



Department
for Environment
Food & Rural Affairs

Developing Natural Capital Accounts for the UK: a brief introduction

Valuing Nature Network Event
September 2017

Colin Smith

Defra, Environment Analysis Unit



Forestry Commission
England



Environment
Agency

Why we need to account for natural capital

- GDP tells us only part of our economic story
 - hides and excludes services provided by natural capital
 - focuses only on flows, not stocks
 - nature is priceless but not valueless
- Accounts have a foundational role - Natural Capital Committee and NEA
- Signalling and leadership
- “What doesn’t get measured doesn’t get managed”

A developed set of accounts can ...

- ✓ offer a systematic overview of natural assets and related ecosystem services - illuminate losses, gains over time, trade-offs
- ✓ provide an integrated information set for further analysis of economy–environment interactions
- ✓ inform resourcing and management decisions and business cases
- ✓ highlight links between economic activity, ecosystem service provision and pressures on natural capital
- ✓ inform educational and communication tools for different audiences
- ✓ expose data gaps and valuation challenges

Defra-ONS Natural Capital Accounting Programme

- Conceived in 2012 following commitment in Natural Environment White Paper and international commitments
- Strong recommendation in all NCC reports



“We agree that getting natural capital into the national accounts by 2020 is a priority”

(Government response to Natural Capital Committee report, Sept 2015)



Building on a constructive partnership between Defra and ONS

ONS provides

- Links to Environmental and National Accounts
- Access to data scientists, other national data sources
- Experience in compilation of accounts
- Research funding and staff resources
- Official statistics status and outreach to new stakeholders

Defra provides

- Policy perspective
 - Ecosystems accounting and environmental economics expertise
 - Access to environmental scientists, data sources, international experts
 - Research funding and staff resources
-

So what are Natural Capital Accounts?

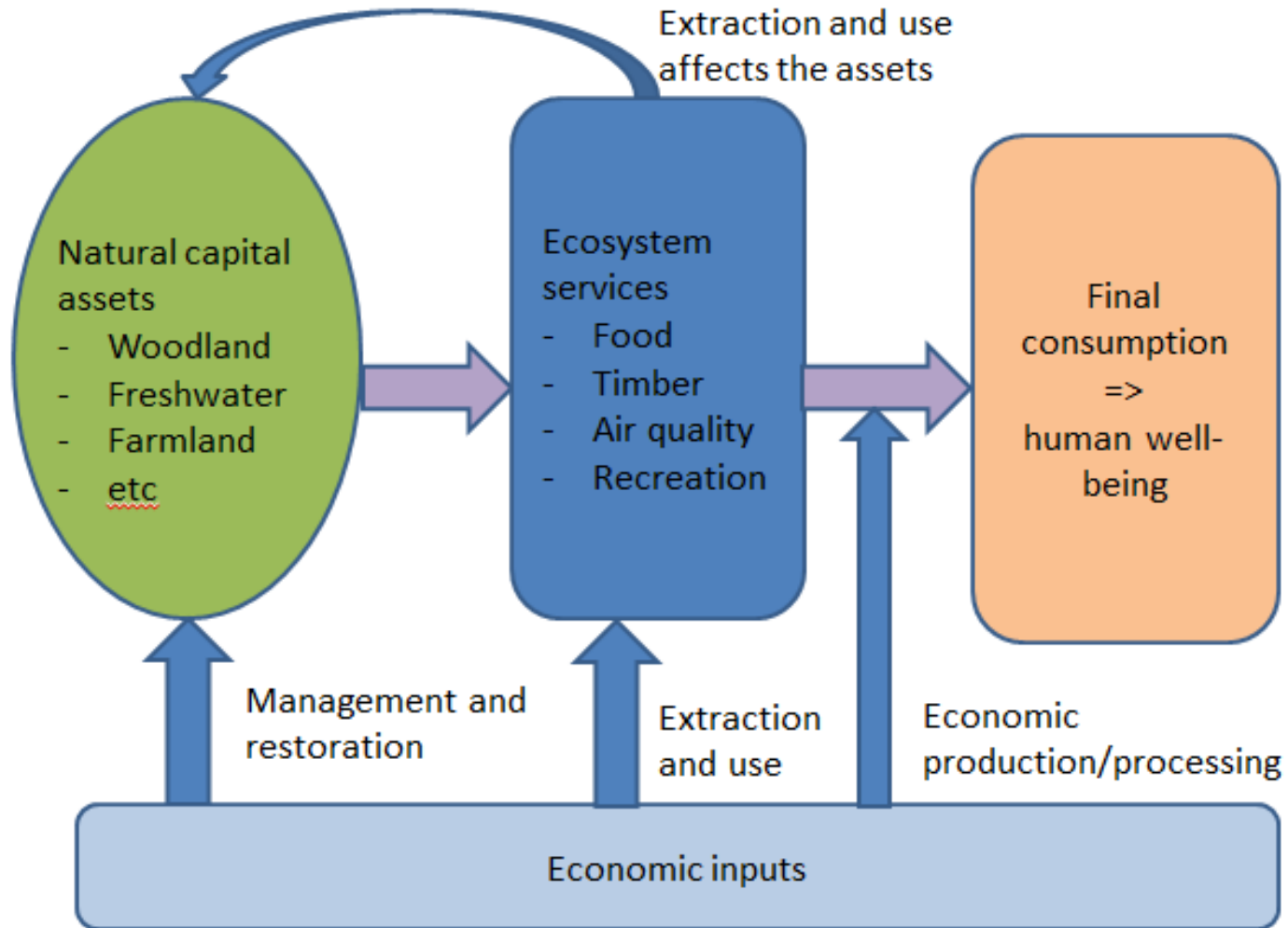
Extensions of standard national accounting to natural capital / ecosystems

- **Stocks and flows**
 - Stock of assets at a point in time (extent / condition / wealth)
 - “Supply” of services provided and used each year – concept of “transactions”
- **Physical and monetary measures**
 - Allows for balanced sustainability and wealth perspectives
 - Wide range of services don't have a market value
- **Contribution of natural capital to economic production and welfare**
 - Final benefits may be included in GDP or not
 - Beneficiaries are economic or social entities e.g. households, businesses
- Spatial detail important



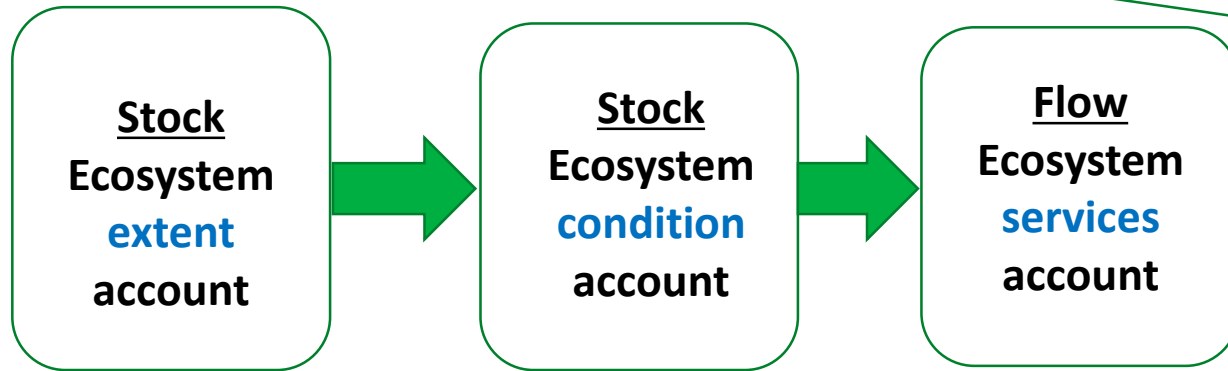
A coherent and rigorous framework within which to understand and monitor change

Equal emphasis on both assets and services



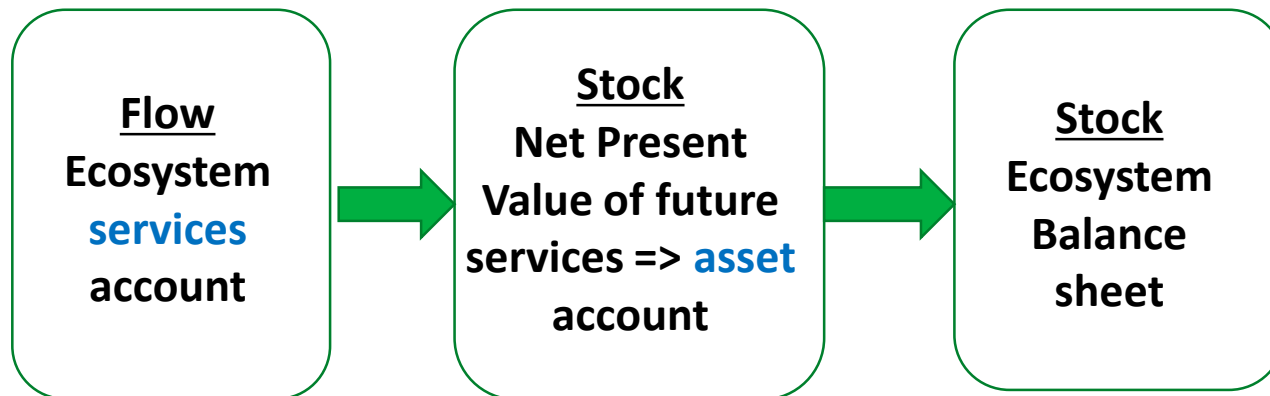
This perspective gives rise to a standardised set of accounts (not one account!)

Non-monetary accounts



Describe the state of the asset and flows of services in physical terms

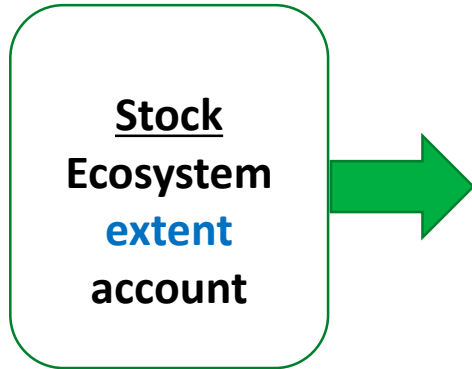
Monetary accounts



Describe the value of the services and place a value on the asset itself

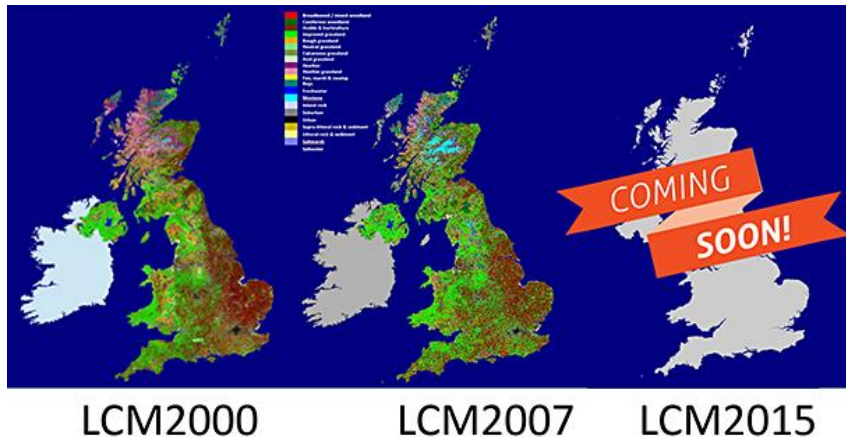
Stock accounts – ecosystem extent

In future the UK ecosystem extent accounts should systematically reflect the full range of 23 Land Cover classes from the Land Cover Map



Information on extent and condition of each asset can be linked with information on:

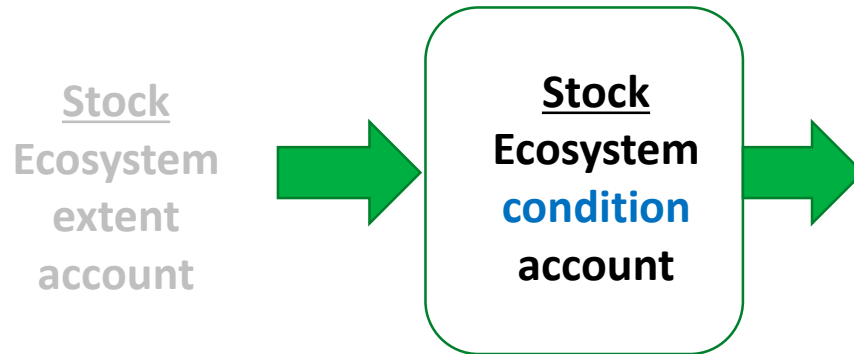
- land use
- landscape type,
- land ownership
- protected area status
- land management practices



Broad Habitat	LCM habitat class
Woodlands 	1 Broadleaved woodland
	2 Coniferous woodland
Enclosed farmland 	3 Arable and horticulture
	4 Improved grassland
Semi-natural grassland 	5 Rough grassland
	6 Neutral grassland
	7 Calcareous grassland
	8 Acid grassland
Open water, wetlands, floodplains 	16 Freshwater
	9 Fen, marsh and swamp
	12 Bog
Mountains, moorlands, heaths 	10 Heather
	11 Heather grassland
	13 Montane habitats
Marine 	14 Inland rock
	15 Salt water
	19 Littoral rock
Coastal margins 	20 Littoral sediment
	17 Supra-littoral rock
	18 Supra-littoral sediment
Urban 	21 Saltmarsh
	22 Urban
	23 Suburban

Stock accounts - ecosystem condition

To monitor changes in stock in terms of its capacity to continue to deliver ecosystem services.



Capacity to deliver services can be influenced by quantity, quality and spatial configuration:

Relevant volume estimates (e.g. timber biomass, water quantity or flow, length of linear features)

Biodiversity indicators (e.g. abundance indicators, mean species richness)

Soil indicators (e.g. carbon content, water content)

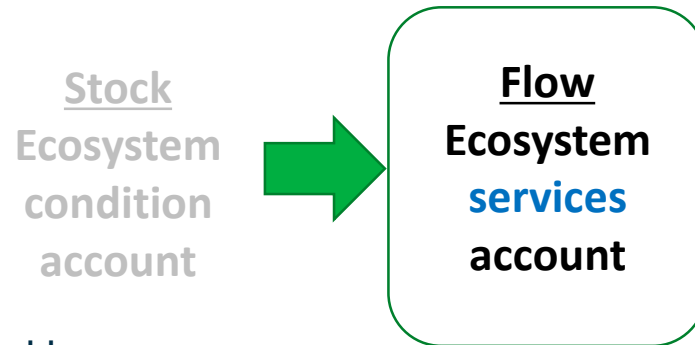
Ecological condition indicators (e.g. water quality, plant health, invasive species)

Spatial configuration (e.g. fragmentation, connectivity)

Access (e.g. proximity to areas of population)

Management practices (e.g. organic farming, degree of protection)

Flow accounts - ecosystem services (physical)



- Services are strictly defined by reference to the **interface** between the ecosystem and the economy/society
 - **Classification** follows standard NEA approaches (provisioning /regulating / cultural services)
 - **Spatial dimension important** for understanding supply of services
 - **Service flows may need to be modelled** using spatially detailed data e.g. air filtration by vegetation, noise mitigation, water flow regulation
-

A range of services we want to measure and value

SUPPLY TABLE (£bn)

Woodland	Freshwater	Farmland	Marine	Coastal margins	Mountain, moor and heath	Semi-Nat Grassld	Urban
----------	------------	----------	--------	-----------------	--------------------------	------------------	-------

Provisioning Services

- Input to food productions
- Biomass for timber
- Fish capture
- Renewable energy
- Oil and gas
- Public water supply
- Peat extraction

		High value					Lower value
High value							
	Lower value		Medium value				
	Medium value	Medium value	Medium value		High value		
			High value				
	High value						
	Lower value						

Regulating services

- Air pollutant filtration
- Carbon seq
- Flood risk reduction
- Temperature regulation
- Noise regulation
- waste mediation

High value	Lower value	Lower value		Lower value	Lower value	Lower value	Lower value
High value		Lower value		Lower value		Lower value	
High value				Medium value			Lower value
							Lower value
							Lower value
Lower value	Lower value	Lower value	Lower value		Lower value		

Cultural services

- Contribution to recreation
- Contribution to tourism
- Health savings
- Local amenity value
- Educational interactions

High value	Medium value	Medium value		High value		Lower value	High value
Lower value	Lower value	Lower value	Lower value	Lower value	Lower value	Lower value	
							High value
Lower value				Lower value			Lower value
Lower value	Lower value	Lower value	Lower value	Lower value	Lower value	Lower value	Lower value

The current state of UK ecosystem accounts



Woodland



Farmland



Freshwater

Initial accounts established

- ***Core accounts, based on UK Broad Habitats***



Urban

Initial account in development

- ***Together they provide a complete overview of UK ecosystems***



Mountains/
moorlands



Coastal
margins

Scoping study completed

- ***Spatially detailed accounts where possible and separate accounts for specific habitats such as peatland***



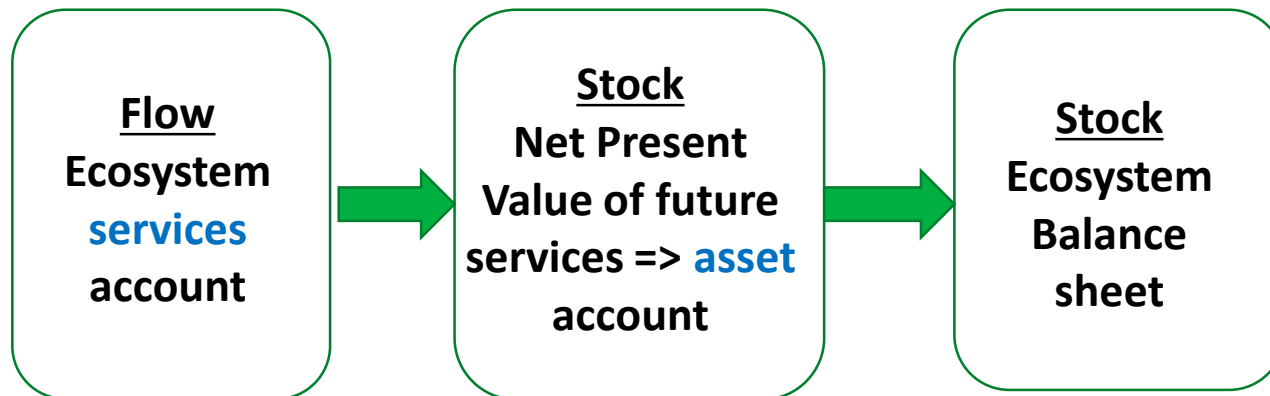
Semi-natural
grassland

To be completed by 2020

Monetary flow and stock accounts



Monetary accounts



Two types of valuation in natural capital accounting

1. Valuing actual flow of services

- Valuation of services based on physical flows
- Many different methods used. Aim is identify and value the contribution of the ecosystem

2. Valuing ecosystem assets

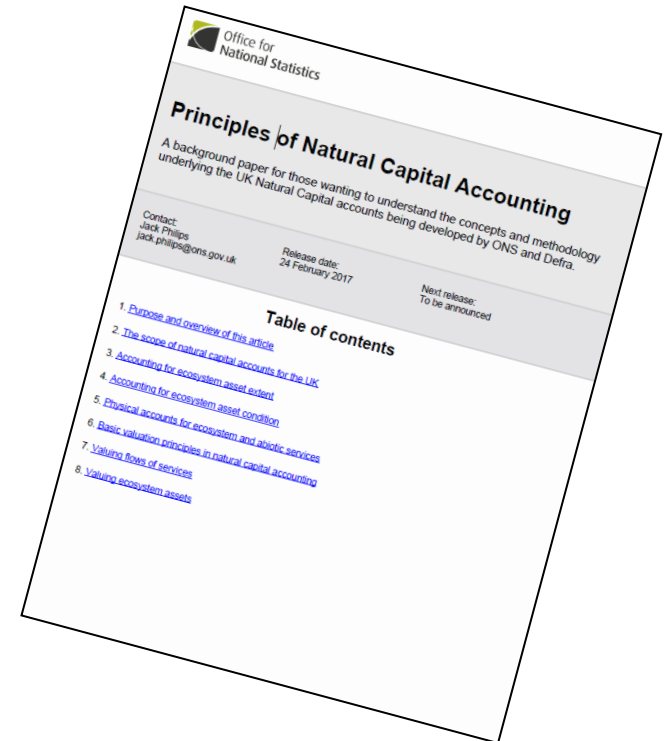
- Asset values are capital values (e.g. a house, a company share, a football player transfer) – reflect stream of expected benefits
- Based on projecting services over 100 years and discounting according to HM Treasury Green Book to a “net present value” i.e. a capitalised value.

Valuation provides a common metric through which services can be aggregated and compared within and across habitats

It enables comparisons with the flows and stocks that are already included in the System of National Accounts.

ONS-Defra accounting principles (updated 2017)

- ✓ Basis for consistent methodology in developing UK accounts
- ✓ Adapts and translates UN guidance for our purpose
- ✓ Institutionalises “learning by doing” – a virtuous circle
- ✓ Identifies issues needing further research and testing
- ✓ Much of the guidance relevant for accounting at sub-national level
- ✓ Scope to develop into a practical manual



What can we expect to have by 2020?

- A comprehensive set of habitat accounts that underpin high-level UK estimates. Limited spatial disaggregation
- Valuation of most key services, with reasonably stable estimates
- Established methods and data sources
- A number of regular natural capital account users
- Annual production rounds for key bulletins
- Pilot cost-based accounts, building upon current scoping work

Further developmental needed beyond 2020, especially spatial disaggregation

Limitations of accounting

- Can't value the full range of ecosystem services
- Accounts are retrospective and annual. Asset values require projections and educated guesses
- Evolving – need to establish accepted standards and methods
- Degree of spatial resolution affects results and interpretation
- Data challenges
 - Partial / missing data
 - Need for modelling, esp. spatial
 - Consistency with accounting needs
 - Time series critical

Uses and benefits of accounting

- Core to generational change - mainstreaming understanding of the value of nature in policy and decision-making
- Institutionalises interdisciplinarity
- Policy relevant indicators, linking data from different sources
- Basis for analysis, scenario development and modelling, linking with the national accounts
- Spatially disaggregated and sub-national applications
- Potential methods, standards and default data for corporate and sub-national accounting

Value of accounts will grow as time-series are developed, methods and data improved and understanding and use increased

