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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**
Ecosystem services – what are we talking about?

The saltmarsh story…
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.*
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

Environment
- Clean air
- Clean water
- Land and soil
- Stable climate
- Nutrient recycling etc

Benefitting from clean, safe, sustainable environment
Benefitting from level playing field
Impacting via resource flows
Impacting via pollution

Businesses covered by environmental regulation

Environmental protection, secures benefits, controls impacts
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
Mapping ecosystem services and indicators

Water Regulation
For flood risk management
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:**

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<th>Measure</th>
<th>Climate change mitigation</th>
<th>Climate change adaptation</th>
<th>Food prodn</th>
<th>Biodiversity</th>
<th>Diffuse pollution</th>
<th>Flood mgmt</th>
<th>Recreation</th>
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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
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

Wildlife
Scottish habitats are rich and diverse. Healthy ecosystems are vital for our survival but are threatened by some land management practices.
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**