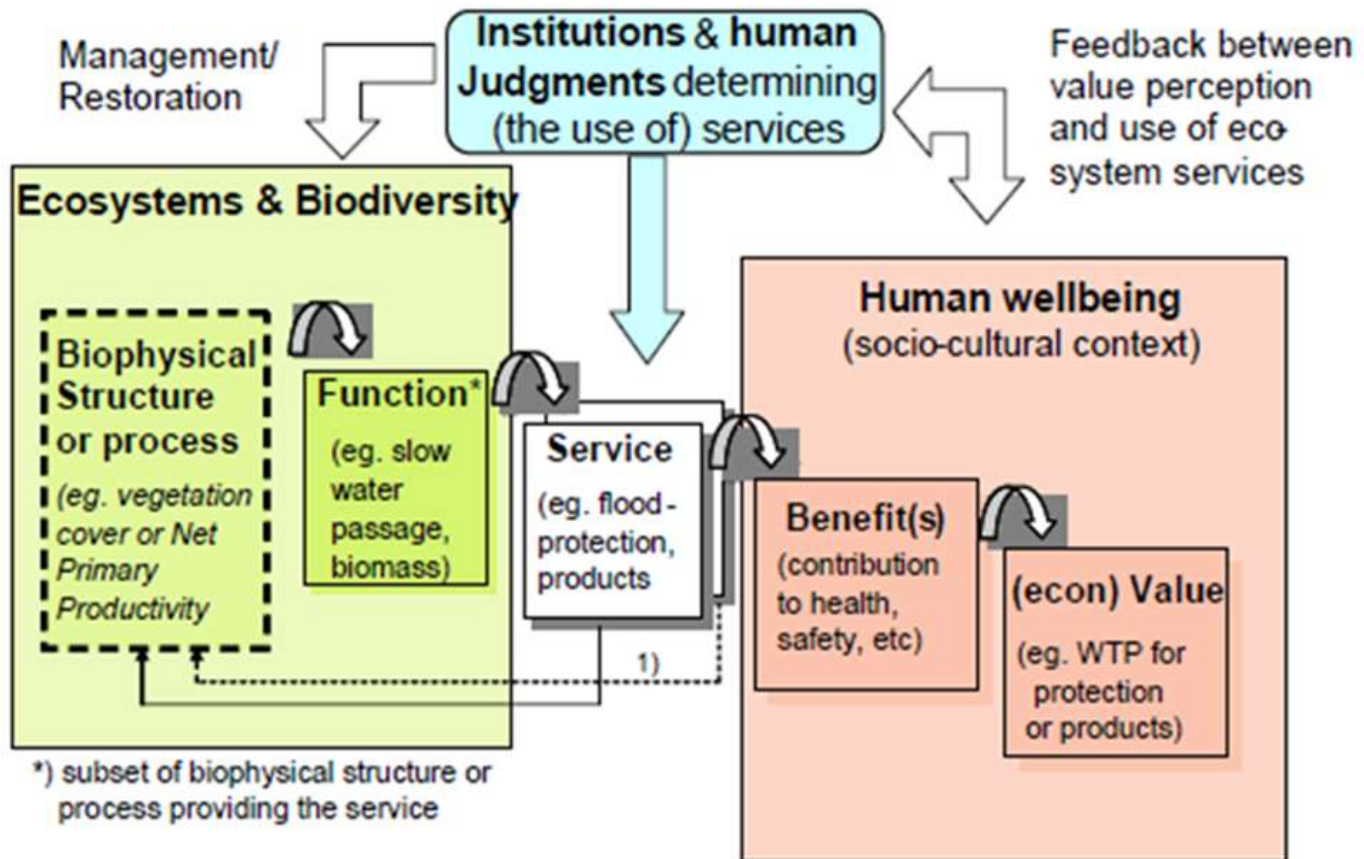
# Millennium Ecosystem Assessment 2005



Source: Millennium Ecosystem Assessment

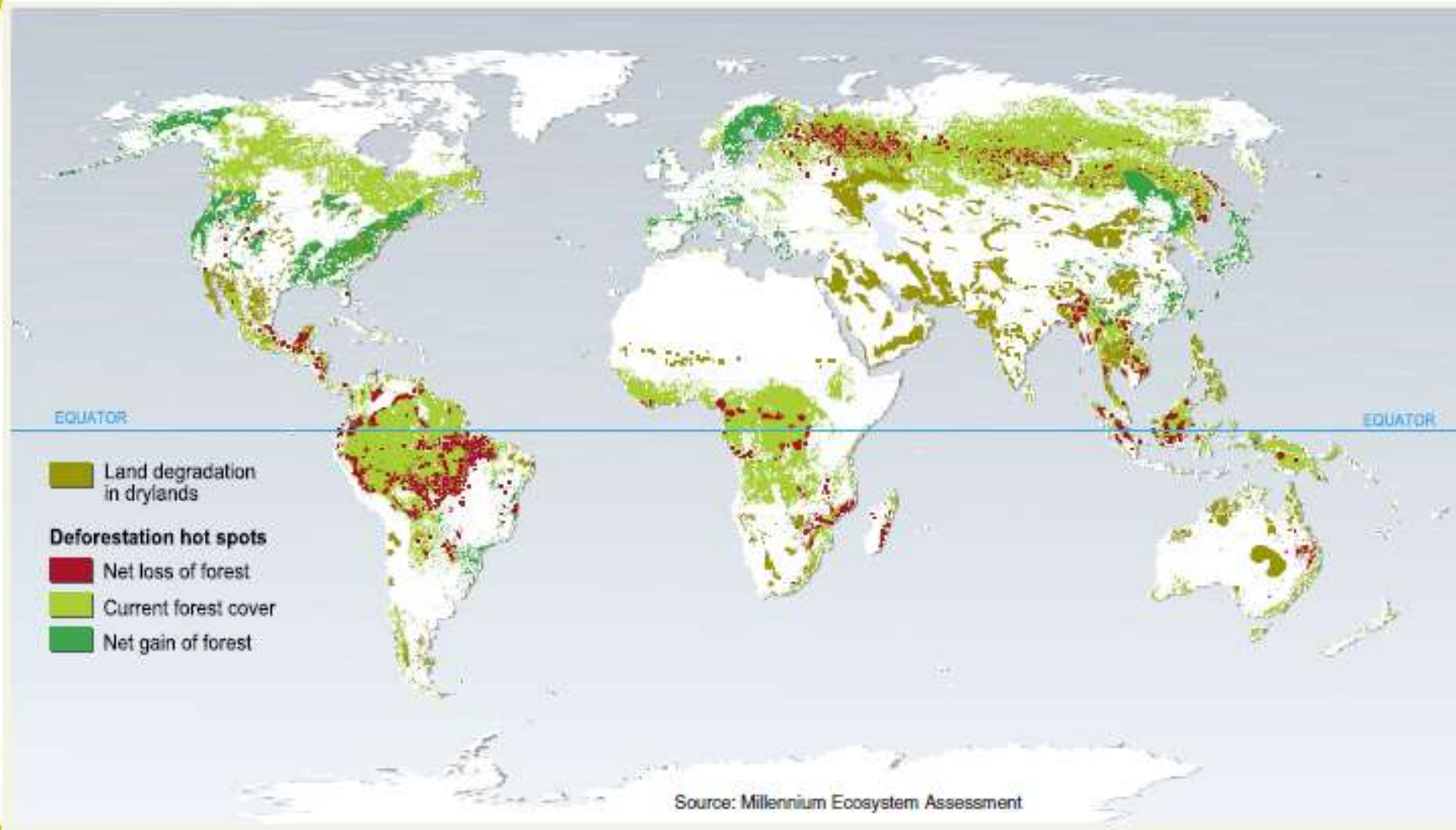


# Cascade model: Recent standard in describing ESS



\*) subset of biophysical structure or process providing the service

Adapted from Haines-Young & Potschin, 2010 and Maltby (ed.), 2009



# Assessment of Status, Trends & Value of Ecosystem Services

- **Convention on Biological Diversity (CBD)**
  - Nagoya 2010: Aichi Targets 2020: Vision, Mission, Goals, and Targets
- **EU's Biodiversity Strategy 2020**
  - Mapping & Assessment of Ecosystems and their Services (MAES)
- **Finland's Biodiversity Strategy and Action Plan 2012-2020**

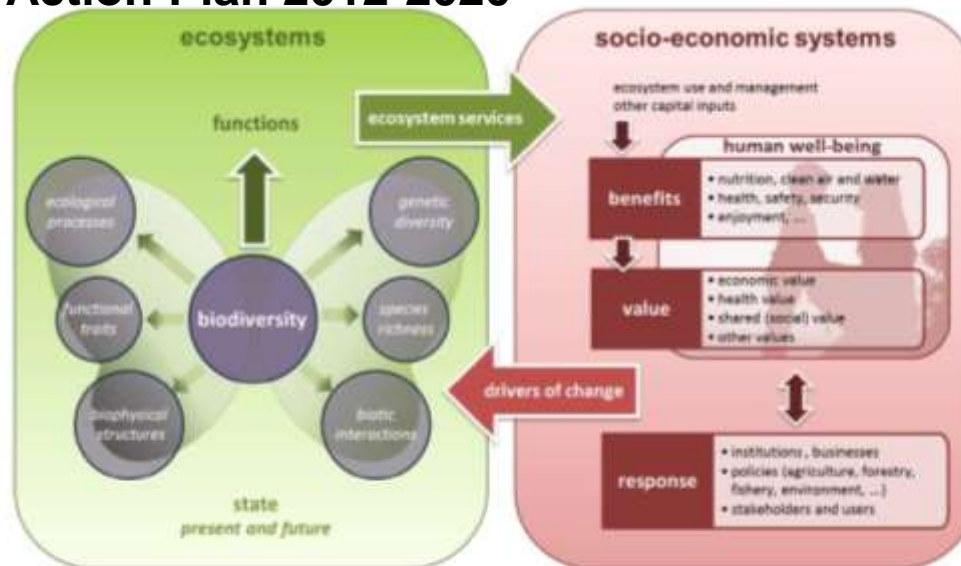
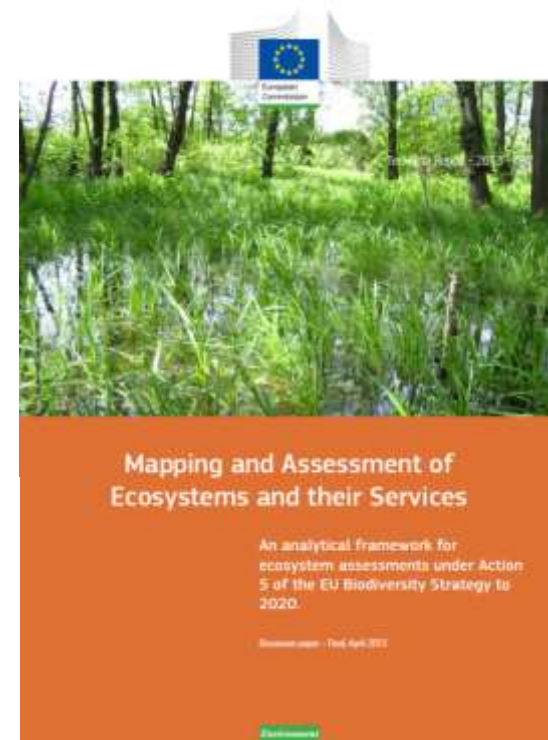


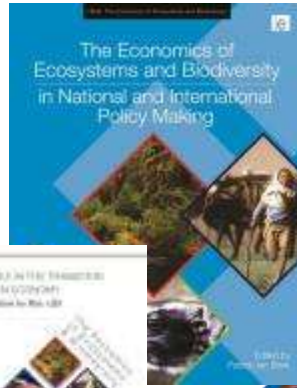
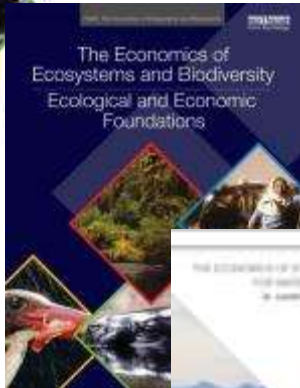
Figure 2. Conceptual framework for EU wide ecosystem assessments.

# Global TEEB initiative

## TEEB – The Economics of Ecosystems and Biodiversity

Making Nature's Values Visible

The Economics of Ecosystems & Biodiversity



**RIO+20**  
United Nations  
Conference on  
Sustainable  
Development

ny, into the future



**G8 2007**  
Environment Ministers Meeting  
Potsdam, 15-17 March 2007



**ONE NATURE · ONE WORLD · OUR FUTURE**  
COP9 MOP4 Bonn Germany 2008

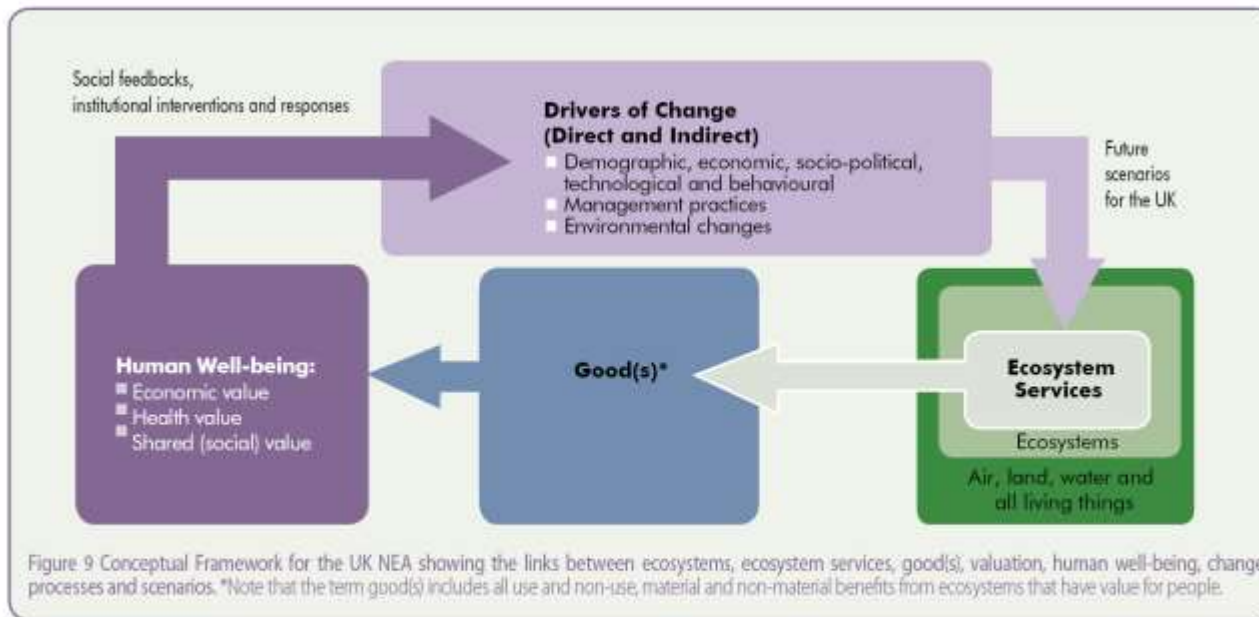


**COP10/MOP5 AICHI-NAGOYA, JAPAN 2010**



**XI Conference of Parties**  
CONVENTION ON BIOLOGICAL DIVERSITY  
HYDERABAD INDIA 2012

# UK's National Ecosystem Assessment (2011)





| Service Group          | Final Ecosystem Service                      | Mountains, Moorlands & Heaths | Semi-natural Grasslands | Enclosed Farmland | Woodlands | Freshwaters – Openwaters, Wetlands & Floodplains | Urban | Coastal Margins | Marine |   |
|------------------------|--|-------------------------------|-------------------------|-------------------|-----------|--|-------|-----------------|--------|---|
| Provisioning           | Crops  |                               | ↔                       | ↑                 |           | ↓  | ↗     | ↘               |        |   |
|                        | Livestock/Aquaculture                        | ↓                             | ↗                       | ↔                 | ↔         | ↓  | ↔     | ↘               | ↗      |   |
|                        | Fish   |                               |                         |                   |           | ↓  | ↔     | ↘               | ±      |   |
|                        | Trees, standing vegetation, peat             | ↓                             | ↔                       | ↗                 | ↗         | ↓  | ↔     | ↘               |        |   |
|                        | Water supply                                 | ↔                             | ↘                       | ↓                 | ↔         | ↓  | ↔     | ?               |        |   |
| Wild species diversity |  | ↔                             | ↓                       | ↓                 | ↗         | ↓  | ↔     | ↘               | ↓      |   |
| Cultural               | Environmental settings: Local places         | ↔                             | ↔                       | ?                 | ↑         | ↗  | ↔     | ↔               | ?      |   |
|                        | Environmental settings: Landscapes/seascapes | ↔                             | ↔                       | ↔                 | ↗         | ↔  | ↔     | ↗               | ?      |   |
| Regulating             | Climate                                      | ↔                             | ↔                       | ↗                 | ↗         | ↔  | ↓     | ↗               | ↘      |   |
|                        | Hazard                                       | ↓                             | ↔                       | ↓                 | ↗         | ↓  | ↓     | ↔               | ↘      |   |
|                        | Disease and pests                            | ↔                             | ↔                       | ±                 | ↓         | ↓  | ?     | ±               | ↘      |   |
|                        | Pollination                                  | ↓                             | ↓                       | ↓                 | ↔         |  | ↔     | ↔               |        |   |
|                        | Noise  | ↔                             | ↔                       | ?                 | ↗         | ↔  | ↘     | ↔               |        |   |
|                        | Detoxification & purification                | Water quality                 | ↔                       | ↗                 | ±         | ↔  | ±     | ±               | ?      | ↔ |
|                        |  | Soil quality                  | ↔                       | ↓                 | ↓         | ↔  | ↓     | ↘               | ↘      |   |
| Air quality            |  | ↔                             | ↔                       | ↗                 | ↗         | ↔  | ↔     | ↔               | ?      |   |

Figure 5 Relative importance of Broad Habitats in delivering ecosystem services and overall direction of change in service flow since 1990. This figure is based on information synthesized from the habitat and ecosystem service chapters of the UK NEA Technical Report (Chapters 5–16), as well as expert opinion. This figure represents a UK-wide overview and will vary nationally, regionally and locally. It will therefore also inevitably include a level of uncertainty; full details can be found in the Technical Report. Arrows in circles represent where there is high evidence for or confidence in the direction of service flow amongst experts; arrows in squares represent where there is less evidence for or confidence in the direction of service flow. Blank cells represent services that are not applicable to a particular Broad Habitat.

Importance of Broad Habitat for delivering the ecosystem service

- High
- Medium – High
- Medium – Low
- Low

Direction of change in the flow of the service

- ↑ Improving
- ↗ Some improvement
- ↔ No net change
- ± Improvement and/or deterioration in different locations
- ↘ Some deterioration
- ↓ Deterioration
- ~ Unknown

## TEEB Nordic: Key findings

- Results/report published in January 2013
- Nature / Natural capital is of high socio-economic significance for the Nordic countries
  - While developing sustainable and greener economies there is a need to integrate Biodiversity and Ecosystem services (Natural Capital) into decision-making and national accounting systems.
  - Good examples exist - it's time to mainstream!
- Nordic way: "Key ecosystem services"
  - It makes sense to consider ESS also at the Nordic (regional) level, not only nationally.
- Significant gaps in existing knowledge base
  - No 'quick fix' solutions; we need to work systematically towards more comprehensive information base to support decision-making.



# Nordic example: Berries, Mushrooms, Game

Table 3: Quantities and values of berries and mushrooms picked for markets in 2005 in Finland, Norway and Sweden. Source: Turtiainen and Nuutinen (2011).

| Country | Berries                  |                              | Mushrooms                |                              |
|---------|--------------------------|------------------------------|--------------------------|------------------------------|
|         | Quantity (tonnes / year) | Value (mil EUR) <sup>2</sup> | Quantity (tonnes / year) | Value (mil EUR) <sup>2</sup> |
| Finland | 12,027                   | 11.862                       | 426                      | 1.019                        |
| Sweden  | 13,790                   | 32.435 <sup>1</sup>          | Not available            | Not available                |
| Norway  | 350                      | 0.524                        | 500                      | 1.873                        |

Table 4: Socio-economic significance of hunting in the Nordic countries

| Country                          | Finland                 | Sweden  | Norway                    | Denmark                | Iceland   | Greenland                       |
|----------------------------------|-------------------------|---|---------------------------|------------------------|---|---------------------------------|
| <b>Hunters</b><br>(with licence) | 311,000                 | 263,000   | 195,500                   | 171,119                | 12,227  | 6,539                           |
| <b>Large mammals</b>             | Eurasian elk<br>68,423  | Eurasian elk<br>80,974                                | Eurasian elk<br>36,400    | Roe deer<br>128,200    | Reindeer<br>1,229                                     | Reindeer<br>15,092              |
| <b>Bears</b>                     | 179                     | 181   | 3                         | NA                     | NA  | Polarbear 124                   |
| <b>Other species</b>             | Mallard<br>265,400      | Roe deer<br>119,000                                   | Willow grouse<br>127,850  | Pheasant<br>721,400    | Rock ptarrigan<br>68,831                              | Guillemot<br>84,412             |
|                                  | Wood pigeon<br>232,100  | Mallard 91,500<br>Wood pigeon                         | Wood pigeon<br>56,900     | Mallard<br>485,400     | Greytag goose<br>45,828                               | Harp seal<br>84,223             |
|                                  | Black grouse<br>170,000 | 71,000  | Red deer<br>39,100        | Wood pigeon<br>299,500 | Puffin 33,074   | Ringed seal<br>71,260           |
| Ref. year                        | 2010                    | 2007-2008   | 2010-2011                 | 2010-2011              | 2010  | 2007-2009                       |
| Source                           | RKTL 2012               | Naturvårdverket<br>2012,<br>Statistics<br>Sweden 2009 | Statistics<br>Norway 2012 | Asferg (2011)          | Heiðarsson et al. 2010,<br>Statistics<br>Iceland 2012 | Statistics<br>Greenland<br>2012 |
| <b>Value of game meat</b>        | 83 mil EUR              | 1,119 mil SEK<br>(~125 mil EUR)                       | 44 mil EUR                | NA                     | NA  | NA                              |
| Ref. year                        | 2010                    | 2005-2006   | 2001                      |                        |   |                                 |
| Source                           | RKTL 2012               | Mattsson et al.<br>2008                               | Lunnan et al.<br>2005     |                        |   |                                 |

Data source: TEEB Nordic report

## Nordic example: pollination

- **Finland:** the value of honeybee pollination service of selected crops would be around 18 million EUR and of wild berries (bilberry and lingonberry) 3.9 million EUR (Lehtonen 2012).
- **Finland:** estimated value of pollination (by honeybees) in home gardens was 39 million EUR in Finland (Yläoutinen 1994, cited in Lehtonen 2012).
- **Denmark:** the value of the general insect pollination service was calculated to be worth 421-690 million DKK (~56.6 to ~92.8 million EUR) a year (Axelsen et al. 2011).
- **Sweden:** the value of honeybee pollination service was calculated to be 189-325 million SEK (~21.5- ~37 million EUR) (Pedersen 2009a).

## The Economics of Ecosystem Services and Biodiversity (TEEB) in Finland (5/2013-10/2014)

- Goal: Synthesis & Roadmap for decision-makers on all governmental levels as well as business sectors.
- Enhance knowledge and discussion on ESS and their role/importance for human well-being.
- Partners: SYKE (leader), Institute for European Environmental Policy (IEEP) & MTT Agrifood Finland.
- Main funder: Finnish Ministry of the Environment.



*YHA Kuvapankki*

## TEEB Finland: Components/Tasks

- 1) Identifying the most important ecosystem services and their indicators for Finland.
- 2) Synthesis of their biophysical status and trends.
- 3) Synthesis of their socio-economic importance and value.
- 4) Exploring policy responses for the safeguarding of ESS.
- 5) Potential of ecosystem services in promoting Green economy.
- 6) Conclusions and policy recommendations.
- 7) Communication/mainstreaming plan.



# TEEB Finland: Material and Methods 1

- Carried out according to the models of TEEB Global & TEEB Nordic
- A synthesis from existing knowledge and results of several parallel projects:
  - Finland's 4<sup>th</sup> and 5<sup>th</sup> National Report to the CBD (2008)
  - TEEB Nordic
  - National ESS indicators of Finland (FESSI)
  - Green infrastructure -pilot
  - Valuating ESS of boreal mires and peatlands (SuoEko)
  - Nessling Foundation's ESS synthesis project
  - Potential for Implementation of PES in Finland (TEEB Finland; a poster available in this seminar)
  - ESS and Human health (Argumenta-project).
- A leading researcher is in charge of every component.
- Discussion with co-operating stakeholders is done in Expert groups and Workshops.

## TEEB Finland: Expected outcomes 1

- (1) Ecosystem based lists of the most important ESS and their indicators in Finland (incl. sosio-economic indicators)
  - Ecosystems: Forests, Mires, Baltic Sea, Inland waters, Agri-environments, Constructed areas.
- (2) Biophysical state and trends of ESS (incl. pressures).
- (3) Case studies on socio-economic importance and value.



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## TEEB Finland: Expected outcomes 2

- (4) Recommendation for future policy responses: e.g. policy-mixes needed to address ESS; potential role of Green-infrastructure and Payment of Ecosystem Services (PES) schemes in Finland; the role of ESS in green economy; and integration of ESS in National Capital Accounting (NCA).
- (5) A policy brief for decision-makers (in Finnish).
- (6) Main report for the international audience (in English).
- (7) Scientific publications: e.g. ESS indicators; application of GreenFrame -method on land-use planning.

→ **A synthesis and roadmap for decision-makers**



**Thank you!**