

Recognising the Importance of Scotland's Natural Capital



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What is Natural Capital, and why is it important for Scotland?

Natural capital refers to the stock of natural resources including air, water, minerals and all living things. These natural resources are crucial to the functioning of our society and economy as they underpin and provide a wide range of social, environmental and economic benefits to the people living and working in Scotland. The types of benefits that Scotland's natural capital provides include:

- ◆ **Provisioning services** - material outputs such as fish, timber, and fossil fuels.
- ◆ **Regulating services** - the regulation of natural processes that help to maintain the quality of the natural environment we rely upon, such as carbon sequestration (the removal of greenhouse gases from the atmosphere), air pollution removal and noise mitigation.
- ◆ **Cultural services** - non-material benefits such as recreation and aesthetics.

The 2021 Dasgupta Review on the Economics of Biodiversity (commissioned by HM Treasury), called for changes in how we think, act and measure economic success to protect and enhance our prosperity and the natural world. It recognised that the economy is embedded within in nature, not external to it (illustrated in Figure 1 below).



Figure 1: The Economy is Embedded in the Biosphere – [Dasgupta Review](#).

Despite the economy being fundamentally dependent on nature to supply the natural capital it needs and to assimilate its wastes, including greenhouse gases, historically the value of natural capital has been overlooked in decision-making. This has contributed to our natural assets becoming degraded and sometimes even lost, reducing their ability to provide vital benefits to the people in Scotland.

Traditional measures of economic performance often don't fully take account of the role nature plays in delivering economic wellbeing. For example, a forest grown for timber is only seen as "valuable" in GDP figures when trees are felled and timber is sold. However, our forests provide a range of vital benefits beyond timber, which aren't all directly captured in our national accounts¹. Natural capital measurement seeks to measure the state of our natural assets and quantify the additional benefits that society receives from interacting with our natural world, such as improving air quality, recreation, and health benefits from spending time in nature.

By attempting to measure the value of the natural world, we improve our ability to ensure economic growth does not occur at the expense of our natural environment.

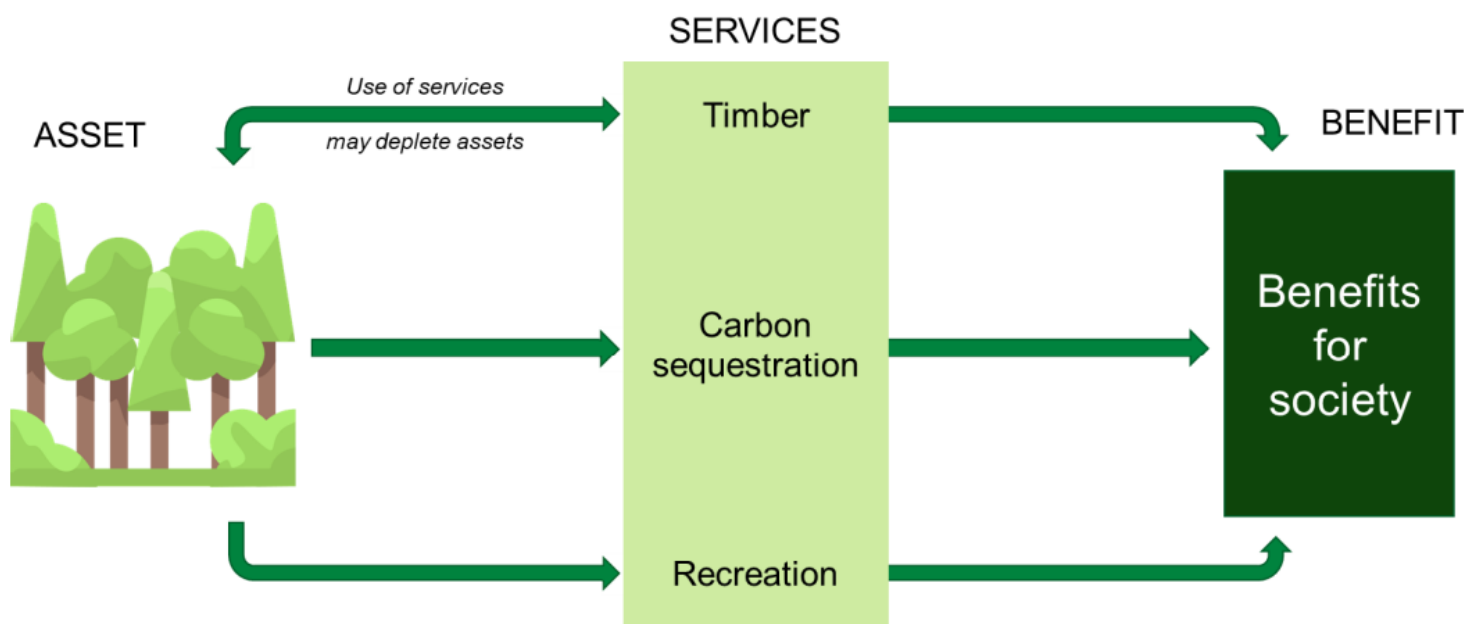


Figure 2: Illustrative example of ecosystem services provided by woodlands.

In Scotland, we have two related annual publications that help us assess the status of our natural capital - the [Natural Capital Asset Index](#) (the Index), produced by NatureScot, and the [Natural Capital Accounts](#) (the Accounts), produced by ONS on behalf of the Scottish Government². The index tracks how well Scotland's habitats can provide ecosystem services that contribute to our quality of life. This is understood by looking at the extent of different Scottish habitats and their characteristics³, which

¹ [GDP Quarterly National Accounts: 2022 Quarter 4 \(October to December\) - gov.scot \(www.gov.scot\)](#)

² NB: ONS also produce sets of Natural Capital Accounts for the UK and England.

³ The Index includes 38 quality indicators for habitat characteristics.

determine their ability to provide different types of ecosystem services⁴ to people. The accounts, on the other hand, estimate monetary values for a number of the ecosystem services that our environment brings to society.

Figure 3 highlights the range of dimensions of natural capital captured in the index and the accounts within the categories of 'provisioning', 'regulating' and 'cultural' services⁵. Note that services within the accounts are not directly mapped to services in the index.

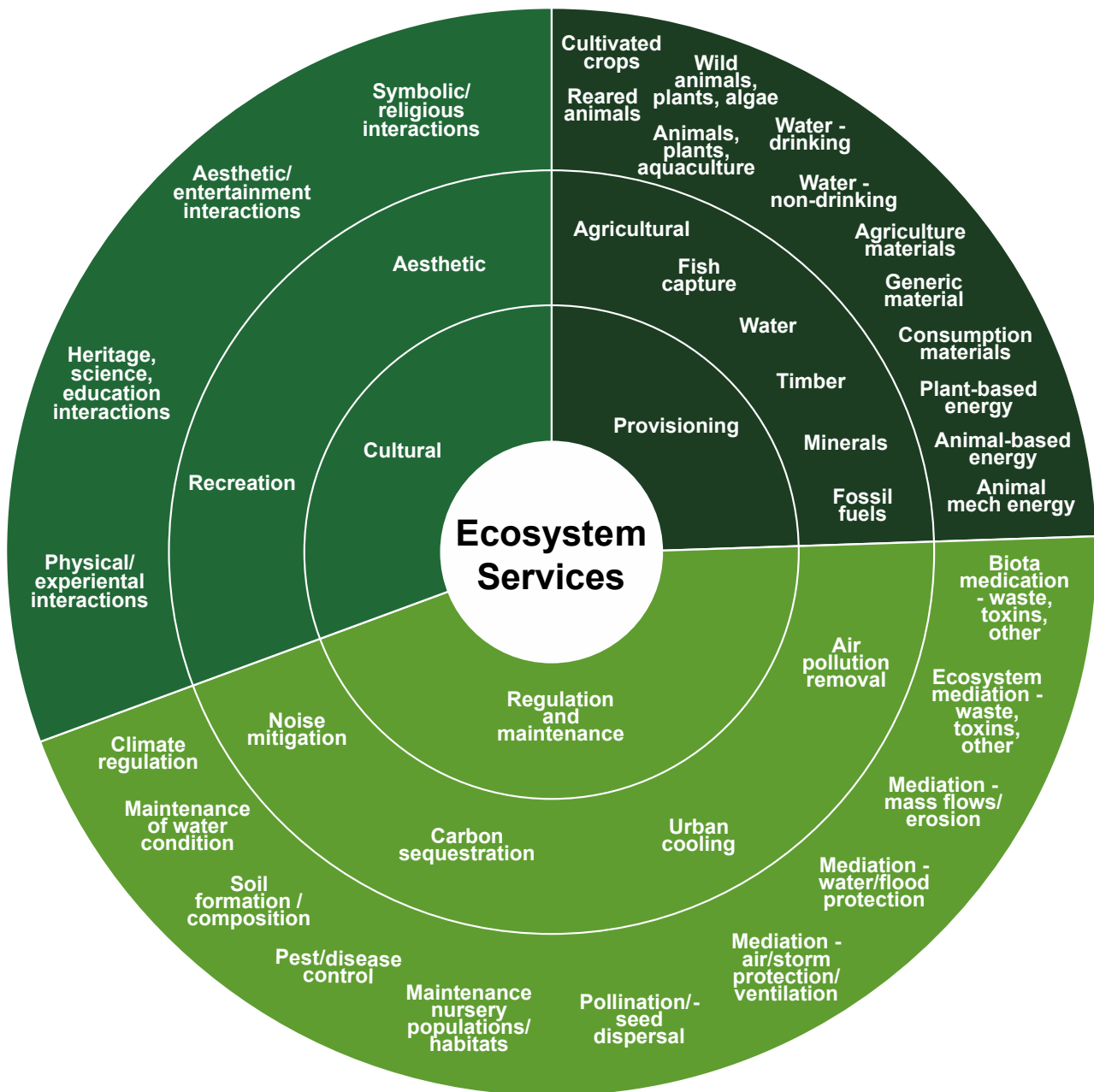


Figure 3: Services measured in the accounts and in the index

Inner ring = Service category
Middle ring = Services in the accounts
Outer ring = Services in the Index

⁴ The Index uses the CICES framework and includes 28 ecosystem services. More on the methodology [here](#).

⁵ Services are not shown in proportion to their extent in the Accounts/Index. Within the Index, scoring takes place across these dimensions at a habitat level. Within the Accounts financial sums are allocated to each element. A more detailed overview of the two tools can be found [here](#).

The accounts and the index represent a positive step forward in accounting for nature and the multiple benefits it provides. However, there are important ecosystem services that are not yet captured in these measures, including some key regulating services such as flood mitigation and water quality. Therefore, there is still scope for further improvements in how we account for natural capital.

Key Insights from the Natural Capital Asset Index and the Natural Capital Accounts

1 Efforts to enhance Scotland's Natural Capital still have some way to go.

- The capacity of Scotland's habitats to provide ecosystem services that contribute to people's wellbeing is dependent on habitat extent and characteristics (for example, habitat condition). An increase or decrease in the capacity of a habitat or habitats refers to a change in the scale of ecosystem services provided by the habitats in question.
- The backdated index shows a decrease in the capacity of Scotland's habitats to provide ecosystem services since records began in 1950 through to 1990 (Figure 4). Much of this decline was due to land use changes such as deforestation - a trend established during the industrial revolution.
- The potential of Scotland's habitats to deliver ecosystem services has improved slightly over the past 20 years. However, the index is officially classed as 'performance maintaining' by the [National Performance Framework](#) where it is an economic indicator of sustainable development.

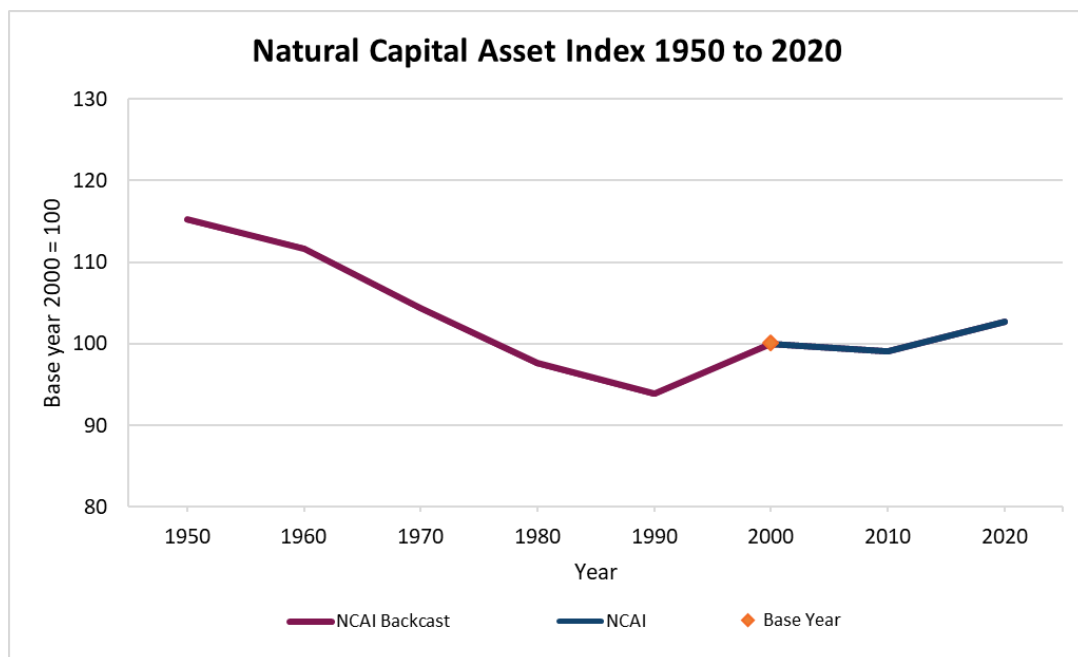


Figure 4: Historic trend of the index.

The vertical axis is the relative ability of Scotland's natural environment to provide benefits to people. Backdated data is used from 1950 to 2000 and the current index methodology is used from 2000 to 2020.

2 Of all the habitats included in the index, woodlands have the greatest capacity to provide benefits to people.

- The capacity of woodlands to provide benefits to people has increased by 12 percentage points since 2000 (Figure 5), largely due to woodland creation. Although the capacity of woodlands to contribute to people's wellbeing is increasing, overall woodland condition remains relatively poor with around half of woodlands in protected areas⁶ in unfavourable condition as of 2021⁷.
- Agriculture and cultivated habitats have decreased the most in their capacity to provide benefits to people, largely due to a decrease in habitat extent.

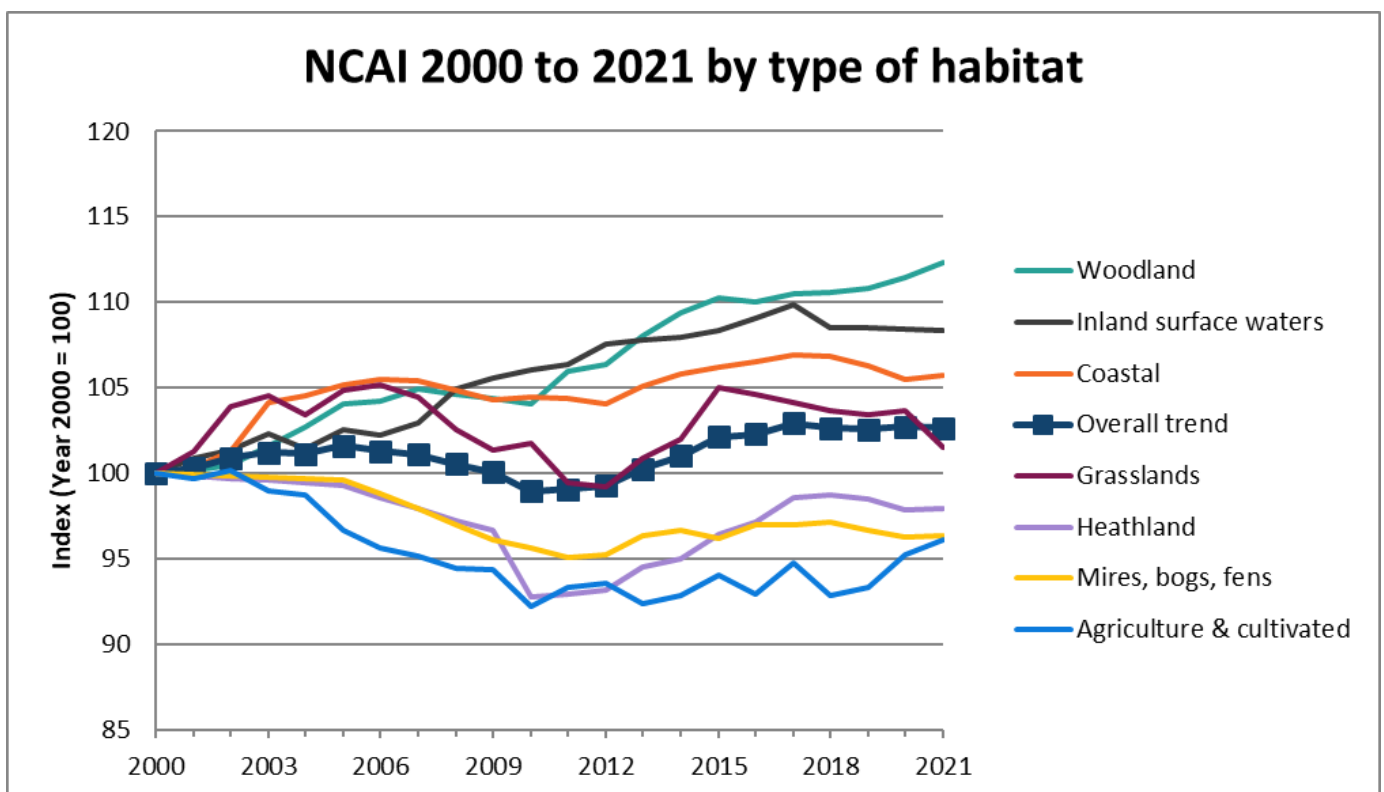


Figure 5: The Natural Capital Asset Index by type of habitat 2000 to 2021.

A graph of the Index broken down into its constituent habitats, where the vertical axis is the ability of Scotland's habitats to provide benefits to people relative to each other.

⁶ Woodlands in protected areas refers to woodlands in sites of special scientific interest (SSSIs), special protection areas (SPAs), and special areas of conservation (SAC).

⁷ Site condition monitoring is carried out to determine the condition of the natural features in each site to determine overall site condition. More on site condition monitoring can be found at [Site condition monitoring | NatureScot](#).

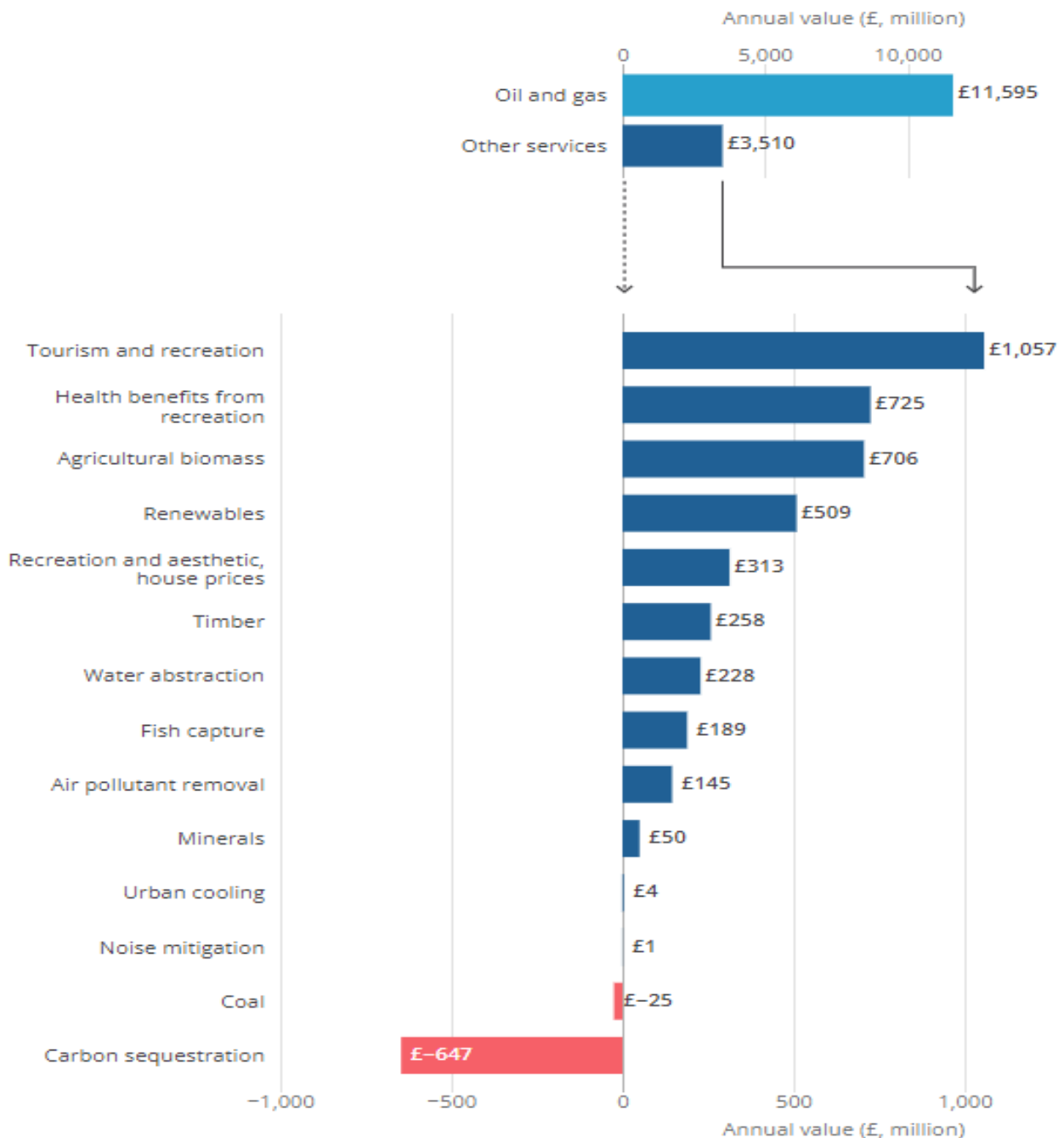
3 Natural capital makes an important contribution to Scotland's Wealth.

- In the accounts, Scotland's natural capital 'asset value' reflects the value of all quantifiable future annual flows of services expected over the lifetime of each natural asset – it stood at £230bn in 2019.
- As a point of comparison, Scotland's (population) share of total UK net capital stock – comprised of dwellings, other buildings, machinery, equipment, intellectual property and other assets – was £368bn in 2020⁸.
- Oil & gas accounted for a third of Scotland's asset value, the largest single element. This is closely followed by 'tourism and recreation' and 'the health benefits of recreation' which made up 25% and 22% of the asset value. The asset value excluding oil & gas in 2019 is £155bn.

⁸ This figure was estimated by calculating Scotland's population share of [UK total net capital stock](#).

4 The annual values of services derived from Scotland’s natural capital includes some negative as well as positive values.

- In 2019, the total net annual value of Scotland’s natural capital for the benefits that are currently measured and valued within the accounts (Figure 6) is £15bn including oil & gas, and £3.5bn excluding oil & gas.



Source: UK natural capital accounts from the Office for National Statistics

Figure 6: Annual value of ecosystem services for Scotland, £ million, 2019

Oil & gas is presented on a separate scale alongside all other services (currently measured in the accounts) with positive values. Oil & gas accounted for around 70% of the net annual value of all services in 2019.

- Most services in the accounts have positive values – including recreation, agricultural output, timber, water abstraction and air pollutant removal.
- In the accounts ‘carbon sequestration’ – the removal of greenhouse gases - has a value of negative £647 million. Figure 7 shows what this is comprised of.
- Woodlands are a key sector, which sequestered a net total of 2.6 million tonnes of carbon dioxide equivalents in 2019, with a value of almost £1.5bn. In addition, carbon is stored in wood harvested and used in building or furniture.
- Other land uses – in particular cropland, grasslands, wetlands and settlements appear in the accounts as net sources of emissions. As the greenhouse gases emitted from these sources collectively exceed the carbon dioxide sequestered by wood, the overall carbon sequestration figure is negative.
- Although not separately shown in this output, in Scotland, degraded peatlands are a notable source of the emissions from wetlands, grasslands and cropland. While peatlands in their natural state can be a great store for carbon, when they become degraded – as has happened in around 75% of Scotland’s peatlands – they emit carbon dioxide into the atmosphere. Although peatlands are a net emitter, peatlands that are in near natural or re-wetted condition (around 25% of Scotland’s peatlands) do sequester carbon and peatland restoration is a priority to help meet Scotland’s climate change targets

5 The overall annual value derived from Scotland's natural capital in 2019 stacks up well against key Scottish sectors.

- To put the £15bn annual net contribution of Natural Capital to Scotland's economy into context, it is larger than the gross value added (GVA) of the Life Sciences (worth £1.6bn), building and construction (worth £2.9bn), manufacture of food, beverage, and tobacco products (worth £3.9bn) and the manufacture of computer, electrical and electronic equipment (worth £1.9bn)⁹.
- Scotland's annual natural capital value excluding oil & gas (£3.5bn) is still larger than all but one of these sectors.

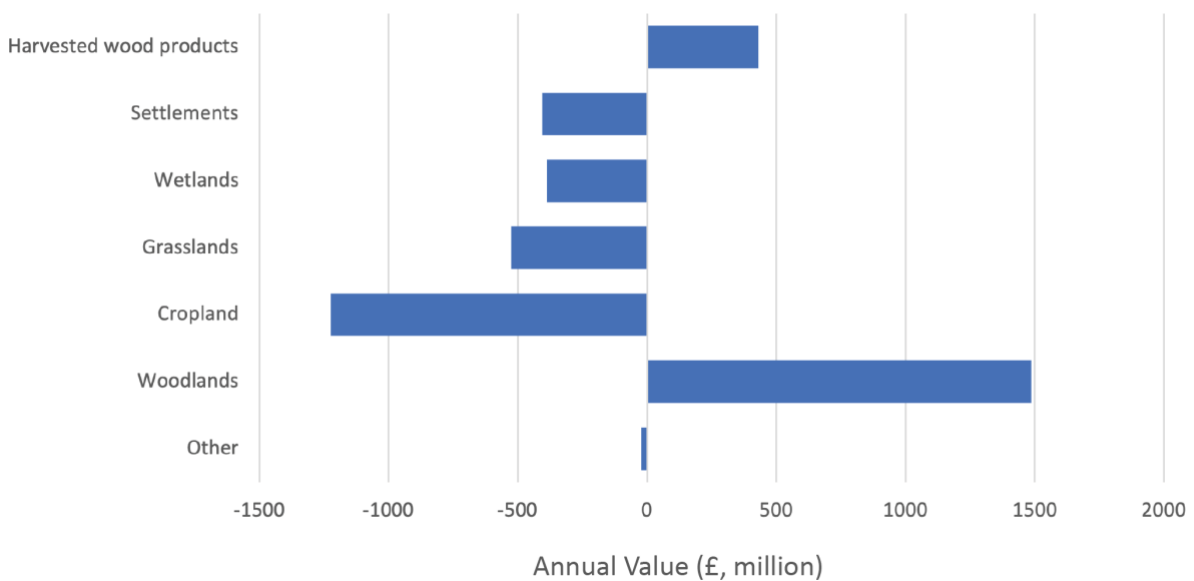


Figure 7: Carbon sequestration annual value for different land uses, £ million, 2019

⁹ [Business and innovation statistics](#)

6 There are some key regulating services that aren't currently valued in the Natural Capital Accounts.

- In 2019 the annual value of regulating services (the regulation of natural processes by habitats, e.g. carbon sequestration and air pollutant removal) measured in the accounts is negative £498m. The values for most regulating services are positive, but the value of carbon sequestration is negative, outweighing the positive value of other regulating services (Figure 8).
- It is important to note that the accounts do not currently value the role that Scotland's habitats play in flood mitigation and improving water quality, or the carbon which is stored in peatlands. If these were captured in the accounts, regulating services would account for a larger portion of natural capital.

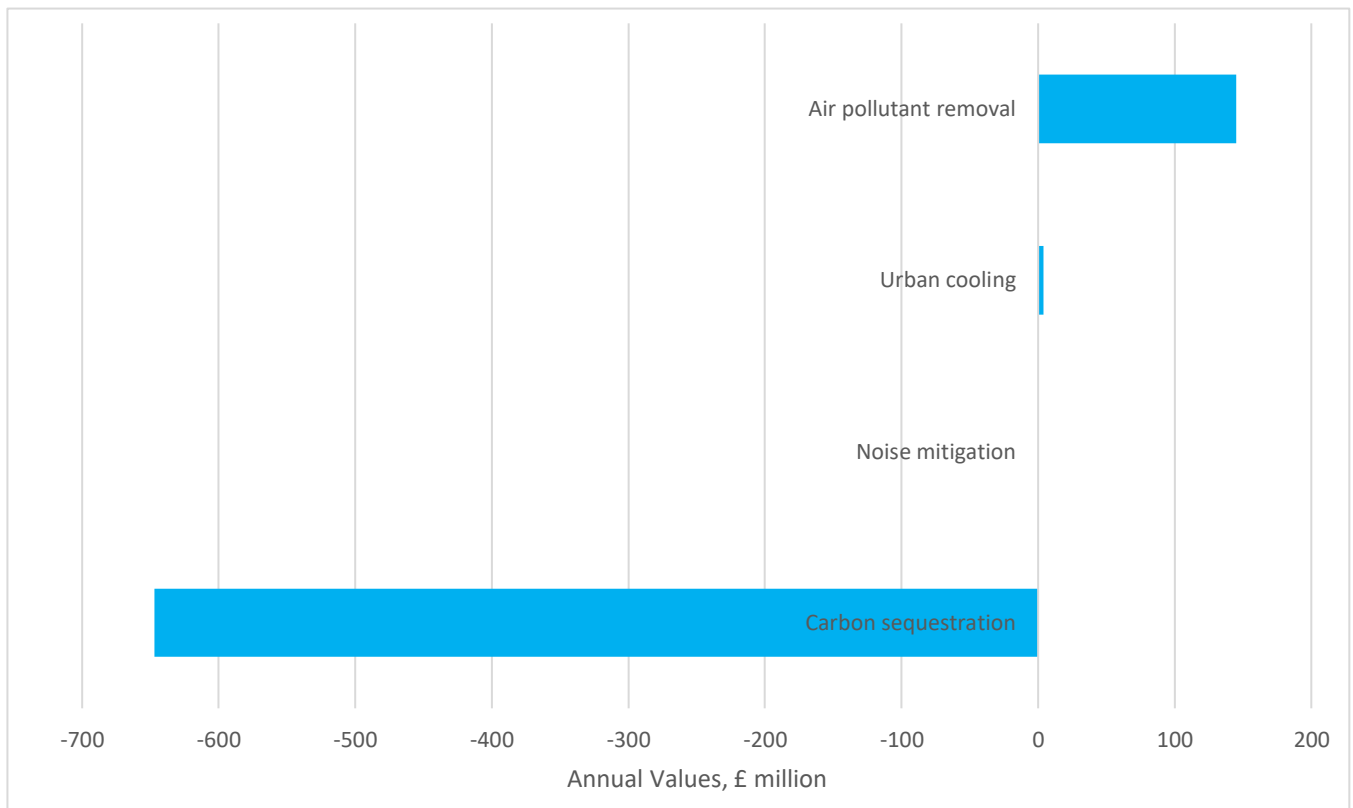


Figure 8: Annual values of regulating services, £ million, 2019

7 Natural capital provides important health benefits to people in Scotland.

- Scotland's natural environment provides valuable physical and mental health benefits to people. The accounts currently values the health benefits from nature derived from two sources: the health benefits from air pollution removal by vegetation and the health benefits from recreation in nature.
- In 2020 air pollution removal by vegetation in Scotland resulted in avoided health impacts (including reduced mortality rates, reduced respiratory hospital admissions, reduced cardiovascular hospital admissions) worth £145m. At the same time, the annual value of the health benefits derived from recreation (in the form of self-reported general health) in nature is £717m.
- There will be a number of other health benefits of the natural environment which are not currently quantified in the accounts such as health benefits from improved water quality and health benefits from climate regulation.

Embedding a natural capital approach in decision-making.

Scotland's natural environment forms an indispensable part of the functioning of our society and economy. Although we can never capture the full value of nature, because the natural world supports all life on earth, it is vital that we ensure natural capital is embedded in decision-making.

One way that natural capital is being embedded in public policy across the world – including in Scotland - is via the principles of the Wellbeing Economy. A wellbeing economy – embedded in the Scottish Government's National Strategy for Economic Transformation – is an economic system which serves the collective wellbeing of current and future generations within safe ecological limits. The Scottish Government has also adopted the “Four Capitals” approach, which places natural capital on an equal and interlinked footing with social, economic and human capital and recognises the benefits of nature-based solutions for climate change, local employment and biodiversity.

As the index and accounts show, natural capital can be significantly improved in Scotland. Both public and responsible private investment in our natural capital is necessary to maintain, restore and enhance the vital benefits that natural capital provides. Nature-based solutions to the twin crises of climate change and biodiversity loss, like peatland restoration and woodland creation, provide ways to target investment in the right types of natural capital in the right places. This is why the Scottish Government have committed to the development of a values-led, high integrity market for responsible investment in natural capital in Scotland and are directly investing in peatland restoration and forestry.

There are a growing number of tools designed to help decision-making which take a natural capital lens and layer data to enable consideration of options and opportunities for nature based projects and initiatives. These are of interest to policy makers, government analysts, land managers and those seeking to invest in natural capital.

For example, in Scotland, NatureScot is partnering with Liverpool John Moores University to develop a [landscape natural capital](#) tool which should be available in 2024. PeatSCOPE is another useful tool developed by Environment Systems Limited for the Scottish Government. The tool brings together a range of datasets to identify where peat is in Scotland and where potential benefits from restoration might arise, therefore helping to make more informed investment decisions. The HM Treasury Green Book cites the [Enabling a Natural Capital Approach](#) as a tool to help incorporate natural capital into impact assessments. Such tools will ideally support decision making and future monitoring and verification of improvements in natural capital.

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