VALUING NATURE PROGRAMME

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UK Research and Innovation —
High-level Sector Round Tables

Round Table 2

Valuing and Measuring Natural Assets for Land Management

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Valuing and Measuring Natural Assets for Land Management

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Contents

This paper presents the objectives and captures key points made during the Round Table.

The Round Table followed Chatham House rules for the discussion of research an innovation (R&I) needs, thus comments and opinions in Section 3 are not attributed to specific participants.

Annex 1 provides a list of participants.

The following RT2 papers are separately available:

- **RT2 01: Background Paper.** This paper outlines the objectives, the expected output and longer-term outcomes of the Round Table. It also provides brief context for the Round Table, including an overview of the relevance of, and drivers for, measuring and valuing nature for the land management sector, some examples of current activity, and direction of travel.
- **RT2 02: Overview of relevant UKRI funding instruments/ programmes for research and innovation.** This paper outlines why the Research Councils engage with business, policy-makers and wider society, why NERC is investing in this Round Table, and provides an overview of existing mechanisms to support academic-policy-business collaboration.
- **RT2 03: Relevant Research and Knowledge Exchange.** This paper provides an overview and specific relevant examples of (predominantly NERC-funded) research and innovation output relating to measuring and valuing natural assets with potential relevance for land management.

Executive summary

The objective of the Round Table was to identify the research and innovation (R&I) needs and priorities of businesses and policy-makers in the land management sector related to measuring and valuing natural assets, so that current and future research has enhanced utility for the sector.

The Round Table considered: current activity to measure and value nature in the sector, drivers for this activity, and barriers and challenges to expansion of activity; the extent to which knowledge needs may be supported by existing output from R&I (e.g. data, tools, methods, models) and how uptake of this output may be accelerated; and what further R&I investment may be needed to support the sector in measuring and valuing nature. Finally, it considered what role the Natural Environment Research Council (NERC), other funders within UK Research & Innovation (UKRI) or beyond, may have in supporting that.

The Round Table revealed considerable activity for measuring and valuing natural assets (the term incorporates the concepts of natural capital, ecosystem services and biodiversity) across the land management sector, including by agricultural and forestry landowners, non-governmental landowners, landowning water utilities and infrastructure companies, landowner representative bodies, food retail companies; statutory and charitable bodies advising on land management, land surveyors and other advisers/ consultants. This activity includes:

- Piloting natural capital assessment and natural capital accounting.
- Developing indicators and metrics for natural capital and ecosystem services.
- Developing decision-making tools relating to natural assets.
- Bringing data to bear on decision-making around natural assets (e.g. through making data accessible, interpreting data, mapping data).
- Trialling payment for public goods with landowners and managers.
- Exploring private sector motivations for investing in natural assets.
- Brokering cross-sector catchment-scale collaborations for investment in natural assets.
- Developing functioning markets for natural assets.
- Certification.
- Knowledge-sharing.
- Improving resilience in food supply chains.
- Working on net gain in developments impacting on land assets.

There was general consensus that the direction of travel was towards greater attention from landowners and managers to the measurement and valuation of natural assets and the integration of natural asset consideration in decision-making. However different organisations were at very different stages of that journey, often dependent on whether they felt they could access enough data to start measuring and valuing.

Key drivers for this activity are:

- Regulation, e.g. 25 Year Environment Plan, EU Water Framework Directive and UK water regulations, post-Brexit agricultural policy, National Planning Policy Framework, Ofwat 2019 price review.
- In-house policies, strategies and plans, e.g. for longer-term resilience, new business models that favour natural assets, Sustainable Growth agreements, sustainable catchment management plans.
- Trends in corporate accounting, reporting and disclosure, e.g. government interest in natural capital accounting.
- Cost considerations, in particular associated with food production.
- Reputational considerations.

Barriers/challenges include:

- **Knowledge gaps,** e.g. on what natural assets exist, what ecosystem services they supply; insufficient understanding of the value of ecological connectivity within natural capital thinking; limited knowledge on performance of green versus grey infrastructure (e.g. natural flood management, constructed wetlands, upland restoration, effects of grey infrastructure on downstream assets).
- **Data issues,** including: availability of relevant data at land parcel scale; missing national datasets (e.g. recent data on Priority Habitats); availability of data relevant to complex supply chains; availability of earth observation data; high costs of obtaining new data on, and monitoring of, natural assets.
- **Challenges around natural capital accounting** including: lack of standard metrics and valuation methods; difficulty in obtaining full accounts; lack of simple accounting methods for use at farm scale; scaling accounts from farm to corporate scale; dealing with qualitative data in accounts; dealing with complexity of ecological-social-economic systems; dealing with biodiversity in accounts; issues around putting values on nature – what should and should not be monetised; incorporating natural capital accounts in corporate decision-making.
- **Challenges in dealing with multiple natural asset owners and multiple beneficiaries** of ecosystem services at landscape/catchment scale, linking farm-scale interventions with landscape/catchment scale needs; absence of suitable brokers for landscape/catchment-scale investment in natural assets involving multiple players.
- **Challenges around securing investment in natural assets,** including: absence of reliable models and scenarios to predict capital growth and revenue streams from changes in natural asset management funded by investment; disconnect between natural capital value, land value and market price and the related difficulty in incentivising investment in natural assets; securing return on investment in natural assets; incentivising farmers to manage land for, and innovate in favour of, natural assets.

- **Issues around communication and awareness** including: missing shared frameworks/visions for natural assets – at national, regional and catchment scales; communicating natural asset considerations with landowners and managers, and across landowning corporations; problems with terminology/language; limited public recognition of the public goods benefits arising from private sector investment in natural assets.

- **Regulatory constraints** that obstruct investment in natural assets, including: single focus regulations; multiple regulatory frameworks for multiple sectors; low tolerance of uncertainty in some regulatory frameworks.

Research and innovation needs include:

- **New Knowledge** – understanding how land management practice links to natural capital, ecosystem services and benefits and values flowing from these; consideration of ecological connectivity in natural capital approaches; which natural assets are approaching critical tipping points; links between soil health and water quality; understanding leakage effects; effectiveness of collaborative approaches (e.g. catchment-scale) to restore natural assets through land management; new business models for multi-stakeholder, multi-beneficiary, multi-sector working and markets.

- **Frameworks and models,** including: a consistent natural capital accounting framework that works across the range of land management contexts; models linking land management to natural capital, ecosystem services and benefits and values flowing from these.

- **Data — defining needs/gaps, filling gaps, enhancing access & monitoring:** building consensus on what data (and indicators), how much data is really needed; compiling/updating key maps and datasets (e.g. on Priority Habitats, the wider countryside beyond protected areas, at land parcel scale, for complex agricultural/food supply chains); enhancing access to key existing data, testing utility of technology (e.g. drones) to monitor natural assets at farm scale.

- **Demonstration, scaling:** development and implementation of natural capital plans at national and regional scales; demonstrating landscape/catchment-scale, cross-sector approaches to investing in natural assets through land management; trialling of post-Brexit agri-environment payments for public goods; development of natural assets farm advisory services; review of effectiveness of cross-sector and multi-stakeholder collaborations in scaling gains for natural assets through land management; building understanding on how to incentivize a basic level of good land stewardship.

- **Developing markets for natural assets, stimulating investment,** including: designing, piloting and demonstrating effective markets to sustain and enhance natural assets; developing a clear case for landowners and managers for investment in natural assets, (e.g. assess costs and benefits of investing in soil health); exploring the relationship between natural capital value and commercial value; better differentiating who benefits from, and who pays for, investment in natural assets; reviewing approaches to brokering investment in natural assets with multiple beneficiaries.

- **Knowledge exchange, dissemination and communication,** including: making better use of existing research output related to measuring and valuing natural assets for land management; collating real-world experience and good practice; sharing knowledge/experience between sectors; raising public awareness of the importance of natural assets and public goods from land management.

Some of these needs are more suited to research and innovation funding through the Research Councils, and others more suited to innovation funding through Innovate UK. While business will be a key player in taking forward this work with academia, the engagement of other stakeholders will be important, including regulators, planners, the third sector and the general public.

Next Steps

The Valuing Nature Programme ran two other sector Round Tables for NERC: RT1 addressed the infrastructure sector (June 2018) and RT3 addressed the insurance/financial services sector (January 2019). We anticipate that there will be a good deal of common ground in terms of research and innovation needs across these three sectors.

The findings from all three Round Tables will be analysed with a view to identifying this common ground (as well as differences), and where there may be greatest opportunity for academia to contribute to business (and policy) in the realm of measuring and valuing nature. This analysis will be shared in due course with participants of all three Round Tables to obtain feedback and will subsequently be published in an analysis and options paper in 2019.

A longer-term view is towards the co-creation, with business and policy-makers, of a future research and innovation agenda related to measuring and valuing natural assets. This would involve further activity, such as a possible cross sector workshop bringing together the sectors involved in Round Tables 1, 2 and 3.

1. Introduction

1.1 Objective and expected outcomes of the Round Table

The objective of the Round Table was to identify the research and innovation (R&I) needs and priorities of businesses in the land management sector, related to measuring and valuing natural assets, so that current and future research has enhanced utility for the sector.

Expected outcomes include: (a) better integration of nature in project and investment decisions, and in the management and development of land assets; (b) knowledge needs and priorities identified by the sector influence R&I funding.

The Round Table considered:

- **current activity to measure and value nature in the sector,** the direction of travel in this respect, and the related knowledge needs;
- **the extent to which these knowledge needs may be supported by existing output from university-based R&I** (e.g. data, tools, methods, models) and **how uptake of this output may be accelerated** (e.g. through collaborative working between the research and business communities, filling knowledge gaps); and
- **what further R&I investment may be needed** to support the sector in measuring and valuing nature, and **what role the Natural Environment Research Council (NERC), or other funders, may have** in supporting that.

This was the second in a series of Round Tables commissioned by the NERC Innovation & Business Partnerships Team[1] and delivered by the Valuing Nature Programme[2]; RT1 addressed the infrastructure sector (June 2018), and RT3 (January 2019) will address the insurance/financial services sector.

NERC, as part of UK Research & Innovation (UKRI) are interested in stimulating **benefit to the UK economy from publicly funded UK environmental research,** by enabling business and policy-makers to access the latest research. The Round Tables therefore focus on involving businesses with significant operations in the UK (not necessarily UK-owned), but may also consider how these businesses are integrating natural capital in their business decision-making internationally.

1.2 Participants

The Round Table brought together representatives *(see List of Participants, Annex 1)* from across the land management sector, including:

- agriculture and forest landowners (private and non-governmental);
- landowner representative bodies;
- food retail companies;
- landowning water utilities;
- landowning infrastructure companies;
- statutory and charitable bodies involved in land management;
- land surveyors and other advisers/consultants.

1 https://nerc.ukri.org/innovation

2 http://valuing-nature.net

2. Overview of current activity

Participants recognised the area of measuring and valuing natural assets was a fast developing one, and noted it is difficult to be fully aware of current work. Each organisation was therefore asked to first address the following questions to set the context for subsequent discussion:

- *What is your organisation currently doing in relation to measuring and valuing natural assets? What are you aware others are doing?*
- *What is your organisation's future ambition in this regard?*
- *What are the drivers for this?*
- *What are the enablers and barriers?*

CROWN ESTATE SCOTLAND (CES)

Current activity/direction of travel

CES is now a public body. The motivation for measuring and valuing natural assets is primarily about how to build resilience for tenants, taking into account impacts and dependencies. CES works with the Scottish Environmental Protection Agency, Scottish Natural Heritage, Scottish Wildlife Trust, Scottish Land and Estates, Scotland's Rural College and James Hutton Institute and has piloted the Natural Capital Protocol (NCP) at varying scales including at farm level.[3] The report on this work by Cumulus Consulting (see Annex 1 to paper RT2 01) finds that the NCP is useful in helping to understand farm impacts and dependencies on ecosystem services, and in establishing a baseline and measuring improvements over time. However, it is a challenge to get buy-in to the language of natural capital from farmers. CES is now working to try to integrate natural capital assessment into Integrated Farm Management Plans, which are supported by the Scottish Government.[4]

Drivers

- Building long-term resilience for tenant farmers

Barriers/limitations/challenges

- Natural capital language does not resonate with farmers
- Data availability

Reports/tools used

- Natural Capital Protocol

3 https://naturalcapitalcoalition.org/crown-estate-scotland-complete-natural-capital-protocol-application

4 https://www.fas.scot/integrated-land-management-plans-ilmps

THE WILDLIFE TRUSTS (TWT)

Current activity/direction of travel

TWT manage c. 100,000 ha of land and advise on a further 120,000 ha. Relevant work has included work on the economic value of land managed for wildlife. TWT found that the public goods value (recreation, etc.) is often significantly higher than the food/timber production value, especially for poorer quality soils and marginal land.

Barriers/limitations/challenges

- Knowledge gaps include: (a) what natural assets exist; (b) what ecosystem services a natural asset provides; (c) measuring benefits from ecosystem services and assigning benefits to multiple beneficiaries; (d) what economic value to put on benefits, particularly where there is limited willingness to pay.
- The need for regulation to create new markets for public goods.
- Lack of baseline data
- Lack of robust scenarios of how differing land management interventions would impact on natural asset and ecosystem service values and revenue streams (missing evidence which is vital to build business case for changes to land management).
- Need for standardisation of methods for measurement and valuation of benefits from ecosystem services.

Reports/tools used

- Nature Recovery Maps (plans to maximise value from actions to enhance nature)

THE CROWN ESTATE (TCE)

Current activity/direction of travel

TCE's business model now involves creating places for people to enjoy as part of growing the business, as opposed to the traditional model, which was focused on land rental returns. TCE piloted corporate natural capital accounting (NCA) at the Windsor Estate for the Natural Capital Committee in 2014 (see case study in annex to paper RT2 01) and is now revisiting this. There were challenges around the accounting — the metrics were too blunt and some of the values were not very helpful. Much of Windsor Great Park is designated Site of Special Scientific Interest (SSSI) and/or under the EU Nature Directives and it has proved very difficult to put a value to these unique assets using methods such as willingness to pay. TCE is working to strengthen the methods and data, for example to get a better handle on recreation value. TCE's 2017 Total Contribution Report[5] takes a capitals-based approach to impact measurement and valuation.

5 https://www.thecrownestate.co.uk/en-gb/our-business/integrated-annual-report/total-contribution

Drivers

- New business model focussing on 'creating places'.

Barriers/limitations/challenges

- Putting economic values on unique conservation areas.

Reports/tools used

- Corporate NCA (as developed for a Natural Capital Committee pilot[6])

HAMPTON ESTATE

Current activity/direction of travel

Hampton Estate is a farming estate with common land. Hampton Estate is in the early stages of exploring natural capital but is convinced of the need to produce a natural capital report with a view to creating economic value. As a major landowner with nearby urban communities, the Estate offers significant public goods values, including in relation to public health. Hampton Estate is a member of the Surrey Nature Partnership.[7]

Barriers/limitations/challenges

- Need simple tools and approaches that can be adapted to farm-level.

NATURAL ENGLAND (NE)

Current activity/direction of travel

NE owns and manages National Nature Reserves (NNRs) and notifies SSSIs. NE has a long history of work on natural capital, which forms one of three pillars of NE's strategy. The focus has been on measuring and quantifying natural capital. NE is currently working with the Environment Agency to review and identify indicators and metrics for natural capital and ecosystem services. They are finding that a lot of the required data to populate these indicators is missing, and are looking at how to fill these data gaps and the validity of proxies.

6 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/516968/ncc-research-cnca-final-report.pdf

7 https://surreynaturepartnership.org.uk

NE has applied natural capital accounting (NCA) to NNRs using both national datasets and local data; however, accounts are partial, not full. In particular, NCA does not work well for biodiversity. NE is now working to bring qualitative data in to these accounts. NE is also working with the University of Oxford to develop a new tool on how to bring biodiversity net gain decisions into planning — the tool is a matrix which provides 'answers' on where biodiversity net gain can be located and the natural capital outcomes of the various options.

Barriers/limitations/challenges

- How to get full (not partial) natural capital accounts?
- The NCA approach is quite reductionist — there is a challenge to adequately reflect the complexity of ecological-social-economic systems.
- Data gaps, identification of valid proxies.
- Availability and utility of NCA tools. Tools must not be black boxes. Different tools may be needed for different settings — not sure we are ready yet for standardisation.

JOINT NATURE CONSERVATION COMMITTEE (JNCC)

Current activity/direction of travel

JNCC is not itself a land manager but offers data and advice for land managers. JNCC gathers lots of biodiversity data and is developing tools and models to interpret this data in terms of natural capital. JNCC increasingly works with corporates on how to report on biodiversity. JNCC is also looking at applications of Geographic Information Systems (GIS) and earth observation (EO) to look at supply chain impacts on biodiversity. EO can increasingly provide data on extent and quality of habitats that can give better metrics.

Barriers/limitations/challenges

- Data availability, particularly EO data.

NATIONAL TRUST (NT)

Current activity/direction of travel

Land management on the NT estate is devolved to local managers and tenants with little central control. Like TCE, NT has been involved in piloting corporate NCA at the Wimpole Estate — this raised issues around the problem of partial accounts. Moreover, tenants were not keen to share the data and NT concluded it was not ready to roll out NCA across the whole NT estate. NT is currently trialling payment for public goods with tenants. Future agri-environment scheme payments (administered by Defra) are expected to be part-based on natural capital, so NT are considering how to apply this across the estate. Natural capital indicators may offer a way to operate across the estate and at the farm level. NT is particularly interested in cultural services of nature, e.g. number of visits, members' use, educational services, 'nature connectedness' as a measure of wellbeing.

Barriers/limitations/challenges

- Lack of data.
- Scaling of data and accounts from farm to corporate level.
- Partial natural capital accounts present a challenge.

Reports/tools used

- Corporate NCA (as developed for a Natural Capital Committee pilot[8]).

SCOTTISH ENVIRONMENT PROTECTION AGENCY (SEPA)

Current activity/direction of travel

SEPA recently hosted a VNP placement looking at potential for private sector investment in natural capital with a focus on Speyside.[9] In general, there is interest to invest in natural capital but landowners struggle to see how to secure a return on investment. Tipping points may provide a useful driver for action if we accept that answers aren't always precise. James Hutton Institute is involved in a research programme funded by Scottish Government looking at natural assets inventory and accounts.[10]

8 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/516968/ncc-research-cnca-final-report.pdf

9 https://www.sepa.org.uk/media/372005/vn_-business_investment_in_nc-_executive_summary.pdf

10 https://www.hutton.ac.uk/research/srp2016-21/wp141-natural-asset-inventory-and-accounts

SCOTTISH WATER (SW)

Current activity/direction of travel

SW is dependent on land management and resilient catchments for water supply and quality and is looking at how to factor these into decision-making. Catchment management for water quality is fairly standard practice in water utilities — but how to factor in longer-term ecosystem resilience? How can better understanding of natural capital help deliver longer-term resilience as opposed to short-term delivery of water quality? SW has a Sustainable Growth Agreement with SEPA[11] and is working on catchment-scale decision-making with other water users. SW is also looking at how to manage wastewater services (which can be very energy intensive) more in tune with the environment. The water sector, through UKWIR, is working on a quantitative tool for NCA and social capital assessment — including development of a more qualitative approach under phase 2.

Drivers

- Dependence on resilient catchments.
- High energy costs of water and wastewater treatment.
- Sustainable Growth Agreement (with SEPA).

ANGLIAN WATER (AW)

Current activity/direction of travel

AW has worked with the University of East Anglia to create a natural capital asset check and risk register across the AW estate and the wider region, identifying benefits to AW and others.[12] AW is part 'Natural Capital East', a business coalition working on the commercial opportunities around enhancing NC. AW has developed natural capital metrics — covering soil, water, bathing water, biodiversity — for its 2020 business plan. These metrics address extent and condition — especially in relation to major investments — but not necessarily value. However, it is possible to take action to protect NC without assigning a value to it. AW is working with the Cambridge Institute for Sustainability Leadership (CISL) Natural Capital Impact Group including workstreams on soil, water and biodiversity; this work focuses on the international food, beverage and clothing supply chains.[13] AW is also working with the Rivers Trust and local estates to look at investment in natural capital around boreholes.

12 https://www.anglianwater.co.uk/environment/our-commitment/our-projects/natural-capital.aspx

13 https://www.cisl.cam.ac.uk/business-action/natural-capital/natural-capital-impact-group

Barriers/limitations/challenges

- Lack of recent data on Priority Habitats.[14]
- Need for better understanding on link between soil and water quality.
- Need for better understanding of effectiveness of natural flood management in lowland landscapes.
- Performance of constructed wetlands, e.g. for ammonia treatment.
- Better understanding of effects of grey infrastructure on natural capital downstream.
- Regulation is too focussed on water quality at the expense of wider environmental quality.

SAVILLS

Current activity/direction of travel

Savills recognises the environment as part of land management, both from the public good and private investment viewpoints. A key issue is the ability to audit and crosscheck measurements — landowners want a dependable audit trail. Farmers are very busy and need simple methods at farm and parcel level rather than catchment level — for example simple up/down arrows for key criteria.

Barriers/limitations/challenges

- Lack of simple tools for measuring and valuing natural capital, simple, dependable and auditable measurements.

3KEEL

Current activity/direction of travel

3Keel advise business on sustainability and risk in relation to natural resources. 3Keel has developed the 'Landscape Enterprise Network' (LENS) approach with Nestlé and Business in the Community[15], which seeks to activate regional natural capital markets with investors. 3Keel use network analysis to identify and engage with regional players, seek to understand their needs in relation to natural assets and ecosystem services, map multiple value chains relating to these assets and services and identify opportunities for co-investment in the same natural asset(s).

14 http://jncc.defra.gov.uk/page-5718 and https://webarchive.nationalarchives.gov.uk/20140605093420/http://www.naturalengland.org.uk/ourwork/conservation/biodiversity/protectandmanage/habsandspeciesimportance.aspx

15 https://www.bitc.org.uk/sites/default/files/practical-economics-of-ecosystems-report.pdf

No abstract valuation is involved — economic value is instead defined by the price point; this circumvents the problem of assigning values to ecosystem services. It may be that different players have interests in different ecosystem services but all benefit from working together to protect the natural asset that delivers these services. This may require a broad suite of interventions. 3Keel has applied the LENs approach in Cumbria, Greater Manchester, Yorkshire, Hampshire and Avon.

Barriers/limitations/challenges

- Need for landscape-scale intervention services, which connect multiple beneficiaries to the same natural asset(s) to encourage co-investment.
- Dealing with uncertainties and probabilities of investment in natural assets.
- Need for mechanisms to engage and harness innovation of farmers as problem-solvers.

Reports/tools used

- Landscape Enterprise Networks (LENS) approach.[16]

CLINTON DEVON ESTATES (CDE)

Current activity/direction of travel

CDE extends to c. 10,000 ha. CDE is currently doing corporate NCA using the ORVal tool (developed at University of Exeter) looking at dependencies and risks — but finding it a challenge to put values on these. But to what extent does NCA tell land managers anything new? Farmers are already familiar with good land management practice. Simply implementing 'gold standard' management would help many of the National Ecosystem Assessment arrows for trends in ecosystem services turn upwards. Soil metrics are a big challenge. Suggest use simple traffic light approach for habitats, rather than trying to assign monetary values.

Barriers/limitations/challenges

- Lack of data and metrics, notably for soil natural capital.
- High monitoring costs (surveyor time).
- How to derive income from investments in natural assets.

Reports/tools used

- ORVal tool.[17]

16 https://www.3keel.com/landscape-innovation

17 https://www.leep.exeter.ac.uk/orval

UNITED UTILITIES

Current activity/direction of travel

There are three main strands to UU's work on natural assets: (1) piloting corporate NCA at the company and sub-catchment level; (2) nature-based solutions, e.g. constructed wetlands to treat waste water, sustainable catchment management; (3) funding and markets, e.g. can we create markets for natural capital, work on future public sector payments for public goods. UU is also working on the overarching issues of communication and governance. How can UU best communicate natural asset considerations across the business and with landowners in catchments? How can consideration of natural capital be brought into corporate decision-making? Water companies are expected to use established suppliers — how can water companies get these suppliers to deliver on natural assets, given contractual and regulatory constraints? Opportunities may exist around the 2019 price review (of water companies' business plans 2020—2025), which will assess the wider societal value of water companies. For example, UU land has higher value for recreation than for water.

Drivers

- Sustainable catchment management plans (driven by Water Framework Directive).
- Ofwat price review 2019.[18]

Barriers/limitations/challenges

- Contractual constraints to introduction of nature-based solutions with established suppliers.
- Regulatory constraints (driven by the Water Framework Directive and agencies responsible for WFD implementation) to use of nature-based solutions.
- Communicating natural asset considerations across the business and with landowners.
- Integrating natural asset considerations in corporate decision-making.
- Incentivising suppliers to deliver on natural assets within regulatory constraints.

Reports/tools used

- Corporate NCA (as developed for a Natural Capital Committee pilot[19]).

18 https://www.ofwat.gov.uk/regulated-companies/price-review

19 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/516968/ncc-research-cnca-final-report.pdf

WESSEX WATER (WW)

Current activity/direction of travel

WW recognises its impacts and dependencies on natural assets and has been recording sustainability indicators for a long time. WW has carried out natural capital assessments on its own land holdings and has aspirations to deliver gains in natural capital (likely to be an Ofwat requirement) in its 2020—25 business plan. There are challenges in doing this at multiple scales — business, region, landholding, project-level — and in finding appropriate accounting procedures across these scales. Do we really need to monetize natural assets and benefits flowing from these? How can we understand the relative benefits of green versus grey solutions? WW has trialled a reverse auction system for farmers — EnTrade[20] — under which farmers make bids for WW funding to deliver interventions to remove nutrients from catchments. This is based around the price of intervention, and so circumvents the need to value benefits.
How might this be used to reveal value, and who benefits from this value? More information on the social and environmental investments made by water companies could improve their position politically.

Drivers

- Reducing the costs of meeting water quality targets.
- Ofwat 2019 price review.

Barriers/limitations/challenges

- Bottoming out the need, or not, to monetize benefits from natural assets.
- Understanding better the relationships between price and value.
- Better understanding the public goods value of water company investments in natural assets.

Reports/tools used

- EnTrade reverse auction tool.

[20] https://www.entrade.co.uk/Case_study

ENVIRONMENT SYSTEMS (ES)

Current activity/direction of travel

ES helps organisations measure and value natural capital at different scales, making use of earth observation data. ES offers two tools: (1) SENCE — spatial evidence for natural capital evaluation — uses best available public research to map and model natural assets and ecosystem services flows, maps risks and identify opportunities to enhance ecosystem services; (2) Satellite data services tool — delivers satellite analytics across the UK (6 day return) — including biophysical change. ES has delivered dozens of projects using these two tools, from city level to catchment level (e.g. Scottish borders) to natural capital evaluations for Wales, Ireland and the Caribbean island of Anguilla, including working with corporate agricultural supply chains.

Drivers

- Wellbeing of Future Generations (Wales) Act 2015.

Barriers/limitations/challenges

- Some fundamental data missing at national scale — this data would be a national asset if the gap can be filled. A key example of this is soils data, which exists but is only available under a commercial licence (despite the data collection being publicly funded).

Reports/tools used

- SENCE[21]
- Satellite Data Services[22]

SOIL ASSOCIATION (SA)

Current activity/direction of travel

SA works at the production and consumption end of the value chain, with a focus on organic and Circular Economy approaches. SA works with 6000 businesses on sustainability quality assurance, providing knowledge and management systems to track the benefits of sustainable use (of soils) and is engaged in certification (>1.5 m ha worldwide, particularly for textiles).

21 https://www.envsys.co.uk/sence

22 https://data.envsys.co.uk

To some extent natural assets are already taken into account in assurance/certification schemes, although not monetarily valued. SA also works on market drivers — notably sustainability in the market. Data collection (e.g. on soil natural assets) is a challenge — needs support and incentives, and clear benefit to those (farmers) collecting the data. SA tends to rely on one-off research rather than continuous monitoring. Lots of natural asset work is blind to landscape-level connections. SA provides low-level funding to innovative farmers to tackle sustainability challenges, supported by researchers — this has proved very cost-effective. SA recognises the need to consider social capital alongside natural capital, e.g. treatment of farm workers.

Barriers/limitations/challenges

- Translating natural capital work at farm scale to landscape scale.
- How to incentivise farmer innovation.
- Securing broader public understanding of natural capital concepts.

WOODLAND TRUST

Current activity/direction of travel

WT finds the natural capital debate useful in terms of informing effective spend of its £50m budget. WT has developed a canopy map dataset[23] to assess how the landscape is linked through canopy cover and understand change in ecological connectivity and permeability of the landscape over the last 100 years. Lots of natural capital thinking is blind to this connectivity. A challenge is to translate this knowledge to action, engage landowners and find the right incentives to enhance connectivity. Attempts to create a market solution through the Woodland Carbon Code have failed — so what next?

Drivers

- 25 Year Environment Plan.
- Climate Change Committee target for 19% woodland by 2050.

Barriers/limitations/challenges

- Incorporating ecological connectivity across the landscape with natural capital thinking.
- Finding the right incentives to enhance connectivity.
- Engaging with landowners — how can data be used?

Reports/tools used

- Canopy map dataset.

23 https://www.woodlandtrust.org.uk/blog/2018/03/tree-canopy-cover-results

SAINSBURY'S

Current activity/direction of travel

Sainsbury's does not have a formal method to address natural assets and natural assets are not part of Sainsbury's decision-making. However there is appetite to look at this (Sainsbury's have recently appointed a new Head of Sustainability from The Crown Estate). Sainsbury's owns lots of land (retail stores) and is hugely dependent on natural assets through farmers in the food supply chain. Sainsbury's has a degree of influence but are 'stewards from a distance'. Sainsbury's supply chains are international and Sainsbury's is working in some areas to improve resilience, e.g. with tea suppliers in Africa to improve soil quality. Standardisation of methods for measuring and valuing natural assets is complex when working with huge numbers of products in variable geographies. This presents challenges also in terms of data and audit.

Barriers/limitations/challenges

- Number of products and variety of geographies involved in complex, global food and beverage supply chains.
- Applying methods in a standardised way to complex supply chains.
- Data availability and auditing.
- Distance between retailer and land manager in supply chain with many intermediaries.

NATIONAL GRID (NG)

Current activity/direction of travel

NG owns c.7000 ha of land (mostly sub-stations) and has a very visible footprint. NG developed a natural capital tool with AECOM (see case study, paper RT2 01 Annex 1), which works well for NG and its engineers. The tool draws on existing information and academic studies and produces a baseline for sites, identifies how to grow natural assets and who to work with. This leads to new partnerships and activities, e.g. harvesting timber, opening up sites for recreation, restoring habitats. Financial value is attributed for internal use only (some values are difficult to calculate and may cause controversy). New infrastructure builds on this natural capital approach, e.g. visual screening, flood security, ecological connectivity. NG is also working with planners on net gain in developments. Renewables take more land than fossil fuel power generation and so are more sensitive to natural capital of land. There is a disconnect between natural capital value and real estate value — natural capital values do not feed in well to decisions on income and revenue.

Drivers

- National Planning Policy Framework — no net loss/net gain in planning
- Lawton Review (which argued for enhanced connectivity of protected areas)[24]

Barriers/limitations/challenges

- The disconnect between land value and natural capital value and the related challenge to incentivise land management for both rental value and natural capital value.
- Building biodiversity in to natural capital accounting.

Reports/tools used

- Natural capital tool (developed by AECOM).

NATIONAL FARMERS UNION (NFU)

Current activity/direction of travel

NFU has 55,000 members. Brexit is a catalyst for natural capital debate. The 25 Year Environment Plan features natural capital strongly. Natural capital may provide the conceptual framework for post-Brexit farm support, which is likely to be more outcome-focussed. Farmers like this — but it remains as yet somewhat hypothetical as there is no market for public goods and the methods are not sufficiently robust at land parcel scale. Moreover, valuation is very different from market price, which is what drives farmers. How will funding for public goods, for example nature-based flood management, trickle down to farmers? Farmers are currently rewarded under agri-environment payments on an income-foregone basis, but this is not sustainable. Can a natural capital approach derive a fair market value? There are significant issues around data availability, access to data (and related issues such as broadband access to download data and maps) and how to deal with variability (e.g. seasonality). One way forward may be to focus on the link between soil health and productivity and use this to engage and drive farmer behaviour — there needs to be a clear benefit to the farmer.

Drivers

- Post-Brexit agricultural policy, payment for public goods.
- 25 Year Environment Plan.

Barriers/limitations/challenges

- Methods and data at the land parcel scale.
- Disconnect between natural capital value and farming markets.
- Ways to incentivise farmers to manage land for the long-term.

24 https://webarchive.nationalarchives.gov.uk/20130402170324/http://archive.defra.gov.uk/environment/biodiversity/documents/201009space-for-nature.pdf

BUCCLEUCH ESTATES (BE)

Current activity/direction of travel

BE owns considerable landholdings in Scotland and the east Midlands. BE are working with the University of Oxford to establish baseline data, for a well-researched and well-monitored catchment in the Scottish borders. For poor upland soils, natural capital value is high in relation to market value.

3. Knowledge gaps/R&I needs

The Round Table addressed the questions:

- *What knowledge/tools/data do you already have, what are the gaps, how might these be filled?*
- *What should R&I investment focus on, to be of most use to the sector?*
- *How might R&I investment most usefully be structured for business, policy-makers and civil society to engage?*

Discussion centred on the following issues. In the following, the term 'natural assets' incorporates the notions of natural capital stocks, the ecosystem services that flow from these stocks, and biodiversity (which, as an element of natural capital, underpins ecosystem function and the flow of ecosystem services).

New knowledge

- **Fill knowledge gaps on what natural assets exist, what ecosystem services they supply** and how these relate to economic values and existing market pricing.
- **Develop approaches to incorporate consideration of ecological connectivity** (e.g. between high-nature-value habitats, across landscapes and landowners) **in natural capital thinking.**
- **Identify which natural assets, UK-wide, are closest to critical tipping point(s)** and what interventions are required to avert these tipping points.
- **Review the effectiveness of cross-sector and multi-stakeholder collaborations in scaling gains for natural assets through land management.** There are many cases of collaborations across the public, private and third sectors but these are rarely subject to robust monitoring and assessment.
- **Develop new business models for investment in natural capital.**
- **Improve understanding of the leakage effect** – to what extent does managing one land area for longer-term ecological resilience result in a pressure to use another land area in less sustainable ways leading to no net gain or net loss? Such effects can be complex, distant and international.
- **Improve understanding of the links between soil health and water quality.**

Frameworks and models

- **Develop a consistent NCA framework that works across the variety of land management contexts** with standardised metrics and valuation methods applicable at farm and corporate scales – to what extent can/should this deliver full, rather than partial, accounts and to what extent can/should these include qualitative elements?
- **Develop models and scenarios that link land management to the ecosystem services 'cascade'** (natural assets → ecosystem function → ecosystem services → benefits → values) – we need better understanding of how land management affects this cascade.

Data – defining needs/gaps, filling gaps, enhancing access

- **Compile key missing maps and datasets** – reliable, comprehensive datasets in a processed/usable form. Examples include: (1) updated dataset on Priority Habitats (current inventory is out of date); (2) datasets on the wider countryside (beyond Priority Habitats); (3) a national tree canopy map – this could help, for example, limit the very high costs (projected to be £15 bn) of managing ash dieback and related woodland/landscape restoration efforts; (4) datasets relevant at land parcel scale; (5) datasets relevant to complex agricultural/food supply chains.
- **Enhance access to key existing mapping data.** The UK Government is in the process of making parts of the Ordnance Survey MasterMap freely available[25] – this opens up opportunities for mapping of natural assets and related NCA. On the negative side, there are some restrictions on the use of the publicly funded UK soil map (for which copyright is held by Cranfield University[26]).
- **Enhance accessibility and usability of data** – there is a big shortfall in funding for making relevant data accessible and usable. Ensure that publicly funded data is open access.
- **Build understanding and consensus on how much data is really needed** – in many cases we already know what is the right thing to do – to what extent can natural capital accounts be simplified (e.g. simple up/down arrows).
- **Review the utility of technologies (e.g. drones) to monitor natural assets at farm scale** – drones are already used widely in agricultural monitoring.
- **Development of agreed common definitions/language/terms** relating to the measurement and valuation of natural assets.

25 https://www.ordnancesurvey.co.uk/about/news/2018/mastermap-announcement.html

26 https://data.gov.uk/dataset/ea1442bf-ba77-42cc-80e7-2ea339ccb28a/natmap-national-soil-map

Demonstration, scaling

- **Develop and implement natural capital plans.** The 25 Year Environment Plan in England proposes 14 regional 'natural capital plans'[27] – these plans need to engage asset owners and be more than just Defra-family plans. The RSA Commission on the Future of Food, Farming and the Countryside has proposed national strategic land use frameworks[28], which would need to be linked to natural capital plans. The Wildlife Trusts have developed 'Ecological Opportunity' maps (Nature Recovery Networks) that are relevant in this context, helping to identify best locations for investment.

- **Demonstrate landscape/catchment-scale, cross-sector approaches to investing in natural assets through land management** – e.g. through action research in 'landscape laboratories', learning by doing with business. How can disparate regulations and regulatory bodies and sectors work together on natural assets to enhance public goods? How to secure investment in multiple ecosystem services rather than just one or two with higher short-term value (e.g. flood risk reduction)? How do approaches transfer between differing environmental, social and economic contexts? What approaches and methods can be used to create and sustain the relevant partnerships?

- **Run robust trials for post-Brexit agri-environment payments for public goods** to assess what works and what provides best value for money in terms of benefits to natural capital and ecosystem services. What does a farm system that delivers on natural assets look like?

- **Develop a natural assets farm advisory service** (similar to the Farming and Wildlife Advisory Group?) to advise on what natural assets mean to individual farms, what practically can be done to enhance natural assets – to make it real for people 'at the coal-face' (Crown Estate Scotland have found this works).

- **Build understanding on how to incentivise a basic level of good land stewardship** – without worrying too much about putting a value on things.

Developing markets for natural assets, stimulating investment

- **Design effective markets to sustain and enhance natural assets** – how to structure markets to incentivise investment in natural assets, and what regulatory 'floor/ baseline' and what planning framework is required to enhance the basic level of good land management. This includes social science research to ensure societal benefits.

- **Develop a clear case for landowners and managers** – in particular for farmers. What do the concepts of natural capital and ecosystem services mean for farmers? What language/terminology carries greatest traction? What are the drivers for farmers and how can we use these to make the case?

27 25YEP, p140: https://www.gov.uk/government/publications/25-year-environment-plan

28 https://www.thersa.org/globalassets/pdfs/reports/rsa-our-common-ground.pdf

- **Assess the relationship between soil health, costs of maintaining/restoring soil health, and market returns from agriculture in the medium- to long-term** – is there a clear return on investment, who benefits, who pays? What potential is there to develop a soil carbon market and what lessons can be learned from other carbon markets? (Note: The Woodland Carbon Code has not worked as woodland carbon in the UK is too costly in a global carbon market, the Peatland Carbon Code has more traction as the UK has a globally important stock of peatlands).

- **Explore the relationship between natural capital value and commercial value (land prices, market prices, rental returns), with a view to engaging landowners/ managers** – which ecosystem service flows deliver benefits that can be monetized through existing markets, which have potential to be monetized through new markets, and which cannot be monetized?

- **Better differentiate who benefits from, and who pays for, investment in natural assets,** e.g. sustainable drainage in urban areas is paid for by the water utility but there are multiple beneficiaries (e.g. roads, which benefit from less surface water; housing, which benefits from less flooding).

- **Review approaches to brokering investment in natural assets with multiple beneficiaries** – what brokerage mechanisms are most effective?

Knowledge exchange, dissemination and communication

- **Make better use of existing research output related to measuring and valuing natural assets for land management** – collate and review existing data, models, tools and knowledge (e.g. outputs of NERC's Biodiversity & Ecosystem Services programme [29]). Identify what has practical relevance for land management and translate this through a business lens to make it more useful for landowners and managers. Organise materials according to user needs, e.g. by scale (parcel, farm, corporate, supply chain, landscape) or by purpose (assessment, accounting, decision-making, reporting).

- **Collate real-world experience and good practice related to measuring and valuing natural assets for land management,** including from landowners and managers who are already piloting this, the Defra Pioneer Projects, experience from other EU countries, etc. – what works and what doesn't?

- **Enhance sharing of knowledge between sectors.**

- **Raise public awareness** of the importance of natural assets and public goods from land management – how can we create a groundswell of public opinion to demand restoration of natural capital – how can we make natural capital the next 'marine plastic'.

29 https://ecosystemsknowledge.net/bess

4. Next steps

This Round Table has revealed the range of activity going on across the land management sector of relevance to the measurement and valuation of natural assets, and identified a wide range of research and innovation needs in this regard.

This was the second in a series of Round Tables: RT1 (June 2018) addressed the infrastructure sector and RT3 (Jan 2019) addressed the insurance/financial services sector. We anticipate that there will be a good deal of common ground in terms of research and innovation needs across these three sectors.

The findings from all three Round Tables will be analysed with a view to identifying this common ground (as well as differences), and where there may be greatest opportunity for academia to contribute to business (and policy) in the realm of measuring and valuing nature. This analysis will be shared in due course with participants of all three Round Tables to obtain feedback and will subsequently be published in an analysis and options paper in 2019.

A longer-term view is towards the co-creation, with business and policy-makers, of a future research and innovation agenda related to measuring and valuing natural assets. This would involve further activity, such as a possible cross sector workshop bringing together the sectors involved in Round Tables 1, 2 and 3.

Annex 1 — List of participants

Surname	Name	Position	Organisation
Atkinson	Nick	Senior Conservation Adviser — Evidence	Woodland Trust
Barden	Ruth	Head of Environment & Catchment Strategy	Wessex Water
Biddle	Bill	Estate Manager	Hampton Estate
Bridgewater	Sam	Head of Conservation and Wildlife	Clinton Devon Estates
Browning	Helen	CEO	Soil Association
Bullen	Clare	Strategic Catchment Manager	United Utilities
Cornwell	Sue	National Specialist Manager of the Natural Environment	National Trust
Curtis	Tom	Innovations Partner	3Keel
Deakin	John	Head of Forestry, Windsor Estate	Crown Estate
Dearsley	Jon	Associate Director	Savills
Dolby	Adrian	Head of Agriculture	Buccleuch Estates
Gerrard	Chris	Climate Change and Biodiversity Manager	Anglian Water
Kaushish	Rohit	Economist	NFU
Keyworth	Steve	Commercial Director	Environment Systems
Packer	Mike	Strategy and Business Development Lead	Berks, Bucks & Oxon Wildlife Trust
Plester	Chris	Senior Sustainability Adviser	National Grid
Rose	Paul	Chief Scientist	JNCC
Shephard	Rod	Economic Sustainability Manager	Sainsbury's
Siddiky	Shakera		Sainsbury's
Singleton	Peter	Research, Innovation & Evidence Manager	SEPA
Waters	Ruth	Deputy Chief Scientist	Natural England
Wells	Andrew	Head of Property	Crown Estate Scotland
Williams	Mark	Head of Environmental Science and Regulation	Scottish Water
UKRI & VNP team			
Duke	Guy	Business Champion, VN Programme Coordination Team	VN Programme Coordination Team
Hughes	Ruth	Senior Programme Manager, Innovation Team	NERC
Mitchell	Jodie	Senior Programme Manager, Innovation Team	NERC
Young	Peter	Chair	VN Business Interest Group

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The Valuing Nature Programme is a 5 year £7M research programme which aims to improve understanding of the value of nature both in economic and non-economic terms, and improve the use of these valuations in decision making. It funds interdisciplinary research and builds links between researchers and people who make decisions that affect nature in business, policy-making and in practice. See **www.valuing-nature.net**

The Valuing Nature Programme is funded by the Natural Environment Research Council, the Economic and Social Research Council, the Biotechnology and Biological Sciences Research Council, the Arts and Humanities Research Council, and the Department for Environment, Food and Rural Affairs.

Further information visit: valuing-nature.net/ business-round-tables

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