Department
for Environment
Food & Rural Affairs

Ecosystem Accounting in the UK
Review of National Experience and Expected Outcomes

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Background

- The Natural Environment White Paper published in June 2011 included a commitment to fully include natural capital in the UK Environmental Accounts, with early changes by 2013 and further improvements by 2020.

- The NEWP also created the Natural Capital Committee (NCC), who aim to provide independent expert advice on the state of English natural capital.

Process

- National Ecosystem Assessment (NEA): We have used the NEA to help prioritise work and our 8 broad habitats are based on the NEA.

- NCC: We work with the NCC to identify priority habitats in line with the NCC remit.

- Roadmap: Last December the Office for National Statistics (ONS) published our roadmap to 2020 setting out the timeline and approach for the development work.

Timeline for Ecosystem Accounts

Ecosystem accounting roadmap, 2013-20
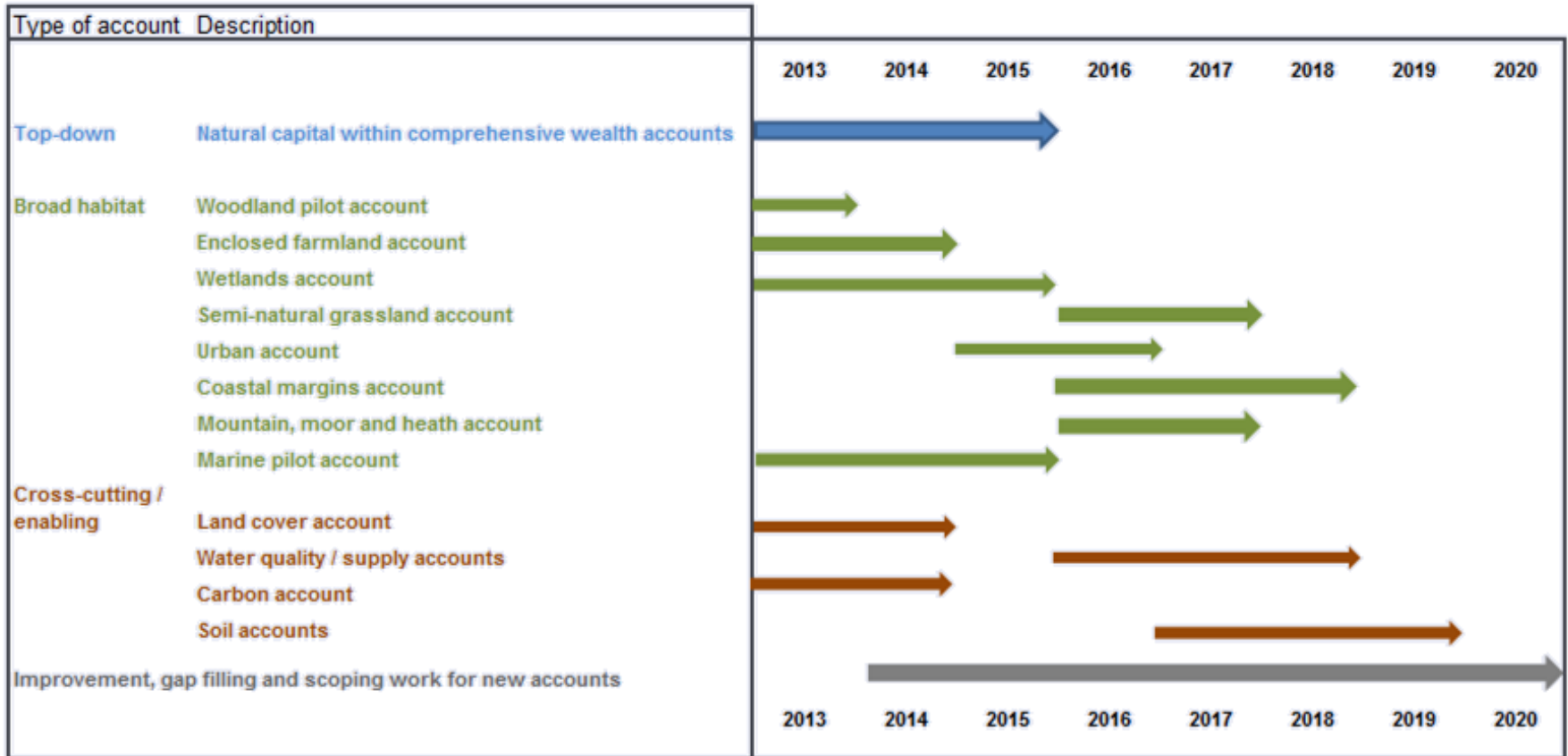
Progress to date

Top down accounts
Monetary valuation of **oil and gas** reserves published 26th June 2013
Update note on progress on **top-down** accounts published 26th June 2013

Cross-cutting accounts
Land use/land cover: physical asset account for **land use** to be published 26th June 2013
Carbon: exploratory work on **carbon in soils** completed, need further research into carbon flows

Priority habit accounts
Initial physical asset accounts discussion paper for **woodlands and timber** resources assets June 26th 2013
Methodology for monetary valuation of UK **timber resources 26th** June 2013
Discussion paper on **woodlands ecosystem** asset and services accounts 26th June 2013
Enclosed farmland: discussion paper drafted, work on-going

Cross Cutting Accounts

Gigagrams carbon (GgC)	Geocarbon					Biocarbon			Atmosphere	Water in Oceans	Accumulation in economy				TOTAL
	Lime stone	Oil	Gas	Coal	Other	Terrestrial ecosystems	Aquatic ecosystems	Marine ecosystems			Inventories *	Fixed assets	Consumer durables	Waste	
Opening stock															
Additions to stock															
Natural expansion															
Managed expansion															
Discoveries															
Upwards reappraisals															
Reclassifications															
Total additions to stock															
Reductions in stock															
Natural contraction															
Managed contraction															
Downwards reappraisals															
Reclassifications															
Total reductions in stock															
Imports and exports															
Imports															
Exports															
Closing stock															

*Excludes inventories included in biocarbon (e.g. plantation forests, orchards, livestock, etc)

Framework

- Structure of asset accounts has to reflect the services. The accounts have to provide information about the characteristics of the stocks which are key to the delivery of the services. These characteristics are quality, quantity and spatial aspects.

- The NCC have created a conceptual framework demonstrating how assets and services (benefits) can inter relate.

- This is a work in progress which we are using to informed the development of accounts.
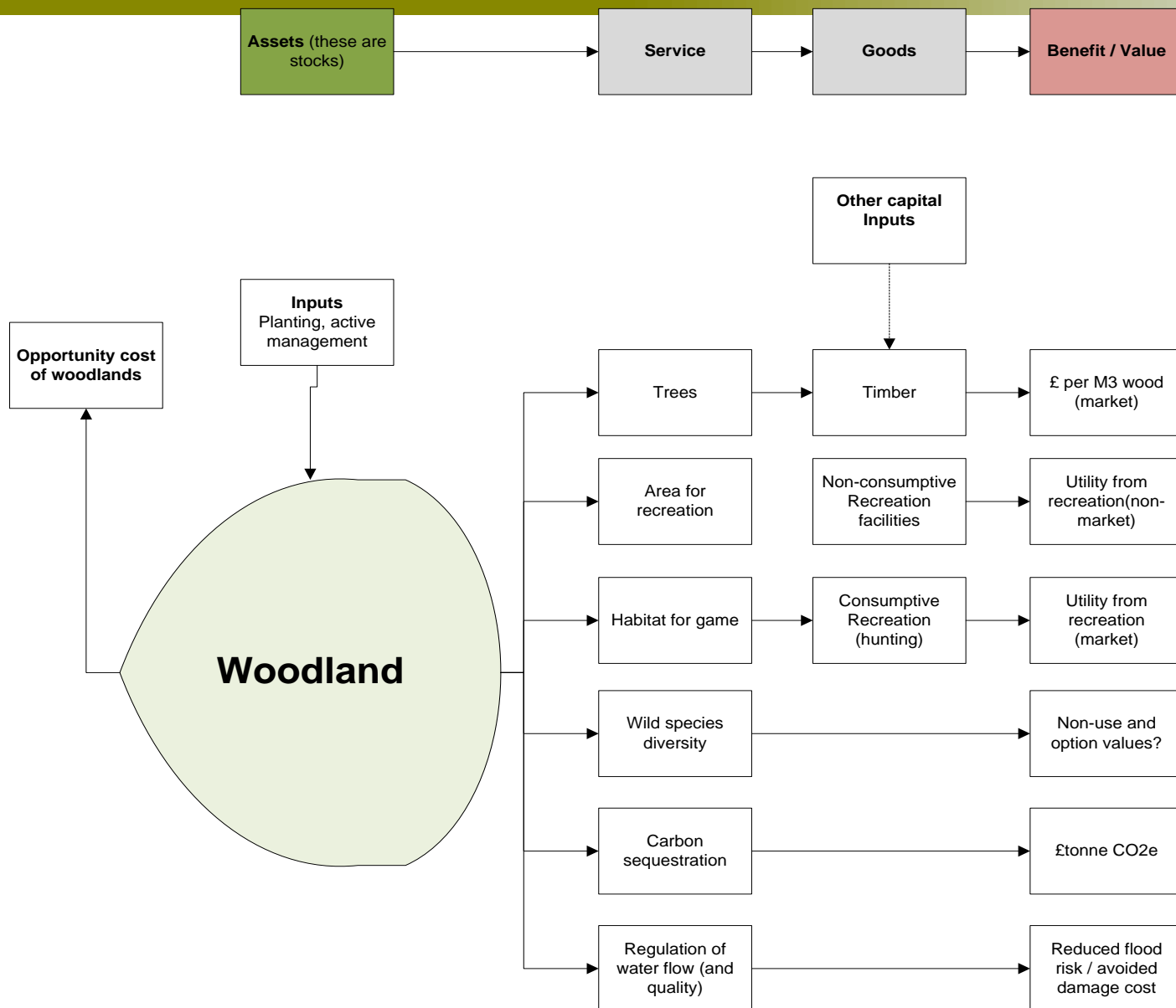
Conceptual Framework
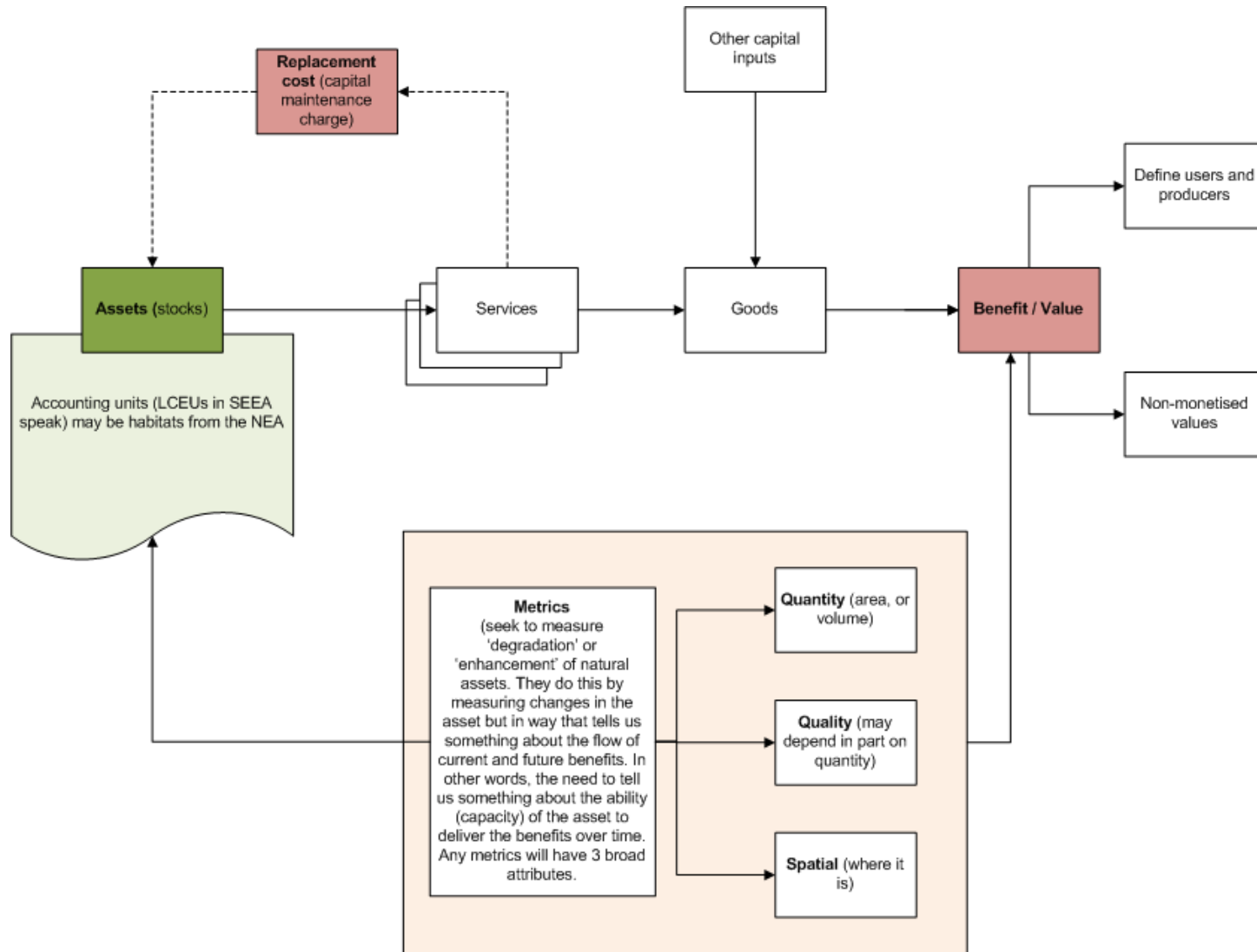
The State of Evidence for Woodland

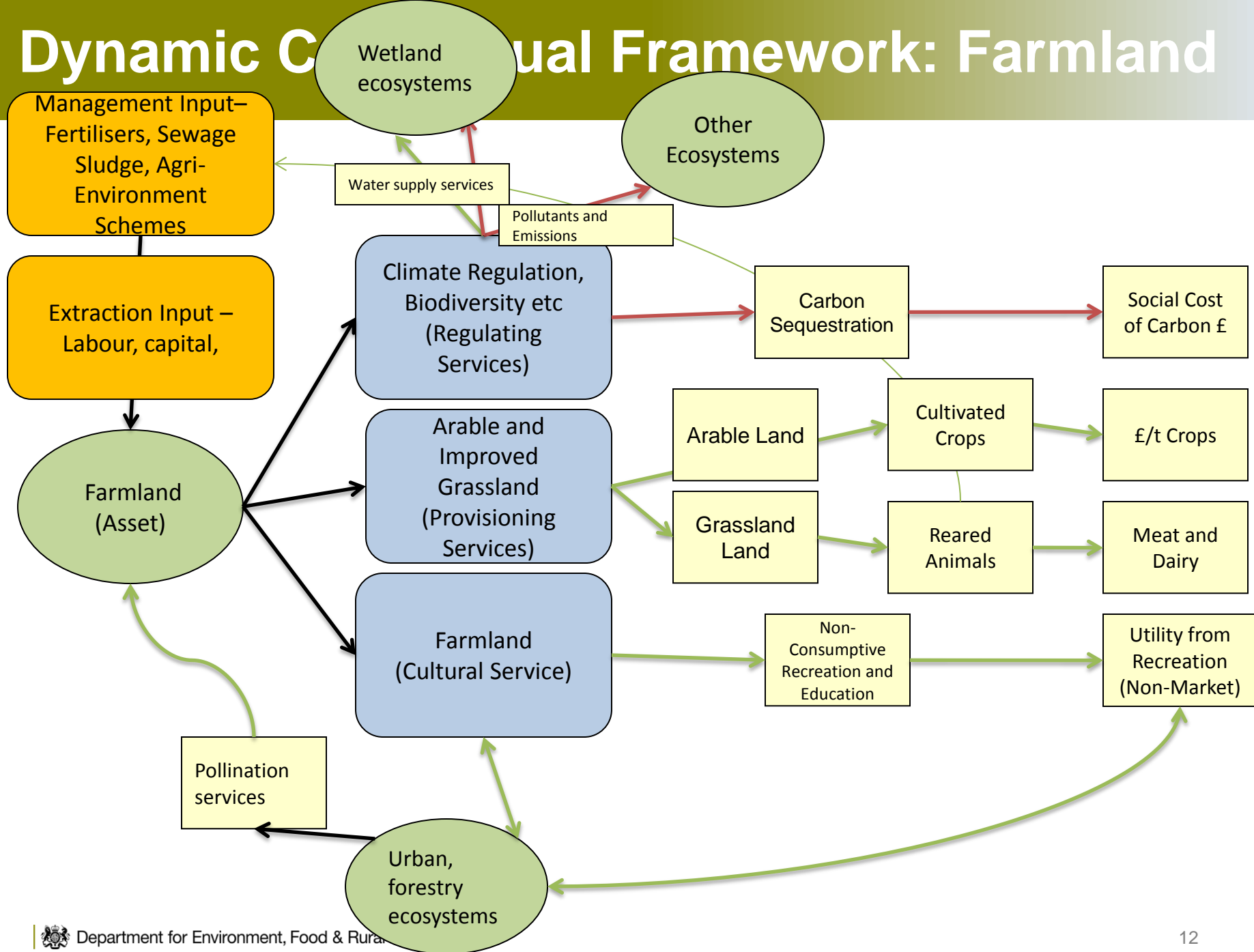| Habitat (spatial accounting unit)	Service (flow)	Goods produced (with other capital inputs)	Benefit / Valuation evidence (Recreation cost potentially applies in all cases)	
Woodlands	Trees	Timber	Market value, resource rent	Good
	Area for recreation	Non-consumptive recreation	Economic activity from tourism (Gross value added) Utility from recreation (non-market values including travel cost and stated preference, consumer surplus included)	Some
	Habitat for game	Consumptive recreation	Market value, resource rent, stated preference (including consumer surplus)	Good
	Wild species diversity	-	Limited market values / resource rents. Mainly stated preference (aimed at capturing non-use and option values). Varying degrees of robustness.	Poor
	Carbon sequestration	-	Non-traded (or traded) shadow price of carbon (essentially a cost based approach)	Good
	Regulation of water flow (and quality)	Reduced risk of flooding / drought (physical data preventing robust valuation)	Market value (damage cost avoided, changes in output). Hedonic pricing (changes in property values). Stated Preference (WTP/WTA distress of flooding)	Poor

The State of Evidence for Farmland

Habitat (spatial accounting unit)	Service (flow)	Goods produced (with other capital inputs)	Benefit / Valuation evidence (Recreation cost potentially applies in all cases)	
Enclosed Farmland	Arable Land	Cultivated Crops for Food and Biomass	Market Value, Resource Rent, Productive Potential Assessment	Good
	Improved Grassland	Reared Animals and Dairy	Market Value, Resource Rent, Productive Potential Assessment	Good
	Area for Recreation and Education	Non-Consumptive Recreation and Education	Utility from recreation and educational farmland visits(non-market values including travel cost and stated preference, consumer surplus included) apportioned to farmland.	Some
	Climate, soil and water regulation.	Sequestration, filtration and flow regulation (all negative)	Social cost of carbon, apportionment of clean up and pollutant costs from market values and stated preference studies.	Some
	Pollination and Wild Species Diversity	Crop pollination and maintenance of biodiversity	Market value of output, Replacement cost estimates (pollination) and stated preference estimates for bird species. (possible double counting with cultivated crops)	Some

Static Conceptual Framework: Woodland

Dynamic Conceptual Framework: Farmland

Management Input– Fertilisers, Sewage Sludge, Agri-Environment Schemes

Extraction Input – Labour, capital,

Farmland (Asset)

Wetland ecosystems

Other Ecosystems

Water supply services

Pollutants and Emissions

Climate Regulation, Biodiversity etc (Regulating Services)

Arable and Improved Grassland (Provisioning Services)

Farmland (Cultural Service)

Carbon Sequestration

Social Cost of Carbon £

Arable Land

Cultivated Crops

£/t Crops

Grassland Land

Reared Animals

Meat and Dairy

Non-Consumptive Recreation and Education

Utility from Recreation (Non-Market)

Pollination services

Urban, forestry ecosystems

Research Programme

- Currently, as per the Roadmap, the ONS is working on Woodland, Land Cover, Oil/Gas and Wetland accounts whilst Defra works on Enclosed Farmland and Cross Cutting Carbon Accounts.

- We are looking into running a contract for development of Marine accounts and other ecosystems.

- Questions such as cross cutting accounts and especially valuation are under discussion. The UK is holding a workshop on valuation issues in November 2013.

Valuation

- Physical accounts are a necessary step and important as stand alone accounts, the UK is also interested in valuation.

- We want to work in the SEEA framework whenever possible for the broad habitats and cross-cutting accounts, bearing in mind that this is evolving

- At the same time we need to be pragmatic about data availability and overall feasibility of valuation approaches

- We may need to rely on proxy values in a number of areas where suitable valuation evidence is not readily available

Managing Expectations

- Accounts won't necessarily add up, especially in the earlier versions and there is a high risk of double counting.

- When accounts do not add up, it is important to focus on measuring the change in an account so that we can understand the change taking place.

- Periodicity will range between 1-5 years. Accounts such as timber can be readily updated but others would not make sense to update more than in 5 year intervals.

- Indicators: Intention is to establish a set of accounts which can be assessed and applied to national accounts data. Issues about whether such accounts can support 'Green GDP' estimates have not yet been resolved.

A Few Key Challenges

- The need to manage stakeholder expectations; balance quick wins with a longer term research agenda.

- Spatially detailed data: we have a lack of data from a spatially detailed, bottom up focus and it is important that GIS modelers and other data experts are involved from an early stage. Spatial disaggregation will require different statistical assessments and finer breakdowns

- Limits and thresholds.