

Rural and Environment Science and Analytical Services

Strategic Research Programme 2011 – 2016

- Theme 1: Ecosystem Services

Research Plan 1 – Engagement and Evaluation

Coordination and management of the Ecosystem Approach Working Group (EAWG): A group involving individuals and experts from agencies and academia

Evaluation of an integrated framework: Assessing a framework based on mappings, indicators, impacts of pressure etc

Carry out stakeholder consultation on developing frameworks to aid in policy making decisions: Co-constructing scenarios based on NEA story lines

Research Plan 2 – Reviewing and analysing the Ecosystem Approach

Assessment of the utility of the Ecosystem Approach as applied in practice to specific case studies and the potential for wider application at a range of spatial scales, including costs, benefits, difficulties and uncertainties.

Evaluating methods of communicating an EA to different audiences

This is a small project that will evaluate methods of communicating an EA to different stakeholders (based on tracking and evaluating the approaches and methods used in the Knowledge Exchange component of the Ecosystem Services theme (RP1)).

Evaluating PES theory in practice.

This project will explore the extent to which PES (Payments for Ecosystem Services) schemes are or could be implemented within Scotland, with primary focus on water and forestry. It will likely include relevant CAP instruments such as “green payments” and SRDP measures, alongside PES-like schemes involving river management organizations and woodland trusts.

Research Plan 3A – Characterising the System

Developing and testing the Decision Making Framework using participatory models and scenarios: Our general aim is to develop socio-ecological models that can be used to explore the consequences for our Ecosystem goods and services from the way people and biodiversity respond to environmental change. The research effort involves testing and applying our integrated framework (see RP1) in a set of nested and related case studies.

Research Plan 3B – Applying The Ecosystem Approach To Optimise Upland And Lowland Agricultural Systems

Implementing a decision making framework for sustainable management of lowland (arable/grass) and upland (sheep, cattle, deer) farming systems: Designing multifunctional production systems requires a method of optimisation (getting the best solution for a range of services) through understanding and costing the trade offs between services.

Research Plan 4 – Identification And Mapping Of Indicators Of Ecosystem Services

RP4.1 – Mapping ecosystem services

- *Appraisal and mapping of ecosystem services (ES) in Scotland using existing information*
- *Development of approaches to mapping ES supply*
- *Assessment of supply of ES in Scotland*

RP4.2 – Indicators of Ecosystem Services

- *Ecosystem Services Database*
- *Indicators of freshwater services*
- *Indicators of good ecological status of soils*
- *Resilience of ecosystem services to invasive species – flatworms in Scotland*

Research Plan 5 – Biophysical And Biodiversity Processes And ES Regulation

RP5.1 – Spatial and temporal analysis of ecosystem services: exploring distributions, resilience and trade-offs

- *A spatial analysis* of how the distribution and richness mainly of vascular plant species are related to ecosystem productivity, soil variables (e.g. acidity drainage, soil moisture) and land use.
- *Linking spatial and temporal analyses.* This will extend the spatial analysis undertaken in 1 above
- *Downscaling from national-scale assessments to regional scale relationships*
- *Modelling the role of soil biodiversity in supporting ES supply*

RP5.2 – Detailed studies of biodiversity/biophysical process – Ecosystem Service linkages

- *Impacts of land use and climate change on ES provision and ecosystem function*
- *Impacts of cropping systems on plant-microbe interactions and service delivery*
- *The role of genetic diversity in regulating crop production and system resilience*

Research Plan 5 – Biophysical And Biodiversity Processes And ES Regulation (cont)

RP5.3 – Cultural services of woodlands

Key research questions include:

- *How can we incorporate CESs into decision-making at different spatial scales?*
- *How do the diverse values of stakeholders and different power structures influence decision making at different spatial scales?*
- *Are sense of place and identity changed by landscape change?*

RP5.4 – Synthesis and Review – biodiversity and biophysical underpinning

- *Review of the links between biodiversity/biophysical processes and the delivery of Ecosystem Services*
- *Revisit and update of initial review documents*

Research Plan 6 – Green Accounting

- *Review of environmental accounting frameworks*
- *Environmental accounting framework for Scotland*
-
- *Disaggregation to sector or system*

Research Plan 7 – Valuation, benefits transfer, and PES

The activity is concerned with four major ecosystems and their services:

- *Terrestrial ecosystem services of agricultural systems*
- *Terrestrial ecosystem services of forests and trees*
- *Water ecosystem services*
- *Marine ecosystem services*

More Information and Queries:

- <http://www.hutton.ac.uk/research/themes/safeguarding-natural-capital/ecosystem-approach-working-group>
- Alison.Hester@hutton.ac.uk