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Why SEPA and it's partners are thinking in terms of ecosystems and the services they provide

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Summary

- SEPA – what we do and how we work
- Ecosystems and ecosystem services
- State of ecosystem services in Scotland
- How can we improve things?
- How can ecosystem services help us?
- Practical examples

SEPA

- Scotland's national environment regulator
 - Excellent regulator
 - Regulate environmentally damaging activities
 - Help business to comply and understand benefits of doing so
- Monitor environmental quality
- Flood risk warning
- National Waste Strategy
- Approx 1000 employees at 22 offices

Better Environmental Regulation

- Fair
 - Businesses that impact on the environment should pay their fair share
- Effective
 - Charging to be based on environmental risk and performance
- Flexible
 - Tackle problems and issues that matter most
- Outcome based
 - Use mechanisms to encourage appropriate outcomes

Ecosystems and ecosystem services

An ecosystems approach

The ecosystem approach is a strategy for the integrated management of land, water and living resources that promotes conservation and sustainable use in an equitable way.

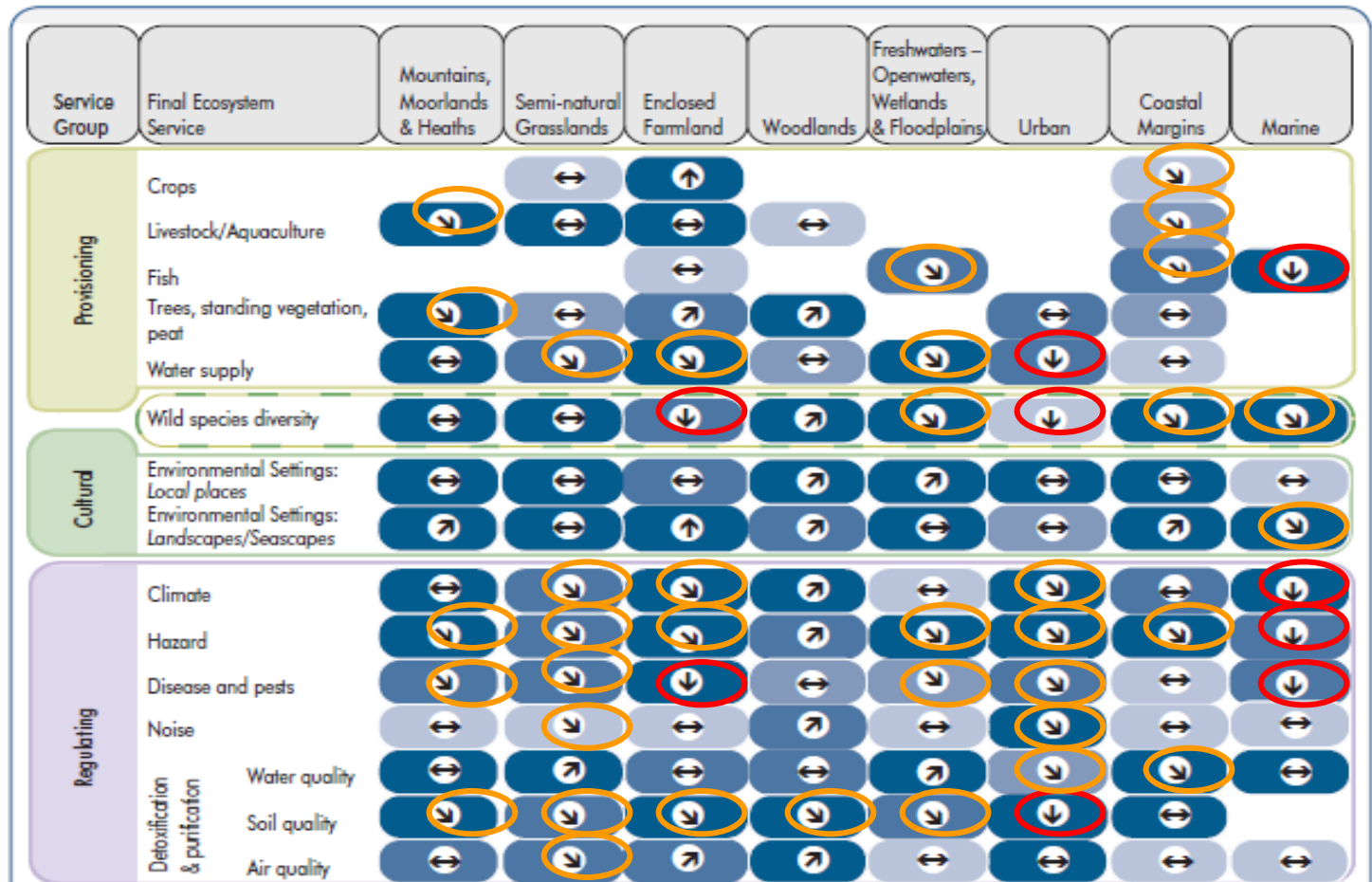
(The Convention on Biological Diversity, 1994)

Ecosystem services

- **What the environment does for people**
- Categories:
 - Provisioning – food, drinking water, tourism, minerals etc
 - Regulating – flood regulation, climate regulation, waste management
 - Cultural – aesthetic enjoyment, recreation, spirituality, public health
 - Supporting – habitat, nutrient cycling, soil formation, water cycling, oxygen provision
- **Benefits from nature**



State of our environment – NEA 2011



Trends in ecosystem service flows from broad habitat types in **Scotland** 1990-2011



some deterioration



large deterioration

applicable to a particular broad habitat.

National Ecosystem Assessment – key points for Scotland

- Provisioning services broadly increasing (eg. food production)
- Regulating services broadly decreasing (eg. clean water, clean air, climate regulation)
- Underlying ecosystem health declining: **not sustainable**
- Our knowledge is not complete but it's sufficient



The Future

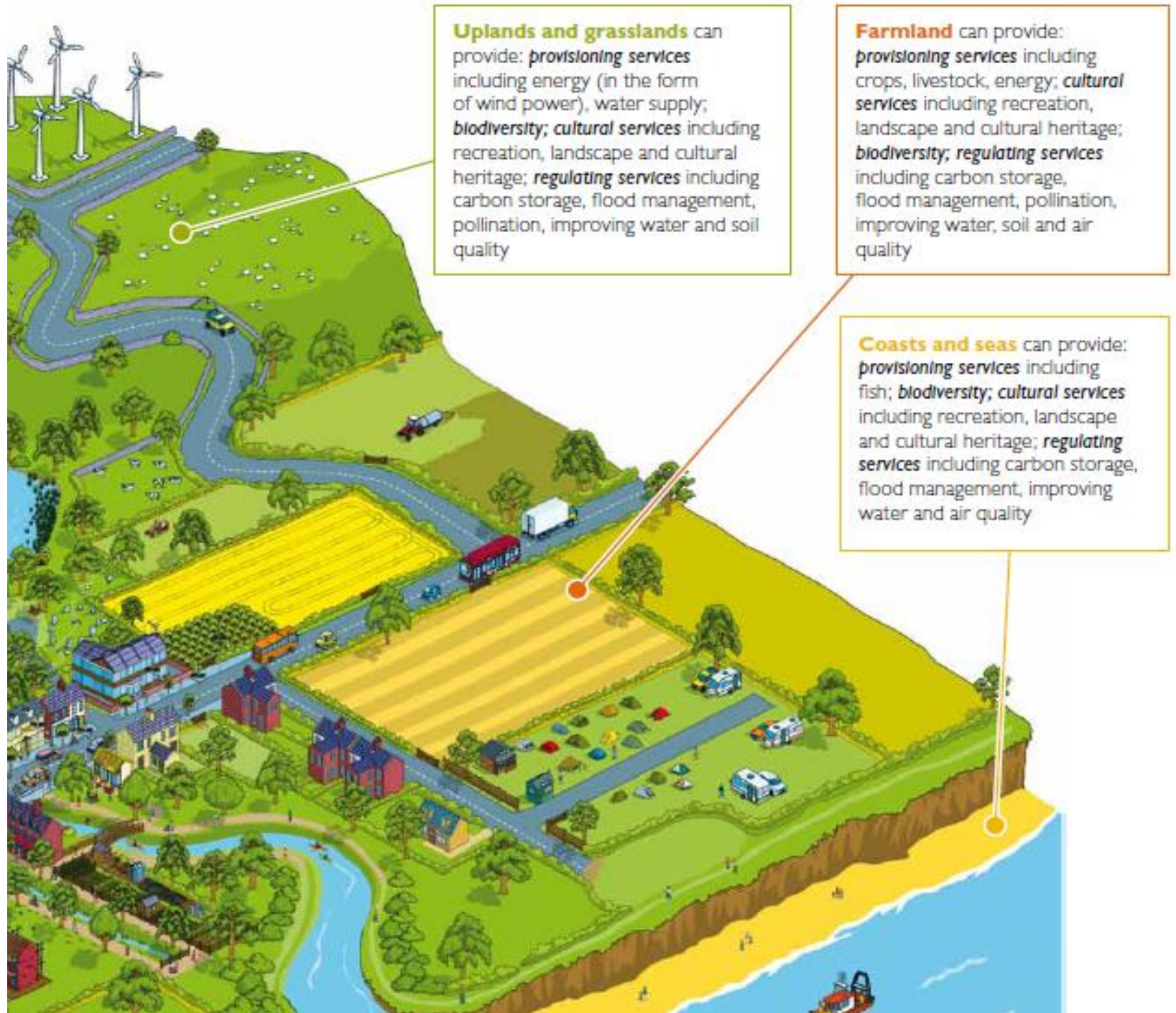
- Increasing pressures on ecosystems due to:
 - climate change
 - population increases
 - globalisation
 - changing consumption patterns
 - desire for improved living standards
- Sustainable development needs:
 - Individual and societal behaviour change
 - Integrated, rather than sector based, ecosystem management
 - A mixture of regulation, technology, investment and education

How can an ecosystem services approach help?

- **Communication** - describe the benefits from protecting and improving the environment to government, businesses and public
- **Risk based approach** – prioritise action to address pressures that matter most
- **Measures selection** – choose measures that deliver most – better bang for your buck

Communication – using ecosystem services

- Use the ‘ecosystem services’ terminology sparingly and appropriately
- We need people and businesses to better understand what their environment does for them

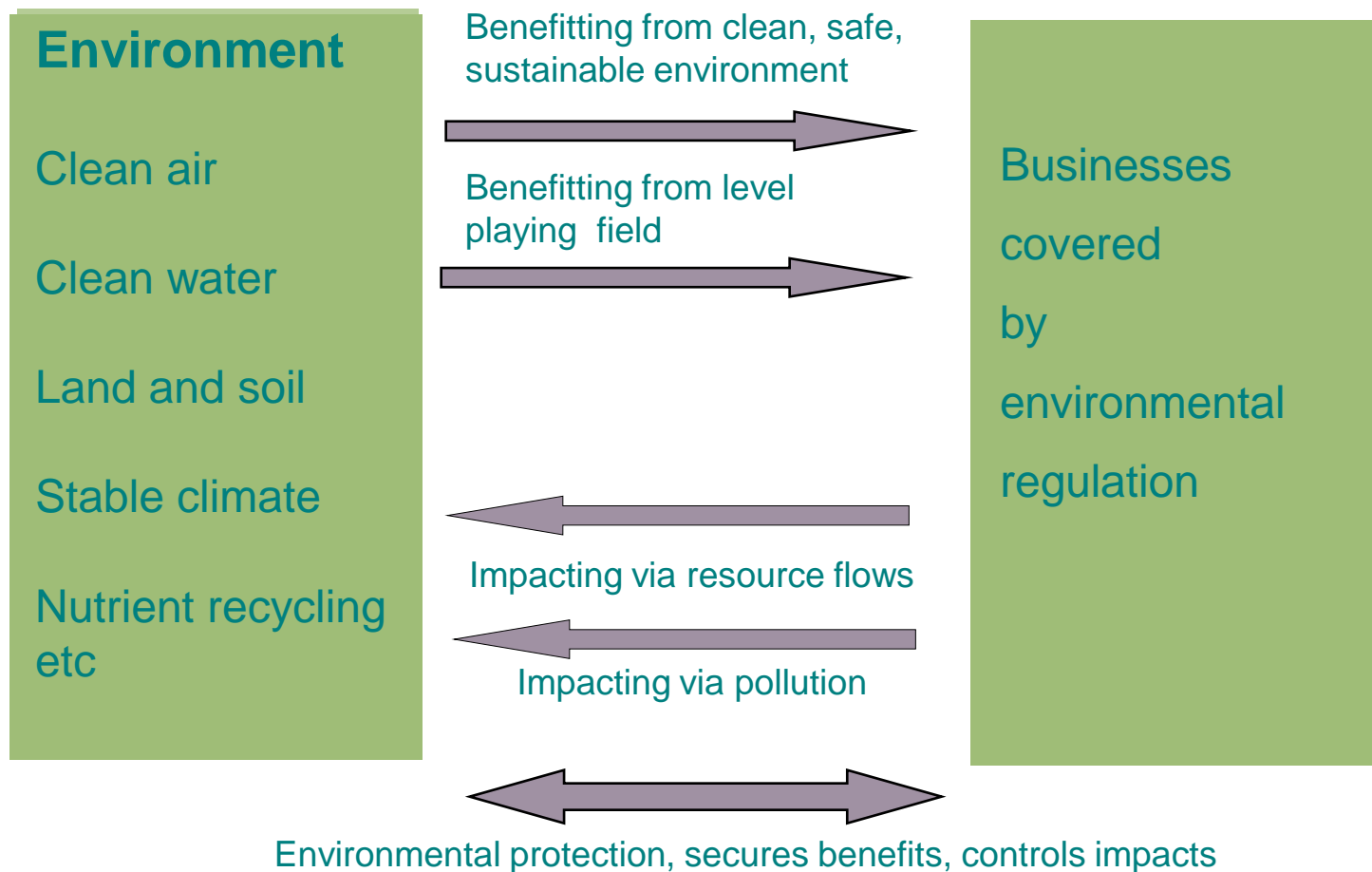


Uplands and grasslands can provide: *provisioning services* including energy (in the form of wind power), water supply; *biodiversity*; *cultural services* including recreation, landscape and cultural heritage; *regulating services* including carbon storage, flood management, pollination, improving water and soil quality

Farmland can provide: *provisioning services* including crops, livestock, energy; *cultural services* including recreation, landscape and cultural heritage; *biodiversity*; *regulating services* including carbon storage, flood management, pollination, improving water, soil and air quality

Coasts and seas can provide: *provisioning services* including fish; *biodiversity*; *cultural services* including recreation, landscape and cultural heritage; *regulating services* including carbon storage, flood management, improving water and air quality

Benefits of the Environment to Scottish businesses



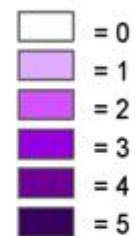
Communication – using ecosystem services

- Use the ‘ecosystem services’ terminology sparingly and appropriately
- We need people and businesses to better understand what their environment does for them
- To help people understand what parts of the environment are important and where

Water Regulation

For flood risk management

Delivery Score

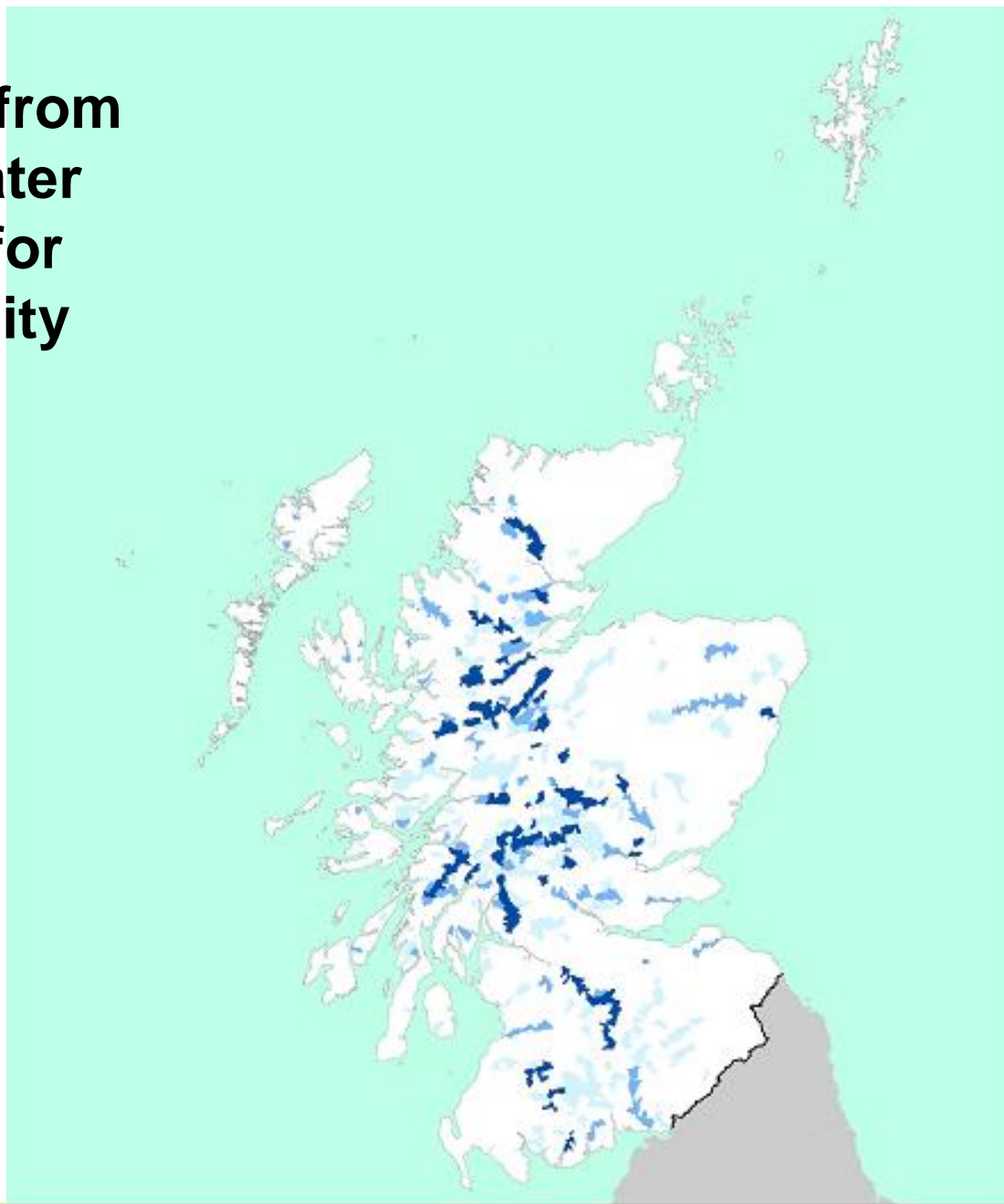


**Mapping
ecosystem
services and
indicators**

0 5 10 20 Kilometers



Abstractions from Scotland's water environment for hydro electricity generation



Communication – using ecosystem services

- Use the ‘ecosystem services’ terminology sparingly and appropriately
- To help people understand what their environment does for them
- To help people to understand what parts of the environment are important and where
- Projects underway:
 - Natural England ecosystems pilot work
 - SNH/SEPA pilot project in Stirling
 - SEPA economic characterisation of the water environment

Risk based approach

- Scottish Government/SEPA work on Better Environmental Regulation
- Allow SEPA's regulation to focus on environmental issues that matter most
- Issues that matter most might have greatest impact on ecosystem services
- Environmental risk might be greatest where potential ecosystem services impacts are greatest

Deciding what needs to be done (selecting measures)

- Sustainable development
 - Multiple benefits
 - Balancing impacts
 - Managing trade offs
 - ‘Valuing’ (and comparing) impacts
 - ‘Cost benefit analysis’
 - Cost effectiveness analysis
-
- Ecosystem services can be used to identify (and ‘value’) the impacts of different courses of action

Example - selecting measures for catchment restoration

1. Identify impacts of different measures on priority ecosystem services:

Measure	Climate change mitigation	Climate change adaptation	Food prodn	Biodiversity	Diffuse pollution	Flood mgmt	Recreation
Nutrient management	✓✓✓	x	✓✓✓	✓✓	✓✓✓	x	✓
Buffer strips							
Wetland management and recreation							
Floodplains management and recreation							

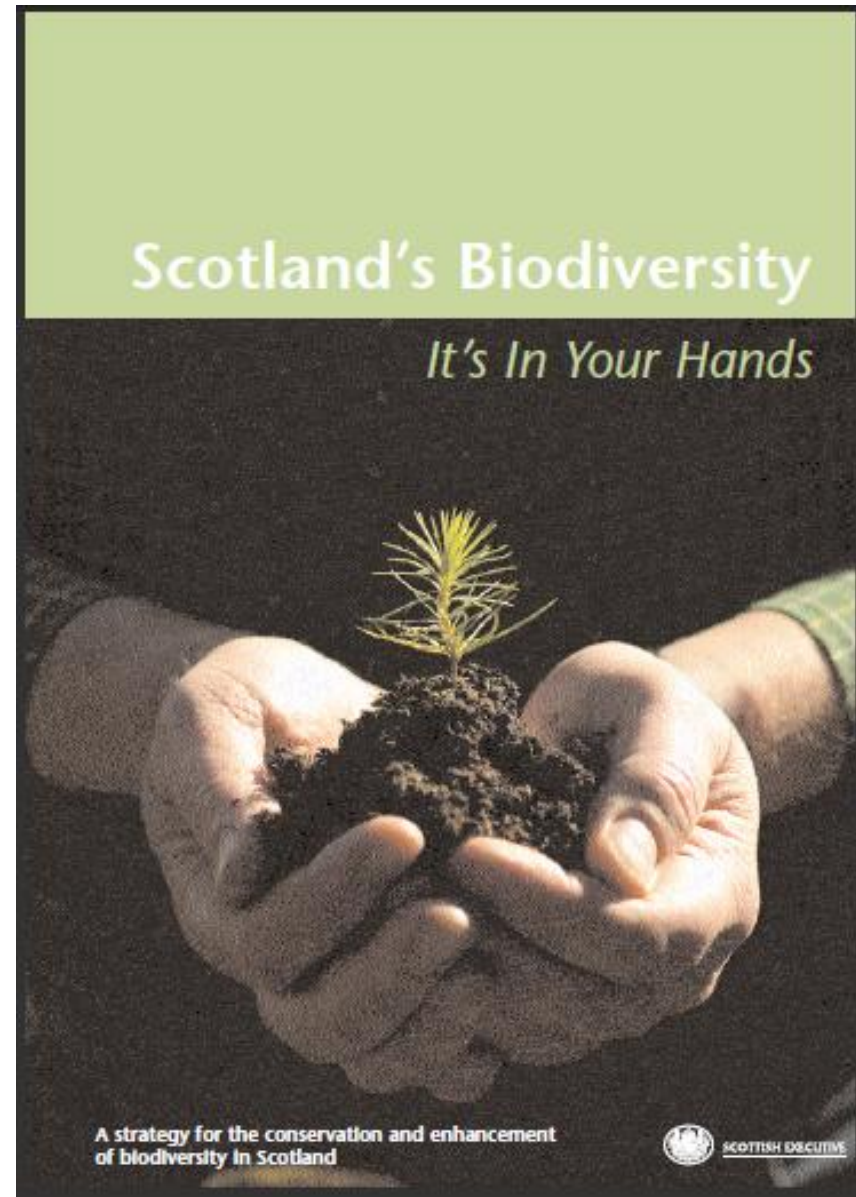
2. Compare impacts on ecosystem services with the financial cost and technical complexity of different measures

3. Select preferred measure(s)

Scottish Biodiversity Strategy 2004

Being reviewed, final
new strategy due Spring
2013

- Embraces the concepts of ecosystem services and natural capital



Land Use Strategy for Scotland

3 principles for
implementing an
ecosystems approach:

- Take account of
ecosystem services
- Involve people
- Understand natural
system and
interactions



Getting the best from our land

A land use strategy for Scotland

SE Web – Scotland's Environment website

Scotland's environment 



[Home](#) | [Our Environment](#) | [Library](#) | [Map](#) | [Citizen Science](#) | [Trends & Indicators](#) | [Sectors & Issues](#)

Home

Welcome to Scotland's Environment Web

Bringing together information on Scotland's environment in one place. There is nowhere else that environmental data and reports from known and trusted sources can be accessed and looked at in combination.

The site provides straight-forward descriptions of the state of Scotland's environment and key messages that highlight our progress in protecting it.

Latest News

- [Movement on discard issue](#) - Mon, Mar, 19 2012
- [Billion pound waste concern for Lochhead](#) - Mon, Mar, 19 2012
- [Tay beaver watch](#) - Fri, Mar, 16 2012
- [Mapping bird of prey poisoning](#) - Wed, Mar, 14 2012
- [£6.9m to support climate reductions](#) - Tue, Mar, 13 2012
- [Green energy investment plans](#) - Fri, Mar, 9 2012

Quick Links



Other opportunities to take an ecosystems approach

River Basin Management Planning:

- First RBMP paved the way for many multiple benefit approaches
- More opportunities to deliver measures through partnerships
- Second RBMP – economic characterisation will focus on ecosystem services associated with the water environment

Overview

- Introductions:
 - To SEPA
 - To Better Environmental Regulation
 - To ecosystem services
- Our environment is not being managed sustainably
- Use ecosystem services:
 - To communicate with people
 - To identify major environmental risks
 - To identify solutions
- Action is already being taken by SEPA and its partners
- Many opportunities for further applying ecosystems thinking this is an opportunity we must not miss