SEEA-EA Natural Capital Accounts in the UK

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What we'll cover today

- The UK journey to develop NCA
- Overview of UK NCA and key principles in relation to SEEA-EA
- Working with policy makers
- Challenges, successes and next steps

Developing the UK Natural Capital Accounts

Natural Capital

Recap - What we measure at the ONS

Natural Capital Accounts

- Physical and monetary accounts
- Habitat accounts
- Contributes to ONS inclusive income/wealth statistics

Today

Environmental accounts and surveys

- Low Carbon and Renewable Energy Economy Survey
- Green Jobs
- Physical and monetary emissions accounts
- Environmental Protection Expenditure Survey

Also…

- Rapid surveys of people & businesses' attitudes
- Energy Efficiency of Housing
- Climate & health in official statistics
- Measuring Progress, Well-being & Beyond GDP

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Background and a bit of history

- ONS started developing Natural Capital Accounts (NCA) in 2012, following development of SEEA EEA (Experimental Ecosystem Accounting).

- First UK NCA (aligned to SEEA-EA) published in 2019

- NCA statistics published in the Blue Book, October 2020

- Continuous methods development ever since, including increased granularity by UK four Nations in 2023

We will put natural capital at the heart of government accounting. We will work with the Office for National Statistics to fully include natural capital in the UK Environmental Accounts"

UK Government White Paper, 2011

The Review demonstrates that in order to judge whether the path of economic development we choose to follow is sustainable, nations need to adopt a system of economic accounts that records an inclusive measure of their wealth. The qualifier 'inclusive' says that wealth includes Nature as an asset.

Dasgupta Review, 2021

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SEEA Central Framework vs Ecosystem Accounts

- SEEA EA takes a spatial approach to accounting, as the benefits a society receives from ecosystems depend on where those assets are in the landscape in relation to the beneficiaries.

- SEEA Central Framework looks at individual environmental assets (resources), such as water or energy resources.
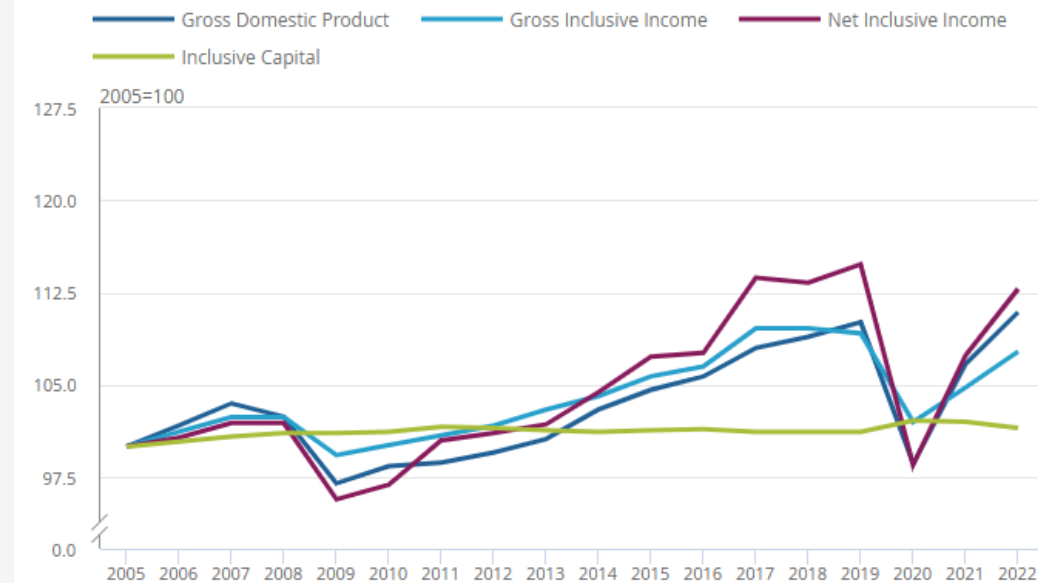
SEEA Ecosystem Accounts
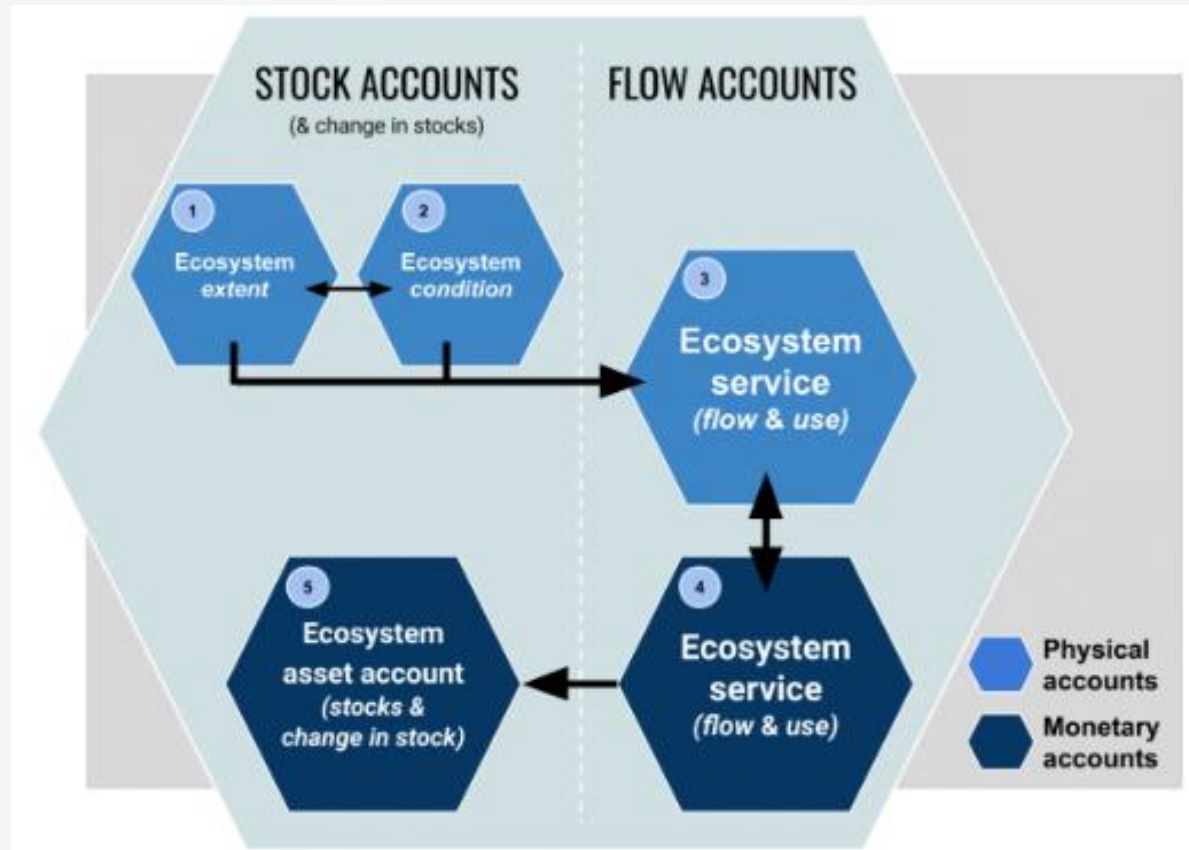
An integrated and comprehensive statistical framework for organizing data about habitats and landscapes, measuring the ecosystem services, tracking changes in ecosystem assets, and linking this information to economic and other human activity.

System of National Accounts

- NCA satellites of UN SNA

- Some overlaps for goods and services described in the SEEA-EA as "SNA benefits". They are largely "produced ecosystem" services, such as fish.

- With new SNA25 main inclusion of EA in SNA will be depletion, to calculate Net Domestic Product (NDP) alongside GDP

Inclusive income and wealth

Per person measures of gross domestic product (GDP), gross inclusive income (GII), net inclusive income (NII), and inclusive capital, chained volume measures, UK

— Gross Domestic Product   — Gross Inclusive Income   — Net Inclusive Income
— Inclusive Capital

2005=100

(Line chart with y-axis values 0.0, 97.5, 105.0, 112.5, 120.0, 127.5 and x-axis years 2005 through 2022)

Source: Office for National Statistics

- Provide a broader measure of the economic welfare of the UK population.
- Reflect the economic value of both paid activity (included in GDP), and unpaid activity, which includes **ecosystem services** and unpaid household services.

Habitat (Ecosystems) in UK NCA

Broad habitat classifications ONS use

➢ Woodland

➢ Urban

➢ Fresh water

➢ Enclosed farmland

➢ Mountain, moorland and heath

➢ Semi-natural grassland

➢ Marine

➢ Coastal margins

Extent

- SEEA guidance calls for the habitat types used by the International Union for Conservation of Nature (IUCN) Global Ecosystem Typology (GET) levels one to three

- Best available UK-wide land use data remain the UK Centre for Ecology and Hydrology (UKCEH) land cover maps. This 21-habitat typology is readily converted into the eight broad habitats

- Asset-based definitions of habitats are entirely mutually exclusive, while cross-cutting accounts can contain transitional areas associated with the primary ecosystem.

Condition

- We follow SEEA template – but data gaps exist

- Challenge: identify "reference condition" – conceptual ideal condition, start of the reporting period, or a Government target?

- We use the most ambitious and technically robust reference condition available, including government targets

- However, SEEA recommends avoiding Government targets where possible

- The primary purpose of the condition account in the UK national capital accounts (NCA) is to help understand changes in the production of ecosystem services and consequent asset values

Table 35: Summary of the number of condition indicators, UK: 2010 to 2020

	Physical state	Chemical state	Compositional state	Structural state	Functional state	Landscape level characteristics	Total
Enclosed Farmland	0	0	5	0	0	1	6
Woodland	0	0	8	6	0	0	14
Semi-natural grassland	0	0	3	0	0	0	3
Mountain, moorland, and heath	0	2	3	0	0	0	5
Freshwater, wetlands, and floodplain	2	0	5	1	0	0	8
Coastal margins	0	0	3	0	0	0	3
Marine	1	0	2	1	0	0	4
Urban	0	0	3	0	0	0	3
Total	3	2	32	8	0	1	

Source: Office for National Statistics

Ecosystem Services – Physical flows

Table 4: UK nations breakdown of woodland annual physical flow by service, 2021

Service type	Provisioning		Regulating		Cultural	
Country	Timber provisioning total fellings (thousand cubic metres of overbark standing)	Woodfuel provisioning (thousand cubic metres of overbark standing)	Greenhouse gas regulating (thousand tonnes CO2 equivalent)	Air pollution regulating (thousand tonnes of pollutants)	Recreation and tourism (expenditure) (visits, million)	Recreation (health benefits) (people benefitting, million)
England	2,029.8	1,031.0	8,521.1	131.6	546.9	2.4
Scotland	7,101.6					
Wales	1,170.2					
Northern Ireland	461.6					
UK	10,761.9					

Conditions and Physical flows - Data Sources

Not a simple answer!

Ecosystem services – Monetary Flows (1)

- SEEA guidance emphasizes the use of exchange values when choosing prices for ecosystem services
- But exchange (market) prices not always available… or recommendable!

Table 1: Typology of valuation methods by preference order.

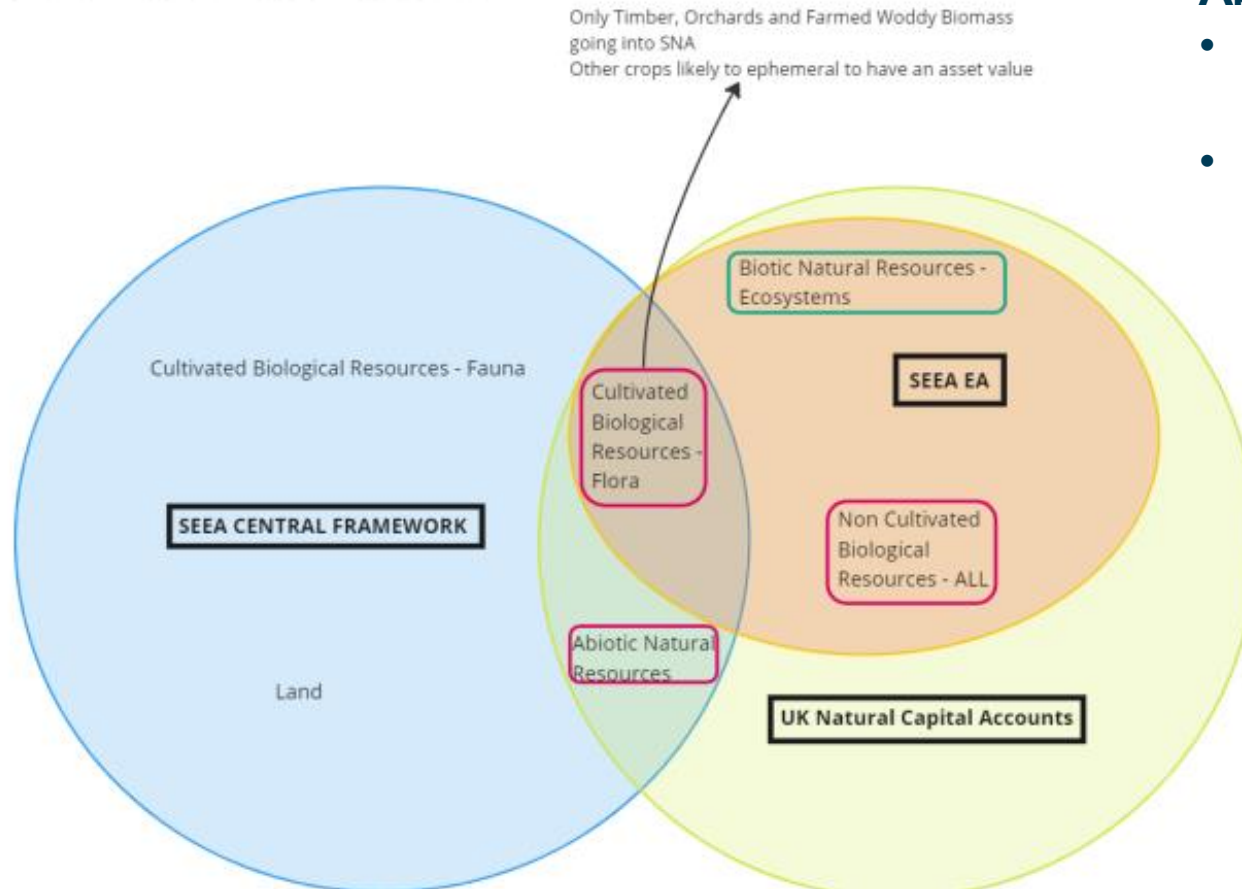| Tier (SEEA EA)	Desciption	Method	Alternative names	Acronym	Type
1	Directly observable values	Market prices	Gross Revenue; Public Pricing; Monetary Incentives	MP	Market price
2	Prices from similar markets	Proxy markets		PM	Market price
3	Embodied in market transactions				
		Resource rent	Net Factor Income; Residual Value	RR	Revealed Preference - direct
		Hedonic Price		HP	Revealed Preference - indirect
		Productivity Change	Production Function method	PC	Revealed Preference - direct
4	Related goods and services				
		Defensive Expenditure	Averting behavior; averting cost	DE, AB, AC	Revealed Preference - direct
		Travel Cost	Consumption expenditure	TC	Revealed Preference - indirect
5	Expected expenditures or markets				
		Replacement Cost		RC	Revealed Preference - direct
		Avoided damage costs	Cost of Illness; Human Capital	ADC; CoI; HC	
		Simulated Exchange Value		SEV	Modeling
	Other methods				

Ecosystem services – Monetary Flows (2)

- Resource rent approach widely used for multiple services in UK NCA

  - Surplus value accruing to the extractor or user of a natural capital asset calculated after all costs, including opportunity costs, have been considered.

- Various other methods used: Health Benefits, hedonics (house prices)

Ecosystem Assets valuation

- The accounting asset life is the time over which the services from a natural resource or habitat are expected to be supplied

- We use 25 years as a default for non-renewable resources, following the World Bank's [The Changing Wealth of Nations report](#)

- For renewables we adopt a 100-year asset life to better reflect the longevity of renewable natural assets.

- We assume consistent production based on recent years over the appropriate asset lifetime, using a five-year average or trend.

Natural Capital Accounts

Only Timber, Orchards and Farmed Woddy Biomass going into SNA
Other crops likely to ephemeral to have an asset value

Abiotic resources
- **SEEA EA** treats these separately from ecosystem services and applies accounting in line with CF
- **ONS** includes abiotic resources in natural flows and assets withing NCA
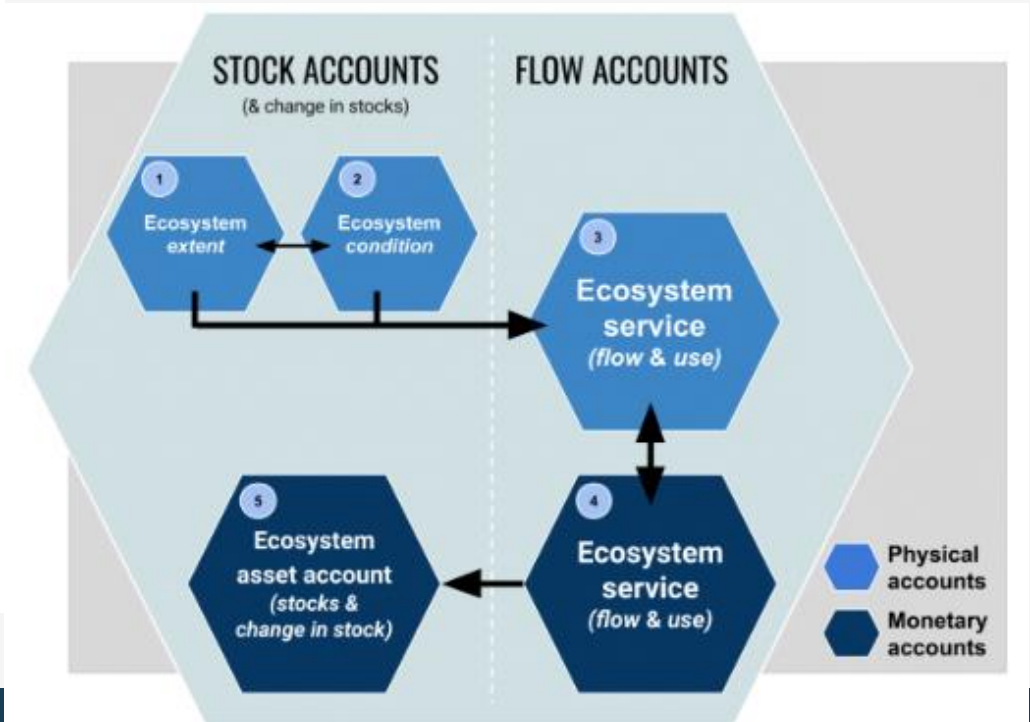
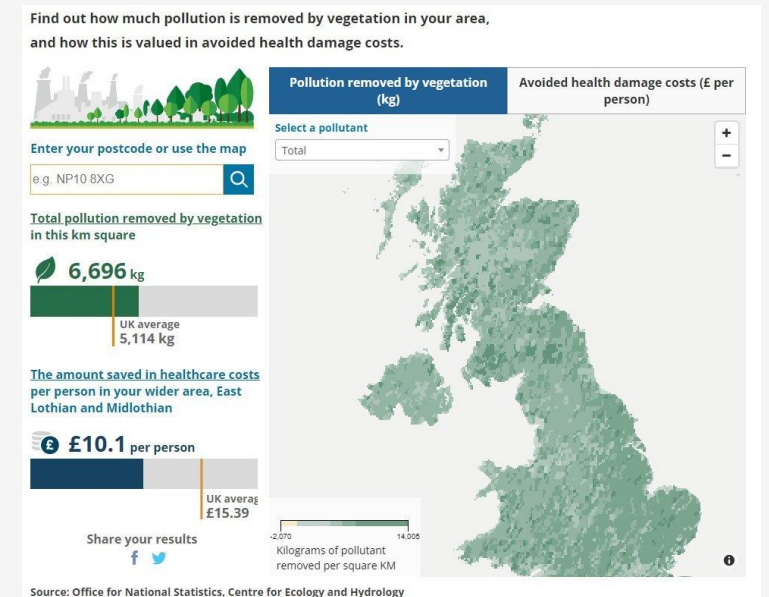# A selection of principles guiding our accounts

UK NCA mostly align with SEEA-EA, with a few exceptions, including:

- Both biotic and abiotic natural assets are included in our accounts

- We use the broad habitat typology used by the UK National Ecosystem Assessment (8 broad habitats)

- If provision of a service leads to degradation of the natural asset, the cost of that damage will be subtracted from the value of the benefit, like a cost of production. This can lead to negative valuation

- Our valuation approach is to identify the closest approximation to an exchange value, where available

- We treat carbon sequestration as one service (greenhouse gas regulating), inclusive of capture and storage

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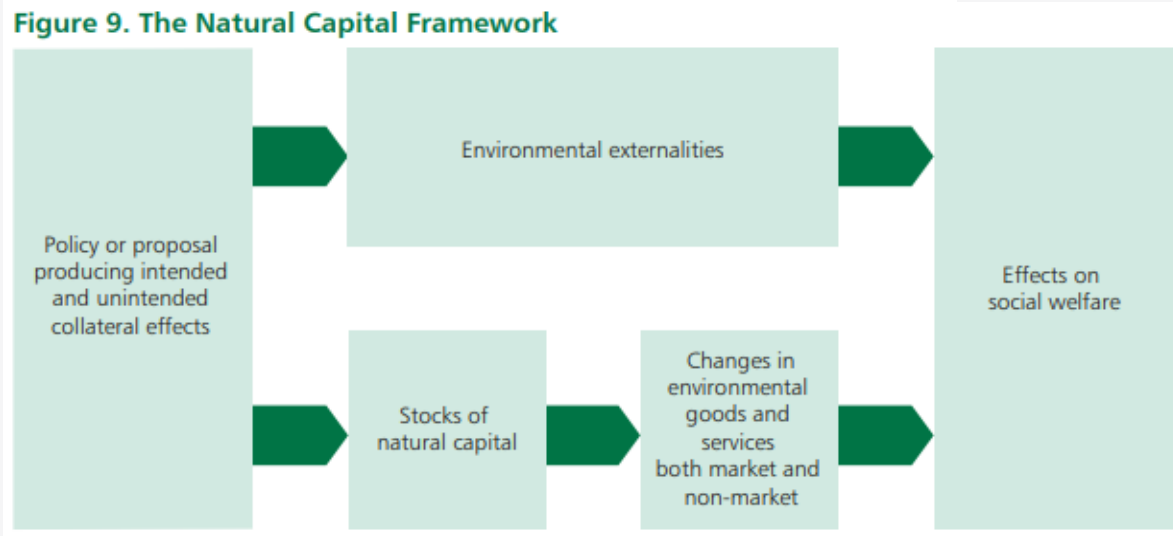# Working with UK policy departments

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Impact on policy makers

- Included in Defra's 'Enabling a Natural Capital Approach'
- Monetary estimates provide values for the current and expected future service to inform land management decisions

Source: Office for National Statistics, Centre for Ecology and Hydrology

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Working with UK policy makers

Guidance

Green Book supplementary guidance: climate change and environmental valuation

Figure 9. The Natural Capital Framework

Guidance

Enabling a Natural Capital Approach (ENCA)

Guidance for policy and decision makers to help them consider the value of a natural capital approach.

Table 3: Summary of environmental values, and land value uplift, referenced in Annex 1 (20/21 prices)[32]

Value	Description	Low	Central	High	Unit
Air pollution (NOx)	National average damage cost values	£681	£7,120	£26,995	per tonne of pollutant
Air pollution (PM2.5)		£17,716	£81,847	£253,474	
Air pollutant removal by vegetation	Welfare/health benefit of reduced air pollution from vegetation	£17	-	£931	per hectare (various land covers)

Some applications:
- Monetary estimates inform land management decisions
- Feed into indicators for KM-GBF reporting

Impact on policy makers: Ecosystem services

From 1 November 2023, Ministers of the Crown have a legal duty to have due regard to the environmental principles policy statement when making policy. Where the duty applies, it is relevant for appraisals and evaluations that are conducted in line with the Green Book. This duty will be reflected in the Green Book when the document is next updated. Further information can also be found in the guidance on Enabling a Natural Capital Approach. The Green Book also contains details of the other statutory duties with which appraisals must comply.

Challenges, successes and next steps

Challenges, successes and next steps

Challenges

- Data and subnational granularity
- Engagement & communication with users

Successes:

- Continue to expand coverage, with >45 condition indicators included
- Initial methods for measuring depletion published in 2023
- Continue method development, e.g. measure of CO_2 sequestration by seagrass

What's next

- Develop measures of depletion towards implementation of SNA25
- Methods development (e.g. urban heath) and increased geographic granularity
- Towards Official Statistics accreditation

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Future: three broad streams of work

- Develop our existing NCA estimates:
  - Improving methodology, develop estimates for new services
  - More granular estimates or improving timeliness
- Towards official statistics accreditation:
  - Assess how our statistics meet the Code of Practice and implement changes required
- Develop new estimates of depletion (in line with SNA changes)

Conclusions

- SEEA provide guidance, but important to work pragmatically with what's available/suitable
- No need for perfection straight away – develop as you go
- Importance of policy/user engagement – accounts are only useful if they're used
- SNA25 can be an accelerator
- Collaboration (domestic and international) - we're all figuring it out!

What's next

- ONS in collab. with UNECA and KNBS will runs a series of virtual teaching sessions on Ecosystem Accounts
- Focus on: forest ecosystem accounts, recreation and tourism ecosystem services, carbon sequestration
- Dates: TBC between December '25 and February '26
- Participation: open with some knowledge and implementation pre-requisites
- Invites from UNECA in the coming weeks

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Questions?

Thank you for listening!

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Relevant links

- UK natural capital accounts: 2024

- Marine and coastal margins natural capital accounts, UK: 2025

- UK natural capital accounts quality and methods guide

- Natural capital accounts roadmap: 2022

- Principles of UK natural capital accounting: 2023

- Developing estimates of depletion for the UK natural capital accounts: 2024

- Habitat extent and condition, natural capital, UK: 2022

- Defra Enabling a Natural Capital Approach (ENCA)

- The Economics of Biodiversity: The Dasgupta Review

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