LIVERPOOL JOHN MOORES UNIVERSITY

THE NATURAL CAPITAL APPROACH: A BACKGROUND

Prepared for the Liverpool City Region Combined Authority in support of the Spatial Development Strategy

November 2023

NATURAL CAPITAL HUB

LIVERPOOL CITY REGION COMBINED AUTHORITY

METRO MAYOR LIVERPOOL CITY REGION

Natural capital is defined as the world's stock of natural assets that provides social, environmental, and economic benefits to society.

UK policy seeks to embed 'a natural capital approach' into the planning system, recognizing nature's benefits, and driving a flow of finance into projects that protect and restore local habitats.

Work is ongoing across the Liverpool City Region to facilitate public and private investment into nature's recovery.

Understanding and enhancing our natural capital assets is imperative to tackling the twin climate and ecological emergencies.

WHAT IS NATURAL CAPITAL?

The term 'capital' is often used by economists to describe a stock of something that has the capacity to generate a flow of goods and services that will benefit people.

Natural Capital refers to the world's stock of natural resources, both renewable and non-renewable, that directly or indirectly provide value to society through a flow of multiple benefits[1].

When combined with other forms of capital, natural capital forms part of human wealth. The other forms of capital comprise manufactured capital, financial capital, human capital and social capital (Figure 1).

Our natural capital underpins, maintains, and supports other forms of capital as it provides the basic conditions for human existence. A thriving environment is essential for economic and human well-being.

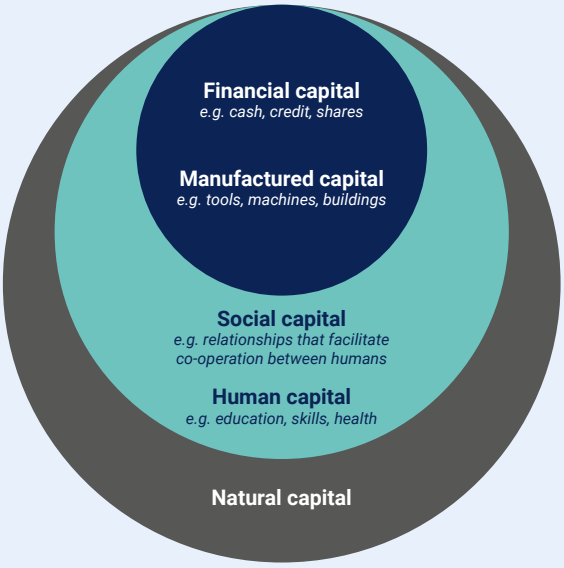


Figure 1. Diagram presenting the relationship between the five capitals – capitals within the inner circles will rely on those further out.[2]

1 Defra. 2019. Natural Capital Committee: natural capital terminology
2 First published in 2005 in Jonathon Porritt's book 'Capitalism as if the World Matters'.

THE EARTH'S STOCK OF NATURAL ASSETS

Nature provides us with a variety of natural capital 'assets' both biotic (living) and abiotic (non-living), these include:

- Species e.g. plants, animals, fungi
- Habitats e.g. grasslands, forests, coral reefs
- Soils
- Freshwater bodies (rivers, lakes, ponds) and wetlands
- Oceans
- Land
- Minerals
- Sub-soil assets (including fossil fuels)
- Atmosphere

The natural assets listed are not mutually exclusive, for example, our oceans contain abundant species, habitats and minerals. This overlap demonstrates the complexity of natural systems and starts to highlight some of the challenges faced when trying to value nature.

AMBITION

The LCR State of Nature report shows that our local biodiversity is in a state of decline.[5] The Metro Mayor and Combined Authority have set the ambition for the LCR to be the cleanest, greenest city region in the country and are committed to making the City Region net zero carbon by 2040[6]. To achieve these goals will require the protection and restoration of our natural capital assets.

FLOWS OF BENEFITS

From these assets we can derive a number of benefits, known as ecosystem services (Figure 2). Ecosystem services fall under four categories: provisioning services, regulating services, cultural services, supporting services.

Natural capital approaches consider the economic value of these assets and their flow of benefits.

In 2020, the asset value of the natural capital we can currently value across England was estimated to be worth £1.4 trillion[3]. In the same year, the total annual value of ecosystem services that can be valued in England was estimated at £35.7 billion.

There are also opportunities to boost the economy through nature-based jobs. Three types of environmental enhancement - improving woodlands, peatlands, and urban parks – could create over 16,000 jobs across the 20% of UK constituencies facing the most severe employment challenges.[4]

3 Office for National Statistics. 2023. England natural capital accounts: 2023
4 Green Alliance. 2021. Jobs for a green recovery
5 Merseyside Environmental Advisory Service & Merseyside BioBank. 2022. State of Nature Report for the Liverpool City Region.
6 Liverpool City Region Combined Authority. 2023. Five Year Climate Action Plan 2023-2028
7 Adapted from NatureScot

Ecosystems **PROVIDE** us with a range of products such as:

- Materials
- Food
- Fresh water
- Medicine
- Energy

The natural environment **REGULATES** numerous important processes, namely:

- Pollination
- Water purification and flood management
- Clean air
- Carbon storage and sequestration
- Disease and pest control

CULTURAL services encompass the ways in which nature directly impacts our wellbeing and provides enrichment. This is through:

- Spiritual/historical connections
- Sense of place
- Recreation
- Mental health and learning
- Physical health

SUPPORTING services form the basis of the other three service categories. They include:

- Habitat provision for biodiversity
- Photosynthesis
- Water cycling
- Nutrient cycling
- Healthy soils

Figure 2. The four categories of ecosystem services.[7]

Investing in nature across our towns and cities has the capacity to improve both our mental and physical health,[8 9] saving money for our National Health Service.[10] It can make our neighbourhoods safer both by reducing levels of crime[11] and by improving our resilience to the impacts of climate change.[12 13] Furthermore, natural capital interventions have the potential to enhance the local economy and skilled job provision for the area.[14]

On the other hand, failing to protect and restore our green and blue spaces will be costly. Around 325,000 properties in England are in areas that have a high risk of flooding in the next 30 years,[15] impacting on homeowners' insurance premiums as well as their health and wellbeing. By 2025, an increase of up to 135,000 properties in these areas of high risk is expected due to the impacts of climate change, which will increase the intensity and frequency of heavy rainfall. Nature-based solutions will play a large part in helping to reduce flood risk locally. One study has shown that nature-based mitigation measures can result in a reduction of 3.5% in the average cost of damages, equalling around £32,000 annually.[16]

A natural capital approach to decision making recognizes nature as an essential set of assets that deliver multiple benefits to the economy and society.

Natural capital approaches generate a flow of finance into projects that restore natural habitats while building green economic growth.

NATURE'S BENEFITS IN ACTION: TREES FOR CLIMATE

Trees for Climate is a multi-million-pound woodland creation programme, part of the National Government-led Nature for Climate Fund. The Mersey Forest is one of 13 Community Forests across England, delivering the project that is playing an important role in meeting national and local net zero emissions targets. Trees planted by the Mersey Forest across the first three years of the programme have been measured to have multiple societal and economic benefits for the region[17], including:

- An increased carbon sequestration capacity of nearly 3,000 tonnes of CO2 annually, which has an economic value of around £219k per year.[18]
- A gain of ca. 57,000m3 per year in water storage, contributing to natural flood management and valued at over £26k each year.
- Improved access to nature for ca. 47,000 households, 20% of which are in the most deprived areas.
- An additional 1,620ha of ecological network creating more "useable" space for wildlife to roam between preferred habitats.

NATURE-BASED SOLUTIONS (NBS)

NBS are actions to protect, manage or restore nature that address societal challenges such as climate change, human health and disaster risk reduction effectively and adaptively.

8 Kondo et al. 2018. Urban Green Space and Its Impact on Human Health
9 Bratman et al. 2019. Nature and mental health: An ecosystem service perspective
10 The Wildlife Trusts. 2023. A Natural Health Service
11 Shepley et al. 2019. The Impact of Green Space on Violent Crime in Urban Environments: An Evidence Synthesis
12 IPBES. 2019. Global assessment report on biodiversity and ecosystem services of the Intergovernmental Science-Policy
13 IPCC. 2023. AR6 Synthesis Report: Climate Change 2023
14 Scottish Government. 2022. Understanding the local economic impacts of natural capital investment
15 National Infrastructure Commission. 2022. Reducing the risk of surface water flooding
16 Hankin et al. 2021. How can we plan resilient systems of nature-based mitigation measures in larger catchments for flood risk reduction now and in the future?
17 Calculated based on work by LJMU supporting the England Community Forest to evaluate the Trees for Climate programme. This analysis was underpinned by an EcoservR approach
18 Contributing to the Liverpool City Region's net zero carbon by 2040 target
19 RSPB. 2021. Economic benefits of nature-based climate solutions

MONEY REALLY DOES GROW ON TREES!

Afforestation can generate approximately 25 temporary jobs for every 100 ha of trees planted and £1.2 million in Gross Value Added (GVA).

Long term, the need to maintain these habitats could create additional 6 job-years for every 100ha planted and £314k in GVA annually per ha.[19]

£314K
IN GVA ANNUALLY PER HA.

INCREASED CARBON SEQUESTRATION OF NEARLY
3,000
TONNES OF CO_2 ANNUALLY

57,000m³
GAIN PER YEAR IN WATER STORAGE

NATURAL CAPITAL IN POLICY AND LEGISLATION

25 YEAR ENVIRONMENT PLAN (25YEP)

In 2018, UK Government published a plan which set out goals for improving the environment within the next generation.[20] The 25 Year Environment Plan was unique, being the first time a government strategy had centred on natural capital considerations, and pledged to maximise both environmental and economic outcomes.

"When we give the environment its due regard as a natural asset – indeed a key contributor – to the overall economy, we will be more likely to give it the value it deserves to protect and enhance it."[21]

Some of the standout commitments from the plan were:

- To embed an **'environmental net gain'** principle for development, including housing and infrastructure, ensuring that developers leave the environment in a measurably better state compared to the pre-development baseline.
- To develop a **Nature Recovery Network**, a national network of wildlife-rich places that will connect across our town, cities, countryside, and coast. This should provide 500,000ha of additional wildlife habitat to link existing protected sites. The plan's delivery would depend on increased investment in natural capital from both public and private sectors, as well as the use of scientific and economic evidence at the forefront.

The 25YEP is required to be every refreshed every five years and March 2023 saw the publication of the document's first revision: the Environmental Improvement Plan 2023.[22]

THE DASGUPTA REVIEW

In 2019, HM Treasury commissioned an independent global review on the Economics of Biodiversity led by Professor Sir Partha Dasgupta from the University of Cambridge.[23]

The landmark paper, published after two years of extensive research, concludes that we must reshape our global economies to account for "our most precious asset", nature.

It describes how our demands on nature vastly exceed the Earth's capacity to supply them. We must learn to manage our natural capital sustainably and change how we think, act and measure our success to ensure the wellbeing of current and future generations. To do this requires transformational change of our finance and education system.

20 Defra 2018. A Green Future: Our 25 Year Plan to Improve the Environment
21 Quote taken from 25YEP (pg. 19).
22 Defra. 2023c.Environmental Improvement Plan 2023
23 HM Treasury. 2021. The Economics of Biodiversity: The Dasgupta Review
24 Defra. 2011. The Natural Environment White Paper
25 DESNZ & BEIS. 2017. Clean Growth Strategy
26 Defra 2018. A Green Future: Our 25 Year Plan to Improve the Environment
27 DESNZ. 2019. Transforming finance for a greener future: 2019 green finance strategy
28 HM Treasury. 2020. The Green Book and accompanying guidance and documents
29 Agriculture Act 2020
30 Environment Act 2021
31 HM Treasury. 2021. The Economics of Biodiversity: The Dasgupta Review
32 Convention on Biological Diversity. 2022. Kunming-Montreal Global Biodiversity Framework – Target 15
33 Defra. 2023a. Nature markets framework.
34 Defra. 2023b. Mobilising Green Investment - 2023 Green Finance Strategy

Figure 3. Key publications for the integration of natural capital into policy and legislation.

THE 10 TARGETS WITHIN THE 25 YEAR ENVIRONMENT PLAN

- Clean air
- Clean and plentiful water
- Thriving plants and wildlife
- Reducing the risks of harm from environmental hazards
- Using resources from nature more sustainably and effectively
- Enhancing beauty, heritage, and engagement with the natural environment
- Mitigating and adapting to climate change
- Minimising waste
- Managing exposure to chemicals
- Enhancing biosecurity

ENSHRINING ENVIRONMENTAL PROTECTION INTO LAW: THE ENVIRONMENT ACT, 2021

The Environment Act[35] provides a legal framework for the government to meet environmental objectives in England, setting statutory targets in four priority areas: waste, air quality, water and nature and biodiversity. The Act brings in several new requirements for planners and decision-makers that will help to protect our natural capital:

- Biodiversity Net Gain
- Local Nature Recovery Strategies
- Strengthened biodiversity duty
- Strategic protected site and species strategies
- New tree felling consultation requirements

MITIGATION HIERARCHY

Planning proposals must follow a mitigation hierarchy which seeks to limit the negative impacts of a development on biodiversity from the outset.[36] Measures must be pursued in the following order:

1. Avoidance – Prevent or reduce biodiversity impacts through site selection and layout. Design a development to avoid/ retain habitats onsite.
2. Minimisation – Reduce severity, duration or extent of negative impacts on biodiversity that can't be avoided.
3. Compensation – Restore habitats that have been lost/ degraded due to development.
4. Offsetting – Where it is not possible to secure compensation on-site, off-site solutions should be sought. Solutions should be found as close to the initial impact as possible.

BIODIVERSITY NET GAIN (BNG)

From January 2024, most large-scale developments granted planning permission in England will have to demonstrate how they will deliver a minimum 10% net benefit for wildlife. This will be extended out for small sites from April 2024 and is planned for Nationally Significant Infrastructure Projects (NSIPS) in 2025.[37] Before development can commence, applicants will submit a biodiversity gain plan for approval by the planning authority.[38]

BNG is to be calculated using the latest version of the Biodiversity Metric, developed by Natural England.[39] The metric uses habitat features to assess biodiversity value, calculated as 'biodiversity units', before and after proposed interventions. Legal mechanisms (planning conditions and obligations or conservation covenants) will ensure habitat is secured for at least 30 years.

BNG is additional to existing habitat and species protections. It reinforces the mitigation hierarchy, with a premium on gains as close to the development site as possible. For developers unable to use on-site or off-site units to deliver BNG, statutory biodiversity credits are available to buy as a last resort.[40] BNG is an example of a compliance nature-based market (detailed in the "Nature Markets" section).

LOCAL NATURE RECOVERY STRATEGIES (LNRS)

Local Nature Recovery Strategies (LNRS) are spatial plans for our natural capital which will help to drive more coordinated, practical and focussed action and investment in nature's recovery to help deliver the Nature Recovery Network. There are 48 strategy areas across England, with a 'Responsible Authority' assigned to lead preparation in each area.[41] LNRS development must be locally led, evidence based and co-produced, bringing together communities and decision makers from across the public, private and voluntary sectors.

The Liverpool City Region Combined Authority will lead on preparation for our city region, working closely with local partners to deliver three objectives:

1. Mapping the most valuable existing habitats for nature.
2. Detailing specific proposals for creating or improving habitat, both for nature and wider environmental goals.
3. Agreement of the priorities for recovery of our local nature.

The LNRS can help to plan and identify potential opportunities for Biodiversity Net Gain, alongside wider environmental objectives. Priority areas within the LNRS will receive higher biodiversity values for BNG to incentivise strategic nature restoration.[42] Once developed, the LNRS will highlight natural capital investment opportunities to fund planned interventions.

STRENGTHENED BIODIVERSITY DUTY

Government departments, local authorities and other public authorities in England must consider what actions they will take for biodiversity by January 1st, 2024.[43] Policies and objectives targeted and conserving and enhancing nature should be agreed as soon as possible after this and are to be reviewed at least every 5 years.

Examples of what this could look like include:

- Creating habitats and 'nature corridors' that connect existing habitats, allowing species to move.
- Less frequent mowing of parks, greenspaces and roadsides to establish grassland and wildflower areas.
- Building and installing nest boxes for birds, bats and other animals.
- Helping to educate the public through communications or collaborative projects to encourage them to take action for nature.
- Reviewing internal policies and processes, for example transport, waste and procurement.

LEVELLING-UP AND REGENERATION ACT[44]

In November 2023, the Levelling-up and Regeneration Bill received Royal Assent. This will makes important changes to the planning system and requires all relevant plan-makers to 'take account of' LNRS.

35 Environment Act 2021
36 DLUHC. 2023. National Planning Policy Framework
37 Defra & DLUHC. 2023. Biodiversity Net Gain moves step closer with timetable set out [Press Release]
38 Defra. 2023d. The biodiversity gain plan: draft template and guidance
39 The Biodiversity Metric 4.0
40 Defra, 2023e. Statutory biodiversity credit prices.
41 Defra, 2023f. Local nature recovery strategies: areas and responsible authorities
42 Defra, 2023g. Local nature recovery strategies
43 Defra, 2023h. Complying with biodiversity duty
44 Levelling-up and Regeneration Act 2023

NATURAL CAPITAL FINANCING

Traditionally, finance for UK natural capital has been obtained from public sources and charitable funding. Current examples of public funding include:

- Nature for Climate Fund (NCF) - £640 million to enhance woodland cover and manage peatlands until 2025.[45]
- Species Recovery Programme Capital Grant Scheme (SRPCGS) - £18 million for the enhancement or creation of heritage assets which benefit species recovery[46]
- Green Recovery Challenge Fund - £40 million available to kick-start environmental renewal and create green jobs.

Examples of organisations providing charitable funding include:

- National Lottery Heritage Fund
- Esmée Fairburn Foundation

However, in 2021 a report published by the Green Finance institute revealed a **minimum of £44-£97 billion in investment above public sector commitments would be required to meet nature-related targets** over the next ten years.[47] Despite public investment continuing to increase since this publication, **private investment will be essential to plug this gap** and allow for outcomes outlined in the 25 Year Environment Plan in England and equivalent in the rest of the UK.

Because of this, UK Government have set a target to raise at least £500 million in private finance to support nature's recovery every year by 2027 in England, rising to more than £1 billion by 2030.[48]

WHY WOULD THE PRIVATE SECTOR INVEST IN NATURE?

1. For direct investment in benefits to their own operations
2. To meet an organisation's own net-zero and/or biodiversity-related targets
3. To comply with legislative drivers (e.g., BNG)

NATURE MARKETS

One mechanism for private investment into nature is through nature markets – **the sale of ecosystem services as units or credits**.[49] Nature markets enable businesses to invest with landowners to provide carbon, nature recovery, clean water and other benefits. UK markets are currently small scale and mostly in the early stages of development but are expected to grow rapidly in the coming years, these include:

Voluntary nature-based carbon markets e.g. the UK Woodland Carbon Code (WCC)[50] and UK Peatland Code.[51] These are two of the most mature markets in the country and allow for compensation for carbon emissions.

Compliance nature markets – A market in which buyers purchase units of an ecosystem service in order to meet regulatory requirements e.g. biodiversity net gain credits. A Marine Net Gain policy is currently in development which will also explore a market-based approach.

Voluntary water quality and flood risk markets – Examples include the development of a Woodland Water Code by the Forestry Commission (expected by March 2025) and markets currently being established by water utilities in some catchments (see "NFM in the Wyre" section).

BLENDED FINANCE

Both public and private finance will have a considerable role in nature's recovery, with a third option being to combine these sources. Blended finance uses public and philanthropic capital to change the risk/return profile of projects in order to catalyse large scale private investment.[52] This method can:

- Provide funding for the design or preparation of projects to ensure they are investor ready.
- Build capacity of investees and key stakeholders.
- Provide guarantees to protect investors against losses.
- Lower the overall cost of capital and mobilise finance from more risk-averse investors.

45 Defra. 2021. Nature for people, climate and wildlife
46 Natural England. 2023. Boost for rare and threatened species with new conservation funding announced. [Press release]
47 Green Finance Institute. 2021. The Finance Gap for UK Nature
48 HM Treasury. 2021. Autumn Budget and Spending Review 2021
49 Defra. 2023a. Nature markets framework
50 UK Woodland Carbon Code
51 IUCN. 2023. Peatland Code
52 Earth Security. 2021. The Blended Finance Playbook for Nature Based Solutions
53 Green Finance Institute. The Wyre Catchment Natural Flood Management Project

NATURAL FLOOD MANAGEMENT (NFM) IN THE WYRE

The Wyre River Catchment Natural Flood Management Project is a local example of a natural capital project that has reached a stage of investment readiness.[53] Communities in this area had experienced a one-in-50-year flood event four times in the last 20 years. This project aims to use nature-based solutions to reduce flood risk whilst simultaneously removing carbon, increasing biodiversity and improving water quality, through the sale of ecosystem services to private and public beneficiaries. The project is the first of its kind in the UK to use private finance for natural flood management measures. Multiple stakeholders are engaged in the transaction structure of the project:

- **Land managers**, predominantly farmers, are responsible for hosting and maintaining the nature-based interventions helping to reduce flood risk, receiving an annual payment with the potential for additional payments if biodiversity targets are met.
- **Beneficiaries** of the reduced flood risk (e.g. United Utilities, the Environment Agency and Wyre Council) pay an annual project fee for delivery of the interventions.
- **A Community Interest Company (CIC)** acts as the legal entity through which the project capital flows and have sourced external investment to provide upfront capital and manage risk.
- **Investors** provided a mix of public grants and private loans in order to meet the up-front costs of the project.

Interventions are predicted to deliver a 10% reduction in flood impact with interventions expected to last around 120 years. The value of the ecosystem services created is estimated to outweigh the creation and delivery costs several times over.

The UK Government have set a target to raise at least £500 million in private finance to support nature's recovery every year by 2027 in England, rising to more than £1 billion by 2030.

INVESTING IN NATURE IN THE LIVERPOOL CITY REGION

In 2022 the Liverpool City Region, led by the Combined Authority, submitted a successful bid to the Natural Environment Investment Readiness Fund (NEIRF), securing £100,000 to help reverse biodiversity decline and stimulate private investment into nature. The project aims to develop a Nature Based Investment Model for the LCR to help facilitate BNG and delivery of the LNRS as well as producing wider benefits for nature and ecosystem services.

The project, managed by Merseyside Environmental Advisory Service (MEAS), has brought together a number of partners, including LJMU, to identify habitat creation and restoration opportunities within three Nature Improvement Areas (NIAs) focused around the Alt and Sankey river catchments. Consultants are helping to understand the investment and seller opportunities to achieve ecological recovery. The project will provide a model which can be scaled up and rolled out across the Liverpool City Region and further afield.

NATURAL CAPITAL MAPPING

Scientific and economic evidence must be at the forefront of embedding natural capital into decision-making. Mapping approaches can measure natural capital assets and ecosystem services at scales relevant to local and regional projects and policy.

LIVERPOOL CITY REGION NATURAL CAPITAL BASELINE

The LCR Natural Capital Working Group (part of the Local Nature Partnership – Nature Connected) led on the creation of a Liverpool City Region Natural Capital Baseline commissioned by the LCR Combined Authority.[54]

The first step towards understanding and measuring the value of benefits derived from nature is creating a natural capital asset map and register. The Ecoserv approach was used to produce a detailed habitat map (basemap), based on a range of nationally available datasets and assess the location and extent of these assets[55] (Figure 4).

The habitats of the LCR are predominantly urban but with a reasonably diverse mosaic of other habitats such as woodland and intertidal.

The basemap can be used to calculate the ecosystem service flows that different habitats generate and consequently can allow for the creation of capacity maps. Socioeconomic data can then be incorporated for the development of maps which identify area with the highest demand for ecosystem services.

Capacity and demand maps allow for analysis that identifies opportunities and “pinch points” to plan and recommend where interventions are best suited or most needed. Tools such as the Environment Agency’s Natural Capital Registers and Accounts Tool[56] can be drawn on alongside the basemap for biophysical or economic valuation.

54 Holt et al. 2020. Baseline natural capital assessment for the Liverpool City Region
55 EcoservR
56 The Environment Agency’s Natural Capital Register and Account Tool (NCRAT)

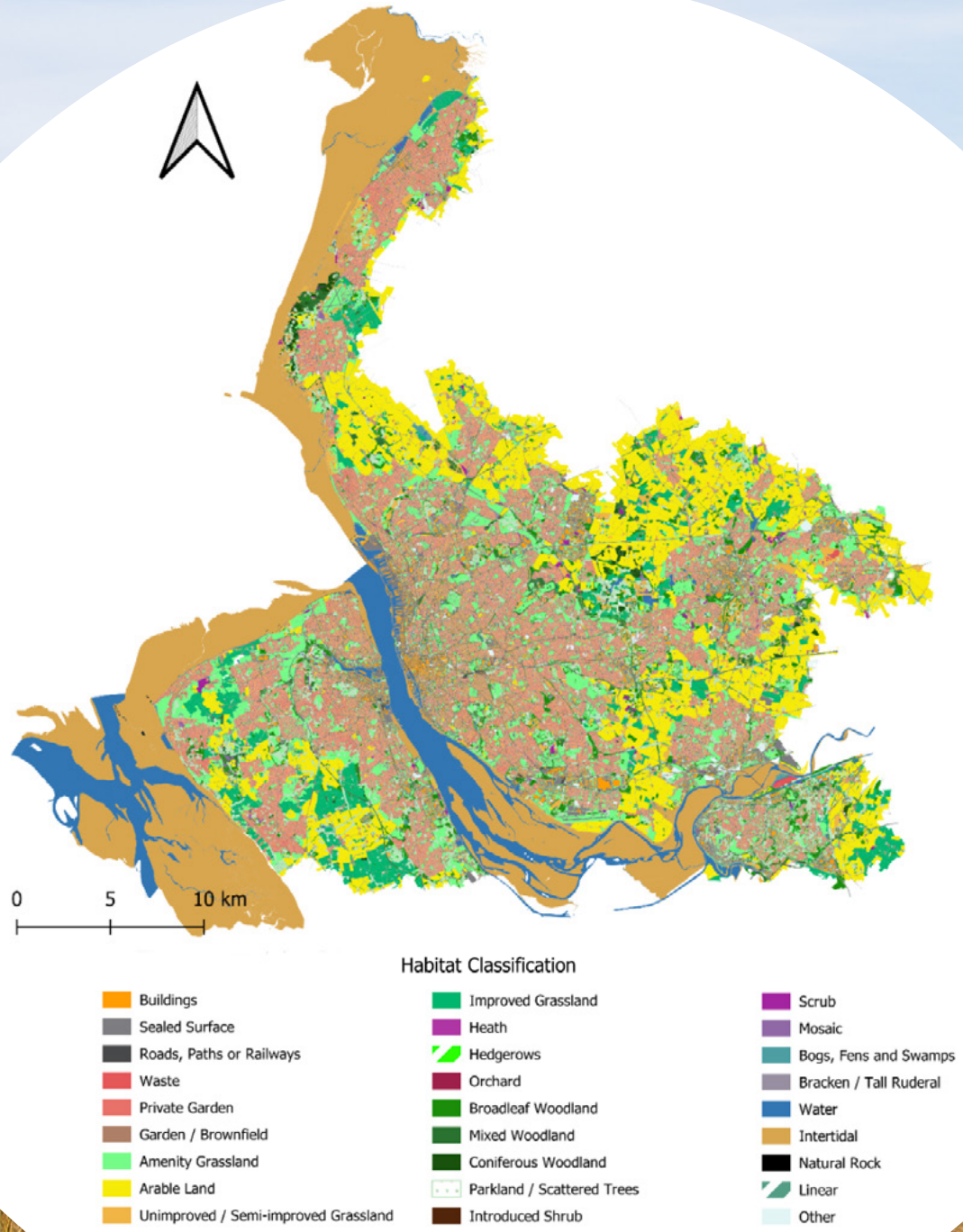


Figure 4. Natural Capital basemap displaying habitat types across the LCR.

THE LCR NATURAL CAPITAL BASELINE CAN BE USED TO PLAN, MEASURE AND MONITOR ENVIRONMENTAL IMPROVEMENTS IN THE CITY REGION.

The **capacity** for the following ecosystem services was mapped for the LCR:

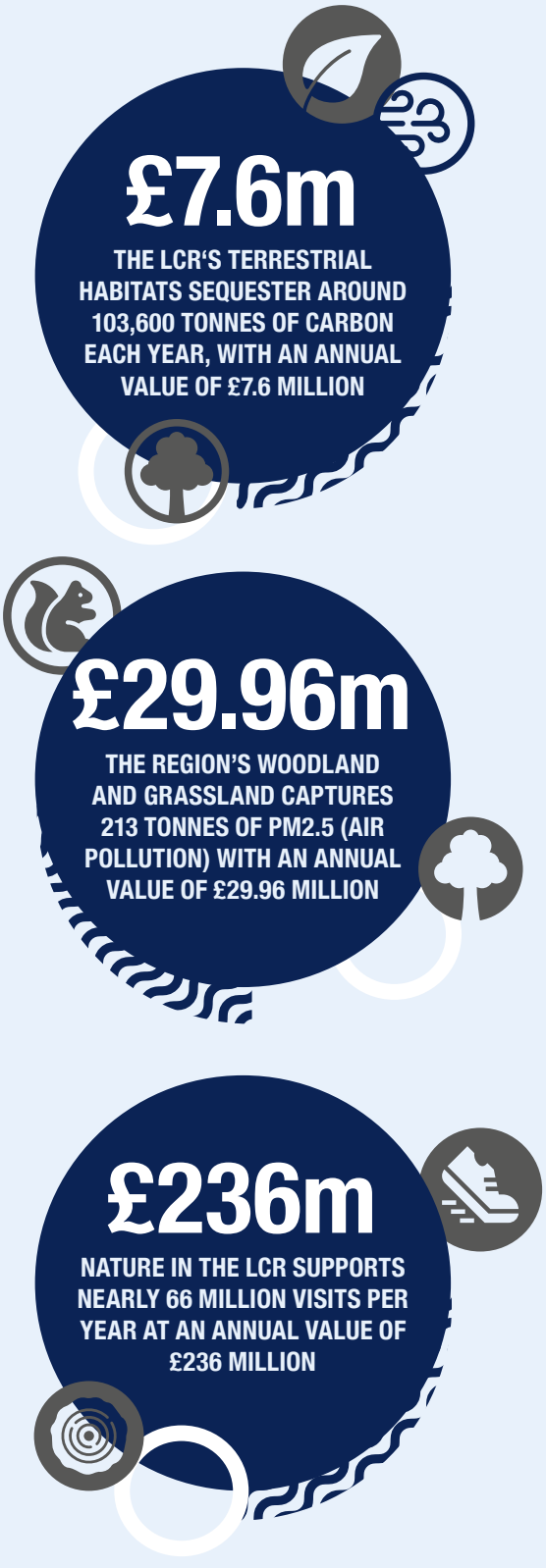
- Carbon storage
- Carbon sequestration
- Air purification
- Local climate
- Noise regulation
- Water flow
- Water quality
- Access to nature

The **demand** for the following ecosystem services was mapped for the LCR:

- Air purification
- Local climate
- Noise regulation
- Access to nature

The **value** of the following ecosystem services was calculated for the LCR:

- Carbon sequestration and storage
- Timber production
- Air pollution regulation
- Recreation
- Physical health services



THE ECOSERVR APPROACH

The mapping tool EcoservR, is a re-write of Ecoserv-GIS,[57] developed by the Natural Capital Hub at LJMU and used to plan and evaluate a range of interventions, ranging from site scale nature-based solutions to Defra's national Nature for Climate woodland creation scheme.

One site scale example is the Heath Park Masterplan, for which EcoservR was used to model the effects of an innovative, new design plan for the regeneration of the 57-acre Heath Business and Technical Park, in Runcorn.

Ecosystem service provision was calculated under both the current site layout and the proposed design, which added over 3ha of native broadleaved woodland (Figure 5). Significant environmental benefits were evidenced for both the site itself and the wider Runcorn area (Table 1). Large gains in air purification (Figure 6), carbon storage, noise regulation and local climate regulation (cooling) were found.

This natural capital backed project proposal won the RIBA "A Vision of the Future" design competition and demonstrates how the Liverpool City Region baseline can be used to inform development plans, and to provide an evidence base for environmentally conscious design proposals.

Figure 5. Maps displaying the habitats of the Heath Park site before (left) and after (right) the proposed interventions.

57 Winn, Bellamy & Fisher. 2018. EcoServ-GIS: a toolkit for mapping ecosystem services

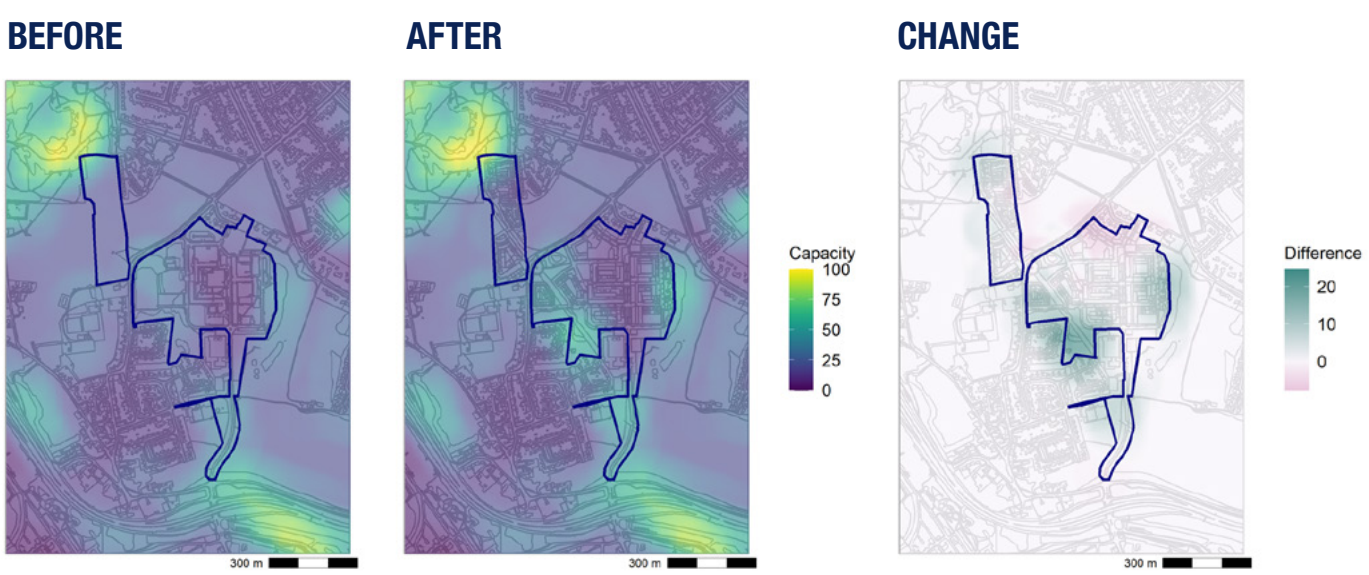


Figure 6. Capacity for the Heath Park Masterplan to improve air purification before and after interventions (left), and the percentage change from baseline (%) (right).

BOUNDARY	ACCESSIBLE NATURE EXPERIENCE	AIR PURIFICATION	CARBON STORAGE	FLOOD RISK MITIGATION	LOCAL CLIMATE REGULATION	NOISE REGULATION	POLLINATION
HEATH PARK	4	25.6	21.3	-8.5	132	20.9	6.6
HEATH PARK +500M	1.9	3.9	1.6	-0.7	11.1	4.9	0.7
HEATH WARD	0.4	1.8	0.5	-0.3	1.9	2.2	0.3

Table 1. Relative change from baseline (%) for interventions planned for the Heath Park development. The boundaries assessed are defined in Figure 7.

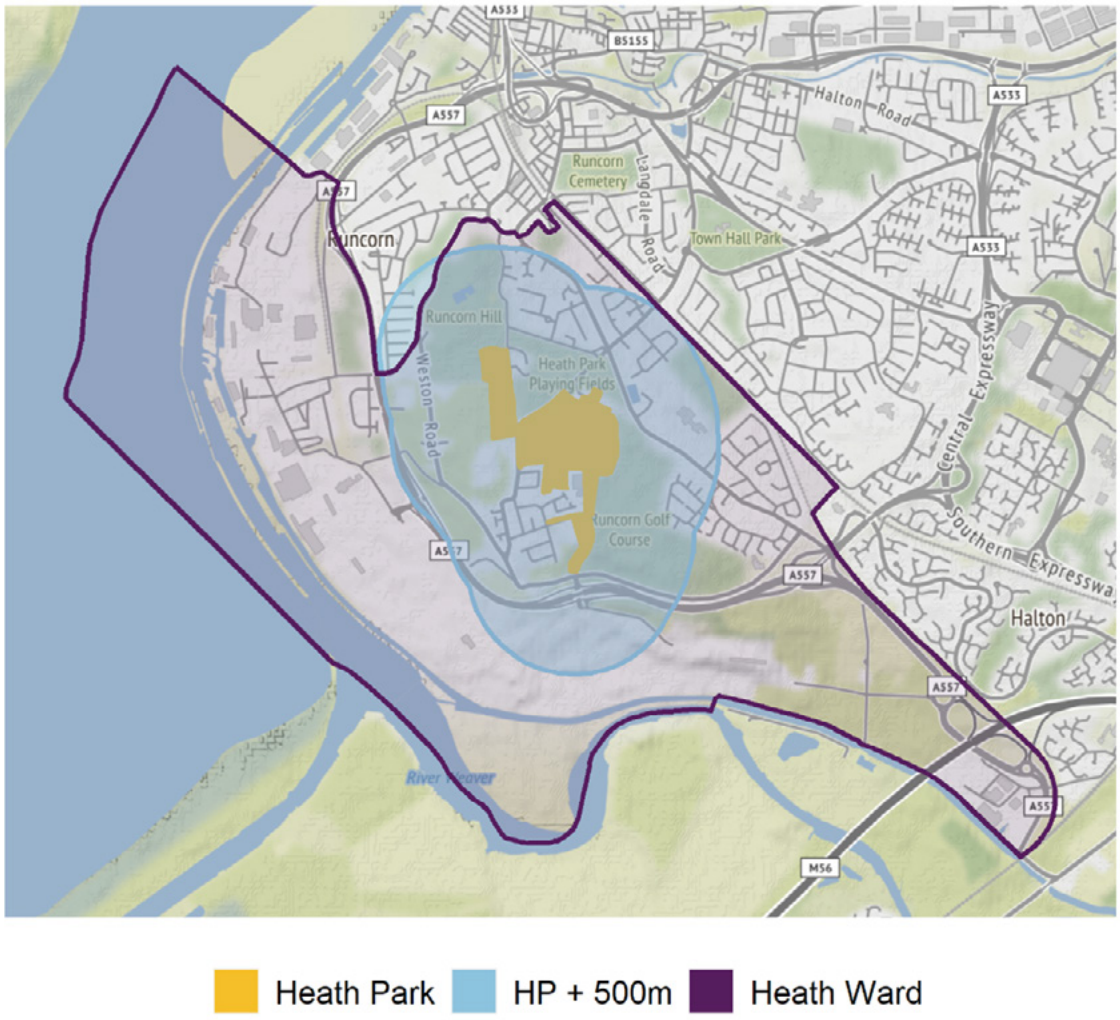


Figure 7. Heath Park and surrounding boundaries. ('Heath Ward' based on previous ward boundary).

LIVERPOOL JOHN MOORES UNIVERSITY

AUTHORS
Hannah Branwood,
Sandra Angers-Blondin
and Colm Bowe

FUNDED BY
Liverpool City Region Combined Authority and through the Mersey Forest led, Green Recovery Challenge Funded project "More from Trees"

LIVERPOOL CITY REGION COMBINED AUTHORITY

METRO MAYOR LIVERPOOL CITY REGION

THE MERSEY FOREST more from trees

Green Recovery Challenge Fund

Department for Environment Food & Rural Affairs

The National Lottery Heritage Fund

Environment Agency

NATURAL ENGLAND

NATURAL CAPITAL HUB