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Evidence Synthesis Report 13

Role of Public Lands in Delivering on the Government's Objective of Improving Socioeconomic, Climate, Biodiversity, and Water and Air Quality Outcomes

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Rialtas na hÉireann
Government of Ireland

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5. Office of Communications and Corporate Services

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EPA RESEARCH PROGRAMME 2021–2030

Role of Public Lands in Delivering on the Government's Objective of Improving Socioeconomic, Climate, Biodiversity, and Water and Air Quality Outcomes

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by

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This report is based on research carried out/data from May to September 2024. More recent data may have become available since the research was completed.

The EPA Research Programme addresses the need for research in Ireland to inform policymakers and other stakeholders on a range of questions in relation to environmental protection. These reports are intended as contributions to the necessary debate on the protection of the environment.

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Executive Summary

Recent studies have highlighted the need for an unprecedented transformation across Ireland's land sector to achieve a sustainable and resilient future. Managing at least 8% of national land area, public bodies have a critical role to play in leading by example.

Government objectives to mitigate and adapt to climate change, enhance biodiversity, improve water and air quality, and improve socioeconomic outcomes are embedded across multiple policies and regulations. Significant progress is being made in delivering these objectives from public land, including peatland rehabilitation across tens of thousands of hectares (ha) of Bord na Móna land, management of tens of thousands of hectares of Coillte forests for biodiversity and water quality, and management of tens of thousands of hectares of national parks and public green spaces for biodiversity. Collectively, these actions could make a substantial contribution towards the Nature Restoration Law. However, specific objectives regarding land are not transparently communicated within official mandates of key agencies. Further transparency is required on which agencies manage which land, and for which purpose(s).

Bord na Móna is working through a plan for extensive peatland rehabilitation and is scaling out renewable energy deployment to support climate, air quality and socioeconomic objectives. In some areas, raising water tables to rehabilitate or restore peat bogs may conflict with the Office of Public Works' (OPW's) mandate to maintain drainage systems and protect property from flooding. Clarity is required to ensure that appropriate context-specific decisions can be made on drainage implementation, giving due regard to potentially competing objectives. Local authority (LA) planning offices could also be provided with guidelines/support to expedite appropriate decisions on planning applications for peatland renewable energy projects, forest redesign on peatlands and other land use changes.

Ambitious afforestation is critical for climate targets, including commercial forestry, which has a key role to play in climate mitigation across the wider economy, and could become highly valued under future high carbon pricing. Coillte plans 100,000 ha of forest expansion by 2050 – *c*.20% of what is necessary to achieve the government's stated goal of 18% forest cover. Barriers include land prices and regulatory complexity. Possible solutions include regulatory streamlining (recommended in a recent review of forestry licensing) and use of public/public–private financing to accelerate afforestation. All public bodies should consider opportunities for tree planting on open ground, in parks, along streets and in car parks as an effective way to deliver multiple objectives.

The National Parks and Wildlife Service plays a leading role in managing Ireland's biodiversity, directly across national parks and nature reserves but also through important advisory and regulatory roles. These services will need to be expanded to deliver government objectives for land, implying a significant increase in funding. Other public bodies, such as the OPW and Health Service Executive, manage significant areas of land with high public footfall, and thus can play an important educational role in managing land for biodiversity. Transport Infrastructure Ireland manages strategically important transport (biodiversity) corridors and implements a range of practices, including native planting and reduced-frequency mowing, to enhance biodiversity and the abundance of pollinator species. LAs have an important role in managing roadsides and green spaces, and could play a strategic role in developing ecological networks (e.g. Fingal County Council Biodiversity Plan). Public space (re)development should involve landscape architects and ecologists to fully integrate environmental and socioeconomic outcomes into high-quality public realm management and design. Through Climate Action Regional Offices, LAs will report climate and biodiversity actions to a centralised database.

Socioeconomic outcomes are often best delivered through multifunctional (stacked) land use, such as integration of public amenity value, renewable energy generation and peatland rehabilitation or afforestation. Natural capital and ecosystem services approaches can highlight risks and reflect benefits

of managing natural resources more sustainably from a multifunctional perspective, but require further development. Coillte and Bord na Móna projects demonstrating multifunctional land use represent useful test beds for natural capital reporting.

Many climate, biodiversity and water/air quality actions also generate economic activity in rural areas, supporting employment. More training is required to ensure a suitably qualified workforce to deliver habitat restoration, natural landscaping, forestry and renewable energy installation at relevant scales.

Managing land to deliver multiple objectives requires multidimensional assessment and a long-term (e.g. to 2100) national perspective to coordinate appropriate scaling and evaluate inevitable trade-offs. A national land use strategy is urgently needed to guide this (across both public and private land).

1 Introduction

1.1 Objectives

The world is facing interrelated climate and biodiversity crises that threaten the security and well-being of current and future generations. Humanity has exceeded the Earth's carrying capacity across six out of nine "planetary boundaries" (Figure 1.1). Many of these transgressions relate to either land use or land-based activities, in particular loss of biosphere integrity, land system change, freshwater use and reactive nitrogen and phosphorus pollution. Globally, dramatic changes are required in the way we use and manage land in order to live within our planetary boundaries. Meanwhile, 85% of Ireland's EU protected habitats are in unfavourable status. The National Biodiversity Action Plan 2023–2030 (NPWS, 2024a) concludes that Ireland's biodiversity is in a state of crisis, and that urgent, impactful action is required.

As a small but wealthy country with a relatively large productive land area and high environmental impact per capita, Ireland has a strong responsibility (and potential) to play a leadership role in sustainable and resilient land management. Doing so should contribute to the socioeconomic, climate, biodiversity, and water and air quality objectives of the Irish government.

Recent work has shown the immense challenge of meeting just one environmental objective – climate neutrality by 2050 (Haughey *et al*., 2023; Bishop *et al*., 2024). Achieving the necessary scale of land use and management change across the private and public land bank to achieve a genuinely sustainable and resilient land sector will require strategic vision and government leadership (EPA, 2024a). Leading by example will be essential to bring tens of thousands of private landowners on the long but necessary journey. This report documents how public lands are, or could

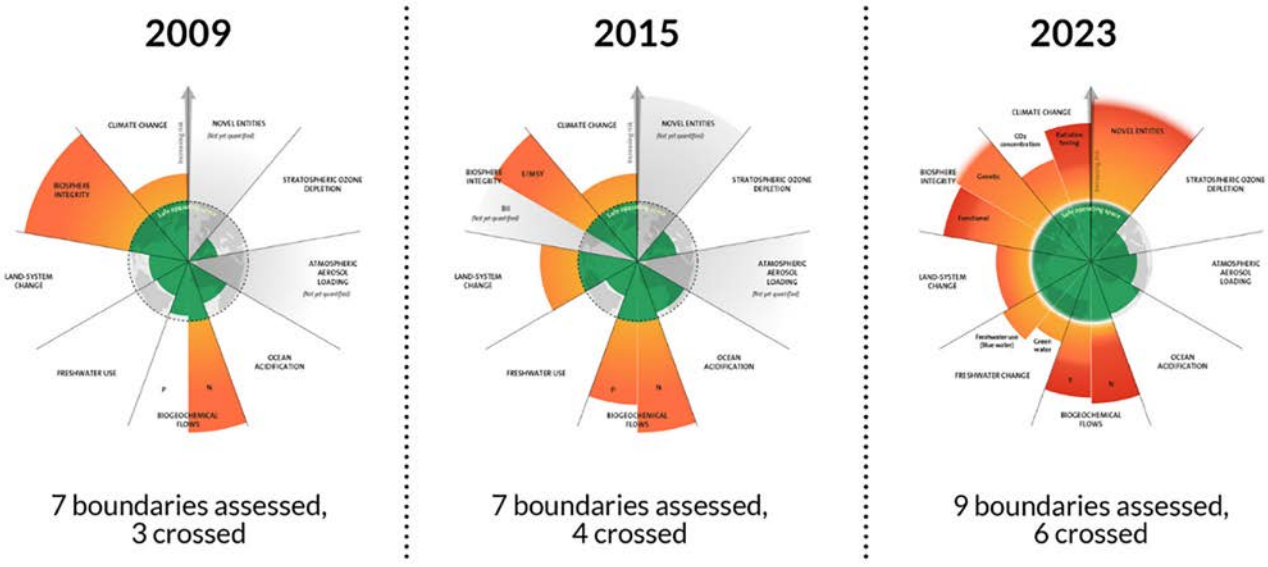


Figure 1.1. Results of three planetary boundary assessments undertaken to date. Source: Azote for Stockholm Resilience Centre, Stockholm University (https://www.stockholmresilience.org/research/planetary-boundaries.html); licensed under CC BY-NC-ND-3.0 (https://creativecommons.org/licenses/by-nc-nd/3.0/deed.en). Based on Richardson *et al*. (2023), Steffen *et al*. (2015) and Rockström *et al*. (2009).[1]

1 Richardson, J., Steffen, W., Lucht, W. *et al*. (2023). Earth beyond six of nine planetary boundaries. *Science Advances* 9: 37; Steffen, W., Richardson, K., Rockström, J. *et al*. (2015). Planetary boundaries: guiding human development on a changing planet. *Science* 347: 1259855; Rockström, J., Steffen, W., Noon, K. *et al*. (2009). Planetary boundaries: exploring the safe operating space for humanity. *Ecology and Society* 14(2): 32.

be, managed to demonstrate leadership in sustainable and resilient land management.

This report is based on a study commissioned by the Environmental Protection Agency (EPA) to answer the following research questions regarding public lands:

- What are the managers' mandates for the management of their public land banks and resources?
- How are government objectives of improving socioeconomic, climate, biodiversity, and water and air quality outcomes incorporated, or how could they be incorporated, into those mandates?
- What barriers and opportunities can be identified?
- How can natural capital and ecosystem services and their enhancement be recognised, valorised and duly reported by public landowners?

1.2 Background

1.2.1 Land Use Review Phase 1

The Land Use Review (LUR) Phase 1 was a milestone for Ireland's commitment to optimise land use for the benefit of human life, biodiversity and climate action, as outlined in the programme for government and acknowledged in Ireland's national Climate Action Plan 2021 (Government of Ireland, 2023a). Phase 1, led by the EPA, primarily focused on assembling comprehensive evidence relating to existing stakeholders and the environmental, social and economic characteristics of land in Ireland. A key outcome of Phase 1 was understanding the landownership profile. Through the use of spatial data, it was determined that approximately 78% of Ireland's land is privately owned, while 8% is publicly owned. The remaining 14% was unable to be characterised due to data limitations.

Phase 1 did not produce land policies, but provided valuable insights that have informed Phase 2. The report put forward suggestions for future research, which included engaging with the Property Registration Authority to enhance data reliability and completeness. It also recommended collaborating with local authorities (LAs) to compile a comprehensive list of publicly owned residential properties. Additionally, integrating data from EPA-licensed facilities to cover industrial and waste disposal areas was suggested. The development of a spatial database to complement the Central Statistics Office's (CSO's) Register of Public Sector Bodies in Ireland was proposed, along with identifying and incorporating data sources to better understand the leasing status of agricultural land.

1.2.2 Land Use Review Phase 2

Phase 2 of the LUR aims to build on the foundational evidence collected in Phase 1 by identifying the demands on both public and private lands. This phase seeks to inform government policies that are aligned with multiple objectives, including the enhancement of socioeconomic outcomes, biodiversity protection, climate resilience and assurance of clean water and clean air. There is a leading role for government to play in mobilising public lands to deliver pivotal land use change. Central to Phase 2 is the acknowledgement of the critical role that farmers and farming families serve in providing high-quality food alongside being stewards of the environment. The review will place a strong emphasis on encouraging sustainable farming practices and ensuring that measures adopted by farmers remain voluntary and are developed collaboratively in partnership with the government. Another critical focus of Phase 2 is the urgency of addressing the ongoing climate and biodiversity crisis, realising the importance of measures taken in the remaining years of this decade to get Ireland "on track" to meet its international climate obligations under the Paris Agreement. Additionally, this phase will play a significant role in shaping future climate action plans, particularly concerning land use, land use change and forestry (LULUCF).

1.3 Report Structure

This report comprises a sequence of short chapters structured to answer the questions posed above in relation to public lands, based on stakeholder consultation through a literature review, email correspondence, participation in LUR Phase 2 workshops and structured interviews (*c.*14) – detailed in Appendix 1. Research was undertaken over 5 months, from July to early November 2024, and information is not exhaustive, given the wide diversity of agencies managing public land. However, targeted review and communication with stakeholders

provided sufficient insight to draw a series of tentative conclusions and recommendations. Pertinent information is presented as follows:

- Chapter 1: Introduction (objectives and background);
- Chapter 2: Relevant Public Bodies and Mandates;
- Chapter 3: Natural Capital and Ecosystem Services Frameworks;
- Chapter 4: Climate Objectives;
- Chapter 5: Biodiversity Objectives;
- Chapter 6: Water, Air and Socioeconomic Objectives;
- Chapter 7: Conclusions and Recommendations.

2 Relevant Public Bodies and Mandates

2.1 Identifying Public Land Managers

Previous analysis by the EPA as part of Phase 1 of the LUR found that public land represented 8.5% of Ireland's land area (although 13.8% of land area is unmapped) (Government of Ireland, 2023b). The Land Development Agency's (LDA's) register of public lands contains information on the location, ownership and certain characteristics of "relevant public lands", as required by the LDA Act 2021. Relevant land is defined as all land within a census town (any urban area with a population over 10,000 people as per latest census) owned by a relevant public body. Relevant public bodies are defined in the LDA Act 2021 to include non-commercial public bodies/agencies and government departments, as well as commercial public bodies/agencies and LAs (LDA, 2024). The LDA register is focused on (semi)urban areas and appears to exclude substantial areas of rural land under public ownership – as implied by the coverage of 5% of Ireland's land area (vs 8.5% attributed to public ownership by the Government of Ireland (2023b)). Furthermore, landownership records do not necessarily indicate the specific public bodies actually responsible for managing the land, e.g. referring simply to the minister for the relevant government department (Figure 2.1). Coillte and Bord na Móna land areas are significantly underestimated, but may partially be accounted for under the 49.2 kha of land

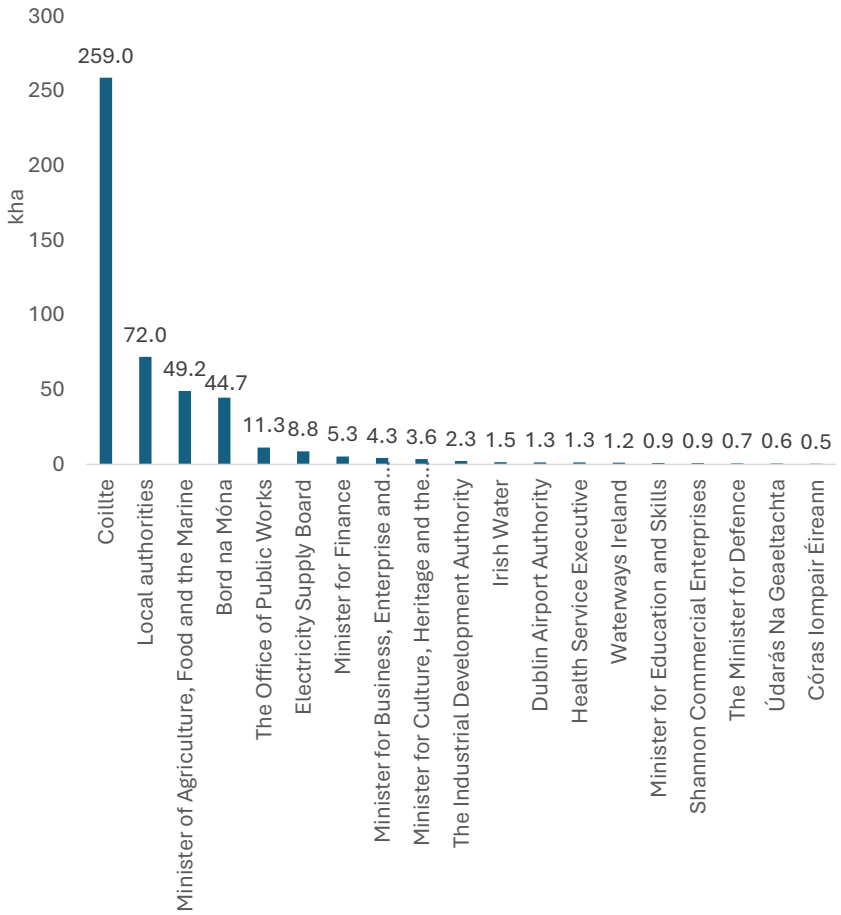


Figure 2.1. Registered owners of public land recorded in the state land database (based on data extracted from the public lands register, September 2024; https://lda.ie/public-lands/register-of-relevant-lands). Only owners of land ≥450 ha are displayed. NB: these data relate to "relevant public lands" as defined in the LDA Act 2021, and exclude substantial rural land banks.

attributed to the Minister of Agriculture, Food and the Marine (Figure 2.1).

Nonetheless, despite the caveats, these data do indicate some of the main bodies responsible for managing Ireland's public land bank, notably Coillte, Bord na Móna, the Office of Public Works (OPW) and the Electricity Supply Board (ESB) (Figure 2.1). Missing from this list is the National Parks and Wildlife Service (NPWS), which has a major role to play in management of public land (see section 2.2). The LDA register includes a few hundred additional owners of smaller areas (<450 ha) of public land. Cumulatively, these owners could be important. Owing to a short timeline for completing this report, actions by smaller owners of public land have not been systematically evaluated.

2.2 Mandates

Major owners and/or managers of public land in Ireland, such as Coillte, Bord na Móna, the ESB, the Health Service Executive (HSE), NPWS, Teagasc (Agriculture and Food Development Authority) and LAs, are all *expected* to support implementation of government policies, e.g. to deploy climate actions relevant to their scope under the Climate Action and Low Carbon Development (Amendment) Act 2021 (Irish Statute Book, 2021) and the associated national Climate Action Plan.

However, specific written reference to land use and management mandates pertaining to climate, biodiversity or air or water quality objectives is scarce. It is clear that land use and management by public agencies is determined by a wide range of factors, many of which cascade from other mandates. Only in a few cases are the aforementioned objectives a primary driver of land use and management decisions. For example, the OPW's primary mandate regarding drainage is to maintain the previously constructed arterial drainage schemes and provide flood protection (see Box 2.4), not to manage water table levels across peat bogs in order to deliver climate and biodiversity objectives (see Chapters 4 and 5). The HSE's primary mandate is to deliver patient care, which includes the development of new buildings on existing lands and in some cases restricting access to some areas to protect patient privacy (see Chapter 6). Table A2.1 in Appendix 2 summarises some of the main objectives for the use and management of public land across key public bodies.

It is worth noting that since 2017 original narrow mandates for independent semi-state companies (i.e. Coillte, Bord na Móna, ESB and EirGrid) have been supplemented with "letters of expectation" issued by the government. These letters set out expectations of the government, as the main shareholder in these companies, for the board to consider in strategic and operational decisions. The Code of Practice for the Governance of State Bodies describes the function of shareholder letters of expectation:

> Clear accountability underpins effective relations between Government Departments and the State bodies under their aegis. Effective accountability depends upon respective roles and responsibilities being clearly defined and understood on both sides of the agreement.
>
> The starting point for clarity of accountabilities is the oversight agreement between the relevant Minister/parent Department and the State body. For commercial State bodies the oversight agreement is the Shareholder Letter of Expectation.
>
> The oversight agreement should reflect the State bodies legal framework; the environment in which it operates (e.g. commercial, non-commercial, regulatory body); the purpose and responsibilities of the State body; the State body's level of compliance with this Code; details of the Performance Delivery Agreement (e.g. outputs to be delivered); and arrangements for oversight, monitoring and reporting on conformity with Government policy including those actions and areas of expenditure where prior sanction from the parent Department and/or the Department of Public Expenditure and Reform is required.
>
> Commissioner for Environmental Information (2021)

Boxes 2.1–2.5 summarise the information available on mandates for some of the key public bodies with most influence over management of public lands in Ireland.

Box 2.1. Coillte

Coillte is the largest individual shareholder of land in the state, managing approximately 440 kha (roughly the area of County Tipperary) of forests across 6000 sites.

Coillte was established as a state-owned company under the Forestry Act 1988,[a] with a primary mandate to manage commercial exploitation of forestry. The act is introduced as "An act to make provision for the development of forestry and to provide for the establishment of a company for that purpose and for the assignment to the company of functions heretofore exercised by the minister for energy; and to provide for related matters".

Section 12(1) of the act states:

"The principal objects of the company shall be stated in its memorandum of association to be –

(a) to carry on the business of forestry and related activities on a commercial basis and in accordance with efficient silvicultural practices,
(b) to establish and carry on woodland industries,
(c) to participate with others in forestry and related activities consistent with its objects, designed to enhance the effective and profitable operation of the company, and
(d) to utilise and manage the resources available to it in a manner consistent with the above objects."

Section 13(1) of the act states:

"It shall be the general duty of the company –

(a) to conduct its affairs so as to ensure that revenues of the company are not less than sufficient to –
    (i) meet all charges properly chargeable to revenue account (including depreciation of assets and proper allocation to general reserve) taking one year with another,
    (ii) generate a reasonable proportion of capital needs, and
    (iii) remunerate capital and repay borrowings,
(d) to conduct its business at all times in a cost effective and efficient manner,
(e) to have due regard to the environmental and amenity consequences of its operations, and
(f) to provide for consultation with the Minister for Finance concerning forestry development in areas of scientific interest."

Recent letters of expectation[b] from the New Economy and Recovery Authority (NewERA) (the state's advisory body for commercial semi-state companies) set out clear expectations on behalf of Coillte's shareholders (Minister for Finance and Minister for Agriculture, Food and the Marine). These include that "Coillte will seek to balance its commercial obligations under the Forestry Act 1988 with the delivery of the multiple benefits of forestry for society including increased afforestation and recreation provision and through contributing to Ireland's emission reduction targets under the Climate Action plan 2021" (DAFM, 2022). Specific reference is made to Coillte's involvement in the National Biodiversity Action Plan 2023–2030, Ireland's Forest Strategy 2023–2030 and Agenda 2030 reporting on Sustainable Development Goals.

Thus, Coillte has a narrow commercial mandate in legislation, and is required to deliver a profit to the state, but is *expected* by government to deliver wider public good.

[a]**https://www.irishstatutebook.ie/eli/1988/act/26/enacted/en/print (accessed 17 April 2025).**

[b]**https://irishriverproject.com/wp-content/uploads/2023/02/Coillte-Shareholder-Letter-of-Expectation-2022_Redacted.pdf (accessed 17 April 2025).**

Box 2.2. Bord na Móna

Bord na Móna manages almost 80 kha of the national land bank (approximately the area of County Louth), primarily peat bogs, which represent priority areas for climate and biodiversity action through restoration via raising the water table.

Bord na Móna was established as a state-owned company under the Turf Development Act 1946,[a] with a narrow mandate to manage commercial exploitation of peat bogs. The act is introduced as "An act to make better provision for the development in the national interest, of the production, distribution and supply of turf in the state, and for this purpose to establish a board to be called Bord na Móna, to define its powers and duties, to dissolve the turf development board, limited and to transfer its property and liabilities to Bord na Móna, and to provide for certain other matters connected with the matters aforesaid".

Section 17(1) of the act states:

"It shall be the duty of the Board –

(a) to produce and market turf and turf products, and
(b) to foster the production and use of turf and turf products, and
(c) to acquire bogs and other lands, and
(d) to manage, develop and work bogs and other lands vested in the Board, and
(e) generally to do all such other things as arise out of, or are consequential upon, the duties mentioned in the preceding paragraphs of this section."

This mandate was carried forward in the revised Turf Development Act 1998.[b]

It is important to stress that Bord na Móna announced a cessation of all industrial peat extraction in 2021, and has pivoted towards renewable energy generation as its main business. As an independent semi-state company, Bord na Móna is issued with letters of expectation from the government, which presumably place an emphasis on climate action and biodiversity protection; however, these letters are not publicly available and so this is impossible to verify.

Thus, notwithstanding important actions delivering public goods, to which Bord na Móna is committed (see Chapters 3–6), there is no official (publicly) documented mandate for the company to deliver wider public good objectives from land.

[a]http://www.legislation.ie/eli/1946/act/10/enacted/en/print (accessed 18 April 2025).
[b]https://www.oireachtas.ie/en/bills/bill/1997/50/ (accessed 18 April 2025).

2.3 Summary of Findings

The picture of public land management is complex and remains somewhat opaque. A large number of organisations are responsible for managing public land, and in some cases with overlapping responsibilities. For example, NPWS and the OPW play important regulatory, advisory and coordinating roles with LAs, Coillte, Bord na Móna and others.

Building on the conclusions of Byrne and Murray (Government of Ireland, 2023a), there is a need for more accurate information to detail the public bodies primarily responsible for managing specific parcels of public land. The LDA register of public lands does not cover all areas, and contains insufficient information to identify the specific divisions or agencies responsible for managing particular parcels of land.

Government objectives for land management are evolving in response to evidence on the multifaceted societal challenges invoking land use and management (changes). The objectives explored in this report are largely absent from some of the original legislative mandates for critical managers of public lands, such as Bord na Móna and Coillte. Letters of expectation from government (as the major shareholder in these semi-state companies) reflect

Box 2.3. National Parks and Wildlife Service

NPWS is directly responsible for management of over 87,000 ha (approximately the area of County Carlow) across six national parks and 74 nature reserves, as well as smaller areas spread across other conservation and recreation properties.

NPWS is a "division" of the Department of Housing, Local Government and Heritage, with a primary focus on the delivery of policy objectives. According to a recent review of NPWS (Stout and Ó Cinnéide, 2022), its role is:

- to secure the conservation of a representative range of ecosystems to maintain and enhance populations of flora and fauna in Ireland;
- to provide designation, consultation and advice on protection of habitats and species identified for nature conservation (Natural Heritage Areas, Special Areas of Conservation (SACs) and Special Protection Areas) – covering 2.4 million ha;
- to aid the implementation of national and EU legislation and policies for nature conservation and biodiversity, and ratification and implementation of the range of international conventions and agreements relating to natural heritage;
- to manage, maintain and develop state-owned national parks and nature reserves;
- to promote awareness of natural heritage and biodiversity issues through education, outreach to schools and engaging with stakeholders.

NPWS is the primary responsible authority for national implementation and/or oversight of, *inter alia*, the Birds Directive; Habitats Directive; Nature Restoration Law; Zoo Directive; EU regulations on invasive alien species; wildlife acts from 1976 to 2001; European Communities (Birds and Natural Habitats) Regulations 2011; Flora (Protection) Order 2022; the National Biodiversity Action Plan 2023–2030; and sectoral climate change adaptation plans under the National Adaptation Framework for Biodiversity.

NPWS also has a role in assessing planning applications referred by planning authorities and An Bord Pleanála, and applications from other authorities regulating activity that might impact on the natural environment, within or outside designated sites (Stout and Ó Cinnéide, 2021).

Thus, NPWS has a mandate to:

- protect biodiversity and support delivery of socioeconomic benefits (cultural, recreational) on land under direct management (i.e. state-owned national parks and nature reserves);
- protect biodiversity more widely across other public and private land as relevant to implementation of aforementioned legislation and policies.

NPWS appears to have a mandate for climate adaptation via responsibility for sectoral climate change adaptation plans, but does not appear to have an explicit mandate for climate mitigation or water or air quality.

the more recent government objectives for land use and management, but the degree to which these are binding is not clear. The current approach certainly lacks transparency, given that letters of expectation are not routinely made publicly available.

A diverse range of public bodies manage land, from divisions within government departments (e.g. NPWS) through to state agencies (e.g. HSE), state-owned companies (e.g. Coillte) and LAs. Responsibilities relating to land management are varied and often distributed across (sub)divisions. Each public body has its own structure, responsibilities, priorities and constraints. This poses a challenge for systemised implementation of best practice in land management (and reporting) for delivery of public good objectives – addressed throughout this report.

Box 2.4. Office of Public Works

The OPW is a government office that delivers public services for flood protection, managing government properties and heritage services.

The OPW, established in 1831 under the Public Works (Ireland) Act,[a] consolidated the previously fragmented roles of undertaking public works, managing public buildings, building canals and administering loans related to these activities. It is overseen by the Minister of State at the Department of Public Expenditure and Reform.

Notably, in relation to land management, the OPW is responsible for implementing the requirements of the 1945 Arterial Drainage Act,[b] which includes drainage maintenance across 243,000 ha of agricultural land and the protection of over 21,000 properties. Much of this drainage is on peat land that may need to be rewetted to deliver climate and biodiversity objectives. However, the OPW's current mandate does not provide for his objective.

A 1995 revision to the Arterial Drainage Act[c] provided for the implementation of flood relief schemes. The OPW now oversees a budget of €1.3 billion allocated under the National Development Plan for development of flood relief schemes out to 2030. The OPW works with LAs to prioritise and deliver these schemes to protect areas at high risk of costly flood damage.

The OPW maintains two World Heritage Sites, 780 national monuments and over 800 ha of gardens and parklands. It also manages a significant part of the state's property portfolio and provides accommodation for government departments, over 700 Garda properties and approximately 550 offices (Government of Ireland, 2024).

Thus, the OPW has a mandate to:

- maintain drainage of lands that may need to be reversed in some peat areas in order to deliver public good objectives pertaining to climate, biodiversity and water quality;
- deliver flood protection schemes that could support delivery of socioeconomic and possibly water quality objectives.

[a]https://www.irishstatutebook.ie/eli/1831/act/33/enacted/en/print.html (accessed 18 April 2025).
[b]https://www.irishstatutebook.ie/eli/1945/act/3/enacted/en/html (accessed 18 April 2025).
[c]https://www.irishstatutebook.ie/eli/1995/act/14/enacted/en/print.html (accessed 18 April 2025).

The following recommendations are made:

- Expand the LDA register of public lands to include all public land and the specific bodies responsible for managing each land parcel. This may require a separate database to be established, building on (and fed by) the LDA register.
- Provide clarity on mandates of state-owned companies, through either updated legislation on the objectives of these companies or more transparent leverage of shareholder influence (i.e. *public* letters of expectation).
- Strategically map priorities for public bodies against land use objectives within the context of a national land use strategy that considers scaling and location of priority actions.

Box 2.5. Local authorities

LAs are responsible for delivering statutory obligations in national and international legislation and commitments across the policy spectrum.

Responsibilities that implicate the use and management of public land include:

- developing local area plans, subject to strategic environmental assessment and oversight by the Office of the Planning Regulator to ensure that environmental considerations are integrated;
- maintenance of public amenities and roads (including roadsides);
- provision of affordable housing;
- development of flood protection schemes (in conjunction with the OPW);
- adjudicating on planning applications;
- enforcing local environmental regulations.

More recently, LAs have been mandated to develop and implement climate action plans that outline strategies for reducing greenhouse gas (GHG) emissions and adapting to climate change. This mandate stems from the Climate Action and Low Carbon Development (Amendment) Act 2021, which places legal obligations on LAs to contribute to national climate targets. LAs are also mandated to monitor and report on their progress in implementing climate action measures.

Recognising the additional effort and expertise that would be required by LAs to deliver these objectives, the County and City Management Association recommended the establishment of Climate Action Regional Offices (CAROs)[a] to provide competence and expertise across LAs. The four established CAROs support and coordinate climate actions undertaken by LAs, including monitoring and reporting across key performance indicators, supporting advancement of behavioural change initiatives, competency development and training, and the identification and sourcing of ongoing funding opportunities for the benefit of the sector (CARO, 2022). The CAROs facilitate implementation of the County and City Management Association's overarching Strategic Plan for Climate Action across Ireland's 31 LAs.

In aggregate, LAs manage a significant share of Ireland's public land bank (considerably more than the 72 kha of "relevant land" recorded in the LDA database – see Figure 2.1). However, this land is divided across the 31 entities and further fragmented across divisions with different primary responsibilities, which can pose challenges for strategic management.

LAs have a broad mandate to manage public land in a manner that delivers core government objectives to improve climate, biodiversity, socioeconomic, and water and air quality outcomes.

[a]https://www.caro.ie/the-caros/background (accessed 18 April 2025).

3 Natural Capital and Ecosystem Services Frameworks

3.1 Objective of This Chapter

The objective of this chapter is to summarise the key features of natural capital and ecosystem services accounting approaches, and critically evaluate how these approaches could complement existing reporting to better represent, and incentivise, delivery of public goods from public land.

The Irish government requested advice on natural capital accounting frameworks through the Climate Action Plan 2021, which prompted the National Economic and Social Council (NESC) to review how Ireland currently accounts for nature and the potential of natural capital accounting – building on research by NPWS, the Department of Agriculture, Food and the Marine (DAFM) and various academic institutions (NESC, 2024a). There remain significant gaps in national reporting on biodiversity, habitats and ecosystems in Ireland. A recent report by NESC concluded that there is an urgent need for Ireland to more effectively incorporate nature into its policymaking and decision-making frameworks through the use of natural capital accounting (NESC, 2024a). The NESC authors regard natural capital accounting as a crucial tool that reveals often overlooked value and risks associated with natural assets, and could support delivery of the National Biodiversity Action Plan 2023–2030, the European Green Deal and the EU Nature Restoration Law. The report notes that the United Nations' (UN's) standardised approach to natural capital accounting is presently being implemented by the CSO and Eurostat, with mandatory EU ecosystem reporting set to begin by 2026.

3.2 Natural Capital and Ecosystem Services

Natural capital includes all abiotic and biotic components of ecosystems, covering both the ecosystems themselves and their constituent natural resources, such as water, soil, vegetation, species and air – collectively referred to as "stocks" (Mace *et al*., 2015). Natural capital provides a range of ecosystem services essential to human well-being, including clean air and water, fertile soil for agriculture, climate regulation and recreational opportunities. Stout *et al*. (2023) state "The natural capital approach frames nature and ecological, geological, hydrological and atmospheric systems as assets, from which goods and services flow. It deliberately uses the language of business and economics to bring nature into decision-making. As part of this, natural capital accounting is a formalised framework for recording and tracking changes in stocks and flows of natural capital assets." Natural capital accounting is structured around information frameworks such as the UN System of National Accounts and the UN System of Environmental Economic Accounting (NESC, 2024a). Natural capital accounting can increase the visibility of nature through the measurement and monitoring of natural assets or ecosystems, such as rivers, peatlands and woodlands, and their services to society (NESC, 2024a).

Natural capital accounting can be implemented at any scale, in companies and across the public sector. Natural England has developed a Natural Capital Risk Register to record ecological status and trends across major habitat types in England (Morgan and Lusardi, 2024). An example of summary information for woodland habitats is displayed in Figure 3.1. Risk registers can be compiled in the absence of full knowledge of a system, and indicate priority areas for action based on the severity of risk.

3.3 Possible Indicators for Natural Capital Monitoring in Ireland

3.3.1 National-scale accounting

Natural capital accounting can be implemented at any scale, from company level through to national or even global levels. The CSO established an Ecosystem Accounts Division in 2020 that is working towards the compilation of ecosystem accounts for Ireland, based on the UN's standardised approach to natural capital accounting (NESC, 2024a). Preliminary statistics have been compiled on the extent and condition of a

Woodlands	Land-use change	Pollution	Resource exploitation [a]	Climate change	Invasive Species	RISK
Timber and wood products				M ↗	H ↑	H
Plant-based energy						N/A
Plentiful water				M ↗		M
Clean water		M ↗				M
Clean air	M ↗	M ↗		M ↗		M
Erosion control	M ↗		VH ↘	M ↗		M-H
Flood protection	M ↗		VH ↘	M ↗		M-H
Thriving plants and wildlife	M ↗	M ↗	VH ↘	M ↗	H ↑	H
Climate regulation	M ↗	M ↗	VH ↘			M-H
Cultural benefits	M ↗		VH ↘	M ↗		M-H

Figure 3.1. Summary of information contributing to the risk ratings for ecosystem services benefits from woodlands in the UK. Cell shading and letters denote medium (M), high (H) and very high (VH) risk across major drivers (columns), while arrows indicate increasing (upwards) or declining (downwards) risk trends for particular ecosystem benefits (rows). Source: Morgan and Lusardi (2024).

small number of habitat types (Figure 3.2). Despite these efforts, Ireland still faces challenges in fully integrating natural capital considerations into policy and economic planning, particularly in critical sectors such as agriculture. Progress is impeded by a lack of ecosystem (extent and condition) maps (Stout *et al.*, 2023). Nonetheless, there is a growing commitment to enhancing the understanding and application of these frameworks to support sustainable development and biodiversity conservation (NESC, 2024a). Reporting on ecosystem accounting in a new EU environmental economic accounts module, specifically on the extent and condition of ecosystem assets and the services they provide to society and the economy, will be required from 2026 (NESC, 2024b).

Monetary valuation is not an essential step in natural capital accounting – accounts may comprise physical flows, and in some cases this may be preferable owing to the inherent limitations and methodological uncertainties of monetary valuation (Stout *et al.*, 2023; NESC, 2024a).

3.3.2 Localised accounting

Ireland has hosted a number of pilot projects on "results-based payments". A results-based payment scheme provides financial incentives to farmers (or other land managers) based on the ecological quality of their land. One example is the LIFE IP Wild Atlantic Nature project, which aims to enhance the conservation of blanket bogs within Ireland's SAC network (see Box 3.1). This approach differs from traditional schemes by linking payments directly to measurable environmental outcomes, which are proxied in a pragmatic and structured manner through habitation assessment (scoring the condition of peatlands, grasslands, woodlands, associated watercourses, etc.). This system is designed to support biodiversity, improve water quality and build resilience in rural communities by creating a market for environmental services (Wild Atlantic Nature, 2021a).

Scorecard indicators could serve as a useful tool for land managers to monitor ecological, hydrological and site integrity. This method has been widely adopted to support the new Agri-Climate Rural Environment Scheme (ACRES), which employs 10 scorecards to assess different land types, including grassland, peatland, scrub/woodland, rough grazing, winterage, low-input peatland grassland, coastal grassland, and chough breeding areas (Government of Ireland, 2023c). The uptake of this scorecard approach by ACRES implies a level of scalability and stakeholder

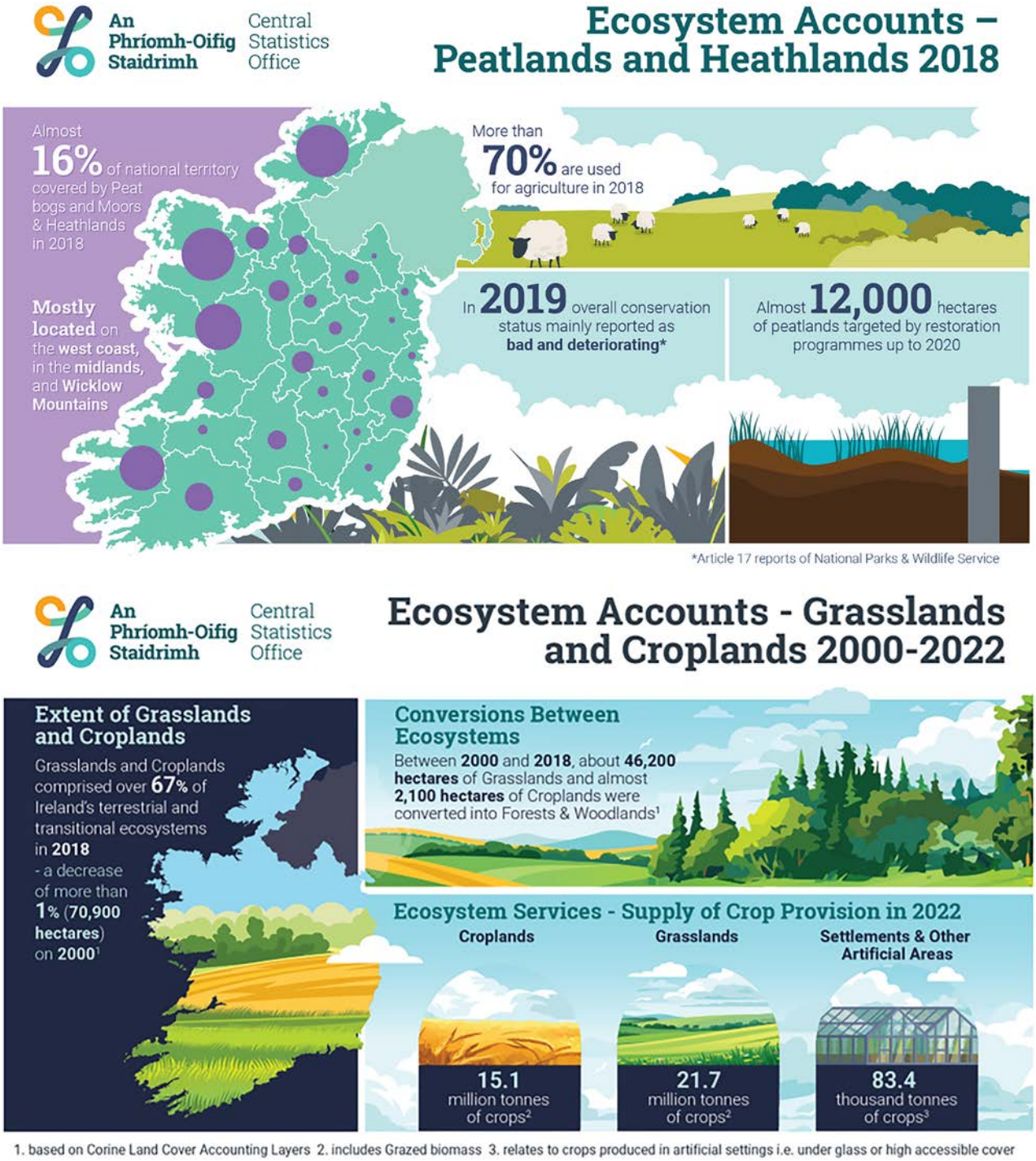


Figure 3.2. Example ecosystem accounts for peatlands and heathlands (top) and grasslands and croplands (bottom) produced by the CSO. Source: https://www.cso.ie/en/statistics/ecosystemaccounts/; licensed under CC BY 4.0 (https://creativecommons.org/licenses/by/4.0).

acceptance. Such scorecards could potentially be applied to public lands, as demonstrated by NPWS, as an expedient approach to track and incentivise progress in managing public lands in a way that maximises stocks of natural capital and flows of ecosystem services.

3.3.3 Established reporting frameworks

Natural capital accounting does not replace but rather relies upon established monitoring and reporting frameworks that can quantitatively assess pertinent stocks and flows. Key performance indicators are

Box 3.1. Wild Atlantic Nature results-based payments scheme

Evaluation criteria. Land is assessed based on the quality of key habitats (peatlands, woodlands, grasslands), including indicators such as habitat condition, farmyard management, nutrient balance and watercourse management.

Scoring system. Each plot of land receives an annual habitat score, ranging from 0 to 10, reflecting its environmental quality. Higher scores result in higher payments. Scorecards are developed for each main habitat type. An example of a peatland habitat scorecard is outlined in Figure 3.3.

Payment structure. Payments are directly tied to habitat scores, incentivising landowners to improve and maintain their land to achieve better scores (see figure below).

The results-based payment scheme provides a straightforward and structured method for assessing natural capital by focusing on key habitat quality indicators. This simplicity ensures that stakeholders can effectively evaluate and enhance environmental stewardship without the complexity of detailed quantification. Additionally, the scheme allows land managers to balance ecosystem functioning with marketable outputs, providing flexibility to aim for specific habitat quality scores that align with both ecological and economic goals (e.g. a forester could balance future income from timber harvests with potential income from maintaining a higher scoring habitat comprising native tree species). This practical approach makes the results-based payment scheme an accessible and adaptable tool for managing land in a way that integrates both environmental and productivity objectives (Wild Atlantic Nature, 2021a).

Sources: Wild Atlantic Nature (2021a) and Derek McLaughlin, NPWS, personal communication, September 2024.

referenced in subsequent chapters in relation to the specific themes.

3.4 Summary and Recommendations

Natural capital accounting is a potentially useful approach to recognising (some of) the value of otherwise non-marketable natural assets. Entering natural capital on corporate and government balance sheets could encourage better management of natural assets, contributing to the protection of nature and minimisation of degradation (thereby reducing negative environmental externalities, including emissions to air and water). A focus on natural capital is important to ensure *long-term* delivery of ecosystem services and resilience. NESC (2024a) concludes that natural capital accounting could be instrumental in national and local planning, foster sustainable finance and investment, and enhance Ireland's National Well-Being Framework.

Recommendations from NESC (2024a) pertinent to management of public land by public bodies include development of pilot natural capital accounts in a small number of LAs and cities, e.g. for green infrastructure development, to assess feasibility, data availability and resource requirements; development of guidelines for the inclusion of nature in decision-making processes,

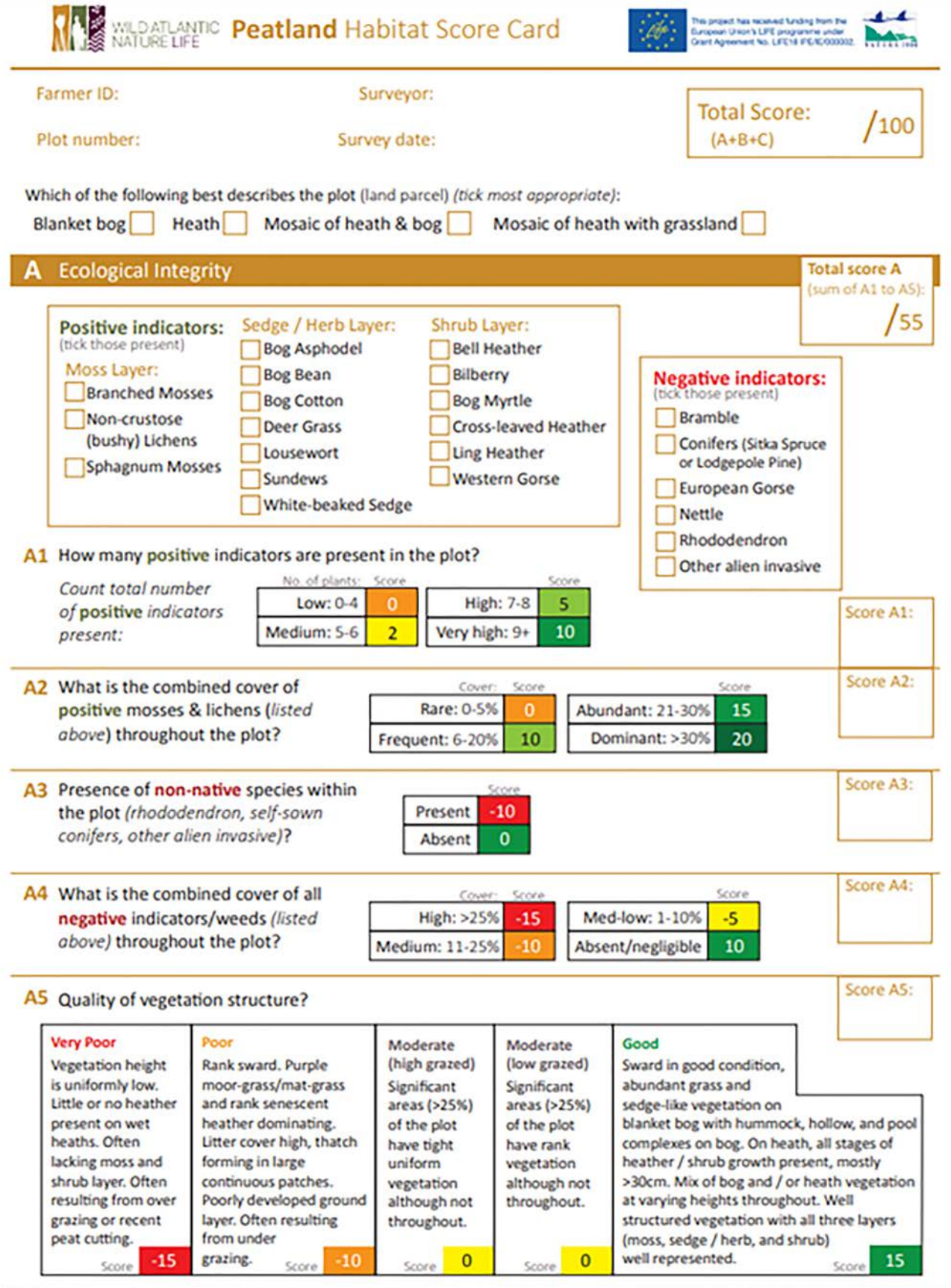


Figure 3.3. Peatland habitat scorecard developed to underpin a results-based payment scheme. Source: Wild Atlantic Nature (2021b); https://www.wildatlanticnature.ie/wp-content/uploads/2022/03/WAN-habitat-scoring-sheet-PEATLAND-July-2021.pdf (results-based payment scheme materials).

using the natural capital accounting framework; annual reporting on natural capital; and tasking an appropriate government department to drive natural capital accounting in policymaking and sectoral decision-making. Stout *et al*. (2023) highlight that operationalisation of ecosystem accounting in Ireland requires increased expertise; a high-resolution ecosystem map; more developed and standardised ecosystem condition assessment methodologies; and a centralised data platform.

There are a few caveats to natural capital accounting in practice:

- While standards have been developed for the overarching framework of natural capital accounting, the devil is in the detail, and there is a wide array of methods, with limited underpinning data to undertake ecosystem assessments and monetary valuations. NESC (2024a) notes concerns that the creation of natural capital accounts might not advance swiftly enough to facilitate extensive nature restoration.
- Many environmental challenges – including climate and water and air quality – are driven by *flows* (e.g. carbon dioxide (CO_2)) that represent very small annual changes in the *stocks*. Accounting methods for many flows already exist to inform appropriate decision-making. However, many flows are ultimately dependent on the state of relevant natural capital in the long term, making parallel natural capital accounting of value.

Government-related agencies are already in a position to recognise the value of public goods delivered by nature based on scientific evidence (and already do so). Thus, while natural capital accounting methodologies are further developed and standardised to represent nature “in the boardroom”, and to identify the broad suite of trade-offs and co-benefits of particular actions, smart use of established indicators and assessment approaches will be essential to drive timely action on the ground, and to evaluate trade-offs at the relevant scale (e.g. site, organisation, catchment, national).

Based on the above information and previous recommendations, this report sets out the following priority recommendations in relation to how natural capital and ecosystem services accounting could support delivery of priority objectives from public land:

- Trial natural capital accounting across a selection of LAs and other public bodies (e.g. NPWS, Coillte) to assess feasibility, data availability and resource requirements.
- Support coordinated development of standardised ecosystem assessment methods and mapping data in a centralised database to support standardised assessment and reporting.
- Promote the use of scorecards as a pragmatic way to track and incentivise progress in the delivery of ecosystem services from public land.

4 Climate Objectives

4.1 Government Climate Objectives

The Climate Action and Low Carbon Development (Amendment) Act 2021 established a legally binding sectoral carbon budget framework to drive ambitious GHG emission reductions towards national "climate neutrality" by 2050. Carbon budgets have been established to achieve a 51% reduction in GHG emissions by 2030, relative to 2018, although the focus for LULUCF has shifted towards compliance with the EU LULUCF Regulation and implementation of relevant actions – reflecting the slow response of LULUCF fluxes to activity changes. Achieving 2030 (and even 2050) GHG emission targets is challenging in the LULUCF sector for a number of reasons, including:

- recent changes in LULUCF GHG emission factors that have reduced the accounted GHG mitigation efficacy of peatland rewetting;
- the age profile of Ireland's forests, and past planting on peat soils, which will result in the existing forest estate becoming a net source of GHG emissions;
- legacy drainage across large areas of the 20% of land comprising peat soils;
- cultural barriers to changing land management;
- a time lag between land use/management changes and GHG mitigation (reduced emissions and/or enhanced carbon sinks).

Figure 4.1 provides a graphical summary of GHG emissions and removals across LULUCF (EPA, 2024b). Biophysical constraints make it impossible to achieve a 51% reduction in LULUCF emissions by 2030 (against a 2018 baseline). Consequently, the Climate Action Plan 2024 (DECC, 2023) proposed a LULUCF emissions target based on the EU LULUCF Regulation ((EU) 2018/841),[2] i.e. 0.626 Mt CO_2eq below a baseline set at the average of 2016–2018 emissions (Table 4.1).

While there remains some uncertainty around national GHG inventory accounting methods for LULUCF, and the definition of climate neutrality (Bishop *et al*., 2024), it is clear that far-reaching changes in land use and management will be needed to meet any robust definition of climate neutrality by 2050 – including extensive rewetting of drained organic soils under grass, large-scale wetland (peat bog) restoration and afforestation in the order of 10 times the current planting rate (Styles *et al*., 2024). There is a particular urgency to ramping up afforestation rates given the time lag in building up forestry carbon sinks, juxtaposed against huge barriers to forest expansion in the form of exclusion zones and aversion to planting by private landowners who may wish to retain alternative use options into the future (it is prohibited to revert out of forest land use) (Government of Ireland, 2024). Natural disturbance events such as ash dieback and extensive winds, as experienced during the historic Storm Éowyn in 2025, are also likely to dampen interest in forestry.

Meanwhile, decarbonisation of transport and the built environment will require a modest amount of land for public transport infrastructure, renewable energy generation and new residential and commercial buildings. Land will also play a vital role in providing materials and energy sources based on biogenic carbon to replace fossil carbon-intensive materials and energy sources that are difficult to substitute in other ways (e.g. aviation fuels, concrete) – ideally culminating in the capture of that biogenic carbon at end of life, enabling storage (biochar or geological storage) to achieve negative emissions (Forster *et al*., 2021). Climate targets pertinent to land use and management are listed in Table 4.1.

4.2 Mandates

As outlined in section 2.2, few public body mandates contain specific reference to climate action. Most notably, climate action is not explicitly mentioned in the respective acts that established Bord na Móna and Coillte, despite the criticality of these state-owned companies in delivering specific climate targets set out in the Climate Action Plan (Table 4.1).

2 https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:32018R0841 (accessed 17 April 2025).

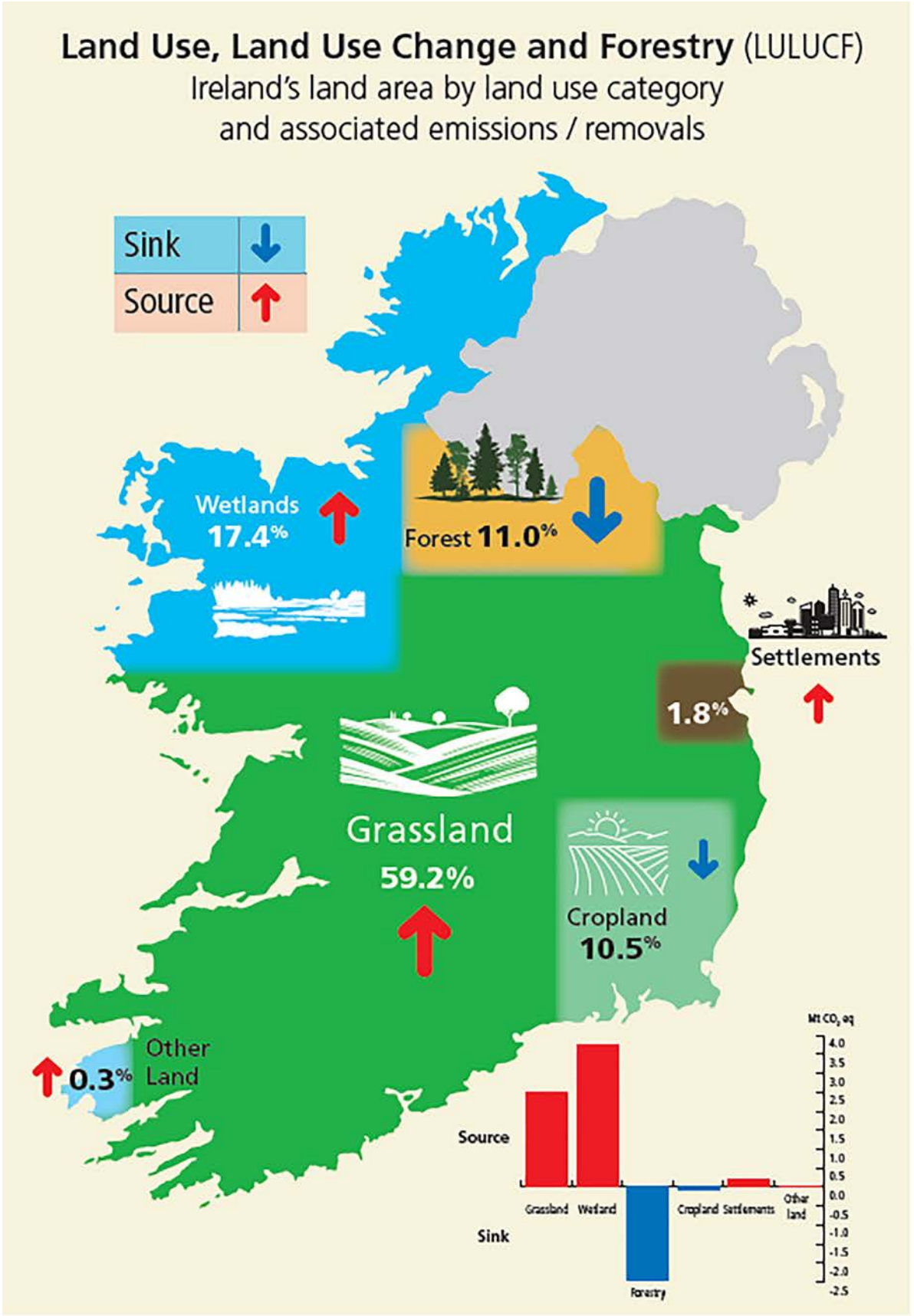


Figure 4.1. Overview of main GHG emission sources and sinks across the LULUCF sector. Source: EPA (2024b).

Table 4.1. Climate targets pertinent to land use and management, including actions inferred to achieve climate neutrality by 2050 in recent research (denoted by asterisk)

Climate target	2030	2050
National climate targets	51% GHG reduction vs 2018[a]	Climate neutrality[b]
LULUCF target	0.626 Mt CO_2eq vs 2016–2018 baseline	Climate neutrality[b]
Drained organic soil under grass	Reduced management intensity across 80 kha[a]	Rewetting of 107 kha*
Peat bog rehabilitation/restoration	35.9 kha peatlands plus 30 kha exploited peat rehabilitated	112 kha rehabilitated*
Existing forestry	Improved silvicultural management	Improved silvicultural management
Afforestation	Rates of 8000 ha y^{-1} out to 2030	18% forest cover
		c.500 kha new forest*
Agricultural emissions	25% reduction vs 2018[a]	*c*.50% reduction*
Renewable energy generation	80% electricity from renewable sources	Estimated 100% electricity from renewable sources

***Actions associated with climate neutrality in Styles *et al*. (2024).**

[a]Government of Ireland (2024).

[b]Climate Action and Low Carbon Development (Amendment) Act 2021.

Nonetheless, a letter of expectation from NewERA outlines a government expectation that Coillte provide shareholder value by returning profits to the government while delivering public goods such as biodiversity conservation and recreational services (Coillte, 2023). Coillte has established a "Nature Good" board to focus on public goods in relation to environmental and social outcomes (Coillte, 2023). Coillte's strategic vision emphasises four pillars: climate, wood, nature and people. This approach seeks to achieve climate resilience, sustainable timber production, biodiversity enhancement, and recreational and health benefits for the public, aligning with national sustainability and climate objectives (Coillte, 2023).

Similarly, although the letter of expectation for Bord na Móna is not publicly available, the semi-state company is responsible for implementing the Peatlands Climate Action Scheme, otherwise known as the Enhanced Decommissioning, Rehabilitation and Restoration Scheme (Bord na Móna, n.d.). Bord na Móna no longer undertakes industrial peat extraction, but instead focuses on renewable energy deployment across its land. This scheme will rehabilitate approximately 33,000 ha of peatland across 80 bogs to reduce GHG emissions, and stabilise and potentially enhance long-term carbon storage.

NPWS has an implied mandate for climate adaptation insofar as it is responsible for the sectoral climate change adaptation plans under the National Adaptation Framework for Biodiversity. Some nature restoration work within its remit (e.g. woodland regeneration) has the capacity to increase carbon stores and therefore mitigate climate change. LAs have a clear mandate for climate action through the Climate Action and Low Carbon Development (Amendment) Act 2021.

The act requires LAs to develop LA climate action plans, and LAs are required to undertake strategic environmental assessment of their development plans to ensure that wider environmental objectives are integrated.

4.3 Reporting

4.3.1 National Inventory Reports

Ireland reports annual data on GHG emission sources and sinks to the UN Framework Convention on Climate Change via National Inventory Reports (EPA, 2024c). These are based on Intergovernmental Panel on Climate Change (IPCC) good practice guidelines for GHG reporting, and 100-year "global warming potentials" that enable aggregation of the main LULUCF GHGs (CO_2, methane and nitrous oxide) into CO_2 equivalents. Relevant emission or removal (carbon sink) factors are applied to activity data, representing, for example, areas of particular soils and vegetation types under particular management, in order to estimate annual GHG fluxes. The methodology for LULUCF comprises a range of Tier 1 (IPCC default) to Tier 3 (process-based model derived) emission factors, and is summarised in a

recent bulletin produced by the EPA (EPA, 2024b). Recent changes to Ireland's national GHG inventory reporting include revised estimates of the area of drained organic soils under grass, and new emission factors for peat soils in wetlands, grassland and forest categories (EPA, 2024b). It is anticipated that there will be a stream of refinements made to the national GHG inventory reporting methodology over the coming years, as new spatial data improve the accuracy and precision of activity factors, and new data from scientific studies enable the development of improved emission factors. These refinements may enable smaller scale, fragmented actions to be captured in national GHG reporting, which could be important for small woodland, hedge and tree planting that may fall below the "forest" category threshold for reporting purposes (minimum area of 0.1 ha, minimum width of 20 m, trees taller than 5 m and a canopy cover greater than 20%) (Hendrick and Black, 2009).

4.3.2 Climate Action Regional Office reporting

Following the establishment of the four CAROs in Ireland in 2018, a new standardised reporting structure has been established for LAs to monitor and report on climate action. CAROs assist LAs in preparing annual reports on their climate action plans, detailing progress, challenges and outcomes related to emissions reduction and adaptation efforts, including a section on LULUCF. Guidelines cover relevant performance indicators and metrics for measuring the effectiveness of climate actions, while LAs are supported to collate and analyse data on GHG emissions in a manner aligned with national GHG inventory reporting. Performance data from all LAs will be collated in a centralised database, available for interrogation, to ensure transparency and accountability (Kevin Motherway, Cork County Council, personal communication, July 2024).

4.3.3 Potential for natural capital approach

National GHG inventory reporting is based on annual *fluxes* (emissions and removals). In LULUCF, these fluxes typically represent very small annual changes in very large carbon pools in soils, litter, and above- and below-ground biomass (i.e. natural capital), and also biologically mediated processes such as methanogenesis and denitrification. In some cases, there may be trade-offs between maximising terrestrial carbon stores (natural capital) and maximising overall GHG mitigation. It has been demonstrated that commercial harvested forests can deliver particularly strong long-term (100-year) GHG mitigation through cascading use of wood to substitute GHG-intensive materials and energy sources, while storing carbon in wood products and potentially in geological storage via bioenergy with carbon capture and storage (BECCS) at end of life (Forster *et al*., 2021). Aforementioned accounting methodologies based on the IPCC framework are well established, albeit continuously improving, and can be adapted to account for intersectoral GHG mitigation achieved for cascading use of wood. Natural capital accounting that focuses on stocks in nature is not designed to represent these effects, and is therefore less pertinent to monitoring climate mitigation.

However, improving the condition of peatlands and other habitats through use of scorecards could help ameliorate emissions from these lands and very gradually increase carbon storage, while enhancing resilience to climate change impacts.

Thus, the primary focus of reporting on climate impacts (and mitigation potential) of land use should be through refinement of national GHG inventory reporting, including the development of higher resolution spatial activity data and more precise emission factors. However, natural capital accounting could be useful for climate adaptation and resilience.

4.4 Best Practice

4.4.1 International examples

Scotland has a similar climate, soils and topography to Ireland, although a more concentrated landownership pattern. The Scottish Government has been promoting nature-based solutions to climate change across private and public lands for over a decade. The Peatland ACTION programme was established in 2012, and in 2020 received a long-term funding commitment of £250 million over 10 years to accelerate the restoration of degraded peatlands (Scottish Government, 2020). It is led by the Scottish Government and delivered in partnership with NatureScot, Cairngorms National Park Authority, Loch Lomond and The Trossachs National Park Authority, Scottish Water, and Forestry and Land Scotland. Large

areas of rehabilitation have been targeted across the Flow Country in the far north of Scotland, claimed to be the most intact and extensive blanket bog system in the world – covering 400,000 ha and demonstrating the scale and ambition required for successful peatland restoration. Approximately 75,000 ha of peatland have been restored, including over 10,300 ha in 2023–2024 alone (a record annual rate). The Scottish Government's Programme for Government has committed to restoring at least 10,000 ha of degraded peatland during 2024–2025 (Scottish Government, 2020).

Two aspects of Peatland ACTION's success are as follows:

- Long-term government investment, which has allowed for a structured, large-scale restoration programme. This funding has covered measures such as rewetting drained peatlands, removing non-native forestry plantations and blocking drainage ditches to encourage the re-establishment of natural hydrological processes. The long-term financial commitment provides security for ongoing monitoring and research, ensuring that restoration efforts are scientifically informed and adapted as new knowledge emerges.
- A collaborative, multi-stakeholder approach, with partnerships between government bodies, non-governmental organisations, scientists, landowners and local communities, has been vital in achieving widespread support for peatland restoration. Engaging communities in the process helps secure long-term stewardship, which is essential for the sustained success of restoration projects (Scottish Government, 2020). A focus on scientific monitoring has generated robust data demonstrating the multiple benefits of peatland restoration, reinforcing the case for continued investment.

Government funding is also being used to leverage private finance via the Facility for Investment Ready Nature in Scotland, which provides grants to organisations to develop a business plan to attract private finance to the deployment of nature-based solutions (NatureScot, 2024).

The principles of Peatland ACTION are highly applicable to the Irish context. Ireland has already initiated efforts to restore its peatlands, but scaling these up will require a long-term vision, sustained funding and collaborative approaches akin to those demonstrated in Scotland. Peatland ACTION provides a successful template.

Scotland also provides some useful examples of good practice in forestry, which covers 19% of national land area (vs 11% forest cover in Ireland), supports 25,000 jobs and contributes over €1.15 billion annually to the economy (COFORD, 2022). These forests deliver a wide range of environmental and socioeconomic benefits, from biodiversity conservation to carbon sequestration. Scotland's Forestry Strategy 2019–2029 is framed within a broader 50-year vision (Scottish Forestry, 2019). This strategy is supported by the Forestry and Land Management (Scotland) Act 2018, which has modernised the legal and administrative framework for sustainable forest management.

4.4.2 Peatland restoration in Ireland

Since the 1990s, Bord na Móna has restored or rehabilitated 36,500 ha of peatlands, which equates to *c*.46% of its landholding. Depending on the level of exploitation and environmental conditions, exploited bogs can be either fully restored to natural bogland or rehabilitated to other habitats. Rehabilitation can also include development of other land uses, such as the Lough Boora Discovery Park, which has commercial forestry and amenity, as well as a mosaic of natural habitats. Other land uses include the development of renewable energy. At a site like Mountlucas Bog, about 5% of land is used for renewable energy infrastructure, while the majority of the remainder of the bog is used for developing natural habitats. To date, 4000 ha of raised bog have been restored, and it is expected that this raised bog restoration programme will be completed in 2025 (Bord na Móna, personal communication, October 2024).

The Enhanced Decommissioning, Rehabilitation and Restoration Scheme is a large-scale environmental restoration initiative designed to rehabilitate degraded peatlands, approved by the government in 2020. The primary goal of the scheme is to restore, rehabilitate and decommission 33,000 ha of the Bord na Móna estate by 2030. The key objective is optimising climate action by reducing carbon emissions from these sites, as well as supporting other co-benefits, including

biodiversity, flood attenuation and water quality (Bord na Móna, 2024a). Through integration of renewable energy deployment on rehabilitated peat bogs, Bord na Móna contributes to wider climate mitigation and air quality improvement via fossil fuel substitution, as well as creating jobs in rural parts of the Midlands (see Chapter 6) (Figure 4.2). Smaller scale peat bog restoration across blanket bogs is being implemented by NPWS (Box 4.1).

Around half of Coillte's forests are on peat soils, giving rise to emissions from drainage-induced oxidation (Jovani-Sancho *et al*., 2021). On deep peats, where forest productivity is low, it may not be commercially viable to harvest trees. In these situations, the climate and biodiversity benefits of rehabilitating or restoring the underlying peatlands are deemed to be greater than leaving the trees *in situ* over the long term – although, in the short term, the climate impact of the associated deforestation increases emissions, which take many decades to "pay back" through reduced soil emissions (Coillte, 2022). Thus, Coillte has embarked

Figure 4.2. Restored (top) and rehabilitated (bottom) bogs. Source: Bord na Móna (2024b).

Box 4.1. NPWS bog restoration in Wicklow

NPWS is collaborating with Intel Corporation on an ecological restoration project at Liffey Head blanket bog in the Wicklow Mountains SAC. This initiative, ongoing since 2021, focuses on approximately 60 ha of degraded blanket bog within Wicklow Mountains National Park, which spans 20,000 ha and is designated as both a SAC and a Special Protection Area. Liffey Head is one of the best-preserved mountain blanket bogs in eastern Ireland, and is home to important flora and fauna and a complex system of bog pools. Unfortunately, parts of this habitat have suffered from drainage and desiccation, necessitating rewetting measures such as drain blocking to restore its ecology. The NPWS–Intel Corporation project has involved various field investigations, including studies on hydrology, geophysics, ecology and GHG emissions, to establish baseline conditions for the restoration area. Located along the Military Road between Kippure Mountain and Sally Gap, this project aims to enhance biodiversity and contribute to climate change mitigation efforts in the region. It could also contribute to flood mitigation and water quality improvement by increasing the water retention capacity of the restored bog by up to 90 million litres of water (Irish River Project, 2022).

Source: North Pennines National Landscape and Durham County Council. Copyright North Pennines National Landscape.

The above photo shows simple dams made from non-treated wood, installed to raise the water table and restore blanket bog – similar to work being undertaken by NPWS in the Wicklow Mountains SAC, as part of the Sustainable Uplands Agri-environment Scheme (Wicklow Uplands Council, 2022; NPWS, 2024b).

Hundreds of such dams have been installed, and specially formulated grasses planted to stabilise the soil while heather and mosses recolonise. Areas have been fenced off to protect against grazing animals.

on a "forest redesign" programme to address *c*.30 kha of forests on deep peat (see Box 4.2).

4.4.3 Commercial forest management and afforestation

Commercial forestry has a critical role to play in long-term climate mitigation (Forster *et al*., 2021) and needs to represent a major share of new afforestation in order to achieve a climate-neutral economy by 2050 (Duffy *et al*., 2022; Henn, 2024). The Forestry Programme 2023–2027 repeats a long-standing ambition to increase Ireland's forest cover to 18% (Government of Ireland, 2023c). Assuming this target is to be reached around or soon after mid-century, the implied expansion would be in line with estimates of the magnitude of afforestation needed to achieve climate neutrality across the land sector by 2050 (Haughey *et al*., 2023; Styles *et al*., 2024) – i.e. 16–20 kha per annum.

Here, it is worth focusing on the climate mitigation "heavy lifting" that can be undertaken through management and expansion of commercial forestry to act as a "carbon pump" in the landscape. Coillte manages 440 kha forest across 6000 forests and 127,000 forest parcels, and harvests approximately 3 million m^3 annually (all of which is Forest Stewardship Council and Programme for the Endorsement of Forest Certification certified). With plans to plant an additional 100 kha of new forest by 2050, half of which will be faster growing conifers, a cumulative net CO_2 sink of 18 Mt is forecast by 2050. However, this target falls well short of the 500 kha estimated as a minimum to achieve a robust definition of climate neutrality in the agriculture and land sector (Styles *et al*., 2024). Furthermore, Coillte is concerned that it will be difficult to meet even the current 100 kha target, owing to competing demands for suitable (non-peat) land for agriculture. Despite shifting towards 50:50 native:conifer planting, Coillte projects that harvests will remain constant out to 2050, and has ambition to significantly increase the use of wood products in Ireland. Raising timber frame construction from 20% to 80% of new builds by 2050 would support local economies through adding value to wood harvests (Coillte, 2023), while contributing to national climate change mitigation through substitution of GHG-intensive traditional building materials and creating long-term storage of biogenic carbon that could become available for future BECCS (Forster *et al*., 2021).

Box 4.2. Coillte forest redesign on deep peats

Plantation forests on deep peats are typically less productive in terms of timber than forests on mineral soils, yet contribute to the almost 2 Mt CO_2eq emitted annually by organic soils under forest, according to Ireland's National GHG Inventory (EPA, 2024c) – based on new emission factors for organic soils under forest (Jovani-Sancho *et al*., 2021).

The redesign protocol is necessarily site specific, and can include partial regeneration of peat bogs, the establishment of native tree species in rewetted bogs and/or restoration to semi-natural wilderness ("rewilding"). Site heterogeneity means that different areas of the same site may require tailored management strategies, making planning and implementation more complex, and costly (thousands of euros per hectare). Key efforts also involve the restoration and regeneration of degraded or underproductive forest areas along the west coast of Ireland. By concentrating on these restoration projects, Coillte aims to enhance natural habitats and overall ecological health. The approach not only contributes to biodiversity but also supports the resilience of forest ecosystems against climate change and other environmental pressures (Coillte, 2023). Some 3000 ha of redesign have been implemented so far via LIFE projects, with a further 30 kha of peat sites identified for redesign. Obtaining planning permission from LA planning authorities for the land use change out of forestry can be a challenge, and scaling out forest redesign will be expensive. Careful analysis is required to ensure that GHG emission savings are achieved over a useful time horizon when full deforestation is involved.

Source: Coillte, personal communication, September 2024.

Finally, Ireland's forest estate is expected to become a net source of emissions owing to a shift in age class structure that results in decreasing landscape-level productivity; an increase in harvest; and ongoing emissions from organic soils (Jarmain *et al*., 2024). By extending rotation length to ensure that harvest offtakes do not exceed the mean annual increment, Coillte has a role in leading better forest management that can improve the emission profile (moderate the scale of net emissions) across existing forest area until new afforestation contributes more substantially towards emission offsets.

4.5 Barriers and Opportunities

4.5.1 Barriers

Some key climate actions by both Bord na Móna and Coillte are contingent on planning consent – for renewable energy projects on cutaway peatlands and for forest redesign. In such cases, lack of ecological knowledge in planning authorities can impede effective decision-making.

Ireland's Forest Strategy 2023–2030 (Government of Ireland, 2024) states that "The overriding objective between now and 2030 is to urgently expand the national forest estate on both public and private land in a manner that will deliver lasting benefits for climate change, biodiversity, water quality, wood production, economic development, employment and quality of life. This will be a challenge of significant proportions, which will require a whole of society and whole of government response if we are to succeed."

One of the primary challenges Coillte faces in expanding its forestry initiatives is the cost of purchasing or leasing land on mineral soils. It is increasingly difficult to compete with agricultural uses that attract various subsidies and tax breaks, especially when land prices have been driven higher by relatively low interest rates and recent dairy expansion.

Coillte has solid plans for a balanced approach to forestry that delivers biodiversity (see Chapter 5) and socioeconomic objectives (see Chapter 6), as well as climate objectives. As the main public body pertaining to forestry, it has an important role as a forest industry leader in sustainable and resilient practices. However, it may also be called on to address strategic gaps in the delivery of government objectives (and on Ireland's Forest Strategy 2023–2030) over time. Notwithstanding the current low uptake of grants by private landowners under the new forestry scheme, these grants and the waiving of licence requirements for up to 1 ha of planting on individual farms strongly favour small-scale native woodland planting. Unless private *commercial* forestry can be scaled, Coillte may need to "unbalance" its targets in future to fill a critical national gap in both wood supply and strong climate mitigation (across land, construction and energy sectors) provided by commercial forestry.

LAs encounter significant challenges in strategic land management due to the absence of detailed land use maps, which impedes ability to assess land suitability for various development initiatives, such as afforestation or conservation projects. The process of gathering essential data on land use, ownership, soil characteristics and ecological status is labour intensive. Improved mapping resources would empower LAs to make informed, sustainable decisions more effectively and enhance land use planning across Ireland, supporting both local and national development goals.

4.5.2 Opportunities

The expertise that Bord na Móna is developing in peatland rehabilitation and restoration could be scaled to help deliver the 80 kha of "reduced management intensity" targeted by 2030 in Ireland's Climate Action Plan. Various projects, such as the Farm Payments for Ecological and Agricultural Transitions (FarmPeat) project, have been trialling drain blocking at small scale on farms. While water table management on private lands is undertaken on a voluntary basis and may require additional policy support to accelerate, the development of a national rehabilitation and restoration team centred on Bord na Móna's expertise could support efficient scaling out. Bord na Móna has been working with NPWS to restore protected raised bog sites (Bord na Móna provides support such as community liaison, project management, ecological survey and monitoring and operational support). Some specific sites have been restored by third-party contractors, managed by Bord na Móna, while other sites have been restored by Bord na Móna staff and machines.

Coillte is managing forests well, in particular to enhance biodiversity, but has not dramatically expanded forest area since the 1990s. Given the challenges facing private forestry expansion, and the constraints around where planting can happen, it seems inescapable that Coillte will need to drive initial forest expansion through acquisition of private land. The recent establishment of the Irish Strategic Forestry Fund – comprising Coillte, the Ireland Strategic Investment Fund, part of the state-owned National Treasury Management Agency and Gresham House (a private UK investment fund) – is expected to deliver 5000 ha of new forestry over 5 years. This appears to be a promising business model, but was subject to strong opposition from some stakeholders owing to the prospect of land acquisition by a consortium involving overseas investors. Pursuing this or similar business models, alongside long-term leasing arrangements so that land can stay in farm ownership, seems to be necessary – but will need to be accompanied by careful public communication.

4.5.3 Recommendations

The following preliminary recommendations arising from this chapter may be worth consideration:

- Facilitate planning (approval) for both peatland renewable energy projects and forest redesign by providing clear guidelines and involving NPWS as an advisor to LA planning offices.
- Establish long-term funding commitments for bog restoration to instil stakeholder confidence to pursue projects.
- Develop a long-term (to 2100) strategy for forestry that considers the full GHG mitigation potential of cascading wood value chains and the biogenic carbon they contain – preferably within a national land use strategy and cross-referenced in a bio-industrial strategy. Indicate clearly the situations where forest redesign, and commercial and semi-natural afforestation can deliver the greatest overall benefits (climate and biodiversity).
- Accelerate realisation of Coillte's afforestation and alternative management ambition to set an example for the private sector, and to prime supply chains (tree nurseries, etc.) for private expansion. If the private sector fails to accelerate afforestation by 2030, Coillte may need to expand its 100,000 ha afforestation target via more ambitious land acquisition through either private finance partnerships (communicated carefully in terms of public good objectives) or leasing agreements with farmers.
- Continue to implement the recommendation of Ireland's Forest Strategy 2023–2030 (Government of Ireland, 2024) to streamline afforestation and felling licence processes, and identify afforestation "green zones" that have been pre-cleared for some criteria to enable fast-tracked licensing, building on recommendations in the Mackinnon review (Mackinnon, 2019), and preferably within a national land use strategy.

5 Biodiversity Objectives

5.1 Government Biodiversity Objectives

The status of biodiversity in Ireland is poor in many respects (NESC, 2024a). The National Biodiversity Action Plan 2023–2030 (NPWS, 2024a) concludes that Ireland's biodiversity is in a state of crisis, and urgent, impactful action is required. Scientific assessments have found that 85% of Ireland's EU protected habitats are in unfavourable status, with almost half demonstrating ongoing decline, negatively impacting on wildlife. Heath and scrub, grasslands, forests, and bogs, mires and fens are in predominantly bad conservation status (Figure 5.1).

Over half of native Irish plant species, and of Ireland's 100 bee species, have undergone declines (30% of bee species are threatened with extinction). A total of 21% of breeding and 52% of key wintering bird species were reported to have short-term declining trends (NPWS, 2024a). Currently, less than 14% of the national territory of Ireland is designated for nature conservation, including the Natura 2000 network, national parks and nature reserves (Table 5.1). Of this, approximately 90% of designated sites are privately owned. Ireland does not have a comprehensive policy or system for management planning and delivery of conservation measures for most of its Natura 2000 sites.

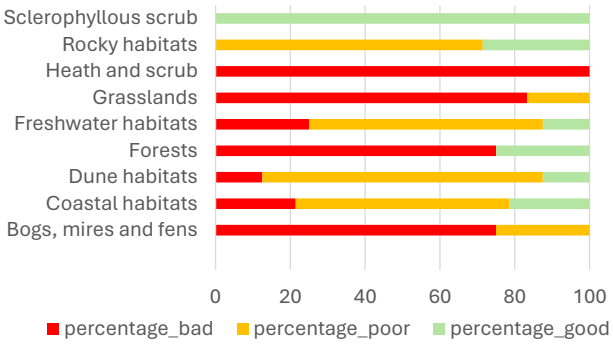


Figure 5.1. Breakdown of conservation status by habitat group in Ireland. Source: Based on data from Europa.eu (2024).

Bird numbers in Ireland generally improved between 1998 and 2023 after significant declines in earlier decades. The Irish Common Bird Index increased from 100 in 2000 to 126 in 2023. The Irish Common Farmland Bird Index increased from 103 in 2000 to 108 in 2023 (CSO, 2025).

Ireland is committed to various biodiversity measures through European strategies and directives. The Birds Directive and Habitats Directive set legally binding targets for the restoration of particular habitats and species to improve biodiversity, enhance climate resilience and ensure the long-term sustainability of natural resources. More recently, in August 2024, the Nature Restoration Law (European Union, 2024) came into force across the EU, representing the first continent-wide, comprehensive legislation of its kind. It will deliver objectives set out in the EU Biodiversity Strategy, setting binding targets to restore degraded ecosystems, particularly those with significant potential to capture and store carbon (European Union, 2024). Ireland will need to submit a National Restoration Plan to the European Commission by mid 2026, showing how targets will be delivered. This will build on the recent National Biodiversity Action Plan 2023–2030 (NPWS, 2024a) and will include key national targets such as:

- increase protected areas from 13% of terrestrial and inland waters to 30% by 2030;
- 50% of species listed under the Habitats Directive and 70% of habitats in favourable conservation status by 2027;
- restore > 15% of degraded ecosystems by 2025;
- increase the number of pollinator-friendly habitats by 25% over the next 4 years.

5.2 Mandates

NPWS is a critical public body for achieving national biodiversity objectives. NPWS has a mandate to (i) protect biodiversity and support delivery of socioeconomic benefits (cultural, recreational) on land under direct management (i.e. state-owned national parks and nature reserves); and (ii) protect biodiversity

more widely across other public and private land as relevant to implementation of aforementioned legislation and policies (see Box 2.3).

As outlined in sections 2.2 and 4.2, few public body mandates contain specific reference to biodiversity. Nonetheless, "nature" is one of Coillte's four priority pillars promoted by a "Nature Good" board within this semi-state company (Coillte, 2023), and, through the Enhanced Decommissioning, Rehabilitation and Restoration Scheme, Bord na Móna is committed to large-scale rehabilitation and restoration of exploited peat bogs as well as delivering climate action through renewable energy deployment.

LA land areas recorded in the LDA land register amount to almost 80 kha, although this is probably a significant underestimate for reasons explained in section 2.1. Systematic implementation of small actions for biodiversity across LA land could be cumulatively important.

Crucially, the Wildlife (Amendment) Act 2023 requires all public service bodies, including government departments, agencies and LAs, to integrate biodiversity into plans, policies and programmes.[3]

The Climate Action and Low Carbon Development (Amendment) Act 2021 also requires LAs to develop LA climate action plans that include biodiversity.

5.3 Reporting

5.3.1 National reporting

The CSO reports a range of statistics relating to biodiversity, including the extent of various protected areas (Table 5.1). The National Biodiversity Data Centre (https://biodiversityireland.ie/) and Biodiversity Information System for Europe (https://biodiversity.europa.eu/countries/ireland) provide repositories for useful data and reports.

Much of these data are sourced from NPWS, which reports to the European Commission regarding the status of protected habitats and species under Article 17 of the Habitats Directive (see Figure 5.1) and Article 12 of the Birds Directive.

LAs report progress on a wide range of actions pertaining to land use to the CAROs. A centralised database of actions is being compiled and will be made available to the public to track progress against targets, including on biodiversity. However, it seems that this reporting is somewhat ad hoc and disparate, and could benefit from some degree of standardisation.

5.3.2 Natural capital approach

Natural capital accounting could play a useful role in promoting habitat restoration to enhance biodiversity. This is particularly the case as biodiversity benefits can be realised through well-targeted small-scale actions, and are becoming increasingly sought after within environmental, social and governance plans at the corporate level. Framing biodiversity corridors as assets is a work in progress that is supporting recognition of ecological aspects at the board level in Transport Infrastructure Ireland (TII) – and could support implementation of an ambitious biodiversity plan (see Box 5.2) (Eimear Fox, TII, personal communication, September 2024). Scorecards described in section 3.3.2 provide a practical approach for habitat quality and biodiversity monitoring at the site level to guide better management.

Table 5.1. Selected indicators of biodiversity status of land and habitat coverage for Ireland

Indicator	Share of land area	Notes
Natura 2000 site extent (2020)	13.9%	Half EU average
Special Protection Area extent (Birds Directive)	6%	Fourth lowest share in EU
SAC extent (Habitats Directive)	10%	Seventh lowest share in EU
Forest cover	11.2%	Third lowest in EU

Sources: CSO (2025) and Europa.eu (2024).

3 https://www.npws.ie/news/new-public-sector-duty-will-strengthen-national-action-biodiversity (accessed 17 April 2025).

5.4 Best Practice

5.4.1 Peatland restoration

Extensive peatland rehabilitation and restoration, described in section 4.3.2, enhances biodiversity and reduces GHG emissions. Bord na Móna's Enhanced Decommissioning, Rehabilitation and Restoration Scheme aims to rehabilitate or restore approximately 79 kha of peat bog previously exploited for industrial uses. This could make a significant contribution to the Nature Restoration Law, although areas involved are relatively small compared with the 20% land area expected to undergo restoration according to this law (European Union, 2024). Bord na Móna is currently updating its Biodiversity Action Plan to replace the most recent plan, which spanned 2016–2021. The new Biodiversity Action Plan 2024–2029 will build on previous efforts focused on peatland rehabilitation and biodiversity enhancement, to include (i) habitat conservation and species monitoring (e.g. surveys on Birds of Conservation Concern in Ireland); (ii) protection of critical pollinator species, including the marsh fritillary butterfly; and (iii) public engagement and data sharing, including via Ireland's National Biodiversity Data Centre (Bord na Móna, 2024a).

Coillte forest redesign, described in Box 4.2, also contributes to biodiversity benefits via bog rehabilitation and restoration. In addition, approximately 10% of the area under Coillte management comprises unplanted peat soils. Rewetting drained areas of these soils would represent an important contribution to overall peatland rehabilitation and restoration targets.

5.4.2 Native woodland

Ireland's native woodland habitats have undergone high levels of habitat loss and fragmentation. Native woodland expansion and creation measures are needed at national scale to address these issues. Restoration of existing native woodlands is also needed to bring these habitats into favourable ecological condition, as required under the Nature Restoration Law. NPWS owns and manages 8 national parks and 80 nature reserves. There is potential for woodland expansion and/or tree planting within numerous sites, where ecologically appropriate. As these sites are managed primarily for nature conservation, this should comprise native species and native woodland habitat. Careful consideration is needed to balance this with the other conservation objectives of these sites. Expansion and creation of native woodland habitat within NPWS properties, where ecologically appropriate, can deliver multiple benefits simultaneously. It can contribute to meeting the following policy targets and/or legal obligations:

- conservation objectives of the overlapping SACs;
- re-establishment targets for Annex I woodland habitats under the Nature Restoration Regulation and National Restoration Plan;
- afforestation targets (Climate Action Plan and Ireland's Forest Strategy 2023–2030);
- climate targets (Climate Action Plan).

Native woodland can be established by planting or natural regeneration. The latter is considered best practice in ecological restoration and can deliver forest expansion at landscape scale. NPWS utilises a combination of these approaches, depending on site-specific conditions. Natural regeneration is achieved primarily through herbivore management, particularly deer; this reduces the mortality rate of young trees, enabling woodland expansion. The associated reductions in grazing and trampling can also benefit the restoration of other habitats, particularly peatlands. This approach has been successfully demonstrated at landscape scale in Scotland, for example by the Cairngorms Connect project (Cairngorms Connect, 2024). Natural regeneration of broadleaf woodland is also occurring on Bord na Móna cutaway peatland that is no longer being harvested, on both wet and dry sites (Bord na Móna, personal communication, October 2024).

Under the Habitats Directive and Nature Restoration Law, Ireland is obliged to re-establish large areas of the Annex I habitats alluvial forests and old sessile oak woods. The latter is of particular relevance within Ireland's national parks. NPWS recently completed a woodland management strategy for Glenveagh National Park (O'Neill *et al*., 2024), which sets out a science-based long-term vision for the restoration, expansion and connectivity of native woodland in the park. In this case, significant potential for native woodland expansion has been identified (see Box 5.1). This science-based approach to planning large-scale woodland expansion and restoration is intended to be replicated in other Irish national parks, where

Box 5.1. NPWS native woodland establishment

NPWS is implementing a woodland management strategy for Glenveagh National Park that aims to increase native woodland cover from 123 ha currently to up to 1000 ha. NPWS aims to plant approximately 110 ha of native woodland by 2030 in areas that were formerly wooded, as identified on the historical Ordnance Survey 6-inch maps. The remainder is to be achieved through natural regeneration at landscape scale. A native tree nursery has been established within Glenveagh National Park to supply local-provenance stock for tree planting. NPWS is currently required to apply to DAFM for an afforestation licence to permit any tree planting covering 0.1 ha or more. Grant applications under the Native Woodland Conservation Scheme are limited to 20 ha, thus requiring restoration to be spread across multiple applications with a lot of additional administration.

The woodland management strategy for Glenveagh National Park has undergone the appropriate assessment process. It was deemed to be necessary for the management of the Cloghernagore Bog and Glenveagh National Park SAC and the overlapping Derryveagh and Glendowan Mountains Special Protection Area.

The multi-annual resourcing necessary to fully implement the woodland management strategy for Glenveagh National Park is not yet in place. The implementation of the strategy has been costed at €6,550,000 in total for the first 5 years (€1,310,000 per annum), including the payroll costs of additional staffing.

Source: Text submitted by Dr Jenni Roche (NPWS Restoration Planning Ecologist).

appropriate. A woodland management strategy is now in preparation for Wicklow Mountains National Park.

In addition to forest redesign on deep peats (see Box 4.2), Coillte currently manages approximately 20% of its forest estate primarily for nature, with native species and practices such as continuous cover forestry, and has plans to increase this to 50% of the Coillte forest estate in the long term (in line with the target set out in Ireland's Forest Strategy 2023–2030 for 50% native or broadleaf tree species in new planting). Although harvesting can be maintained at a lower intensity on some of these areas, e.g. within continuous cover practices, replacing fast-growing conifers with slower growing native trees will incur a trade-off with long-term climate mitigation and wood supply. This may be compensated by significant expansion of Coillte's forest estate, as may be necessary to contribute to climate objectives (see Chapter 4). Overall, these measures imply a need for additional forest managers, with training in managing forests for biodiversity as well as commercial production.

5.4.3 Transport corridors

Road and rail transport corridors occupy a small fraction of national land but provide strategic opportunities to connect fragmented habitats. Linear elements – such as rivers, hedgerows, greenways and transport corridors – are vital for sustainable land management, offering both ecological and socioeconomic benefits. These features connect fragmented landscapes, enhance biodiversity and provide crucial corridors for species movement. This connectivity supports genetic exchange, migration and access to resources, playing a key role in ecosystem resilience, particularly in areas impacted by urbanisation and agricultural development (Fingal County Council, 2022a). Ireland's relatively new motorway network, now managed by TII, provides an example of managing transport corridors for biodiversity (Box 5.2).

5.4.4 Urban areas

LAs manage significant areas of public land, including in urban zones where pockets of biodiversity could be particularly valuable for amenity value as well as biodiversity refuges. Urban areas contain potentially valuable wildlife habitats such as gardens, parks, playing fields, churchyards, cemeteries, brownfield sites and roadsides, supporting robins, blackbirds, sparrows, wrens, thrushes, blue tits, great tits,

Box 5.2. TII transport corridors and biodiversity plan

TII was established through a merger of the National Roads Authority and the Railway Procurement Agency under the Roads Act 2015, to deliver and operate safe and efficient light rail and national road networks. It manages 3500 ha of land adjacent to motorways. For the past 20 years, these land banks have been planted with native vegetation, influenced by the vision of Vincent O'Malley.

Source: TII (2023).

TII has developed a biodiversity plan (TII, 2023) to guide land management for biodiversity. A key element of this plan is reduced management intensity for grass verges (e.g. 6-weekly cutting), which allows for the growth of important species like orchids and clover. Dormant wildflower seeds from 20 years ago have germinated after mowing was reduced. TII's biodiversity plan also requires biodiversity assessments for new projects to demonstrate a net neutral or net positive impact on biodiversity from development, which may require interventions outside transport infrastructure corridors (e.g. compensatory habitat restoration elsewhere). Medium-term targets within the plan include the following:

- **Capacity-building targets.** Recruit biodiversity specialists at early planning phases of major projects; develop a specific biodiversity role in TII with oversight of management of the existing network and future projects; establish a TII biodiversity working group to be chaired by a nominated biodiversity officer and with representatives from each sector of TII operations; and develop community links with LAs, national and local biodiversity groups, and landowners to encourage engagement with the biodiversity plan and provide assistance in implementing specific actions.
- **Biodiversity standards and technical specifications.** Develop biodiversity standard documents for the construction and commissioning phase of projects; and develop topic-specific standard and technical documents to support the overarching biodiversity impact assessment and construction and commissioning documents (e.g. digital data management, surveying habitats using remote sensing methods, the role of the environmental/ecological clerk of works on projects, and monitoring of the effectiveness of mitigation measures).

TII collaborates with LAs on local road management, presenting opportunities to connect both habitats and best practices. The recent National Land Cover Map is being used to identify priority areas for connectivity that can maximise biodiversity benefits.

Source: TII (2023) and Eimear Fox (TII, personal communication, September 2024).

chaffinches, frogs, newts, butterflies, damselflies, bees, foxes and badgers (Fingal County Council, 2022a). Over the last decade, increasing efforts have been made worldwide to make urban areas more suitable for declining species such as swifts, house sparrows, various bat species and amphibians.

This is particularly important given the propensity towards artificial surfaces outside homes and for sports facilities. Simple practices such as reduced-frequency mowing and planting native trees can enhance biodiversity and pollinator abundance in these areas, also contributing to well-being. Many LAs

have begun to implement such practices, and must report biodiversity actions via the CARO network. However, systemised biodiversity enhancement is rare, and there remains high potential to improve biodiversity across LA areas. Fingal County Council's draft Biodiversity Plan 2022–2030 (2022a) presents a positive vision for what could be achieved. It is centred around the development and delivery of an ecological network across Fingal, comprising:

- core nature conservation sites (2920 ha);
- buffer zones around the core sites (1350 ha);
- nature development areas (7050 ha);
- ecological corridors and stepping stones (1800 ha; 300 km).

The ecological network provides a framework for nature conservation efforts in Fingal over the next decade. It comprises habitats in good ecological condition, and links protected sites and other biodiversity hotspots across a wider nature-friendly farmed and urban landscape, providing maximum benefit for biodiversity. This network includes existing or potential healthy, resilient ecosystems that provide a range of important ecosystem services as well as allowing the movement of species across landscapes in response to climate change. It is important that the ecological network in Fingal is diverse and of sufficient scale and extent to enable species and habitats to adapt to disturbance and change (Fingal County Council, 2022a). Some examples of urban landscape management for biodiversity are presented in Figure 5.2. Fingal County Council notes the particular importance of incorporating biodiversity-friendly features into urban landscapes as such landscapes expand into greenfield areas over the coming decade owing to house-building targets.

Provisions for publicly owned and managed urban green spaces are also advanced through the spatial planning system, which has moved beyond the protection of green spaces towards a green infrastructure approach to promote greater ecological connectivity in urban environments. Within the recently published First Revision of the National Planning Framework, green infrastructure is defined as "an interconnected network of green space that conserves natural ecosystem values and functions that also provides associated benefits to the human population. It is a strategically planned network of natural and semi-natural areas with other environmental features designed and managed to deliver a wide range of ecosystem services" (Government of Ireland, 2025). Fundamental to this perspective is that green infrastructure provides multifunctional benefits, suggesting that urban green infrastructure networks should be designed and managed as multifunctional spaces (Scott *et al*., 2016); for example, an urban green space may be designed to aid local drainage management, provide a habitat for wildlife and biodiversity, mitigate the urban heat island effect, mitigate local noise and air pollution, and provide a space for recreation, physical activity and social interaction (Scott *et al*., 2020). Green infrastructure objectives are promoted at the national level through the National Planning Framework, which calls for integrated planning for green infrastructure to be incorporated into the preparation of statutory land use plans while maintaining ecosystem services and ecosystem functions and conserving and/or restoring biodiversity. There is now widespread adoption of green infrastructure principles within LA development plans as a means of managing and connecting publicly owned green spaces, greenways and green infrastructure assets to maximise the multifunctional services they provide to the public.

5.5 Barriers and Opportunities

5.5.1 Barriers

Conflicts may arise between biodiversity objectives and infrastructure development plans integral to public organisations' core mandates. For example, the HSE has a core mandate to deliver patient care, which may include restricting non-resident access to some outdoor areas and the designation of other areas for new buildings (where attracting protected species or planting trees would create a conflict). Similarly, LAs have a mandate to provide housing and services via infrastructure, which may require designation of areas for development.

Peatland and native woodland restoration are labour intensive and require careful planning. The pace of restoration by NPWS is highly constrained by the limited resources available. Planning for the long term, such as the ambitious 100-year forest strategy, is difficult to achieve due to uncertainty around sustained

Figure 5.2. Fingal's winning "show garden" display at the Bord Bia Bloom 2024 awards, showcasing how biodiversity can be incorporated into urban landscapes (top photo; source: https://www.fingal.ie/fingals-emphasis-biodiversity-and-urban-landscapes-recognised-bloom) and an example of soft engineering by TII in Grangemockler, County Tipperary, to improve urban drainage and biodiversity (bottom photo; courtesy of TII).

resource commitments. Currently, NPWS can avail of forest planting and conservation grants offered by DAFM, but the latter are restricted to a 20 ha project size (for any organisation), which means that larger projects need to be broken down into smaller applications, which is administratively costly. The shortage of suitably qualified ecological/technical staff to carry out large-scale landscape projects, especially in tree planting, is a particular challenge in both the planning and implementation of projects. NPWS also faces similar licensing and planning challenges to Coillte.

Finally, the ecological approach to native woodland regeneration is biophysically constrained by the rate

at which tree establishment happens and the relatively slow growth rates across native tree species at lower densities (compared with commercial forestry). Woodland created this way is incredibly valuable from a biodiversity perspective and will contribute to Nature Restoration Law targets, as well as to a more sustainable and resilient future landscape. Over decades, woodland regeneration at scale could significantly increase Ireland's land-based carbon sink. Natural woodland regeneration is therefore a crucial component of more sustainable and resilient land use, but is likely to make only a modest contribution towards 2050 climate targets compared with fast-growing and densely planted commercial forestry.

5.5.2 Opportunities

Compass Informatics is working with NPWS, LAs, business and non-governmental organisations to identify suitable planting locations in national parks and on LA land to expedite appropriate forest planting and regeneration (Compass Informatics, n.d.). More extensive use of geographic information systems and data analytics has the potential to expedite establishment of (conservation) forests, contributing to both climate and biodiversity objectives.

TII's coordinating role in enhancing connectivity among communities and landscapes presents a unique opportunity to coordinate biodiversity management across communities. For example, adoption of TII practices on national roadsides by community employment workers on townland roadsides provides a pathway for those practices to be implemented on other community land managed by those community employment workers.

5.5.3 Recommendations

Based on the information in this chapter, the following recommendations are made:

- LAs can play an important role in enhancing biodiversity across urban and rural landscapes. Green infrastructure plans within statutory county/city development plans can be used to integrate biodiversity, heritage, health-promoting infrastructure, flood alleviation and sustainable mobility objectives. Comprehensive biodiversity plans, such as that of Fingal County Council, should include mapping of habitat types to incorporate habitat connectivity along linear features (roads, greenways, rivers, etc.).
- Deriving maximum benefit from the Coillte estate requires an integrated, ambitious national vision that considers the types and areas of forestry that could be established and managed by different categories of land manager across Ireland (see Chapter 4).
- There is a clear need for more training in landscape management, whether through full third-level courses or targeted training for professionals in strategic positions – e.g. LA engineers and ecologists.
- Given the areas of land restoration that will be required, sizeable long-term funding commitments will be required to plan for systematic scaling and strategic delivery (see Chapter 4).
- The already high demands on NPWS to deliver restoration projects across national parks and nature reserves, and provide advice and regulation, will become considerably greater if government objectives for land are to be met. More resourcing will be required – particularly for suitably qualified ecologists and landscape engineers (see Chapter 4).

6 Water, Air and Socioeconomic Objectives

6.1 Government Water, Air and Socioeconomic Objectives

Land plays an important role in water quality, and a supporting role in air quality and socioeconomic objectives. Water quality impacts arise in part from wastewater treatment (a public body remit), but more substantially from agriculture, which is outside the scope of direct land management by public bodies. Similarly, air quality impacts largely arise from transport, domestic heating, industry, agriculture and power generation. The potential for public bodies to influence air emissions via management of public land is limited. These factors have therefore been considered together in this chapter, which also provides an opportunity to elaborate on the need to develop multifunctional land use solutions.

6.1.1 Water quality

Nearly half of Ireland's surface waters are not ecologically healthy, primarily due to human activities. Agriculture, damage to hydromorphology, commercial conifer forestry plantations and poorly treated sewage are the most significant pressures on Ireland's aquatic environment (Figure 6.1).

The Water Framework Directive mandates that EU Member States achieve "good status" for all surface waters, groundwater and coastal waters through an integrated, river basin-based approach. If any water bodies are not expected to meet "good status" by the 2027 deadline, Member States must justify the delay and propose alternative measures to improve quality (Noone *et al.*, 2023).

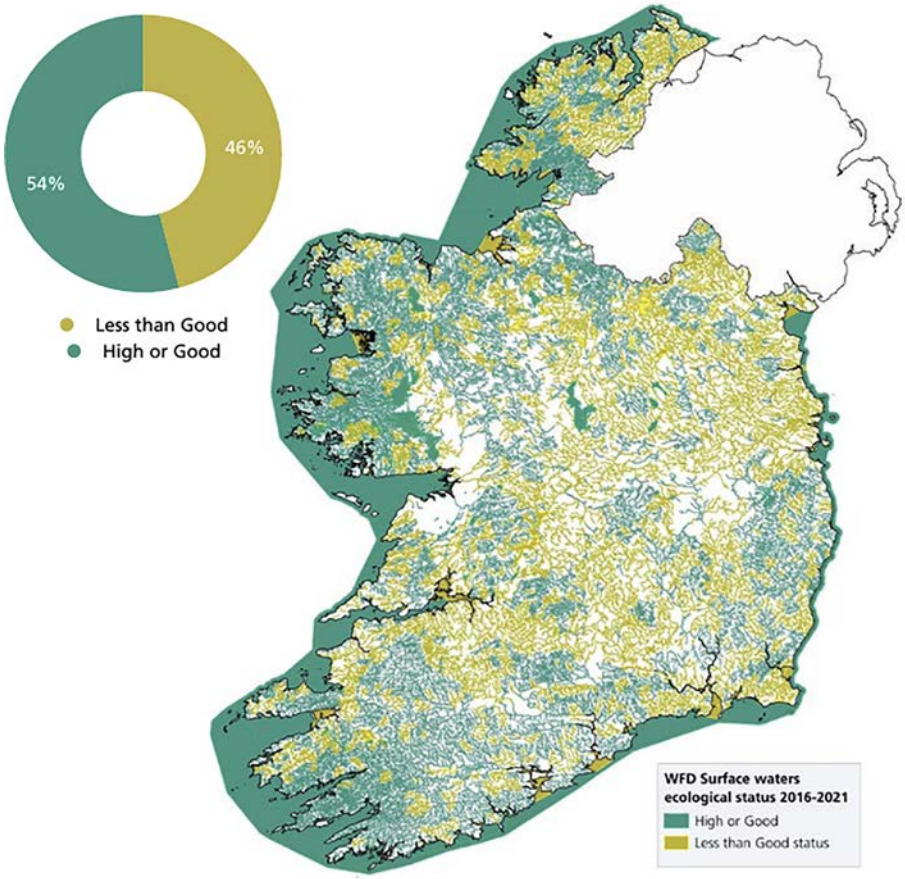


Figure 6.1. Surface water ecological status across Ireland 2016–2021. WFD, Water Framework Directive. Source: EPA (2024a).

Nitrate concentrations are too high in 40% of rivers, primarily driven by agriculture. While significant investment and additional resources have been committed to address water quality issues in recent years, based on current and planned measures Ireland will not achieve its legally binding water quality objectives by 2027 (EPA, 2024a).

6.1.2 Air quality

Poor air quality is a major threat to public health, and is linked with premature death and life-limiting conditions such as dementia. In Ireland, over 1600 premature deaths every year are attributed to air pollution, via cardiovascular disease and respiratory illnesses (EPA, 2024a). Healthcare costs of five conditions linked to poor air quality in Ireland have recently been estimated at €14 million per year (EPA, 2024a). Fine particulate concentrations are associated with an increase in the prevalence of depression and anxiety. Improving air quality is therefore strongly linked with improved socioeconomic outcomes.

European ambient air quality legislation sets out concentration limits for 13 air pollutants, including nitrogen dioxide, particulate matter (PM_{10} and $PM_{2.5}$), ozone, sulfur dioxide, benzene, lead, carbon monoxide, arsenic, cadmium, nickel and benzo(a) pyrene. Key European directives with which Ireland must comply include the Cleaner Air For Europe Directive and the National Emission reduction Commitments Directive ((EU) 2016/2284).

Targets for annual emission loading reductions have been established for a number of pollutants. Relative to 2005, annual emissions for sulfur dioxide, nitrogen oxides, ammonia, non-methane volatile organic compounds and particulate matter should be, respectively, 85%, 69%, 5%, 32% and 41% lower by 2030 (EPA, 2024a).

6.1.3 Socioeconomic objectives

Land use and management pertains to a number of socioeconomic objectives, directly and indirectly. In particular, activities such as landscape management, peat harvesting (or peatland restoration), forestry and recreation support rural economic development and employment (alongside agriculture, which is largely outside the scope of public land). Important land-related socioeconomic objectives noted elsewhere in the LUR Phase 2 include the target to build between 33,000 and 50,000 houses per year out to 2030, the revitalisation of rural communities, and the strategic development of regional and national greenways.

6.1.4 Multifunctional land use

Land multifunctionality refers to the ability of land to deliver multiple benefits. This approach is essential for achieving robust economic outcomes while also delivering social and environmental benefits. By evaluating the trade-offs and synergies between various land uses, multifunctionality promotes efficient land use – identifying opportunities to layer multiple outputs and determining when they should remain distinct. A pilot study on multifunctional land use planning in Devon and Cambridgeshire demonstrated the need to consider appropriate boundaries due to the complexity of land considerations at a larger scale (FFCC, 2023). It was proposed that local or combined authorities would be suitable groups to take on this responsibility. This approach has strong potential and should be considered best practice for land management in Ireland, as it empowers local and combined authorities to make context-sensitive decisions.

Linear elements – such as rivers, hedgerows, greenways and transport corridors – offer both ecological and socioeconomic benefits. These features connect fragmented landscapes, enhance biodiversity and provide crucial corridors for species movement. This connectivity supports genetic exchange, migration and access to resources, playing a key role in ecosystem resilience, particularly in areas impacted by urbanisation and agricultural development. Greenways, for example, offer accessible routes for walking and cycling, promoting public health and community well-being. They also contribute to local economies by attracting tourism, increasing property values and supporting local businesses. As multifunctional components of land use, linear elements are essential for climate resilience and sustainable development. By prioritising their preservation and development, we can create landscapes that balance ecological health, human needs and economic growth (FFCC, 2023).

6.2 Mandates

LA mandates are most relevant here, spanning water and air quality and socioeconomic objectives – including delivery of public transport services. Notably, the Local Authority Water Programme (LAWPRO) works on behalf of Ireland's 31 LAs to protect and restore good water quality in our rivers, lakes, estuaries, groundwater and coastal water through catchment science and local community engagement (LAWPRO, 2023). LAWPRO was established to fulfil requirements under the EU Water Framework Directive and is funded by the Department of Housing, Local Government and Heritage. LAWPRO coordinates the efforts of LAs and other public bodies in the implementation of the River Basin Management Plan.

The OPW is a state body under the Department of Public Expenditure, NDP Delivery and Reform, and operates under several mandates critical to advancing Ireland's environmental and cultural objectives. The OPW manages public monuments and buildings, supports large-scale renewable energy projects on suitable public lands, and manages flood risk and mitigation under the EU Floods Directive (including through maintenance of arterial drainage schemes). Box 6.1 highlights potential conflicts in how drainage will be managed going forward.

6.3 Reporting

6.3.1 Water quality

The EPA carries out regular ecological, hydromorphological, biological and physico-chemical analyses of water bodies under the Water Framework Directive and Nitrates Directive.

6.3.2 Air quality

Continuous monitoring is required across a strategic network of sites for concentrations of 13 air pollutants, including nitrogen dioxide, particulate matter (PM_{10} and $PM_{2.5}$), ozone, sulfur dioxide, benzene, lead, carbon monoxide, arsenic, cadmium, nickel and benzo(a) pyrene. Some pollutants have annual loading thresholds (e.g. ammonia).

6.3.3 Socioeconomics

Public access to land is critical to derive maximum well-being from landscapes, and can be tracked using metrics such as annual visitor numbers.

The number of jobs and scale of economic activity supported by particular uses of land provide an indication of economic contribution, which can be particularly important in rural areas where employment opportunities are more limited. Bord na Móna and Coillte report on the number of jobs they support directly and indirectly, for example.

6.3.4 Potential for natural capital approach

As noted in Chapter 5, a natural capital approach could have value in recognising the human-derived value of better-quality habitats, especially when these are accessible to large numbers of people (in urban areas or highly accessible rural sites). Natural capital and ecosystem services frameworks are particularly well suited to capturing multifaceted benefits of multifunctional land use.

6.4 Best Practice

6.4.1 Water quality and drainage

Infrastructure projects will need to include details on how nature-based solutions are being considered to manage future flood risks under LAWPRO (Grainne Kennedy, Waterford County Council, personal communication, October 2024). TII integrates soft-landscaping practices into urban transport designs, which include the establishment of green corridors and sustainable urban drainage systems. These efforts not only enhance biodiversity and ecological connectivity, but also contribute to healthier urban environments, improving the quality of life for residents while supporting local wildlife (TII, 2024). Effective implementation of these initiatives relies on strong collaboration among TII, LAs and community groups. By focusing on these interconnected elements, TII addresses climate change mitigation and adaptation while establishing a long-term vision for a sustainable and interconnected Ireland (TII, 2024). Figure 6.2 provides a before-and-after illustration of a soft-landscaping project funded as part of a TII safety scheme focused on the multifaceted benefits

Box 6.1. Competing demands for the OPW's role in flood alleviation and bog rewetting

State intervention in addressing the flooding of lands through drainage commenced with the passing of the first Drainage Act in 1842. Schemes of drainage works were carried out in over 200 drainage districts to improve over 200,000 ha of land. Maintenance of drains across the 170 remaining districts is the statutory responsibility of the relevant LA.

The Arterial Drainage Act 1945 tasked the OPW with carrying out a programme of large-scale arterial drainage schemes, on a catchment basis. Between 1948 and 1992, the OPW implemented 34 catchment arterial drainage schemes and 5 estuarine embankment schemes. Investment by the state through the OPW in the programme of catchment arterial drainage schemes and estuarine embankment schemes was bolstered by significant investment through the Department of Agriculture in improving land drainage for food production under the Land Project 1949 and successor funding initiatives. It is estimated that arterial drainage schemes progressed under the 1945 act provide drainage outfall for 242,800 ha of agricultural lands. Importantly, there has been significant development in these areas since the schemes were completed, and the land drainage schemes are now also providing a degree of protection from flooding to property, infrastructure and communities, including in excess of 21,000 properties, 2400 km of roads and 77 towns and villages. In order to preserve the benefits of the schemes, the OPW has a statutory duty under Section 37 of the act to maintain the schemes in proper repair and effective condition. Failure to do so would result in an increased flood risk to benefiting areas and communities.

Maintenance of OPW arterial drainage schemes has evolved significantly over the past 20 years, driven primarily by environmental legislation such as the EU Birds Directive, Habitats Directive and Water Framework Directive. Arterial drainage maintenance works are carried out in accordance with relevant legislation, through a range of environmental assessments, supported by widespread stakeholder consultation. The OPW, in partnership with Inland Fisheries Ireland and other stakeholders, has developed environmental drainage maintenance procedures to mitigate potential environmental impacts on rivers and streams that are maintained by the OPW for the purpose of land drainage.

There are many views in relation to the programme of arterial drainage maintenance being undertaken by the OPW. While there are calls to cease arterial drainage to progress a number of cross-cutting environmental objectives, there are also calls from others to increase the maintenance activities being carried out in light of flood risks and a desire to maintain agricultural production on organic soils. In that context, it is important to note that climate change will increase flood risks. Options to reverse arterial drainage schemes or to cease arterial drainage maintenance activities for lands currently benefiting from such maintenance must be informed by land use policy. The flood risk implications for communities must be carefully considered. The LUR will provide clarity regarding future national drainage requirements, having regard to a broad range of policy goals, including maintenance of arterial drainage schemes for agricultural production and flood risk mitigation, climate action, biodiversity and water quality. This will inform consideration of any changes to arterial drainage practices and any potential legislative changes to be made to the Arterial Drainage Act, having regard to all potential benefits and impacts.

Source: Text submitted by Planning and Climate Adaptation Division, OPW.

of soft-landscaping treatments in urban transport environments and how they contribute to road safety.

The OPW plays a major role in strategic deployment of flood protection and drainage schemes, as illustrated in Box 6.1. Fingal County Council's draft Biodiversity Plan 2022–2030 includes a description of natural regeneration of a saltmarsh, which also acts as a natural flood plan (Figure 6.3). Such examples of nature-based solutions to flood management deliver multifaceted benefits, and will become increasingly important as sea levels rise with climate change (Fingal County Council, 2022a).

Figure 6.2. Example of TII soft-landscaping redevelopment of a bus stop in Grangemockler, County Tipperary. Photos courtesy of TII.

6.4.2 Air quality

The main ways that land can be managed to reduce air pollutant emissions are the development of public transport infrastructure to reduce car dependency and the development of renewable electricity generation to replace fossil-based electricity, ultimately supporting the green transition towards electrified transport and heating. All public sector bodies have a role to play in these objectives by facilitating public transport use, installing on-site renewable energy generation and reducing energy demand. For example, the HSE has an ambitious building programme that will result in a substantially more energy-efficient building stock with lower maintenance emissions (albeit with loss of green space to construction).

Figure 6.3. Flood embankment removal at the Rogerstown Estuary to restore the natural saltmash habitat and floodplain functioning. Source: Final County Council (2022a).

Coillte and Bord na Móna have developed a number of sites where renewable energy generation has been integrated or "stacked" with various other objectives. One example is the Cloncreen Wind Farm in County Offaly. Completed at a cost of €100 million, Cloncreen generates enough renewable electricity to power 55,000 homes. In addition to its renewable energy contribution, the site offers community amenities, including a sensory garden and 21 km of walking trails open to the public, enhancing recreational opportunities for local residents. Bord na Móna has also rewetted a significant part of this site as part of the Enhanced Decommissioning, Rehabilitation and Restoration Scheme, and has developed battery storage capacity to buffer grid electricity. The example of Mountlucas Wind Farm is described in Box 6.2.

6.4.3 Socioeconomics

Bord na Móna's recent shift out of peat extraction and into climate solutions is generating substantial employment in Ireland's Midlands. Directly and indirectly, including through its Accelerate Green programme, Bord na Móna has supported the creation of 1400 jobs in renewable energy, recycling and peatland rehabilitation. In the last 18 months alone, 550 jobs were created, and an additional 885 roles are planned over the next 4–5 years. This expansion is expected to return direct employment to pre-transition levels by 2028, helping to support the local economy (Bord na Móna, 2025b). The company's partnerships with third-party organisations further bolster this impact, adding 335 jobs across sectors, while upcoming renewable energy projects will provide an average of 300 construction jobs annually over 6 years. This commitment underscores Bord na Móna's role in the Just Transition by supporting sustainable, long-term employment for local workers (Bord na Móna, 2025b). Realising a Just Transition is critical in regions such as the Midlands, where "old" industries such as peat extraction and peat electricity generation supported a high share of employment.

The forestry sector directly and indirectly supports 9400 rural jobs, as well as additional downstream jobs in wood processing and construction (Government of Ireland, 2024). Coillte manages 440 kha of forest that are open for public access, recording 29 million visits per year.

Bord na Móna's Lough Boora Discovery Park offers walking trails through diverse amenities, as well as bike hire, fishing, a fairy wood for children and bird watching facilities. It includes a visitor centre and

Box 6.2. Mountlucas Wind Farm, County Offaly (Bord na Móna)

Mountlucas Wind Farm provides a noteworthy example of multifunctional "stacking". This project successfully integrates renewable energy generation, bog rehabilitation, sensory gardens and recreational facilities. It plays a crucial role in supporting Ireland's transition to renewable electricity generation (central to reducing air pollution, especially as transport and heating electrify), while enhancing biodiversity and delivering significant benefits to the local community.

Renewable energy generation. The wind farm comprises 28 turbines with a total installed capacity of 84 MW. Annually, Mountlucas Wind Farm generates enough electricity to power around 50,000 homes. This offsets *c.*130,000 tonnes of CO_2 emissions each year, and reduces air pollution from fossil fuel electricity.

Bog rehabilitation. Constructed on former cutaway bogland, the wind farm has undergone extensive rehabilitation efforts. This process has involved rewetting and re-vegetation techniques aimed at restoring the ecological functions of the bog. Rehabilitation is focused on rewetting, where possible, and creating small wetland features. The site overall is relatively dry and a significant portion is developing scrub, woodland and other habitats via natural colonisation. Comprehensive monitoring programmes are in place to assess improvements in biodiversity and to evaluate the success of these initiatives.

Recreational facilities. Mountlucas Wind Farm offers an array of recreational facilities designed to foster community engagement and enhance visitor experience. A network of walking and cycling trails (5 km in length) provides scenic views of the wind turbines and the surrounding landscape. These trails are accessible to individuals of all abilities and feature educational signage that informs visitors about renewable energy and local ecosystems.

A prominent feature of the recreational offerings is the sensory gardens, thoughtfully designed to provide an interactive experience that engages all five senses: sight, sound, touch, taste and smell. These gardens are populated with a diverse selection of native plants that attract pollinators, such as bees and butterflies, thereby promoting local biodiversity. The sensory gardens serve as a peaceful retreat for relaxation and contemplation, encouraging visitors to connect with nature and appreciate the ecological significance of the landscape.

Community engagement and employment. Community events and guided tours are regularly organised to further engage the public and raise awareness about renewable energy and conservation efforts. The combination of walking trails and sensory gardens not only promotes outdoor activity but also fosters a deeper understanding of environmental issues and the importance of sustainable practices. The wind farm has established a Community Benefit Fund, which allocates resources to local projects and initiatives aimed at improving community infrastructure and enhancing quality of life. The development of the wind farm created jobs during the construction phase and continues to provide employment opportunities in operations and maintenance.

Source: Bord na Móna (2025a).

educational material on peat bogs (Bord na Móna, 2025b) (Figure 6.4).

An important multifunctional activity for public land is tree planting, which can deliver benefits for drainage, biodiversity and amenity value (Fingal County Council, 2022b). There is considerable potential for tree planting across LA land in Ireland, and also potentially across OPW land. Ireland's Forestry Programme 2023–2027 (Government of Ireland, 2023c) provides optional funding for public authorities to develop recreational forests on public lands, enhancing accessibility for public enjoyment, under FT3 (Forests on Public land). FT4 (Amenity Forests/Neighbourhoods) of the programme provides funding for partnerships, including local communities, to develop forests on highly accessible greenfield sites

Figure 6.4. Lough Boora visitor centre and trails, managed by Bord na Móna. Source: https://www.loughboora.com/plan-your-visit/interactive-map/.

with high potential to deliver amenity value to local residents. Box 6.3 outlines Fingal County Council's tree planting strategy.

The OPW manages 21,000 properties across Ireland (Figure 6.5), representing a small but highly accessible (visible) land bank. Implementation of multifunctional land management practices, as described for LAs, could provide multiple benefits at a modest scale, while providing education through demonstration to the general public.

6.5 Barriers and Opportunities

6.5.1 Barriers

Multifunctional land use requires careful planning and appropriate spatial data, including ecological surveys, to understand the extent and conditions of habitats within the managed area. Often, critical habitats may span administrative boundaries, so that multi-authority planning is required to deliver optimal outcomes. Implementing multifunctional land use plans at scale will require significant investment and engineers, architects and ecologists with relevant skills in soft-landscaping and ecological assessment.

6.5.2 Opportunities

Soil specification guidelines used for engineering works, e.g. for transport and renewable energy projects, are based on engineering properties, but could be expanded to include information on biodiversity and ecosystem functions of soils.

Engineers working in landscapes could be offered training in sustainable urban drainage systems and biodiversity to incorporate these features into schemes at an early design phase.

An opportunity for improving land management in Ireland is the creation of best practice guidelines for soft-engineering solutions in landscapes, particularly when addressing flood management and peatland restoration. These approaches use natural processes – such as wetlands, vegetation and floodplain restoration – to mitigate flood risks while enhancing biodiversity and carbon storage. By prioritising natural systems alongside traditional infrastructure, this approach supports both environmental goals and climate resilience.

High-resolution ecological habitat maps for all public lands would provide a basis for more sophisticated planning and informed decisions regarding land use, conservation, restoration and public access. This would also help agencies like the OPW, LAs and community groups coordinate efforts and optimise land for multiple uses. These improvements could foster collaboration, boost public engagement and contribute to a more sustainable and resilient landscape.

6.5.3 Recommendations

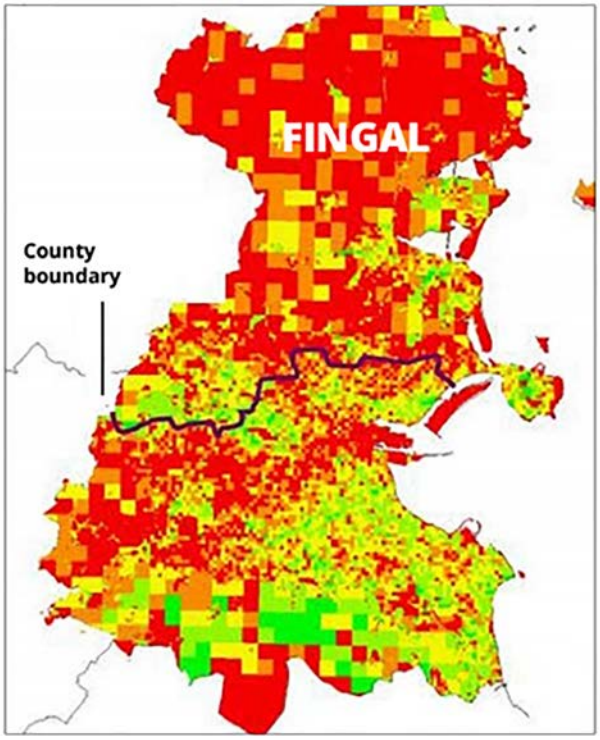
- Involve landscape architects, urban designers and ecologists in public space (re)development to fully integrate environmental and socioeconomic outcomes into high-quality public realm management and design.
- Establish clear principles that can be applied by the OPW to identify appropriate drainage interventions across localities, having regard to agricultural, flood risk mitigation, climate action,

Box 6.3. Fingal Tree Strategy

There are approximately 70,000 publicly owned or managed trees in Fingal, and approximately 400 ha of public woodland, with tree canopy cover of 6.5% – the lowest of the four Dublin LAs and well below the European city average of 15% (Fingal County Council, 2022b). Overall, there is estimated to be 2000 ha of public open space in Fingal.

The Fingal Tree Strategy mentions working towards 15% tree canopy cover, although planning appears to be at a relatively early stage. The multifunctional attributes of trees are emphasised, and a range of tree species will be planted depending on the situation.

While the selection, planting and protection of native species is highly desirable, there is a large palette of exotic species available that can thrive in challenging urban environments. Exotic trees may be selected for planting in urban centres, which would provide an opportunity to diversify the urban forest. Such diversity will gradually decrease to native selection, transitioning from urban to peri-urban and eventually through to Fingal's rural geographical areas.



Source: Fingal County Council (2022b).

Box 6.3. Continued

Millenium Park in Dublin 15. Source: Fingal County Council (2022b).

biodiversity and water quality objectives (e.g. with context-specific weighting).

- Trial natural capital reporting across a small number of LAs to monitor multifunctional land use in terms of multiple ecosystem services delivery. This could form the basis of future CARO reporting.
- In addition to reduced-frequency mowing, which appears to be becoming widely established, all public bodies could consider opportunities for tree planting on open ground, in parks, along streets and in car parks as an effective way to deliver multiple objectives.

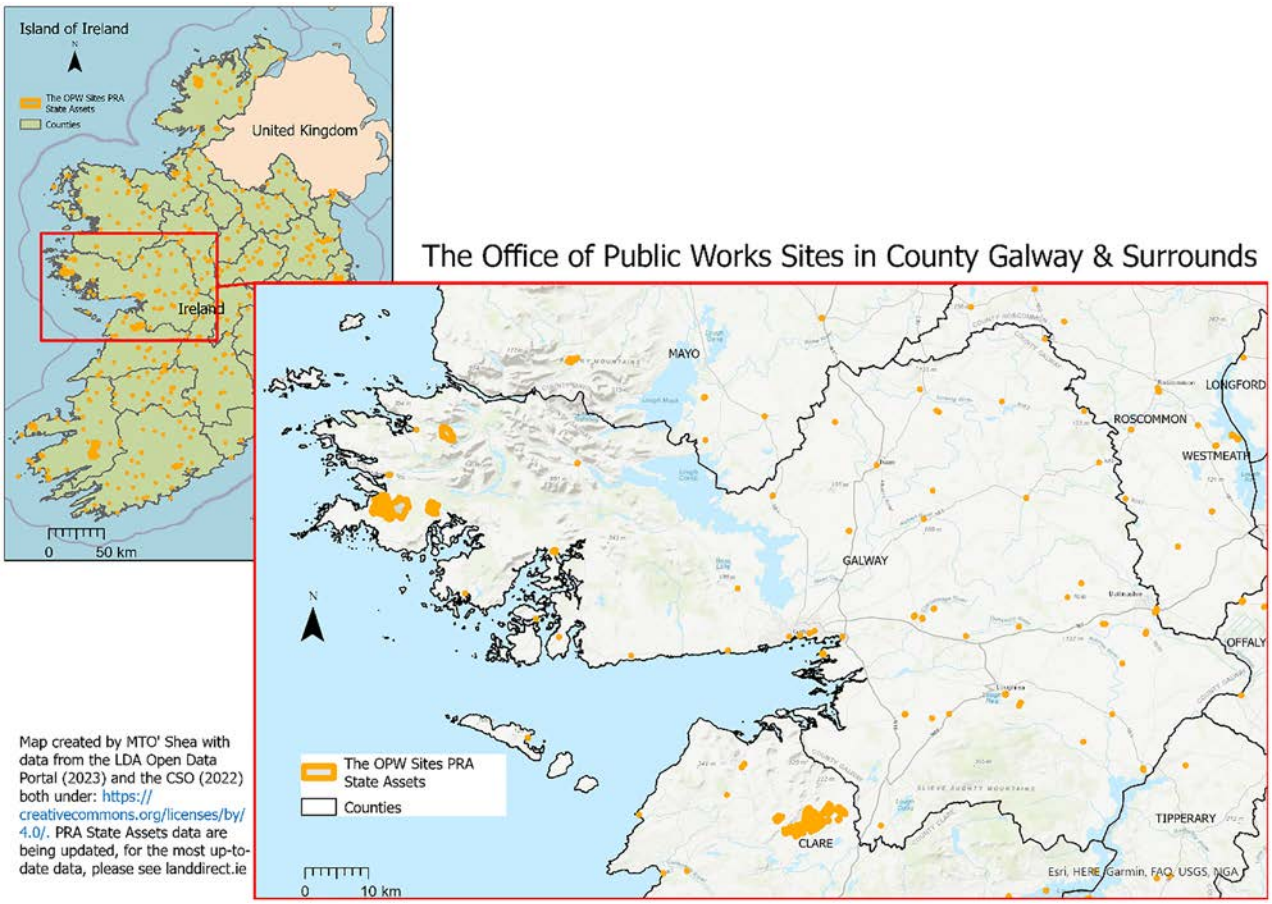


Figure 6.5. Distribution of OPW sites across Ireland, with a zoom-in on County Galway. PRA, Property Registration Authority.

7 Conclusions and Recommendations

7.1 Synthesis of Main Findings

Scientific evidence clearly shows that we are living beyond our ecological budget, placing the well-being of future generations in jeopardy. Continued prosperity depends on urgent action to address the climate and biodiversity crises and live within our planet's carrying capacity. Changing the way we use and manage land will be critical. Recent studies have highlighted the need for an unprecedented transformation across Ireland's land sector to achieve a sustainable and resilient future. Action will be required across millions of hectares of private land. Managing at least 8% of national land area, public bodies have a critical role to play in leading by example.

Government objectives to mitigate and adapt to climate change, enhance biodiversity, improve water and air quality, and improve socioeconomic outcomes, are embedded across multiple policies and regulations. However, representation of these objectives is at best patchy across the official mandates of critical public bodies managing public land. For example, letters of expectation from the government to state-owned companies reflect the aforementioned objectives, but their status is not clear and not all letters are publicly available. Thus, although state-owned companies such as Bord na Móna and Coillte are undertaking a range of important actions to deliver government objectives (for climate and biodiversity in particular), there is a case for clearer mandates.

Natural capital and ecosystem services approaches have been proposed to highlight risks and to reflect the benefits of managing natural resources more sustainably – using boardroom language to elevate the importance of ecological considerations within organisations. Such approaches have many merits but remain under-developed. There is a role for public bodies in pioneering these approaches, but action that is urgently needed to improve land management cannot wait for the resolution of ongoing methodological issues. Existing monitoring provides ample evidence on the type of action needed. Newly established reporting by LAs under the CARO network provides an opportunity to trial natural capital accounting across a number of LAs.

For climate mitigation within the land sector, rehabilitation and restoration of degraded peatlands, and afforestation, are the major levers to reduce emissions and increase carbon sinks, respectively. Bord na Móna is working through a comprehensive plan for the former. Coillte has a plan for forest expansion of 100,000 ha by 2050, representing around 20% of what is necessary to achieve Ireland's climate neutrality target and stated goal of 18% forest cover. However, there remain many barriers to achieving even the modest ambition of 100,000 ha over the next 25 years, related to land availability and regulatory complexity. These barriers need to be urgently addressed through regulatory streamlining (as recommended in a recent review of forestry licensing) and use of public/public–private financing to make long-term investments in land purchases or long-term leases for forestry expansion. Commercial forestry has a key role to play in climate mitigation across the wider economy, and could be particularly lucrative in future decades when carbon prices are projected to be very high and when biogenic carbon will be a sought-after resource. This suggests a case for long-term public investment to drive expansion of commercial (as well as semi-natural) forestry, and a need for a more ambitious afforestation target by Coillte.

Bord na Móna and Coillte are scaling out renewable energy across their land, making a significant contribution to economy-wide climate mitigation, as well as air quality and socioeconomic objectives. LAs are obliged to submit action plans through CAROs, and have modest potential to contribute to land-based climate mitigation, alongside substantial potential to contribute to climate adaptation and biodiversity.

TII manages strategically important transport (biodiversity) corridors, and implements a range of practices, including native planting and reduced-frequency mowing, to enhance biodiversity and the abundance of pollinator species – particularly alongside motorways. LAs have an important role in managing roadsides and green spaces, and could play a strategic role in developing ecological networks (as demonstrated by Fingal County Council's draft Biodiversity Plan 2022–2030). NPWS plays a

leading role in managing Ireland's biodiversity directly across national parks and nature reserves, but also through important advisory and regulatory roles. NPWS is directly involved in peatland restoration and native woodland regeneration, delivering both biodiversity and, to a lesser extent, climate benefits. Other public bodies, such as the OPW and HSE, manage significant areas of land with high public footfall, and thus can play an important educational role in managing land for biodiversity. There are some constraints on use of public land earmarked for development, insofar as attracting protected species and planting trees are incompatible with development ambitions.

In terms of water quality, LAWPRO coordinates actions across Ireland's 31 LAs to protect and restore good water quality through catchment science and local community engagement. The OPW plays a coordinating role in the maintenance and expansion of drainage and flood defences, with an original mandate to drain land. Climate and biodiversity objectives may conflict with this drainage mandate in areas of extensive peatland. Greater clarity is required from the government to ensure that appropriate context-specific decisions can be made on drainage implementation, giving due regard to potentially competing objectives.

Socioeconomic outcomes are often best delivered through multifunctional (stacked) land use, such as integration of public access and renewable energy (wind turbine or photovoltaic panel) infrastructure with peatland rehabilitation or afforestation, exemplified by a number of Coillte and Bord na Móna sites (e.g. Mountlucas Wind Farm). Such projects could provide useful test beds for natural capital reporting, which provides a framework for assessing delivery of multiple ecosystem services. Actions such as tree planting in public spaces, soft-landscaping and establishing pocket habitats in urban areas can provide significant health and well-being benefits, thus aligning with socioeconomic objectives. Meanwhile, actions referred to throughout this report invoke a clear need for more employment in the fields of, *inter alia*, habitat restoration, natural landscaping, forestry and renewable energy installation, which could support economic activity in rural areas.

Finally, this report has compiled some information on management of public lands by the larger public bodies. Time did not allow for a systematic exploration of many smaller, but potentially important, managers of public land. Further analysis could be important to identify additional examples of transferable best practice and opportunities for improvement.

7.2 Specifi Recommendations

The following list of recommendations are drawn from the preceding chapters of this report, and grouped under the following four themes.

7.2.1 Data and monitoring

- Expand the LDA register of public lands to include all public land, and the specific bodies responsible for managing each land parcel. This may require the establishment of a separate database, building on (and fed by) the LDA register.
- Trial natural capital accounting across a selection of LAs and other public bodies (e.g. Coillte) to assess feasibility, data availability and resource requirements.
- Support coordinated development of standardised ecosystem assessment methods and mapping data in a centralised database to support standardised assessment and reporting.
- Promote the use of scorecards as a pragmatic way to track and incentivise progress in the delivery of ecosystem services from public land.

7.2.2 Governance

- Strategically map priorities for public bodies against land use objectives within the context of a national land use strategy that considers scaling and location of priority actions.
- Provide clarity on mandates of state-owned companies, either through updated legislation on the objectives of these companies or, at least, through more transparent leverage of shareholder influence (i.e. public letters of expectation).
- Develop a long-term (to 2100) strategy for forestry that considers the full GHG mitigation potential of cascading wood value chains and the biogenic carbon they contain – preferably within a national land use strategy and a national bio-industrial strategy. Indicate clearly the situations where forest redesign, commercial and semi-natural afforestation can deliver the greatest overall benefits (climate and biodiversity).

- Accelerate realisation of Coillte's afforestation and alternative forest management ambition to set an example for the private sector and to prime supply chains (tree nurseries, etc.) for private expansion. If the private sector fails to accelerate afforestation by 2030, Coillte may need to expand its 100,000 ha afforestation target via more ambitious land acquisition through either public–private finance partnerships (communicated carefully in terms of public good objectives) or leasing agreements with farmers. This would require a strong policy drive to overcome the substantial barriers to afforestation mentioned throughout this report.
- Continue to implement the recommendation of Ireland's Forest Strategy 2023–2030 (Government of Ireland, 2024) to streamline afforestation and felling licence processes, and identify afforestation "green zones" that have been pre-cleared for some criteria to enable fast-tracked licensing (as recommended in the Mackinnon report) – preferably within a national land use strategy.

7.2.3 Planning

- LAs can play an important role in enhancing biodiversity across urban and rural landscapes. Comprehensive biodiversity plans, such as that of Fingal County Council, should include mapping of habitat types to incorporate habitat connectivity along linear features (roads, greenways, rivers, etc.). These can be part of, or complement, green infrastructure plans that provide a framework for LAs to strategically integrate all land objectives (including socioeconomic aspects of heritage, health and sustainable mobility) into land use planning.
- Public space (re)development could involve landscape architects, urban designers and ecologists to fully integrate environmental and socioeconomic outcomes into high-quality public realm management and design.
- Establish clear principles that can be applied by the OPW (and LAs) to identify appropriate drainage interventions across localities, having regard to agricultural, flood risk mitigation, climate action, biodiversity and water quality objectives (e.g. with context-specific weighting).
- Facilitate planning (approval) for peatland renewable energy projects, forest redesign and other land use change applications by providing clear guidelines and involving NPWS as an advisor to LA planning offices.
- In addition to reduced-frequency mowing, which appears to be becoming widely established, all public bodies could consider opportunities for tree planting on open ground, in parks, along streets and in car parks as an effective way to deliver multiple objectives.

7.2.4 Funding and training

- Establish long-term funding commitments for bog restoration to instil stakeholder confidence to pursue projects.
- The already high demands on NPWS to deliver restoration projects across national parks and nature reserves, and provide advice and regulation, will become considerably greater if government objectives for land are to be met. More resourcing will be required – particularly for suitably qualified ecologists and landscape engineers.
- There is a clear need for more training in landscape management, whether through full third-level courses or targeted training for professionals in strategic positions – e.g. LA engineers and ecologists.

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Appendix 1 Stakeholder Organisations

Table A1.1. Organisation, interview and workshop information

Organisation	Contact's position	Date of engagement	Form of engagement
Donegal County Council	Waste Manager/Climate Action Officer	7/8/2024	Email
DECC		7/11/2024	Email
CSO	Ecosystem Accounts	11/7/2024	Email
NPWS	NPWS (Housing)	22/7/2024	Teams meeting
CARO	CARO	18/7/2024	Teams meeting
County and City Management Association (CCMA)	CCMA Water, Environment and Emergency Planning Committee	16/7/2024 and 24/7/2024	Email
NPWS (Housing) – Nature Restoration Law		29/7/2024	Email
NPWS – Wild Atlantic Nature	Founder of the payments scheme	29/7/2024	Email
Kilkenny County Council	Climate Action Officer	31/7/2024	Email
Waterford County Council	Climate Action Coordinator	31/7/2024	Email and online meeting
Waterford County Council	Administrative Officer – Property Management Department	8/12/2024	Email and online meeting
Monaghan County Council	Biodiversity Officer	31/7/2024	Email
Meath County Council		8/2/2024	Email
Coillte	Director and manages corporate social responsibility	23/8/2024	Email
Coillte	Development Manager Land Solutions	5/9/2024	Teams meeting
TII	Senior Landscape Architect	17/9/2024	Teams meeting
NESC		18/9/2024	Meeting (Dublin)
Teagasc	Head of Climate Centre	10/10/2024	Email
Trinity College Dublin	Natural Capital Research Fellow	15/10/2024	Meeting (Dublin)
NPWS	Forestry Specialist	25/10/2024	Teams meeting
HSE	Capital and Estates Managers – Sustainability and Climate	30/10/2024	Teams meeting
OPW	Planning and Climate Adaptation	30/10/2024	Teams meeting
Bord na Móna	Project Manager	4/11/2024	Teams meeting

Appendix 2 Public Body Objectives Relating to Public Land

Table A2.1. List of key targets and actions specified by a selection of public bodies responsible for managing public land in Ireland, categorised according to the five public good objectives for land use

Public body	Climate	Biodiversity	Water	Air	Socioeconomic
Coillte	Ensure continuous carbon sink in forest estate out to 2050 Expand forest area by 100,000 ha by 2050 Supply construction materials that store biogenic carbon in built environment	20% of forest estate managed primarily for nature (target 50%)	Have established setback buffer zones for watercourses	Indirectly: renewable energy generation mitigates air pollution	**Support 9000 rural jobs** **Supply low-carbon construction materials to support house building** Target for 1 GW additional renewable energy generation by 2030
Bord na Móna	Cessation of peat extraction Plans to restore or rehabilitate 87 kha of peat bog (27 kha completed)	Biodiversity Action Plan 2025–2029 aims to enhance biodiversity and ecosystem services on the company's rehabilitated peatlands	Manage water in peatland rehabilitation to restore flows and biodiversity Ensure water quality, flood control and regulatory compliance	Indirectly: renewable energy generation mitigates air pollution	Shift to renewable energy generation on exploited bogs to support employment (Just Transition) Public engagement and data sharing: Bord na Móna contributes to Ireland's National Biodiversity Data Centre and participates in public awareness efforts, disseminating information on the importance of biodiversity (Bord na Móna, 2024a)
NPWS	**Restoration of 8 ha of bog on Liffey Head** **Public–private collaboration to restore 60 ha of drained bog in the River Liffey headwaters, enhancing water storage by 50–90 million litres** **Natural woodland regeneration**	**Manage national parks for biodiversity** **Conservation of species habitats** **Management of Special Protected Areas** **Initiate and support habitat restoration** **Produce guidance for biodiversity (National Biodiversity Action Plan)**	**Bog restoration work provides flood mitigation benefits**	N/A	**Manage national parks for public access** **Responsible for public engagement and education: achieved through promoting awareness and understanding of biodiversity issues via education and outreach programmes, encouraging public participation in conservation efforts**

Table A2.1. Continued

Public body	Climate	Biodiversity	Water	Air	Socioeconomic
OPW		Promote biodiversity conservation through habitat management and restoration projects	**Deliver flood alleviation schemes** **Collaborate with agencies to manage river basins, ensuring sustainable water use and maintaining water quality**		Manage national monuments for public access **Manage national monuments, historic properties and cultural heritage sites, ensuring their preservation for future generations** **Enhance public access to state-owned properties and heritage sites, providing opportunities for education, recreation and tourism**
Teagasc	Climate action objectives align with Ireland's Climate Action Plan 2023 and the European Green Deal Support a 25% reduction in agricultural emissions by 2030 Target: 4 Mt CO_2 eq sequestered annually by 2030 Promote 20–30% less nitrogen use and widespread adoption of low-emission technologies	Aim to create 1000 ha of pollinator-friendly habitats by 2025, including wildflower meadows and hedgerows Over 50,000 farmers in the Green Low Carbon Agri-Environment Scheme, enhancing biodiversity on approximately 1.2 million ha of farmland Target to improve soil health practices on over 60% of agricultural land in Ireland to enhance soil biodiversity Promote integrated pest management practices on 30% of farms to reduce pesticide reliance and protect ecosystem health	Conduct research to assess water quality in agricultural areas, targeting improvements to address nutrient runoff and minimise pollution Promote efficient nutrient management practices to reduce nutrient runoff and improve water quality, with a goal of reaching 20,000 farmers by 2025 Aim to establish riparian buffer zones on at least 10% of farmland by 2030 to filter pollutants and enhance biodiversity	Aim for a 10% reduction in ammonia emissions from agriculture by 2030 through improved livestock and fertiliser management Promote precision farming and nutrient management to optimise fertiliser use and reduce airborne pollutants, training 20,000 farmers by 2025 Conduct ongoing research to assess air quality and identify pollution sources in agricultural areas, contributing to evidence-based policy development	Aim to improve farm income by €1500 per hectare through applied research Aim to train 20,000 farmers annually in sustainable practices Aim to support 1000 new agri-businesses by 2025
ESB	Aim to achieve a net-zero carbon footprint in electricity generation by 2040 Plan to invest €3 billion in renewable energy projects by 2025	Aim to enhance biodiversity across ESB's operational sites by implementing habitat restoration projects Plan to integrate biodiversity considerations	Aim to reduce water consumption across operations by 15% by 2025 Plan to improve the management of water resources to minimise environmental impacts	Aim to minimise air pollutants from operations by implementing advanced emission control technologies Plan to reduce nitrogen oxide emissions by 50% by 2030 compared with 2018 levels	**Support regional development through the generation and distribution of affordable electricity** **Aim to support local economies by investing in community**

Table A2.1. Continued

Public body	Climate	Biodiversity	Water	Air	Socioeconomic
	Target: a 35% reduction in GHG emissions by 2030 from a 2018 baseline Strive for a 20% reduction in energy consumption across operations by 2030	into all new developments and infrastructure projects Target to increase native vegetation cover by 20% across its sites by 2030 Strive to engage local communities in biodiversity initiatives and awareness programmes	Target to enhance the quality of water in surrounding areas through effective runoff management and treatment systems Strive to promote sustainable water use practices among employees and local communities	Target to monitor and report on air quality impacts from operations regularly to ensure compliance with regulations	**projects and initiatives** Plan to promote workforce diversity and inclusion, targeting a 50% female representation in leadership roles by 2025 Target to provide training and development opportunities for 5000 employees annually to enhance skills and career progression Strive to foster partnerships with local businesses and stakeholders to drive sustainable economic growth
Waterways Ireland	Energy efficiency and decarbonisation: targeting net-zero emissions by 2050, this involves reducing carbon output across operations	**Aim to ensure the resilience of waterways' heritage against climate change for future generations while contributing to biodiversity protection through the safeguarding and enhancement of natural habitats within waterway ecosystems** **Implement strategies to safeguard waterways as biodiverse and climate-resilient environments through nature-based solutions**	**Ensure waterways are managed to withstand climate impacts and environmental risks**	N/A	Indirectly, through improvements in water quality, reduce costs of water treatment and achieve higher amenity values
CAROs/LAs	**Implement strategies to increase energy efficiency and green procurement across LAs** **Develop and implement local climate adaptation strategies, focusing on increasing resilience in**	**Implement measures to safeguard and restore natural habitats critical for diverse species** **Incorporate biodiversity considerations into local planning and development processes**	**Prioritise solutions that use natural processes to enhance water management and resilience**	**Enhance green spaces to improve air quality** **Encourage sustainable urban planning to minimise pollution** **Conduct air quality monitoring and assessment** **Foster public awareness campaigns about air pollution**	**Expand provision of social housing** **Ensure resources and alignment for LAs to support climate initiatives** **Foster collaboration with communities and strategic partners to implement transformative climate actions**

Table A2.1. Continued

Public body	Climate	Biodiversity	Water	Air	Socioeconomic
	buildings and infrastructure **Foster a holistic approach that combines emission reduction with climate adaptation for sustainable local governance**			**Integrate air quality considerations into local climate action plans**	
TII	**Develop and promote public transport to reduce emissions** **Aim to reduce emissions by 51% by 2030 in line with national climate targets** **Plan to expand the electric vehicle charging network across Irish roads** **Strive to promote sustainable public transport options to lower urban emissions** **Aim to enhance climate resilience in transport infrastructure to cope with extreme weather**	Integrate biodiversity in transport planning to reduce ecological impact Target to enhance habitats along transport corridors with biodiversity action plans Plan to conduct ecological assessments for all new infrastructure projects Strive to promote public awareness of biodiversity initiatives through community engagement	Ensure appropriate drainage (including through soft-landscaping) Protect water quality by minimising pollution from road runoff Reduce flood risks with sustainable drainage systems **Ensure compliance with national and EU water standards** Restore habitats by mitigating construction impacts on watercourses	**Develop and promote public transport to reduce emissions** **Aim to reduce transport-related air pollution through sustainable solutions** **Target to enhance air quality monitoring along transport corridors** **Plan to increase public transport and cycling mode share by 10% by 2030** **Strive to support low-emission infrastructure, including electric vehicle charging stations**	**Facilitate mobility** Soft-landscaping can increase inclusivity **Plan to invest in infrastructure projects that create up to 20,000 jobs during construction and associated activities**
HSE	Reduce GHG emissions by 50% by 2030 across healthcare facilities Promote sustainable healthcare by working towards a net-zero health system by 2050 Plan to develop climate-resilient healthcare infrastructure to withstand extreme weather events Target to implement green procurement, ensuring 100% of suppliers meet sustainability criteria by 2030	May indirectly contribute	**Monitor water quality (drinking and bathing)** **Monitor waterborne diseases** **Provide guidance on water safety**	Collaborate with the EPA to ensure that national and EU air quality standards are met	**Deliver healthcare to national population** **Improve well-being and reduce incidence of preventable illness** Reduce healthcare emissions to create green jobs and lower operational costs Support local economies through sustainable procurement practices Engage healthcare workers and communities in sustainability efforts to foster innovation and social well-being

Actions and targets in bold indicate core mandates. N/A, not applicable.

Abbreviations

ACRES	Agri-Climate Rural Environment Scheme
BECCS	Bioenergy with carbon capture and storage
CARO	Climate Action Regional Office
CSO	Central Statistics Office
DAFM	Department of Agriculture, Food and the Marine
EPA	Environmental Protection Agency
ESB	Electricity Supply Board
GHG	Greenhouse gas
HSE	Health Service Executive
IPCC	Intergovernmental Panel on Climate Change
LA	Local authority
LAWPRO	Local Authority Water Programme
LDA	Land Development Agency
LULUCF	Land use, land use change and forestry
LUR	Land Use Review
NESC	National Economic and Social Council
NewERA	New Economy and Recovery Authority
NPWS	National Parks and Wildlife Service
OPW	Office of Public Works
SAC	Special Area of Conservation
TII	Transport Infrastructure Ireland
UN	United Nations

An Ghníomhaireacht Um Chaomhnú Comhshaoil

Tá an GCC freagrach as an gcomhshaol a chosaint agus a fheabhsú, mar shócmhainn luachmhar do mhuintir na hÉireann. Táimid tiomanta do dhaoine agus don chomhshaol a chosaint ar thionchar díobhálach na radaíochta agus an truaillithe.

Is féidir obair na Gníomhaireachta a roinnt ina trí phríomhréimse:

Rialáil: Rialáil agus córais chomhlíonta comhshaoil éifeachtacha a chur i bhfeidhm, chun dea-thorthaí comhshaoil a bhaint amach agus díriú orthu siúd nach mbíonn ag cloí leo.

Eolas: Sonraí, eolas agus measúnú ardchaighdeáin, spriocdhírithe agus tráthúil a chur ar fáil i leith an chomhshaoil chun bonn eolais a chur faoin gcinnteoireacht.

Abhcóideacht: Ag obair le daoine eile ar son timpeallachta glaine, táirgiúla agus dea-chosanta agus ar son cleachtas inbhuanaithe i dtaobh an chomhshaoil.

I measc ár gcuid freagrachtaí tá:

Ceadúnú

- Gníomhaíochtaí tionscail, dramhaíola agus stórála peitril ar scála mór;
- Sceitheadh fuíolluisce uirbigh;
- Úsáid shrianta agus scaoileadh rialaithe Orgánach Géinmhodhnaithe;
- Foinsí radaíochta ianúcháin;
- Astaíochtaí gás ceaptha teasa ó thionscal agus ón eitlíocht trí Scéim an AE um Thrádáil Astaíochtaí.

Forfheidhmiú Náisiúnta i leith Cúrsaí Comhshaoil

- Iniúchadh agus cigireacht ar shaoráidí a bhfuil ceadúnas acu ón GCC;
- Cur i bhfeidhm an dea-chleachtais a stiúradh i ngníomhaíochtaí agus i saoráidí rialáilte;
- Maoirseacht a dhéanamh ar fhreagrachtaí an údaráis áitiúil as cosaint an chomhshaoil;
- Caighdeán an uisce óil phoiblí a rialáil agus údaruithe um sceitheadh fuíolluisce uirbigh a fhorfheidhmiú
- Caighdeán an uisce óil phoiblí agus phríobháidigh a mheasúnú agus tuairisciú air;
- Comhordú a dhéanamh ar líonra d'eagraíochtaí seirbhíse poiblí chun tacú le gníomhú i gcoinne coireachta comhshaoil;
- An dlí a chur orthu siúd a bhriseann dlí an chomhshaoil agus a dhéanann dochar don chomhshaol.

Bainistíocht Dramhaíola agus Ceimiceáin sa Chomhshaol

- Rialacháin dramhaíola a chur i bhfeidhm agus a fhorfheidhmiú lena n-áirítear saincheisteanna forfheidhmithe náisiúnta;
- Staitisticí dramhaíola náisiúnta a ullmhú agus a fhoilsiú chomh maith leis an bPlean Náisiúnta um Bainistíocht Dramhaíola Guaisí;
- An Clár Náisiúnta um Chosc Dramhaíola a fhorbairt agus a chur i bhfeidhm;
- Reachtaíocht ar rialú ceimiceán sa timpeallacht a chur i bhfeidhm agus tuairisciú ar an reachtaíocht sin.

Bainistíocht Uisce

- Plé le struchtúir náisiúnta agus réigiúnacha rialachais agus oibriúcháin chun an Chreat-treoir Uisce a chur i bhfeidhm;
- Monatóireacht, measúnú agus tuairisciú a dhéanamh ar chaighdeán aibhneacha, lochanna, uiscí idirchreasa agus cósta, uiscí snámha agus screamhuisce chomh maith le tomhas ar leibhéil uisce agus sreabhadh abhann.

Eolaíocht Aeráide & Athrú Aeráide

- Fardail agus réamh-mheastacháin a fhoilsiú um astaíochtaí gás ceaptha teasa na hÉireann;
- Rúnaíocht a chur ar fáil don Chomhairle Chomhairleach ar Athrú Aeráide agus tacaíocht a thabhairt don Idirphlé Náisiúnta ar Ghníomhú ar son na hAeráide;
- Tacú le gníomhaíochtaí forbartha Náisiúnta, AE agus NA um Eolaíocht agus Beartas Aeráide.

Monatóireacht & Measúnú ar an gComhshaol

- Córais náisiúnta um monatóireacht an chomhshaoil a cheapadh agus a chur i bhfeidhm: teicneolaíocht, bainistíocht sonraí, anailís agus réamhaisnéisiú;
- Tuairiscí ar Staid Thimpeallacht na hÉireann agus ar Tháscairí a chur ar fáil;
- Monatóireacht a dhéanamh ar chaighdeán an aeir agus Treoir an AE i leith Aeir Ghlain don Eoraip a chur i bhfeidhm chomh maith leis an gCoinbhinsiún ar Aerthruailliú Fadraoin Trasteorann, agus an Treoir i leith na Teorann Náisiúnta Astaíochtaí;
- Maoirseacht a dhéanamh ar chur i bhfeidhm na Treorach i leith Torainn Timpeallachta;
- Measúnú a dhéanamh ar thionchar pleananna agus clár beartaithe ar chomhshaol na hÉireann.

Taighde agus Forbairt Comhshaoil

- Comhordú a dhéanamh ar ghníomhaíochtaí taighde comhshaoil agus iad a mhaoiniú chun brú a aithint, bonn eolais a chur faoin mbeartas agus réitigh a chur ar fáil;
- Comhoibriú le gníomhaíocht náisiúnta agus AE um thaighde comhshaoil.

Cosaint Raideolaíoch

- Monatóireacht a dhéanamh ar leibhéil radaíochta agus nochtadh an phobail do radaíocht ianúcháin agus do réimsí leictreamaighnéadacha a mheas;
- Cabhrú le pleananna náisiúnta a fhorbairt le haghaidh éigeandálaí ag eascairt as taismí núicléacha;
- Monatóireacht a dhéanamh ar fhorbairtí thar lear a bhaineann le saoráidí núicléacha agus leis an tsábháilteacht raideolaíochta;
- Sainseirbhísí um chosaint ar an radaíocht a sholáthar, nó maoirsiú a dhéanamh ar sholáthar na seirbhísí sin.

Treoir, Ardú Feasachta agus Faisnéis Inrochtana

- Tuairisciú, comhairle agus treoir neamhspleách, fianaise-bhunaithe a chur ar fáil don Rialtas, don tionscal agus don phobal ar ábhair maidir le cosaint comhshaoil agus raideolaíoch;
- An nasc idir sláinte agus folláine, an geilleagar agus timpeallacht ghlan a chur chun cinn;
- Feasacht comhshaoil a chur chun cinn lena n-áirítear tacú le hiompraíocht um éifeachtúlacht acmhainní agus aistriú aeráide;
- Tástáil radóin a chur chun cinn i dtithe agus in ionaid oibre agus feabhsúchán a mholadh áit is gá.

Comhpháirtíocht agus Líonrú

- Oibriú le gníomhaireachtaí idirnáisiúnta agus náisiúnta, údaráis réigiúnacha agus áitiúla, eagraíochtaí neamhrialtais, comhlachtaí ionadaíocha agus ranna rialtais chun cosaint chomhshaoil agus raideolaíoch a chur ar fáil, chomh maith le taighde, comhordú agus cinnteoireacht bunaithe ar an eolaíocht.

Bainistíocht agus struchtúr na Gníomhaireachta um Chaomhnú Comhshaoil

Tá an GCC á bainistiú ag Bord lánaimseartha, ar a bhfuil Ard-Stiúrthóir agus cúigear Stiúrthóir. Déantar an obair ar fud cúig cinn d'Oifigí:

1. An Oifig um Inbhunaitheacht i leith Cúrsaí Comhshaoil
2. An Oifig Forfheidhmithe i leith Cúrsaí Comhshaoil
3. An Oifig um Fhianaise agus Measúnú
4. An Oifig um Chosaint ar Radaíocht agus Monatóireacht Comhshaoil
5. An Oifig Cumarsáide agus Seirbhísí Corparáideacha

Tugann coistí comhairleacha cabhair don Ghníomhaireacht agus tagann siad le chéile go rialta le plé a dhéanamh ar ábhair imní agus le comhairle a chur ar an mBord.

epa Research

Evidence Synthesis Report 13

Role of Public Lands in Delivering on the Government's Objective of Improving Socioeconomic, Climate, Biodiversity, and Water and Air Quality Outcomes

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