

Indicators of ecosystem services

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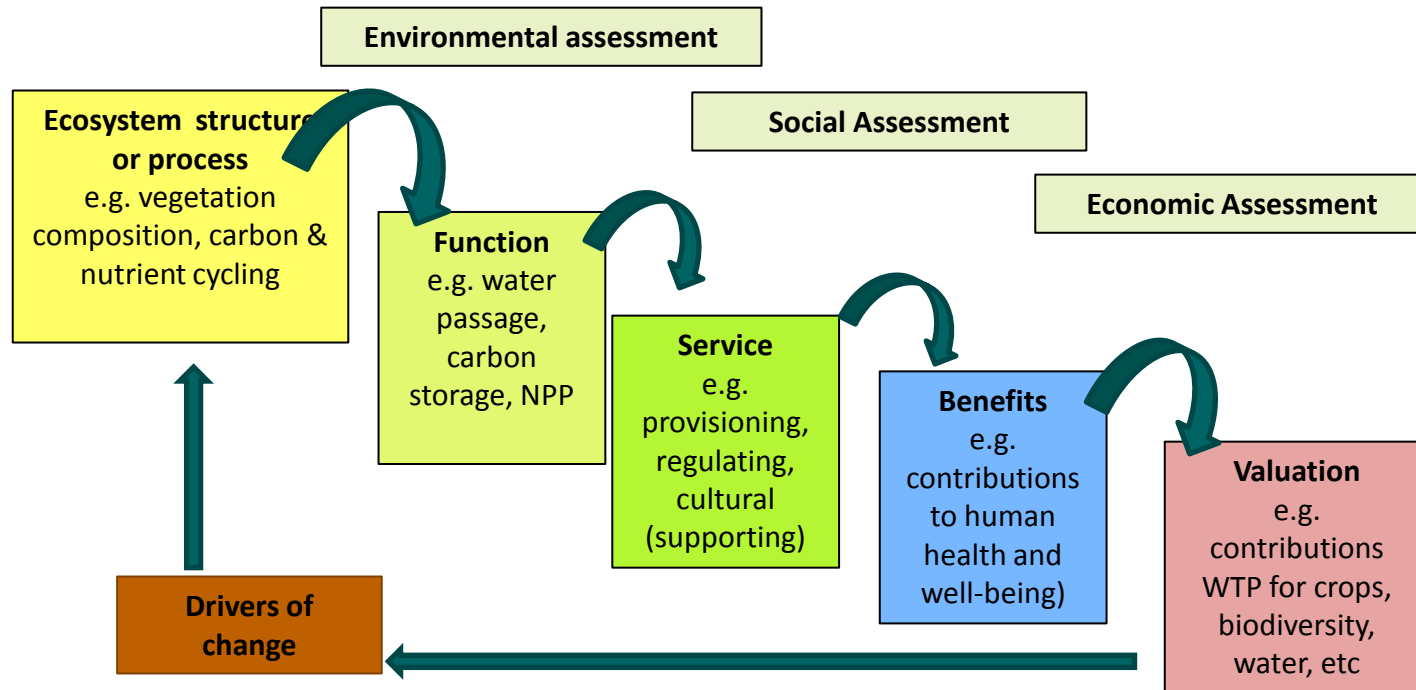


The James
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Ecosystem Service Indicators

- Quantification of the current and potential supply of benefits from the environment and early-warning of threats to supply of benefits from the environment MONITORING
- Improve decision-making by considering the range of both market and non-market benefits supplied by the environment and judge the success of policies / management to maintain or enhance supply of benefits DECISION-MAKING
- Understand the implications of decision-making on monetary and non-monetary benefits supplied by the environment VALUATION

Ecosystem services cascade



- We rely on the environment for a wide range of benefits
- Our environment delivers benefits through ecosystem services
- Valuation is used to assess the implications of decision-making on benefits
- We are interested in the implications for multiple benefits
- Defined relationships in the cascade are key

Expert Workshop on Ecosystem Service Indicators.



A workshop jointly convened by UNEP World Conservation Monitoring Centre. (UNEP-WCMC), IUCN Commission on Ecosystem Management (IUCN CEM) and World Resources Institute (WRI), UNEP –WCMC, Cambridge, United Kingdom, 22nd to 23rd September 2009

1. Existing indicators are unable to convey the full picture or understanding for the majority of ecosystem services.
2. Indicators of ecosystem services are:
 - underdeveloped
 - inadequately supported by data collection processes
 - quality of ecosystem service indicators is poor
 - data availability to support indicators' use by policy-makers
 - ESI of cultural, supporting & regulating services particularly limited.
3. Recommendation to identify a set of ecosystem service indicators that will support integration of ecosystem services into decision making processes.

RESAS Ecosystem Services Theme

- We will review, identify and develop indicators suitable for the characterisation and quantification of the supply of different ecosystem services in Scotland.
- The suitability of indicators will be assessed by their capacity to identify sensitivity in the actual, predicted and potential supply of ES from the underlying environmental assets under different pressures and scenarios of change.
- Initially... we will collate and review current knowledge and data on indicators of provisioning, supporting, regulating and cultural services for their relevance to Scotland ... *and* determine the usefulness of these indicators for valuation.

Benefits focussed approach

Table 1. The ecosystem services cascade.

An example from regulation of wastes to illustrate the chain from biophysical through ecosystem services to benefit and valuation. Adapted from the common ES classification proposed by the EEA (EEA, 2010).

ES group	stock	flows	function / service	examples	indicative benefits	value	
	BIOPHYSICAL		SOCIAL / HUMAN			ECONOMIC	
Regulation of wastes	functional structure of plant and microbial communities	bio-remediation	remediation using plants	phyto-accumulation, rhizo-deposition	removal of pollutants	improve / reduce risks to health	reduced health care costs
			remediation using microbes	in situ bioremediation; ex situ bioreactors	removal of pollutants	reduced risk to wildlife	reduced loss in biodiversity
	soil quality	dilution and sequestration	dilution	solute reduction	reduction of pollutants		reduced costs for water purification
			filtration	sediment capture	retention of pollutants		reduced off-site costs
			sequestration and adsorption	removal of odours	retention of pollutants		better quality of life

What's next

- Assessment using suitability criteria
 - Standard performance requirements
 - Relevant
 - Easy to understand
 - Reliable
 - Early warning
 - Ecosystem services relevant
 - Indicator related to benefits within all ES groups
 - Relationships to benefits known
 - Known consequences of change for benefits
 - ...