

Natural capital monitoring – a science perspective

NCI meeting on Monitoring Natural Capital in the UK

8th January 2016

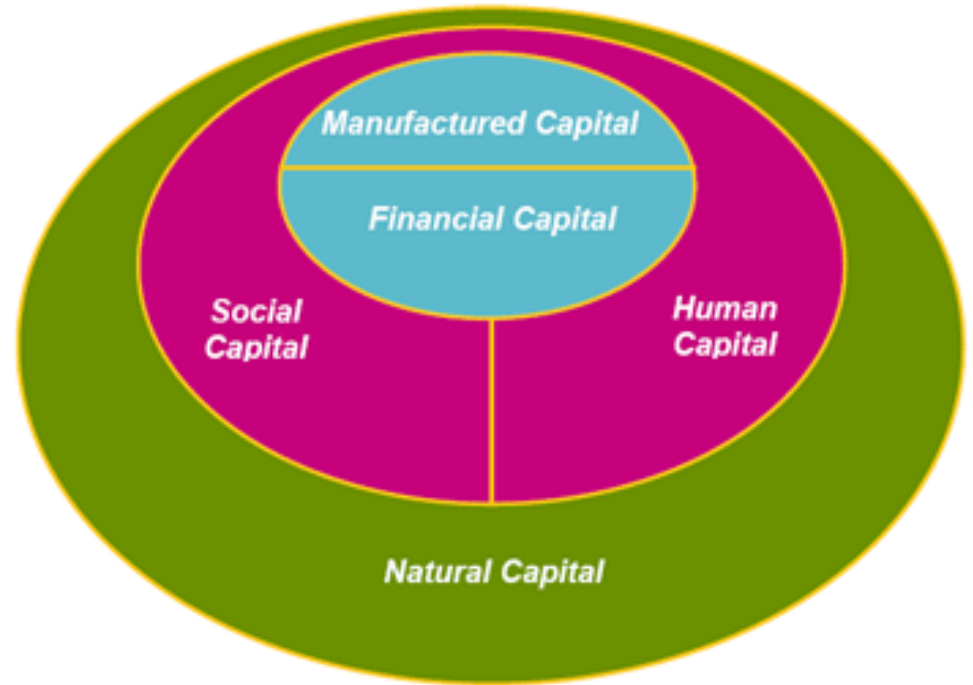
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What is natural capital?

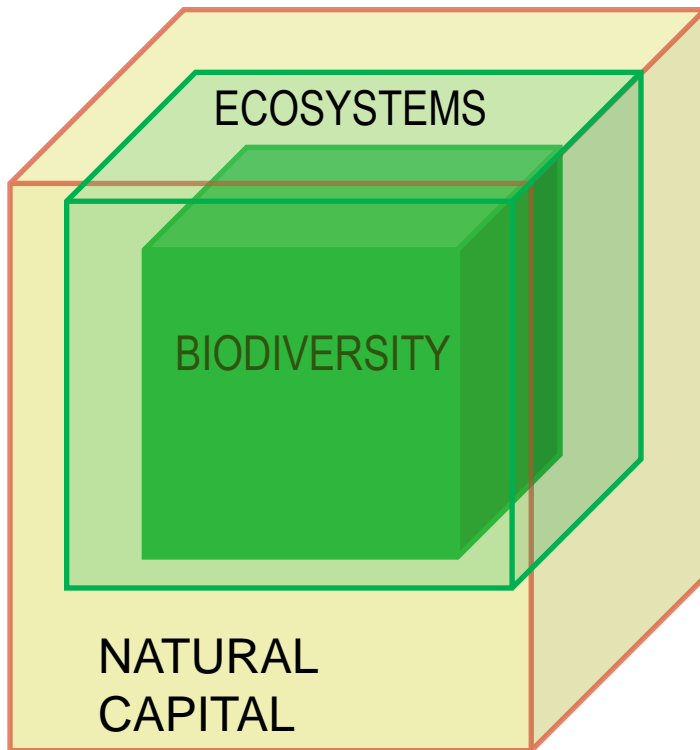
The term ‘natural capital’ is used to describe the parts of the natural environment that produce *benefits* of value to people (“*wealth*”).



<http://www.naturalcapitalcommittee.org/natural-capital.html>

<http://www.forumforthefuture.org/project/five-capitals/overview#sthash.Xmo2hc70.dpuf>

Natural Capital: terminology & definitions

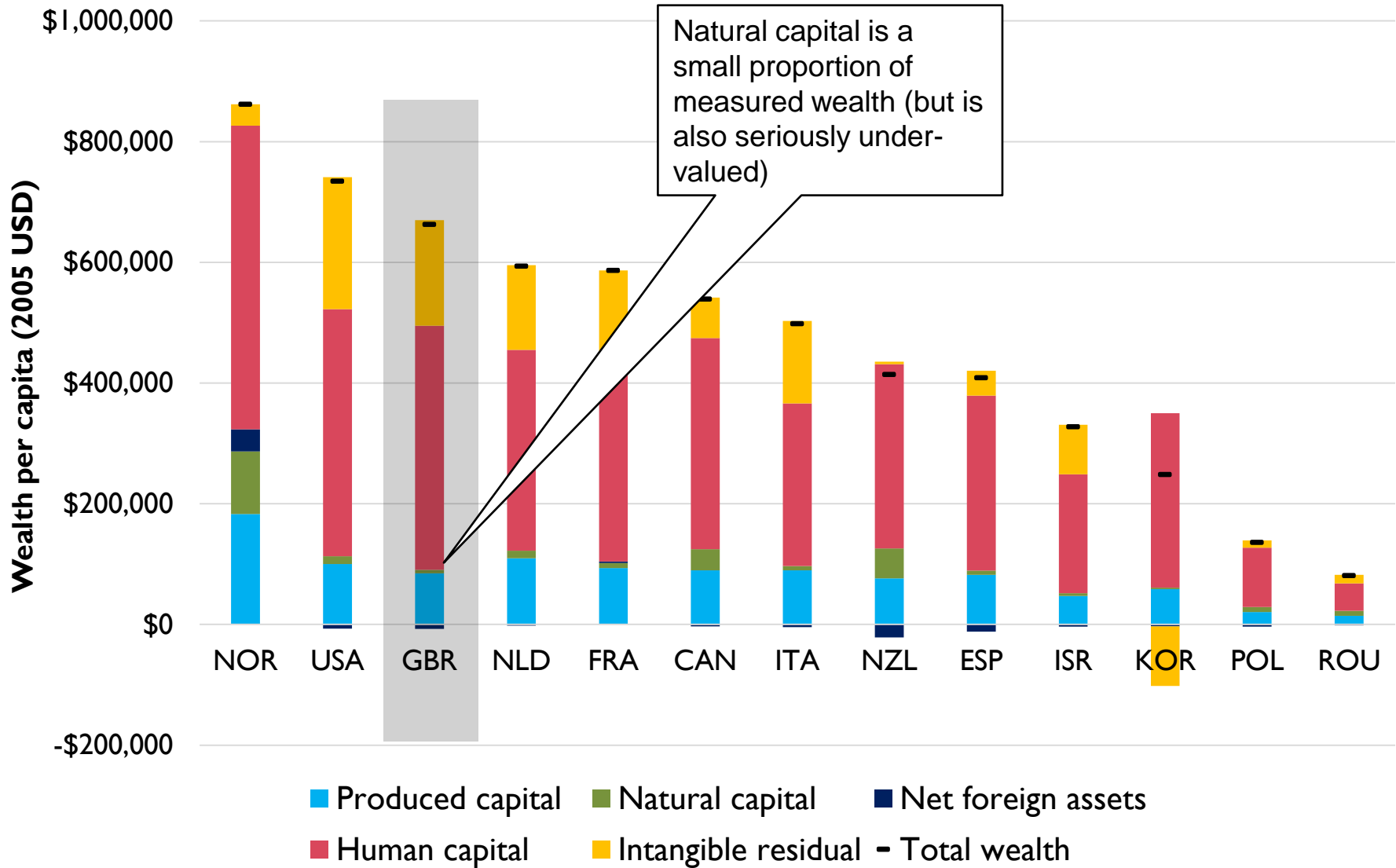


- Natural Capital > Ecosystems > Biodiversity.
- Includes sub-soil assets and non-renewables.
- But its not 'everything'...
- ...bounded by economics and focus on utility.
- An extension of ecosystem services with a greater focus on 'stocks'.

What is wealth?

- Wealth is the *stock* of assets that can generate future income and well-being.
- The *flow* of value (income) is the return on wealth
- So wealth and income are related, though often rather weakly



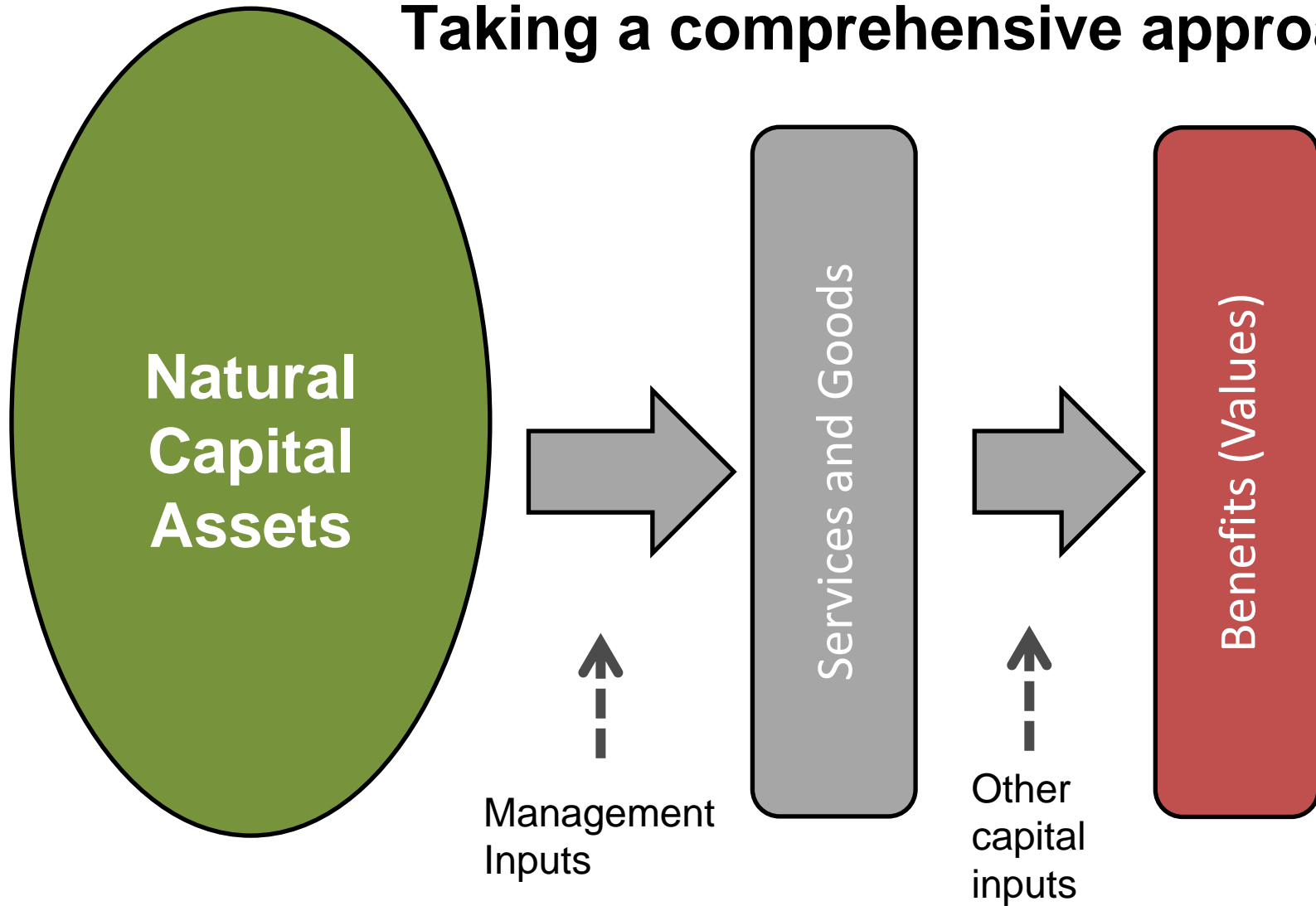


Source: Hamilton and Hepburn (2014, Oxrep); Wealth. NB: Total wealth is estimated (per World Bank, 2011) as the present value of future consumption. Natural and produced capital are measured bottom-up, residual is allocated to human or residual

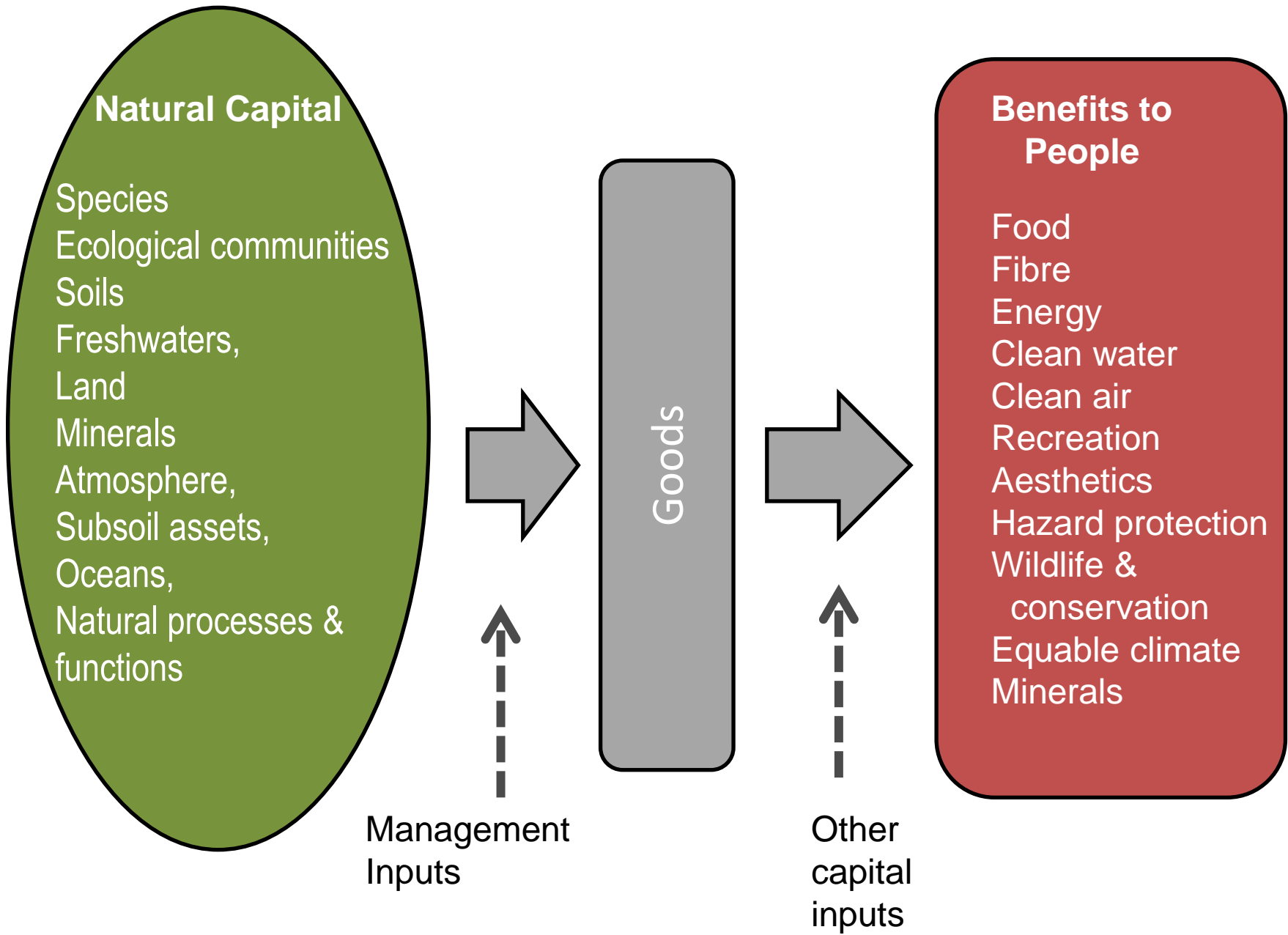
How is natural capital under-estimated ?

- Values are *prices*, subject to biases, not always an accurate reflection of social value.
- Sometimes, markets do not exist. Non-market-valuation techniques can be ‘corrected’ for market failure – the ‘shadow price’.
- Only some values are included – e.g. forest values for timber, C seq only
- The accounts are incomplete

Taking a comprehensive approach

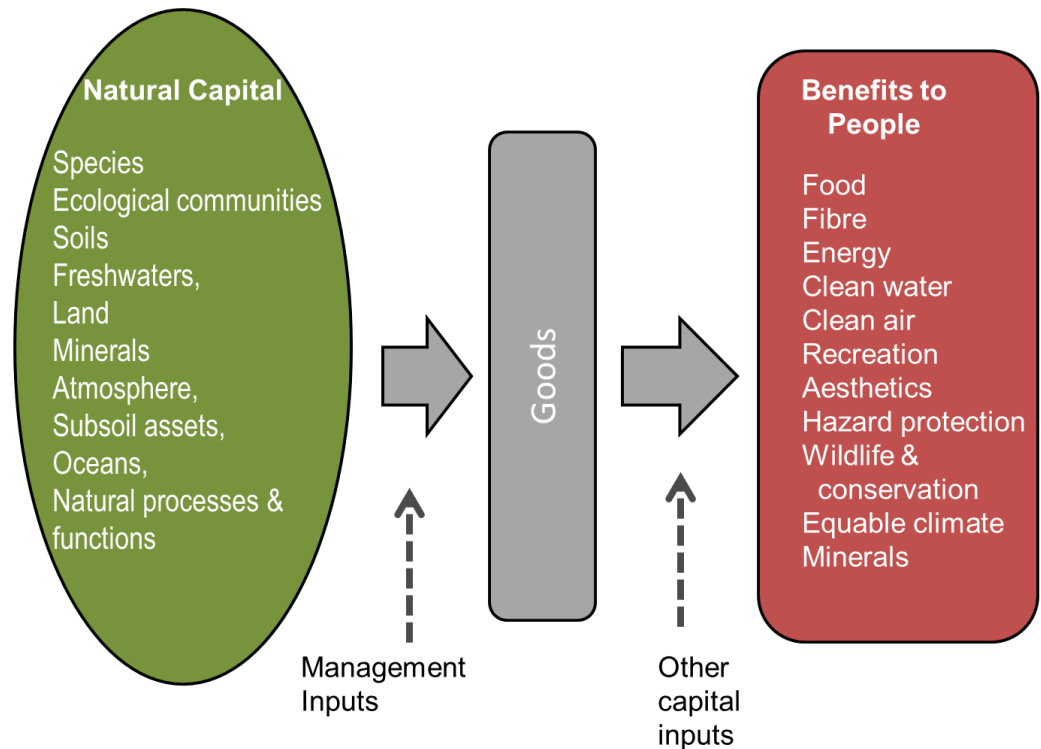


What are the assets and what are the benefits?



The linkages between each asset and any benefit is complex; there are multiple dependencies and feedbacks

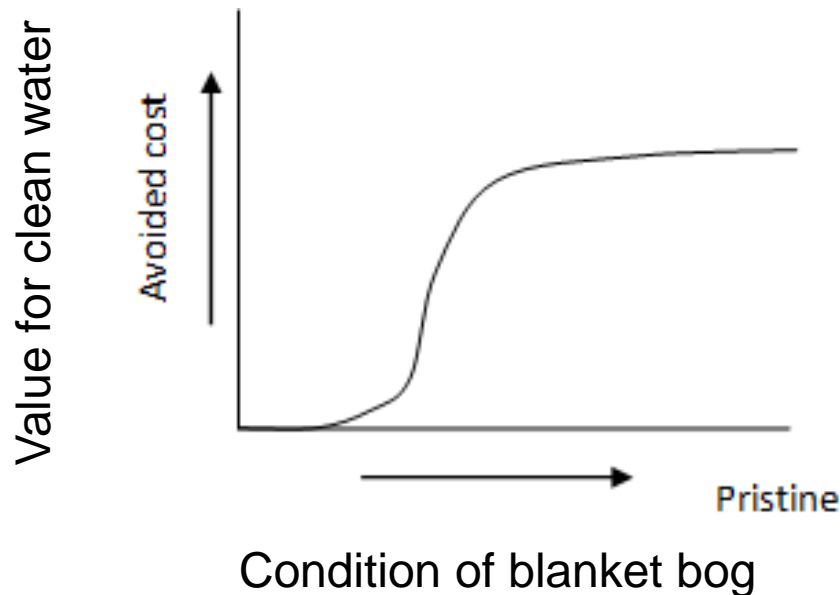
But, the benefits can be valued (££, health terms), and the major natural capital asset underpinning identified



Valuing natural capital

- We define the value of natural capital assets in terms of the value of the benefits that society derives from them.
- This may be different from simple measures of the asset itself

Valuing the restoration of blanket bog for clean and clear water

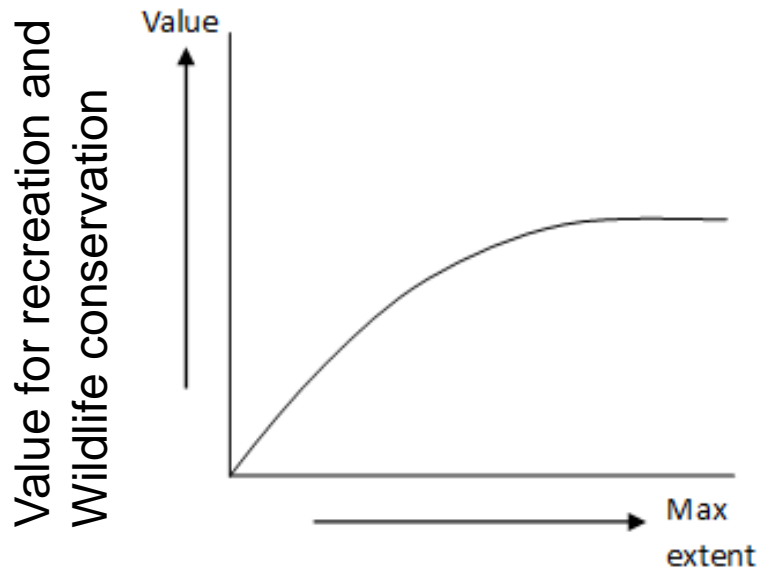


As the quality of blanket bog improves, the cost of treating water to drinking water standards will decrease.

Peat accumulation immobilises nutrients.

The impact of degraded peatland on clean water is significant.

Valuing the increased planting of woodlands for recreation and wildlife



Extent of woodland planting in the UK

The value increases with the area of woodland. However, there will be a point where it saturates.

Woodlands have many different benefits.

Location is very important for recreation

General points about monitoring

- Monitoring is the process of gathering information about state variables over time for the purpose of drawing inferences about changes in state
- Monitoring should be guided by objectives, e.g. knowledge versus decision-support.
- Allocation of funding for monitoring should be informed by the value of any monitoring scheme for achieving the objectives.

The purpose of monitoring determines the practice of monitoring

Knowledge-focus

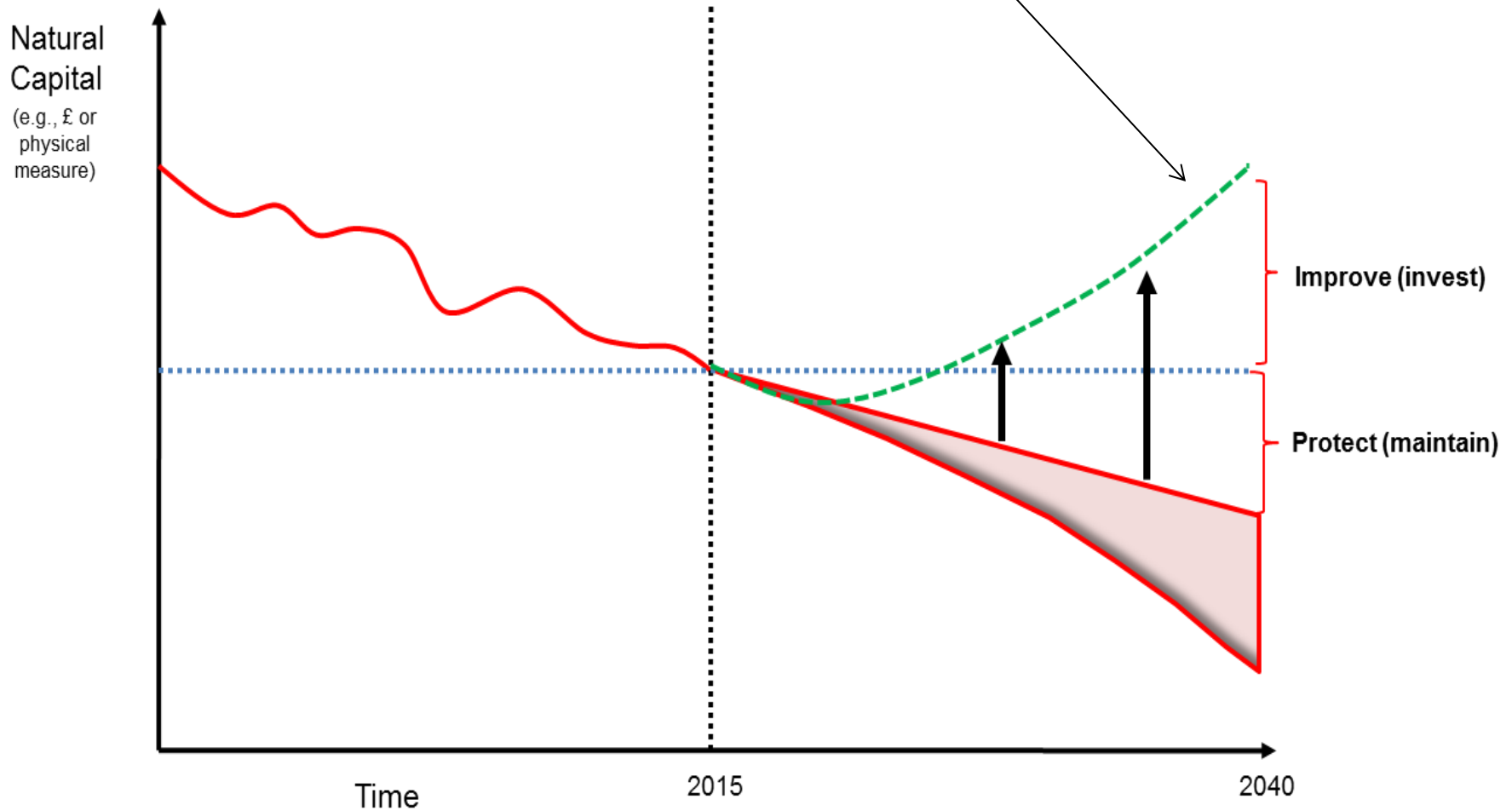
Learn about the system
 Detect unexpected change
 Raise awareness
 Audit management actions
 Inform policy and decisions



Action-focus

The goal – the 25 year plan to restore natural capital

To improve the environment within a generation



Summary

- We have defined natural capital assets and provided a basis for metrics
- Metrics of natural capital assets should relate to the benefits that emerge from them
- Monitoring should be designed to gather information for the metrics *efficiently*, i.e. with relevance to the objectives
- There is work to be done to:
 - streamline and validate the metrics
 - develop the natural science underpinning asset-benefit relationships