

What are ecosystem services and (how) can they be used as part of the EA?

- What is Ecosystem services?
- And what is Resilience?
- How do you determine the "health" of an ecosystem?
- Is an Ecosystem Service Approach useful for decision making?



Magnus Tuvendal, December 2013
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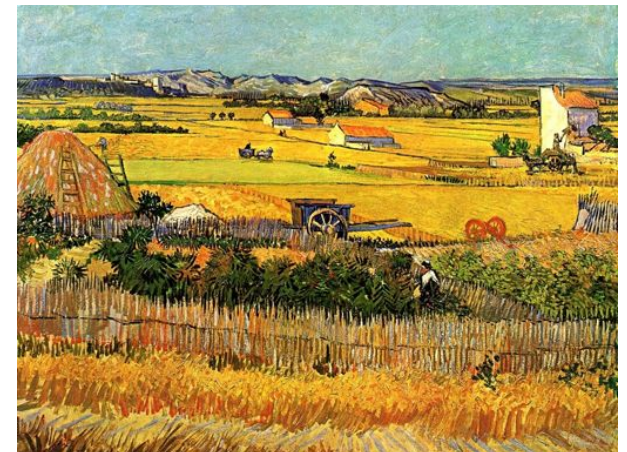
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ECOSYSTEM SERVICES

What kind of beast is it?

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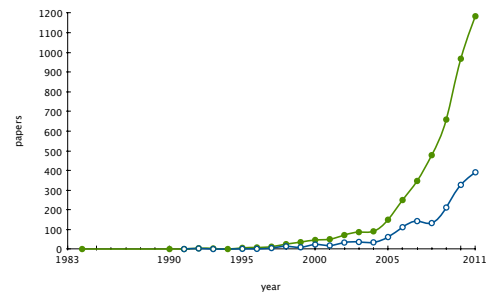
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Joseph Priestley
1733 – 1804

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"... it seems to be extremely probable that the putrid effluvium [i.e., whatever it is that extinguishes candles and mice] is in some measure extracted from the air, by means of the leaves of plants, and therefore that they render the remainder more fit for respiration"



Joseph Priestley
1733 – 1804

Source: Gorham, E. 1991. Biogeochemistry

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"...highly probable, that the injury which is continually done to the atmosphere by the respiration of such a number of animals, and the putrefaction of such masses of both vegetable and animal matter; is, in part at least, repaired by the vegetable creation"

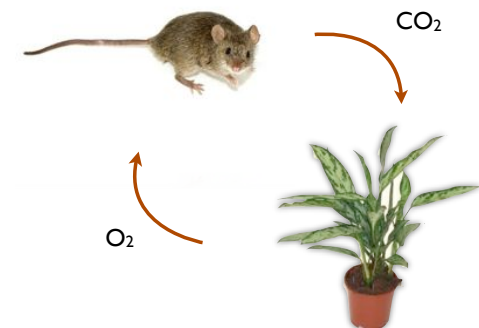


Joseph Priestley
1733 – 1804

Source: Gorham, E. 1991. Biogeochemistry

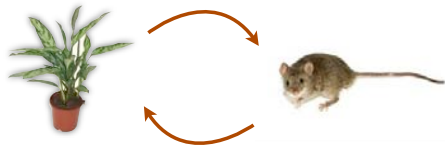
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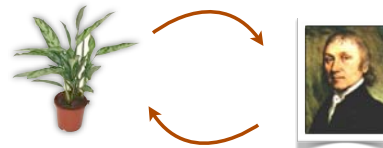
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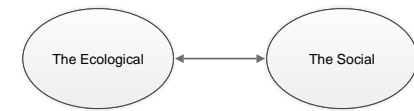
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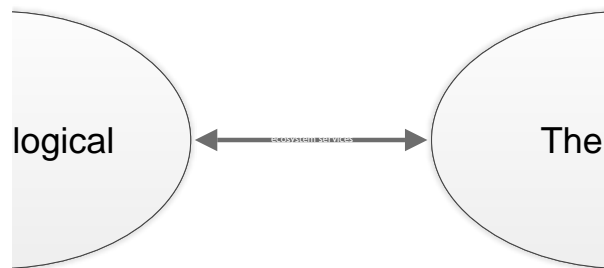
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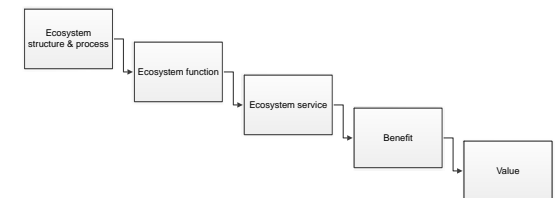
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“...the direct and indirect contribution
from ecosystems to human-wellbeing”.
MEA 2005

ecosystem services

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Source: Potschin & Haines-Young, 2011

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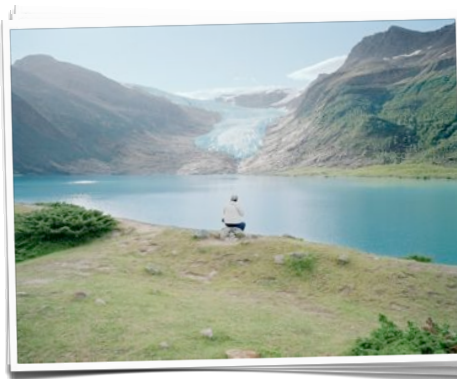
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Source: TEEB. Se also Cices.eu

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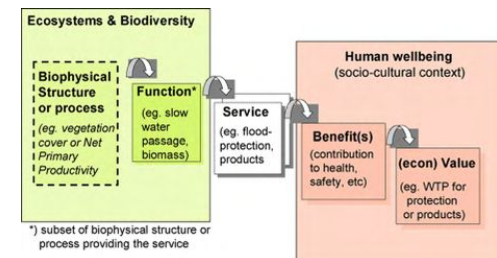
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Source: “Watching Humans Watching”, Photo Book Award 2012

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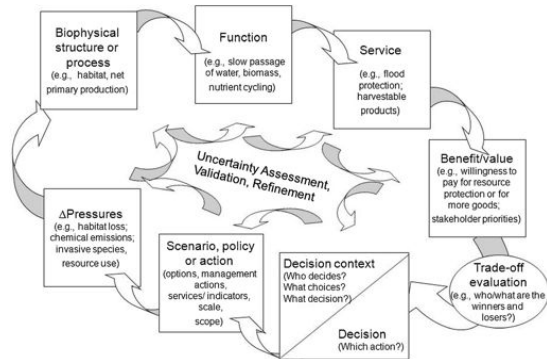
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Source: Potschin & Haines-Young, 2011

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Apitz, S. E. (2013). Ecosystem services and environmental decision making: Seeking order in complexity. Integrated Environmental Assessment and Management.

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I understand ecosystem services as:
“A heuristic device for making human-ecology interaction more visible in decision making.”

And it that can contribute in three different ways:

- 1) Increasing overall understanding and awareness of human dependence on ecosystems.
- 2) Quantification and valuation (in some form) of services from nature and inclusion of these values in decision making.
- 3) To inspire novel solutions, new institutions, for sustainable management and governance of ecosystems.

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And what is Resilience Thinking?

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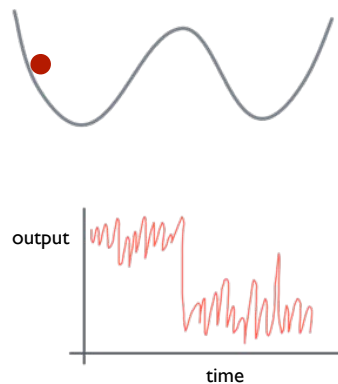
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“... the capacity of a system to absorb disturbance and reorganize while undergoing change and still retain essentially the same function, structure, identity, and feedbacks”

Folke, Carpenter, & Walker, 2010

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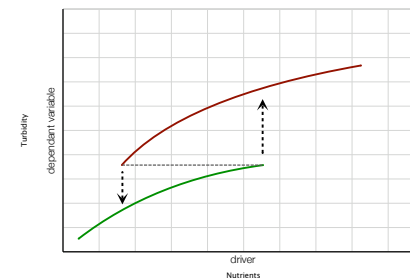
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**Tipping points
non-linear behaviour**



When a critical threshold is crossed a different set of feedbacks becomes dominant.

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aikido [jɛˈdɔː ɪˈkɛdɔː]
 noun
 a Japanese form of self-defense and martial art that uses locks, holds, throws, and the opponent's own movements.
 ORIGIN 1950s: from Japanese *aikidō*, literally ‘way of adapting the spirit,’ from *ai* ‘together, unify’ + *ki* ‘spirit’ + *dō* ‘way.’



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How do you determine the “health” of an ecosystem?

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Nature progress towards a relatively stable climax state. Successional stages are evident.

Human are a destructive force reducing nature from it's natural progression.

Ecology can help reorganize society and supress destructive individualism. The “wholeness” is the priority.

Frederic Clements,
1874 - 1945

The most influential naturalist, botanist of his time.

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If nature change continuously - there is no absolute norm to separate disturbed nature from undisturbed.

The doomsday is overstated and organism and the idea of wholeness are neighbours with totalitarianism.

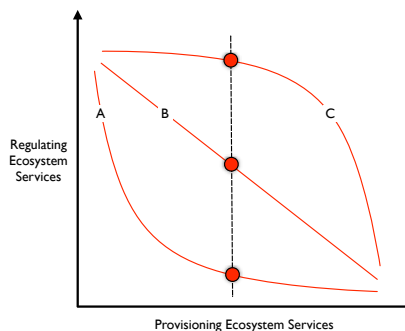
We must look towards the future - and meet the demand of a future with humans.

James Malin,
1893-1979

A highly prolific historian, a myth-buster.

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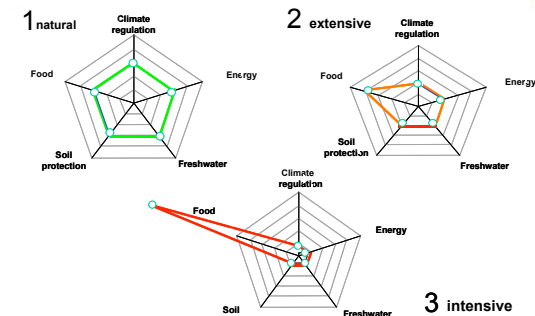


Källa: Elmqvist T., Tuvendal M., Krishnaswamy J., and Hylander K (2009)

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Multifunctional landscapes



Source: Ben van Brink (MNP) presentation at the Workshop: The Economics of the Global Loss of Biological Diversity 5-6 March 2008, Brussels, Belgium.

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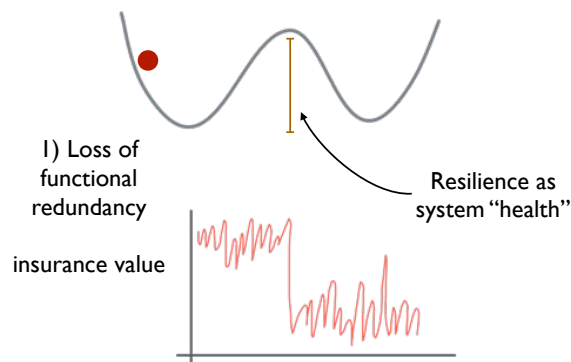
System failure

"a failure of systems to provide services or goods upon demand." (Naem 1998)

forced transformation
unintentional regime shift

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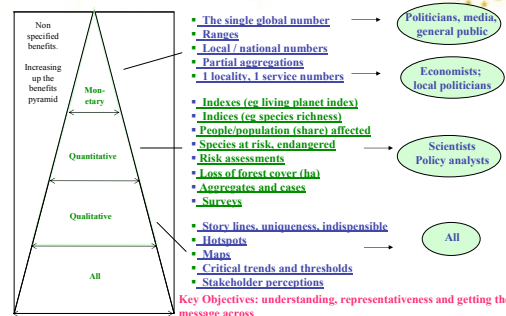
Spatial Resilience
- recovery from disturbance depending upon "support area"

Source: From Lundberg & Moberg 2003

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Is an Ecosystem Service Approach useful for decision making?

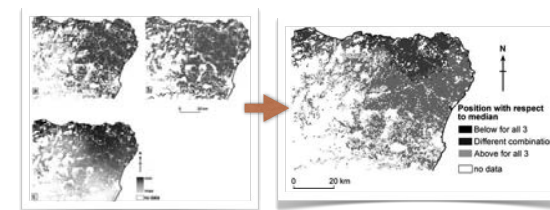


Source: Patrick van Brink (MNP) presentation at the Workshop: The Economics of the Global Loss of Biological Diversity 5-6 March 2008, Brussels, Belgium

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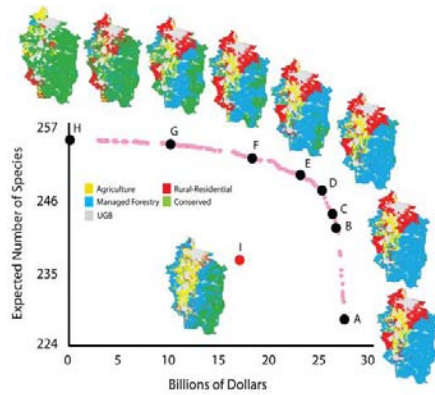
Where should we restore forest?



Gimona et al. Mapping hotspots of multiple landscape functions: a case study on farmland afforestation in Scotland. Landscape Ecology (2007) vol. 22 (8)

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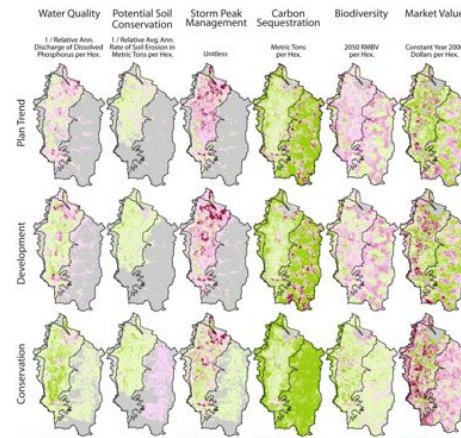
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Polasky, et al. (2008). Where to put things? Spatial land management to sustain biodiversity and economic returns. Biological conservation.

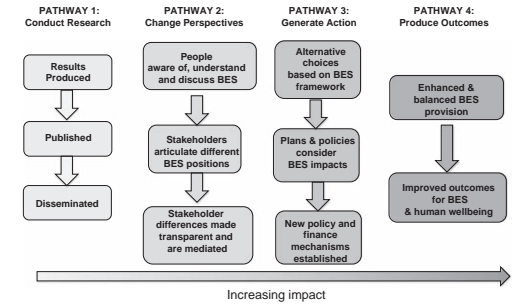
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Ruckelshaus, et. el. (2013). Notes from the field: Lessons learned from using ecosystem service approaches to inform real-world decisions. Ecological Economics.

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Restoration of ecosystem services in Seoul to enhance water quality in the bay.



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"We end, I think, at what might be called the standard paradox of the twentieth century: our tools are better than we are, and grow faster than we do. They suffice to crack the atom, to command the tides. But, they do not suffice for the oldest task in human history:

- to live on a piece of land without spoiling it."

Aldo Leopold, 1938

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