Operationalizing the ecosystem service concept

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Trade-offs between ecosystem service beneficiaries

UK Grouse moors

• Recreational service – grouse hunting, versus
• Conservation of biodiversity – hen harriers

For a discussion see Rounsevell, et al. (2010). A conceptual framework to assess the effects of environmental change on ecosystem services. *Biodiversity and Conservation, 19(10)*, 2823-2842
Context for this talk

- Two new European Commission funded research projects on “operationalizing the ecosystem service concept”

**OPERAs: Operational Potential of Ecosystem Research Applications**
- 27 research and private sector partners
- 14 European countries and 1 non-European country
- Total budget of ca. €12m (ca. $15.5m)

**OpenNESS: Operationalization of Natural Capital and EcoSytem Services: From Concepts to Real-world Applications**
- 35 research and private sector partners
- 14 European countries and 4 non-European countries
- Total budget of ca. €11.5m ($15m)
The ecosystem cascade framework

After: Potschin & Haines-Young, 2011
What is meant by ‘operationalize’

• Applying the ES concept to enhance the sustainable management of ecosystems, through ‘instruments’ that operationalize the ecosystem service concept

• ‘Instruments' is used here in the broadest sense to include:
  
  • information tools (e.g. databases and visualization)
  • decision support tools, including market-based instruments such as auditing, certification/labelling and PES schemes, and
  • policy instruments
Instruments in the information chain from data to action

Adapted after: Roy Brouwer, IVM, Free University of Amsterdam
Information tools

• **Data services**
  • indicator databases, monitoring, geographic information systems, mapping, visualization, …

• **Models and simulation tools**
  • simple spreadsheet accounting methods, integrated assessment models, agent-based models, …

Data ➔ information ➔ decision ➔ implementation
Data: mapping ecosystem services in Europe

Relative pollinator abundance across Europe

Recreation Opportunity Spectrum (ROS) classifies ecosystems into 3 classes of accessibility and 3 classes of recreation potential

Source: PEER (Partnership for European Environmental Research)
Example of an integrated modelling tool

See Harrison et al., next presentation
Decision support tools

- Scenarios and futures analysis

- Economic and social valuation
  - payments for ecosystem services (PES),
  - contingent valuation,
  - hedonic pricing,
  - deliberative, participatory approaches, and
  - approaches to capture cultural identities attached to ES/NC,…

- Benchmarking – tools to enable investors to understand the extent to which companies are dependent on (or impact on) biodiversity and ecosystem services

Data ➔ information ➔ decision ➔ implementation
Scenarios and futures analysis

- Tartan spring
- Mad Max
- The Scottish play
- MacTopia
Management and policy instruments

- **Certification and Labelling**
  - cf. energy rating, Fairtrade, organic labels, …

- **Policy instruments and regulatory frameworks**
  - markets, regulations, incentives, quotas, environmental protection, green infrastructure

- **Mainstreaming ecosystem services**
  - incorporating the ecosystem services into the policies and practices of sectors that deal with land and water-use planning

Data ➔ information ➔ decision ➔ implementation
Example policy instruments and mainstreaming

- **Common Agricultural Policy (CAP)**
  - public payments for public goods - high nature value farming, agri-environmental schemes, less-favoured area payments
- **Common Fisheries Policy (CFP)**
- **Water Framework Directive (WFD)**
  - Implementing good ecological status
- **REDD+**
  - (Reduced Emissions from Deforestation and Degradation) supported by the UNFCCC and the UN CBD focusing on carbon
- **The Habitats Directive (together with the Birds Directive)**
  - the cornerstone of Europe's nature conservation policy built around the Natura-2000 network of protected sites and species protection.
- **The European Commission’s Green Infrastructure strategy**
  - objective of ecosystem restoration as part of the 2020 biodiversity target
- **Climate change adaptation (including the Adaptation Policy White Paper and the Floods directive)**
  - synergies with ecosystem services
European Union Biodiversity Strategy to 2020

**Target 1**
Conserving and restoring nature

**Target 2**
By 2020 ecosystems and their services are maintained and enhanced by establishing green infrastructure and restoring at least 15% of degraded ecosystems

**Target 3**
Sustainable agriculture and forestry

**Target 4**
Sustainable fishery

**Target 5**
Combatting invasive alien species

**Target 6**
Addressing the global biodiversity crisis

**Knowledge base**

**Action 5**
- Mapping and assessment of ecosystems and services (by 2014)
- Economic value assessment and integration into accounting and reporting systems (by 2020)

**Action 6a**
- Restoration and prioritisation framework (by 2014)

**Action 6b**
- Green Infrastructure Strategy (by 2012)

**Action 7a**
- Biodiversity proofing methodology (by 2014)

**Action 7b**
- No Net Loss initiative (by 2015)
Iterating between knowledge, instruments & practice
Testing instruments in exemplar case studies

Total of 37 exemplar case studies
Building longevity and continuity (perennity) …

• A web-based ‘Resource Hub’ containing
  • data (point-based and spatial),
  • exemplar studies,
  • meta-analyses and syntheses,
  • tools and methods,
  • best practice guidelines,
  • training programmes,
  • educational resources, …
• To support a Community of Excellence of practitioners
Integration and outreach
How might we support decision making in this case?

- Data and mapping tools to assess the extent of the problem
- Social and monetary valuation methods
- Conservation policy instruments
- Training and educational tools
- …
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Some concluding remarks …

- A number of instruments exist to operationalize the ecosystem service concept
- These are at different stages of development, and some may be more useful than others
- An understanding of the social basis of ecosystem beneficiaries is crucial …
- … as is an understanding of the relationships between ecosystem functioning and the flow of services …
- … within complex, adaptive socio-ecological systems
- A concerted effort is needed to establish the ecosystem service concept as a mainstream approach to ecosystem management