



Environment
Agency

Achieving more with less through ecosystems thinking

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The perils of 'silo' management...



Where do ecosystem services come from?

⇒ International development

- ⇒ Development funding to drain of wetlands for rice...
- ⇒ ...unsustainable!
- ⇒ Assumed that wetlands had NO INHERENT VALUE!

⇒ Local people derive multiple values from nature...

- ⇒ 'First world' economy
- ⇒ Subsistence/informal economy
- ⇒ Spiritual, cultural, aesthetic values, etc...

⇒ Big Yellow Taxi!

What are ecosystem services?

- ➔ The benefits people derive from ecosystems
 - ➔ Considering impacts on whole ecosystems...
 - ➔ ...and all who benefit from them
- ➔ Millennium Ecosystem Assessment
 - ➔ Declining trend in global ecosystems
 - ➔ Parlous implications for human wellbeing
- ➔ Defra 2007 action plan and 2010 update
 - ➔ NVP, NEF, NEA, NEWP...

The MA ecosystem services classification...

Provisioning services
Fresh water
Food (eg crops, fruit, fish, etc)
Fibre and fuel (eg timber, wool, etc)
Genetic resources (used for crop/stock breeding and biotechnology)
Biochemicals, natural medicines, pharmaceuticals
Ornamental resources (eg shells, flowers, etc)

Regulatory services
Air quality regulation
Climate regulation (local temp. /precipitation, GHG sequestration, etc)
Water regulation (timing/scale of run-off, flooding, etc)
Natural hazard regulation (ie storm protection)
Pest regulation
Disease regulation
Erosion regulation
Water purification and waste treatment
Pollination

Cultural services
Cultural heritage
Recreation and tourism
Aesthetic value
Spiritual and religious value
Inspiration of art, folklore, architecture, etc
Social relations (eg fishing, grazing, cropping communities)

Supporting services
Soil formation
Primary production
Nutrient cycling (water recirculation in landscape)
Water recycling
Photosynthesis (production of atmospheric oxygen)
Provision of habitat



Unintended consequences...



➔ Focused on provisioning services

➔ Some Agri-environment schemes focus on other (poorly defined) services

➔ CAP widely seen as undermining:

- ➔ Other provisioning services (genetic stock, natural medicines, etc.)
- ➔ Regulating services (flood, climate, erosion, pest predators, etc.)
- ➔ Cultural services (valued landscapes and biodiversity, etc.)
- ➔ Supporting services (functioning and resilience of ecosystems)

Unintended benefits...

- Tamar 2000:
 - Farm income
 - River enhancement
 - *Other ecosystem services*
- Alkborough Flats:
 - Flood risk/climate change
 - Habitats Directive
 - *Other ecosystem services*



Intended benefits...

Mayesbrook Park and Mayes Brook regeneration:

- *London Borough of Barking and Dagenham*

Ecosystem service	Benefit assessment
Annual provisioning service benefits	No uplift to provisioning services
Annual regulatory service benefits	Approximately £28,000 ➤ Climate regulation + flood risk + erosion + 'likely significant positive benefits' for regulation of air quality and microclimate
Annual cultural service benefits	Approximately £820,000 ➤ Recreation and tourism + educational value + regional regeneration
Annual supporting service benefits	Approximately £31,000: ➤ Nutrient cycling + habitat for wildlife
Total ecosystem services across the four categories	Benefit-to-cost = approximately 7:1



A framework to work together...

- ⇒ Across disciplines/departments
- ⇒ Across organisations
 - ⇒ Outcomes for fish, human health, amenity, flood risk, birds, etc.
- ⇒ Breaking out of narrow 'siloed' remits
- ⇒ Bigger outcomes for more people
 - ⇒ Different, interdependent ecosystem service beneficiaries

True partnerships; a bigger society...

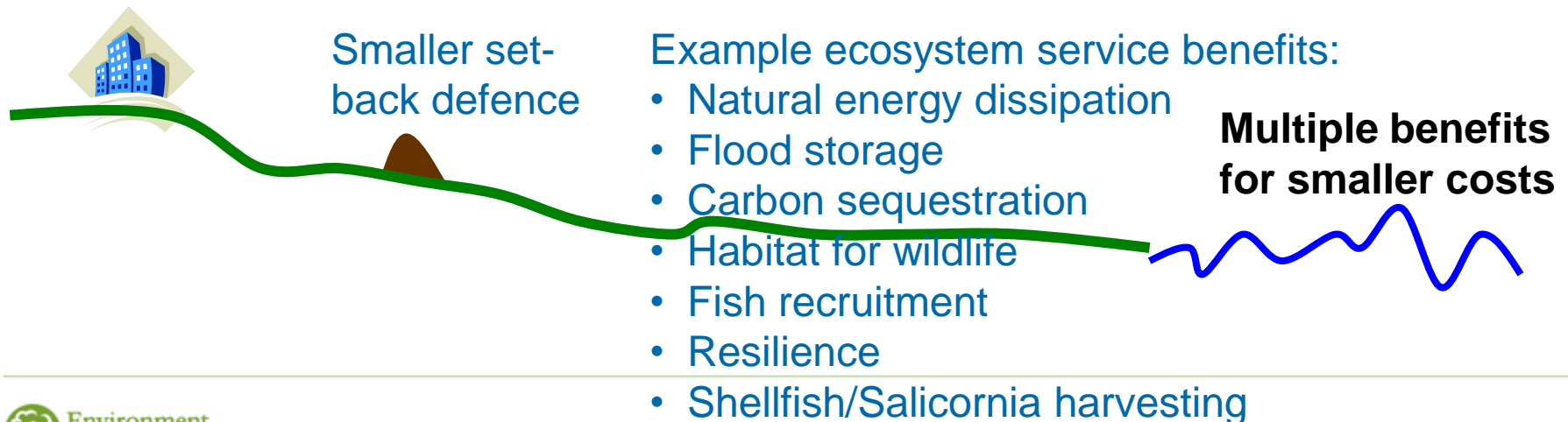
⇒ Doing it once

- ⇒ Reduced conflicts
- ⇒ Increased synergies
- ⇒ Increasingly working with natural processes/functioning
- ⇒ Doing it 'right' (or at least 'less bad' or 'no regrets')

⇒ Participation

- ⇒ All stakeholders and a common conceptual framework
- ⇒ Adaptive management throughout life

For example, managed realignment...



Planning for multiple benefits in MR...

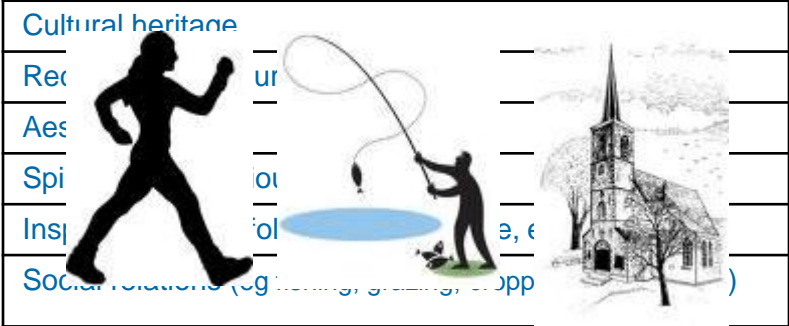
Provisioning services



Ornamental resources (eg shells)

Cultural services

Cultural heritage



Recreation (eg running, fishing, etc.)

Aesthetics (eg scenic views, etc.)

Spirituality (eg religious sites, etc.)

Inspiration (eg art, music, etc.)

Social relations (eg community, etc.)

Regulatory services



Air quality regulation (e.g. reducing greenhouse gas emissions)

Disease regulation (e.g. reducing mosquito populations)

Erosion regulation (e.g. stabilising soil)

Water purification and waste treatment (e.g. filtering pollutants)

Pollination (e.g. supporting crop production)

Supporting services

Soil formation (e.g. creating fertile soil)



Primary production (e.g. growing crops)

Nutrient cycling (e.g. recycling nutrients)

Water regulation (e.g. storing water)

Pollination (e.g. supporting crop production)

Primary production (e.g. growing crops)

- ➔ Optimising multiple benefits
- ➔ Anticipating potential costs
- ➔ Adaptive management
- ➔ MUCH MORE WITH LESS!!!



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