

NATURAL CAPITAL

Past drivers

- A wide range of activities influence Scotland's Natural Capital assets including, farm management practices, transport, urban development, mineral extraction, forestry, aquaculture and commercial fishing.
- The impact of climate change on our natural capital is difficult to predict. However, natural capital can be managed to mitigate and adapt to climate change.

Where are we now?

- After decades of decline, our land-based 'natural capital stocks' have improved over the past 15 years and are now at their highest level since 2000.
- The extent of woodland continues to increase and woodland birds have shown marked improvements. Freshwater habitats continue to improve although lochs have struggled to recover from the legacy of pollutants locked into catchment or sediments.
- Heathland and peatland habitats have made a substantial recovery from historic lows in 2012. For agriculture, there has been a historical downward trend driven by habitat loss.
- In 2015, the partial asset value of Scotland's natural capital was estimated to be £291 billion.

Where do we want to be?

- Increase natural capital to pass it on to the next generation.¹

Current initiatives

- Scotland's Biodiversity: A Route Map to 2020: Identifies 'investment in natural capital' as one of the six Big Steps to help us deliver the 2020 Challenge. It cites the Woodland Carbon Code and the Peatland Code as examples of on-going investment in natural capital. It also mentions investment in green infrastructure.
- Scotland's National Marine Plan (NMP): Outlines the Scottish Government's ambition to promote an ecosystem approach in marine planning and policy-making.
- Within the Scotland Rural Development Programme, Agri-Environment Climate Scheme, Peatland Restoration and the Forestry Grant scheme will help enhance natural capital.

Future drivers

- Threats to Scotland's natural capital include:
 - invasive non-native species;
 - plant pests and pathogens;
 - climate change and ocean acidification;
 - development;
 - habitat destruction;
 - pollution and marine litter;
 - changing land and marine use and management;
- The Natural Capital Protocol is a tool that has been developed that aims to allow businesses to assess the impacts of business decisions on natural capital.

Key evidence gaps

- The best way to develop a sustainable, efficient, productive primary production sector and economy in Scotland, supporting a range of ecosystem services and natural capital.
- Identification and measurement of marine natural capital assets, and framework for assessing change in marine asset and habitat quantity and quality over time.
- The key adaptation actions needed to develop, maintain and enhance the resilience of Scotland's natural capital to future pressures including a changing climate.
- Initiatives to raise awareness of natural capital in order to enhance public engagement.
- The full impacts on economic growth of investing in natural capital.
- The contribution and value of soil to Scotland's Natural Capital, and how land management practices can enhance the long-term benefits soils provide.
- Monitoring the quantity and quality of habitats, particularly peatlands and uplands, and quantification of the non-market benefits people derive from the environment.
- Assessment of how natural capital supports regulating, provisioning and cultural services across habitat types and the cost effectiveness of natural capital in delivering services.

¹ National Performance Framework

A. Introduction

1. Natural capital, which is a relatively new concept, is the environmental resources (e.g. plants, animals, air, water, soils) that combine to yield a flow of benefits to people. Scotland's natural assets are the basis of our quality of life and underpin our economy, and it is crucial that they are protected and enhanced in order to benefit us now and for future generations. Investing in Scotland's natural capital is seen as fundamental to maintaining a healthy and resilient economy.
2. Scotland's natural capital is measured in two ways.ⁱ The Natural Capital Asset Index is a change indicator that uses ecosystem services to track the potential of Scotland's environment to benefit the people of Scotland now and into the future. The Natural Capital Accounts demonstrate the vast contributions of Scotland's natural capital to the economy and society in monetary terms.
3. Many of Scotland's growth sectors, such as tourism and food and drink, depend on high quality air, land and water. There are many other less tangible ways in which nature sustains us, contributing to our health, wellbeing, enjoyment, sense of place and who we are as a nation.

B. Recent trends

4. After decades of decline until the 1990s, our land-based 'natural capital stocks' have improved over the past 15 years and are now at their highest level since 2000.ⁱⁱ Freshwater habitats continue to improve although lochs have struggled to recover from the legacy of pollutants locked into catchment or sediments. Heathland and peatland habitats have made a substantial recovery from historic lows in 2012. For agriculture, there has been a historical downward trend driven by habitat loss.ⁱⁱⁱ

5. There has been woodland expansion in Scotland in recent years and woodland birds have shown marked improvements. However, designated woodland features in 'favourable' condition continue to decline. Native woodland creation can provide more benefits for ecosystems and wildlife than commercial conifer plantations.^{iv}
6. There have been improvements in the 'ecological status' of rivers and lochs, with pollution (e.g. nitrates) less widespread in rivers. However, there has been a decline in designated natural features to 2009, but has remained stable since then. In terms of coastal areas, there have been improvements in designated natural features and a similar upturn in bathing water quality.
7. In urban areas there is evidence of a decline in investment and maintenance of green space leading to a decline in levels of use.^v
8. The current Natural Capital Asset Index does not include marine habitats. A feasibility study is currently investigating what is required to create a marine Natural Capital Asset Index, which would allow us to identify trends in quantity and quality of marine assets such as fish stocks, marine mammals and sea birds, and seabed and water column habitats.
9. Scotland's natural capital the partial asset value was estimated to be worth £291 billion in 2015, around 37% of the UK asset valuation. This estimate includes the contribution of natural capital to both the economy and to Scotland's well-being.^{vi}

C Past drivers of change

10. A wide range of factors influence natural capital, both positively and negatively, and the headline trend in the Natural Capital Asset Index must be dissected to understand patterns for particular ecosystem services and/or habitats. For example, anything which affects the quality or quantity of our terrestrial habitats will

have an influence on natural capital. While we currently do not have a marine Natural Capital Asset Index, previous ecosystem assessments allow us to identify trends and drivers in ecosystem services pressures and provision.

11. Land management practices and marine environment use have an important impact on natural capital. For example, the reduction in cattle and sheep numbers has partly contributed to a recovery in the condition of grasslands since 2011. In the marine environment, seabed habitats were assessed in 2010 to have suffered physical damage from mobile fishing gear such as trawls and dredges, affecting levels of biodiversity and ecosystem function.
12. The impact of climate change on our natural capital is difficult to predict. Similarly, the interaction between climate impacts may be uncertain leading, for example, to extreme weather conditions. An increasing atmospheric concentration of carbon dioxide is also contributing to the acidification of the oceans, which will increase pressure on the marine ecosystem.
13. There are trade-offs and synergies associated with different management choices. For instance, the choice to harvest trees on a particular piece of land might have a positive impact on provisioning ecosystem services (timber), but a negative impact on regulation & maintenance (e.g. flood risk management) and cultural (e.g. opportunities for recreation) ecosystem services. In this example, the overall impact on the indicator might be neutral, and this illustrates why it is important to investigate overall changes within the Natural Capital Asset Index. A holistic approach to natural capital management is therefore required to align policy outcomes and avoid negative conflicts.^{vii}

D Future drivers

14. Threats to Scotland's natural capital include:
 - invasive non-native species;
 - plant pests and pathogens;
 - climate change and ocean acidification;
 - development;
 - habitat destruction;
 - pollution (including marine litter); and
 - changing land and marine use and management.

E Current initiatives

15. Scotland's Biodiversity: A Route Map to 2020: identifies 'investment in natural capital' as one of the six Big Steps to help us deliver the 2020 Challenge. It cites the Woodland Carbon Code and the Peatland Code as examples of on-going investment in natural capital. It also mentions investment in green infrastructure.
16. Agri-environment Climate Scheme: As part of the EU Common Agriculture Policy Pillar 2 (Scotland Rural Development Programme), this scheme promotes land management practices which protect and enhance Scotland's natural heritage, improve water quality, manage flood risk and mitigate and adapt to climate change. Overall, there is strong scientific underpinning of the agri-environment options but scope to increase efficacy of options through better targeting and habitat connectivity. Assessing the impacts of the scheme is not straightforward.^{viii}
17. River Basin Management Plans: The Water Framework Directive (2000) requires Member States to establish a framework for the management of our water resources through the introduction of River Basin Management Plans, a cyclical, detailed planning mechanism for setting environmental objectives for each water body within a river basin district. Scotland's approach to tackling controlled activities and diffuse pollution has been recognised by the European Commission as leading the way in Europe.
18. Plant Health: The Scottish Plant Health Strategy sets out the Scottish

Government's approach to the protection of the health of plants in the natural environment (and across other sectors). The recently appointed Chief Plant Health Officer for Scotland leads on plant health matters including emergency response plans for an outbreak situation, and supported by scientific expertise from the Scottish Government-funded Plant Health Centre of Expertise.

19. Forest Grant Scheme: This supports the creation of new woodlands, contributing towards the Scottish Government's target of 10,000 hectares of new woodlands per year and the sustainable management of existing woodlands.
20. Peatland Action Fund: Aims to restore Scottish peatlands whilst also supporting demonstration sites and events to raise standards and encourage innovation for effective peatland restoration (with funding of £8 million for 2017-18). Initial evaluations show positive biodiversity benefits.
21. Scotland's National Marine Plan (NMP): Sets out how Scottish Ministers intend marine resources to be used and managed out to 200 nautical miles. The Plan promotes an ecosystem approach, putting the marine environment at the heart of the planning process to promote ecosystem health, resilience to human induced change and the ability to support sustainable development and use.
22. The UK's Marine Strategy sets out the UK's programme of measures for achieving Good Environmental Status; that is, protecting the marine environment, preventing its deterioration and restoring it where practical, while using marine resources sustainably. The Marine Strategy implements the EU's Marine Strategy Framework Directive (MSFD).

23. The OSPAR (Oslo-Paris) Convention on the Protection of the North East Atlantic, to which the UK is a contracting party, has used an ecosystem approach to identify common issues across the OSPAR region as part of its Intermediate Assessment. The OSPAR Commission develops harmonised policies and strategies, including drawing up of programmes and measures for the protection of the marine environment of the North East Atlantic by reducing pollution and protecting biodiversity.
24. Flood Risk Management Act: Supports the development of natural flood management actions. Funding support is provided to local authorities through a capital grant.

Endnotes

- i <https://www.nature.scot/natural-capital-asset-index-comparison-document>
- ii <https://www.nature.scot/professional-advice/planning-and-development/valuing-our-environment/natural-capital-asset-index>
- iii <https://www.nature.scot/professional-advice/planning-and-development/valuing-our-environment/natural-capital-asset-index>
- iv <https://www.nature.scot/professional-advice/planning-and-development/valuing-our-environment/natural-capital-asset-index>
- v The Third State of Scotland's Greenspace Report, 2018 http://www.greenspacescotland.org.uk/Data/Sites/1/media/docs/sosgreport/3rdstateofscotlandsgreenspacereport_010218.pdf
- vi <https://www.gov.scot/publications/scottish-natural-capital-ecosystem-service-accounts-2019/pages/1/>
- vii Blackstock, K.L., Juarez-Bourke, A., Maxwell, J., Tindale, S. and Waylen, K.A. (2018) Aligning policy instruments for biodiversity, soil and water. James Hutton Institute https://www.hutton.ac.uk/sites/default/files/files/Aligning%20Policy%20Instruments_final.pdf
- viii Blackstock, K.L., Van Hulst, F., MacLeod, C.J.A. and Waylen, K.A. (2017) Monitoring and Evaluation for Ecosystem Management (MEEM) - Comparing theory and documented practice across Europe [https://www.hutton.ac.uk/sites/default/files/files/research/srp2016-21/MEEM%20Technical%20Report%20\(Nov%202017\).pdf](https://www.hutton.ac.uk/sites/default/files/files/research/srp2016-21/MEEM%20Technical%20Report%20(Nov%202017).pdf)

Prepared by the Rural and Environment Science and Analytical Services at the Scottish Government.

Contact: environmentknowledgeaccounts@gov.scot

© Crown Copyright 2020