ARUP

Coillte

# Draft Forest Estate Strategic Land Use Management Plan (FESLUP)

## Screening for Appropriate Assessment and Natura Impact Statement

Reference: 294083_HS_AA_0002

Issue 01 | 18 August 2023



Job number 294083-00

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# Executive Summary

Arup has been appointed by Coillte to prepare the Appropriate Assessment (AA) reporting for the Forest Estate Strategic Land Use Plan (FESLUP) 2023-2050. The Plan was prepared by Arup in conjunction with Coillte. The FESLUP sets out the high-level objectives that will enable the delivery of the 'Strategic Vision for Our Future Forest Estate'. Following a period of statutory and public consultation, feedback from this phase shall be reviewed and where appropriate, integrated into the draft FESLUP. Subsequent to this phase, and following review of the changes, the draft FESLUP shall be published as the FESLUP and adopted as such.

This report contains the AA Screening (Stage 1) and Habitat's Directive AA Natura Impact Statement (NIS) (Stage 2) and provides information on and assesses the potential for the draft FESLUP 2023-2050 firstly to result in likely significant effects on any European site within the Natura 2000 network and secondly, after inclusion of mitigation, to adversely affect the integrity of any European site.

In the preparation of the AA to the draft FESLUP, a multi-step approach was undertaken with the purpose of aligning the AA process with the requirements of the Strategic Environmental Assessment (SEA) Directive (2001/42/EC) process; which was also required to support the development of the draft FESLUP. This Screening for AA & NIS report was prepared in accordance with Article 6 of the Council Directive 92/43/EEC on the Conservation of the Natural Habitats and of Wild Fauna and Flora (as amended), which is transposed into Irish law by Part XAB of the Planning and Development Act 2000 (as amended) and the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477/2011).

This report has considered the potential of the draft FESLUP to give rise to likely significant effects which could adversely affect any European site with regard to their qualifying interests, associated conservation status and the overall site integrity. The 607 European Sites Ireland were scoped into assessment in Ireland on a precautionary basis, as details on specific sources of impact, and therefore distances of pathway, were too high-level to be able to rule out effects on European Sites with certainty. Specifically, in considering the implementation of the draft FESLUP and its nationwide scale, this report has assessed the potential for the draft FESLUP to have likely significant effects on Qualifying Interests and Special Conservation Interests. Specifically, those interests that were identified to be vulnerable or at risk from forestry and recreation related activities which might be arise from the draft FESLUP.

Of the 68 objectives contained within the draft FESLUP, it was determined that 16 of those had the potential, in the absence of mitigation, to have likely significant effects on the Qualifying Interests and Special Conservation Interests of European sites. With the implementation of the mitigation recommended within this NIS, there is sufficient evidence for the NIS to conclude that implementation of the draft FESLUP would not result in adverse effects on the integrity of European sites, alone or in-combination with other plans or projects.

# 1. Introduction

## 1.1 Overview

Coillte, in conjunction with Arup, have prepared a draft Forest Estate Strategic Land Use Plan (referred to hereafter as the 'draft FESLUP' or the 'draft Plan') 2023-2050. The draft FESLUP sets out the high-level objectives that will enable the delivery of the 'Strategic Vision for Our Future Forest Estate'. Following a period of statutory and public consultation, feedback from this phase shall be reviewed.

The draft FESLUP, in conjunction with the Strategic National Vision, aims to deliver multiple benefits from Coillte's forests, bring more focus to climate action and set ambitious new targets for biodiversity and recreation, all whilst continuing to deliver for the forest and wood products industry. It is guided by the overarching pillars of Climate, Nature, Wood and People as set forward in the Strategic National Vision.

Arup has also been commissioned by Coillte to carry out the Appropriate Assessment (AA) and in tandem, the Strategic Environmental Assessment (SEA) of the draft FESLUP. The AA provides information on, and assesses the potential for, the draft FESLUP 2023-2050 firstly, to result in likely significant effects on any European site and secondly, after inclusion of mitigation as necessary, to adversely affect the integrity of any European site within the Natura 2000 Site network (hereafter referred to as European site(s))[1].

Article 6(3) of the Habitats Directive requires that any plan or project, which is not directly connected with, or necessary to the management of a European site, but would be likely to have a significant effect, either alone or in combination with other plans or projects, should be subject to AA.

This report is based on the draft FESLUP and any such updates to the draft Plan will result in consequent changes to this report. An expanded discussion on each of the QIs and SCIs considered within this AA is provided in Appendix A which adjoins this report.

## 1.2 Legislative Context for Appropriate Assessment

The Habitats Directive sets out the requirement for Member States to maintain or restore to a favourable conservation status, the natural habitats and species as listed under the Annexes of the Directive. The EU wide network of protected sites of which these natural habitats and species belong to are known as the Natura 2000 site network. Natura 2000 is a network of protected sites which comprises Special Areas of Conservation (SACs) and Special Protection Areas (SPAs) (sometimes referred to as European sites).

SACs are protected sites designated under the Directive on the conservation of natural habitats and wild fauna and flora (92/43/EEC) (the 'Habitats Directive'). They are high quality sites that contribute significantly to the conservation of a range of habitats and species considered threatened in the EU territory. Under the European Directive 2009/147/EC on the conservation of wild birds (the 'Birds Directive'), member states have the power and responsibility to identify and classify SPAs in order to protect birds that are rare and vulnerable in Europe.

SACs are selected for the conservation of Annex I habitats (including priority types which are in danger of disappearance) and Annex II species (other than birds). SPAs are selected for the conservation of Annex I birds and all migratory birds and their habitats. The Annex habitats and species, for which each site is selected, are termed the Qualifying Interests (QIs) for SACs and termed Special Conservation Interests (SCI) for SPAs of each site. Conservation Objectives for the site are defined for these QIs and SCIs.

Articles 6(3) and 6(4) of the Habitats Directive set out the decision-making tests for plans and projects likely to affect European sites.

Article 6(3) establishes the requirement for AA:

[1] Appropriate assessment comes from the Habitats Directive (92/43/EEC), which seeks to safeguard the long-term survival of Europe's most valuable and threatened species and habitats. The geographical areas of particular importance to these species and habitats have been selected as Special Areas of Conservation (SAC) and Special Protection Areas (SPA) which are collectively referred to (in Ireland) as European site (s). Together these sites comprise of the pan-European Natura 2000 site network of protected areas.

*Any plan or project not directly connected with or necessary to the management of the [European] site but likely to have a significant effect thereon, either individually or in combination with other plans or projects, shall be subjected to appropriate assessment of its implications for the site in view of the site's conservation objectives. In light of the conclusions of the assessment of the implications for the site and subject to the provisions of paragraph 4, the competent national authorities shall agree to the plan or project only after having ascertained that it will not adversely affect the integrity of the site concerned and, if appropriate, after having obtained the opinion of the general public.*

Article 6(4) states:

*If, in spite of a negative assessment of the implications for the [European] site and in the absence of alternative solutions, a plan or project must nevertheless be carried out for imperative reasons of overriding public interest, including those of a social or economic nature, Member States shall take all compensatory measures necessary to ensure that the overall coherence of Natura 2000 is protected. It shall inform the Commission of the compensatory measures adopted.*

The Habitats Directive has been transposed in Ireland by the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No. 477 of 2011) (as amended), and by Part XAB of the Planning and Development Act, 2000 (as amended). In the context of the draft FESLUP, the governing legislation is principally the European Communities (Birds and Natural Habitats) Regulations 2011 (S.I. No 477/2011).

Under these Regulations, prior to submitting (to the public authority[2]) for approval[3] a plan[4] that is not directly connected with or necessary to the management of either a SPA or SAC, public authorities are required to consider whether the plan may have a significant effect on such a site; and where this is the case, the public authority is required to ascertain if the plan would give rise to adverse effects on the integrity of a European site(s).

## 1.3 Approach to this AA

Our approach aligns the AA process with the requirements of the SEA Directive (2001/42/EC) process which is also required.

The purpose of the SEA is to evaluate at an early stage, the range of environmental consequences that may occur as a result of implementing the draft FESLUP and to give statutory and public bodies an opportunity to comment upon the perceived or actual environmental impacts of the draft Plan. Article 3.2(b) of the SEA Directive expressly links to assessments pursuant to Article 6 of Directive 92/43/EEC. The preparation of the SEA and AA reporting comprises an integrated approach, such as sharing of baseline data and mapping of European sites and sharing of potential ecological effects of the draft FESLUP on European sites.

The SEA process requires that an Environmental Report is prepared to accompany a draft plan for public consultation. After the consultation period, the draft Plan shall integrate the necessary mitigation as stated within the AA report(s) and mitigation and monitoring as found within the SEA report(s). The plan shall then only be finalised in its issue form following this and after incorporating the feedback and submissions from statutory bodies and the public, as appropriate. To facilitate an informed assessment under both processes, it is necessary to consider both the draft and final versions of the plan.

[2] Public Authority as defined by the Birds and Natural Habitats Regulations 2011 as amended (SI 477/2011) : "Public authority" means …….(u) Coillte…..".

[3] Approval of a plan falls under the realm of 'consent' as defined within the Birds and Natural Habitats Regulations 2011 as amended (SI 477/2011): "consent" includes any licence, permission, permit, derogation, dispensation, approval or other such authorisation granted by or on behalf of a public authority, relating to any activity, plan or project that may affect a European Site, and includes the process of adoption by a public authority of its own land use plans or projects; "

[4] 'Plan' as defined by the Birds and Natural Habitats Regulations 2011 as amended (SI 477.2011): subject to the exclusion, except where the contrary intention appears, of any plan that is a land use plan within the meaning of the Planning Acts 2000 to 2011, includes— (a) any plan, programme or scheme, statutory or non-statutory, that establishes public policy in relation to land use and infrastructural development in one or more specified locations or regions, including any development of land or on land, the extraction or exploitation of mineral resources or of renewable energy resources and the carrying out of land use activities, that is to be considered for adoption or authorisation or approval or for the grant of a licence, consent, permission, permit, derogation or other authorisation by a public authority, or (b) a proposal to amend or extend a plan or scheme referred to in subparagraph (a)

Where, following the period of public consultation, changes are made to the draft FESLUP, these changes will be assessed to determine their potential for likely significant effects and to ascertain if they would give rise to adverse effects on the integrity of a European site(s). Where necessary, additional information and assessment material will be prepared.

## 1.4 Purpose of the AA Process

The overall purpose of the AA process is to ensure that the draft FESLUP does not result in any adverse effects on the integrity of any European site(s) in view of its conservation objectives. This Screening for AA and Natura Impact Statement (NIS) report has been prepared in support of the AA process having regard for the legislative requirements of EU and national law as outlined previously.

## 1.5 Statement of Competency

The statements of competencies for the contributing authors to this AA report are provided below:

Donncha Madden has a BSc in Applied Ecology and a PGDip in Restoration Ecology and is a Chartered Ecologist and Full Member of CIEEM. Donncha has over 20 years' experience in the environment and ecology sector and has prepared numerous Appropriate Assessment Screening and full Appropriate Assessment reports for a variety of plans and projects in both Ireland and the UK.

Hannah Sheridan has a BSc (Hons) in Marine Science and an MSc in Marine Planning for Sustainable Development and is a Qualifying Member of CIEEM. Hannah has four years of experience working as an ecologist in public and private sectors and has prepared Screening for Appropriate Assessments, Natura Impact Statements/Reports and biodiversity chapters for EIARs across a number of projects and plans in the Republic of Ireland and Northern Ireland.

## 1.6 Layout of Report

This report presents the Screening for AA (Stage 1) and the NIS (Stage 2) for the draft FESLUP.

- Section 2 provides an overview of Coillte's draft FESLUP;
- Section 3 outlines the guidance, data and methodology used to inform the assessment;
- Section 4 provides the information on the state of the environment in Ireland;
- Section 5 outlines the Zone of Influence for the implementation of the draft FESLUP;
- Section 6 documents Impact Prediction and Potential for Likely Significant Effects;
- Section 7 is the Assessment of Effects of the draft FESLUP objectives;
- Section 8 documents Stage 2 Appropriate Assessment with the Assessment of Effects and proposed mitigation ;
- Section 9 provides the Summary and Conclusion of the AA.

# 2. Coillte's Forest Estate Land Use Plan (FESLUP)

## 2.1 Overview

Coillte is a forestry company, owned by the Irish State, and is listed as a public authority on the Birds and Natural Habitats Regulations 2011 (as amended) (SI 477/2011). The company is the largest supplier of timber in Ireland with operations in timber panel production, renewable energy, and land management. Coillte's core purpose is to deliver the multiple benefits from forests in relation to Climate, Nature, Wood and People.

Coillte runs business divisions within its organisation - Coillte Forest, Land Solutions, Coillte Nature and MEDITE SMARTPLY. Each of these divisions is outlined below from Section 2.1.1 to Section 2.1.4.

Arup, in cooperation with Coillte, is currently preparing Coillte's draft FESLUP 2023-2050. The draft FESLUP will set out high-level policies and actions that will enable the delivery of the 'Strategic Vision for Our Future Forest Estate' which was published by Coillte in 2023. Following the publication of the FESLUP, an implementation plan for the FESLUP shall be developed by Coillte and is anticipated to contain detailed actions and measures with geographic specifications.

### 2.1.1 Coillte Forest

Coillte's forest division sustainably manages the estate of approximately 440,000 hectares in a way that delivers multiple benefits to society. Coillte's Forest estate has both Forest Stewardship Council (FSC®) and Programme for the Endorsement of Forest Certification (PEFC™) accreditation, providing certification for sustainable forest management. Coillte is the leading supplier of roundwood to the Irish wood processing sector. Over 3 million cubic metres of roundwood is produced by Coillte's harvesting operations each year, the majority of which is processed by the sawmill sector to produce construction timber, transport of goods and materials, and agricultural and horticultural practices. Small-diameter roundwood is mainly used by wood-based panel mills and, to a lesser extent, for bioenergy. Coillte provides outdoor recreational activities, with open public access to over 6,000 forest properties throughout Ireland, 3,000 km of way-marked trails, 12 forest parks, 6 mountain-bike trails, and 260 recreational sites. Over 18 million annual visits to forests across the country occurs. Coillte's 'Woodlands for Health' programme was designed to provide mental health support.

Over 90,000 hectares of our estate (c. 20%) is managed primarily for biodiversity. These biodiversity areas occur throughout the estate and contain a wide variety of habitats of high biodiversity value including native forest, mixed and conifer forests, blanket bog, raised bog, wet and dry heath. Coillte has developed a science-based approach called 'BioClass', which classifies the ecological value of the biodiversity areas in our estate. This allows Coillte to develop ecological and silvicultural plans to enhance and/or restore these sites to improve their biodiversity value. Work to restore habitats and enhance biodiversity in biodiversity areas is ongoing across the estate. For example, more than 6,000ha of native forest and blanket bogs have already been restored in major projects and further work is ongoing.

### 2.1.2 Land Solutions

Coillte's Land Solutions division is responsible for building and growing opportunities that create a more sustainable future for Ireland. The division works across a portfolio of businesses. This portfolio includes asset development and providing innovative and sustainable solutions to activities in areas such as renewable energy, housing, infrastructure development, tourism and education.

FuturEnergy Ireland exists as a portfolio within Coillte's business. As part of Coillte's vision to develop 1 Gigawatt (GW) of renewable energy, it has partnered with the ESB through FuturEnergy Ireland with the aim to develop wind farms with the support of local communities in the aim of combating climate change and contributing to more sustainable living. Coillte also continues to work with other developers outside of this joint venture in supporting the development of renewable energy.

Land Solutions is also responsible for acquiring new land and forests and for land sales that support local and national needs. These sales can range from local housing needs to significant infrastructure development in Ireland.

### 2.1.3 Coillte Nature

In June 2019, Coillte established the not-for-profit, Coillte Nature, which seeks to deliver significant climate and nature solutions through innovative projects-of-scale through:

- Afforestation of land to create new native woodland;
- Restoration of important biodiversity habitats at selected flagship sites;
- Regeneration of urban forests; and
- Rehabilitation of critical ecosystem services.

Since January 2020, work has been ongoing on initiatives such as the Dublin Mountains Makeover, Midlands Native Woodlands, Wild Western Peatlands and Hazelwood Restoration projects. The 'Nature Trust' was established in 2021 with forestry partners to deliver native forest afforestation at scale by combining public and private finances. This enterprise has diversified into peatland restoration and rehabilitation as of 2023.

### 2.1.4 Medite Smartply

MEDITE SMARTPLY produces engineered wood-based construction panels used in furniture manufacture and construction respectively. The mills utilise small-dimension pine and spruce logs and residues from sawmilling as raw materials with all of the panel products are certified by the FSC® and PEFC™.

## 2.2 Purpose and Scope of the FESLUP

The purpose of the draft FESLUP is to set out the framework for the management of its existing forestry estate and to guide the geographical areas of afforestation, renewable energy developments, increased biodiversity areas and restoration areas, that are set to be established throughout the adopted Plan period of 2023-2050. Coillte's estate covers over 440,000 hectares of land, of which approximately 364,000 hectares (or 84%) are forested land and 71,000 hectares is non-forested land.


**Figure 1 Coillte's planning hierarchy with the FESLUP serving as the bridge between the Strategic Vision and the Implementation Plan**

The Strategic National Vision and, by extension, the adopted FESLUP will deliver multiple benefits from Coillte's Estate, bring more focus to climate action and set ambitious new targets on biodiversity and recreation, all whilst continuing to deliver for the forest and wood products industry. The achievement of the

draft FESLUP will be guided by the balancing of multiple benefits of forests through the objectives of climate, nature, wood and people.

The FESLUP forms the middle tier of Coillte's new strategic planning framework for the forest estate for the period 2023 to 2050. Coillte will commence, by the beginning of 2024, the preparation of the Forest Estate Strategic Implementation Plan which will drive the delivery of the FESLUP objectives for the subsequent 10-year period. The Strategic Implementation Plan will take the strategic objectives and translate these into a range of implementable, measurable actions, across specific geographical locations. Once this new strategic planning framework is in place, with all strategic ambitions, objectives and actions identified, the associated refined timelines and milestones to monitor delivery of the Plans, will become known.


**Figure 2 Proposed breakdown of Coillte's future management of its estate.**

## 2.3 Content of the FESLUP

The draft FESLUP provides an overview and background to Coillte's forest estate and divisions, including those pertaining to commercial afforestation (Forests for Wood), climate, nature and recreation (Forests for People). The drivers behind the development of this draft Plan include feedback from public consultation carried out in 2022 on the "Strategic Vision for its Future Forest Estate", the emerging needs from the forestry and wood sector and the climate and biodiversity crisis.

The ambitions for the draft FESLUP have been set out by Coillte's Strategic National Vision under four pillars. The four pillars of the draft FESLUP and their associated (11) ambitions are :

- Forests for Climate
  - Enable the creation of 100,000 hectares (ha) of new forests, half of which will be native woodlands, which will sink 18 million tonnes of $CO_2$ by 2050;
  - Manage the existing Forest Estate to increase the carbon store by 10 million tonnes of $CO_2$ by 2050;
  - Redesign 30,000 ha of peatlands forest for climate and ecological benefits by 2050; and
  - Generate an additional 1 Gigawatt of renewable wind energy to power 500,000 homes by 2030.
- Forests for Nature
  - Enhance and restore biodiversity by increasing the area of the Coillte estate that is managed primarily for nature from 20% to 30% by 2025; and
  - Transform areas of Coillte's forests so that 50% of the estate is managed primarily for Nature in the long-term.
- Forests for Wood
  - Produce 25 million cubic metres of certified Irish timber, to support the construction of 300,000 homes by 2030; and

- Promote the use and benefits of wood products to increase the level of timber homes from 20% to 80% by 2050.

- Forest for People
  - Enable the investment of 100 million euro in world-class Visitor Destinations to support growth in tourism and recreation by 2030;
  - Double the number of Recreational Areas to 500, to benefit local communities and people's wellbeing; and
  - Create 1,200 new jobs in rural communities to support the just transition to a low carbon economy.

Sixty eight objectives are listed within Section 4.2 of the draft Plan which align with the aspirations of the Strategic Vision. The draft Plan objectives pertain to internal reviews of strategies, plans and policies, employment opportunities, upskilling and training, biodiversity management and enhancements, recreational masterplans and more; and can be found in Table 4 of this report.

**Table 1 Emerging Objectives under the Sections of the draft FESLUP**

| Section | Content |
|---|---|
| Forests for Climate | 16 objectives surrounding review of policy, collaboration with government and key stakeholders, access to funding, guidelines for peatland redesign and restoration, research actions into the impact of forest management and carbon management. |
| Forests for Nature | 19 objectives pertaining to the management of biodiversity on Coillte estate, improving biodiversity skills and knowledge amongst staff, monitoring measures, environmental protection methods, improvements in planning and operations, guidance development for habitat management, invasive species solutions and engagement and leadership with key stakeholders. |
| Forests for Wood | 16 objectives relating to certification, standards and quality of timber production, enhancing processes and monitoring mechanisms, collaboration and engagement with government and stakeholders, public engagement and promotion of timber and research and development measures. |
| Forests for People | 17 objectives in relation to recreation on the Coillte estate. These objectives include measures to increase measures for health and wellbeing such as expanding Woodlands for Health programme, supporting educational and training courses for the sector, measures to increase employment, acquiring more information on recreational service offering in the Coillte estate and engagement with government, stakeholders and the public. |

As part of this Screening for AA and NIS, all draft Plan objectives are assessed to determine whether the potential for likely significant effects on European sites exists.

## 2.4 Extent of Plan Area

Coillte currently owns and manages approximately 440,000 hectares of lands, which represents almost 7% of the total land area of Ireland. Given the scale of the draft Plan the potential for transboundary environmental effects on Northern Ireland has also been considered.

## 2.5 Plan Period

The plan period for the draft FESLUP is 2023-2050.

## 2.6 Broad Themes of Activities

The objectives within the draft FESLUP refer to the overarching ambitions for climate, nature, wood and people. Coillte's activities can be described in the broad themes below.

### 2.6.1 Forest Management

Forest management, under Coillte's remit, pertains to both the management and operations of commercial forestry sites and native forest areas. Activities including planting, thinning, harvesting, felling and re-planting, in combination with activities such as development of forest road infrastructure, drainage works

associated with replanting certain site types, biosecurity measures and fertilisation are encompassed within the management and operation of commercial forests. Similar activities are also necessary for the primary development of native and mixed forests. Their consequential management can include some of the same elements as commercial forestry management and can range from selective felling, forest road development, biosecurity measures etc.

### 2.6.2 Recreation and Tourism

Sites open to recreation facilitate the movement of people and vehicles throughout the forest estate and can provide spaces for tourism. Activities may include, but are not limited to, walking, hiking, mountain biking, off-roading, horse riding and camping. Recreational facilities for forest sites can include car parks, access roads, play areas, WC facilities, picnic areas, the provision of paths, signage and wayfinding and more (DAFM, 2006).

### 2.6.3 Biodiversity Management

In addition to the range of forest habitats that exist within the Coillte estate, other habitats such as peatlands, grasslands and waterbodies are managed as part of the estate. A range of biodiversity management actions are implemented in Coillte's biodiversity areas[5], for example: control of invasive species (including removal of *Rhododendron ponticum* or cherry laurel from forest habitats, and removal of lodgepole pine from restored raised bog and blanket bog habitats); blocking drains on restored raised bog and blanket bog habitats. Many of these actions are informed by the experience and knowledge gained from Coillte's former[6] and current[7,8] restoration and management projects.

[5] These account for 70,000ha on the estate and form part of the 20% of estate currently managed for nature and referred to in Coillte strategy.

[6] Former restoration projects can be accessed here: https://www.millenniumforests.com/; https://www.irishbogrestorationproject.ie/; https://www.raisedbogrestoration.ie/; https://www.woodlandrestoration.ie/

[7] Wild Western Peatlands is a Coillte Nature driven project to restore and rehabilitate approximately 2,100ha of blanket bog and wet heath that is currently planted with commercial spruce and pine forests. Information accessed at https://www.coillte.ie/coillte-nature/ourprojects/wildwesternpeatlands/ on 06/07/2023

[8] The LIFE INSULAR project is a joint venture project between Coillte Nature and the National Parks and Wildlife Service (NPWS) in collaboration with local communities and scientific experts to develop long-term conservation management plans for sand dune ecosystems in Donegal and Wexford. Information accessed at https://www.coillte.ie/coillte-nature/ourprojects/insular/ on 06/07/2023

# 3. Appropriate Assessment Process

## 3.1 Overview

This section provides detail on the adopted methodology with sources of guidance, legislation and information gathered to inform the preparation of this report. Any relevant guidance and data sources which were used during the preparation of this report are listed below.

## 3.2 Guidance

The following guidance was considered in carrying out the Assessment:

- Appropriate Assessment of Plans and Projects in Ireland – Guidance for Planning Authorities (Department of Environment, Heritage and Local Government, 2010 revision);
- Appropriate Assessment under Article 6 of the Habitats Directive; Guidance for Planning Authorities. Circular National Parks and Wildlife Service (NPWS) 1/10 and PSSP 2/10;
- Assessment of Plans and Projects Significantly Affecting Natura 2000 sites: Methodical Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC (European Commission Environment Directorate-General, 20214);
- Communication from the Commission on the precautionary principle. European Commission (2000);
- Guidance Document on Article 6(4) of the Habitats Directive 92/43/EEC (European Commission, 2007);
- Guidelines for Good Practice Appropriate Assessment of Plans under Article 6(3) Habitats Directive (International Workshop on Assessment of Plans under the Habitats Directive, 2011);
- Managing Natura 2000 Sites: The Provision of Article 6 of the Habitats Directive 92/43/EEC (EC Environment Directorate-General, 2018); [hereafter referred to as MN 2018];
- Office of the Planning Regulator Practice Note PN01 - Appropriate Assessment Screening for Development Management (OPR, 2021);
- The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report. NPWS (2019);
- The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neil. NPWS (2019); and
- The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report (2019). Edited by: Deirdre Lynn and Fionnuala O'Neill (2020)

The requirements for Screening for AA and AA for European sites, are set out in Regulation 42 of the European Communities (Birds and Natural Habitats) Regulations, 2011 (S.I. 477 of 2011) with numerous relevant rulings and opinions issues in both Irish and EU courts. AA is a process required under Article 6(3) of the EU Habitats Directive as transposed by the aforementioned Regulations.

## 3.3 Data Sources

The ecological data reviewed to inform this document comprises of:

- National Parks and Wildlife Service (NPWS) Designations web viewer[9];
- NPWS The Status of EU Protected Habitats and Species in Ireland Web Viewer[10];
- NPWS Protected Sites in Ireland[11];
- Department of Agriculture, Environment and Rural Affairs (DAERA) Protected Areas[12];
- Northern Ireland Environment Agency (NIEA) Protected Areas web viewer[13];
- Environmental Protection Agency (EPA) Map Viewer[14];
- EPA- - Ireland's Environment. An Integrated Assessment 2020 Article 12 web tool. Species trends at Member State Level. Legislative Background; and
- Joint Nature Conservation Committee UK Protected Areas[15].

## 3.4 Purpose of Appropriate Assessment

This report details the Screening for AA and NIS of the draft FESLUP.

The AA screening process scrutinises the plan or project to determine if there are likely significant effects either individually or in combination with other plans or projects, on a European site. This AA Screening and NIS report describes the outcome of this analysis in respect of the draft FESLUP. The obligation to undertake a Screening for AA, and if necessary, an NIS, derives from Article 6(3) of the Habitats Directive (92/43/EEC) with both AA stages involving several steps and tests that need to be applied.

The competent authority is required to carry out a Screening for AA, and if necessary, an NIS, as per Article 6(3) of the Habitats Directive. As per the Birds and Natural Habitats Regulations 2011 (as amended) (SI 477/2011)., the competent authority is defined as a 'public authority' and under such Regulations, Coillte are a public authority[2].

If it is determined that the plan or project will adversely affect the integrity of a European site, the public authority may only authorise that plan or project by following the Article 6(4) procedure. The Article 6(3) procedure is outlined below in Section 3.5.

The overall purpose of the AA process is to ensure that the draft FESLUP does not result in any adverse effects on the integrity of any European sites in view of the conservation objectives of that site(s). This AA report has been prepared having regard to EU and national legislative requirements. The responsibility for carrying out the AA lies with the public authority[16].

[9] https://dahg.maps.arcgis.com/apps/webappviewer/index.html?id=8f7060450de3485fa1c1085536d477ba accessed 29 June 2023
[10] https://storymaps.arcgis.com/collections/1a721520030d404f899d658d5b6e159a accessed 29th June 2023
[11] https://www.npws.ie/protected-sites accessed 29th June 2023
[12] https://www.daera-ni.gov.uk/landing-pages/protected-areas accessed 29th June 2023
[13] https://gis.daera-ni.gov.uk/arcgis/apps/webappviewer/index.html?id=bb721449cb8949e7a4f90c722bd2d80b accessed 29 June 2023
[14] https://gis.epa.ie/EPAMaps/ accessed 29th June 2023
[15] https://jncc.gov.uk/our-work/uk-protected-areas/ accessed 29th June 2023
[16] As per the Birds and Natural Habitats Regulations 2011 (as amended) part 7 "(7) The public authority shall determine that an Appropriate Assessment of a plan or project is not required where the plan or project is not directly connected with or necessary to the management of the site as a European Site and if it can be excluded on the basis of objective scientific information following screening under this Regulation, that the plan or project, individually or in combination with other plans or projects, will have a significant effect on a European site"

## 3.5 Appropriate Assessment Stages

The AA process as required by Article 6(3) and 6(4) of the Habitats Directive and as per the DEHLG (2010) guidance include four distinct stages, Stages 1 to 4. The four stages are outlined below, with the assessment of the draft FESLUP limited to Stage 1 and Stage 2. Plans or projects proceeding to Stage 3, and Stage 4 have to date been uncommon.

**Stage 1 – Screening for Appropriate Assessment –** to assess, in view of best scientific knowledge, if the project or plan, individually or in combination with another plan or project is likely to have a significant effect on a European site(s).

**Stage 2 – Appropriate Assessment -** This is required if it cannot be excluded, on the basis of objective information, that the project or plan, individually or in combination with other plans or projects, will likely have a significant effect on a Natura 2000 site. The AA must include a final determination by the public authority as to whether or not a proposed project would adversely affect the integrity of a European site. In order to reach a final determination, the public authority must undertake examination, analysis and evaluation, followed by findings, conclusions and a final determination. The appropriate assessment must contain complete, precise, and definitive findings and conclusions, and may not have lacunae or gaps.

**Stage 3 – Assessment of alternative solutions –** the process which examines alternative ways of achieving the objectives of the project or plan that avoid adverse impacts on the integrity of a European site.

**Stage 4 – Assessment where no alternative solutions exist and where adverse impacts remain –** an assessment of compensatory measures where, in the light of an assessment of imperative reasons of overriding public interest (IROPI), it is deemed that the project or plan shall proceed.

## 3.6 Definitions

Key terminology used for the purpose of this Assessment and found throughout the report are introduced below including European sites, the Source-Pathway-Receptor model, the Zone of Influence and Conservation Objectives.

### 3.6.1 European Sites

European sites (sometimes referred to as Natura 2000 sites) are part of the Natura 2000 network and include those designated as Special Areas of Conservation (SACs), Candidate SACs, Special Protection Areas (SPAs) or Proposed SPAs.

### 3.6.2 Source-Pathway-Receptor

The Source-Pathway-Receptor model is used to assess where a potential effect may result by examining the source, its pathway and the receptor. As per guidance from the OPR[70] these can be defined as follows:

**Source:** The origin of a potential effect which may include characteristics of a plan or project that have the potential to result in effects e.g. direct impacts such as loss of habitat;

**Pathway:** How the potential effect may occur on the source. These are identifiable through linkages that may occur through the plan or project and European sites e.g. direct pathways such as physical proximity, hydrological connections or indirect pathways such as disturbance to migrating species; and

**Receptor:** The European site network and respective QIs/SCIs, their ecological condition and sensitivities e.g. freshwater pearl mussel is sensitive to siltation in water.

### 3.6.3 The Zone of Influence

A Zone of Influence (ZoI) within any assessment of projects and/or plans considers the area over which ecological features may be affected by biophysical changes as a result of the proposed plan/project and associated activities. The ZoI is established using the Source-Pathway-Receptor framework and takes into consideration the national scale of the draft FESLUP.

The ZoI is in alignment with the precautionary principle, determined by ecological links within and beyond site boundaries (such as species mobility distances) and the potential implementation of objectives found within the draft FESLUP. This is focused on certain species where their foraging ranges, home ranges, nesting/roosting sites (and connections between same). This may extend beyond the European site network where no hydrological or hydrogeological pathways exist between European sites and the draft FESLUP.

The ZoI for the draft FESLUP is considered to be the entire island of Ireland, given that:

- the source is the 68 objectives which have the potential to adversely impact European sites and cover the majority of the island;
- there are 8 key types of pathway for effect on European sites; and
- the receptor is the European site network across the island of Ireland, comprising 441 SACs, 165 SPAs and one candidate SPA site[17] in Ireland and another 16 SPAs and 58 SACs and one proposed SPA in Northern Ireland.

Given the national scale of the draft FESLUP, there exists the potential for likely significant effects on much of the European site network within Ireland. Considering the potential ZoI of the draft FESLUP, assessment of each qualifying feature of every European site is considered a task which would not benefit and would more than likely obfuscate the AA process.

The objectives of the draft FESLUP are anticipated to be implemented within a future FESLUP Implementation Plan and through other plans within Coillte's remit. It is expected that specific aspects of these plans will contain further detail with geographic specificity and as such, is anticipated to have different ZoIs. As a result, there will be further scope to explore specific ZoIs further within the respective environmental assessments required for these plans.

### 3.6.4 Conservation Objectives

The COs of the 441 SACs and 165 SPA sites within the Republic of Ireland are focused primarily on maintaining or restoring the favourable conservation status of the habitats and species of interest (i.e. the qualifying features). Many of the European sites have Site-Specific Conservation Objectives (SSCOs), which focus on the specific populations of the qualifying habitat or species at that site by setting targets for appropriate attributes. The maintenance of habitats and species of European sites at favourable conservation status will contribute to the overall maintenance of favourable conservation status of those habitats and species at a national level.

Detailed site synopses for each European site are available from the NPWS website[18]. In Ireland 'generic' COs have been prepared for all European sites. Generic COs which have been developed by NPWS encompass the spirit of site-specific COs[19] in the context of maintaining and restoring favourable conservation condition as follows:

- For SACs: "To maintain or restore the favourable conservation condition of the Annex I habitats and/or Annex II species for which the SAC has been selected"; and
- For SPAs: "To maintain or restore the favourable conservation condition of the bird species listed as Special Conservation Interests for the SPA".

[17] The North West Irish Sea candidate SPA was announced on 13th July 2023.

[18] NPWS Conservation Objectives

[19] NPWS Strategic Plan for 2023-25 states within their 'Key Programmes, Projects and Initiatives' that they intend to 'Publish Site Specific Conservation Objectives for all our Natura 2000 sites by the end of 2024'. The NPWS Strategic Plan was accessed at https://www.gov.ie/pdf/?file=https://assets.gov.ie/261433/b1a2055f-3879-484d-8c25-9636ef380ee3.pdf#page=null July 2023

Favourable conservation status of a habitat is achieved when:

- Its natural range, and area it covers within that range, are stable or increasing;
- The specific structure and functions which are necessary for its long-term maintenance exist and are likely to continue for the foreseeable future; and
- The conservation status of its typical species is favourable.

The favourable conservation status of a species is achieved when:

- Population dynamics data on the species concerned indicate that it is maintaining itself on a long-term basis as a viable component of its natural habitats;
- The natural range of the species is neither being reduced nor is likely to be reduced for the foreseeable future; and
- There is, and will probably continue to be, a sufficiently large habitat to maintain its populations on a long-term basis.

## 3.7 Transboundary Considerations

The ZoI of the draft FESLUP has the potential to extend to Northern Ireland, due to shared physical, aerial, hydrological or catchment-based link to European Sites in NI, therefore transboundary considerations are included within this assessment. Aerial emissions and the presence of functionally linked land[20] is also considered within this assessment's ZoI.

The ZoI for European sites in Northern Ireland was established by reviewing any potential Source-Pathway-Receptor routes. More geographic specificity can be applied to NI sites which might be subject to likely significant effects as there is a defined geographical limit to activities arising from the plan i.e. the border between Northern Ireland and Ireland. The types of pathway used to establish which Northern Ireland European sites could be affected by the activities arising from the draft FESLUP are listed below:

### 3.7.1 Direct Physical Connectivity

Where the Coillte forest estate landholdings share a border with Northern Ireland, any European sites that have the potential to interact with the forest estate based on functionally linked land[20] were identified using GIS spatial datasets[21].

### 3.7.2 Hydrological Connectivity

Hydrological connectivity was established using GIS spatial datasets[22] that contained all the European sites in Northern Ireland and the Republic of Ireland, and watercourses in both territories. This spatial data[21] was analysed for any mapped watercourse or body within the Coillte estate that flows downstream to European Sites within Northern Ireland.

### 3.7.3 Sub-catchment Connectivity

Potential hydrological connections for habitats such as fens or petrifying springs were searched for by reviewing the EPA maps web viewer and datasets[22] for sub catchment connectivity where sub basins in the Republic of Ireland are connected to European designated sites in Northern Ireland.

[20] Functionally linked land can be described as 'areas of land or sea occurring outside a designated site which is considered to be critical to, or necessary for, the ecological or behavioural functions in a relevant season or a qualifying feature for which an SAC/SPA/Ramsar site has been designated' as defined by Natural England in their report on 'Identification of Functionally Linked Land supporting Special Protection Areas (SPAs) waterbirds in the North West of England (NECR361) accessed at https://publications.naturalengland.org.uk/publication/6303434392469504#:~:text='Functionally%20linked%20land'%20(FLL,Areas%20of%20Conservation%20(SAC)%2F

[21] GIS spatial datasets include the European site network in Northern Ireland and the Republic of Ireland and GIS data of Coillte's landholdings.

[22] Datasets from the EPA utilised were River Flow Direction, River Basin District, River Waterbodies, River Forestry Pressures, Rivers In SAC habitats, Rivers in SAC Species, Rivers in SPA Habitats, Rivers in SPA Species. Dataset used from Open Data NI was Northern Ireland River Segments, River Basin Districts, Special Protection Areas, Special Areas of Conservation and RAMSAR sites.

### 3.7.4 Aerial Emission Connectivity

The potential for aerial emissions, including dust, to spread onto European sites within Northern Ireland was assessed by applying a 15km buffer along the land border with the Republic of Ireland. Given the potential for aerial emissions to disperse in any direction because of prevailing winds etc., any mobile QI, SCI has the potential to be affected.

## 3.8 Impact Prediction

The methodology for the assessment of impacts is derived from the *Assessment of Plans and Projects Significantly Affecting Natura 2000 Sites* (EC, 2001)[23], which sets out generic types of effects that have the potential to occur as a result of a plan or project. In theory, these types of effects could occur through implementation of the draft FESLUP in absence of mitigation:

- Direct and indirect effects;
- Short and long-term effects;
- Construction, operational and decommissioning effects;
- Changes in key indicators of conservation value; and
- Isolated, interactive and cumulative effects

[23] Assessment of plans and Projects Significantly Affecting Natura 2000 sites; Methodological Guidance on the Provisions of Article 6(3) and (4) of the Habitats Directive 92/43/EEC, European Commission. Accessed at https://www.epa.ie/publications/circular-economy/resources/NHWMP-NIS.pdf March 2023

# 4. State of the Environment

## 4.1 Overview

European protected habitats and species in Ireland have been experiencing ongoing declining trends (NPWS, 2019). Such declines are attributed to anthropogenic activities such as agriculture, forestry and the development, construction, and use of residential, commercial, industrial, and recreational infrastructure. Further information relating to EU habitats and species and their respective interactions with the aforementioned activities is described below in Section 4.5 with an expanded discussion provided in Appendix A.

Forestry impacts approximately 30% of the protected habitats and over 15% of the species detailed within the NPWS Habitats Directive reporting[24,25]. Recreational activities and the provision of recreation amenities and infrastructure affect approximately 37% of protected habitats, approximately 15% of all species listed under NPWS Habitats Directive reporting. An estimated 16% of SCI species face a recreation pressure whilst approximately 30% face a recreation threat according to NPWS Habitats Directive reporting.

Under both Article 17 of the Habitats Directive and Article 12 of the Birds Directive, Member States are required to report on the status of protected habitats and species. Both reporting processes are discussed in Section 4.4.1 and Section 4.4.2.

There are 59 Annex 1 habitats in total recorded within Ireland and 73 Annex II species. A full list of the Annex I habitats and Annex II species can be found in Appendix A with corresponding conservation status, the number of SACs/SPAs for which it is a QI and the relevant pressure (s) and threat (s).

## 4.2 Biodiversity Policy

"Irelands Environment, An Integrated Assessment" (EPA, 2020) highlights how climate and biodiversity policy in Ireland has undergone improvement in recent years but the implementation of such policies requires further focus. The EPA report contains thirteen key messages for Ireland to delivery on its sustainable development with a number of environmental protection goals included. Of relevance to the draft Plan the report refers to forestry, its related activities, recreation and tourism and their respective impacts on the environment.

Irish policies referred to include the Climate Action Plan (DECC, 2022) and the draft National Biodiversity Action Plan (NBAP) (DHLGH, 2022). Proposed policies of the draft NBAP such as embedding biodiversity at the heart of climate action and strengthening compliance and enforcement of existing legislation would be relevant to the draft FESLUP. Utilising biodiversity to address climate action is relevant to the Forests for Climate and Forests for Nature categories within the draft FESLUP, whilst compliance and legislation enforcement is relevant to all aspects of the draft FESLUP. As the NBAP is currently in draft format, it is unclear as to when or how it shall be implemented.

The Citizen's Assembly Report on Biodiversity Loss[26] was published in March 2023 following discussion and deliberation on the means and methods of how Ireland can improve its response to biodiversity loss. The Report issued 159 recommendations, 73 of which were high-level recommendations and 86 were sectoral specific recommendations with a number relevant to Coillte. The report has been referred to the Joint Committee on Environment and Climate Action for further examination.

[24] NPWS (2019) The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.

[25] NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill.

[26] The Report of the Citizen's Assembly on Biodiversity Loss was published in March 2023 and is accessible here https://citizensassembly.ie/wp-content/uploads/Report-on-Biodiversity-Loss_mid-res.pdf

## 4.3 Conservation Status of EU Protected Habitats and Species

### 4.3.1 Overview

Under the Habitats Directive, Member States are required to report on the conservation status of the natural habitats and species in the Annexes. Member States conduct this through Article 17 reports[27], which detail the conservation status, pressures, threats, and conservation measures both taken and recommended to achieve or retain favourable conservation status. A summary of the main pressures and threats to habitats and species is provided online on the European Online Agency[28].

Article 12 of the Birds Directive requires Member States "*to report about the progress made with the implementation of the Birds Directive.*

*The Article 12 report contains information on status and trends of bird populations together with information on main pressures and threats. The report further contains information related to the impact of the Natura 2000 network and conservation measures*".

The threats and pressures for EU protected habitats and species are listed under several overarching categories, of which there is a specific pressure and threat category relating to forestry. The overarching pressure and threat categories are:

- Agriculture;
- Forestry;
- Extraction of resources (minerals, peat, non-renewable energy resources);
- Energy production processes and related infrastructure development;
- Development and operation of transport systems;
- Development, construction, and use of residential, commercial, industrial and recreation infrastructure and areas**;**
- Extraction and cultivation of biological living resources (other than agriculture and forestry);
- Military action, public safety measures and other human intrusions;
- Alien and problematic species;
- Mixed source pollution;
- Human-induced changes in water regimes;
- Natural processed (excluding catastrophes and processes induced by human activity or climate change);
- Climate change; and
- Unknown pressures, no pressures, and pressures from outside the Member State.

Whilst 'Forestry' exists as its own category as a pressure/threat, the impacts and effects of recreation can be contained within a number of activities and may potentially sit within several of the categories listed above.

[27] The most recent Article 17 reporting for the Republic of Ireland was published in 2019 for the period 2013-2018 .

[28] Pressures and Threats as defined by the European Online Agency can be found here: https://www.eea.europa.eu/themes/biodiversity/state-of-nature-in-the-eu/article-17-national-summary-dashboards-archived/main-pressures-and-threats

### 4.3.2 Forestry and Recreation Related Pressures and Threats

#### Article 17 Habitats Directive

Within the Article 17 reports [25], forestry is listed within its own category with a number of forestry related pressures and activities which have the potential to have negative implication on European sites. The 2019 Article 17 Reports for Habitats and Species provides information on the Annex I habitats and Annex II species that are vulnerable to pressures and threats from forestry. Recreational activities could be included in several of the reporting categories and could comprise of a number of different types of activities e.g. motorised sport, horse riding, and outdoor sports, which can all have negative implications for European sites. Forests are popular for walks, bird watching, mountain biking and running, and during peak seasons visitor numbers can lead to increased disturbance and potential for pollution.

The 2019 Article 17 Report for Habitats and Species provides information on the QIs that are vulnerable to activities that may be encompassed within forestry and recreation. In preparing this AA report, a review has been carried out to identify which Annex I habitats and Annex II species are vulnerable to such activities. An overview of the relevant QIs are presented in Section 4.5 with expanded discussion in Appendix A. The conservation status of each QI and any relevant recreational pressures and threats were identified from the Article 17 report. As per the AA guidance[70] Only species listed as a QI of an SAC are considered in this AA report**.**

#### Article 12 Birds Directive

Article 12 of the Birds Directive requires Member States to report on the status of bird populations, and similar to the Article 17 reporting discussed above, to list the main pressures and threats each Annex I species faces. Article 12 reports are issued every six years with the most recent report published in 2019 for the reporting period for the 2013-2018. Information, where available, on the specific pressures and threats from forestry and forestry related activities on bird species is provided within the reporting. An overview of the SCIs is presented in Section 4.5.3 with expanded discussion presented in Appendix A. The conservation status of each SCI, its residential status in Ireland, the number of SPA sites designated for that species and the specific forestry-related pressures and threats they face are listed is provided within Appendix A. As per the AA guidance[70], only species listed as a SCI of an SPA are considered in this AA report.

As discussed above, Member States are required to report on the status of bird populations, including the pressures and threats impacting Irish bird populations, including recreational pressures and threats. A succinct summery of the relevant SCIs is presented in Section 4.5.3 with expanded discussion presented in Appendix A. The Appendix provides each Annex I species' conservation status, Irish residential status, the number of SPA sites for which that species is designated in and the recreational pressures and threats they face. As per the AA guidance[70] only species listed as an SCI of an SPA are considered in this AA report.

## 4.4 Current Status of Ireland's Protected Habitats & Species

### 4.4.1 Habitats Directive Reporting

EU Member States are required under the Habitats Directive to report the status of its protected habitats and species. The European Environment Agency (EEA) then uses this national scale reporting to report on the proportion of habitats and species assessed as being affected by one or more pressures/threats from broad pressure categories.

Approximately 13,500km$^2$ of the State is designated as SAC with 53% of this within the terrestrial and freshwater environments. Of the 441 SAC sites in the Republic of Ireland, 59 Annex I habitats are listed as the QI of at least one designated site, 13 of which have been designated as priority habitat e.g. lagoons, blanket bog, Cladium fens, Yew woodland etc.

Article 17 reports list the conservation status, pressures, and threats of each of the Annex I habitats and Annex II species for which SACs are designated and provide a rating of low, moderate and high for each pressure and threat. Whilst there is the potential for all QIs to be impacted by both forestry and recreation activities, a concise overview of those QIs considered to be most at risk is provided in Sections 4.5.1 and 4.5.2. An expanded discussion on each QI is provided in Appendix A.

### 4.4.2 Birds Directive Reporting

Under the Birds Directive, Annex I species, known as SCIs, are the protected features of SPA sites. Within Ireland's SPA network, over 80% are designated for species that belong to either breeding seabird or wintering water bird groups. Under Article 12 of the Birds Directive (2009/147/EC) Member States are required to report on the status of Annex I species, whether they occur within or outside SPA sites.

The most recent Article 12 report provides information on the short term and long term population trends for breeding and wintering species. Whilst breeding bird populations in each of the trend categories remain stable, several species are in decline. Several species of wintering birds and breeding waders are exhibiting declining trends which may be associated with activities such as intensifying agricultural activities, commercial forestry activities and as a result of the impacts of climate change which are contributing to changes in species ranges. As an example, some notable forest bird species such as hen harrier (*Circus cyaneus*) and merlin (*Falco columbarius*) have been in a declining status since 2010[29]. A full list of the SCIs found in Ireland, their current conservation status and whether they are listed as being subject to forestry and recreation related pressures and threats can be found in Appendix A.

Section 4.5.3 provides a concise overview of the relevant SCIs that are determined to be most vulnerable to forestry, forestry related activities and recreational activities.

### 4.4.3 Relevant QIs and SCIs

Fifty-nine Annex I habitat types are present in Ireland (16 of these Annex I habitat types are designated as 'priority' habitats i.e., habitat types in danger of disappearance and whose natural range mainly falls within the territory of the European Union). Twenty-six Annex II species are QIs of SACs. Thirty-three Annex I bird species are the SCIs of the 166 SPAs in Ireland. A concise overview of the relevant QIs and SCIs are discussed in Section 4.5 whilst an expanded discussion can be found in Appendix A.

## 4.5 Relevant QIs and SCIs

QIs and SCIs determined to be relevant to the draft FESLUP were established through a review of Article 17 and Article 12 reports, published scientific literature and national reports including the Irish Wildlife Manuals. Where it was indicated that QIs and SCIs are already susceptible the impacts of forestry and recreation related activities, such as having been impacted by habitat loss, degradation, species mortality, habitat and species fragmentation, disturbance, indirect effects and changes in key conservation value, those QIs and SCIs were identified as vulnerable to the potential objectives of the draft FESLUP. As a result, these were determined to be the relevant QIs and SCIs that are representative of the network of European sites within the Republic of Ireland. Outlined below is a concise summary of these relevant QIs and SCIs, their relationship with forestry and recreation sectors. An expanded discussion on the relevant QIs and SCIs is provided in Appendix A.

### 4.5.1 Qualifying Interest: Habitats

All Annex I habitats have the potential to be impacted by the implementation of the draft FESLUP in the absence of mitigation where there is the potential for habitat loss, destruction, fragmentation, degradation, disturbance, indirect effects and in-combination effects with other plans/projects.

Article 17 reporting provides an indication of the QI habitats that are currently facing pressures and threats in relation to forestry and recreation. Further desktop review, including review of scientific papers and information provided by Coillte ecologists provided detail on the potential impacts on QI habitats (grouped according to high level habitat type) which are the most vulnerable to the impacts resultant from forestry and recreation based activities. Although some habitats such as freshwater and peatland have a history of being impacted more by forestry related activities, all are recorded as either having forestry or recreation pressure in Article 17 reporting or have been highlighted through discussions with Coillte therefore all are considered at this high level as a potential receptor.

- **Peat and heath habitats:** Approximately 211 SAC sites are designated for the presence of a peatland habitat (active raised bogs, degraded raised bogs, blanket bog, transition mire, *Rhynchosporion*

[29] In addition to their declining status within Article 12 reports, according to the Birds of Conservation Concern Ireland (BOCCI) list, both Hen harrier and Merlin species are amber listed species.

depressions) accounting for half the nation's SAC sites. Where commercial afforestation practices have historically been conducted in peatland habitats, this has led to issues such as the direct replacement of bog habitat with forestry and consequent drainage of bog, resulting in changes in hydrology and species composition. Whilst there is a decreasing trend of commercial forestry within these habitats, there are continued forestry practices meaning that in many cases legacy issues have to be addressed. Recreational activities, if not managed appropriately, can also have direct and indirect impacts on peatland, including habitat loss, degradation and fragmentation through the use of off-road vehicles. Walking and cycling trails can cause degrade habitats through trail spread whilst any camping (although possibly limited in extent on Coillte land) can lead to wildfires with uncontrolled burning leading to peatland damage.

- **Freshwater habitats:** These Annex I habitats are susceptible to changes in hydrological changes resulting from activities relating to forestry and recreation. In relation to forestry, these habitats can be hydrologically connected to commercial forestry via streams, ditches, rivers, and artificial drains created from activities such as agriculture and forestry, as well as natural overland and subsurface pathways. The water quality of these waterbodies and their connecting habitats can deteriorate through release of sediment and nutrients as well as impacts from acidification.
  Moreover, artificial drains created from forestry can modify the natural hydrological regime[30] of the area with wet and peat soils drying out, potentially resulting in erosion. Anthropogenic activities can generate pollution to surface or ground waters and/or modify hydrological conditions of waterbodies resulting in changes to receiving QIs downstream or hydrologically linked. Upland areas dominated by peat forming substrates were heavily planted upon in the past, and where these practices are still operational, the resultant changes to these habitats have caused impacts upon hydrologically connected waterbodies. Clear felling activities impact water quality through increases in nutrient, sediment and dissolved organic matter, particularly the case where forests are on peatland[31]. Furthermore, conifer forests on peatland that undergo fertilisation have shown higher levels of pollutants within receiving waterbodies. Ongoing impacts on water quality from commercial forestry can result from the slow decomposition of conifer needles, branches and roots leading to a loss in organic matter and nutrients. It has been noted however, that temporal differences exist between anthropogenic activities and their impacts to water quality, with forestry management practices occurring infrequently over decades[32]. Recreational activities within an area hydrologically connected or within a zone of influence of freshwater habitats can result in an increased density of traffic, people and possible pollution to Annex I freshwater habitats. The construction and operation of recreation amenities such as trails, carparks and public toilets may result in pollution through surface water runoff and insufficient waste-water treatment. Whilst there can be negative impacts upon water quality as a result of human activities, appropriate management actions can result in positive effects[31] such as protection from rainfall, nutrient and sediment loss through the development of litter layer, understorey growth and surface roughness provided by tree roots[32].

- **Grassland habitats**: Whilst the majority of the Annex I grasslands in the Coillte estate are in unplanted uplands they all still have the potential to be impacted by forestry activities including afforestation and recreation which can cause habitat loss, degradation, fragmentation. Inappropriate or lack of management can have negative impacts on grasslands, with the European Commission reporting threats[33] such as unregulated grazing, abandonment and succession to woodland, invasive species, agricultural improvement, land use change, nitrogen deposition, recreational pressures and anthropogenic activities as greatest threats to calcareous grassland habitats. Afforestation activities including felling, thinning etc. and seed spread from adjacent plantation and/or application of fertilisation can impact directly and indirectly on Annex I grasslands. Where forestry has been historically established within an Annex I grassland habitat or is established in proximity to an SAC Annex I grassland site, there is a threat of seed spread from the plantation with resulting soil and vegetation impacts. The 2019 Article 17 report

[30] Laine, Jukka & Vasander, Harri & Sallantaus, Tapani. (2011). Ecological effects of peatland drainage for forestry. Environmental Reviews. 3. 286-303. 10.1139/a95-015.

[31] Shah, N.W., Baillie, B.R., Bishop, K., Ferraz, S.F., Högbom, L., & Nettles, J.E. (2022). The effects of forest management on water quality. Forest Ecology and Management.

[32] Duffy, C., O'Donoghue, C., Ryan, M., Kilcline, K., Upton, V., & Spillane, C. (2020). The impact of forestry as a land use on water quality outcomes: An integrated analysis. Forest Policy and Economics, 116, 102185.

[33] Calaciura B & Spinelli O. 2008. Management of Natura 2000 habitats. 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites). European Commission

summarises detail from the Annex I grassland monitoring project[34] identifying one specific site which was impacted by forestry or forestry related activities. Data collected during the most recent Annex I Grassland monitoring survey[34] indicated that the biggest threat to Molinia meadow habitat was through mismanagement including abandonment, agricultural intensification and forestry. All Annex I grassland habitats have the potential to be impacted by recreational walkers and motor sports[35] which could be facilitated at Coillte properties.

- **Coastal habitats**: Indirect effects from forestry related activities, such as pollution to surface or ground waters has been recorded as a pressure and/or threat upon freshwater and coastal water environments within the Article 17 reports from the last two reporting periods[24]. Habitat loss through land-use changes, disturbance and indirect effects from sports, tourism and leisure activities and indirect effects from discharge points of recreational facilities generating pollution were all indicated within the Article 17[24] report as pressures and threats to the coastal habitats. Impacts on water quality as a result of forestry and recreation related activities can have a downstream resultant impact on coastal QIs including estuaries, tidal mudflats and sandflats and coastal lagoons.
  Upstream activities such as intensive agriculture, wastewater and forestry activities can result in increased nutrient loads which eventual discharge to estuaries, tidal mudflats and sandflats and coastal lagoons leading to dysfunctional system. Whilst forestry is not likely to be the primary source of nutrient inputs to coastal systems it has for example been found to contribute approximately 1% of the total N load to an Irish estuarine system[36]. The planting, felling, thinning and replanting stages of forestry ca have an impact on water quality by contributing to changes in organic matter and nutrient input. A review of impacts on Irish coastal habitats from the Heritage Council[37] ascertained within the report that three of the top 15 impacts are recreation or leisure related resultant from caravanning/camping, litter, beach activities, walking and water pollution from visitor related infrastructure (i.e. public toilets).

[34] Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland

[35] Natural England (March 2021) Definition of Favourable Conservation Status of Calaminarian grassland. Accessed at https://publications.naturalengland.org.uk/publication/5499976347287552 August 2023.

[36] Ní Longphuirt, O'Boyle and Stengel, 2015, Environmental response of an Irish estuary to changing land management practices, Science of The Total Environment, Volumes 521–522,

[37] Neff, Jenny (1999) Irish Coastal Habitats: A Study of Impacts on Designated Conservation Areas. An Chomhairle Oidhreachta/The Heritage Council. Accessed at https://www.heritagecouncil.ie/content/files/irish_coastal_habitats_impacts_conservation_areas_1998_2mb.pdf on 10/07/2023

- **Uncommon habitats within the Coillte Estate:** Aside from those mentioned above there are a number of other Annex I habitats which exist, though are uncommon, within the Coillte Estate. Designated dune habitats frequently occur in a mosaic with each other, with some dune complexes comprising all Annex dune habitats. Dune systems are susceptible to anthropogenic impacts including those pertaining to forestry activities and recreation. As well as the potential for impacts arising from seed spread or hydrological regime changes from adjacent plantation, Dunes with *Salix repens* ssp. *aregentea* (*Salicion arenaria*)(2130), have been found to be impacted by recreational activities including sports, tourism and leisure activities, all recorded as pressures and threats to several types of dune systems[24] The impacts of trampling upon vegetation and soil in dune systems has been studied extensively with some research finding that the effects of trampling, walking and vehicle use can cause a reduction in habitat cover of several types of Annex I habitat including dune slacks, fixed dunes, and machair[38]. The facilitation of amenities for tourism and recreation can impact the structure of sand dunes as the surface area and representative vegetation species of the dune system are lost[39]. Other uncommon habitats within the Coillte estate include fens and rocky habitats, including those Annex I habitats of petrifying springs with tufa formation (*Cratoneurion*) and limestone pavements. These habitats could be subjected to direct and indirect human activities which could include recreation and/or forestry. Article 17 report[24] identified pressures from sports, tourism and leisure activities for petrifying springs whilst no pressures and/or threats were noted for limestone pavements. Human activities such as historical drainage practices, forest planting on open ground and the pollution of surface and groundwater resources was found to impact fen habitats. Activities that happen directly adjacent to fens can alter hydrological conditions and make it less suitable for species that depend on this habitat e.g., through drainage, nutrient run-off or seed spread from plantation[25].

### 4.5.2 Qualifying Interest: Species

All Annex II species have the potential to be impacted by the implementation of the draft FESLUP in the absence of mitigation where there is the potential for direct loss, destruction, fragmentation, degradation, disturbance, indirect effects and in-combination effects with other plans/projects.

Article 17 reporting provides an indication of the QI species that are currently facing pressures and threats from the various Coillte activities which might arise from implementation of the FESLUP. QI species are grouped below according to either common traits or habitats or according to how they might be impacted by Coillte activities.

- **Plant Species:** Killarney fern (*Vandenboschia speciosa*), marsh saxifrage (*Saxifragus hirculus*), slender naiad (*Najas flexilis*), slender green feather moss (*Hamatocaulis vernicosus*) and petalwort (*Petalophyllum ralfsii*). These species are most likely to be impacted either by direct removal through afforestation or reforestation, through introduction of recreational activities in proximity to populations[40] or through water pollution affecting macrophytes.
  The introduction of biocides, pesticides, hormones, chemicals, and nutrients into the supporting habitats and spread of seed from adjacent plantations may also occur as result of forestry activities or the construction and operation of recreation amenities.

  Slender naiad is a rare freshwater plant species found in lakes, rivers and pools, and is the main indicator plant species of the annex habitat 3130. Any decline in the water quality of freshwater habitats which is contributed to by Coillte activities arising from the FESLUP can have a knock on effect on slender naiad due to increases in sediment, dissolved organic matter and/or from acidification. Hydrological changes contributing to fluctuations in water level can hamper growth patterns of slender naiad[41].

  Petalwort is a pale green thalloid liverwort with erect lamellae on its upper surface. It grows in open, damp, calcareous dune slacks. As discussed in relation to dune Annex I habitats there may be limited

[38] Kindermann, G., Gormally, M.J. Vehicle damage caused by recreational use of coastal dune systems in a Special Area of Conservation (SAC) on the west coast of Ireland. *J Coast Conserv* 14, 173–188 (2010). https://doi.org/10.1007/s11852-010-0102-7

[39] Antonio I. Hernández-Cordero, Luis Hernández-Calvento, Emma Pérez-Chacón Espino, Vegetation changes as an indicator of impact from tourist development in an arid transgressive coastal dune field, Land Use Policy, Volume 64, 2017, Pages 479-491, ISSN 0264-8377, https://doi.org/10.1016/j.landusepol.2017.03.026.

[40] Ratcliffe, Birks and Birks (1993) The ecology and conservation of the Killarney Fern *Trichomanes speciosum willd*. In Britain and Ireland

[41] Roden, C., Murphy, P. & Ryan, J.B. (2021) A study of lakes with Slender Naiad (*Najas flexilis*). Irish Wildlife Manuals, No. 132. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

instances where Coillte activities are a pressure or threat on petalwort populations, however as forestry is listed in Article 17 reporting and has the potential to impact on this species it is considered here. Monitoring[42] in Ireland shows that frequent positive impact recorded at the sites surveyed was use by walkers and non-motorised vehicles. Moderate amounts of disturbance through these activities is beneficial to the habitat for Petalwort as it maintains open low vegetation and compacts the ground allowing it to establish. However, too much disturbance from these activities, particularly the use of motorised vehicles, may destroy the integrity of the substrate and can break up the bryophyte crust. While Petalwort may eventually recolonise these areas, too much disturbance on a continual basis is detrimental to the ability of the species to establish and maintain itself.

Marsh saxifrage is found in a limited number of locations within blanket bog habitats and requires a wet environment to grow, such as the mineral flushes on blanket bog. Any negative impacts to blanket bog habitat such as afforestation and associated drainage and irrigation operations, peat extraction, erosion and burning, can have knock on impacts on the conservation status of marsh saxifrage. Although there are limited locations where marsh saxifrage occurs there is still a risk that activities arising from the Coillte FESLUP could impact on this species.

- **Freshwater species** The freshwater and Nore pearl mussel (*Margaritifera margaritifera, Margaritifera durrovensis),* Atlantic salmon (*Salmo salar*) and Pollan (*Coregonus pollan)* can be negatively impacted by changes in water quality and regime. Impacts to water quality can include heavy sedimentation[43] that can occur through forest thinning, clearance and clear-felling operations where the soils surface is disrupted and exposed to erosion, potentially causing the transportation of particles into the water[44]; Increases in the nutrient load can impact the hydrological regime of riverine system which may be as a result of tree felling where conifer needles, branches and roots are slow to dissolve contributing to increases in nutrients such as nitrates[45]. The creation of forest roads[46], the movement of machinery and the use of fertilisers to bring conifers to maturity can result in changes to water quality. Freshwater pearl mussel populations are in decline, with factors such as pearl fishing, pollution, acidification, organic enrichment, siltation, river engineering and declining salmon stocks contributing to the decline. The mussel has a symbiotic relationship with Atlantic salmon, spending the larval stage attached to the gills of salmonoid fish. Changes to the receiving freshwater habitat in addition to the surrounding habitat, which is more commonly upland peatland habitats, can have a knock-on effect on freshwater pearl mussel.
  Afforestation and forestry related activities can cause adverse effects in pearl mussel catchments through the creation of drains during afforestation, nutrient input from tree felling activities and fertiliser us and sedimentation during afforestation and felling. These adverse effects can cause sedimentation, nutrient enrichment and eutrophication with the knock-on effects resulting in adverse outcomes for pearl mussel populations. Pollan (*Coregonus pollan)* are shoaling fish and an endemic species, that feed on planktonic invertebrates but have experienced a population decline over the last 20-30 years[25]. The introduction of biocides, pesticides, hormones, chemicals, and nutrients into the environment was a common pressure or threat found to affect pollan, through diffuse pollution of surface water and groundwater resources [25]. Changes in the levels of dissolved organic matter, nutrients and sediment can impact the life cycle of Atlantic salmon. Studies on Atlantic salmon in afforested catchments show that the density and biomass of juvenile species were significantly lower in streams draining from afforested catchments and that the

[42] Campbell, C., Hodd, R. & O'Neill, F. (2019) The monitoring and assessment of Petalophyllum ralfsii (Petalwort) in the Republic of Ireland 2016–2018. Irish Wildlife Manuals, No. 109. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland)

[43] Shah NW, Nisbet TR. The effects of forest clearance for peatland restoration on water quality. Sci Total Environ. 2019 Nov 25;693:133617. doi: 10.1016/j.scitotenv.2019.133617. Epub 2019 Jul 30. PMID: 31635007.

[44] Hutton SA, Harrison SSC and O'Halloran J (2008). An Evaluation of the role of forests and forest practices in the eutrophication and sedimentation of receiving waters. Department of Zoology, Ecology and Plant Science. Environmental Research Institute. University College Cork. Water Framework Directive Western River Basin District. Programme of Measures. Forest and Water National Study. Accessed at https://www.catchments.ie/download/forestry-and-water/?wpdmdl=1211&ind=MTQ3MjQ3NTAwNHdwZG1fRm9yZXN0IGFuZCB3YXRlciBFdXRyb3BoaWNhdGlvbl9TZWRpbWVudGF0aW9uIExpdGVyYXR1cmUgcmV2aWV3IC5wZGY on 22 September 2022

[45] Neal, C., Reynolds, B., Neal, M., Wickham, H., Hill, L., and Williams, B.: The impact of conifer harvesting on stream water quality: the Afon Hafren, mid-Wales, Hydrol. Earth Syst. Sci., 8, 503–520, https://doi.org/10.5194/hess-8-503-2004, 2004.

[46] L. Kuglerová, E.M. Hasselquist, R.A. Sponseller, T. Muotka, G. Hallsby, H. Laudon Multiple stressors in small streams in the forestry context of Fennoscandia: the effects in time and space Sci. Total Environ., 756 (2021), Article 143521

tolerance to changes in water quality was much lower than that found in other species[47].

- **Invertebrates** such as narrow-mouthed whorl snail (*Vertigo angustior)* and marsh fritillary (*Euphdryas aurinaria)*. Marsh fritillary use a variety of habitat types ranging from coastal sand dunes along western seafront to mosaics of upland habitats and grasslands. Marsh fritillary is generally found where its larval food plant, devil's-bit scabious occurs and is solely dependent on this species at its larval stage. This plant can be found in a diverse range of habitats including wet heath, bogs, woodland clearings however, it is more commonly found on acidic or calcareous grasslands managed by low intensity agricultural practices. Marsh fritillary habitats are often subjected to recreational pressures. In Ireland, about 50% of dune systems have deteriorated in the last century, a significant proportion of which can be attributed to recreational pressures and unimpeded access[48]. Habitats such as sand dunes are prone to physical stress such as erosion damage through trampling, such pressure can reduce the total area of devils-bit scabious[49]. Reduced food availability increases pressure on marsh fritillary and can lead to a species population decline[50]. Recreational activities can influence grasslands at two levels: community composition and substrate stability. Disturbance to the community composition can result in the prevention of flowering and the loss of sensitive species.

- **Mammals** - Lesser horseshoe bat *(Rhinolophus hipposideros)* and otter (*Lutra lutra)*. This bat species can be found roosting during the summer in roofs of disused structures, such as old houses and stables, whilst their winter roosts can be found in caves, mines, souterrains and disused cellars. It is adept at navigating dense vegetation during foraging due to its highly evolved echolocation system. As a result, it is highly sensitive to its environment and by extension the movement of other species and objects. Lesser horseshoe bats are particularly sensitive to disturbance, especially in their nursery and winter roost. Studies have shown that light pollution may have significant negative impacts upon the selection of flight routes[51]. Specific protection and sensitive management of foraging habitat is also important[52]. Bat Conservation Ireland studied population, trends and threat 1986 to 2012 and found a number of activities around roosts such as increased urbanisation or inappropriate forest management may be considered a future threat, although current negative activities are often related to deterioration of buildings which benefit from human intervention, or climatic factors that are outside the control of conservation bodies.[53] Where recreational activities may in result in the introduction of lighting there may be potential implications to lesser horseshoe bat and considerations should be made to reduce the impact to habitats surround roosts and foraging habitats. Otter are found throughout Ireland, favouring areas where aquatic habitats and sheltered terrestrial habitats are found in unison providing food and shelter.

  An opportunistic species with a diet of aquatic invertebrates and fish[54], otter are highly likely to be found within the Coillte Estate given the breadth of freshwater systems located within. Whilst it can be elusive species itself, the features upon which otter use for breeding and resting, such as couches, holts and chutes are identifiable within the landscape. Such features can be located near watercourses, under trees of bankside trees, within log piles, cavities in rocky banks or caves or along the banksides of rivers[55]. Reported threats to species mortality by NPWS[56] relate to road kill, mortality due to entrapment within fishing nets and lobster pots, severe water pollution incidents leading to fish kills and the removal of riparian habitats. It is noted however, that otters are adaptable to change and can be found within a

[47] Harrison, S.S.C., Hutton S., Baars, J.-R., Cruikshanks, R., Johnson, J., Juhel, G., Kirakowski, T., Matson, R., O'Hal loran, J, Phelan, P. and Kelly-Quinn, M. 2014 Contrasting impacts of conifer forests on brown trout and Atlantic salmon in headwater streams in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy 2014 DOI: 10.3318/ BIOE.2014.20

[48] Carter, R.W.G. and Chance, S., 1997. Integrated management of coastal dunes in Ireland: assessment and example. *The Ecology and Conservation of European dunes*, pp.301-312.

[49] Kindermann, G. and Gormally, M.J., 2013. Stakeholder perceptions of recreational and management impacts on protected coastal dune systems: A comparison of three European countries. *Land use policy*, *31*, pp.472-485.

[50] Orams, M.B., 1996. Using interpretation to manage nature-based tourism. *Journal of sustainable tourism*, *4*(2), pp.81-94.

[51] Stone et al (2009) Street Lighting Disturbs Commuting Bats. Current Biology 19, 1123–1127, July 14, 2009 ª2009 Elsevier Ltd All rights reserved DOI 10.1016/j.cub.2009.05.058

[52] Bat Conservation Trust (BCT) lesser horseshoe 11.02.13.indd (bats.org.uk)

[53] Bat Conservation Ireland (2012) Lesser Horseshoe Bat Report November 2012 _4_.docx (npws.ie)

[54] Preston, S., Portig, A., Montgomery, W.I., Mcdonald, R.A., & Fairley, J. (2022). Status And Diet Of The Otter Lutra Lutra In Northern Ireland. Biology and Environment: Proceedings of the Royal Irish Academy, 106B, 57 - 63.

[55] NIEA (2011) Otters and Development. Northern Ireland Environment Agency. Accessed at https://www.daera-ni.gov.uk/sites/default/files/publications/doe/natural-information-otters-and-development-2011.pdf August 2023.

[56] Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

variety of rural and urban areas[55]. Where human activities occur within the range of otters, there exists the potential risk of disturbance. For example, forestry operations may cause disturbance to foraging otters by altering their habitat or the facilitation of recreational paths and walkways may fragment habitat and cause the species to alter their movements to avoid disturbance. Given that the species is dependent on aquatic prey for its diet, it is plausible that any negative impacts to aquatic habitats, such as changes in water quality, could result in direct and indirect impacts to otter such as changes in prey abundance[25].

### 4.5.3 Special Conservation Interests

All SCIs have the potential to be impacted by the implementation of the draft FESLUP in the absence of mitigation where there is the potential for habitat loss, destruction, fragmentation, degradation, disturbance, indirect effects and in-combination effects with other plans/projects.

Article 12 reporting provides an indication of the SCIs that are currently facing pressures and threats in relation to forestry and recreation. Further research conducted, including review of scientific papers and review of relevant Coillte reports[57,58] provides further information on the potential impacts upon states that the following SCIs are the most vulnerable to the impacts resultant from forestry and recreation based activities: bar-tailed godwit *(Limosa lapponica)*, black-tailed godwit (*Limosa limosa)*, common tern (*Sterna hirundo)*, curlew (*Numenius arquata)*, dunlin (*Calidris alpina)*, golden plover (*Pluvialis Apricaria)*, lapwing (*Vanellus vanellus)*, Greenland white-fronted goose (*Anser albifrons)*, hen harrier (*Circus cyaneus)*, little tern (*Sternula albifrons)*, merlin (*Falco columbarius)*, redshank (*Tringa tetanus)*, red-throated diver (*Gavia stellata)*, roseate tern (*Sterna dougallii)*, sandwich tern (*Sterna sandvicensis)* and whooper swan (*Cygnus cygnus)*.

SCIs are dependent on habitats for breeding, foraging and resting and it can be assumed that any significant effects to their supporting habitats, such as changes in land-use, could present a significant effect to the receiving SCI. Several QI habitats, including those that have been summarised above in Section 4.5.1, support a range of bird species. Waders such as curlew, lapwing, golden plover and dunlin utilise peatlands, heath, semi-natural and managed grasslands as well as wetland habitats including fens and saltmarsh. These species rely on open landscapes and therefore where afforestation occurs in proximity to wader habitats, this can result in loss of those open landscapes or provision of more cover and perching opportunities for predators such as foxes and corvids which can take young and eggs[59]. Species such as dunlin and golden plover prefer flat, exposed ground close to bog pools, and are directly influenced by forest edge which can cause individuals to move further from forestry to find suitable nesting and foraging habitat[60].

As well as afforestation and reforestation, the development, construction and use of recreational infrastructure is a pressure to species such as the curlew[61]. This can include activities such as improving site access, conversion of land to recreational areas and built recreational facilities. Such activities can result in the habitat loss, degradation, and fragmentation for species like curlew. Other types of disturbance listed include dog walking, shooting, intrusive surveying, and nest abandonment. Increase stress and recreational use of a site can cause curlew to abandon it.

Seabird species, including Roseate tern, common tern, little tern and sandwich tern, are dependent on coastal habitats including coastal cliffs, dune habitats, salt marshes, estuaries etc,. Pressures from recreational use, such as disturbance from tourism can have indirect effects on the seabirds that feed and breed in receiving areas. The construction of recreational infrastructure such as sea cliff paths may cause an increase in tourism density in an area that could add disturbance to seabirds. Other SCIs that utilise these coastal habitats for foraging include the bar-tailed godwit, black-tailed godwit, redshank, Greenland-white fronted goose, whooper swan and lapwing. Often found within coastal estuarine areas and shallow inlets and bays, SCIs which forage here can be sensitive to disturbance such as localised changes in noise from the presence of

[57] Biosphere/Coillte (2020) Guidance On Disturbance To Birds During Forestry Operations (Felling And Reforestation).
[58] Coillte (2022) Hen Harrier Habitat Feasibility Analysis: Update to Supply Further Information Requested.
[59] Mark H. Hancock, Daniela Klein, and Neil R. Cowie. "Guild - level Responses by Mammalian Predators to Afforestation and Subsequent Restoration In a Formerly Treeless Peatland Landscape." Restoration ecology, v. 28 ,.5 pp. 1113-1123. doi: 10.1111/rec.13167
[60] Wilson, J., Anderson, R., Bailey, S., Chetcuti, J., Cowie, N.R., Hancock, M.H., Quine, C.P., Russell, N., Stephen, L., & Thompson, D.B. (2014). Modelling edge effects of mature forest plantations on peatland waders informs landscape-scale conservation. Journal of Applied Ecology, 51, 204-213.
[61] Colhoun, K., Flannelly, F., O'Neill, J., Phelan, E., Servignat, H., O'Donoghue, B. and Kelly, S., 2022. Status and distribution of breeding Eurasian Curlew in Ireland 2021. *Irish Wildlife Manuals*, (138).

people, plant and machinery. Changes to the habitat types that support these species, such as afforestation, fertilisation, drainage activities and/or land-use change may reduce food availability for the species. As a result, it can be assumed that these species may be required to travel further for its food source, thereby potentially causing stress. Afforestation in land types that are adjacent to foraging areas is a threat to the Greenland white-fronted goose as noted by NPWS[62] .

SCIs including the hen harrier and merlin, are notably susceptible to activities arising from the Coillte FESLUP, including afforestation, reforestation, forestry management and recreation. Human activities within the vicinity of breeding birds can lead to increased rates of nest desertion and reduced rates of site occupancy and subsequently reduced breeding success[63]. It is known that anthropogenic recreational activities can impact hen harriers breeding and foraging habitats. Caravaggi, A. et al (2019) states that hen harrier breeding habitats in Ireland are subjected to a wide range of anthropogenic pressures that could have significant implications for the vulnerable species. Recreational Studies were strongly associated with hen harrier territories, demonstrating that recreational activities can negatively impact breeding birds[64]. The importance of upland habitats is noted in published literature[65] with changes to these habitats causing habitat fragmentation and increases to the forest edge[66]. Hen harrier nest within coniferous forestry plantations, typically before the plantation reaches full maturity. As the forestry reaches full maturity, habitat becomes less suitable for hen harrier nesting as the volume of foliage increases to levels that restrict nesting[67].For merlin, forestry activities such as clear-felling can impact the breeding population, as they are found to nest in mature conifers. Continued habitat loss through replanting, in addition to an increase in disturbance through the movement of machinery and personnel during replanting and thinning stages reduces ground nesting availability for merlin.

Hen harrier species predate small birds and small mammals with some of their food source originating from low-intensity agricultural land near roost sites. Medium-sized ground nesting birds (such as common snipe (*Gallinago gallinago*)) found within bog and young conifer forests also form part of the hen harrier's diet [68]. Some variation in the diet of this species is normal however, in mature forests post-thicket (12 years maturity) hen harriers are unable to hunt effectively due to the closed canopy which can result in the species having to travel further during the breeding season to provide for their young, leaving the nest exposed to predation and weather[69]. It is clear from the scientific literature, that landscape level management across all sectors is required to favourably restore the hen harrier population to favourable condition.

For all SCIs there is the potential for land-use changes, including infrastructure and development, afforestation, facilitation of recreation activities to have the potential to cause a significant effect to SCIs through habitat loss, destruction, fragmentation, degradation and indirect effects such as disturbance, changes to the availability of nutrients and water quality.

[62] Lewis, L. J., Burke, B., Fitzgerald, N., Tierney, T. D. & Kelly, S. (2019) Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

[63] Webber, A.F., Heath, J.A. and Fischer, R.A., 2013. Human disturbance and stage-specific habitat requirements influence snowy plover site occupancy during the breeding season. *Ecology and Evolution*, *3*(4), pp.853-863.

[64] Caravaggi, A., Irwin, S., Lusby, J., Ruddock, M., Mee, A., Nagle, T., O'Toole, L., O'Neill, S. and O'Halloran, J., 2019. Anthropogenic pressures within the breeding range of the Hen Harrier Circus cyaneus in Ireland. *Bird Study*, *66*(4), pp.461-470.

[65] Anthony Caravaggi, Sandra Irwin, John Lusby, Marc Ruddock, Lorcán O'Toole, Allan Mee, Tony Nagle, Shane O'Neill, David Tierney, Alan McCarthy & John O'Halloran (2019):Factors influencing Hen Harrier *Circus cyaneus* territory site selection and breeding success, BirdStudy, DOI: 10.1080/00063657.2019.169277

[66] Kathryn Sheridan, Jason Monaghan, T. David Tierney, Susan Doyle, Charles Tweney, Steve M. Redpath, Barry J. McMahon "The influence of habitat edge on a ground nesting bird species: hen harrier *Circus cyaneus*," Wildlife Biology, 2020(2), (16 June 2020)

[67] NPWS (2015) Hen Harrier Conservation and the Forestry Sector in Ireland 2015. Version 3.2 Date 31/03/2015. Accessed at https://www.npws.ie/sites/default/files/publications/pdf/HHTRP%20-%20Forestry%20-%20V3.2.pdf on 15 August 2022

[68] Alan McCarthy, Pat Smiddy, Tony Nagle, Allan Mee, Sandra Irwin, Anthony Caravaggi & John O'Halloran (2021) Landscape and temporal influences on the winter diet of a threatened diurnal raptor, the Hen Harrier Circus cyaneus, Bird Study, 68:3, 408-421, DOI: 10.1080/00063657.2022.2103515

[69] Caravaggi, Anthony & Irwin, Sandra & Lusby, John & Mccarthy, Alan & Mee, Allan & Nagle, Tony & O'Halloran, John. (2020). Forest management and Hen Harrier Circus cyaneus conservation in Ireland.

# 5. Identifying the Zone of Influence

## 5.1 Overview

In accordance with guidance from the Department of Environment, Heritage, and Local Government (DEHLG) this report assesses the potential impact of the draft FESLUP on sites within the European site network, as well as the potential for transboundary impacts on sites outside of the Member State.

The identification of the ZoI relates to the Screening for AA and NIS, both contained within this report.

## 5.2 Identification of Zone of Influence

A total of 607 European sites exist in Ireland, with a further 75 European sites within Northern Ireland. Coillte occupies an area of approximately 440,000ha across the landscape of Ireland and is the largest single landowner in the State. Due to the scale and distribution of this landholding across the country, there is potential for interaction with most of Ireland's European site network which consists of 441 SACs, 165 SPAs and one candidate SPA and those European sites located within the ZoI with Northern Ireland.

### 5.2.1 Review of Best Practice Guidance and Relevant Literature

Guidance pertaining to the ZoI, as stated within '*Appropriate Assessment of Plans and Projects in Ireland'* recommends:

*"A distance of 15km is currently recommended in the case of plans, and derives from UK guidance (Scott Wilson et al., 2006). For projects, the distance could be much less than 15km, and in some cases less than 100m, but this must be evaluated on a case-by-case basis with reference to the nature, size and location of the project, and the sensitivities of the ecological receptors, and the potential for in combination effects"*

Guidance[70] published by the Office of the Planning Regulator in 2021 recommends not using a buffer of defined distance, such as 15km, for the identification of relevant European sites:

*"The identification of European sites within a 15km zone has become common practice in screening projects for AA. However this approach is not based on the S-P-R model and should not be used for projects. Few projects have a zone of influence this large, but some more complex projects may require a greater zone of investigation.*

*Instead the zone of influence of a project should be considered using the Source-Pathway-Receptor model. This should avoid lengthy descriptions of European sites, regardless of whether they are relevant to the proposed development, and a lack of focus on the relevant European sites and issues of importance"*

As the approach to assessment for likely significant effects on European sites has matured, it is beginning to be accepted that determination of receptors should be identified solely on source and pathways for effect and should be considered on a case-by-case basis, rather than application of a blanket buffer. For example, there is the potential that a QI of a European site (e.g. freshwater species) could be adversely affected by changes in water quality of distances further than 15km away from the source.

In consideration of this, the application of the 15km buffer in the assessment of this draft Plan could mistakenly omit those European sites that have some hydrological or other ecological connection to activities arising from the draft Plan in relation to the Republic of Ireland. Therefore a standard distance for ZoI has not been used and this assessment's ZoI is based upon the Source-Pathway-Receptor model.

[70] OPR (2021) Appropriate Assessment Screening for Development Management. OPR Practice Note PN01

The sources and pathways for effect discussed in Section 5.3 and Section 5.4 and are relevant to the Republic of Ireland. When examining transboundary effects however, the receptor varies as it relates to the European site network across certain parts of Northern Ireland. For this reason, this methodology includes consideration of hydrological connectivity, functionally linked land and aerial emissions. To adequately capture the potential for effects, a combination of the Source-Pathway-Receptor model and a buffer of 15km has been utilised to identify the relevant European sites within Northern Ireland and is discussed below in Section 5.7.

## 5.3 Source: Draft FESLUP Objectives

The objectives within the draft FESLUP have been designed to have positive effects for the pillars of Climate, Nature, Wood and Recreation. Any of the objectives could have the potential for likely significant effects including those specifically relating to Nature which may have unintended consequences. Following review of the draft objectives it was determined that they could be grouped according to how they may be implemented by Coillte. This has included the following grouped "source" categories: biodiversity management; biosecurity and climate change management; commercial forestry business management; commercial forestry operations; desktop review & research; development of desk-based tools; engagement and collaboration; internal staffing development; policy, plan, standards and guidelines development and support provision. Each objective has been assigned a "source" category as shown in Table 4. Following identification of these common grouped sources this report proceeds to analyse pathways to the identified receptors.

The draft objectives can by synthesised into the following mechanisms for implementation which can be described in the S-P-R model as the source.

1. **Biodiversity management:** The implementation of objectives including those that relate to management plans for biodiversity areas, nature conservation, monitoring standards, guidance and training for Coillte staff etc., which, although having positive intentions, has the potential to interact with relevant QIs and SCIs and result in unintended LSE. For example, where biodiversity management objectives may be proposed for ancient and long-established woodland, if the design and resulting implementation of such an objective is not informed by site-by-site data and specialist professional input, it has the potential to result in unintended consequences to a QI and/or SCI linked by a pathway.
2. **Commercial forestry business management:** Where decisions relating to forestry business management of timber and wood production in the office and may be reflected within Coillte Forest, Land Solutions and Medite Smartply outlined in Section 2.1. Such objectives can include those to monitor forest health and condition and guide management interventions could have the potential to have unintended consequences upon relevant QIs and SCIs.

3. **Commercial forestry operations:** Objectives that relate to the operation of commercial forestry on the ground, such as piloting new decision-making tools for carbon management within the timber sector or where alternative measures for silviculture, such as Continuous Cover Forestry (CCF) has the potential to interact with European sites and result in unintended consequences on relevant QIs and SCIs.

4. **Desktop review & research:** Objectives including those that commit to researching relevant policies, plans and existing information that inform forthcoming frameworks such as consultation frameworks for communities and statutory bodies. In addition, it refers to exploring business opportunities for Coillte, including avenues for supporting energy development, improving understanding and methodologies for climate, biodiversity and timber and recreation management. Whilst these objectives have been designed to incur positive outcomes, there is the potential for unintended consequences to result in likely significant effects upon relevant QIs and SCIs should their design lack specialist knowledge input.

5. **Development of desk-based tools:** These are objectives that will result in the development of desk-based information tools such as frameworks, decision making tools for carbon management in forests, methods to improve recording biodiversity, operational guidance for habitats and species and increasing the understanding of how the Coillte estate is used for recreation. Whilst these objectives have been designed to incur positive outcomes, there is the potential for unintended consequences to result in likely significant effects upon relevant QIs and SCIs should their design lack specialist knowledge input.

6. **Engagement and collaboration:** Objectives that pertain to discussion, meetings, collaboration and engagement with the public, stakeholders, statutory bodies and government across the pillars of Forests for Climate, Nature, Wood and People. These are determined to be objectives that contend with the meeting of relevant parties with Coillte to strengthen relationships, to inform actions and measures for the future management of the Coillte estate and build trust between Coillte and relevant parties such as the public. Whilst these objectives have been designed to incur positive outcomes, there is the potential for unintended consequences to result in likely significant effects upon relevant QIs and SCIs should their design lack specialist knowledge input.

7. **Internal staffing development:** This relates to the objectives that contends with the training, development, necessary upskilling and future recruitment of staff and contractors within Coillte. Objectives pertaining to upskilling, training and development are anticipated to have positive effects for biodiversity however, where these are implemented without the necessary input from specialists, including ecologists, there is potential for likely significant effects on European sites and as a result, upon relevant QIs and SCIs.

8. **Policy, plan, standards and guidelines development:** The objectives that relate to developing policies, protocols, plans, guidance, approaches for training, monitoring and metrics are captured within this mechanism. Objectives such as these are acknowledged to have positive effects under the pillars of Climate, Nature Wood and People, however, where these are not designed with the necessary input from specialists, including ecologists, there is potential for likely significant effects on European sites and as a result, upon relevant QIs and SCIs.

9. **Support provision:** Where Coillte are committing to research on innovation, research and development, supporting government, stakeholders and the public, supporting the education sector for training and development for the wood industry etc., Objectives such as these are acknowledged to have positive effects under the pillars of Climate, Nature Wood and People, however, where these are not conducted with the necessary input from specialists, including ecologists, there is potential for likely significant effects on European sites and as a result, upon relevant QIs and SCIs.

10. **Other management:** This category includes other types of management not covered by the above categories such as measures to address issues that may be presented from threats of invasive species and the effects of climate change. This can include the development of monitoring standards, engagement and collaboration with stakeholders on the management of invasive species has the potential to interact with European Sites and result in unintended consequences upon relevant QIs and SCIs.

## 5.4 Pathway: Potential Pathways for Effect

The potential pathways for effects have been identified for each of the sources outlined in Section 5.3. These pathways relate how the implementation of the objectives could potentially impact European sites. The pathways identified for the draft FESLUP are outlined below.

1. **Aerial –** Aerial fertilisation, a commercial forestry activity, has the potential to be a pathway for effect on relevant QIs and SCIs as those within a certain distance of the site undergoing aerial fertilisation, or those QIs/SCIs that share a hydrological connection may undergo unintended consequences of aerial fertilisation e.g. nutrient enrichment of watercourses[71]. Aerial emissions resultant from activities, such as the construction of infrastructure, operation of cars, machinery etc., have the potential to result in the release of pollutants[72] such as nitrogen oxides, sulphur dioxide, ammonia and hydrogen fluoride. Their deposition can cause indirect effects on Relevant QIs and/or SCIs and has the potential for likely significant effects.

2. **Direct land take –** This has the potential to occur through the siting of forestry related infrastructure (such as forest roads), recreation amenities (such as trails and paths) and the planting of new commercial forestry sites etc., The resultant effects may be direct habitat loss, fragmentation, degradation, disturbance and indirect effects such as changes in water quality.

3. **Disturbance –** Resultant from a range of activities that have the potential to occur through the implementation of the draft FESLUP including the movement of people, plant and machinery, through construction and operation of recreation amenities, through commercial forestry activities such as felling, through land management practices etc.

4. **Hydrological –** Potential changes to waterbodies and hydrological connections may occur as a result of activities including, but not limited to, commercial forestry operations, development of recreation amenities, installation, maintenance and upgrades to walking routes and paths and actions towards nature conservation and climate change management such as the rewetting of degraded peatlands. Potential changes to the natural condition of waterbodies such as flow rate and water quality provide pathways to QIs and SCIs within a ZoI. Pollution to hydrological bodies can act as a pathway to QIs located at the source of the pollution event and to those connected downstream. Nutrient enrichment, through fertilisation in commercial forestry, siltation and sedimentation and the accidental introduction of hydrocarbons from the movement of plant and machinery has the potential to impact QIs and SCIs.

5. **Lighting –** The provision of lighting, whether permanent (e.g. lighting for carparks in forest parks) or temporary (during construction of recreation amenities or from machinery used in commercial forestry operations) has the potential to act as a pathway for disturbance and indirect effects upon QIs and SCIs.

6. **Movement of people, machinery –** The movement of people during recreation activities, or through implementing measures towards biodiversity and climate management has the potential to act as a pathway for disturbance or potentially cause indirect effects on QIs and SCIs. Where plant and machinery is required for activities such as the development of trails, paths, carparks etc., and for use in forestry planting, harvesting, felling and associated infrastructure, this can result in habitat fragmentation, degradation, disturbance and indirect effects upon QIs and SCIs. The introduction of invasive species may occur through the movement of people, plant and machinery via a lack of appropriate biosecurity measures. Introductions may be resultant from commercial forestry operations, recreation, habitat management etc., where invasive species are introduced through footwear, plant and machinery or from other sites which do not have appropriate biosecurity controls. In respect of the planting of new trees, there is potential for biosecurity risks where the donor sites or nursery sites are not suitably managed for biosecurity.

[71] Shah, Nadeem; Nisbet, Tom. The Research Agency of the Forestry Commission (2015) The effects of aerial and hand fertiliser applications on water quality in the North Forest Region: monitoring in sub-catchments of the River Oykel, Peffery Burn and Loch Shin. Final Report. August 2019. Accessed at https://cdn.forestresearch.gov.uk/2015/12/fr_highland_fertiliser_monitoring_aug2019_final_report.pdf on 17/07/2023

[72] IAQM (2019) A guide to the assessment of air quality impacts on designated nature conservation sites. Version 1.0 June 2019. Institute of Air Quality Management. Accessed at https://iaqm.co.uk/text/guidance/air-quality-impacts-on-nature-sites-2019.pdf on 17/07/2023

7. **Noise and Vibration –** Resultant from the use of plant and machinery through forest management, installation, maintenance and upgrades to forest park and trail infrastructure, habitat management e.g. peatland rewetting. Further noise may occur during peak visitor periods to forest parks where disturbance to QIs and SCIs may occur due to the density of visitors or during events held within the Coillte Estate gather large crowds.

8. **Recreation –** Activities such as hiking, mountain biking, camping, off-roading and horse riding all have the potential to act as a pathway for effect upon QIs and SCIs and result in habitat loss (where fires are lit for camping), habitat degradation and fragmentation (creation of desire lines through QI habitat), disturbance (use of vehicles in off-roading has potential to disturb SCIs and QI species) and indirect effects (such as the introduction of diseases through footwear, tires etc.,). The introduction of invasive species may occur through the movement of people, plant and machinery within the Coillte estate via a lack of appropriate biosecurity measures.

## 5.5 Receptors: European Sites Under Consideration

Given that the draft FESLUP is national in scale, all European sites within the Republic of Ireland have the potential to be impacted by the implementation of the draft FESLUP. In addition, some European sites within Northern Ireland are may also be impacted where the potential for transboundary effects occurs.

Ireland hosts 441 SACs designated for the presence of one or more Annex I habitat types and/or Annex II species. There are 165 SPAs and one candidate SPA designated for the protection of endangered wild birds including listed rare and vulnerable species, regularly occurring migratory species, and for the wetland habitat that support such species. To provide focus to assessment this report examines how the draft FESLUP could potentially lead to likely significant effects on any European sites through the relevant QIs and SCIs that are referenced in Section 4.5 using the source-pathway receptor assessment and in cognisance of the precautionary principle.

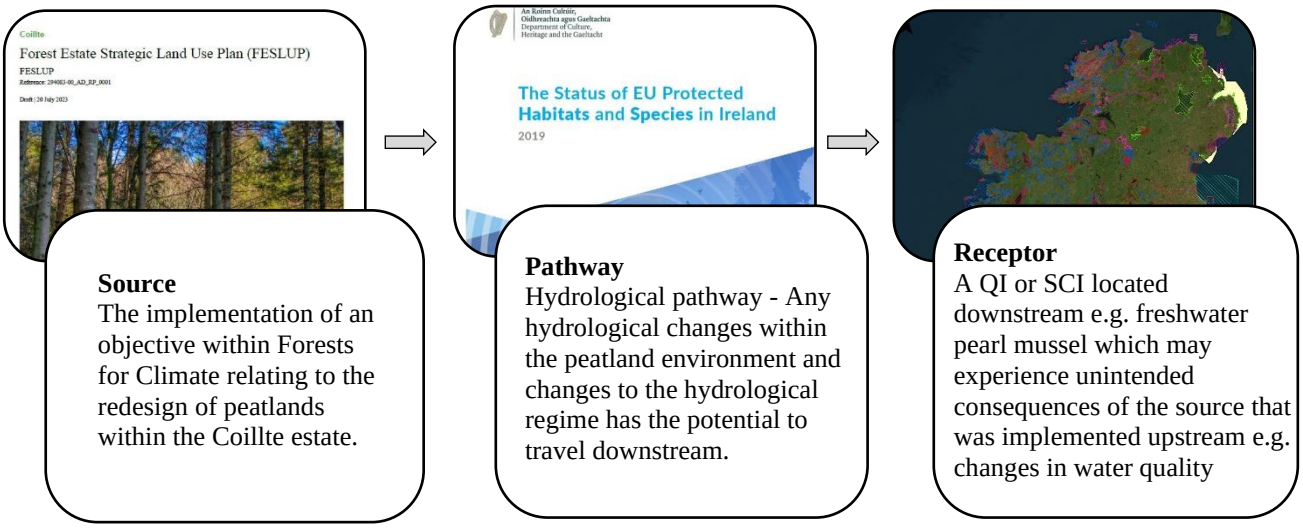


**Figure 3 Example of S-P-R on a relevant QI/SCI**

## 5.6 Republic of Ireland

The draft FESLUP is a strategic land-use plan which will be implemented at national level. The draft Plan's implementation within the Republic of Ireland does not contain geographic specificity, meaning that the objectives found within could be implemented anywhere within the Republic of Ireland and involve potential linkages to Northern Ireland. An analysis of all QIs and SCIs of each of the 606 sites within the Republic of Ireland has been considered a process which would obfuscate the AA process, and as discussed in Section 4.5, an overarching analysis of the QIs and SCIs of European sites within Ireland has been carried out within this assessment. Pressures and threats from forestry and recreation related activities were identified for QIs and SCIs, and it was considered that any QIs/SCIs at risk or vulnerable were those relevant to this assessment. Relevant QIs and SCIs within the Republic of Ireland are listed in Table 2.

To provide focus to this AA, the impact assessment utilises the Source-Pathway-Receptor method which is detailed above in Sections 5.3, 5.4 and 5.5. The QIs and SCIs, or receptors, considered relevant to this assessment, as discussed in Section 4.5, are shown in Table 2.

**Table 2 Relevant QIs and SCIs Considered in this Report**

| QI Habitat | QI Species | SCI |
|---|---|---|
| Coastal Habitats:<br>1130 Estuaries<br>1140 Mudflats and sandflats not covered by seawater at low tide<br>1150 Coastal lagoons*<br>1160 Large shallow inlets and bays<br>1210 Annual vegetation of drift lines<br>1220 Perennial vegetation of stony banks<br>1230 Vegetated sea cliffs of the Atlantic and Baltic coasts<br>1330 Atlantic salt meadows (*Glauco-Puccinellietalia maritimae)* | Plant Species<br>6985 Killarney Fern<br>1528 Marsh Saxifrage<br>1395 Petalwort<br>1833 Slender Naiad | A157 Bar tailed godwit<br>A156 Black tailed godwit<br>A346 Chough<br>A193 Common tern<br>A122 Corncrake<br>A768 Curlew<br>A149 Dunlin<br>A140 Golden plover<br>A395 Greenland white-fronted goose<br>A082 Hen harrier<br>A229 Kingfisher<br>A142 Lapwing<br>A885 Little tern<br>A098 Merlin<br>A103 Peregrine falcon<br>A001 Red Throated Diver<br>A161 Redshank<br>A192 Roseate tern<br>A863 Sandwich tern<br>A037 Whooper swan |
| Dune Habitats:<br>2110 Embryonic shifting dunes<br>2120 Shifting dunes along the shoreline with *Ammophila arenaria* (white dunes)<br>2130 Fixed coastal dunes with herbaceous vegetation (grey dunes)*<br>2140 Decalcified fixed dunes with *Empetrum nigrum**<br>2150 Atlantic decalcified fixed dunes (*Calluno-Ulicetea*)<br>2170 Dunes with *Salix repens* ssp. *argentea (Salicion arenariae)*<br>2190 Humid dune slacks<br>21A0 Machairs | Freshwater Species<br>1106 Atlantic Salmon<br>1029 Freshwater Pearl Mussel<br>1092 White-Clawed Freshwater Crayfish<br>1990 Nore Pearl Mussel<br>5076 Pollan | |
| Freshwater Habitats<br>3110 Oligotrophic waters containing very few minerals of sandy plains (*Littorelletalia uniflorae)*<br>3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or *Isoeto-Nanojuncetea*<br>3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.<br>3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation<br>3160 Natural dystrophic lakes and ponds<br>3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batracion* vegetation | Invertebrates<br>1024 Kerry slug<br>1065 Marsh fritillary | |
| Heaths<br>4010 Northern Atlantic wet heaths with *Erica tetralix* | Mammals<br>1303 Lesser horseshoe bat | |

| QI Habitat | QI Species | SCI |
|---|---|---|
| 4030 European dry heaths<br>4060 Alpine and Boreal heaths | 1355 Otter | |
| Grasslands<br>6130 Calaminarian grasslands of the *Violetalia calaminariae*<br>6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia)(*important orchid sites)<br>6230 Species-rich *Nardus* grasslands, on siliceous substrates in mountain areas (and submountain areas, in Continental Europe)*<br>6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae)* | | |
| Peatlands<br>7110 Active raised bogs*<br>7120 Degraded raised bogs still capable of natural regeneration<br>7130 Blanket bogs (* if active bog)<br>7140 Transition mires and quaking bogs<br>7150 Depressions on peat substrates of the *Rhynchosporion* | | |

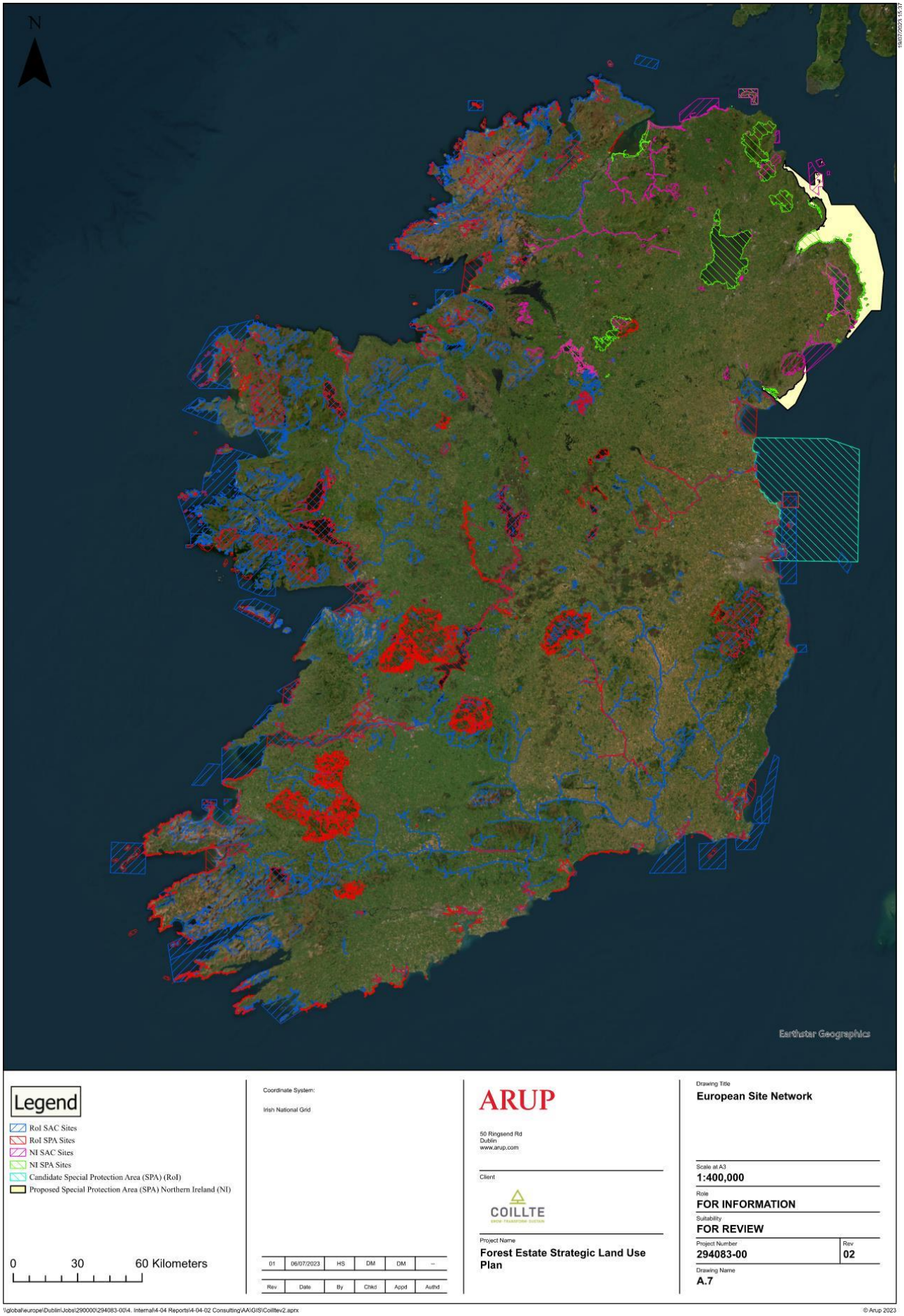


**Figure 4 The European Designated Site Network located within the Republic of Ireland and Northern Ireland**

## 5.7 Northern Ireland

Given the wide distribution of Coillte landholdings throughout the country there exists the potential for transboundary impacts on Northern Ireland and therefore potential for effects were assessed during the AA Screening. The limit of the extent of the Coillte estate within the Republic of Ireland territory establishes the basis of geographic specificity for transboundary effects and as such, makes it possible to identify European sites within Northern Ireland within a zones or zones of influence. Applying the precautionary principle, there is the potential for any part of the Coillte estate upstream of a hydrological link to a European site within Northern Ireland to be a source of an impact on a European site receptor downstream.

Potential European sites in Northern Ireland which could be subject to LSE have been identified through particular parameters that have the potential to be affected by the implementation of the draft FESLUP. The parameters used to inform this assessment are as follows:

- Direct physical connectivity through functionally linked land;
- Direct hydrological connectivity;
- Sub-catchments connectivity; and
- Aerial emission connectivity.

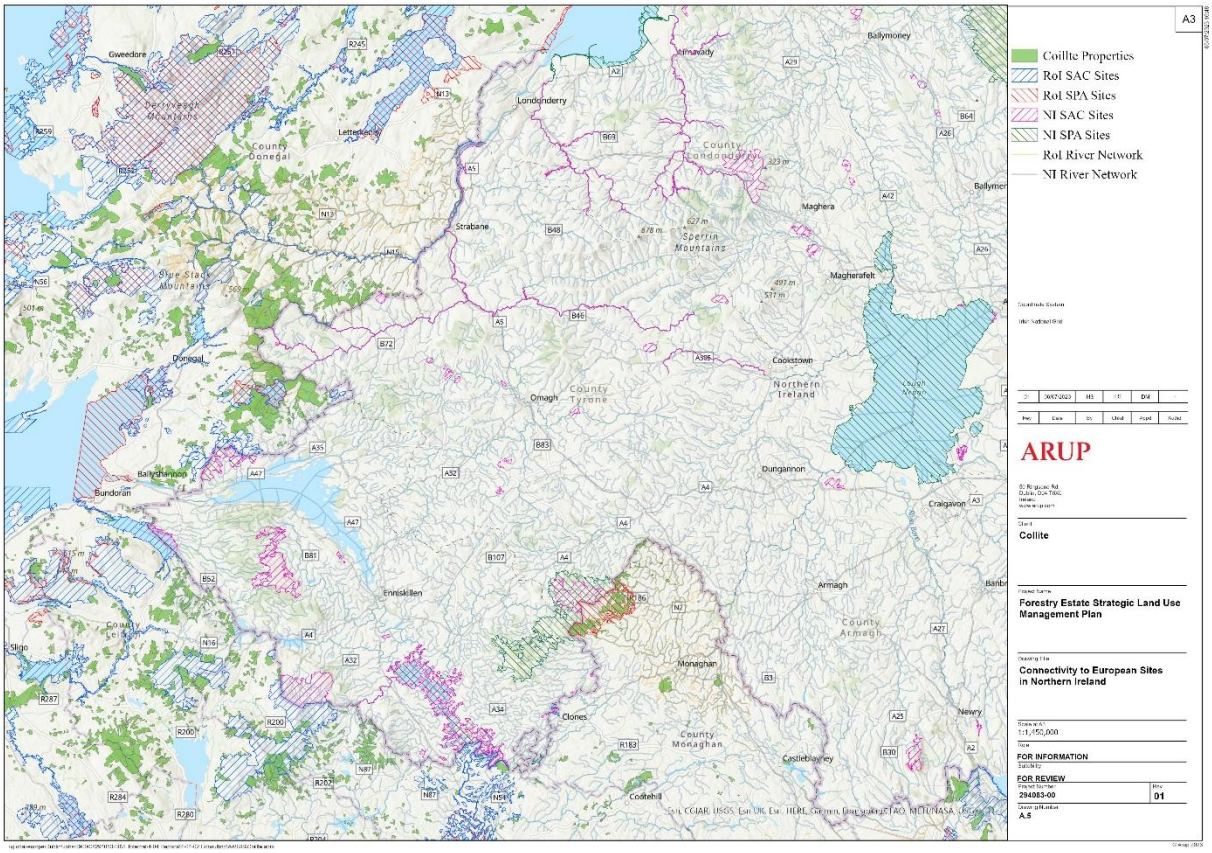


**Figure 5 Physical, hydrological and sub-catchment connectivity to European Sites within Northern Ireland**

Using datasets from the EPA[14] and DAERA[13], it is possible to identify those sites within the ZoI of the Coillte estate. The ZoI comprises of a 15km buffer of the land border between Northern Ireland and the Republic of Ireland to account for functionally linked land and where connectivity to aerial emissions may occur and any hydrological and sub-catchment connections downstream of the Coillte estate. These sites are identified in Table 3.

**Table 3 European Sites within Northern Ireland identified within the Zone of Influence.**

| European Sites | Pathway for Effect within the ZoI | QI | SCI |
|---|---|---|---|
| Cladagh (Swanlibar) River SAC | Hydrological Connectivity and<br>Aerial Emission Connectivity | 1029 Freshwater pearl mussel | |
| Cuilcagh Mountain SAC | Physical connectivity | 7130 Blanket bogs | |
| Derryleckagh SAC | Aerial Emission Connectivity | 7140 Transition mires and quaking bogs | |
| Fairy Water Bogs SAC | Aerial Emission Connectivity | 7110 Active raised bogs | |
| Largalinny SAC | Aerial Emission Connectivity | 91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles | |
| Lough Melvin SAC | Hydrological connectivity | 3130 Oligotrophic to mesotrophic standing waters with vegetation of the *Littorelletea uniflorae* and/or of the *Isoeto-Nanojuncetea*<br>6410 *Molinia* meadows on calcareous, peaty or clayey-silt-laden soils | |
| Magheraveely Marl Loughs SAC | Aerial Emission Connectivity | 3140 Hard oligo-mesotrophic waters with benthic vegetation of *Chara* spp.<br>7230 Alkaline fens<br>092 White-clawed (or Atlantic stream) crayfish | |
| Monawilkin SAC | Aerial Emission Connectivity | 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites) | |
| Moneygal Bog SAC | Hydrological connectivity | 7110 Active raised bogs | |
| Moninea Bog SAC | Aerial Emission Connectivity and<br>Hydrological Connectivity | 7110 Active raised bogs | |
| Owenkillew River SAC | Aerial Emission Connectivity | 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitricho-Batrachion* vegetation<br>91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles<br>1029 Freshwater pearl mussel | |
| Pettigo Plateau SAC | Hydrological connectivity | 3160 Natural dystrophic lakes and ponds<br>7130 Blanket bogs | |
| Pettigo Plateau SPA | Hydrological connectivity | | A140 *Pluvialis apricaria* |

| European Sites | Pathway for Effect within the ZoI | QI | SCI |
|---|---|---|---|
| River Foyle and Tributaries SAC | Hydrological connectivity | 3260 Water courses of plain to montane levels with the *Ranunculion fluitantis* and *Callitrico-Batrachion* vegetation<br>1106 Atlantic salmon | |
| River Roe and Tributaries SAC | Aerial Emission Connectivity | | |
| Slieve Beagh Mullaghfad Lisnaskea SAC | Physical connectivity and Hydrological connectivity | 3160 Natural dystrophic lakes and ponds<br>7130 Blanket bogs | |
| Slieve Beagh Mullaghfad Lisnaskea SPA | Physical connectivity and Hydrological connectivity | | A082 *Circus cyaneus* |
| Slieve Beagh SAC | Physical connectivity and Hydrological connectivity | 3160 Natural dystrophic lakes and ponds<br>7130 Blanket bogs (* if active bog) | |
| Slieve Gullion SAC | Aerial emission connectivity | 4030 European dry heaths | |
| Upper Lough Erne SAC | Physical connectivity and Hydrological connectivity | 3150 Natural eutrophic lakes with *Magnopotamion* or *Hydrocharition*-type vegetation<br>91A0 Old sessile oak woods with *Ilex* and *Belchnum* in the British Isles<br>91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanae, Salicion albae*)<br>1355 Otter | |
| Upper Lough Erne SPA | Physical connectivity and Hydrological connectivity | | A038 *Cygnus cygnus* |
| West Fermanagh Scarplands SAC | Aerial connectivity | 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuco-Brometalia*) (* important orchid sites)<br>6410 Molinia meadows on calcareous, peaty or clayey-silt-laden soils (*Molinion caeruleae*)<br>8240 Limestone pavements<br>9180 *Tilio-Acerion* forests of slopes, screes and ravines | |

# 6. Impact Prediction

## 6.1 Overview

This Screening for AA takes into account the potential impact the draft FESLUP may have on relevant QIs and SCIs. Transboundary impacts on European sites found within Northern Ireland are reviewed where the implementation of the draft FESLUP has the potential to impact on sites outside the Member State territory.

## 6.2 Potential for Likely Significant Effects

The potential for likely significant effects arising from the implementation of the draft FESLUP on European sites cannot at this stage be confirmed based on the level of detail available however, they may be inferred particularly in relation to the relevant QIs, and SCIs stated in Section 4.5.

Examples of generic effects include:

- Direct and indirect effects;
- Short and long-term effects;
- Disturbance effects; and
- Isolated, interactive, indirect, and cumulative effects;

The likely potential effects that could arise through the implementation of this draft FESLUP are outlined below:

- Habitat loss, destruction, fragmentation and degradation through forestry activities: including afforestation and re-planting, harvesting, thinning and felling;
- Habitat loss, destruction, fragmentation and degradation through construction of forestry related infrastructure (forest roads, drainage) operational and decommissioning effects;
- Habitat loss, destruction, fragmentation and degradation through construction, maintenance and upgrades of recreation related amenities such as paths, trails, carparks, public toilets etc;
- Loss/reduction of habitat area;
- Disturbance to habitats, important ecological features, and hydrological regime;
- Habitat/species fragmentation;
- Reduction in species density;
- Species mortality; and
- Changes in key indicators of conservation value (e.g., decrease in water quality/quantity).

## 6.3 Potential Effects of the Draft FESLUP

A summary of the main potential ecological impacts that could arise from the implementation of the draft FESLUP are presented below and are used in the impact prediction.

### 6.3.1 Habitat Loss, Destruction, Fragmentation or Degradation to relevant QIs and SCIs

The loss or destruction of habitat occurs where there is a complete removal or conversion of a habitat type; for example, arising from the planting of forests, the development of trails, paths and related recreation infrastructure, forest road construction, construction of amenities such as carparks, public toilets etc., on a particular habitat type e.g., grasslands.

Habitat fragmentation is defined as the process during which a large expanse of habitat is transformed into a number of smaller patches of smaller total area isolated from each other by a matrix of habitats unlike the original[73]. This can occur where forestry or recreation related infrastructure (drainage, walking trails, forest roads) prevents the natural movement of species within a larger landscape. This is relevant where important corridors for movement or migration are disrupted e.g., migration routes for fish species e.g. Atlantic salmon, along river corridors which have been affected by hydrological changes due to infrastructure development for recreation or drainage for commercial forestry.

Habitat degradation can occur where the quality of habitat and/or its functions is diminished. This can potentially occur for example in areas that become accessible for recreation/tourism or where commercial forestry (planting, forest road construction/operation) could introduce an invasive species through the movement of machinery and people. This could arise from poor planning and management practices.

### 6.3.2 Disturbance to relevant QIs and SCIs

Disturbance to relevant QIs and SCIs can potentially occur where there is an increase in noise levels or movements of people, vehicles and machinery as a result of tourism and forestry operations. This would include noise and movement by both machinery and humans which can occur during any recreational movement throughout the landscape, either through the use of vehicles or by foot and as a result of the planting, operation and felling stages of forestry. Machinery movement including those required for forest road construction, planting, felling, thinning and fertilising stages, and human movement associated with the aforementioned activities or recreation, can potentially disturb relevant QIs and SCIs, for example such as dunlin, red-throated diver and curlew from their resting/nesting places and dissuade species from foraging in an area where these activities are taking place. As a result, a species' range and habitat can be directly impacted. Recreational activities, and amenity developments, and commercial forestry activity in proximity to a species range within a European site and functionally linked areas supporting QIs, and SCIs has therefore the potential to cause disturbance to relevant QIs and SCIs. Scientific literature has noted the impacts of human related impacts on species, with potential significant negative effects on breeding success of bird species directly impacted through nest abandonment and via increased predation. Outside the breeding season, recreation can reduce the use of sites by birds. Where species are forced to escape disturbed sites, there is often the case where these species are required to travel further resulting in increased energy expenditure. Repeated disturbance can force species to travel further afield to forage from their nesting sites which can lead to negative impacts on populations including increased adult mortality, emigration and/or decreased reproductive success[74]. Disturbance through the use of vehicles in open landscapes has been shown to affect grazing birds in lowland and wetland habitats[75].

### 6.3.3 Indirect Effects to relevant QIs and SCIs

Indirect effects as a result of forest management, biodiversity management and recreation can potentially include a change in availability of nutrients and light, an increase in the vulnerability of the site to other new threats such as invasive alien species, changes to water quality and water movement and changes to habitat or species as a result of inadequate or inappropriate training to those involved in tourism and forestry. These indirect effects have the potential to occur during the course of recreation and tourism pursuits as well as during forestry operations including the afforestation process and throughout the lifetime of a forest.

Changes in the availability of nutrients and light could potentially occur during planting, thinning, and harvesting stages, impacting the ability of some plant species to grow, as well as indirectly affecting the predation capabilities of species such as merlin.

Changes to water quality and/or water movement could potentially occur during all stages of the afforestation process through either point and/or diffuse pollution and new or altered drainage patterns.

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[73] Fahrig, L. (2003). Effects of Habitat Fragmentation on Biodiversity. Annual Review of Ecology, Evolution, and Systematics, 34, 487–515. http://www.jstor.org/stable/30033784

[74] Platteeuw, Maarten; Henkens, Rene J H G. Possible impacts of disturbance to waterbirds: individuals, carrying capacity and populations. Wildfowl, [S.l.], p. 225-236, Jan. 1997. ISSN 2052-6458. Available at: <https://wildfowl.wwt.org.uk/index.php/wildfowl/article/view/1032>. Date accessed: 21 Jul. 2023.

[75] D. Hockin, M. Ounsted, M. Gorman, D. Hill, V. Keller, M.A. Barker, Examination of the effects of disturbance on birds with reference to its importance in ecological assessments, Journal of Environmental Management, Volume 36, Issue 4, 1992, Pages 253-286, ISSN 0301-4797, https://doi.org/10.1016/S0301-4797(08)80002-3.

Where recreational amenities are constructed and operational, changes in water quality may occur where pathways are inappropriately sited, waterbodies are altered due to the construction and operation of amenities (such as surface run-off from carparks, access-roads).

Planting, felling, fertilising and the use of chemicals can negatively impact water quality attributes such as dissolved organic carbon, pH and flow and lead to increased concentrations of toxic chemicals. The construction of infrastructure, such as the installation of culverts, bridges and drains can cause the release of suspended solids into watercourses and impact the natural hydrological regime of the watercourse both where immediately adjacent to the source and downstream.

Insufficient training on ecological sensitivities and risks to relevant QIs and SCIs delivered to those involved in the forestry process can have a potential impact on relevant QIs and SCIs. This is particularly the case where those involved are not trained in ecology, do not have sufficient ecological experience, and do not fully understand obligations under the Habitats and Birds Directive.

### 6.3.4 In Combination Effects to relevant QIs and SCIs

A series of individual insignificant effects may 'in combination' produce a significant effect. It is important to note that accounting for combined impacts will often only occur over time. Within this context, all relevant plans and/or projects which are completed, in preparation or approved but uncompleted must be considered. Where there is a series of small, but potentially adverse impacts occurring to relevant QIs and SCIs, consideration should be made as to their combined impacts.

When considering in combination effects the following should be taken account of:

- Projects completed;
- Projects approved but not started or uncompleted;
- Proposed projects (where an application has been submitted to the relevant competent authority, but no decision has been determined yet);
- Proposals in adopted plans; and
- Proposal in finalised draft plans formally published or submitted for consultation or adoption.

## 6.4 Likely Effects of the Draft FESLUP

The objectives within the draft FESLUP are national in their application and are limited in scale and detail. As a result, the discussion of the likelihood of significant effects is high-level. The level of detail and information within the draft FELSUP is insufficient to undertake detailed assessment of the adverse effects on individual European sites, however considering the land-use activities that occur within the Coillte estate, e.g. forestry and recreation, a summary of the potential for effects resulting from the implementation of the draft FESLUP across the pathways for effects has been established for relevant QIs and SCIs.

Without mitigation, there is potential for the implementation of the draft FESLUP which promotes the creation of new woodlands, redesign of peatlands, increase of carbon storage, generation of wind energy, enhancement and restoration of biodiversity, the production and promotion of wood products and increase in the number of recreation areas, to have adverse effects on the integrity of the European site network.

The information provided within this document should be built upon and used to guide and inform future AA of the future FESLUP Implementation Plan and subsequent plans that may evolve from the actions within. This includes a thorough assessment of the QIs/SCIs, conservation objectives, current condition of the relevant European Sites (including supplementary advice if available) and potential effects on QIs/SCIs as a result of each proposed plan, to determine appropriate mitigation (if required) and any adverse effects on integrity of the site.

# 7. AA Screening - Assessment of Effects

## 7.1 Overview

The list of objectives proposed within the draft FESLUP have been screened for Appropriate Assessment to consider any potential for likely significant effects. This has been summarised in Table 4 below. Any measures within the draft FESLUP that have the potential for likely significant effects have been brought forward to Stage 2 Appropriate Assessment in Section 8.

**Table 4 Screening assessment of the proposed objectives of the draft FESLUP**

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| Forests for Climate | | | | |
| Ambition 1 - Enable the creation of 100,000 hectares of new forests, half of which will be native woodlands, which will sink 18m tonnes CO2 by 2050. | CO1. Undertake a review to understand Land Use policy implications for Commercial & Native afforestation and assess land resource availability. | Desktop review & research | The act of undertaking a review to understand land use policy implications and assessing land resource availability is understood to be a desk-based activity. This objective does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | CO2. Engage with government and other key regulatory bodies to ensure that the policy and regulatory framework supports Coillte's Climate ambitions. | Engagement and collaboration | This act of influencing government and key stakeholders does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | CO3. Support Local and National Government to develop afforestation opportunities on suitable publicly owned lands | Engagement and collaboration | The act of collaboration does not in itself lie within the scope of management or conservation of European sites. This particular objective does not pertain to the implementation of afforestation on suitable publicly owned lands. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | CO4. Collaborate with key stakeholders to explore options for farmer led afforestation. | Engagement and collaboration | The act of collaboration does not in itself lie within the scope of management or conservation of European sites. This particular objective does not pertain to the implementation of farmer led afforestation. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its QIs/SCIs. | Screened Out |
| | CO5. Secure the necessary investment to achieve Coillte's Climate ambitions by exploring all sources of available funding. | Desktop review & research<br>Engagement & Collaboration | Securing investment and exploring sources of available funding does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its QIs/SCIs. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| Ambition 2 - Redesign 30,000 hectares of Peatland Forests for climate and ecological benefits by 2050. | CO6. Synthesise existing information that identifies potential location(s) for the redesign of peatlands at scale. | Desktop review & research | The synthesis of existing information to identify potential locations for the redesign of peatlands at scale is a desk-based activity. This objective in itself does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | CO7. Continuously develop guidelines for the redesign of peatlands based on best Irish and international practice.. | Desktop review & research<br>Policy, plan, standards and guideline development | The development of guidelines for the redesign of peatlands does not in itself lie within the scope of management or conservation of European sites. There is the potential for likely significant effects on European sites however, where the design of these guidelines, if done incorrectly, could lead to likely significant effects on the European site network or its respective QIs/SCIs. | Screened In |
| | CO8. Establish monitoring and management frameworks for redesigned peatlands. | Policy, plan, standards and guideline development<br>Desktop review & research<br>Development of desk based tools | The establishment of monitoring and management framework for redesigned peatlands does not in itself lie within the scope of management or conservation of European sites. There is the potential for likely significant effects on European sites however, where the design of monitoring and management frameworks, if done incorrectly, could lead to likely significant effects on the European site network or its respective QIs/SCIs. | Screened In |
| Ambition 3 – Manage the existing Forest Estate to increase the carbon store by 10m tonnes of CO2 by 2050. | CO09. Utilise land use planning models to deliver balanced carbon mitigation management options to achieve the 10m tonnes of CO2 storage target. | Engagement and collaboration | Utilising land use planning models to deliver balanced carbon mitigation does not fall within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | CO10. Undertake continued refinement and analysis of the impact of forest management and mitigation measures to improve forest productivity, including managing the age profile to achieve our climate ambitions.. | Desktop review & research | Refinement and analysis are desk top based activities which does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | CO11. Identify and quantify the impacts of climate change and develop measures to make Coillte's estate more climate resilient. | Desktop review & research<br>Engagement & Collaboration<br>Other management | This objective is a desk-based activity and does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall result in the potential for likely significant effects on the European site network. | Screened In |
| | CO12. Develop evidence and understanding of carbon management within the forest and across the forestry supply chain, and pilot new decision-making tools. | Desktop review & research<br>Commercial forestry operations<br>Development of desktop based tools | In the absence of mitigation the application of new decision making tools has the potential to interact with the European site network and its QI/SCIs during its implementation. Where these decision making tools are not appropriately designed to reflect environmental and ecological conditions, and specifically in consideration of the Habitats Directive, this has the potential to result in likely significant effects. Potential likely significant effects include habitat loss, degradation, fragmentation, disturbance to QIs/SCIs and indirect effects on European sites. | Screened In |
| | CO13. Deepen our understanding of the potential of product substitution from harvested wood and undertake additional analysis related to fossil fuel displacement and value chain emissions. | Desktop review & research<br>Engagement & collaboration | This objective is a desk-based activity and does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall result in the potential for likely significant effects on the European site network. | Screened Out |
| Ambition 4 - Generate an additional 1 Gigawatt of renewable wind energy to power 500,000 homes by 2030. | CO14. Support FuturEnergy Ireland and 3rd party renewable energy developers in their current and future renewable energy endeavours. | Support Provision<br>Engagement and collaboration | The provision of support or the act of engagement does not lie within the scope of management or conservation of European sites. Where this support provision and engagement is not cognisant of the requirements of the Habitats and Birds Directives, forthcoming actions in relation to this support could have the potential to result in likely significant effects on European sites or its respective QIs/SCIs. | Screened In |
| | CO15. Engage with Government along and key stakeholders to ensure that the policy and regulatory framework can effectively deliver the approval and granting of permissions for renewable energy projects including a correctly structured, timely and well-resourced planning appeals process | Engagement and collaboration | The act of influencing does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall result in the potential for likely significant effects on the European site network. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | CO16. Develop a clear policy and explore opportunities for both onshore and offshore grid infrastructure, rollout and services to support ongoing development. | Policy, plan, standards and guideline development<br>Desktop review & research<br>Engagement and collaboration | Developing policy and exploring opportunities for onshore and offshore grid infrastructure etc., does not lie within the scope of management or conservation of European sites. Where the development of such policies are not informed by environmental and ecological data, and compliant with the requirements of the Habitats and Birds Directives, there is the potential that its implementation may result in the potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened In |
| Forests for Nature | | | | |
| 5 - Enhance and restore biodiversity by increasing the area of our estate managed primarily for nature from 20% to 30% by 2025 | NO1. Classify additional biodiversity areas on the estate, focusing on habitats of the best ecological quality, and/or which have the best habitat restoration potential. | Desktop review & research | Activities relating to mapping are perceived to be desktop activities and do not lie within the scope of management or conservation of European sites and/or QIs/SCIs. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network. | Screened Out |
| | NO2. Continue the process of producing and implementing management plans for biodiversity areas, combining both ecological and forestry perspective and expertise. | Biodiversity management<br>Policy, plan, standards and guideline development | Continuance of developing management plans for biodiversity does have the potential to result in likely significant effects on European sites where the conservation objectives of QIs/SCIs are not adhered to. There is potential that actions designed within the management plans could result in unintended consequences on European sites/QIs/SCIs such as habitat fragmentation, degradation, disturbance and indirect effects as a result of their implementation. | Screened In |
| | NO3. Create a framework for the selection, appropriate restoration and conservation of ancient and long-established woodland, and engage with key regulatory bodies to promote the approach. | Policy, plan, standards and guideline development<br>Biodiversity management | The creation of a framework and engagement of key regulatory bodies does not within itself lie within the scope of management or conservation of European sites and/or QIs/SCIs. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network, QIs or SCIs. | Screened Out |
| | NO4. Continue to increase the implementation of alternative silvicultural systems including continuous cover forestry (CCF) in forests of ecological value. | Commercial forestry operations | Increasing the implementation of alternative silvicultural systems including CCF in forests where the ecological objectives require it does have the potential to result in likely significant effects on the European site network. Unintended consequences of implementing these management techniques include habitat loss, fragmentation, degradation, disturbance and indirect effects. | Screened In |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| 6 - Transform areas of our forests so that 50% of our estate is managed primarily for Nature in the long-term | NO5. Develop metrics, set targets and develop an effective regime to monitor and report on key environmental parameters on the Coillte estate; including valuable habitats / species and the ecological benefits of biodiversity management actions. | Biodiversity management<br>Policy, plan, standards and guideline development<br>Engagement and collaboration | Developing targets and set of metrics for monitoring and reporting does not in itself pertain to the implementation of such metrics/targets or approaches. As a result, it does not fall within the scope of management or conservation of European sites and/or QIs/SCIs. It is not anticipated that this particular objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs. | Screened Out |
| | NO6. Continue to identify portions of the estate with potential to make greater contribution to biodiversity and explore opportunities to transform them to improve their nature conservation value. | Biodiversity management | The act of identifying portions of the forest estate that are not contributing significantly to the values of climate, nature, wood or people is a desk based activity pertaining to review of data and further research. As a result, it does not fall within the scope of management or conservation of European sites and/or QIs/SCIs. It is not anticipated that this particular objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs. | Screened Out |
| | NO7. Engage with key regulatory and other bodies to develop a common vision for how these sites (ref NO6) should be managed. | Engagement and collaboration<br>Policy, plan, standards and guideline development<br>Biodiversity management | Engagement with key regulatory and other bodies to develop a vision does not in itself relate to the implementation of such a vision on a site basis. As a result, it does not fall within the scope of management or conservation of European sites and/or QIs/SCIs. It is not anticipated that this particular objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs. | Screened Out |
| | NO8. Develop protocols for managing these sites (ref NO6), appropriate to their scale, habitat connectivity and site type, that will improve their nature conservation value. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Biodiversity management | Developing protocols for managing these sites, appropriate to their scale, habitat connectivity and site type to improve nature conservation value etc., is anticipated to have positive impacts on the European site network, QIs and SCIs. However, where these protocols are not appropriate designed there exists the potential for likely significant effects on the European site network, QIs or SCIs. | Screened In |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| Additional Nature Objectives | NO9. Review and update, as appropriate, Environmental Risk Assessment (ERA) standards and procedures to inform planning and operations, in line with ongoing and emerging best practice. | Desktop review & research<br>Commercial forestry operations<br>Policy, plan, standards and guideline development | The continuation of developing Environmental Risk Assessment standards and procedures that inform planning and operations does not lie within the scope of management or conservation of the European site network. This objective pertains to desk top activity and does not pertain to its implementation. It is not anticipated that this particular objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs. | Screened Out |
| | NO10. Identify and implement ways of improving the advance planning of biodiversity management actions and integration into business planning, where appropriate and feasible. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Biodiversity management | Identifying and implementing ways to improve advance planning of biodiversity management actions and integration into business planning does not lie within the scope of management or conservation of the European site network. The act of exploration does not pertain to implementation of actions within biodiversity management or business planning. Therefore, it is not anticipated that this particular objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs. | Screened Out |
| | NO11. Identify and implement methods to improve inventory processes and data-gathering, to expand our knowledge of nature on the estate and our reporting capacity. | Desktop review and research<br>Policy, plan, standards and guideline development<br>Biodiversity Management | Identifying and implementing methods to improve inventory processes and data gathering to expand knowledge of nature within the Coillte Estate is broadly positive for biodiversity, but there does pose the potential for likely significant effects on the European site network.<br><br>Potential impacts to European sites/QIs/SCIs may occur where procedures are not designed with full cognisance of the suite of QIs (and respective COs) that may be present on a site by site basis.<br><br>Unintended likely significant effects may include disturbance to QIs/SCIs and indirect effects such as changes to water quality etc., | Screened In |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | NO12. Review and improve methods for how biodiversity features and other important environmental features are recorded across the estate. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Biodiversity Management | Continuing to improve and build how biodiversity and environmental features are recorded is broadly positive in its nature, however, there is the potential to result in likely significant effects on the European site network. Where there is direct implementation of recording methods occurring in-situ, there is the potential for unintended effects of disturbance to QIs/SCIs and indirect effects during recording methods. | Screened In |
| | NO13. Enhance guidance for the management of habitats and species relevant to Coillte's estate and activities. | Development of desk based tools<br>Policy, plan, standards and guideline development<br>Biodiversity management<br>Engagement and collaboration | The enhancement of guidance on habitats and species relevant to Coillte's estate and activities does have the potential to result on likely significant effects on the European site network. Whilst this is broadly positive for biodiversity, without the input of specialists during development, there is the potential for unintended significant effects on QIs and/or SCIs. Effects such as disturbance and indirect effects have the potential to occur where this operational guidance is not customised on a site-by-site basis and not in keeping with the conservation objectives of European sites that are within or connected to.<br><br>Partnering with relevant agencies to achieve guidance that is both science-based and evidence-based is anticipated to be engagement and collaboration and as such this is not anticipated to result in likely significant effects on European sites. | Screened In |
| | NO14. Proactively engage with the relevant regulatory agencies on the measures required to move statutory designated sites to favourable conservation status. | Engagement and collaboration | The act of engagement with regulatory agencies pertains to stakeholder input and collaboration. It does not relate to the implementation of such measures to move statutory designated sites to favourable conservation status. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | NO15. Proactively engage with relevant agencies to develop a science-based understanding of the interaction between forests and water. | Engagement and collaboration<br>Desktop review & research<br>Commercial forestry operations | Proactive engagement with agencies defines the overarching action within this objective. Understanding the interaction between forests and water in conjunction with these agencies, refers to collaboration and research and does not in itself pertain to the management or conservation of European site.<br><br>It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network, QIs and/or SCIs. | Screened Out |
| | NO16. Engage with relevant agencies and stakeholders to explore how Coillte can play a role in delivering programmes and measures aimed at enhancing water quality in catchments. | Engagement and collaboration | The act of engagement with other agencies and stakeholders pertains to collaboration and discussion and does not in itself relate to direct implementation of programmes and measures to enhance water quality in catchments.<br><br>Therefore this objective in itself does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effect on the European site network, QIs and/or SCIs. | Screened Out |
| | NO17. Collaborate with relevant stakeholders to develop national strategies towards the management of invasive species. | Engagement and collaboration<br>Biodiversity management<br>Other management | Collaboration with relevant stakeholders on the development of national strategies does not in itself lie within the scope of management or conservation of European sites, its QIs or SCIs. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network, its QIs or SCIs. | Screened Out |
| | NO18. Collaborate and engage as a key partner with the ongoing preparation of the Deer Management Strategy and seek to implement once published, in so far as possible and appropriate. | Engagement and collaboration<br>Other management | Collaboration and engagement in the preparation of the national deer management strategy pertains to collaborative action with relevant stakeholders engaged within the deer management strategy. Collaboration and engagement does not fall within the scope of management or conservation of European sites, its QIs or SCIs. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network, its QIs or SCIs.<br><br>In addition, such a strategy will be subject to a Screening for Appropriate Assessment (at minimum) and therefore the potential for any likely significant effects would be addressed within that respective AA. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | NO19. Identify and target appropriate funding mechanisms that will enable the implementation of conservation and protection measures at scale. | Desktop review & research<br>Engagement and collaboration | Identifying and targeting funding mechanisms is the action within this particular objective. It does not in itself fall within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network, its QIs or SCIs. | Screened Out |
| Forests for Wood | | | | |
| Ambition 7 – Produce 25m cubic metres of certified Irish timber, to support the construction of 300,000 homes by 2030. | WO1. Maintain production capacity to harvest and supply certified roundwood to support timber production. | Commercial forestry operations | Maintaining the current capacity to harvest and supply certified roundwood does not lie within the scope of management or conservation of European sites. Harvesting roundwood does have the potential to incur likely significant effects where sites are located within European sites. This objective is brought forward to Appropriate Assessment. | Screened In |
| | WO2. Maintain independent environmental certification of Coillte-managed forests. | Desktop review & research<br>Commercial forestry business management | Independent environmental certification of Coillte managed forests does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO3. Work with other contributors to produce a twenty-year all-Ireland roundwood forecast every five years. | Engagement and collaboration<br>Desktop review & research<br>Policy, plan, standards and guideline development<br>Commercial forestry business management | Working with contributors to produce a forecast does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO4. Introduce a three-year rolling tactical plan for roundwood supply that addresses all the short-term and medium planning requirements to make roundwood available in each planned year of operations. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Commercial forestry business management<br>Commercial forestry operations | Introducing a plan for roundwood supply does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO5. Report annually to the wood processing sector on the available supply of roundwood for the year ahead and the actual supply that materialised in the previous year. | Desktop review & research<br>Engagement and collaboration<br>Commercial forestry business management | Reports to wood processing sector does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | WO6. Ensure that access to the Forest Estate for the purpose of Roundwood removals is maintained through Forest Industry Transport Group collaboration with the partners and stakeholders. | Engagement and collaboration | Ensuring that access to the forest estate is maintained through collaboration does not in itself pertain to direct implementation of forestry roads etc.,. This objective therefore does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO7. Monitor forest health and condition to detect and mitigate against the potential impact of pests and diseases and guide management interventions to ensure that the estate can continue to deliver under the pillars of Climate, Nature, Wood and People. | Commercial forestry operations<br>Commercial forestry business management<br>Other management | Monitoring forest health and condition is anticipated to be broadly positive in its nature. Monitoring forest health and condition does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO8. Maintain timber security measures including the geofencing of all forests and tracking of roundwood removals from the Coillte Estate. | Commercial forestry operations<br>Commercial forestry business management | Geofencing is a virtual perimeter and not a physically present feature. Maintaining timber security measures does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO9. Support innovation and the adoption of new technologies and practices to enhance the efficiency of the roundwood supply chain, including mechanisms for monitoring roundwood stocks in the forest. | Support Provision<br>Development of desk-based tools<br>Commercial forestry operations | The act of support of innovation does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO10. Support government and other stakeholders to expedite the approval and granting of forestry licences to ensure that sufficient and consistent volumes of roundwood supply are available. | Support Provision | The act of support does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | WO11. Promote initiatives aimed at increasing public awareness regarding the importance of forests in delivering the wood supply needed to meet Irish housing demand. | Engagement and collaboration | The promotion of initiatives to increase public awareness does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| Ambition 8 – Promote the use and benefits of wood products to increase the level of timber homes from 20% to 80% by 2050. | WO12. Deliver comprehensive evidence on the benefits delivered by the forestry sector (to the circular and bioeconomy) and on the benefits of using home grown sawn-wood in construction. | Desktop review & research | Delivering comprehensive evidence on the benefits of the forestry sector does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO13. Engage with government and relevant bodies to revise regulations concerning the use of wood in construction in Ireland. | Engagement and collaboration | Engagement with government and stakeholders does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO14. Engage with government and relevant bodies to introduce green procurement guidelines for new public buildings and to introduce sustainability mechanisms in construction to reduce the carbon footprint of new builds. | Engagement and collaboration | Engagement with government and stakeholders does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO15. Support the demonstration of new forms of timber-based construction in Ireland.. | Engagement and collaboration | The provision of support does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | WO16. Assist in the development of design guidance for practitioners and educational courses in timber building systems including the use of mass timber and timber frame construction in Ireland. | Desktop review & research<br>Engagement and collaboration<br>Commercial forestry business management | Providing assistance in the development of design guidance and educating practitioners for timber building systems does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| Forests for People | | | | |
| Ambition 9 - Enable the investment of €100m in world-class Visitor Destinations to support growth in tourism and recreation by 2030. | PO1. Identify priority site locations and develop masterplans for future Visitor Destinations. | Desktop review & research<br>Policy, plan, standards and guideline development | The identification of priority site locations and the development of masterplans has the potential to incur likely significant effects on the European site network where sites are located within, adjacent or connected to a European site network. There is the potential for habitat loss, degradation, fragmentation, disturbance and/or indirect effects to (a) European site(s) QIs/SCIs could occur where these sites and/or implementation of masterplans occurs. | Screened In |
| | PO2. Strengthen our strategic partnership for the delivery of Visitor Destinations with Failte Ireland to support shared objectives. | Engagement and collaboration | Engagement with Failte Ireland to support shared does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO3. Engage with Local Authorities to identify opportunities to create recreational projects of scale, in line with local and national development plans | Engagement and collaboration<br>Desktop review & research | Engagement with local authorities to identify opportunities does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO4. Monitor visitor numbers and measure impact, to protect the environment and enhance customer experience.. | Desktop review & research<br>Development of desktop based tools | The action of monitoring visitor numbers and measuring their impact relates to desktop based activities and does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO5. Develop commercial partnerships that support investment to deliver outstanding Visitor destinations. | Engagement and collaboration | The development of commercial partnerships does not lie within the scope of the management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| Ambition 10 - Double the number of Recreation Areas to 500, to benefit local communities and people's wellbeing. | PO6. Create a system of classification for Recreation Areas, setting out the offer and facilities to be provided for each category | Desktop review & research<br>Policy, plan, standards and guideline development<br>Development of desktop based tools | Creating a classification system for recreation areas has the potential to result in likely significant effects on European sites where the system is not strongly influenced by the presence and protection of important ecological features including QIs and SCIs of European sites. There is the potential for unintended consequences on European sites as a result of this objective. | Screened In |
| | PO7.Develop assessment criterion to identify locations for future Recreational Areas. | Desktop review & research<br>Development of desktop based tools | Creating assessment criteria does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO8. Develop a community model to enable public and local authority involvement in the development of Recreation Areas. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Development of desktop based tools | Developing a community model to enable public and local authority involvement is a desk based activity and does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs | Screened Out |
| | PO9. Develop methods to measure and quantify the social and wellbeing benefits of outdoor recreation.. | Desktop review & research<br>Development of desktop based tools | Developing methods to measure and quantify social and wellbeing benefits does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs | Screened Out |
| Ambition 11: Create 1,200 new jobs in rural communities to support the just transition to a low carbon economy. | PO10. Support businesses of different types and scales to develop and grow markets for value-added wood products, forest tourism and recreation opportunities. | Support provision | The provision of support does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO11. Support the operational contractor base to grow and diversify, so that it has the capacity to deliver Coillte's afforestation, peatland redesign and nature ambitions | Support provision | The provision of support does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |

| Response to Ambition | Objective | The 'Source' category for which the objective sits within per Section 5.3 | Discussion of the potential for likely significant effects | Screening Outcome |
|---|---|---|---|---|
| | PO12. Enhance operational guidance for staff and contractors regarding biodiversity management and peatland redesign. | Biodiversity management<br>Other management<br>Internal staffing development | Enhancing operational guidance for staff and contractors has the potential to result in likely significant effects on European sites where the guidance is not designed appropriately. The potential for unintended consequences upon European sites may occur as a result. | Screened In |
| | PO13. Support the provision of education and training to attract new entrants to the sector and enhance skills in new and emerging areas | Support provision | The provision of support does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO14. Support the enhancement of the curriculum in tertiary education and the development of apprentices to attract new forestry and related professionals to the sector. | Support provision | Supporting curriculum enhancement does not lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO15. Support and continue to engage with government and other stakeholders towards the inclusion of forestry skills on the Critical Skills List. | Support Provision<br>Engagement and collaboration | The act of support does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| Additional People Objectives: Human wellbeing & health | PO16. Maintain occupational health and safety across the Coillte estate. | Commercial forestry business management | Maintaining occupational health and safety does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |
| | PO17. Expand the Woodlands for Health programme. | Desktop review & research<br>Engagement and collaboration<br>Support provision | The expansion of the Woodlands for Health programme does not in itself lie within the scope of management or conservation of European sites. It is not anticipated that this objective shall pose any potential for likely significant effects on the European site network or its respective QIs/SCIs. | Screened Out |

## 7.2 Assessment of In-Combination Effects with Other Plans or Projects

The following approach has been adopted;

- Identify plans/projects that might act in combinations;
- Identify types of impacts that might occur;
- Define the boundaries of the assessment;
- Identify pathways for impacts; and
- Impact prediction and assessment.

Table 5 outlines the policies, plans, and projects which have been reviewed and assessed for potential in-combination effects.

**Table 5 In Combination Assessment with other Policies, Plans and Projects**

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| European Union Level | | |
| 8th Environmental Action Programme (EAP) to 2030<br><br>Guides European environmental policy until 2030, supporting the climate action objectives of the European Green Deal. It's overarching aim is to 'ensure wellbeing for all, while staying within the planetary boundaries (Commission, 2022).' | Improved habitat and species protection; Improvements to environmental quality; and Climate resilience To support the Green Deal to 2050 the EAP has six priority objectives including: restoring biodiversity and enhancing natural capital/ ecosystems; achieving greenhouse gas reduction targets and for the EU to be climate neutral by 2050; enhancing adaptiveness and increasing resiliency to the effects of climate change; decoupling economic growth from resource use and therefore degradation of the environment; aiming for a zero-pollution environment; and reducing pressures on the environment and the climate from consumption/production. The Draft Ireland's Forest Strategy Implementation Plan (IFSIP) is broadly aligned with the actions identified in the EAP and green deal. It is anticipated that there is potential for positive in-combination effects with the Draft IFSIP | Improved habitat and species protection; Improvements to environmental quality; and Climate resilience To support the Green Deal to 2050 the EAP has six priority objectives including: restoring biodiversity and enhancing natural capital/ ecosystems; achieving greenhouse gas reduction targets and for the EU to be climate neutral by 2050; enhancing adaptiveness and increasing resiliency to the effects of climate change; decoupling economic growth from resource use and therefore degradation of the environment; aiming for a zero-pollution environment; and reducing pressures on the environment and the climate from consumption/production. The draft FESLUP is broadly aligned with the actions identified in the EAP and green deal. It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| EU Green Deal<br><br>The deal will transform the EU into a modern, resource-efficient and competitive economy, aiming for no net emissions of greenhouse gases by 2050 and to decouple economic growth from resource use. Improved habitat and species protection; Improvements to environmental quality; and Climate resilience (Commission, 2019). | EU Green Deal The deal will transform the EU into a modern, resource-efficient and competitive economy, aiming for no net emissions of greenhouse gases by 2050 and to decouple economic growth from resource use. Improved habitat and species protection; Improvements to environmental quality; and Climate resilience | A number of actions have been assigned through the EU Green Deal, relevant to the draft FESLUP are the EU Biodiversity Strategy to 2030, development of a Zero Pollution Action Plan, and the EU Forest Strategy for 2030. The draft FESLUP is broadly aligned with the actions identified in the green deal and would be expected to give rise to positive in combination effects. It is anticipated that there is potential for positive in-combination effects. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| EU Forest Strategy for 2030<br><br>The strategy builds on the EU Biodiversity Strategy to 2030 and will contribute to achieving the EU's greenhouse gas emission reduction target of at least 55% by 2030 and climate neutrality by 2050 (Commission, EU Forest Strategy for 2030, 2021). | Improved habitat protection, restoration, and improvement; Disturbance to habitats/species; Climate resilience; and Growth to sustainable bioeconomy. | The EU Forest Strategy has two main themes to it. The first is to protect the EU's last remaining primary and old growth forests, while promoting re/afforestation and sustainable forest management. The second aim of the strategy is to promote sustainable bioeconomy including sustainable use of wood-based resources for bioenergy and ecotourism. The draft FESLUP is broadly aligned with the actions outlined in the strategy and would be expected to give rise to positive in combination effects. It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| Land Use, Land-Use Change and Forestry (LULUCF) Regulation (EU 2018/841) The Regulation includes greenhouse gas emissions and removals from LULUCF into the 2030 climate and regulation framework (Union, 2018). | Habitat loss or destruction; Habitat fragmentation or degradation; Alterations to ecosystem services; Disturbance to habitats/species; and Climate change mitigation | The draft FESLUP is aligned with the LULUCF and sits within its framework and so there is no potential for in-combination effects. It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| Farm to Fork Strategy<br><br>This strategy is at the core of the European Green Deal with an aim to make food systems fair, healthy, and environmentally friendly (Commission, Farm to Fork Strategy, 2020). | Improved habitat and species protection; Improvements to environmental quality; and Climate resilience | The strategy is to ensure that the food chain, covering food production, transport, distribution, marketing, and consumption, has a neutral or positive environmental impact, preserving and restoring the land, freshwater and sea-based resources on which the food system depends; helping to mitigate climate change and adapting to its impacts; protecting land, soil, water, air, plant and animal health and welfare; and reversing the loss of biodiversity. It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| Zero Pollution Action Plan<br><br>The action plan requires among other commitments, that by 2030, the EU should reduce; by 25% the EU ecosystems where air pollution threatens biodiversity; by 50% nutrient losses, the use and risk of chemical pesticides, the use of the more hazardous ones, and the sale of antimicrobials for farmed animals and in aquaculture; by 50% plastic litter at sea and by 30% microplastics released into the environment (Commission, Zero Pollution Action Plan, 2021) | Improved habitat and species protection;<br><br>Improvements to environmental quality; and<br><br>Climate resilience | The primary purpose of the plan is to improve ecosystem health by reducing pollution, in the aim of improving the ability of ecosystems to provide services such as carbon sequestration and decontamination. The draft FESLUP is agreeable with the Zero Pollution Action Plan.<br><br>The potential for likely significant in-combination effects is not anticipated. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| Common Agricultural Policy (CAP)<br><br>A key agricultural policy with the main objectives of ensuring a decent standard of living for farmers and the provision of stable and safe food supply at affordable prices for consumers. The CAP through various iterations is the principal policy that drives agricultural management throughout the European Union. It recognises the economic and rural importance of agriculture through a system of subsidies and support programmes (Commission, 2023). | Improved habitat and species protection;<br><br>Improvements to environmental quality;<br><br>Climate resilience;<br><br>Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement; and Introduction or spread of invasive species. | Agriculture and forestry often compete for the same resources, and agriculture poses a significant pressure on habitats and species. The current CAP incorporates sustainable ambitions, in line with the EU Green Deal. Spatial planning and land use change under the draft FESLUP has the potential to cause in-combination effects. It is anticipated that there is potential for negative likely significant in-combination effects. |
| European Union Biodiversity Strategy to 2030<br><br>Aims to halt or reverse biodiversity loss and speed up the EU's transition towards a resource efficient and green economy as per the Convention on Biological Diversity (Commission, Biodiversity strategy for 2030, 2020). | Improved habitat and species protection;<br><br>Improvements to environmental quality;<br><br>Climate resilience; and<br><br>Reduced disturbance to habitats/species. | The primary purpose of the strategy is to halt the loss of habitat and species. The most relevant target to the draft FESLUP is to increase the contribution of forestry to biodiversity, integrating biodiversity needs into forest management plans. This aligns with some of the aims of the draft FESLUP and so there is potential for positive in-combination effect. It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| Environmental Liabilities Directive (LED)<br><br>This directive puts into practice the 'polluter pays' principle. Its aim is to encourage operators to take greater care to prevent damage in the first place, by following a precautionary approach (Commission, Environmental Liability, 2007). | Improved habitat and species protection. | The Directive defines "environmental damage" as damage to protected species and natural habitats, damage to water and damage to soil. No risk of likely significant in-combination effects will result as the primary purpose of the Directive is to improve environmental quality and protect habitats and species. The potential for likely significant in-combination effects is not anticipated. |
| Energy 2020 – A strategy for competitive, sustainable, and secure energy<br><br>Sets out three key requirements of energy supply; Security, competitiveness, and sustainability. It also sets out targets to increase the share of renewable energy to at least 20% of EU's consumption and to improve energy efficiency by at least 20% (Commission, Energy 2020, A Strategy for Competitive, Sustainable and Secure Energy, 2020). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Alterations to ecosystem services;<br><br>Disturbance to habitats/species; and<br><br>Climate change mitigation | The draft FESLUP has an aim to increase sustainable production of forest-based biomass to meet renewable energy targets. This target aligns with the Energy 2020 strategy however, there is acknowledgement that this has the potential to increase pressures on land use change and so the Energy 2020 strategy encourages second generation biofuels. There is potential for in-combination adverse effects through indirect land use change. It is anticipated that there is potential for negative likely significant in-combination effects. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| The Renewable Energy Directive (2009/28/EC)<br>Policy for the production and promotion of energy from renewable sources in the EU to implement 2020 strategy. The national 2020 target for Ireland is to source 16% from renewable resources (i.e., 40% electricity, 12% heat and 10% transport) (Commission, Directive 2009/28/EC of the European Parliment and of the Council on the Promotion of the use of Energy from Renewable Sources and Amending and Subsequently Repealing Directivews 2001/77/EC and 2003/30/EC, 2009). | Habitat loss or destruction;<br>Habitat fragmentation or degradation;<br>Alterations to ecosystem services;<br>Disturbance to habitats/species; and<br>Climate change mitigation. | The draft FESLUP shares the common goal for increasing sustainable sources of renewable energy. There is potential for in-combination adverse effects through indirect land use change.<br>It is anticipated that there is potential for negative likely significant in-combination effects. |
| The EU Policy Framework for Climate and Energy in the period from 2020 to 2030<br>Sets targets for the period 2020 to 2030:<br>Target of 27% renewable energy in the EU;<br>Increase energy efficiency by 27% by 2020; and<br>A 40% cut in greenhouse gas emissions compared to 1990 levels (Commission, The EU Policy Framework for Climate and Energy in the Period from 2020-2030, 2020). | Habitat loss or destruction;<br>Habitat fragmentation or degradation;<br>Alterations to ecosystem services;<br>Disturbance to habitats/species; and<br>Climate change mitigation. | The draft FESLUP shares the common goal for increasing sustainable sources of renewable energy. There is potential for in-combination adverse effects through indirect land use change. It is anticipated that there is potential for negative likely significant in-combination effects. |
| Energy Road Map 2050<br>This roadmap does not set specific energy targets at this point but does aim to achieve an 80% to 95% reduction in greenhouse gases compared to 1990 levels by 2050 (Commission, Energy Roadmap 2050, 2010). | Habitat loss or destruction;<br>Habitat fragmentation or degradation;<br>Alterations to ecosystem services;<br>Disturbance to habitats/species; and<br>Climate change mitigation. | The key aim of the Roadmap is a guide to a low carbon Europe. This plan is complimentary to elements of the draft FESLUP and so it is unlikely that adverse in-combination effects will be had. The potential for likely significant in-combination effects is not anticipated. |
| **Irish National Level** | | |
| National Development Plan (NDP) 2021-2030<br>The National Development Plan sets out the investment priorities that will underpin the implementation of the National Planning Framework (NPF). This will guide national, regional, and local planning and investment decisions in Ireland over the next two decades, to cater for an expected population increase of over 1 million people (Reform, 2022). | Habitat loss or destruction;<br>Habitat fragmentation or degradation;<br>Disturbance to habitats/species;<br>Alterations to water quality and/or water movement; and<br>Introduction or spread of invasive species. | The NDP is a high level budgetary and finance document which identifies priorities for capital investment. Given the nature of the capital investment the majority of the projects referenced and funded under the NDP have been or will be subject to EIA/AA. The NDP does not confer planning, it identifies strategic need. No potential for in-combination effects.<br>The potential for likely significant in-combination effects is not anticipated. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| National Planning Framework (Ireland 2040 Our Plan)<br><br>The National Planning Framework is a long-term strategy focussing on ensuring compatibility between future growth of cities/ towns within Ireland alongside environmental sustainability. The framework also includes the National Development Plan 2021-2030 (Department of Housing P. a., 2018). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement; and<br><br>Introduction or spread of invasive species. | National Policy Objective 52 through 65 ensure the resilience of our natural resources and cultural assets. Specifically Objective 59 to "Enhance the conservation status and improve the management of protected areas and protected species…"<br><br>The plan has been subject to AA and includes clear policy on avoidance of impacts to European sites.<br><br>The potential for likely significant in-combination effects is not anticipated. |
| Regional Spatial and Economic Strategies (RSES)<br><br>The RSES sets out the strategic regional development framework for the Region, with a primary aim to implement Project Ireland 2040 - the National Planning Framework, at the regional tier of Government and to support the achievement of balanced regional development. | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement; and<br><br>Introduction or spread of invasive species. | The RSES includes clear policy and supporting actions to avoid and minimise impacts on European sites. This includes commitments to only implement the policy base within the carrying capacity of the receiving environment as greater detail is known through the planning hierarchy.<br><br>The RSES has been subject to AA and includes clear policy on avoidance of impacts to European sites.<br><br>The potential for likely significant in-combination effects is not anticipated. |
| Climate Action Plan 2023<br><br>Climate Action Plan 2023 is the second annual update to Ireland's Climate Action Plan 2019. This plan is the first to be prepared under the Climate Action and Low Carbon Development (Amendment) Act 2021, and following the introduction, in 2022, of economy-wide carbon budgets and sectoral emissions ceilings (DECC, 2022). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement;<br><br>Introduction or spread of invasive species;<br><br>Alterations to air quality; and Climate resilience. | The plan focusses on energy, transport, waste, agriculture and buildings. The plan includes new governance structures necessary to implement changes and sets out specific targets for each sector. The main direction of the plan is positive and there is potential for positive in combination effects as it supports long term resilience to climate change.<br><br>Potential for in-combination effects as it sets out actions which are similar to the draft FESLUP through targets for sectors such as land use planning and agriculture, and renewable energy. Many of the policies are aligned with sectoral plans which include mitigation to avoid adverse effects.<br><br>It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| National Adaptation Framework (NAF)<br><br>The NAF sets out the national strategy to reduce the vulnerability of the country to the negative effects of climate change and to avail of positive impacts. It builds on the previous National Climate Change Adaption Framework 2012 (Department of the Environment C. a., National Adaptation Framework (NAF), 2018). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement;<br><br>Introduction or spread of invasive species;<br><br>Alterations to air quality; and Climate resilience. | The NAF is a high-level framework and does not identify specific locations, adaption measures or projects. It is likely that adaption approaches and details will be implemented via lower level adaption plans and strategies that have been or will be subject to EIA/AA. The NAF does not confer planning, it identifies strategic need. No potential for in-combination effects.<br><br>The potential for likely significant in-combination effects is not anticipated. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| Draft Biodiversity Action Plan 2023-2027<br><br>Ireland's fourth iteration of the Biodiversity Action Plan (BAP), for conserving and restoring Ireland's biodiversity covering the period 2017 to 2021.<br><br>The aims are to achieve Ireland's Vision for Biodiversity through addressing issues ranging from improving the management of protected areas to increasing awareness and appreciation of biodiversity and ecosystem services (DHLGH, 2022). | Improved habitat and species protection.<br><br>Reduced disturbance to habitats/species;<br><br>Improvements to water quality and/or water movement; and<br><br>Control of spread of invasive species. | The BAP is aimed at environmental protection and improvement to ecosystem services. As such, there is potential for positive in-combination effects with the draft FESLUP.<br><br>It is anticipated that there is potential for positive in-combination effects with the draft FESLUP. |
| Prioritised Action Framework for Natura 2000 (2021-2027)<br><br>This plan identifies the range of actions needed to help improve the status of Ireland's habitats and wildlife within the European site network (National Parks and Wildlife Service, 2021). | Improved habitat and species protection.<br><br>Reduced disturbance to habitats/species;<br><br>Improvements to water quality and/or water movement; and<br><br>Control of spread of invasive species | No risk of likely significant in-combination effects as this plan is entirely positive in its actions with the core aim to protect and improve European sites.<br><br>The potential for likely significant in-combination effects is not anticipated. |
| National Energy and Climate Plan (NECP) 2021-2030<br><br>This Plan builds on previous national strategies and sets out in detail the objectives regarding the five energy dimensions together with planned policies and measures to ensure that objectives are achieved. In June 2019, the government agreed to support the adoption of a net zero target by 2050 at EU level, and to pursue a trajectory of emissions reduction nationally which is in line with reaching net zero in Ireland by 2050 (Department of the Environment C. a., Ireland's National Energy and Climate Plan 2021-2030, 2018). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement;<br><br>Introduction or spread of invasive species;<br><br>Alterations to air quality; and<br><br>Climate resilience. | The NECP was prepared to incorporate all planned policies and measures that were identified up the end of 2019, and which collectively deliver a 30% reduction by 2030 in non-emissions trading system (ETS) greenhouse gas emissions.<br><br>As this draft Plan collates existing policies and measures, it was not subject to an AA since the individual policies and measures will have been if appropriate.<br><br>The potential for likely significant in-combination effects is not anticipated. |
| Food Wise 2025<br><br>Food Wise 2025 strategy identifies significant growth opportunities across all subsectors of the Irish agri-food industry. Growth projection includes increasing the value added in the agrifood, fisheries and wood products sector by 70% to in excess of €13 billion (Department of Agriculture F. a., Food Wise 2025, 2021). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Soil degradation; and<br><br>Disturbance to habitats / species | The Strategy was subject to an AA and SEA, where the strategic nature of the Strategy was acknowledged and that its subsequent implementation will be assessed at other stages where spatial and temporal detail will be set out.<br><br>There is potential for in-combination impacts as intensification of the forestry sector is promoted under both Food Wise 2025 and the draft FESLUP.<br><br>It is anticipated that there is potential for negative likely significant in-combination effects. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| Food Vision 2030 - A World Leader in Sustainable Food Systems<br><br>This ten-year strategy is the successor to the current Food Wise 2025 plan and aims to make Ireland a world leader in Sustainable Food Systems over the next decade. This strategy aims to increase the value of Irish agri-food exports from €14.2 billion in 2020 up to €21 billion by 2030 (Department of Agriculture F. a., Food Vision 2030 - A World Leader in Sustainable Food Systems, 2021). | Indirect effects (land-use changes and intensification)<br><br>Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Species mortality;<br><br>Soil degradation; and<br><br>Habitat loss or destruction/ | The strategy aims to achieve this intensification through sustainable steady value growth in a climate smart, environmentally sustainable agri-food sector. The AA concluded that the adoption of Food Vision 2030 would not have significant adverse effects on the integrity of any European sites. However, indirect impacts on European sites through land use change and intensification of land use from both the draft FESLUP cannot be ruled out. It is anticipated that there is potential for negative likely significant in-combination effects. |
| Our Rural Future: Rural Development Policy 2021-2025<br><br>The vision of this policy is for a thriving rural Ireland which is integral to our national economic, social, cultural, and environmental wellbeing and development (Development, Our Rural Future: Rural Development Policy 2021-2025, 2021). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Alterations to air quality; and<br><br>Introduction or spread of invasive species. | The Policy is a high-level framework and does not identify specific locations, adaption measures or projects. It is likely that the measures will, in due course, be subject to Screening for AA based on detailed operational plans and programmes based on accurate geographic information which is not included within the Policy. The Policy does not confer planning, it identifies strategic need. The potential for likely significant in combination effects is not anticipated |
| Action Plan for Rural Development (2019)<br><br>Action Plan for Rural Development sets out the Government's approach for rural places in Ireland to grow and adapt through supportive measures which encourage innovation and build on the existing strengths of rural communities in Ireland (Development, Action Plan for Rural Development, 2019). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species; Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Alterations to air quality; and<br><br>Introduction or spread of invasive species. | The Action Plan for Rural Development includes over 230 actions focussed on developing the rural economy. As forestry is predominately undertaken in rural areas and promotes rural employment there are direct synergies between the Action Plan and the draft FESLUP.<br><br>It is anticipated that there is potential for negative likely significant in combination effects |
| Nitrates Directive (91/676/EEC) and the Nitrates Action Programme (NAP)<br><br>This Directive has the objective of reducing water pollution caused or induced by nitrates from agricultural sources and preventing further pollution. The NAP is Ireland's response to implementing the directive (Department of Agriculture E. a., 2019). | Habitat degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement;<br><br>Reduction of nutrient enrichment and pollution; and<br><br>Alteration to air quality. | Ireland's fifth NAP is currently in draft and undergoing consultation.<br><br>No risk of likely significant in combination effects from the Directive is anticipated as the primary purpose of it is to improve environmental quality. Furthermore, it is noted that the latest update to the NAP is undergoing AA and an NIS is in preparation. This will ensure appropriate mitigation is included to prevent significant in-combination effects from occurring. The potential for likely significant in combination effects is not anticipated |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| National Peatlands Strategy<br><br>The National Peatlands Strategy 2015-2025 was developed to provide a long term strategy for the management of peatlands for their social, environmental, and economic well-being (Service, 2015). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Alterations to water quality and/or water movement; and<br><br>Alterations to air quality. | The National Peatland Strategy sets out a cross-governmental approach to managing issues that relate to peatlands including compliance with relevant national and international environmental legislation, agreements, plans and policies; climate change; forestry; water quality; flood control; energy; nature conservation and restoration; land use planning; and agriculture. Given the actions set out in the strategy, no in combination effects are predicted.<br><br>The potential for likely significant in combination effects is not anticipated |
| National Raised-Bog Management Plan<br><br>The current NPWS programme for the restoration of raised bogs throughout Ireland, as detailed within the National Raised Bog Management Plan, will deliver ecological benefits for both the raised bog habitats and watercourses downstream of these bogs by implementing a program of restoration and condition improvement (Department of Culture, 2017). | Improved habitat and species protection;<br><br>Improvements to environmental quality;<br><br>Climate resilience; and<br><br>Reduced disturbance to habitats/species | No risk of likely significant in combination effects will result as the primary purpose of the plan is to restore raised bog sites including those that form part of the European site network. The potential for likely significant in-combination effects is not anticipated |
| All Ireland Pollinator Plan (AIPP) 2021-2025<br><br>The All-Ireland Pollinator Plan for 2021-2025 is a new five-year road map that aims to help bees, other pollinating insects, and our wider biodiversity (Centre, 2015). | Improvements to environmental quality; and<br><br>Increased biodiversity. | The AIPP 2021-2025 has 186 actions spread across six objectives that are centred around making public and private lands more pollinator friendly. There is potential for positive in combination effects with the draft FESLUP. |
| Catchment based Flood Risk Assessment and Management (CFRAM) Programme, under the EU Floods Directive<br><br>The Office of Public Works (OPW) is responsible for the implementation of the Floods Directive 2007/60/EC which is being carried out through a Catchment based Flood Risk Assessment and Management (CFRAM) Programme. As part of the directive Ireland is required to undertake a Preliminary Flood Risk Assessment, to identify areas of existing or potentially significant future flood risk and to prepare flood hazard and risk maps for these areas. Following this, Flood Risk Management Plans (FRMPs) are developed for these areas setting objectives for managing the flood risk and setting out a prioritised set of measures to achieve the objectives. The CFRAM programme is currently being rolled out and Flood Risk Management Plans have been prepared. These plans have been subject AA (Works, 2021). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Alterations to water quality and/or water movement;<br><br>Disturbance; and<br><br>In-combination impacts within the same scheme | CFRAM Studies and their product Flood Risk Management Plans, have undergone AA. Any future flood plans will have to take into account the design and implementation of water management infrastructure as it has the potential to impact on hydro morphology and potentially on the ecological status and favourable conservation status of water bodies. The AA of the CFRAMs considered the potential for impacts from hard engineering solutions and how these might affect hydrological connectivity and hydro morphological supporting conditions for protected habitats and species.<br><br>The potential for likely significant in combination effects is not anticipated. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| River Basin Management Plans under the Water Framework Directive (2000/60/EC)<br><br>The primary purpose of this Directive and the various pieces of national legislation that have enacted through the implementation of River Basin Management Plans, is to achieve good status for all water bodies, with no deterioration in water body status. The RBMP sets out the PoM to achieve the objectives of the WFD (Commission, Directive 2000/60/EC of the European Parliment and of the Council, 2000). | Improved Water Quality;<br><br>Improved habitats; and<br><br>Increased resilience in habitats and species. | The primary purpose of the Directive is to improve ecological status and includes achievement of objectives of the Habitats and Birds Directives. The second cycle River Basin Management Plan 2018-2021 was published together with a NIS including mitigation to offset negative effects. The same process would be required for the 3rd RBMP 2022- 2027 which is currently in review stages.<br><br>The potential for likely significant in combination effects is not anticipated. |
| National Implementation Plan for the Sustainable Development Goals (2022-2024)<br><br>The Plan sets out five strategic objectives and 51 actions, with 119 individual measures to increase Ireland's ambition and strengthen implementation structures to achieve the Sustainable Development Goals (SDGs).<br><br>It also incorporates 23 external actions from four other National Plans or Strategies which contribute to and are complementary to the objectives of this Plan and which have been included for coherence and reporting purposes (Department of the Environment C. a., National Implementation Plan for Sustainable Development Goals 2022-2024, 2022). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Improved ecosystem services;<br><br>Improvements to environmental quality and protection; and<br><br>Climate resilience. | The core aims of the Plan are positive, however there is the potential for indirect impacts via land use change and this has the potential for in-combination effects with the draft FESLUP.<br><br>It is anticipated that there is potential for negative likely significant in combination effects. |
| Project Ireland 2040<br><br>The National Planning Framework is a long-term strategy for the next 20 years and it will focus on ensuring compatibility between future growth of cities/ towns within Ireland alongside environmental sustainability. It is intended that the National Planning Framework will both provide the focus to guide and inform future planning and set the framework for integrated investment decisions (Department of Housing L. G., Project Ireland 2040, 2019). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species; Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Alterations to air quality; and<br><br>Introduction or spread of invasive species. | It is a policy of the National Planning Framework to ensure the resilience of our natural resources and cultural assets. Linkage to wider policies such as for European sites under the Birds and Habitats Directives and the Water Framework Directive is recognised and the need to set high level planning policies in protecting and making responsible use of our natural environment. The plan has been subject to AA and includes clear policy on avoidance of impacts to European sites.<br><br>The potential for likely significant in combination effects is not anticipated. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| National Landscape Strategy (NLS) 2015-2025, under the Council of Europe's European Landscape Convention (ELC)<br><br>The NLS is used to ensure compliance with the ELC and to establish principles for protecting and enhancing it while positively managing its change (Department of Housing L. G., National Landscape Strategy, 2020). | Improved protection of landscape character. | The Strategy provides high level policy framework to achieve balance between the protection, management, and planning of the landscape by way of supporting actions.<br><br>It is likely that the plans, policies, and programmes designed to implement the Strategy will, in due course, be subject to Screening for AA based on detailed operational plans and programmes based on accurate geographic information which is not included within the Statement.<br><br>The Policy does not confer planning, it identifies strategic need.<br><br>The potential for likely significant in combination effects is not anticipated |
| Culture 2025<br><br>Culture 2025 is a Framework Policy to 2025 which sets the vision for the future of culture and the arts in Ireland and prioritises actions. It recognises the diverse and multi-faceted nature of culture in Ireland and the contribution of 'culture' to sense of self, national identity, and the arts (Department of Tourism, 2019). | Habitat loss or destruction;<br><br>Disturbance of species; and<br><br>Introduction or spread of invasive species. | There is potential for in-combination impacts due to increased recreational use of protected sites, and indirect impacts due to land use change. However, at a project level EIA/AA will be required and any mitigation necessary will be included.<br><br>The potential for likely significant in combination effects is not anticipated |
| National Renewable Energy Action Plan<br><br>The NREAP is produced as a requirement of the Renewable Energy Directive and sets out Ireland's "national targets for the share of energy from renewable sources consumed in transport, electricity and heating and cooling in 2020" (Department of Communications, 2009). | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species; Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Alterations to air quality; and Introduction or spread of invasive species. | This plan was not subject to AA, but some actions arising out of it have since been subject to AA owing to judicial review.<br><br>The plan is positive in that its aims are to accelerate the uptake on renewable energy, thereby reducing the dependence on fossil fuels.<br><br>The draft FESLUP will contribute to reaching the targets set out within the NREAP and as such the plans are complementary. There is potential for indirect impacts from land use change.<br><br>It is anticipated that there is potential for negative likely significant in combination effects. |
| Department of Agriculture, Food and the Marine – Ireland's Forest Strategy (IFS) 2022-2023<br><br>Ireland's Forest Strategy is linked to the Shared National Vision for the Future of forests within Ireland. It sets forward the objectives, values and goals for the forest estate within Ireland until 2030. | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Alterations to air quality; and Introduction or spread of invasive species. | Ireland's Forest Strategy was subject to an AA and SEA, where the strategic nature of the Strategy was acknowledged and that its subsequent implementation will be assessed at other stages where spatial and temporal detail will be set out<br><br>Considering the high level nature of both the IFS and the draft FESLUP, and the lack of geographic specificity in both, the potential of negative likely significant in-combination effects is not anticipated. |

| Plan/Project/Policy | Key Types of Impacts | Potential for In-Combination Effects |
|---|---|---|
| Department of Agriculture, Food and the Marine – Ireland's Forest Strategy Implementation Plan (IFSIP)<br><br>The IFSIP is the implementation of Ireland's Forest Strategy and is directed through a series of Interventions, requirements and measures to reflect the objectives, values and goals of Ireland's Forest Strategy. | Habitat loss or destruction;<br><br>Habitat fragmentation or degradation;<br><br>Disturbance to habitats/species;<br><br>Species mortality;<br><br>Alterations to water quality and/or water movement;<br><br>Alterations to air quality; and Introduction or spread of invasive species. | The Department's Forest Strategy Implementation Plan was subject to AA and SEA.<br><br>There is potential for in-combination impacts as intensification of the forestry sector is promoted under both the IFSIP and the draft FESLUP.<br><br>It is anticipated that there is potential for negative likely significant in-combination effects. |

## 7.3 AA Screening Conclusion

The Screening process for the potential for likely significant has been carried out and undertaken on a draft Plan that lacks precise detail concerning timelines or locations that may be implementable within a geographic region. As such and given the range of potential objectives that could be implemented in future plans and projects, the AA Screening has been undertaken in a strategic manner and in cognisance of the Precautionary Principle. It was concluded that the potential for likely significant effects could not be ruled out given the uncertainty as to how, where and when certain draft objectives could be implemented.

On completion of the AA Screening, it has been concluded that the potential for likely significant effects on relevant QIs and SCIs, and by extension the European site network, could not be ruled out. As a result, those objectives that have the potential for likely significant effects proceed to the next stage of the AA in Section 8.

# 8. Appropriate Assessment of the Draft FESLUP

## 8.1 Overview

This assessment considers the impacts that the objectives within the draft FESLUP will have on the integrity of the relevant QIs and SCIs as determined within Section 4.5 of this report. The potential effects have been assessed in the absence of any mitigation measures, and in consideration of the precautionary principle. It is noted that the draft FESLUP is a strategic document with high level objectives that lack intimate detail of the actions and measures that may be implemented in the future in addition to a lack of geographic specificity for their implementation. As this detail is developed in future plans by Coillte, further opportunity for assessment will be required to inform decision making at a granularity which cannot be undertaken at the national scale.

## 8.2 Appropriate Assessment: Purposes and Process

The outcome of the AA Screening for the draft FESLUP has determined that the proposed objectives could potentially have impacts on European sites. The potential for likely significant effects was considered through use of the Source-Pathway-Receptor method upon relevant QIs and SCIs. Likely significant effects could not be ruled out for a number of objectives of the draft FESLUP and therefore these are required to subject to Appropriate Assessment.

The AA involves analysing the potential for adverse interactions between the proposed objectives of the draft FESLUP through the Source-Pathway-Receptor method upon relevant QIs and SCIs.

Where the potential for an adverse impact to occur was identified, recommended text changes to the proposed objectives of the draft FESLUP have been provided to avoid or to mitigate the potential impact. These recommendations have been integrated into the draft FESLUP so that its implementation would not result in an adverse effect on the integrity of any European site, either alone or in combination with other plans or projects.

## 8.3 Approach to Appropriate Assessment

In line with the relevant guidance, this stage of the Appropriate Assessment consists of three main steps:

- **Impact Prediction** - where the likely impacts of the draft FESLUP are examined. The source-pathway-receptor model has been used to assess potential for impact;
- **Assessment of Effects** - where the effects of the draft FESLUP are assessed as to whether they have any adverse effects on the integrity of the relevant QIs and SCIs; and
- **Mitigation Measures** - where mitigation measures are identified to ameliorate any adverse effects on the integrity of the relevant QIs and SCIs.

## 8.4 Appropriate Assessment: Impact Prediction

The Source-Pathway-Receptor model utilised for this assessment is given in greater detail in Section 5.3, 5.4, and 5.5 and is summarised below:

- The **source** relates to the 16 draft Plan objectives which are considered within this section of the Appropriate Assessment. These can be categorised into the following: Biodiversity management; Biosecurity and climate change management; Commercial forestry operations; Desktop review & research; Development of desk-based tools; Engagement and collaboration; Policy, plan, standards and guidelines development; and Support provision.
- The **pathways** by which the draft FESLUP can impact a Relevant QI and SCI have been identified as Aerial; Direct Land Take; Disturbance; Hydrological; Lighting; Movement of people and machinery; Noise and Vibration; and Recreation (Section 5.6):
- The **receptors** of the draft FESLUP have been identified to be the relevant QIs and SCIs of European Sites as described in Section 4.5.

Impacts that could potentially occur through the implementation of the objectives that have been determined to have the potential for likely significant effects are aligned with the impact prediction defined in Section 6.3. Table 6 provides the assessment of effects using the S-P-R method defined above and the potential impacts that may occur in the implementation without the provision of mitigation.

## 8.5 Appropriate Assessment: Assessment of Effects

In line with the methodology set forward within this report, the main impacts that could arise from the draft objectives brought forward to AA are summarised in Table 6. The objectives, its source(s), pathway(s) and receptor(s) and the potential impacts are all included. The potential impacts on QIs and SCIs can include habitat loss, destruction, fragmentation or degradation; disturbance; indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc; and In-combination effects with other plans/projects. These impacts are stipulated within Section 6.3.

**Table 6 Assessment of Effects using the S-P-R method and the potential impacts that may occur on relevant QIs and SCIs as a result.**

| Objective | Source | Pathway(s) | Receptor | Potential Impacts (without the provision of mitigation) to relevant QIs/SCIs as provided in Section 6.3 |
|---|---|---|---|---|
| CO7. Continuously develop guidelines for the redesign of peatlands based on best Irish and international practice.. | Desktop review & research<br>Policy, plan, standards and guideline development | Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | QIs which share a hydrological connection: freshwater habitats, heath and peatland habitats, and coastal habitats.<br>QI Species dependent on peatlands and their hydrologically connected habitats - all QI species listed in Table 2.<br>SCIs dependent on peatlands and their hydrologically connected habitats – all SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.<br>In-combination effects with other plans/projects |
| CO8. Establish monitoring and management frameworks for redesigned peatlands. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Development of desk based tools | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | QIs which share a hydrological connection: Coastal habitats, freshwater habitats, heath and peatland habitats.<br>QI Species – marsh saxifrage, slender naiad, Atlantic salmon, freshwater pearl mussel, Nore Pearl mussel, pollan and lesser horseshoe bat.<br>SCIs dependent on peatlands and their hydrologically connected habitats – all SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.,<br>In-combination effects with other plans/projects |
| CO11. Identify and quantify the impacts of climate change and develop measures to make Coillte's estate more climate resilient | Desktop review & research<br>Commercial forestry operations<br>Development of desktop based tools | Disturbance<br>Hydrological | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.,<br>In-combination effects with other plans/projects |

| Objective | Source | Pathway(s) | Receptor | Potential Impacts (without the provision of mitigation) to relevant QIs/SCIs as provided in Section 6.3 |
|---|---|---|---|---|
| CO12. Develop evidence and understanding of carbon management within the forest and across the forestry supply chain, and pilot new decision-making tools. | Desktop review & research<br>Commercial forestry operations<br>Development of desktop based tools | Aerial<br>Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | QIs which share a hydrological connection: Coastal habitats, freshwater habitats, heath and peatland habitats<br>QI Species – Killarney fern, slender naiad, Atlantic salmon, freshwater pearl mussel, Nore pearl mussel, pollan, marsh fritillary and lesser horseshoe bat<br>SCIs dependent on forests or habitats functionally or hydrologically linked: all SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.,<br>In-combination effects with other plans/projects |
| CO14. Support FuturEnergy Ireland and 3rd party renewable energy developers in their current and future renewable energy endeavours. | Support provision<br>Engagement and collaboration | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.,<br>In-combination effects with other plans/projects |
| CO16. Develop a clear policy and explore opportunities for onshore and offshore grid infrastructure, rollout and services to support ongoing development. | Policy, plan, standards and guideline development<br>Desktop review & research<br>Engagement and collaboration | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Lighting<br>Noise and vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.<br>In-combination effects with other plans/projects |

| Objective | Source | Pathway(s) | Receptor | Potential Impacts (without the provision of mitigation) to relevant QIs/SCIs as provided in Section 6.3 |
|---|---|---|---|---|
| NO2. Continue the process of producing and implementing management plans for biodiversity areas, combining both ecological and forestry perspective and expertise | Biodiversity management<br>Policy, plan, standards and guideline development | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, water quality, changes in nutrient/light availability etc.<br>In-combination effects with other plans/projects |
| NO4. Continue to increase the implementation of alternative silvicultural systems including continuous cover forestry (CCF) in forests of ecological value. | Biodiversity management<br>Commercial forestry operations | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, changes in nutrient/light availability etc.<br>In-combination effects with other plans/projects |
| NO8. Develop protocols for managing these sites (ref NO6), appropriate to their scale, habitat connectivity and site type, that will improve their nature conservation value. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Biodiversity management | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, changes in nutrient/light availability etc.<br>In-combination effects with other plans/projects |
| NO11. Identify and implement methods to improve inventory processes and data-gathering, to expand our knowledge of nature on the estate and our reporting capacity. | Desktop review and research<br>Policy, plan, standards and guideline development<br>Biodiversity Management | Disturbance<br>Hydrological | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Disturbance<br>Indirect effects e.g. changes to hydrological regime, changes in nutrient/light availability etc.<br>In-combination effects with other plans/projects |

| Objective | Source | Pathway(s) | Receptor | Potential Impacts (without the provision of mitigation) to relevant QIs/SCIs as provided in Section 6.3 |
|---|---|---|---|---|
| NO12. Review and improve methods for how biodiversity features and other important environmental features are recorded and protected across the estate. | Desktop review & research<br>Policy, plan, standards and guideline development<br>Biodiversity Management | Disturbance | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Disturbance<br>In-combination effects with other plans/projects |
| NO13. Enhance guidance for the management of habitats and species relevant to Coillte's estate and activities. | Development of desk based tools<br>Policy, plan, standards and guideline development<br>Biodiversity management<br>Engagement and collaboration | Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and Vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat degradation, fragmentation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc., |
| WO1. Maintain production capacity to harvest and supply certified roundwood to support timber production | Commercial forestry operations | Aerial<br>Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and Vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.,<br>In-combination effects with other plans/projects |
| PO1. Identify priority site locations and develop masterplans for future Visitor Destinations. | Desktop review & research<br>Policy, plan, standards and guideline development | Direct land-take<br>Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and Vibration<br>Recreation | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat loss, destruction, fragmentation or degradation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc.,<br>In-combination effects with other plans/projects |

| Objective | Source | Pathway(s) | Receptor | Potential Impacts (without the provision of mitigation) to relevant QIs/SCIs as provided in Section 6.3 |
|---|---|---|---|---|
| PO6. Create a system of classification for Recreation Areas, setting out the offer and facilities to be provided for each category | Desktop review & research<br>Policy, plan, standards and guideline development<br>Development of desktop based tools | Disturbance<br>Movement of people, machinery<br>Recreation | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat degradation, fragmentation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc |
| PO12. Enhance operational guidance for staff and contractors regarding biodiversity management and peatland redesign. | Biodiversity management<br>Other management<br>Internal staffing development | Disturbance<br>Hydrological<br>Movement of people, machinery<br>Noise and Vibration | All QI habitats listed in Table 2<br>All QI species listed in Table 2<br>All SCIs listed in Table 2 | Habitat fragmentation<br>Disturbance<br>Indirect effects e.g. changes to hydrological regime, nutrient/light availability, exposure to non-native species etc |

## 8.6 Mitigation

### 8.6.1 Existing Mandatory Requirements for Licensed Forestry Activities

The Department of Agriculture, Food and the Marine (DAFM) are the competent authority within Ireland for the forestry sector. For the purposes of the afforestation, a licensing and consent system exists, in which DAFM regulates forestry activities. Forestry activities, which include planting (afforestation and reforestation), felling, fertilisation, and related infrastructure such as forest roads, drainage etc., are subject to the legislative requirements set forward in the Forestry Regulations 2017 (S.I. No. 191/2017). The Regulations set forward the requirement for an Applicant to submit a licence application for activities including tree felling, afforestation, forest roads and aerial fertilisation. A mandatory requirement for the licence application is to conduct and provide a Screening for AA report with the licence application, a habitat map of the application area and a biodiversity checklist. Once received by DAFM, the application is reviewed and the potential for likely significant effects upon European sites is examined through the Screening for AA report. Where the potential for likely significant effects exists, the Applicant must furnish to DAFM a full AA report with mitigation. Only when the applicant proves, with the provision of mitigation, that no likely significant effects have the potential to occur a licence may be granted. Once a forest licence has been granted, the licensee is mandatorily required to adhere to a suite of standards, guidelines and requirements which are can be found in Appendix B.

### 8.6.2 Proposed Mitigation for Objectives of the Draft FESLUP

Where the AA has identified the potential for significant adverse effects from the implementation of any of the 16 objectives subject to AA, or where doubt exists, mitigation measures have been proposed. This mitigation will eliminate or render insignificant any possible adverse effects on any potentially impacted relevant QIs and SCIs.

Proposed text changes have been proposed to each of the objectives brought forward to AA shown in *italicised red* text below in Table 7. Following publication on the draft Plan and associated environmental reports, it is proposed that the finalised and adopted FESLUP will incorporated some if not all of these proposed text changes.

In addition to the mandatory mitigation that is required for licensed forestry activities, and in cognisance of the pathways for effect on receptors that have been outlined in Table 6, mitigation measures have been recommended for the objectives determined to have potential for likely significant effects in the absence of mitigation. The recommended mitigation is provided for the objectives in order to avoid the potential for likely significant effects. These are provided below in Table 7.

**Table 7 Recommended mitigation to negate the risk of adverse effects on the integrity of European sites.**

| Objective | Recommended Mitigation and *Proposed text changes to draft objectives* |
|---|---|
| CO7. Continuously develop guidelines for the redesign of peatlands based on best Irish and international practice. | It is recommended that during the development of the guidelines for the redesign of peatlands, guidance and input from suitably qualified professionals including environmental managers and specialist ecologists shall be incorporated. The guidelines should take full account of environmental constraints and opportunities, including protection of European sites, and shall be developed with ecological professionals, as necessary.<br>Proposed text change to CO7: *Continuously develop guidelines for the redesign of peatlands based on best Irish and international practice and informed by suitably qualified professionals.* |
| CO8. Establish monitoring and management frameworks for redesigned peatlands. | It is recommended that monitoring and management frameworks are designed by suitably qualified professionals including environmental managers and specialist ecologists. Monitoring and management frameworks should take full account of environmental constraints and opportunities, including protection of European sites, and shall be developed with ecological professionals, as necessary.<br>Proposed text change to C08*: Establish monitoring and management frameworks for redesigned peatlands. Such monitoring and management frameworks shall be designed by suitably qualified multidisciplinary professionals* |

| Objective | Recommended Mitigation and *Proposed text changes to draft objectives* |
|---|---|
| CO11. Identify and quantify the impacts of climate change and develop measures to make Coillte's estate more climate resilient | It is recommended that the development of any measures to make Coillte's estate more climate resilient integrates input from suitably qualified professionals including environmental managers and specialist ecologists. The measures should take full account of environmental constraints and opportunities, including protection of European sites, and shall be developed with ecological professionals, as necessary.<br><br>No proposed text change to CO11. |
| CO12. Develop evidence and understanding of carbon management within the forest and across the forestry supply chain, and pilot new decision-making tools. | It is recommended that during the design of new decision making tools, guidance from suitably qualified professionals including environmental managers and specialist ecologists shall be factored in. Any development of new tools with any potential implications for impacts on European sites shall be screened for Appropriate Assessment.<br><br>Proposed text change to CO12*: Develop evidence and understanding of carbon management within the forest and across the forestry supply chain, and pilot new decision-making tools. Design shall incorporate protection measures for the wider environment and be developed with suitably qualified professionals, as necessary. Piloting these new decision making tools shall be carried out in full consideration of the wider environmental and ecological landscape including AA screening where necessary.* |
| CO14. Support FuturEnergy Ireland and 3rd party renewable energy developers in their current and future renewable energy endeavours. | It is recommended that during the provision of support, engagement and collaboration, respective parties, including Coillte, any plan or project or endeavour which could give rise to a plan or project with any potential implications for impacts on European sites shall be screened for Appropriate Assessment.<br><br>Proposed text change to CO14: *Support FuturEnergy Ireland and 3rd party renewable energy developers in their current and future renewable energy in full consideration of protection of the environment including Appropriate Assessment screening where necessary.* |
| CO16. Develop a clear policy and explore opportunities for onshore and offshore grid infrastructure, rollout and services to support ongoing development. | It is recommended that the development of any such policies and exploration of opportunities with the potential to give rise to plans or projects with any potential implications for impacts on European sites shall be screened for Appropriate Assessment.<br><br>Where areas of the Coillte estate are identified for the facilitation for on shore or offshore wind development, these developments shall be subject to project level Screening for AA at minimum, and where necessary full AA.<br><br>Proposed text change to CO16*: Develop a clear policy and explore opportunities for onshore and offshore grid infrastructure, rollout and services to support ongoing development in full consideration of protection of the environment including Appropriate Assessment screening where necessary.* |
| NO2. Continue the process of producing and implementing management plans for biodiversity areas, combining both ecological and forestry perspective and expertise. | In the absence of mitigation, there is potential for unintended significant effects on the European site network, QIs/SCIs where management actions are not designed with all conservation objectives of relevant QIs/SCIs in mind. It is recommended that during the production and design of such management plans, the conservation objectives of relevant QIs/SCIs are incorporated in the design of the plans.<br><br>Proposed text change to NO2*: Continue the process of producing and implementing management plans for biodiversity areas, combining both ecological and forestry perspective and expertise in the effort to improve biodiversity found within the Coillte estate, subject to Appropriate Assessment screening, as necessary.* |
| NO4. Continue to increase the implementation of alternative silvicultural systems including continuous cover forestry (CCF) in forests of ecological value. | In the absence of mitigation, there is potential for unintended significant effects on the European site network, QIs/SCIs where management actions are not designed with the conservation objectives of relevant QIs/SCIs in mind.<br><br>It is recommended that suitably qualified professionals including specialist ecologists (ornithologists, freshwater habitat and species specialists etc.,) input into the design and implementation of any such alternative methods and where potential to give rise to plans or projects with any potential implications for impacts on European sites an Appropriate Assessment screening shall be carried out.<br><br>Proposed text change to NO4*: Continue to increase the implementation of alternative silvicultural systems including continuous cover forestry (CCF) in forests of ecological value. Implementing such systems shall be conducted in a manner insofar as to avoid unintended consequences of any QI or SCI and any plan or project arising shall be subject to Appropriate Assessment screening, as necessary..* |

| Objective | Recommended Mitigation and *Proposed text changes to draft objectives* |
|---|---|
| NO8. Develop protocols for managing these sites (ref NO6), appropriate to their scale, habitat connectivity and site type, that will improve their nature conservation value. | In order to avoid the potential for likely significant effects on European sites the design of such protocols shall incorporate input from suitably qualified ecologists and relevant specialists across ecology and forestry (e.g. ornithologists).<br>Any implementation of such protocols shall be conducted on a site-by-site basis and where there is potential for impacts on European sites an Appropriate Assessment screening shall be carried out.<br><br>Proposed text change to NO8: *Develop protocols for managing these sites (ref NO6), appropriate to their scale, habitat connectivity and site type, that will improve their nature conservation value. The design of such protocols shall include input from specialists within ecology and forestry respectively and any plan or project arising shall be subject to Appropriate Assessment screening, as necessary* |
| NO11. Identify and implement methods to improve inventory processes and data-gathering, to expand our knowledge of nature on the estate and our reporting capacity. | In order to avoid the potential for likely significant effects on European sites the design of such methods shall incorporate input from suitably qualified ecologists and relevant specialists across ecology and forestry (e.g. ornithologists).<br>Any implementation of such methods shall be conducted on a site-by-site basis and where there is potential for impacts on European sites an Appropriate Assessment screening shall be carried out.<br>Proposed text change to NO11: *Identify and implement methods to improve inventory processes and data-gathering, to expand our knowledge of nature on the estate and our reporting capacity. Methods shall be informed by the input of suitable specialist in ecology.* |
| NO12. Review and improve methods for how biodiversity features and other important environmental features are recorded across the estate. | It is recommended that prior to the implementation of this objective, that these recording methods are informed by the input of suitably qualified professionals including specialist ecologists.<br>Proposed text change to NO12*: Review and improve methods for how biodiversity features and other important environmental features are recorded across the estate. Methods shall be informed by the input of suitable specialist in ecology.* |
| NO13. Enhance guidance for the management of habitats and species relevant to Coillte's estate and activities | It is recommended that guidance is designed with input from suitably qualified professionals including ecologists and specialists.<br>It is recommended that detailed spatial analysis, including source-pathway-receptor analysis is carried out in the development of guidance so as to avoid potential for LSE on any European sites.<br>Proposed text change to NO13*: Enhance guidance for the management of habitats and species relevant to Coillte's estate and activities with the input of suitably qualified specialists and Appropriate Assessment screening for any works arising, as necessary.* |
| WO1. Maintain production capacity to harvest and supply certified roundwood to support timber production . | Embedded mitigation within the afforestation application process already exists as all licensed forestry activities, including afforestation, require approval in the form of a forestry licence. Such a forestry licence requires, at minimum, a Screening for Appropriate Assessment to ensure that such afforestation, harvesting and related forestry activities do not result in a likely significant effect on the European site network. Where the potential for likely significant effects occurs, these applications are required to advance to full Appropriate Assessment and provide mitigation insofar as to remove the potential for likely significant effects.<br>As a result of this embedded mitigation, no further recommendations for mitigation is made as part of this AA report.<br>No recommended text change to WO1 |
| PO1. Identify priority site locations and develop masterplans for future Visitor Destinations | It is recommended, to avoid the potential for likely significant effects, that during the identification process the source-pathway-receptor model is used to identify any potential risks to European sites arising from visitor destination development. Any priority site locations and masterplans shall be subject to an Appropriate Assessment screening (at minimum).<br>Proposed text change to PO1: *Identify priority site locations and develop masterplans for future Visitor Destinations in full consideration of protection of the environment and Appropriate Assessment screening where necessary.* |

| Objective | Recommended Mitigation and *Proposed text changes to draft objectives* |
|---|---|
| PO6. Create a system of classification for Recreation Areas, setting out the offer and facilities to be provided for each category. | It is recommended, to avoid the potential for likely significant effects, that the creation of this classification system has input from suitably qualified professionals including ecologists and specialists to account for important ecological features within the Coillte estate. It is recommended that the classification system shall integrate the presence of important ecological features within its system.<br>Proposed text change to PO6: Create a system of classification for Recreation Areas, *in full consideration of the important ecological features of Coillte's estate*, setting out the offer and facilities to be provided for each category. |
| PO12. Enhance operational guidance for staff and contractors regarding biodiversity management and peatland redesign. | It is recommended that operational guidance is designed with input from suitably qualified professionals including ecologists and specialists.<br>It is recommended that detailed spatial analysis, including source-pathway-receptor analysis is carried out in the development of guidance so as to avoid potential for LSE on any European sites.<br>Proposed text change to PO12: Enhance operational guidance for staff and contractors regarding biodiversity management and peatland redesign, *in full consideration of the important ecological features of Coillte's estate.* |

### 8.6.3 Recommended Mitigation to Address In-Combination Effects

In-combination effects shall be addressed by the mitigation proposed in Table 7 in combination with the mandatory guidance documents and relevant legislation as found within Section 8.6.1.

# 9. Summary and Conclusion

## 9.1 Summary

The screening for AA determined that 16 of the 68 objectives contained within the draft FESLUP have the potential to result in likely significant effects on European Sites within the Zone of Influence of the draft FESLUP. These were taken forward to Appropriate Assessment.

The Source-Pathway-Receptor Model has been used to assess whether implementation of the draft FESLUP will adversely affect the integrity of any European Sites across Ireland, and parts of Northern Ireland which are within the Zone of Influence of the draft FESLUP.

- The **source** is the 16 draft Plan objectives taken forward to AA (C07, C08, CO11, CO12, CO14, CO16, N02, N04, NO8, NO11, NO12, NO13, WO1, PO1, PO6 and PO12).
- The eight **pathways** for effect by which implementation of the 16 objectives in the draft FESLUP can impact a receptor are Aerial; Direct Land Take; Disturbance; Hydrological; Lighting; Movement of people and machinery; Noise and Vibration; and Recreation; and
- The **receptors** are the relevant QIs and SCIs, (47 QIs and 20 SCIs) listed in Table 2 and as described in Section 4.5.

The 607 European Sites scoped into assessment in Ireland and 22 European Sites in Northern Ireland were scoped in on a precautionary basis, as details on specific sources of impact and therefore pathways were too high-level to be able to rule out effects on European Sites with certainty.

Of the European Sites scoped into assessment, further review identified that there were collectively 156 QIs/SCIs, of which 67 (~43%) have been identified from Article 17 reporting to be subject to pressures or threats from forestry and recreation related activities which may arise from implementation of the draft FESLUP. These comprise 34 habitats, four plant species, two mammal species, two invertebrate species, five aquatic species and 20 bird species which are QIs/SCIs of SACs and SPAs within the ZoI.

Mitigation is proposed, including those that are mandatory within licensed forestry activities recommended mitigation measures are provided within Section 8.6 this report. With the implementation of the mitigation recommended within this NIS, there is sufficient evidence for the NIS to conclude that implementation of the draft FESLUP would not result in adverse effects on the integrity of European sites, alone or in-combination with other plans and projects. The draft FESLUP and mitigation proposed in this report is directed at a strategic high level and therefore is considered will avoid adverse effects on the integrity of all European sites, alone or in-combination with other plans and projects.

A Forest Estate Strategic Implementation Plan, Forest Management Plans, and further plans or projects arising from the implementation of the draft FESLUP will all be subject to AA screening where there is any possibility of potential for likely significant effects on any European site, either alone or in-combination with other plans or projects. These plans and projects arising from implementation of the draft FESLUP will allow a greater degree of geographic specificity and therefore greater level of site-specific or receptor-specific analysis therefore allowing more detailed and targeted mitigation.

## 9.2 Conclusions

In order for the AA to comply with the requirements of Article 6(3) the Habitats Directive, a Stage 2 AA undertaken by the public authority must include an examination, analysis, evaluation, findings, conclusions and a final determination. The information in this report will, along with all other submissions and observations received following public consultation, will enable Coillte to perform its statutory function in this regard.

This NIS has examined and analysed, in light of the best scientific knowledge, with respect to the relevant European sites, the sources and pathways for effect, and how these may result in adverse effects on relevant QIs and SCIs and therefore the integrity of European sites.

Mitigation measures are set out within this report to ensure that adverse effects on the integrity of European sites will be avoided during the implementation of the draft FESLUP either alone or in combination with other plans or projects.

Accordingly, in the professional opinion of the authors of this report, whilst it has been acknowledged that there is the potential, in the absence of mitigation, for the draft FESLUP to have the potential for likely significant effects on European sites, with the implementation of the mitigation measures outlined in this NIS, the integrity of any European sites will not be adversely affected.

# 10. References


Centre, N. B. (2015). *All-Ireland Pollinator Plan 2021-2025.* Dublin: National Biodiversity Data Centre.

Commission, E. (2000). *Directive 2000/60/EC of the European Parliment and of the Council.* Brussels: European Commission.

Commission, E. (2007). *Environmental Liability.* Brussels: European Commission.

Commission, E. (2009). *Directive 2009/28/EC of the European Parliment and of the Council on the Promotion of the use of Energy from Renewable Sources and Amending and Subsequently Repealing Directivews 2001/77/EC and 2003/30/EC.* Brussels: European Commission.

Commission, E. (2010). *Energy Roadmap 2050.* Brussels: European Commission.

Commission, E. (2019). *A European Green Deal.* Brussells: European Commission.

Commission, E. (2020). *Biodiversity strategy for 2030.* Brussels: European Commission.

Commission, E. (2020). *Energy 2020, A Strategy for Competitive, Sustainable and Secure Energy.* Brussels: European Commission.

Commission, E. (2020). *Farm to Fork Strategy.* Brussells: European Commission.

Commission, E. (2020). *The EU Policy Framework for Climate and Energy in the Period from 2020-2030.* Brussels: European Commission.

Commission, E. (2021). *EU Forest Strategy for 2030.* Brussells: European Commission.

Commission, E. (2021). *Zero Pollution Action Plan.* Brussells: European Commission.

Commission, E. (2022). *Environment Action Programme to 2030.* Brussells: European Commission.

Commission, E. (2023). *Common Agricultural Policy.* Brussels: European Commission.

DAFM. (2006). *Forest Recreation in Ireland A Guide for Forest Owners and Managers.* Forest Service The Department of Agriculture and Food .

DECC. (2022). *Climate Action Plan 2023.* Dublin: Department of the Environment, Climate and Communications.

Department of Agriculture, E. a. (2019). *Nitrates Directive (91/676/EEC).* Belfast: Department of Agriculture, Environment and Rural Affairs.

Department of Agriculture, F. a. (2021). *Food Vision 2030 - A World Leader in Sustainable Food Systems.* Dublin: Department of Agriculture, Food and the Marine.

Department of Agriculture, F. a. (2021). *Food Wise 2025.* Dublin: Department of Agriculture, Food and the Marine.

Department of Communications, E. &. (2009). *National Renewable Energy Action Plan.* Dublin: Department of Communications, Energy & Natural Resources.

Department of Culture, H. a. (2017). *National Riased Bog Special Areas of Conservation Management Plan.* Dublin: Department of Culture, Heritage and the Gaeltacht.

Department of Housing, L. G. (2019). *Project Ireland 2040.* Dublin: Department of Housing, Local Government and Heritage.

Department of Housing, L. G. (2020). *National Landscape Strategy.* Dublin: Department of Housing, Local Government and Heritage.

Department of Housing, P. a. (2018). *National Planning Framework Project Ireland 2040.* Dublin: Department of Housing, Planning and Local Government.

Department of the Environment, C. a. (2018). *Ireland's National Energy and Climate Plan 2021-2030.* Dublin: Department of the Environment, Climate and Communications.

Department of the Environment, C. a. (2018). *National Adaptation Framework (NAF).* Dublin: Department of the Environment, Climate and Communications.

Department of the Environment, C. a. (2022). *National Implementation Plan for Sustainable Development Goals 2022-2024.* Dublin: Department of the Environment, Climate and Communications.

Department of the Environment, C. C. (2021). *Climate Action and Low Carbon Development (Amendment) Bill 2021.* Dublin: Department of the Environment, Climate, Communications.

Department of Tourism, C. A. (2019). *Culture 2025.* Dublin: Department of Tourism, Culture, Arts, Gaeltacht, Sport and Media.

Development, D. o. (2019). *Action Plan for Rural Development.* Dublin: Department of Rural and Community Development.

Development, D. o. (2021). *Our Rural Future: Rural Development Policy 2021-2025.* Dublin: Department of Rural and Community Development.

DHLGH. (2022). *Ireland's 4th National Biodiversity Action Plan (Draft).* Dublin: Department of Housing, Local Government and Heritage.

EPA. (2020). *Irelands Environment An Integrated Assessment.* Dublin: Environmental Protection Agency.

National Parks and Wildlife Service, D. o. (2021). *Prioritised Action Framework (PAF) for Natura 2000 in Ireland.* Dublin: National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

NPWS. (2019). *The Status of EU Protected Habitats and Species in Ireland.* De[partment of Culture, Heritage and the Gaeltacht . Deirdre Lynn and Fionnuala O'Neill.

Reform, D. o. (2022). *National Development Plan 2021-2030.* Dublin: Department of Publoc Expenditure and Reform.

Service, N. P. (2015). *National Peatlands Strategy.* Dublin: National Parks and Wildlife Service.

Union, E. (2018). *Regulation (EU) 2018/841 of the European Parliment and of the Council.* Brussels: European Union.

Works, O. o. (2021). *Catchment Based Flood Risk Assessment and Management (CFRAM) Programme .* Dublin: Office of Public Works.

# Appendix A

## Relevant QIs and SCIs

# A.1 Relevant QIs and SCIs

## A.1.1 Introduction

This Appendix to the Screening for AA & NIS report (referred hereafter to as the AA report) forms part of the AA reporting process and provides an expanded discussion on Relevant QIs and SCIs (the Qualifying Interests (QIs) and Special Conservation Interests (SCIs)) as identified in Section 4.5 of the AA report.

Whilst this document sits as an Appendix to the AA report, it is considered an integral part of the AA process, providing an expanded discussion on the contents found within the main AA report. The Appendix structure is presented as follows:

- Section A.1.3 – Annex I Habitats (QIs);
- Section A.1.4 – Annex II Species (QIs); and
- Section A.1.5 – Annex I Birds (SCIs)

The baseline information on the QIs and SCIs, including pressures and threats from pathways relevant to the draft FESLUP were identified through Article 17 and Article 12 reports. This information was then supported by a review of published scientific literature, white paper reports from respective bodies/agencies and national reports such as the Irish Wildlife Manuals.

## A.1.2 Approach to Assessment

There are 607 European sites (including one candidate site) within the Republic of Ireland and a further 75 within Northern Ireland. As discussed in the main body of the AA report the sheer number of QIs and SCIs for all sites means that an assessment of the effects of the draft Plan on each European site would not be feasible and could obfuscate the AA process. Therefore, in order to adequately assess the potential for likely significant effects occurring as a result of the implementation of the draft FESLUP, the following approach have been carried out:

a. Review the Article 17 and Article 12 reports to establish the current status of each QI and SCIs designated within SACs and SPAs.

b. Establish the presence of any pressures/threats that may face respective QIs/SCIs as a result of forestry and/or recreation related activities.

c. Review national reports, including Irish Wildlife Manuals and published scientific literature for further information relating to QIs/SCIs in respect of forestry and/or recreation related activities.

The researched information is provided below in Sections A.1.3, A.1.4 and A.1.5.

### A.1.2.1 Pressure and Threat Code Definitions

The Article 17 reporting and Article 12 reporting provides a suite of pressures and threats to Member States. Member states utilise these codes to define the pressures and threats a QI or SCI may face to ensure standardisation across reporting. The definitions of the identified pressures and threats that were identified as present within the analysis of the QIs and SCIs relating to Coillte's activities, such as forestry and recreation as per the Article 17 and Article 12 reports for the period 2013-2018 are provided below:

- **B01 Conversion to forest from other land uses, or afforestation (excluding drainage):** Increase in forest area, including planting of forests on grassland or heathland, or converting shrubs into forest. This pressure does not relate only to land use changes that occurred during the reporting period, but it refers to instances where continuing the current forestry use of a natural/semi-natural habitat prevents the latter from being restored (e.g. in cases of land use conflicts between forestry and nature conservation for the restoration of some heathlands and peats, which were in the past afforested and are currently being managed and replanted as forests).

- **B09 Clear-cutting, removal of all trees**: Targeted removal of old trees (e.g. to preserve the forest structure or to improve regeneration). Includes logging of mature trees (trees with a high potential to become old) in forests with a diverse age structure.
- **B23 Forestry Activities generating pollution to surface or ground waters**: This pressure addresses diffuse water pollution resulting from activities which cannot be directly attributed to specific activities covered by other level 2 pressures (e.g. diffuse pollution due to application of fertilisers or plant protection chemicals should be reported under respective activities B19, application of synthetic fertilisers in forestry, including liming of forest soils or B21 Use of physical plant protection in forestry, excluding tree layer thinning).
- **B27 Modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams)**: Activities modifying the physical structure or hydrological functioning of water bodies triggered by forestry production and exploitation, and activities aimed at drying out the land to facilitate forestry production or exploitation (e.g. altering of flooding regimes, canalisation of rivers, cutting of the oxbow lakes, building draining canals).
- **F01 Conversion from other land uses to housing, settlement or recreational areas (excluding drainage and modification of coastline, estuary and coastal conditions)**: Conversion of natural and semi-natural habitats to housing, settlement, or recreational areas. Includes development of dispersed housing. This pressure does not relate only to land use changes that occurred during the reporting period; it also refers to instances where continuing the current land use of a natural/semi-natural habitat prevent the latter from being restored.
- **F02 Construction or modification (e.g. of housing and settlements) in existing urban or recreational areas**: Construction in existing urban or recreational areas, reconstruction of existing buildings and structures, and the demolition of buildings and human structures. This pressure can include e.g. demolishment of structures important for nesting or sheltering of birds and bats, negative impact of isolation or other reconstruction works to nesting birds or bats. Includes deliberate closure of roofs (to prevent bats or birds).
- **F05 Creation or development of sports, tourism and leisure infrastructure (outside the urban or recreational areas)**: Creation and development of sport and leisure structures outside the urban or recreational areas (e.g. building the ski lifts, cable cars, motocross circuits).
- **F06 Development and maintenance of beach areas for tourism and recreation incl. beach nourishment and beach cleaning**: Activities connected with development and maintenance of recreational coastal areas and beach resorts such as levelling of dunes morphology, beach cleaning (also with mechanical vehicles), beach nourishment, human trampling and overuse, construction of buildings connected to the seaside bathing establishments, marine/beach litter deposition.
- **F07 Sports, tourism and leisure activities**: Sport, tourism, and leisure activities outside the urban and recreational zones (e.g. outdoor sports, leisure aircrafts, drones, human trampling, wildlife watching).
- **F08 Modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures)**: Activities modifying coastline or estuary and coastal conditions triggered by urban development such as development and protection of residential, commercial, industrial and recreational infrastructure and areas. Includes activities like building sea defences and coastal protection infrastructure or maintenance of existing coastal structures (e.g. repairs to existing sea defences, harbour walls).
- **F09 Deposition and treatment of waste/garbage from household/recreational facilities**: Management, including deposition and treatment (e.g. dumps, landfills, incineration and other methods of physical or biological processing) of waste from urban and recreational areas (e.g. household waste, other urban waste like waste from hospitals or from urban green areas, food waste from recreational areas).

- **F11 Pollution to surface or ground water due to urban run-offs**: Pollution from rain and storm water running from urbanised areas carrying pollutants from roads and parking plots as well as fertilizers and pesticides used for urban vegetation.
- **F13 Plants contaminated or abandoned industrial sites generating pollution to surface or ground water**: Discharges of industrial wastewater into surface and ground waters as well as diffuse pollution from contaminated or abandoned industrial sites. Includes also activities related to industrial wastewater treatment.
- **F20 Residential or recreational activities and structures generating marine pollution (excl. marine macro- and micro-particular pollution)**: This pressure should be used to address the marine pollution originating from urban and recreational areas which cannot be directly attributed to specific activities covered by other level 2 pressures (e.g. if the source of the pollution is unknown or pollution is from several different sources).
- **F24 Residential or recreational activities and structures generating noise, light, heat or other forms of pollution**: Different activities and structures related to residential and recreational areas that generate noise, light, heat or other forms of pollution.
- **F28 Modification of flooding regimes, flood protection for residential or recreational development**: Activities modifying physical structure and/or hydrological functioning of water bodies triggered by flood protection of urban and recreational zones (e.g. flood protection dams and reservoirs, river impoundments, canalisation, water deviation, removing bank vegetation).
- **F31 Other modification of hydrological conditions for residential or recreational development**: This pressure should be used to address activities related to development and use of housing and recreational areas and structures modifying physical structure and/or hydrological functioning of water bodies which cannot be directly attributed to specific activities covered by other level 2 pressures.
- **F33 Abstraction of ground and surface waters (including marine) for public water supply and recreational use**: Abstraction from ground and surface waters for public water supply and recreational use (e.g. abstraction of fresh/marine water for swimming pools).
- **J02 Mixed source marine water pollution (marine and coastal)**: Mixed source marine water pollution (marine and coastal). Pollution should only be reported under this category when the key driver of the pollution is unclear or where pollution is related to several causes (e.g. marine pollution by hydrocarbons can be related to several sources, like industrial discharges, water and land based transport operation, pollution, transport and exploitation accidents). Where a key sectoral driver can be identified, pollution should be reported under the corresponding sectoral pollution category.

### A.1.3 Qualifying Interest Habitats

As stated in Section 4.5 of the AA report, this section provides an expanded discussion on the Annex I habitats identified to have the potential to be impacted by the draft FESLUP. This section outlines supporting information relating QI habitats that were determined to be representative of the European site network in and that have vulnerabilities to activities pertaining to forestry and recreation.

Table 1 below provides an overview of the QI habitats which have a corresponding recreational and forestry pressures/threats as defined in Article 17 report[13]. The definitions to the pressure and threats codes are provided in Section A.1.2.1 The table also displays whether the QI is classified as a priority habitat in Ireland and its conservation status. Specific QI habitats classified as ‘priority’ based on their condition are identified with ‘*’ in Table 1 and those QI habitats identified to have pressures and/or threats relating to forestry and/or recreation have been presented in bold. Following Table 1, the QI habitats that have been identified are discussed in relation to forestry and recreation related activities and their vulnerabilities to activities contained therein.

**Table 1 Qualifying Interest Habitats with corresponding pressures and threats in the forestry and recreation categories**

| EU Habitat Code | QI Habitat | Classed as Priority Habitat in Ireland? | Conservation Status | No. SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure - Forestry | Article 17 (2019) Identified Threat - Forestry | Article 17 (2019) Identified Pressure - Recreation | Article 17 (2019) Identified Threat- Recreation |
|---|---|---|---|---|---|---|---|---|
| 1110 | Sandbanks | No | Favourable | 2 | None Identified | None Identified | None Identified | None Identified |
| **1130** | **Estuaries** | **No** | **Inadequate** | **19** | None Identified | None Identified | **F20 (H)** | **F20 (H)** |
| **1140** | **Tidal mudflats** | **No** | **Inadequate** | **42** | None Identified | None Identified | **F20 (H)** | **F20 (H)** |
| 1150 | Lagoons* | Yes | Bad | 25 | None Identified | None Identified | None Identified | None Identified |
| **1160** | **Large shallow inlets** | **No** | **Bad** | **22** | **B23 (M)** | **B23 (M)** | **F20 (H)** | **F20 (H)** |
| 1170 | Reefs | No | Inadequate | 41 | Not Assessed | Not Assessed | None Identified | None Identified |
| **1210** | **Drift Lines** | **No** | **Inadequate** | **24** | None Identified | None Identified | **F08 (H)**<br>**F01 (M)**<br>**F06 (M)**<br>**F07 (M)** | **F08 (H)**<br>**F01 (M)**<br>**F06 (M)**<br>**F07 (M)** |
| **1220** | **Vegetated Shingle/Perennial Vegetation of stony banks** | **No** | **Inadequate** | **36** | None Identified | None Identified | **F08(H)**<br>**F09(M)**<br>**F07(H)** | **F08(H)**<br>**F09(M)**<br>**F07(H)** |
| **1230** | **Vegetated Sea cliffs** | **No** | **Inadequate** | **28** | None Identified | None Identified | **F07 (M)**<br>**F08 (M)** | **F07 (M)**<br>**F08 (M)** |
| 1310 | Salicornia Mud | No | Favourable | 23 | None Identified | None Identified | None Identified | None Identified |
| **1330** | **Atlantic salt meadows** | **No** | **Inadequate** | **38** | None Identified | None Identified | **F07 (H)**<br>**F08 (H)** | **F07 (H)**<br>**F08 (H)** |
| 1410 | Mediterranean salt meadows | No | Inadequate | 33 | None Identified | None Identified | None Identified | None Identified |

| EU Habitat Code | QI Habitat | Classed as Priority Habitat in Ireland? | Conservation Status | No. SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure - Forestry | Article 17 (2019) Identified Threat - Forestry | Article 17 (2019) Identified Pressure - Recreation | Article 17 (2019) Identified Threat- Recreation |
|---|---|---|---|---|---|---|---|---|
| **1420** | **Halophilous Scrub** | **No** | **Bad** | **2** | Not Assessed | Not Assessed | **J02(H)** | **J02(H)** |
| **2110** | **Embryonic shifting dunes** | **No** | **Inadequate** | **33** | None Identified | None Identified | **F07 (H)**<br>**F08 (H)**<br>**F01 (M)**<br>**F06 (M)** | **F07 (H)**<br>**F08 (H)**<br>**F01 (M)**<br>**F06 (M)** |
| **2120** | **Marram dunes (white dunes)** | **No** | **Inadequate** | **46** | None Identified | None Identified | **F07 (H)**<br>**F08 (H)**<br>**F01 (M)**<br>**F06 (M)** | **F07 (H)**<br>**F08 (H)**<br>**F01 (M)**<br>**F06 (M)** |
| **2130** | **Fixed dunes (grey dunes)*** | **Yes** | **Bad** | **43** | None Identified | None Identified | **F07(M)**<br>**F08(M)** | **F07(M)**<br>**F08(M)** |
| **2140** | **Empetrum dunes*** | **Yes** | **Favourable** | **5** | Not Assessed | Not Assessed | **F07(M)** | **F07(M)** |
| **2150** | **Dune heath*** | **Yes** | **Inadequate** | **11** | None Identified | None Identified | **F07(M)** | **F07(M)** |
| **2170** | **Dunes with creeping willow** | **No** | **Inadequate** | **11** | None Identified | None Identified | **F07(M)**<br>**F08(M)** | **F07(M)**<br>**F08(M)** |
| **2190** | **Dune Slacks** | **No** | **Inadequate** | **15** | None Identified | None Identified | **F07(M)** | **F07(M)** |
| **21A0** | **Machair*** | **No** | **Inadequate** | **19** | None Identified | None Identified | **F01(H)**<br>**F07(M)** | **F01(H)**<br>**F07(M)** |
| **3110** | **Oligotrophic isoetid lake habitat** | **No** | **Bad** | **32** | **B23 (H)**<br>**B27 (H)** | **B23 (H)**<br>**B27 (H)** | **None Identified** | **None Identified** |
| **3130** | **Mixed Najas flexilis lake habitat** | **No** | **Inadequate** | **9** | **B23 (M)** | **B23 (M)** | **None Identified** | **None Identified** |
| **3140** | **Hard-water lake habitat** | **No** | **Bad** | **18** | **B23 (H)**<br>**B27 (M)** | **B23 (H)**<br>**B27 (M)** | **F13 (H)**<br>**F33 (M)** | **F13 (H)**<br>**F33 (M)** |

| EU Habitat Code | QI Habitat | Classed as Priority Habitat in Ireland? | Conservation Status | No. SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure - Forestry | Article 17 (2019) Identified Threat - Forestry | Article 17 (2019) Identified Pressure - Recreation | Article 17 (2019) Identified Threat- Recreation |
|---|---|---|---|---|---|---|---|---|
| **3150** | **Rich pondweed lake habitat** | **No** | **Inadequate** | **9** | **B23 (H)** | **B23 (H)** | **F13 (M)**<br>**F11 (M)** | **F13(M)**<br>**F11 (M)** |
| **3160** | **Acid oligotrophic lake habitat** | **No** | **Inadequate** | **10** | **B23 (H)**<br>**B27 (H)** | **B23 (H)**<br>**B27 (H)** | None Identified | None Identified |
| 3180 | Turloughs* | Yes | Inadequate | 45 | None Identified | None Identified | None Identified | None Identified |
| **3260** | **Vegetation of flowing waters** | **No** | **Inadequate** | **21** | **B23 (M)** | **B23 (M)** | **F11 (M)**<br>**F13 (M)** | **F11 (M)**<br>**F13 (M)** |
| 3270 | Chenopodion rubri | No | Favourable | 1 | None Identified | None Identified | None Identified | None Identified |
| **4010** | **Wet Heath** | **No** | **Bad** | **39** | **B01 (H)** | **B01(H)** | None Identified | None Identified |
| **4030** | **Dry \Heath** | **No** | **Bad** | **48** | **B01 (M)** | **B01 (M)** | None Identified | None Identified |
| **4060** | **Alpine and subalpine heath** | **No** | **Bad** | **33** | None Identified | None Identified | **F07 (M)** | **F07 (M)** |
| 5130 | Juniper scrub | No | Favourable | 22 | None Identified | None Identified | None Identified | None Identified |
| **6130** | **Calaminarian grassland** | **No** | **Inadequate** | **33** | **None Identified** | **None Identified** | **F07 (M)** | **F07 (M)** |
| 6210 | Orchid-rich Nardus grassland* | No | Bad | 33 | None Identified | None Identified | None Identified | None Identified |
| 6230 | Species-rich Nardus upland grassland* | No | Bad | 9 | None Identified | None Identified | None Identified | None Identified |
| **6410** | **Molinia meadow** | **No** | **Bad** | **14** | **B01 (H)** | **B01 (H)** | None Identified | None Identified |
| 6510 | Lowland hay meadow | No | Bad | 3 | Not Assessed | Not Assessed | None Identified | None Identified |

| EU Habitat Code | QI Habitat | Classed as Priority Habitat in Ireland? | Conservation Status | No. SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure - Forestry | Article 17 (2019) Identified Threat - Forestry | Article 17 (2019) Identified Pressure - Recreation | Article 17 (2019) Identified Threat- Recreation |
|---|---|---|---|---|---|---|---|---|
| 6430 | Hydrophilous tall-herb swamp | No | Bad | 10 | None Identified | None Identified | None Identified | None Identified |
| **7110** | **Active raised bog*** | **Yes** | **Bad** | **51** | **B01(M)** | **B01 (M)** | None Identified | None Identified |
| **7120** | **Degraded raised bog** | **No** | **Bad** | **53** | **B01 (M** | **B01 (M)** | None Identified | None Identified |
| **7130** | **Blanket Bog (Active)*** | **Yes** | **Bad** | **50** | **B01 (H)** | **B01 (H)** | None Identified | None Identified |
| **7140** | **Transition Mires** | **No** | **Bad** | **16** | **B01 (H)** | **B01 (H)** | None Identified | None Identified |
| **7150** | **Rhynchosporion depressions** | **No** | **Bad** | **63** | **B01 (H)** | **B01 (H)** | None Identified | None Identified |
| 7210 | Cladium fens* | Yes | Inadequate | 17 | None Identified | None Identified | None Identified | None Identified |
| 7220 | Petrifying springs* | Yes | Inadequate | 19 | None Identified | None Identified | F07 (M) | None Identified |
| 7230 | Alkaline fens | No | Bad | 38 | None Identified | None Identified | None Identified | None Identified |
| 8110 | Siliceous scree | No | Inadequate | 3 | None Identified | None Identified | None Identified | None Identified |
| 8120 | Eutric scree | No | Inadequate | 3 | None Identified | None Identified | None Identified | None Identified |
| 8210 | Calcareous rocky slopes | No | Inadequate | 12 | None Identified | None Identified | None Identified | None Identified |
| 8220 | Siliceous rocky slopes | No | Inadequate | 8220 | None Identified | None Identified | None Identified | None Identified |
| 8240 | Limestone pavement* | Yes | Inadequate | 8240 | None Identified | None Identified | None Identified | None Identified |
| 8310 | Caves | No | Favourable | 8310 | None Identified | None Identified | None Identified | None Identified |
| 8330 | Sea caves | No | Favourable | 8330 | None Identified | None Identified | None Identified | None Identified |

| EU Habitat Code | QI Habitat | Classed as Priority Habitat in Ireland? | Conservation Status | No. SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure - Forestry | Article 17 (2019) Identified Threat - Forestry | Article 17 (2019) Identified Pressure - Recreation | Article 17 (2019) Identified Threat- Recreation |
|---|---|---|---|---|---|---|---|---|
| 91A0 | Old oak woodland | No | Bad | 40 | None Identified | None Identified | None Identified | None Identified |
| 91D0 | Bog woodland* | Yes | Favourable | 11 | None Identified | None Identified | None Identified | None Identified |
| 91E0 | Alluvial woodland | Yes | Bad | 25 | None Identified | None Identified | None Identified | None Identified |
| 91J0 | Yew woodland* | Yes | Bad | 5 | None Identified | None Identified | None Identified | None Identified |

### A.1.3.1 Coastal Habitats

Ireland supports a number of coastal Annex I habitats listed from EU Habitat Code 1110 to 1420. These QIs are recorded as having either a forestry or a recreation related pressure/threat within the Article 17 report for the 2013-2019. Indirect effects from forestry related activities, such as pollution to surface or ground waters has been recorded as a pressure and/or threat upon freshwater and coastal water environments within the Article 17 reports from the last two reporting periods[2]. Habitat loss through land-use changes, disturbance and indirect effects from sports, tourism and leisure activities and indirect effects from discharge points of recreational facilities generating pollution were all indicated within the Article 17[2] report as pressures and threats to the coastal habitats as listed in Table 1.

Coastal habitats have the potential to experience impacts in the form of pollution via hydrological connections as a result of activities such as clear-felling, drainage and fertilisation in addition to forestry related infrastructure construction e.g. forestry roads. Nutrient enrichment and sedimentation may occur downstream of the origin point where a hydrological connection exists between habitat and area under forestry activity. These habitats may also be connected by artificial drains created from activities such as agriculture and forestry, as well as overland and subsurface pathways. The water quality of these waterbodies and their connecting habitats can deteriorate through release of sediment and nutrients as well as impacts from acidification. The Environmental Protection Agency (EPA)[3] research provides evidence that waterbodies can recover within a few years and that during the stable period of forestry i.e. outside the felling, planting, and thinning periods, that waterbodies remain in very good condition.

Nutrient enrichment from forestry related activities can potentially occur during fertilisation activities or during the application of herbicides or pesticides to forestry plantations. Sedimentation can occur when harvesting activities occur in addition to forest road construction and related activities such as drainage etc.

#### Estuaries 1130

Estuaries are found along both Atlantic and Irish Sea coastlines which are brackish but dynamic systems of converging currents, with both the freshwater downflow from river systems and tidal conditions sweeping inwards from the sea, mixing both fresh and saline waters. Estuaries can support significant benthic species abundances such as oligochaete worms that provide a dietary requirement for some protected bird species, including waders and migratory seabirds[1], and by extension favour the foraging and breeding behaviours of many waders and wildfowl.

Activities that occur upstream of estuarine systems can have a direct impact on the water quality that flows downstream[2]. Urban areas can impact the water quality of estuarine systems from storm water outputs and wastewater discharges, including those that may be used for recreation and tourism services. Areas of intensive agriculture and/or commercial forestry can contribute to increased sediment levels within the water that flows downstream. The EPA[3] reported approximately 14% of waterbodies in Ireland experience changes in water quality as a result of forestry and/or forestry related activities. Forestry was identified as contributing to, or potentially contributing to, run-off of nutrients, sediment and pesticides. Levels of sedimentation and/or organic matter can increase during planting, thinning and clear-felling stages of afforestation. Potential changes in aquatic sediment regimes, caused by commercial forestry operations increasing sediment material deposited into waterbodies, may also cause impacts to estuaries downstream of the plantations[4].

#### Tidal Mudflats and Sandflats 1140

Tidal mudflats and sandflats are spread around the entire coastline of Ireland. These habitats can occur concurrently with estuarine habitats and large shallow inlets and bays.

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[1] NPWS. Estuaries. Accessed at https://www.npws.ie/marine/marine-habitats/estuaries on 20/01/2023

[2] NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill

[3] EPA (2022) Water Quality in Ireland 2016-2021 Report. Accessed at https://www.epa.ie/publications/monitoring--assessment/freshwater--marine/water-quality-in-ireland-2016-2021/water-quality-2016-2021/EPA_WaterQualityReport2016_2021.pdf on 20/01/2023

[4] Scally, L., Pfeiffer, N. and Hewitt, E. (2020) The monitoring and assessment of six EU Habitats Directive Annex I Marine Habitats. Irish Wildlife Manuals, No. 118. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland

This energetic coastal habitat changes due to the effects of tidal flows, with full exposure of the flats at low tide to fully submerged at high tide. Tidal mudflats and sandflats can vary in structural composition from sandy habitats typically found on open coast beaches and bays with exposure to wave action and strong tidal action to muddy sands and mudflats, which are confined to sheltered areas where silt moves downstream from rivers and estuaries to be deposited in these areas[5]. As a result of the structural diversity present, this habitat can support many species such as burrowing worms, crustaceans and bivalve molluscs, and waterbirds that forage within exposed substrate during low tide.

Similar to estuaries, this habitat can be sensitive to anthropogenic activities that impact water quality. Upstream activities such as intensive agriculture, wastewater and forestry activities can result in increased nutrient loads which eventually discharge to tidal mudflats and sandflats leading to dysfunctional system. Forestry related activities, including afforestation, clear-felling, thinning and replanting stages are considered to have an impact on water quality by contributing to changes in organic matter and nutrient input[3].

### Coastal Lagoons 1150

These shallow water environments are typically characterised by sandbanks, shingle or rocks that compose the structural environment of the coastal lagoon. Due to their shallow nature, these habitats can be brackish or highly saline due to rainfall, evaporation, temporary flooding, tidal flows and the impacts of storms[6]. A variety of marine and avian species are supported by this particular habitat, including seabirds, migratory seabirds, waders, nursery fish species such as mullet and a variety of algae and plants.

Where coastal lagoons are exposed to freshwater inputs, it is possible that changes in water quality to rivers flowing downstream to coastal areas can contribute to impacts on this habitat[4]. Within the Article 17 report it was reported that increases in Biochemical Oxygen Demand (BOD) and in peaty sedimentation from catchments were detected in coastal lagoons presumed to originate from peat extraction activities and/or forestry activities[2]. The sedimentation from peaty material from the wider catchment has been identified as reducing the quality of a number of lagoons (e.g. Drongawn, Cloonconeen, L. Donnell, Loch an Aibhnín, L. Ahalia, Aconeera and Moorlagh). The likely cause of this is the use of machines related to turf cutting and/or forestry activities[2].

### Large shallow inlets 1160

These are very diverse environments with depths ranging up to 30m, catering to a variety of species such as those that require low depths (seagrass meadows restricted to ~10m depth[7]) and lower depths (such as kelp beds ~30m depth[8]). These algal species provide favourable nursery grounds for several marine species including crustaceans, molluscs, amphipods, echinoderms, bivalves and worm species which in turn provide foraging for larger predators such as otters, seals, seabirds and wader species.

Where large shallow inlets have a freshwater input, the potential impacts of forestry and/or forestry related activities relate to nutrient enrichment and/or sedimentation of these waterbodies. Forestry related activities including, but not limited to, felling, thinning, fertilisation and treatment with pesticides can impact water quality. Within the last 15 years, water sampling of some large shallow inlets and bays has uncovered higher levels of nutrients that may have resulted from a variety of sources including commercial forestry.

[5] DG Environment (2013) European Commission. Interpretation Manual of European Union Habitats. Version EUR 28. Accessed at https://eunis.eea.europa.eu/references/2435 on 20/1/2023

[6] European Environment Agency (2022) Habitat Annex I Directive Hierarchical View. Coastal Lagoons. Accessed at https://eunis.eea.europa.eu/habitats/10007 on 20/01/2023

[7] Susanne Baden, Stein Fredriksen, Hartvig Christie, Louise Eriander, Camilla Gustafsson, Marianne Holmer, Birgit Olesen, Jonas Thormar, Christoffer Boström, Effects of depth and overgrowth of ephemeral macroalgae on a remote subtidal NE Atlantic eelgrass (Zostera marina) community, Marine Pollution Bulletin,Volume 177,2022,113497,ISSN 0025-326X,https://doi.org/10.1016/j.marpolbul.2022.113497.

[8] Kelly, E. (ed.) (2005) The role of kelp in the marine environment. Irish Wildlife Manuals, No. 17. National Parks and Wildlife Service, Department of Environment, Heritage and Local Government, Dublin, Ireland.

### Drift Lines (1210), Vegetated Shingle (1220), Vegetated Sea cliffs (1230) and Atlantic Salt Meadows (1330)

These four Annex habitats are located across the coastlines of Ireland, with higher densities along western and southern coasts in comparison to the east coast of Ireland[9]. The identifiable pressures/threats from the Article 17 report pertains to land use changes e.g. to facilitate coastal defence and resilience works, the development and maintenance of beach areas, activities including walking, trampling, camping and off-road driving and litter related issues. Coastal habitats are susceptible to a variety of anthropogenic impacts including those that can exist in the recreation and tourism category. Vegetated shingle has been shown to experience habitat loss from extraction and development but also recreational pressures in a study carried out on behalf of NPWS at 26 sites in Ireland[10]. Drift lines, vegetated shingle and Atlantic salt meadows are exposed to the hydrological fluctuations resulting from tidal exposure and weather related events. Habitat structure and function is therefore susceptible to changes[11] including those that may be resulting from storm weather events. The addition of human related impacts through recreation, walking, trampling, horse-riding, litter etc., has further potential to degrade these habitats, albeit this is relative to the intensity of the recreational activity.

A review of impacts on Irish coastal habitats from the Heritage Council[12] ascertained within the report that three of the top 15 impacts are recreation or leisure related resultant from caravanning/camping, litter, beach activities, walking and water pollution from visitor related infrastructure (i.e. public toilets). The Coillte estate does include several coastal habitats within the estate, most notably across the western seaboard.

### A.1.3.2 Dune Habitats (2110, 2120, 2130, 2140, 2150, 2170, 2190, 21A0)

Several dune formations exist within Ireland, scattered around the entire coastline ranging from the exposed beach fronts to the stable grey dunes, dune slacks and unique machair systems located further inshore. These Annex habitats frequently occur in a mosaic with each other, with some dune complexes comprising all Annex dune habitats (as listed in Table 1). An analysis of the 2019 Article 17 report, in addition to published literature, has shown that these dune systems are susceptible to anthropogenic impacts including those pertaining to recreation and forestry. Dunes with *Salix repens* ssp. *aregentea* (*Salicion arenaria*)(2130), have been impacted by the effects of forestry, albeit in low numbers across the sites and of low importance within the classification analysis provided within the Article 17 report[2]. The remaining dune habitats have not recorded forestry as a pressure or threat.

Dune complexes are exposed to harsh conditions from the coastal winds that spread in from the Atlantic, often experiencing high winds laden with salt spray carried across the ocean. As result, saline loaden winds deposit particles of salt onto the dune habitats. The vegetation of these habitats are therefore habituated to higher than normal saline levels and thrive in this environment. Species such as *Ammophila arenaria* are found along these SAC sites on the western coastline, with machair in particular found in Donegal, Sligo and North Mayo. Sand dunes can support a variety of species, such as ground nesting birds skylark *(Alauda arvensis*) and meadow pipit (*Anthus pratensis)*, flowering plants and reptiles. In addition to their importance as ecosystems, sand dunes act as coastal protection from storm surges, coastal flooding and extreme weather events.

Whilst there were no forestry related pressures and threats recorded within the 2019 Article 17 reports, the previous reporting period between 2007 and 2013[13] identified that forestry was a medium importance pressure for Dunes with creeping willow. For several sand dune systems within Ireland, there have been instances where afforestation has occurred in proximity to SACs.

[9] These Annex I habitat locations were identified using the EU Habitats Directive Annex Habitats Article 17 Reports 2019 – Terrestrial Habitats Web Viewer provided by NPWS and accessed here: https://storymaps.arcgis.com/collections/1a721520030d404f899d658d5b6e159a

[10] Martin, J.R., Daly, O.H. and Devaney F.M. (2017) Survey and assessment of vegetated shingle and associated habitats at 30 coastal sites in Ireland. Irish Wildlife Manuals, No. 98. National Parks and Wildlife Service, Department of Arts, Heritage, Regional, Rural and Gaeltacht Affairs, Ireland

[11] Gissi, E., Manea, E., Mazaris, A.D., Fraschetti, S., Almpanidou, V., Bevilacqua, S., et al., 2021. A review of the combined effects of climate change and other local human stressors on the marine environment. Sci. Total Environ. 755, 142564 https://doi. org/10.1016/j.scitotenv.2020.142564.

[12] Neff, Jenny (1999) Irish Coastal Habitats: A Study of Impacts on Designated Conservation Areas. An Chomhairle Oidhreachta/The Heritage Council. Accessed at https://www.heritagecouncil.ie/content/files/irish_coastal_habitats_impacts_conservation_areas_1998_2mb.pdf on 10/07/2023

[13] NPWS (2013) The Status of EU Protected Habitats and Species in Ireland. Habitat Assessments Volume 2. Version 1.1. Unpublished Report, National Parks & Wildlife Services. Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland

The natural spread or regeneration of commercial forest species can occur in the habitats in proximity to commercial sites and has occurred in some sand dune systems. Changes in both the soil systems[14] and vegetation types[15] can subsequently occur resulting in the forest species outcompeting local sand dune vegetation. A change in habitat dynamics may also be triggered by forestry on sand dune habitats. These can manifest in impacts on the hydrological regime of dune systems[16], with particular influence on dune slacks (Annex habitat 2190) which are dependent on hydrological conditions for their formation and condition of supporting plant species such as *Petalophyllum ralfsii*. The condition of habitat also being impacted by increased scrub encroachment and seed banks of non-native species compromising the natural structure impacting the extent and condition of the habitat[17].

Recreational activities including sports, tourism and leisure activities have been recorded as pressures and threats to several types of dune systems[2]. The development of tourism infrastructure can present implications for dune systems, where activities increase the number of visitors to an area and result in recreational pressure. The impacts of trampling, including that from walking and vehicle use, upon vegetation and soil in dune systems can cause a reduction in any of the Annex I habitats including dune slacks, fixed dunes, and machair[18]. Even in the absence of recreational facilities, dunes are particularly susceptible to destabilisation through recreational pressure involving humans, animals and vehicles, with specific cases noted in the west of Ireland[19].

Coillte is currently partnered with NPWS and third level institutions providing remediation in SAC sand dune habitats sites that were inappropriately afforested through the removal of old forest plantations. Sites include Horn Head and Rinclevan SAC, Donegal Bay (Murvagh) SAC and Raven Point Nature Reserve SAC, funded through the Life Insular[20] programme.

#### A.1.3.3 Freshwater Habitats (3110, 3130, 3140, 3150, 3160, 3260)

Ireland is home to eight Annex I freshwater habitats, six of which are in bad or inadequate status.

The Article 17 report identified forestry related activities that generate pollution to surface or ground waters and/or result in the modification of hydrological conditions, or physical alteration of water bodies and drainage for forestry (including dams) as pressures/threats. Whilst forestry related activities will not be the sole contributor to the status of freshwater Annex I habitats, they can present significant pressures and threats to their conservation status. Activities such as clear-felling, drainage and fertilisation impact these Annex I habitats through pollution of hydrological connections and the alteration of waterbodies from forestry related drainage.

Historically, upland habitats, which occur alongside freshwater lakes such as acid oligotrophic lakes, were targeted for commercial forestry[21]. Planting, felling and modifications to the receiving habitat resulted in degradation of habitats, including these acid oligotrophic lakes. Ponds or pools supporting acid oligotrophic habitats can be lost through damage and degradation of peatland. Clear felling activities impact water quality through increases in nutrient, sediment and dissolved organic matter, particularly the case where forests are on peatland. Furthermore, conifer forests on peatland that undergo fertilisation have shown higher levels of pollutants within receiving waterbodies.

[14] (2010). Afforestation Effect on Soil Quality of Sand Dunes. Polish Journal of Environmental Studies, 19(6), pp.1109-1116.
[15] Delaney, A., Devaney, F.M, Martin, J.M. and Barron, S.J. (2013). Monitoring survey of Annex I sand dune habitats in Ireland. Irish Wildlife Manuals, No. 75. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland
[16] Tim Ryle, Anne Murray, Kieran Connolly & Melinda Swann (2009) Coastal Monitoring Project 2004-2006. A Report to the National Parks and Wildlife Service, Dublin.
[17] Delaney, A., Devaney, F.M, Martin, J.M. and Barron, S.J. (2013). Monitoring survey of Annex I sand dune habitats in Ireland. Irish Wildlife Manuals, No. 75. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.
[18] Kindermann, G., Gormally, M.J. Vehicle damage caused by recreational use of coastal dune systems in a Special Area of Conservation (SAC) on the west coast of Ireland. *J Coast Conserv* **14**, 173–188 (2010). https://doi.org/10.1007/s11852-010-0102-7
[19] Kindermann, G. and Gormally, M.J., 2013. Stakeholder perceptions of recreational and management impacts on protected coastal dune systems: A comparison of three European countries. *Land use policy*, *31*, pp.472-485.
[20] Life Insular Website (2023) Accessed at https://www.lifeinsular.eu/eng/ on 21/01/2023
[21] Renou-Wilson F, Byrne KA (2015) Irish peatland forests: lessons from the past and pathways to a sustainable future. Restor Boreal Temp For 13:321

Further impacts on water quality from commercial forestry is as a result of the slow decomposition of conifer needles, branches and roots leading to a loss in organic matter and nutrients.

Freshwater habitats, including the Annex I habitats listed above, can be hydrologically connected to commercial forestry via streams, ditches, rivers, and artificial drains created from activities such as agriculture and forestry, as well as natural overland and subsurface pathways. The water quality of these waterbodies and their connecting habitats can deteriorate through release of sediment and nutrients as well as impacts from acidification. Moreover, artificial drains created from forestry can modify the natural hydrological regime[22] of the area with wet and peat soils drying out, potentially resulting in erosion.

Freshwater habitats such as rivers and streams are uni-directional, meaning that downstream areas can be heavily impacted by activities and potential pollution sources upstream. It is important to view rivers and streams as a natural unit of the surrounding landscape as rivers combine biotic factors from both the terrestrial and aquatic environment due to their connectivity. Consequently, all terrestrial activities within a catchment can impact conditions in freshwater habitats[23].

Recreational activities such as angling can contribute to this alteration of freshwater habitats[24]. The deliberate actions of removing bankside vegetation in order to gain better access to the river can result in the fragmentation of bankside communities which is not beneficial to river corridor wildlife. It can be assumed that the removal of bankside vegetation from freshwater habitats, albeit under any activity can result in habitat loss, fragmentation and degradation and may also have an indirect effect on species which may use that area for shelter or movement.

#### A.1.3.4 Peatland and Heath

Peatland habitats (EU Habitat Codes 7110, 7120, 7130, 7140,7150 and for inclusion under this section, heath habitats 4010 and 4030) such as blanket bog in the uplands are found throughout Ireland with the highest densities across the western and northern seaboards. Designated active and degraded raised bogs account for approximately 2324ha land area[25] across 53 SAC sites. Peatlands require particular characteristics that aid in the formation of peat. Typical factors that contribute to peat forming habitats are waterlogged soils with a low pH, low nutrient and oxygen availability which contribute to a reduced decomposition rate.

In total, approximately 211 SAC sites are designated for the presence of a peatland habitat (active raised bogs, degraded raised bogs, blanket bog, transition mire, *Rhynchosporion* depressions, wet heath, and dry heath) and accounts for half the nation's SAC sites. These habitats can support a variety of species including a host of endangered birds, with most recorded as breeding[26]. Peatland habitats are a rare habitat in Europe with a unique assemblage of species and structure and function.

The pressures and threats from forestry do not alone contribute to the 'bad' status of these habitats (all are at 'bad' status), but they do frequently occur in combination with pressures and threats such as inappropriate agricultural practices and wildfires. Historical afforestation practices in Ireland targeted the uplands for planting as this habitat was hard to access for infrastructure development and not valuable for farming. The direct replacement of bog habitat with forestry, consequential drainage of bog and heath habitats led to changes in hydrology and species composition. Forestry, as part of wider suite of interacting and cumulative pressures and threats, has led to changes in the hydrological regime which naturally supports peatlands, to species composition changes, to susceptibility to wildfires and to the spread of non-native invasive species such as Rhododendron (*Rhododendron ponticum*). Popular commercial forestry species such as sitka spruce (*Picea sitchensis)* and lodgepole pine *(Pinus contorta)* can self-seed from commercial forestry, spreading onto peatland habitats, thereby contributing to overall habitat degradation.

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[22] Laine, Jukka & Vasander, Harri & Sallantaus, Tapani. (2011). Ecological effects of peatland drainage for forestry. Environmental Reviews. 3. 286-303. 10.1139/a95-015.

[23] Giller, P.S., Johnson, M. and O'Halloran, J., 2002. *Managing the impacts of forest clearfelling on stream environments*. Dublin, Ireland: COFORD.

[24] Murphy, K.J. and Pearce, H.G., 1985, October. Habitat modification associated with freshwater angling. In *Angling & Wildlife in Fresh Waters: ITE Symposium* (Vol. 19, pp. 31-46).

[25] Department of Arts, Heritage and the Gaeltacht (2018) National Raised Bog Special Areas of Conservation Management Plan 2017-2022. Accessed at https://www.npws.ie/sites/default/files/files/FOR%20UPLOAD%20Plan(WEB_English)_05_02_18%20(1).pdf on 14/09/2022

[26] O'Connell, C. A., Madigan, N., Whyte, T. & Farrell, P. (2021) Peatlands and Climate Change Action Plan 2030. Irish Peatland Conservation Council, Co. Kildare.

Both are non-native species to Ireland and were introduced due to their favourable growth patterns and timber provision. Commercial forestry species in conjunction with forestry drainage patterns have contributed to altering hydrological systems including the water table. Where commercial plantation has occurred in these situations this has resulted in species changes through the loss of hydrophilous species such as *Sphagnum* thereby creating unfavourable peatland habitats. Whilst there is a decreasing trend of commercial forestry within these habitats, there are continued forestry practices and lack of restoration management meaning that in many cases legacy issues have to be addressed.

Coillte has already implemented bog restoration measures on more than 3,200ha of prime peatland habitat. The work was completed during 2002-2015 in three LIFE-Nature projects, in which sites where the forest plantation is intrinsically part of a larger, ecologically valuable peatland system, were selected for restoration, following consultation with NPWS[27]. In all, restoration measures were implemented on approx. 2,000ha of blanket bog and more than 1,200ha of raised bog habitat on the Coillte estate. Coillte continues to monitor and maintain these sites. The LIFE projects targeted sites where forestry plantations were located within or adjacent to ecologically significant peatland habitats. For example, all Coillte plantations within the Bellacorick Bog Complex SAC were restored in the LIFE-02 blanket bog restoration project.

This work is being extended in several current projects, some of which have broader objectives to address legacy issues, such as Coillte Nature's Wild Western Peatlands[28] and the EU LIFE programme Wild Atlantic Nature[29], which is led and managed by NPWS. Both projects are targeting specific locations across the north and west of the country, with Coillte Wild Western Peatlands project taking place in Derryclare in Connemara and several other locations across Donegal, Mayo, Sligo and Galway. The NPWS-led Wild Atlantic Nature project is more specifically focused on blanket bog, and includes two Coillte sites, one in Galway (Derrylea, which is part of the Connemara Bog Complex), and one in Mayo (Owenanirragh, part of the Glenamoy Bog Complex).

Peatland and heath habitats within the uplands and mountain areas of Ireland can be isolated in scenic areas and as a result have become popular spaces for recreational activities[30] (walking, cycling, bird watching and facilities installation). However, such recreational activities may also result in pressures, if not managed appropriately. The inappropriate recreational use of off-road vehicles, quad bikes and scramblers can cause damage to peatland habitats. Walking and cycling trails can degrade habitats through trampling or fragment the landscape in popular hiking areas. These effects can be similar in their impact to overgrazing, as the repeated footfall and creation of desire lines through the landscape can damage the bog surface, its vegetation and reduce its ability to form peat[31]. Tracks, trails and desire lines can also become channels for erosion. Camping may cause further degradation through litter and burning. Any wildfire can lead to the destruction of already fragile habitats and wildlife.

#### A.1.3.5 Grasslands

Five semi-natural grassland habitats listed as Annex I habitats face a pressure/threat from forestry related activities. Review of the latest Article 17 reports and published literature has shown that three of these five habitats have forestry and/or forestry related pressures and threats listed. Calaminarian grassland was the only semi-natural grassland listed with a recreation related pressure and threat.

##### Calaminarian Grasslands (6130)

Calaminarian Grassland occur on soils that have levels of heavy metals, such as lead, zinc, chromium, and copper, that are toxic to most plant species. The greatest extent of the habitat occurs on artificial sites associated with past mining activities. Vegetation is characterised by the presence of metallophyte plants, i.e. plants that can tolerate high levels of heavy metals.

[27] https://www.irishbogrestorationproject.ie/; https://www.raisedbogrestoration.ie/;

[28] Coillte Nature – Wild Western Peatlands Project .Accessed at https://www.coillte.ie/coillte-nature/ourprojects/wildwesternpeatlands/

[29] Wild Atlantic Life Nature. Accessed at https://www.wildatlanticnature.ie/

[30] Maltby E (2010) Effects of climate change on the societal benefits of UK upland peat ecosystems: applying the ecosystem approach. Clim Res 45:249-259. https://doi.org/10.3354/cr00893

[31] McKendrick-Smith, Kathryn Amy (2016) The Impact of Tracks on Blanket Peat Ecohydrology. PhD thesis, University of Leeds.

In Ireland, metallophyte vegetation no longer occurs naturally, but it may develop locally in habitats created by past mining activities, particularly on old copper or lead mine spoils. Survey work in 2006, 2008 and 2018 has found that such vegetation can support some very rare bryophyte species (mosses and liverworts), several of which are threatened with extinction in Europe, and has concluded that only 6.2 ha of Calaminarian Grassland habitat remains in Ireland[32].

The vegetation is generally sparse, although grazing by rabbits or sheep is often needed to prevent scrub from taking over. Most plants can't tolerate the high levels of heavy metals found in soils underlying Calaminarian grassland, so the habitat is characterised by a limited range of species. Some species, including sheep's fescue (*Festuca ovina)*, bladder campion (*Silene vulgaris)* and thrift (*Armeria maritima subsp.)*, have specially adapted forms that can grow here, while others, including spring sandwort (*Minuartia verna)* (also known as leadwort) and alpine pennycress (*Nocceaea caerulescens)*, specifically live in this habitat.

Calaminarian sites have been lost over recent years through re-working for minerals, agricultural practices, scrub encroachment and the canalisation of rivers. Article 17 reporting lists two recreational related pressures and threats relating to sports, tourism and leisure activities and the modification of coastline, estuary and coastal conditions for development, use and protection of residential, commercial, industrial and recreational infrastructure and areas (including sea defences or coastal protection works and infrastructures).

A range of impacts have led to losses and degradation of the habitat and its component species due to factors such as mine spoil reclamation or re-working, deposition of atmospheric nitrogen, decline in the toxicity of the surface soil leading to successional change, a cessation of or decline in grazing including by rabbits, tree planting and possibly agricultural improvement by the use of fertilisers.

There is potential for metallophyte plants to be trampled as recreational activities such as walkers utilise the sparse vegetation as a path. Another localised pressure may be due to them being perceived as waste ground and used for motor sports[33].

### Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*)(*important orchid sites)(6210)

Semi-natural dry grasslands and scrubland facies on calcareous substrates (*Festuca-Brometalia*)(*important orchid sites) is a species rich habitat with a variety of plant species such as *Succisa pratensis, Carex flacca, Linum cartharticum, Galium verum* and *Anthyllis vulneraria*. This grassland habitat is generally found on shallow, well-drained calcareous substrates[34] scattered across the Irish landscape associated with limestone geology such as the Burren and Aran Islands and the Dartry Mountains, amongst other sites around Ireland. Management of these types of grasslands is associated with low-intensity agricultural practices wherein characteristic orchid species, kidney vetch, yellow-wort etc. can flourish with low-intensity and rotational grazing practices[35].

In addition to its botanical importance, grasslands such as this support a variety of invertebrates, terrestrial animals and bird species. Butterfly species such as marsh fritillary (*Euphydryas aurinia*) depend on devil's-bit scabious (*Succisa pratensis)* in its larval stage whilst the small blue (*Cupido minimus)* is dependent on kidney vetch in its larval stage.

[32] Lockhart, N. (2022) Natural Heritage Areas (NHAs) for Calaminarian Grassland: Selection Criteria. Irish Wildlife Manuals, No. 130. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

[33] Natural England (March 2021) Definition of Favourable Conservation Statis of Calaminarian grassland.

[34] BSBI (2021) BSBO Ireland Annex I Grassland Resources. Semi-natural dry grasslands on calcareous substrates (EU Habitats Directive Code 6210/*6210)[*important orchid sites]. Accessed at https://bsbi.org/wp-content/uploads/dlm_uploads/Semi_Natural_Calcareous_Grasslands_6210.pdf on 22/01/2023

[35] Martina Köhler, Georg Hiller, Sabine Tischew, Year-round horse grazing supports typical vascular plant species, orchids and rare bird communities in a dry calcareous grassland, Agriculture, Ecosystems & Environment,Volume 234,2016,Pages 48-57,ISSN 0167-8809,https://doi.org/10.1016/j.agee.2016.03.020.

Inappropriate or lack of management can have negative impacts on this habitat type, with the European Commission reporting threats[36] such as unregulated grazing, abandonment and succession to woodland, invasive species, agricultural improvement, land use change, nitrogen deposition, recreational pressures and anthropogenic activities as greatest threats to calcareous grassland habitats.

The 2019 Article 17 reporting provides detail arising from the Annex I grassland monitoring project[37], where sites with Annex or Annex-quality grassland habitats include where 6210 is a QI were surveyed. This project identified one site which was impacted by forestry or forestry related activities. The intensity of that impact was recorded as low with less than 25% of the habitat affected by forestry. Where forestry has been historically established within an Annex I grassland habitat or in proximity to an SAC site, there is a threat of forestry encroachment, soil and vegetation impacts and habitat fragmentation as a result.

### Species rich Nardus upland grassland 6230

This grassland is a QI feature in nine SACs in Ireland[38], located along upland landscapes and generally in a mosaic with other upland habitat types such as heath. The habitat requires mineral flushing to exist[39]. Vegetation composition comprises of grass species such as *Agrostis stolonifera, Nardus stricta* and *Anthoxanthum odoratum* with flowering species of *Prunella vulgaris, Lathyrus linifolius, Pseudorchis albida* and *Viola canina.* Similar to other grassland types, flowering species present within this habitat can be important to butterfly populations and bird species[40]. Open expanses of these types of grassland can provide foraging opportunities for birds of prey.

Afforestation is listed in EC[41] reporting as one of the pressures and threats to this habitat, along with eutrophication, inappropriate grazing practices, land abandonment or low management intensity. The monitoring for this Annex I grassland by NPWS was put on hold during the 2013-2019 reporting period resulting in forestry being assessed as a low-importance pressure or threat in the latest Article 17 report. The 2013 report identified forestry as a low importance threat/pressure. The 2013 report identified that the conversion of land to forestry as low importance threat "*due to the continued trend in Ireland of planting conifer plantation on marginal agricultural land and the technical difficulties with the foresters and ecologists involved with planting recognising the 6230 habitat*".

Potential impacts on this habitat arising from afforestation includes habitat fragmentation, habitat loss through spread of tree species, disturbance during afforestation activities, felling, thinning etc. and changes or loss of vegetation composition as a result of encroaching tree species and/or through the application of fertilisation during afforestation.

### Molinia Meadows 6410

Molinia meadows are generally found on traditionally nutrient poor soils including calcareous, peat or clay-silt laden soils that require a fluctuating supply of water to contribute to the indicative species that grow in Molinia meadows. Often used in agriculture for hay meadows or pasture for stock, this habitat can be found on lowland and upland habitats widely distributed in Ireland but with most found in the north and west. Despite being found on nutrient poor soils, Molinia meadows are species rich grasslands, supporting up to 40 flora species including the plant devils bit scabious (*Succisa pratensis*) which is the main food plant for the Annex II species marsh fritillary (*Euphydryas aurinia*).

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[36] Calaciura B & Spinelli O. 2008. Management of Natura 2000 habitats. 6210 Semi-natural dry grasslands and scrubland facies on calcareous substrates (Festuco-Brometalia) (*important orchid sites). European Commission

[37] Martin, J.R., O'Neill, F.H. & Daly, O.H. (2018) The monitoring and assessment of three EU Habitats Directive Annex I grassland habitats. Irish Wildlife Manuals, No. 102. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland

[38] Caha Mountains SAC; Mount Brandon SAC; Carlingford Mountain SAC; Cuilcagh - Anierin Uplands SAC Ben Bulben, Gleniff and Glenade Complex SAC; Galtee Mountains SAC; Kilduff, Devilsbit Mountain SAC Silvermine Mountains SAC; Glanmore Bog SAC; Wicklow Mountains SAC; Bolingbrook Hill SAC; Anglesey Road SAC

[39] BSBI (2021) BSBI Ireland Annex I Grassland Resources. Species-rich Nardus grasslands (EU Habitats Code Directive Code 6230). Accessed at https://bsbi.org/wp-content/uploads/dlm_uploads/2021/11/Nardus_uplands_6230_updated2021.pdf on 22/01/2023

[40] Brüggeshemke, J., Drung, M., Löffler, F. et al. Effects of local climate and habitat heterogeneity on breeding-bird assemblages of semi-natural grasslands. J Ornithol 163, 695–707 (2022). https://doi.org/10.1007/s10336-022-01972-7

[41] Galvánek D. & Janák M. 2008. Management of Natura 2000 habitats. 6230 *Species-rich Nardus grasslands. European Commission

Molinia meadows are typically managed for agriculture through grazing for cattle or for hay production. The temperate climate of Ireland often contributes higher levels of rainfall which can contribute to waterlogged soils, in turn reducing the availability of some Molinia meadows to be cultivated for hay. In some instances, Molinia meadow habitat has been modified and converted into forestry or more intensive agricultural uses. The 2019 Article 17 report indicated that the loss of Molinia meadows was due to agricultural intensification, forestry, and abandonment and predicted that the impact of these activities is due to continue.

Conversion of Molinia meadow to forestry can result in the alteration of the hydrological regime through the construction of associated artificial drains. Potential impacts from this can result in complete loss of habitat as Molinia meadows are converted to forestry, loss of indicator species through disturbance from planting, shading through trees and the alteration of water table levels. Many typical and indicator species attributed to the Molinia Meadow classification are dependent on light and water availability, with changes in either function having an impact on the species richness. Additionally, commercial afforestation could potentially lower the water table, increase shade and/or present the opportunity for the afforested species to encroach onto adjacent habitat if spread is not managed.

Data collected during the most recent Annex I Grassland monitoring survey[41] indicated that the biggest threat to 6410 habitat degradation was through pressures such as abandonment, agricultural intensification and forestry. Several sites were surveyed, included sites SAC sites, nationally designated sites and non-designated sites with annex-quality grassland. Of the sites included within the monitoring survey, it was found that seven of these underwent a land use change, and where they had formerly been annex-quality grassland they were now used for agriculture or forestry planting however, these did not pertain to any designated sites. NPWS have indicated that this land use change now results in low potential for habitat restoration.

#### A.1.3.6 Other Annex Habitats Impacted

The introduction of biocides, pesticides, hormones, chemicals, and nutrients into the environment through forestry was identified[2] as a common pressure or threat found to affect turlough and woodland habitats through diffuse pollution of surface water and groundwater resources[42,43]. Human activities such as historical drainage practices, forest planting on open ground and the pollution of surface and groundwater resources was found to impact fen habitats. Activities that happen directly adjacent to fens can alter conditions and make it less suitable for species that depend on this habitat e.g., through drainage and/or nutrient run-off.

[42] O'Neill, F.H. & Barron, S.J. (2013) Results of monitoring survey of old sessile oak woods and alluvial forests. Irish Wildlife Manuals, No. 71. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

[43] O Connor, Á. (2017) Conservation objectives supporting document: Turloughs* and Rivers with muddy banks with Chenopodion rubri p.p. and Bidention p.p. vegetation. Conservation Objectives Supporting Document Series. National Parks and Wildlife Service, Dublin.

## A.1.4 Qualifying Interest Species

As stated in Section 4.5 of the AA report, an expanded discussion on the Annex II species identified to have the potential to be impacted by the draft FESLUP is provided here. This section outlines supporting information relating QI species that were determined to be representative of the European site network in and that have vulnerabilities to activities pertaining to forestry and recreation.

Table 2 below provides an overview of the QI species which have a corresponding recreational and forestry pressures/threats as defined in Article 17 report[13]. The definitions to the pressure and threats codes are provided in Section A.1.2.1. Further to the review of the Article 17 listed pressures and threats, additional desktop review and consultation with Coillte identified several other species that exist within the Coillte Estate. Therefore these species (Kerry slug, Nore pearl mussel, White-clawed crayfish and otter) have also been included within this discussion as they are too at risk of the potential for likely significant effects. Those QI species identified to have pressures and/or threats relating to forestry and/or recreation have been presented in bold. Following Table 2, the QI species that have been identified are discussed in relation to forestry and recreation related activities and their vulnerabilities to activities are contained therein.

**Table 2 Qualifying Interest Species with corresponding pressures and threats in the forestry and recreation categories**

| EU Habitat Code | QI Species | Conservation Status | No SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure relating to Forestry | Article 17 (2019) Identified Threat relating to Forestry | Article 17 (2019) Identified Pressure relating to Recreation | Article 17 (2019) Identified Threat relating to Recreation |
|---|---|---|---|---|---|---|---|
| **6985** | **Killarney fern** | **Favourable** | **18** | None Identified | None Identified | **F07 (L)** | **F07 (L)** |
| **1528** | **Marsh saxifrage** | **Favourable** | **5** | **B27 (M)** | **B27 (M)** | None Identified | None Identified |
| **1833** | **Slender naiad** | **Inadequate** | **24** | **B23(M)** | **B23 (M)** | None Identified | **F33 (M)** |
| 6216 | Slender green feather moss | Favourable | 8 | None Identified | None Identified | None Identified | None Identified |
| **1395** | **Petalwort** | **Favourable** | **20** | None Identified | None Identified | **F07 (L)** | **F07 (L)** |
| 1013 | Geyer's whorl snail | Bad | 14 | None Identified | None Identified | None Identified | None Identified |
| **1014** | **Narrow mouthed whorl snail** | **Inadequate** | **13** | None Identified | None Identified | **F05 (M)**<br>**F07 (M)** | **F05 (M)**<br>**F08 (M)** |
| 1016 | Desmoulin's whorl snail | Inadequate | 7 | None Identified | None Identified | None Identified | None Identified |
| 1024 | Kerry slug | Favourable | 7 | None Identified | None Identified | None Identified | None Identified |
| **1029** | **Freshwater pearl mussel** | **Bad** | **19** | **B27 (H)**<br>**B23 (H)** | **B27 (H)**<br>**B23 (H)**<br>**B01 (H)** | **F28 (H)**<br>**F31 (M)**<br>**F33 (M)** | **F28 (H)**<br>**F31 (M)**<br>**F33 (M)** |
| 1990 | Nore pearl mussel | Bad | 1 | Not assessed | Not assessed | Not assessed | Not assessed |
| 1065 | Marsh fritillary | Inadequate | 12 | **B01(H)** | **B01(H)** | None Identified | None Identified |
| 1092 | White-clawed crayfish | Bad | 15 | None Identified | None Identified | None Identified | None Identified |
| 1095 | Sea lamprey | Bad | 12 | None Identified | None Identified | None Identified | None Identified |
| 1096 | Brook lamprey | Favourable | 10 | None Identified | None Identified | None Identified | None Identified |
| 1099 | River lamprey | Unknown | 10 | None Identified | None Identified | None Identified | None Identified |

| EU Habitat Code | QI Species | Conservation Status | No SACs for which it is a qualifying feature | Article 17 (2019) Identified Pressure relating to Forestry | Article 17 (2019) Identified Threat relating to Forestry | Article 17 (2019) Identified Pressure relating to Recreation | Article 17 (2019) Identified Threat relating to Recreation |
|---|---|---|---|---|---|---|---|
| 5046 | Killarney shad | Favourable | 1 | None Identified | None Identified | None Identified | None Identified |
| 1103 | Twaite shad | Bad | 5 | None Identified | None Identified | None Identified | None Identified |
| **5076** | **Pollan** | **Bad** | **3** | None Identified | None Identified | **F33 (H)** | **F33 (H)** |
| **1106** | **Atlantic salmon** | **Inadequate** | **26** | **B23 (M)** | **B23 (M)** | None Identified | **F28 (M)** |
| **1303** | **Lesser horseshoe bat** | **Inadequate** | **41** | None Identified | None Identified | **F01 (M)**<br>**F02 (M)**<br>**F24 (M)** | **F01 (M)**<br>**F02 (M)**<br>**F24 (M)** |
| 1355 | Otter | Favourable | 45 | None Identified | None Identified | None Identified | None Identified |
| 1364 | Grey seal | Favourable | 10 | None Identified | None Identified | None Identified | None Identified |
| 1365 | Harbour seal | Favourable | 13 | None Identified | None Identified | None Identified | None Identified |
| 1351 | Harbour porpoise | Favourable | 2 | None Identified | None Identified | None Identified | None Identified |

### A.1.4.1 Killarney Fern (6985)

Killarney fern is a medium-sized, long-lived fern with delicate, translucent fronds arising from a creeping rhizome. Killarney fern occurs in Irish populations as colonies of sporophytes and gametophytes co-occurring (whereby gametophytes occur intimately or closely associated with sporophytes), sporophyte-only or gametophyte-only.

The Killarney fern is generally a plant of almost permanently moist / humid, sheltered situations. Low light intensity is a typical feature of where it is found. Usually, a species of acidic rock faces, it does grow on trees once the light intensity, shelter and moisture conditions are met. Habitats include but are not necessarily limited to; exposed siliceous rock (ER1), non-marine caves (EU1), wet pedunculate oak - ash woodland (WN4), oak-birch-holly woodland (WN1) and (mixed) broadleaved woodland (WD1). Ireland has designated a total of 24 SACs which contain populations of Killarney fern, in 18 of which it is listed as a QI[44].

The main historic threat to Killarney fern has been from collecting and although it is listed under the Wildlife Act of 1976 in the Flora Protection Order 1987, the threat still exists. This aligns with sports, tourism and leisure activities identified as a pressure and threat (as shown in (Table 2). Given the habitat where this species can be found there is potential for negative impacts through trampling of recreation seekers[45].

Woodland habitats, such as those found within the Coillte estate have the potential to support the Killarney fern, and it can be assumed that where these areas are open to recreational activities or indeed the development of recreation amenities, there is the potential for habitat loss.

The introduction of biocides, pesticides, hormones, chemicals, and nutrients that may originate from fertilisation and maintenance activities of forestry into the environment was a common pressure or threat found to affect Killarney fern.

### A.1.4.2 Marsh Saxifrage (1528)

Marsh saxifrage is found within blanket bog and is noted as one of the rarest flowering plants in Ireland[46]. requires a wet environment to grow, such as in the mineral flushes that occur in blanket bog and which function as a food source. The species has shown a decreasing trend in distribution for a number of years, formerly being found across several counties in the north, but now restricted to Sligo and Mayo. Dependent on the peatland environment it inhabits, negative impacts to blanket bog subsequently affect the conservation status of marsh saxifrage.

Threats to blanket bog habitats include afforestation, peat extraction, erosion and burning. Drainage and irrigation operations from forestry related infrastructure present the greatest pressure and threat to marsh saxifrage, as this contributes to hydrological changes that reduces suitability of supporting conditions. The 2019 Article 17 reporting identifies locations at Bellacorick Bog SAC and the Ox Mountains Bogs SAC where hydrological changes due to drainage activities for forestry has reduced the water table[47].

[44] Ní Dhúill, E., Smyth, N., Waldren, S. & Lynn, D. (2015) Monitoring methods for the Killarney Fern (Trichomanes speciosum Willd.) in Ireland. Irish Wildlife Manuals, No. 82. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland

[45] Ratcliffe, Birks and Birks (1993) The ecology and conservation of the Killarney Fern Trichomanes speciosum willd. In Britain and Ireland

[46] Muldoon, C.S., Waldren, S. & Lynn, D. (2015) Monitoring recommendations for Marsh Saxifrage (*Saxifraga hirculus* L.) in the Republic of Ireland. Irish Wildlife Manuals, No. 88. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland.

[47] Perrin, P.M., Roche, J.R., Barron, S.J., Daly, O.H., Hodd, R.L., Muldoon, C.S. & Leyden, K.J. (2013). National Survey of Upland Habitats (Phase 3, 2012-2013), Site Report No. 10: Ox Mountains Bogs cSAC (002006), Cos. Mayo and Sligo. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Dublin, Ireland.

Although upland habitats have been targeted less frequently for forestry in recent years (due to the introduction of environmental requirements[48] from the Forest Service and updated forestry standards[49]), these areas are may yet be subject to legacy issues associated with historical commercial afforestation and therefore potential effects, such as indirect impacts on the hydrological requirements of marsh saxifrage may exist. However, as previously stated within Section A1.3.4 full restoration of forestry plantations within the Bellacorick Bog Complex SAC is anticipated to alleviate these potential impacts.

Any recreation within the habitats of Marsh saxifrage has the potential to incur habitat loss, degradation and fragmentation including through activities such as hiking and pathway construction and maintenance.

### A.1.4.3 Slender Naiad (1833)

Slender naiad is a rare freshwater plant species found in lakes, rivers and pools, and is the main indicator plant species of the annex habitat 3130 – Mixed Najas flexilis lake habitat of which there are 24 SACs that list it as a QI. Slender naiad typically requires high water clarity, depths of up to 2m, pH between 6.0 and 9.0., and phosphate rich silty sediment[50]. Its distribution in Ireland is within freshwater habitats to west of Ireland with the core regions occurring in Galway, Donegal and Kerry. Freshwater habitats are subject to pressures and threats from afforestation, and by association so are the plants and species that grow within and are indicators of those habitats. Article 17 reporting points to evidence that drainage associated with forestry presents a significant pressure in five catchments where slender naiad exists.

A decline in the water quality of freshwater habitats can have a knock on effect on slender naiad due to increases in sediment, dissolved organic matter and/or from acidification. Hydrological changes contributing to fluctuations in water level can hamper growth patterns of slender naiad[51]. Increases in nutrient load, potentially from fertilisation of afforestation and/or the contribution of dissolved organic matter from leaf litter or pine needles can incur algal blooms, should the right conditions occur. Algal blooms are indicative of declines in water quality and can negatively affect slender naiad presence and abundance.

Conservation measures such as the reversal of drainage impacts on the receiving environment and the restoration of the natural hydrological regime in addition to reduction of pollution from forestry can contribute to improving the conservation status of this slender naiad.

### A.1.4.4 Petalwort (1395)

Petalwort (*Petalophyllum ralfsii*) is a pale green liverwort which grows in open, damp, calcareous dune slacks, often on low hummocks rather than on the very wet ground, on compacted sandy/muddy bryophyte-rich turf. Most locations where the species occurs can be classified as the Annex I habitat type 2190 Humid dune slacks. It has occasionally been recorded in other coastal grassland where conditions are similar. Closely associated species may include the mosses (*Barbula convoluta*, *Bryum* spp., *Didymodon tophaceus*, *Ditrichum flexicaule* (*sensu lato*), *Hypnum lacunosum)*, glaucous sedge (*Carex flacca*), the grasses common bent (*Agrostis capillaris*), red fescue (*Festuca rubra*) and Yorkshire-fog (*Holcus lanatus*).

Sports, tourism and leisure activities is listed as a threat and a pressure with a low impact. Monitoring[52] in Ireland shows that frequent positive impact recorded at the sites surveyed was use by walkers and non-motorised vehicles. Moderate amounts of disturbance through these activities is beneficial to the habitat for petalwort as it maintains open low vegetation and compacts the ground allowing it to establish. The use of motorised vehicles recorded at many sites is also beneficial in this way, and *P. ralfsii* is often found on old trackways and in wheel ruts. However, higher rates of disturbance from these activities, particularly the use of motorised vehicles, may destroy the integrity of the substrate and can break up the bryophyte crust.

[48] Forest Service (2016) Environmental Requirements for Afforestation. Department of Agriculture, Food and the Marine.

[49] Department of Agriculture, Food and the Marine Forestry Standards and Procedures Manual. Available at https://forestryservices.ie/wp-content/uploads/2019/05/Forestry_Standards_and_Procedures_Manual_2015.pdf. Accessed 20 July 2023.

[50] I. D. M. Gunn & L. Carvalho (2020). Slender Naiad (Najas flexilis) Habitat Quality Assessment. CRW2018_27. Scotland's Centre of Expertise for Waters (CREW).Available online at: crew.ac.uk/publications

[51] Roden, C., Murphy, P. & Ryan, J.B. (2021) A study of lakes with Slender Naiad (*Najas flexilis*). Irish Wildlife Manuals, No. 132. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

[52] Campbell, C., Hodd, R. & O'Neill, F. (2019) The monitoring and assessment of Petalophyllum ralfsii (Petalwort) in the Republic of Ireland 2016–2018. Irish Wildlife Manuals, No. 109. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland)

While petalwort may eventually recolonise these areas, too much disturbance on a continual basis is detrimental to the ability of the species to establish and maintain itself. There is the potential that petalwort may exist in proximity to sites within the Coillte estate.

### A.1.4.5 Narrow mouthed whorl snail (1014)

The narrow-mouthed whorl snail is a QI of 13 SAC sites within Ireland, and is found within damp wet habitats including dunes, wet grasslands, fen, marsh, salt marsh and the floodplains of rivers. This snail species is small in size, ranging from 1.7-2.7mm in height and 1-1.5mm in width[13] but despite this its range can extend up to 100m within a 12-month period. The species is currently listed as vulnerable under the Irish Red List and in inadequate status according to the Article 17 report. Sports, tourism, and leisure activities and the creation or development of sports, tourism and leisure infrastructure (outside the urban or recreational areas) were identified as medium pressures and threats for this species. However, it must be noted that a suite of pressures and threats have resulted in the inadequate status of this species within the Article 17 report.

Narrow mouthed whorl snail is known to occur in proximity to the Coillte estate and as such the potential for indirect impacts upon the species may exist. The impacts of recreation on the supporting habitats of this species could by extension have an impact on narrow mouthed whorl snail. As stated in Section A1.3.2 the impacts of recreation on sand dune environments can generate habitat fragmentation and degradation. Hiking, trampling and the use of vehicles within these areas could present the risk of species mortality. Reducing habitat loss has been noted as a key factor in conserving this species[53]. Whilst forestry has not been recorded as a pressure and/threat within the Article 17 report, habitat loss through any activity, including forestry, especially where marginal lands such as wet grassland types are planted upon, can present the potential for habitat loss and species mortality[53].

### A.1.4.6 Kerry Slug (Geomalacus maculosus) 1024

The Kerry slug is a species of gastropod mollusc, native to the south west of Ireland typically found within woodlands, peatlands, wet heath habitats[54] and lake shores[55]. Reported to be within favourable condition according the most recent Article 17 report and improving, the species can be identified by their two forms, black body with white spots or brown body with cream spots. Wet, damp habitats such as that found within moss covered trees, lake shores, blanket bog and wet heath habitats favour this species survival. According to the species threat response plan for Kerry Slug, several Annex I habitats support Kerry slug: 91A0 Old sessile oak woods with Ilex and Blechnum in the British Isles; 91E0 Alluvial forests with Alnus glutinosa and Fraxinus excelsior; 8220 Siliceous rocky slopes with chasmophytic vegetation; 7130 Blanket bog; 4030 European dry heaths; 4010 North Atlantic wet heaths with Erica tetralix; 4060 Alpine and Boreal heaths; and 3110 Oligotrophic waters (shores of acid oligotrophic lakes).

Pressures and threats to this species are noted to be the pressure of invasive alien species, which occurring as a result of encroachment of *Rhododendron ponticum* onto the supporting habitats for Kerry slug with an additional threat of vandalism or arson. The prevalence of the *Rhododenron ponticum* infestation within the south west region is well established[56] and is likely indicative of the invasive alien species problem identified within the Article 17 report. The Kerry slug threat response plan[55] has denoted the habitat preferences which can include, but is not limited to, on rocks and hard substrates across woodland, bog and cultivated grassland habitats, particularly those that are covered with moss, lichens or liverworts. Closed-canopy conifer plantations, *Rhododendron* thickets and mature beech woods have been identified to have very low slug densities or be absent completely[55].

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[53] Byrne, A., Moorkens, E.A., Anderson, R., Killeen, I.J. & Regan, E.C. (2009) Ireland Red List No. 2 – NonMarine Molluscs. National Parks and Wildlife Service, Department of the Environment, Heritage and Local Government, Dublin, Ireland

[54] NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 1: Summary Overview. Unpublished NPWS report.

[55] DEHLG (2010). Threat Response Plan. Kerry Slug *Geomalacus maculosus.* May 2010. Department of Environment, Heritage and Local Government. Accessed at https://www.npws.ie/sites/default/files/publications/pdf/2010_Slug_TRP.pdf August 2023

[56] Hamilton, J.J., Mitchell, F.J.G. & Kelly, D.L. (2022). Monitoring of Vegetation Change Through Permanent Woodland Plots in Killarney National Park: A 30-Year Review. Irish Wildlife Manuals, No. 141. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

Evidence suggests however, that mature stands of sitka spruce result in greater numbers of Kerry slug in comparison to clear felled areas and adjacent peatland[57] which may be resultant of the species colonising planted trees from the surrounding peatlands where they were naturally present.

Forestry management can potentially impact the species[58], where potential habitat loss, species mortality and habitat fragmentation may occur. Specific guidance has been published by the Department of Agriculture, Food and the Marine (DAFM) regarding forestry management and Kerry slug[59]. Should the presence of Kerry slug be identified, the guidelines state to *'Avoid the habitat/likely habitat e.g. retain it as an Area for Biodiversity Enhancement (ABE), route the activity away from the habitat'*. Further measures to protect the Kerry slug include conducting an ecological survey prior to forestry activity/operation to determine species presence. Published scientific literature has noted however, that this particular document does not list the potential impact of forestry practices upon the species[57] as limited scientific studies investigate the differences in population sizes of Kerry slug in clear-fell vs mature conifer stands[60]. Potential changes to forestry management in order to promote populations of Kerry slug have been suggested[57] and include the retention of small stands of forestry[61] and the translocation of species[62].

The suite of documents that have been issued by DAFM are mandatory and must be adhered to for any licensed forestry activity. All licensed forestry activities are required to undergo a Screening for AA at minimum in order to inform the licensing application process. As such, the presence of any European site that has Kerry slug as a QI would be identified within this process, and should the potential for likely significant effects occur, mitigation is required to avoid likely significant effects. If the potential for LSE cannot be avoided, the license is not granted, or the applicant is required to obtain a derogation licence from NPWS.

### A.1.4.7 White Clawed Crayfish (Austropotamobius pallipes) 1092

White-clawed crayfish is a QI of 15 SAC sites, predominantly found within freshwater lakes and rivers in Ireland with density at its greatest within the lime-rich midlands[63]. The species are identifiable by the off-white colour of the underside of their claws, with a brown/olive body, spines upon the carapace of the body and a narrow long or small triangular rostrum[64]. Good water quality and cool temperatures are the preferred conditions for their freshwater habitats. The species has strong habitat heterogeneity - juveniles locating in submerged tree roots, gravel or macrophytes whilst larger species seek shelter under large stones or burrow within embankments[65]. White clawed crayfish are a scavenging species and noted to have a diet[66] of small molluscs, invertebrates, bankside vegetation and dead organic matter.

The reported pressures and threats to this species are notably plant and animal diseases, pathogens and pests and invasive alien species of Union concern according to Article 17 reporting[65].

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[57] Johnston, E., Kindermann, G., O'Callaghan, J. et al. Mature exotic conifer stands have greater catches of the EU-protected Geomalacus maculosus than adjacent peatland or clear-felled stands—implications for forestry. Annals of Forest Science 75, 4 (2018). https://doi.org/10.1007/s13595-017-0684-4

[58] Rancka B, von Proschwitz T, Hylander K, Gotmark F (2015) Conservation thinning in secondary forest: negative but mild effect on land molluscs in closed-canopy mixed oak forest in Sweden. Plos One 10(3):e0120085. https://doi.org/10.1371/journal.pone.0120085

[59] Forest Service (2009) Forestry and Kerry Slug Guidelines. Department of Agriculture, Fisheries and Food. Accessed at https://assets.gov.ie/237568/151ee141-3d56-42f3-937a-1dfdfe4a957b.pdf August 2023

[60] Reich I, Mc Donnell R, Mc Inerney C, Callanan S, Gormally M (2017) EU-protected slug Geomalacus maculosus and sympatric Lehmannia marginata in conifer plantations: what does mark-recapture method reveal about population densities? J. Mollus. Stud. 83(1):27–35. https://doi.org/10.1093/mollus/eyw039

[61] Raivio S, Normark E, Pettersson B, Salpakivi-Salomaa P (2001) Science and the management of boreal forest biodiversity—forest industries' views. Scand J For Res Suppl 3:99–104

[62] Germano JM, Field KJ, Griffiths RA, Clulow S, Foster J, Harding G, Swaisgood RR (2015) Mitigation-driven translocations: are we moving wildlife in the right direction? Front Ecol Environ 13(2):100–105. https://doi.org/10.1890/140137

[63] Demers, A., Lucey, J., McGarrigle, M.L. & Reynolds, J.D. (2005) The distribution of the white-clawed crayfish, Austropotamobius pallipes, in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy 105B, 65-69.

[64] White-clawed crayfish (Austropotamobius pallipes) identification. National Biodiversity Data Centre. Accessed at https://biodiversityireland.ie/crayfish-identification/ August 2023.

[65] NPWS (2019). The Status of EU Protected Habitats and Species in Ireland. Volume 3: Species Assessments. Unpublished NPWS report. Edited by: Deirdre Lynn and Fionnuala O'Neill. Accessed at https://www.npws.ie/sites/default/files/publications/pdf/NPWS_2019_Vol3_Species_Article17.pdf August 2023

[66] Holdich D (2003). Ecology of the White-clawed Crayfish. Conserving Natura 2000 Rivers Ecology Series No. 1. English Nature, Peterborough

Diseases such as crayfish plague *(Aphanomyces astaci)* and non-indigenous crayfish species are noted[67] within scientific studies to negatively impact the populations of white clawed freshwater crayfish. The presence of crayfish plague and direct predation and competition by non-indigenous crayfish has caused the decline in overall status of the species in recent years[67].

Scientific evidence indicates that whilst white-clawed crayfish favour freshwater habitats with good water quality, they have been found within slightly polluted and moderately polluted waters[68]. Where values of Macro invertebrate water quality are low (Q values less than 3.0), studies have shown that crayfish populations became scarce or disappeared from the area. It could be theorised that declines in water quality resulting in decreased macroinvertebrate values could have an impact upon white clawed freshwater crayfish populations. Certain impacts to the natural habitat, including arterial drainage were historically noted to impact the species[69].

Whilst forestry and/or recreation have not been identified as pressures and/or threats to white clawed freshwater crayfish within the Article 17 reporting, it has been shown by the published scientific literature that there is a relationship between the species and impacts to water quality and habitat quality. Potential impacts to water quality could arise from forestry operations however, considering the requirement of a forestry licence which in itself requires a screening for AA, it is estimated that populations of the species within SACs would be considered at this stage. Necessary mitigation would be implemented to avoid likely significant effects. Changes in habitat quality, such as through forestry operations, afforestation, clear-felling etc., and the development of recreational amenities e.g. trails, provision of car parks, toilets etc, could have the potential to incur changes to habitats.

#### A.1.4.8 Freshwater Pearl Mussel & Nore Pearl Mussel

Freshwater pearl mussel and the Nore pearl mussel (a QI species of only the River Barrow and River Nore SAC) are both critically endangered in Ireland with the historical decline of the species resultant from impacts on the species' habitat. It is well noted through published literature that land use changes within freshwater pearl mussel catchments have a direct impact on the population. Agriculture, forestry and direct inputs from outfalls and wastewater discharges can all contribute to diffuse and point source impacts which can have adverse impacts on the freshwater aquatic environment which support the freshwater and Nore pearl mussel.

Identifiable impacts upon this species' habitat are:

- Impacts to water quality can include heavy sedimentation[70] that can occur through forest thinning, clearance and clear-felling operations where the soils surface is disrupted and exposed to erosion, potentially causing the transportation of particles into the water[71];

[67] Gammell,M.,McFarlane, A., Brady, D., O'Brien, J., Mirimin, L.,Graham, C., Lally, H., Minto, C. & O'Connor,I. (2021)White-clawed Crayfish Austropotamobius pallipes survey in designated SACs in 2017.Irish Wildlife Manuals, No. 131. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

[68] Demers, A., Lucey, J., McGarrigle, M.L., & Reynolds, J.D. (2022). The Distribution of the White-Clawed Crayfish, Austropotamobius pallipes, in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy, 105B, 65 - 69.

[69] Reynolds JD, Lynn D, O'Keeffe C, Lucey J, Clabbey K, McGarrigle M and King J (2010a). Conservation assessment and current status of protected white-clawed crayfish, Austropotamobius pallipes (Lereboullet),in Ireland. Freshwater Crayfish 17: 123-127.

[70] Shah NW, Nisbet TR. The effects of forest clearance for peatland restoration on water quality. Sci Total Environ. 2019 Nov 25;693:133617. doi: 10.1016/j.scitotenv.2019.133617. Epub 2019 Jul 30. PMID: 31635007.

[71] Hutton SA, Harrison SSC and O'Halloran J (2008). An Evaluation of the role of forests and forest practices in the eutrophication and sedimentation of receiving waters. Department of Zoology, Ecology and Plant Science. Environmental Research Institute. University College Cork. Water Framework Directive Western River Basin District. Programme of Measures. Forest and Water National Study. Accessed at https://www.catchments.ie/download/forestry-and-water/?wpdmdl=1211&ind=MTQ3MjQ3NTAwNHdwZG1fRm9yZXN0IGFuZCB3YXRlciBFdXRyb3BoaWNhdGlvbl9TZWRpbWVudGF0aW9uIExpdGVyYXR1cmUgcmV2aWV3IC5wZGY on 22 September 2022

- Increases in the nutrient load can impact the hydrological regime of riverine system which may be as a result of tree felling where conifer needles, branches and roots are slow to dissolve contributing to increases in nutrients such as nitrates[72]; and
- The creation of forestry roads[73], the movement of machinery and the use of fertilisers to bring conifers to maturity have all shown to impact water quality[74].

The declining status is indicative of several factors such as pearl fishing, pollution, acidification, organic enrichment, siltation, river engineering and declining salmon stocks. The mussel has a symbiotic relationship with Atlantic salmon, spending the larval stage attached to the gills of salmonoid fish. Changes to the receiving freshwater habitat in addition to the surrounding habitat, which is more commonly upland peatland habitats, can have a knock-on effect on freshwater pearl mussel. Afforestation and forestry related activities can cause adverse effects in pearl mussel catchments through the creation of drains during afforestation, nutrient input from tree felling activities and fertiliser use and sedimentation during afforestation and felling. These adverse effects can cause sedimentation, nutrient enrichment and eutrophication with the knock-on effects resulting in adverse outcomes for pearl mussel populations.

A large proportion of the 19 SACs designated for freshwater pearl mussel (including the River Barrow and River Nore SAC), are located in catchments with peatland habitats present. Historical planting in these sites resulted in drainage networks that drained directly into waterbodies without the appropriate environmental safeguards that are currently implemented in forestry related activities. Where these forests have now matured and are felled, there is an increased risk during forestry operations~~,~~ and any necessary infrastructure works, that sediment and nutrient may enter the watercourses and contribute to the problems facing freshwater pearl mussel. Where forestry has been identified as having a negative impact on the hydrology of these species dependent catchments, removal of plantations and restoration to the original habitat has been cited as integral to enhancing the future of the species resilience.

A European Innovation Project (EIP) for freshwater pearl mussel, The Pearl Mussel Project, was conducted in 2014-2019 across the Caragh and Blackwater river catchments. The project enabled collaborative working between agricultural landowners, researchers and advisors to develop a programme to allow for the coexistence of farming methods and the conservation of the freshwater pearl mussel. Some of the findings from that project highlighted the importance of marginal lands and wetlands in proximity to watercourses draining into the catchment. It was noted that the hydrological regulation and the food supply to juvenile freshwater pearl mussels provided by wetland and peatland habitats were integral to their lifecycle and population success. In addition, the conclusion was also drawn that drained and modified wetlands (including peatlands) cease to provide both those functions, and that restoration of these habitats at catchment level was a key driver in ensuring the survivability of freshwater pearl mussel. Given the habitat modifications associated with afforestation planting, the findings from this project emphasise the significance of maintaining the natural state of habitats within the catchment area of the freshwater pearl mussel.

### A.1.4.9 Pollan

Pollan are shoaling fish and an Irish endemic species that feed on planktonic invertebrates. Pollan habitat includes freshwater lakes such as Lough Derg and Lough Ree and are noted as a key species for biodiversity in freshwater habitats within Ireland. Pollan have experienced a population decline over the last 20-30 years. Subsequently conservation and restoration measures have been put in place to protect the endangered fish species[75].

[72] Neal, C., Reynolds, B., Neal, M., Wickham, H., Hill, L., and Williams, B.: The impact of conifer harvesting on stream water quality: the Afon Hafren, mid-Wales, Hydrol. Earth Syst. Sci., 8, 503–520, https://doi.org/10.5194/hess-8-503-2004, 2004.

[73] L. Kuglerová, E.M. Hasselquist, R.A. Sponseller, T. Muotka, G. Hallsby, H. Laudon Multiple stressors in small streams in the forestry context of Fennoscandia: the effects in time and space Sci. Total Environ., 756 (2021), Article 143521

[74] Mary Kelly-Quinn, Michael Bruen, Simon Harrison, Mark Healy, John Clarke, Tom Drinan, Hugh B. Feeley, Joanne Finnegan, Conor Graham, John Regan, Sean Blacklocke. Research 169: HYDROFOR: Assessment of the Impacts of Forest Operations on the Ecological Quality of Water. 2016. Accessed at https://www.epa.ie/publications/research/water/research-169-hydrofor-assessment-of-the-impacts-of-forest-operations-on-the-ecological-quality-of-water.php

[75] NPWS; NIEA (2005) All Ireland Species Action Plans – Irish Lady's-tresses, Pollan, Hare, Corncrake. Accessed at https://www.npws.ie/sites/default/files/publications/pdf/2005_Group_SAP.pdf

Article 17 report[13] has identified the abstraction of ground and surface water (including marine) for public water supply and recreational use as a pressure and a threat. Pollan face a variety of other pressures such as habitat degradation and climate change, both of which can be indirectly related to forestry related activities. Research has suggested conservation options that will help counteract the species population decline. Proposed actions include regulation and management of commercial fishery, management of water quality and to increase public awareness of pollan and its conservation requirements[76].

The introduction of biocides, pesticides, hormones, chemicals, and nutrients into the environment was a common pressure or threat found to affect pollan, through diffuse pollution of surface water and groundwater resources[77,78,79]. Hydrological connectivity between afforested sites and the waterbodies in which pollan are located can present a pathway for effect. It can be assumed that any activity which has the potential to interfere with a hydrological connection, whether through modification or an accidental pollution event has the potential to impact pollan species.

### A.1.4.10 Atlantic Salmon

Atlantic salmon are found in freshwater lake systems, their connecting rivers, and estuarine areas. Atlantic salmon are a euryhaline species, meaning they can tolerate living in varying degrees of salinity. The species lifecycle starts and ends in freshwater lakes and rivers, but they spend the bulk of their adult life in the marine ecosystem. Despite having the ability to tolerate changes in salinity, the species faces pressures and threats from changes in water quality, which as per Article 17 reporting, can be as a result of pollution from agricultural production, domestic waste water treatment systems and forestry including both rural diffuse and point sources.

Forestry related activities can contribute to the overall health of freshwater habitats, with activities such as clear-felling, drainage works and fertilisation contributing to changes in water quality. Changes in the levels of dissolved organic matter, nutrients and sediment can impact the life cycle of Atlantic salmon. Studies on Atlantic salmon in afforested catchments show that the density and biomass of juvenile species were significantly lower in streams draining from afforested catchments and that the tolerance to changes in water quality was much lower than that found in other species[80].

The HYDROFOR project, a collaboration project between the EPA and DAFM, investigated the effects of coniferous forests and forestry operations on Ireland's surface water quality and aquatic ecology. Research between 2014-2020 found that the impacts of acidification from forestry on upland catchments contributes to water quality changes, with evidence showing that higher acidity levels can impact aquatic macroinvertebrates, thereby impacting on the food-web for species such as Atlantic salmon. Freshwater lakes can have higher levels of heavy metals and dissolved organic carbon, as well as lower levels of dissolved oxygen, with the greatest impact seen in catchments that were subject to forest clear-felling[81].

The impacts of forestry activities, in combination with agriculture activities and domestic waste water treatment has contributed to changes in water quality and consequently a negative impact on Atlantic salmon abundance[13].

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[76] Harrod, C., Griffiths, D., McCarthy, T.K. and Rosell, R., 2001. The Irish pollan, *Coregonus autumnalis*: options for its conservation. Journal of Fish Biology, 59, pp.339-355.

[77] Long, M.P. & Brophy, J.T. (2019) Monitoring of sites and habitat for three Annex II species of whorl snail (Vertigo). Irish Wildlife Manuals, No. 104. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland

[78] Ní Dhúill, E., O'Neill, F.H. & Hodd, R.L. (2022) Monitoring and assessment of Killarney Fern (Vandenboschia speciosa (Willd.) Kunkel) in Ireland, 2015–2018. Irish Wildlife Manuals, No. 133. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland.

[79] NPWS (2009) Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin

[80] Harrison, S.S.C., Hutton S., Baars, J.-R., Cruikshanks, R., Johnson, J., Juhel, G., Kirakowski, T., Matson, R., O'Hal loran, J, Phelan, P. and Kelly-Quinn, M. 2014 Contrasting impacts of conifer forests on brown trout and Atlantic salmon in headwater streams in Ireland. Biology and Environment: Proceedings of the Royal Irish Academy 2014 DOI: 10.3318/ BIOE.2014.20

[81] Mary Kelly-Quinn, Michael Bruen, Simon Harrison, Mark Healy, John Clarke, Tom Drinan, Hugh B. Feeley, Joanne Finnegan, Conor Graham, John Regan, Sean Blacklocke. Research 169: HYDROFOR: Assessment of the Impacts of Forest Operations on the Ecological Quality of Water. 2016. Accessed at https://www.epa.ie/publications/research/water/research-169-hydrofor-assessment-of-the-impacts-of-forest-operations-on-the-ecological-quality-of-water.php

### A.1.4.11 Lesser horseshoe bat 1303

The lesser horseshoe bat is the only bat species in Ireland listed as a QI of an SAC site. This species can be found in counties Mayo, Galway, Clare, Limerick, Kerry and Cork[82] (with SACs limited to these counties).

This species can be found roosting during the summer in roofs of disused structures, such as old houses and stables, whilst their winter roosts can be found in caves, mines, souterrains and disused cellars. It is adept at navigating dense vegetation during foraging due to its highly evolved echolocation system. As a result, it is highly sensitive to its environment and by extension the movement of other species and objects. It prefers to forage within a few kilometres of its maternity roost and uses linear items, such as treelines, hedgerows, stone walls and reed beds to commute along when foraging[83]. All bat species predate on insects with the lesser horseshoe bats diet consisting of flying insects (midges, crane flies, moths) which can be found along waterbodies, both flowing and standing, at the edge of woodlands and around scrubby patches during their night time foraging. There is some evidence to suggest that bat species in general avoid foraging within highly modified environments, such as intensive agricultural areas and conifer forests[84] however, the edges of mixed forests have been recorded as favourable foraging grounds.

With the roosting sites of lesser horseshoe bat being generally restricted to structures, it is considered unlikely that afforestation practices would have any significant impacts on roosting habitats. However, during the summer they form maternity colonies in old buildings and emerge to hunt in nearby forest. The species prefers sheltered valleys with extensive deciduous woods or dense scrub, close to roost sites. Lesser horseshoe bats are particularly sensitive to disturbance, especially in their nursery and winter roost. Studies also show that light pollution may have significant negative impacts upon the selection of flight routes[85]. Lesser horseshoe bats sites need specific protection and sensitive management of their foraging habitat[86]. Bat Conservation Ireland studied population, trends and threat 1986 to 2012 and found a number of activities around roosts such as increased urbanisation or inappropriate forest management may be considered a future threat, although current negative activities are often related to deterioration of buildings which benefit from human intervention, or climatic factors that are outside the control of conservation bodies.[87] Where recreational activities may in result in the introduction of lighting there may be potential implications to lesser horseshoe bat.

### A.1.4.12 Marsh Fritillary 1065

Marsh fritillary is a butterfly which use a variety of habitat types ranging from coastal sand dunes along western seafront to mosaics of upland habitats and grasslands. It is generally found where its larval food plant, devil's-bit scabious occurs and is solely dependent on this species at its larval stage. This plant can be found in a diverse range of habitats[13] including wet heath, bogs, woodland clearings however, it is more commonly found on acidic or calcareous grasslands managed by low intensity agricultural practices.

Marsh fritillary habitats are often subjected to recreational pressures. In Ireland, approximately 50% of dune systems have deteriorated in the last century, a significant proportion of which can be attributed to recreational pressures and unimpeded access[88]. Studies have shown that areas such as sand dunes are prone to physical stress such as erosion damage through trampling and such pressure can reduce the total area of devils-bit scabious[19]. Reduced food availability increases pressure on marsh fritillary and can lead to a species population decline[89].

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[82] NPWS & VWT (2022) Lesser Horseshoe Bat Species Action Plan 2022- 2026. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

[83] Lundy MG, Aughney T, Montgomery WI, Roche N (2011) Landscape conservation for Irish bats & species specific roosting characteristics. Bat Conservation Ireland

[84] Froidevaux JSP, Barbaro L, Vinet O, Larrieu L, Bas Y, Molina J, Calatayud F, Brin A. Bat responses to changes in forest composition and prey abundance depend on landscape matrix and stand structure. Sci Rep. 2021 May 19;11(1):10586. doi: 10.1038/s41598-021-89660-z. PMID: 34011934; PMCID: PMC8134465.

[85] Stone et al (2009) Street Lighting Disturbs Commuting Bats. Current Biology 19, 1123–1127, July 14, 2009 ª2009 Elsevier Ltd All rights reserved DOI 10.1016/j.cub.2009.05.058

[86] Bat Conservation Trust (BCT) lesser horseshoe 11.02.13.indd (bats.org.uk)

[87] Bat Conservation Ireland (2012) Lesser Horseshoe Bat Report November 2012 _4_.docx (npws.ie)

[90] Cooper, A., McCann, T. and Ballard, E., 2005. The effects of livestock grazing and recreation on Irish machair grassland vegetation. *Plant Ecology, 181*, pp.255-267.

[90] Cooper, A., McCann, T. and Ballard, E., 2005. The effects of livestock grazing and recreation on Irish machair grassland vegetation. *Plant Ecology, 181*, pp.255-267.

At a substrate level, high levels of disturbance can cause deflation (lowering of the sand surface) causing a reduction in habitat heterogeneity.
This can cause the habitat to be less suitable for marsh fritillary[90].Peatland, heath, fens and wet grassland habitat types are typical habitats to support the growth of devil's-bit scabious and of the SAC sites designated for the presence of marsh fritillary, there is crossover with the presence of designated peatland, heath and fen habitats[91].

The species persists in the form of metapopulations i.e. groups of spatially separated populations. Taking into account the species dependency on devil's-bit scabious, the species success and mortality rate is intrinsically linked to habitat management where that plant species occurs. Where a habitat (sand dunes, fens, cutover raised bogs, blanket bogs, wet heaths, unimproved wet, neutral or calcareous grasslands, calcareous and coastal heaths) is inappropriately managed or abandoned, destroyed or conditions unfavourable, these metapopulations can suffer with small subpopulations potentially going extinct where the larval food plant is not available.

Where marsh fritillary occurs a level of management is required in order to maintain the availability of devil's-bit scabious, often relating to low intensity agricultural practices and some scrub removal. The metapopulations of SAC sites are supplemented by populations outside of the designated site network. Any potential effects on the populations that have connectivity to SAC populations may have knock-on effects of the SAC metapopulation. The effects of planting on land outside the Natura 2000 site network that support metapopulations could have a direct impact on the marsh fritillary species and could potentially result in population loss. The potential impacts of afforestation on this species include habitat loss, habitat fragmentation and disturbance during the planting, felling and thinning processes including any related forestry infrastructure activities.

### A.1.4.13 Otter (Lutra lutra) 1355

Otter are a QI of 44 SAC sites throughout Ireland and are supported by habitat types which include river channels, coastlines, lakes and blanket bog systems. The species' overall status per Article 17 reports is favourable and in an increasing trend. Otters have a large territorial range[92] but favour areas that have freshwater habitats that provides suitable aquatic prey whilst also having terrestrial cover nearby to rest in[93]. Typically an opportunistic predator, the diet of otters typically consists of invertebrates, salmonids, cyprinids, crayfish, wrasse and eels[94].

In recent years, the populations of otter within Ireland have been stable however, the species was in decline between the 1950s to 1990s across Europe due to severe water pollution and the removal of suitable habitat from riverine areas. Whilst no pressures and threats were recorded for otter within the most recent Article 17 report, reported threats from NPWS[95] relate to road kill, mortality due to entrapment within fishing nets and lobster pots, severe water pollution incidents leading to fish kills and the removal of riparian habitats. It is noted however, that otters are adaptable to change and can be found within a variety of rural and urban areas[93].

Due to the distribution of otter throughout Ireland, it is highly likely that otter are found within the Coillte Estate. Habitats such as those found alongside freshwater habitats have the potential to host couches, holts and chutes in addition to food source provision.

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[90] Cooper, A., McCann, T. and Ballard, E., 2005. The effects of livestock grazing and recreation on Irish machair grassland vegetation. *Plant Ecology, 181*, pp.255-267.

[91] At time of writing, 12 SACs sites are designated for the presence of marsh fritillary, with several of these, including Connemara Bog Complex SAC, East Burren Complex SAC, Gweedore Bay and Islands and Moneen Mountain containing supporting habitats of peatland, heath and fen.

[92] NPWS (2009) Background to the conservation assessment for the otter *Lutra lutra. Lutra lutra (*1355) Conservation Status Assessment Report. Unpublished report. National Parks and Wildlife Service.

[93] Lysaght, L. and Marnell, F. (Eds) (2016) Atlas of Mammals in Ireland 2010-2015, National Biodiversity Data Centre, Waterford.

[94] Preston, S., Portig, A., Montgomery, W.I., Mcdonald, R.A., & Fairley, J. (2022). Status And Diet Of The Otter *Lutra Lutra* In Northern Ireland. Biology and Environment: Proceedings of the Royal Irish Academy, 106B, 57 - 63.

[95] Marnell, F., Looney, D. & Lawton, C. (2019) Ireland Red List No. 12: Terrestrial Mammals. National Parks and Wildlife Service, Department of the Culture, Heritage and the Gaeltacht, Dublin, Ireland.

As the species has a large roaming territory, it can be assumed that species may transit through several habitat types to reach resting or breeding sites, or to feed. Where human activities occur within the range of otters, there exists the potential risk of disturbance.

For example, forestry operations may cause disturbance to foraging otters by altering their habitat or the facilitation of recreational paths and walkways may fragment habitat and cause the species to alter their movements to avoid disturbance. Given that the species is dependent on aquatic prey for its diet, it is plausible that any negative impacts to aquatic habitats, such as changes in water quality, could result in direct and indirect impacts to otter such as changes in prey abundance[54].

Specific guidance has been developed by DAFM in relation to forestry operations and otter[96] in order to avoid any potential impacts upon otter. Any activity included within forestry has the potential to impact the species. Where forestry operations may occur within an SAC, the Applicant to the forestry licence must consult with NPWS and conduct an Appropriate Assessment with the provision of mitigation to avoid likely significant effects. In areas outside of the European site network, where otters occur or are likely to occur, the guidance states that the habitat must be avoided and retained as an Area for Biodiversity Enhancement. Where the forestry operation must proceed, a derogation licence must be obtained. In addition to the specific guidelines issued by DAFM for otter, NPWS issued an Otter Threat Response Plan[97] and notes that disturbance to suitable habitat in the form of recreational activities is heavily related to fishing activities, such as angling and boating. Little evidence suggests that disturbance by recreational activities presents a significant pressure to otter.

#### A.1.4.14 Freshwater Species

Several freshwater QIs were not identified as having pressures and/or threats relating to either forestry or recreation within the Article 17 reports, however, it has been established through Section A1.4.7 Pollan and Section A1.4.8 Atlantic Salmon, that impacts to water quality can impact freshwater species. As a result, it can be assumed that this risk may be extended to all QIs that utilise freshwater habitats. Direct and/or indirect impacts may occur to sea lamprey, brook lamprey, river lamprey and twaite shad. Forestry operations such as drainage, nutrient input from tree felling, fertiliser use and sedimentation are documented to have impacts upon receiving waterbodies via changes in water quality. Sedimentation, nutrient enrichment and eutrophication can occur[98]. Hydrological connectivity between afforested sites and the waterbodies in which freshwater QIs are located can present a pathway for effect. It can be assumed that any activity which has the potential to interfere with a hydrological connection, whether through modification or an accidental pollution event has the potential to impact freshwater QI species.

[96] Forest Service (2009). Forestry and Otter Guidelines. Forest Service Department of Agriculture, Fisheries and Food. Accessed at https://assets.gov.ie/237569/6610e6e5-5d4f-4ce8-9a2b-73bdeb6f61c1.pdf August 2023.

[97] NPWS (2009) Threat Response Plan: Otter (2009-2011). National Parks & Wildlife Service, Department of the Environment, Heritage & Local Government, Dublin

[98] Hutton SA, Harrison SSC and O'Halloran J (2008). An Evaluation of the role of forests and forest practices in the eutrophication and sedimentation of receiving waters. Department of Zoology, Ecology and Plant Science. Environmental Research Institute. University College Cork. Water Framework Directive Western River Basin District. Programme of Measures. Forest and Water National Study. Accessed at https://www.catchments.ie/download/forestry-and-water/?wpdmdl=1211&ind=MTQ3MjQ3NTAwNHdwZG1fRm9yZXN0IGFuZCB3YXRlciBFdXRyb3BoaWNhdGlvbl9TZWRpbWVudGF0aW9uIExpdGVyYXR1cmUgcmV2aWV3IC5wZGY

## A.1.5 Special Conservation Interests (SCIs)

As stated in Section 4.5 of the AA report, an expanded discussion on the Annex I birds identified to have the potential to be impacted by the draft FESLUP is provided here. This section outlines supporting information relating SCIs that were determined to be representative of the European site network in and that have vulnerabilities to activities pertaining to forestry and recreation.

Table 3 below provides an overview of the SCIs which have a corresponding recreational and forestry pressures/threats as defined in Article 12 report. The definitions to the pressure and threats codes are provided in Section A.1.2.1. Further to the review of the Article 12 listed pressures and threats, additional desktop review and consultation with Coillte identified several other species that exist within the Coillte Estate. Additional information has also been included within this discussion as they are too at risk of the potential for likely significant effects. Following Table 3, the SCIs that have been identified are discussed in relation to forestry and recreation related activities and their vulnerabilities to activities are contained therein.

**Table 3 Special Conservation Interests with corresponding pressures and threats in the forestry and recreation categories**

| Latin Name | Species Name | BOCCI Status | Residential Status in Ireland | No. SPA sites for which this is a qualifying feature *[i] | Forestry Related Pressure per Article 12 Reporting | Forestry Related Pressure per Article 12 Reporting | Recreation Related Pressure per Article 12 Reporting | Recreation Related Threat per Article 12 Reporting |
|---|---|---|---|---|---|---|---|---|
| *Anser albifrons flavirostris* | Greenland White-fronted Goose | N/A | Wintering | 29 | None | None | None | None |
| *Alca torda* | Razorbill | Red | Breeding | 11 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |
| *Alcedo atthis* | Kingfisher | Amber | Breeding | 2 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |
| *Anas acuta* | Pintail | Amber | Wintering | 11 | None | None | None | None |
| *Anas crecca* | Teal | Amber | Breeding and Wintering | 21 | None | None | None | **F07 (M)** |
| *Anas platyrhynchos* | Mallard | Amber | Breeding and Wintering | 9 | None | None | **F07 (M)** | **F07 (M)** |
| *Arenaria interpres* | Turnstone | Amber | Wintering | 11 | **B01 (H)** | None | **F07 (M)** | **F07 (M)** |
| *Aythya ferina* | Pochard | Red | Wintering | 6 | None | None | None | None |
| *Aythya fuligula* | Tufted Duck | Amber | Breeding and Wintering | 11 | None | None | **F22 (M)**<br>**F23(M)** | **F22 (M)**<br>**F23 (M)** |
| *Aythya marila* | Scaup | Red | Wintering | 5 | None | None | **F07 (M)** | **F07 (M)**<br>**F28 (M)** |
| *Bucephala clangula* | Goldeneye | Red | Wintering | 6 | None | None | **F22 (M)**<br>**F23 (M)** | **F22 (M)**<br>**F23 (M)** |
| *Branta bernicla hrota* | Light-bellied Brent Goose | Amber | Wintering | 24 | None | None | None | **F07 (M)**<br>**F28 (M)** |

| Latin Name | Species Name | BOCCI Status | Residential Status in Ireland | No. SPA sites for which this is a qualifying feature *[i] | Forestry Related Pressure per Article 12 Reporting | Forestry Related Pressure per Article 12 Reporting | Recreation Related Pressure per Article 12 Reporting | Recreation Related Threat per Article 12 Reporting |
|---|---|---|---|---|---|---|---|---|
| *Calidris alba* | Sanderling | N/A | Wintering | 15 | None | None | **F07 (M)** | **F07 (M)**<br>**F28 (M)** |
| *Calidris alpina schinzii* | Dunlin | Red | Breeding and Wintering | 6 | None | None | **F22 (M)**<br>**F23 (M)** | **F22 (M)**<br>**F23 (M)** |
| *Calidris canutus* | Knot | Red | Wintering | 13 | None | None | **F07 (M)**<br>**F08(M)** | **J02 (H)** |
| *Calidris maritima* | Purple sandpiper | Red | Wintering | 4 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |
| *Circus cyaneus* | Hen Harrier | Amber | Breeding | 8 | None | None | **F07 (M)** | **F07 (M)** |
| *Cygnus cygnus* | Whooper Swan | Amber | Breeding and Wintering | 22 | None | None | **F22 (M)**<br>**F23 (M)** | **F22 (M)**<br>**F23 (M)** |
| *Falco columbarius* | Merlin | Amber | Breeding | 7 | **B01 (H)** | **B01 (H)** | None | None |
| *Falco peregrinus* | Peregrine Falcon | N/A | Breeding | 10 | None | None | None | None |
| *Fulmaris glacialis* | Fulmar | Amber | Breeding | 18* | **B23 (M)** | **B23 (M)** | **F07 (M)**<br>**F11 (M)** | **F07(M)**<br>**F11 (M)** |
| *Fratercula arctica* | Puffin | Red | Breeding | 10* | None | None | **F22 (M)**<br>**F23(M)** | **F22 (M)**<br>**F23(M)** |
| *Gavia stellata* | Red-throated Diver | Amber | Breeding and Wintering | 7* | None | None | **F07 (M)** | **F07 (M)** |
| *Haematopus ostralegus* | Oystercatcher | Amber | Breeding and Wintering | 16 | **B01 (H)** | **B01 (H)** | None | None |
| *Larus marinus* | Great Black-blacked gull | N/A | Breeding | 1* | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |
| *Limosa lapponica* | Bar-Tailed Godwit | Red | Wintering | 24 | None | None | None | **F07 (H)** |
| *Limosa limosa* | Black-Tailed Godwit | Red | Wintering | 25 | None | None | F07 (M) | **F07 (M)**<br>**F28 (M)** |
| *Mareca penelope* | Wigeon | Amber | Wintering | 25 | None | None | **F22 (M)**<br>**F23 (M)** | **F22 (M)**<br>**F23 (M)** |
| *Mareca strepera* | Gadwall | Amber | Breeding and Wintering | 4 | **B03 (M)**<br>**B09 (M)** | **B03 (M)**<br>**B09 (M)** | None | None |
| *Morus bassanus* | Gannet | Amber | Breeding | 3 | None | None | **F07(M)** | **F07 (M)**<br>**F08 (M)** |

| Latin Name | Species Name | BOCCI Status | Residential Status in Ireland | No. SPA sites for which this is a qualifying feature *[i] | Forestry Related Pressure per Article 12 Reporting | Forestry Related Pressure per Article 12 Reporting | Recreation Related Pressure per Article 12 Reporting | Recreation Related Threat per Article 12 Reporting |
|---|---|---|---|---|---|---|---|---|
| *Numenius arquata arquata* | Curlew | N/A | Wintering | 19 | None | None | **F07(M)** | **F07 (M)**<br>**F28 (M)** |
| *Phalacrocorax aristotelis aristotelis* | Shag | Amber | Breeding and Wintering | 15* | None | None | **F07(M)** | **F07 (M)**<br>**F28 (M)** |
| *Pluvialis apricaria* | Golden Plover | Red | Breeding and Wintering | 36 | None | None | **F22 (M)**<br>**F23 (M)** | **F22 (M)**<br>**F23 (M)** |
| *Pluvialis squatarola* | Grey Plover | Red | Wintering | 21 | None | None | **F07(M)** | **F08 (M)** |
| *Puffinus puffinus* | Manx shearwater | Amber | Breeding | 6* | None | None | **F22 (M)**<br>**F23 (M)** | **F07 (M)**<br>**F22 (M)**<br>**F23 (M)** |
| *Pyrrhocorax pyrrhocorax* | Chough | Amber | Breeding | 18 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |
| *Rissa tridactyla* | Kittiwake | Red | Breeding | 18* | None | **B01 (H)** | **F07 (M)** | **F07 (M)** |
| *Somateria mollissima* | Eider | N/A | Breeding | 1 | None | None | None | **F07 (H)** |
| *Spatula clypeata* | Shoveler | Red | Breeding and Wintering | 15 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |
| *Sterna dougallii* | Roseate Tern | Amber | Breeding | 5* | None | None | None | **High** |
| *Sterna hirundo* | Common Tern | Amber | Breeding | 14* | None | None | **F07 (M)** | **F07 (M)** |
| *Sterna paradisaea* | Arctic tern | Amber | Breeding | 17* | None | None | **F22 (M)**<br>**F23 (M)** | **F07 (M)**<br>**F22 (M)**<br>**F23 (M)** |
| *Sternula albifrons* | Little Tern | Amber | Breeding | 9* | None | None | **F07 (M)** | **F07 (M)**<br>**F28 (M)** |
| *Thalasseus sandvicensis (Sterna sandvicensis)* | Sandwich Tern | Amber | Breeding | 9 | None | None | **F07 (M)** | **F07 (M)**<br>**F28 (M)** |
| *Tringa nebularia* | Greenshank | N/A | Wintering | 3 | None | None | **F07 (M)** | **F07 (M)**<br>**F28 (M)** |
| *Tringa totanus* | Redshank | N/A | Breeding and Wintering | 21 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)** |

| Latin Name | Species Name | BOCCI Status | Residential Status in Ireland | No. SPA sites for which this is a qualifying feature *[i] | Forestry Related Pressure per Article 12 Reporting | Forestry Related Pressure per Article 12 Reporting | Recreation Related Pressure per Article 12 Reporting | Recreation Related Threat per Article 12 Reporting |
|---|---|---|---|---|---|---|---|---|
| *Uria aalge* | Guillemot | Amber | Breeding | 12* | None | None | None | **F07 (M)**<br>**F28 (M)** |
| *Vanellus vanellus* | Lapwing | N/A | Wintering | 23 | None | None | **F07 (M)** | **F07 (M)**<br>**F08 (M)**<br>**F28 (M)** |

[i] Includes those SCIs that are the proposed designated features for Candidate SPA sites.

### A.1.5.1 Overview

After review of the Article 12 reports for those SCIs that face pressures and threats from recreation and/or forestry related activities, further research into the potential impacts of such sectors has been carried out. Species have been identified and grouped into respective categories within Table 4 and been categorised in consideration of their similarities e.g. breeding patterns, habitat use, behaviours etc. The expanded discussion in the following sections refers to these categories with some specific mention towards species. Considering the dependency of SCIs on habitats for foraging, breeding, resting etc., it can be assumed that any likely impacts upon a habitat can potentially have a consequential impact on an SCI.

**Table 4 SCIs relevant to the draft FESLUP categorised into their respective groupings.**

| Waders & Waterfowl | Seabirds | Birds of Prey | Ducks & Divers, | Geese & Swans | Others |
|---|---|---|---|---|---|
| Bar-tailed godwit | Arctic tern | Hen Harrier | Eider | Greenland white fronted goose | Chough |
| Black-tailed godwit | Common tern | Merlin | Gadwall | Light-Bellied Brent Goose | Kingfisher |
| Curlew | Fulmar | | Goldeneye | Whooper Swan | |
| Dunlin | Gannet | | Mallard | | |
| Golden plover | Great Black Backed Gull | | Pintail | | |
| Greenshank | Guillemot | | Pochard | | |
| Grey plover | Kittiwake | | Red-throated diver | | |
| Knot | Little tern | | Scaup | | |
| Lapwing | Manx shearwater | | Shoveler | | |
| Oystercatcher | Puffin | | Teal | | |
| Purple Sandpiper | Razorbill | | Tufted Duck | | |
| Redshank | Roseate tern | | Wigeon | | |
| Sanderling | Sandwich tern | | | | |
| Turnstone | Shag | | | | |

### A.1.5.2 Waders & Waterfowl

Waders and waterfowl are found in SPA sites across the island of Ireland, along coastal estuarine areas, shallow inlets, uplands, freshwater habitats, grasslands and agricultural lands. Wader populations are in decline across the UK and Ireland. Studies suggests that disturbance to waders is localised in time and space due to the nature of where disturbance often occurs.

These species rely on open landscapes and therefore where afforestation occurs in proximity to wader habitats, this can result in loss of those open landscapes or provision of more cover and perching opportunities for predators such as foxes, corvids and birds of prey which can take young, eggs and adults[99].

[99] Mark H. Hancock, Daniela Klein, and Neil R. Cowie. "Guild - level Responses by Mammalian Predators to Afforestation and Subsequent Restoration In a Formerly Treeless Peatland Landscape." Restoration ecology, v. 28 ,.5 pp. 1113-1123. doi: 10.1111/rec.13167

Waders within upland areas are found less along the edges[100] of plantation forestry than the open landscape and the potential changes in the vegetation structure in association with the forestry species are responsible. Species such as dunlin and golden plover prefer flat, exposed ground close to bog pools and can be directly influenced by a forest edge, ranging further for suitable habitat to nest and forage within[101]. Changes in land use from human activities can result in habitat loss, habitat fragmentation and degradation and indirect effects such as changes in habitat quality from water pollution. Habitat loss can occur where sites are inappropriately afforested with temporary disturbance during the planting, felling, thinning, fertilisation and harvesting stages through noise and aerial disturbance. Habitat fragmentation can occur due to conifer encroachment from afforested sites.

Evidence from scientific literature points to the anthropogenic pressures that impact foraging habitats, including estuaries and associated coastal habitats, including the effects of pollution and disturbance. Changes in the estuarine environment can cause species to forage further afield, thereby expending more energy and causing a knock-on impact on their ability breed. Wader species, such as curlews depend on a diet of invertebrates, in particular ragworms and molluscs, that are found within estuarine areas. These invertebrate populations are essential for the success of foraging bird species and can often determine the temporal and spatial distribution of species[102]. Species can also locate in upland, lowland bogs, wet grassland and unimproved/semi-improved grassland sites and will forage close to their nests[103]. Waterfowl that utilise coastal habitats, such as estuaries, mud and sandflat and shorelines may experience similar disturbance impacts due to the variety of human-related activities that occur within these zones. Short term behavioural responses from species as a result of human related disturbance may result in the avoidance of areas for foraging, resting or nesting. Sites with high levels of human activity often have lower densities of birds than sites with low levels[104].

Land use changes in these habitats, such as uplands and peatland habitats has been shown to negatively affect the waders like curlew[105], with afforestation noted to result in direct habitat loss and fragmentation[106]. Should afforestation take place on these habitats, there is potential for curlew and other breeding wader species including dunlin, golden plover and grey plover to experience habitat loss, habitat fragmentation and disturbance during afforestation activities in isolation and in-combination[107]. Landscape level land-use change can reduce the available ground cover for nests, disturb the species and cause it to flee from its nest thereby leaving young vulnerable to predation and/or exposure to the elements. Published scientific literature recommends that new afforestation should be sited away from important breeding wader areas[108].

Research relating to the development, construction and use of recreational infrastructure has provided evidence that this is a pressure to wader species such as curlew and dunlin. This can include activities such as improving site access, conversion of land to recreational areas and built recreational facilities. Such activities can result in the habitat loss, degradation, and fragmentation for species. Other types of disturbance listed include dog walking, shooting, intrusive surveying, and nest abandonment.

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[100] D. A. Stroud , T. M. Reed & N. J. Harding (1990) Do moorland breeding waders avoid plantation edges?, Bird Study, 37:3, 177-186, DOI: 10.1080/00063659009477055

[101] Wilson, J., Anderson, R., Bailey, S., Chetcuti, J., Cowie, N.R., Hancock, M.H., Quine, C.P., Russell, N., Stephen, L., & Thompson, D.B. (2014). Modelling edge effects of mature forest plantations on peatland waders informs landscape-scale conservation. Journal of Applied Ecology, 51, 204-213.

[102] Piersma, T. & Baker, A.J. (2000) Life history characteristics and the conservation of migratory shorebirds. Behaviour and Conservation (eds L.M. Gosling & W.J. Sutherland), pp. 105– 124. Cambridge University Press, Cambridge, UK.

[103] Birdwatch Ireland (2023) Curlew. Accessed at https://birdwatchireland.ie/birds/curlew/ on 22/01/2023

[104] Klein, M.L., Humphrey, S.R., Percival, H.F. (1995) Effects of ecotourism on distribution of waterbirds in a wildlife refuge. Conservation Biology, 9, 1454– 1465.

[105] Douglas, D. J., Bellamy, P. E., Stephen, L. S., Pearce‐Higgins, J. W., Wilson, J. D., & Grant, M. C. (2014). Upland land use predicts population decline in a globally near‐threatened wader. Journal of Applied Ecology, 51(1), 194-203.

[106] Ries, L., Fletcher, R.J. Jr, Battin, J. & Sisk, T.D. (2004) Ecological responses to habitat edges: mechanisms, models, and variability explained. Annual Review of Ecology and Systematics, 35, 491–522.

[107] Luís Reino, Pedro Beja, Patrick E. Osborne, Rui Morgado, António Fabião, John T. Rotenberry, Distance to edges, edge contrast and landscape fragmentation: Interactions affecting farmland birds around forest plantations, Biological Conservation, Volume 142, Issue 4, 2009, Pages 824-838, ISSN 0006-3207,https://doi.org/10.1016/j.biocon.2008.12.011.

[108] Douglas, D.J.T., Bellamy, P.E., Stpehen, L.S., Pearse-Higgins, J.W., Wilson, J.D. & Grant, M. (2013). Upland land use predicts population decline in a globally near-threatened wader. Journal of Applied Ecology. DOI: 10.1111/1365- 2664.12167

Increase stress and recreational use of a site can cause curlew to abandon nests[109]. Species such as golden plover have been shown to have less response to disturbance during incubation of eggs however, they exhibit a strong behavioural response to disturbance when guarding chicks[110] . The movement of people through the landscape, where it be widespread and unpredictable as opposed to through pathways and tracks can generate disturbance effects on sensitive species.

### A.1.5.3 Seabirds

Identified within the Article 12 reports are seabird species of razorbill, fulmar, puffin, great black-backed gull, gannet, shag, Manx shearwater, kittiwake, roseate tern, common tern, Arctic tern, little tern, sandwich tern and guillemot. The aforementioned species were noted to be impacted by the pressures and threats from recreation related activities rather than forestry. Pressures and threats relate to sports tourism and leisure activities and the modification of coastline, estuary, and coastal conditions for development, use and protection of residential, commercial, industrial, and recreational infrastructure and areas.

Irelands coastal cliffs, dunes and other habitats provide suitable breeding and feeding conditions for seabirds. Seabirds are amongst the most threatened groups on the planet, with approximately half of all seabird populations declining. Roseate, common, little and sandwich tern species all inhabit the Annex I designated habitat vegetated sea cliffs. Recreational pressures and threats to the habitat can have indirect effects on the seabirds that feed and breed in the habitat and its surrounding area. The construction of recreational infrastructure such as sea cliff paths may cause an increase in tourism density in an area that could add disturbance to seabirds. Nature based recreation, such as hiking, cycling, horse riding, kayaking, birdwatching etc., has been established to have negative environmental effects[111]. A variety of short term and long term responses can be elicited from species however, this is dependent upon the magnitude of originating activity[112]. Where activities may be long term in nature, or higher in frequency, a reduction in the breeding performance or the number of breeding sites has the potential to occur, resulting in a long term negative effect on populations[111].

It is well established that seabirds are vulnerable to human activities[113]. Some of the main impacts includes fisheries, exploitation for food, species invasion and habitat destruction and climate change. Enhanced adult mortality and poor breeding efficiency caused by hunting and egg collection at seabirds breeding sites has been noted in scientific literature. Further to this, human activities have resulted in in-direct impacts to seabirds, such as the introduction of invasive non-native animal and plant species. Invasive species can alter an ecosystems community structure through altering the availability of prey to seabirds.

### A.1.5.4 Birds of Prey

Both hen harrier and merlin, categorised here under birds of prey, are discussed below relating to forestry- and recreation-related pressures and threats.

Hen harrier can nest within conifer plantations, typically before the plantation reaches the growth stage where the canopy closes. During forestry operations as well as forest road construction, habitat loss, fragmentation and disturbance can occur. During nesting, these activities can cause adults to flee their nests exposing eggs or chicks to lack of food and cold.

[109] Colhoun, K., Flannelly, F., O'Neill, J., Phelan, E., Servignat, H., O'Donoghue, B. and Kelly, S., 2022. Status and distribution of breeding Eurasian Curlew in Ireland 2021. *Irish Wildlife Manuals*, (138).

[110] Pearce-Higgins, J. W. ; Finney, S. K. ; Yalden, D. W. et al. / Testing the effects of recreational disturbance on two upland breeding waders. In: Ibis. 2007 ; Vol. 149, No. 1. pp. 45-55.

[111] Rochelle Steven, Catherine Pickering, J. Guy Castley, A review of the impacts of nature based recreation on birds, Journal of Environmental Management, Volume 92, Issue 10, 2011, Pages 2287-2294, ISSN 0301-4797, https://doi.org/10.1016/j.jenvman.2011.05.005.

[112] Steidl, R.J., Powell, B.F., 2006. Assessing the effects of human activities on wildlife. George Wright Forum 23, 50e58.

[113] D. Hockin, M. Ounsted, M. Gorman, D. Hill, V. Keller, M.A. Barker, Examination of the effects of disturbance on birds with reference to its importance in ecological assessments, Journal of Environmental Management, Volume 36, Issue 4, 1992, Pages 253-286, ISSN 0301-4797, https://doi.org/10.1016/S0301-4797(08)80002-3.

Forest boundaries can provide predatory animals, such as mink and pine marten, with enhanced opportunities to prey on nests of hen harrier and their ground nesting prey[114].

Hen harrier is amber-listed on the Birds of Conservation Concern Ireland (BOCCI) with an estimated 52% decline in breeding pairs within the last 40 years and a 27% decline in the population within SPA sites between 2005 and 2010[115]. The species is commonly found in open upland landscapes and across agricultural grounds with supporting habitat identified to be blanket bog types, heath habitats, scrub, seminatural woodlands, plantation forests, some calcareous and neutral grasslands, improved grasslands used for agriculture, mosaic grasslands and some freshwater marsh. The 2014 NPWS Hen Harrier Mapping project identified that approximately 52.3%[116] of the habitats mapped in designated SPA sites are conifer forests. Historically, prior to landscape level afforestation, hen harriers were dependent on open habitats such as blanket bog and rough pastures to breed[117].

The importance of maintaining and improving the open upland landscapes of Ireland is reiterated throughout the conservation objectives supporting document for breeding hen harrier[118], highlighting the importance of this habitat for foraging. The importance of upland habitats is further supported by published literature[119] with changes to these habitats causing habitat fragmentation and increases to the forest edge[120]. Hen harriers predate on small birds and small mammals with some of their food source originating from low-intensity agricultural land near roost sites. Medium-sized ground nesting birds (such as common snipe (*Gallinago gallinago*)) found within bog and young conifer forests also form part of the hen harrier's diet [121]. Some variation in the diet of this species is normal however, in post-thicket forest stands, hen harriers are unable to hunt effectively due to the closed canopy, which can result in the species having to travel further during the breeding season to provide for their young, leaving the nest exposed to predation and weather[122]. It is clear from the scientific literature, that landscape level management across all sectors is required to restore the hen harrier population to favourable condition.

It has been identified that the expansion of commercial forests may limit the foraging opportunities for hen harrier[123]. The Article 12 report notes that the second rotation of planting can be associated with low levels of breeding success. Whilst upland land availability for afforestation has decreased due to the exclusion of soil types and the Natura 2000 site network other more marginal agricultural land may be targeted for forestry thereby impacting on the overall habitat available for the life cycle of this species.

Human activities within the vicinity of breeding birds can lead to increased rates of nest desertion and reduced rates of site occupancy and subsequently reduced breeding success[124].

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[114] Ruddock, M., Mee, A., Lusby, J., Nagle, A., O'Neill, S. & O'Toole, L. (2016). The 2015 National Survey of Breeding Hen Harrier in Ireland. Irish Wildlife Manuals, No. 93. National Parks and Wildlife Service, Department of the Arts, Heritage and the Gaeltacht, Ireland

[115] NPWS (2022). Conservation Objectives Supporting Document: Breeding Hen Harrier. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

[116] Moran, P. & Wilson-Parr, R. (2015) Hen Harrier Special Protection Area (SPA) Habitat Mapping Project 2014. Irish Wildlife Manuals, No. 83. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht, Ireland

[117] Norriss, D.W., Marsh, J., McMahon, D. and Oliver, G.A. 2002. A national survey of breeding Hen Harriers Circus cyaneus in Ireland 1998-2000. Irish Birds 7: 1- 10

[118] NPWS (2022). Conservation Objectives Supporting Document: Breeding Hen Harrier. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage.

[119] Anthony Caravaggi, Sandra Irwin, John Lusby, Marc Ruddock, Lorcán O'Toole, Allan Mee, Tony Nagle, Shane O'Neill, David Tierney, Alan McCarthy & John O'Halloran (2019):Factors influencing Hen Harrier *Circus cyaneus* territory site selection and breeding success, BirdStudy, DOI: 10.1080/00063657.2019.169277

[120] Kathryn Sheridan, Jason Monaghan, T. David Tierney, Susan Doyle, Charles Tweney, Steve M. Redpath, Barry J. McMahon "The influence of habitat edge on a ground nesting bird species: hen harrier *Circus cyaneus*," Wildlife Biology, 2020(2), (16 June 2020)

[121] Alan McCarthy, Pat Smiddy, Tony Nagle, Allan Mee, Sandra Irwin, Anthony Caravaggi & John O'Halloran (2021) Landscape and temporal influences on the winter diet of a threatened diurnal raptor, the Hen Harrier Circus cyaneus, Bird Study, 68:3, 408-421, DOI: 10.1080/00063657.2022.2103515

[122] Caravaggi, Anthony & Irwin, Sandra & Lusby, John & Mccarthy, Alan & Mee, Allan & Nagle, Tony & O'Halloran, John. (2020). Forest management and Hen Harrier Circus cyaneus conservation in Ireland.

[123] NPWS (2015) Hen Harrier Conservation and the Forestry Sector in Ireland 2015. Version 3.2 Date 31/03/2015. Accessed at https://www.npws.ie/sites/default/files/publications/pdf/HHTRP%20-%20Forestry%20-%20V3.2.pdf on 15 August 2022

[124] Webber, A.F., Heath, J.A. and Fischer, R.A., 2013. Human disturbance and stage-specific habitat requirements influence snowy plover site occupancy during the breeding season. *Ecology and Evolution*, *3*(4), pp.853-863.

With regards to recreational pressures and threats impacting hen harriers, very little information is available in public literature, due to prior research focus being on the effects of forestry on the breeding population of hen harrier. It is known that anthropogenic recreational activities can impact hen harriers breeding and foraging habitats. Some studies state that hen harrier breeding habitats in Ireland are subjected to a wide range of anthropogenic pressures that could have significant implications for the vulnerable species[122]. Recreation was strongly associated with hen harrier territories, demonstrating that recreational activities can negatively impact breeding birds[125], which has the potential to include breeding hen harrier.

Merlin forage within upland landscapes and nest in trees, showing a strong preference for conifer plantations[126]. The species is a rare breeding bird in Ireland and has taken to nesting in forest plantations adjacent to moorland. Merlin are predominantly found in the west of Ireland, but also occur at scattered locations across the midlands, and in the east, the Wicklow Mountains also hold good numbers. Where conifer plantations, blanket bog and heath habitats border one another, this can favour foraging behaviour, enabling merlin to forage close to their nesting sites and potentially result in breeding success. However, where these open landscapes become fragmented[127], destroyed or left in a condition unfavourable to the predation tactics of merlin, this can have a potentially negative effect on the breeding success. A survey of merlin SPAs was undertaken in 2018, with results published in 2022. The survey estimated 28 to 41 pairs found across six of the SPA sites (Killarney National Park SPA was not included), with breeding pairs present both inside and outside the SPA boundaries[128]. The findings estimate that these numbers are comparable with estimates of breeding densities within the UK. The study further confirmed theories that merlin predominantly nest in trees, and 80% of the nests selected are located within 10m of the edge of mature conifer plantation, where it adjoins open habitats suitable for foraging.

Pressures and threats to merlin from forestry and forestry-related activities are associated with the clearfelling and thinning stages as this stage of forestry development is most likely where merlin nest. Where harvesting occurs, there is a risk of direct nest loss or mortality. In the case of harvesting, additional impacts such as noise disturbance[129] through the use and movement of machinery can also negatively impact individuals, resulting in nest abandonment and leaving any dependent young vulnerable to predation and exposed to the elements. An increase in disturbance through the movement of machinery and personnel during replanting and felling stages has the potential to indirectly impact merlin.

Whilst no recreational pressures and threats were identified from the Article 12 reports, there is the potential for habitat loss, habitat fragmentation and disturbance as a result of plant and machinery required for recreation infrastructure such as creation of pathways through forests in which merlin nest. This can have a direct and indirect impact on species through direct nest loss (from the removal of trees to facilitate infrastructure) thereby impacting the population and through disturbance from machinery and operational recreation where species are forced to abandon foraging zones, move further afield and expend more energy.

#### A.1.5.5 Geese & Swans

Species identified to have pressures and threats relating to forestry and/or recreation related activities are Greenland white-fronted goose, light-bellied brent goose and whooper swan. These species can be found in a variety of habitats, with a strong association to freshwater habitats including those Annex I habitats which form QIs of the European site network.

[125] Caravaggi, A., Irwin, S., Lusby, J., Ruddock, M., Mee, A., Nagle, T., O'Toole, L., O'Neill, S. and O'Halloran, J., 2019. Anthropogenic pressures within the breeding range of the Hen Harrier Circus cyaneus in Ireland. *Bird Study*, *66*(4), pp.461-470.

[126] Lusby, J., Corkery, I., McGuiness, S., FernándezBellon, D., Toal, L., Norriss, D.W., Breen, D., O'Donaill, A., Clarke, D., Irwin, S., Quinn, J.L., O'Halloran, J. (2017). Breeding ecology and habitat selection of Merlin *Falco columbarius* in forested landscapes, Bird Study

[127] Rebecca, G.W. 2006. The breeding ecology of the Merlin Falco columbarius aesalon, with particular reference to north-east Scotland and land-use change. PhD Thesis, Open University

[128] Lusby, J., O'Brien, I., Lauder, A., Wilson-Parr, R., Breen, D., Cummins, S. & Tierney, D. (2022). Survey of breeding Merlin in the Special Protection Area network 2018. Irish Wildlife Manuals, No. 139. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

[129] Lusby, J., Férnandez - Bellon, D., Norriss, D.W., & Lauder, A. (2011). Assessing the effectiveness of monitoring methods for Merlin Falco columbarius in Ireland: the Pilot Merlin Survey 2010. Irish Birds 9, 143 – 154

Wetland habitats are sites of importance for these species, and a range of land use pressures such as agricultural intensification, drainage, water quality, recreational pressure, scrub and forest encroachment, invasive and predator impacts can result in effects to supporting species[130]. Any potential impacts on the supporting habitats may have a consequential impact on these species such as reduced food availability, habitat area and likely effects on mortality rate.

Greenland white-fronted goose is a winter visitor to Ireland from October to April, found grazing on a variety of habitats including peatland, dunes and agricultural grasslands[131]. Nests may be located by lakes and rivers. Upland blanket bog sites were a preferable habitat for the species, but due to land use changes by peat exploitation, afforestation, energy development and intensification of agricultural activities, the species range expanded outwards to freshwater marshes and wet grasslands[132] and subsequently into agricultural grasslands. Marginal agricultural land provides suitable foraging however, these habitats have been increasingly targeted from both agricultural and forestry sectors[133] .

The diet of the Greenland white-fronted goose is documented to be plant material such as grasses, grains, aquatic plants, winter wheat and potatoes, associated with semi-natural grasslands[134]. Changes to these semi-natural grasslands and other habitat types that support these species, such as afforestation, fertilisation, drainage activities and/or land-use change may reduce food availability for the species. As a result, it can be assumed that the species may be required to travel further for its food source, thereby potentially causing stress. Afforestation of lands adjacent to foraging habitat is a threat to Greenland white-fronted goose[61].

Whooper swan will feed on aquatic vegetation, but they are commonly found grazing on agricultural grasslands and fields where there is spilled grain, as well as potatoes from cultivated land. The whooper swans that are present in Ireland each winter nest in Iceland during the summer. Each year, a small number of whooper swans stay in Ireland for the summer and there have been occasional breeding records on lakes in the midlands and north-west[135].

With regard to recreational pressures, shooting and disturbance are named are the primary reasons for the population decline of Greenland white-fronted geese from 17,500-23,00 in the 1950s to 14,300-16,600 by 1979. In other parts of Ireland, disturbance from recreational activities caused Greenland white-fronted geese to adapt to farmland, feeding on large estates more often than on the more natural grazing habitats, which include peatland and dunes[136]. Evidence does show direct impacts to supporting habitats that experience heavy recreation levels, can result in indirect impacts to species[137].

The effects of human activity on bird behaviour and distribution have been extensively studied. Research indicated that the time taken for the whooper swans to resume undisturbed behaviour varied with the duration of the disturbance event, which in turn depended on the type of disturbance involved, with pedestrians alerting the birds for longer periods than vehicles and aircraft. Recovery rates were linked to field size, flock size and the proportion of the flock alerted.

[130] Lauder, A. & Lauder, C. (2020) Identification of breeding waterbird hotspots in Ireland. Irish Wildlife Manuals, No. 129. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

[131] Birdwatch Ireland (2023) Greenland White Fronted Goose. Accessed at https://birdwatchireland.ie/birds/greenland-white-fronted-goose/ on 22/01/2023

[132] NPWS (2023) Greenland White-fronted Goose. Wexford Wildfowl Reserve. Accessed at https://www.wexfordwildfowlreserve.ie/wildlife-2/greenland-goose/ on 23/01/2023

[133] Lewis, L. J., Burke, B., Fitzgerald, N., Tierney, T. D. & Kelly, S. (2019) Irish Wetland Bird Survey: Waterbird Status and Distribution 2009/10-2015/16. Irish Wildlife Manuals, No. 106. National Parks and Wildlife Service, Department of Culture, Heritage and the Gaeltacht, Ireland.

[134] RSPB (2023) Greenland White-fronted Goose. Accessed at https://www.rspb.org.uk/birds-and-wildlife/wildlife-guides/bird-a-z/white-fronted-goose/ 23/01/2023

[135] Bird Watch Ireland Available on: Whooper Swan - BirdWatch Ireland. Accessed 11 July 2023.

[136] Norriss, D.W. and Wilson, H.J., 1988. Disturbance and flock size changes in Greenland White-fronted Geese wintering in Ireland. *Wildfowl*, *39*(39), pp.63-70.

[137] Norriss, D.W. and Wilson, H.J., 1993. Seasonal and long-term changes in habitat selection by Greenland White-fronted Geese Answer albifrons flavirostris in Ireland. *Wildfowl*, *44*(44), pp.7-18.

Feeding activity was influenced by a range of variables, including year, season, field location, crop type and the number of days that the flock had used the field[138]. Therefore, recreational activities such as hiking have the potential to disturb flocks of whooper swans, if not managed appropriately.

### A.1.5.6 Ducks & Divers

Species identified to have pressures and threats from Article 12 reports and scientific literature that have the potential to occur as a result of Coillte activities, whether direct or indirect, are eider, gadwall, goldeneye, mallard, pintail, pochard, red-throated diver, scaup, shoveler, teal, tufted duck, and wigeon. These species can be found in a variety of habitats, but are strongly associated with freshwater habitats, including those Annex I habitats which form QIs of the European site network. Wetland habitats are important for these species, and a range of land use pressures such as agricultural intensification, drainage, water quality, recreational pressure, scrub and forest encroachment, invasive and predator impacts can result in effects on these species[139]. Any potential direct impacts to supporting wetland habitats may have an indirect impact on these species such as reduced food availability, reduction in available habitat area and likely effects on mortality rate.

Red throated diver is found across Ireland inhabiting small pools and lochs, as well as large lakes and reservoirs. Red-throated divers often move to the coast in winter to feed on fish. A proportion of the estimated Irish population of red-throated diver are reported to occur in non-estuarine coasts[140]. Recreation, through sports, tourism, and leisure activities, presents a pressure and threat to these elusive species. Human disturbance events from recreational activities such as dog-walking can result in moderate to high levels of disturbance to waterbirds such as the red-throated diver[141].

Potential impacts to freshwater habitats, including those which are designated QIs, as a result of forestry and recreation related activities has been discussed in Section A.1.3.3 of this report. Impacts such as changes in water quality could consequently impact the foraging behaviours of duck and diver species such as pochard, tufted duck, scaup and goldeneye. Water quality impacts can reduce the amount of food available, such as the macrobenthos of lakes and other freshwater habitats. A study of two freshwater lakes in Northern Ireland identified a decline in the biomass of benthic macroinvertebrates as a contributing factor in the decline of overwintering bird species[142]. There exists the potential for water quality changes to occur as a result of Coillte activities, in the absence of suitable environmental protection measures, therefore impacting species which are reliant upon such habitats..

### A.1.5.7 Other SCIs Impacted

Chough and kingfisher are two other SCIs considered at risk from land-use changes such as forestry and/or recreation related activities. Chough are dependent on open habitats with a preference for managed unimproved grassland habitats often with heath, scrub and bracken[143].

Kingfisher are predominantly found nesting along river banks and the associated riparian habitats. Riparian habitats of the kingfisher can also be impacted by forestry, through disturbance where activities such as the movement of machinery and recreation amongst others can disturb the species.

Effects on water quality such as sedimentation and/or increased nutrient availability can have trophic level impacts on freshwater bodies, reducing the prey availability for species.

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[138] Rees et al (2005) Factors affecting the behavioural responses of whooper swans (Cygnus c. cygnus) to various human activities.

[139] Lauder, A. & Lauder, C. (2020) Identification of breeding waterbird hotspots in Ireland. Irish Wildlife Manuals, No. 129. National Parks and Wildlife Service, Department of Housing, Local Government and Heritage, Ireland

[140] Crowe, O., Austin, G. and Boland, H., 2012. Waterbird populations on non-estuarine coasts in Ireland: Results of the 2006/07 Non-Estuarine Coastal Waterbird Survey. *Irish Birds*, *9*, pp.385-396.

[141] Lewis, L.J., 2019. An assessment of the effects of recreational and other activities on the waterbirds using the Bull Island saltmarsh. Final Report. Report commissioned by Dublin City & County Council and prepared by BirdWatch Ireland. April 2019. Front Cover Photograph: Brian Burke.

[142] Tománková, I., Boland, H., Reid, N. & Fox, A.D. 2013. Assessing the extent to which temporal changes in waterbird community composition are driven by either local, regional or global factors. Aquatic Conservation: Marine and Freshwater Ecosystems 23: 343-355

[143] Woodhouse, S.P., Good, J.E.G., Lovett, A.A., Fuller, R.J., Dolman, P.M., 2005. Effects of land-use and agricultural management on birds of marginal farmland: a case study in the Llyn peninsula,Wales. Agric. Ecosyst. Environ. 107, 331–340

Considering the habitat preferences for these two species, land use changes from activities, such as afforestation have the potential to affect the species through habitat loss, fragmentation, and indirect effects such as disturbance. Where afforestation may occur within their preferred habitats, habitat loss and loss of suitable cover could cause an increase the number of predators, due to increased cover from forestry[144]. The potential changes in soil structure and vegetation composition may also cause both species to roam further for appropriate vegetation to hunt within and/or nest within.

[144] Mark H. Hancock, Daniela Klein, and Neil R. Cowie. "Guild - level Responses by Mammalian Predators to Afforestation and Subsequent Restoration In a Formerly Treeless Peatland Landscape." Restoration ecology, v. 28 ,.5 pp. 1113-1123. doi: 10.1111/rec.13167

# Appendix B

## Mandatory Mitigation For Forestry Related Activities

# B.1 Embedded Mitigation Measures for Licensed Forestry Activities

## B.1.1 General Mitigation Measures

- Forest Protection Guidelines. Forest Service (2000) Department of the Marine and Natural Resources; and
- Forests & Water – Achieving Objectives under Ireland's River Basin Management Plan 2018-2021 Department of Agriculture, Food and the Marine (2018).

## B.1.2 Recreation

- Forest Recreation in Ireland A Guide for Forest Owners and Managers (2006) Forest Service, Department of Agriculture and Food.

## B.1.3 Afforestation/Reforestation

- Land Types for Afforestation. October 2017. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford;
- Environmental Requirements for Afforestation, December 2016. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford;
- Forestry Standards Manual, November 2015. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford; and
- Forests & Water Achieving Objectives under Ireland's River Basin Management Plan 2018-2021, June 2018. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co.Wexford.

## B.1.4 Forest Road Works

- Ryan, T., Phillips, H., Ramsay, J. & Dempsey, J. 2004. Forest Road Manual. Guidelines for the design, construction & management of forest roads. COFORD, Dublin;
- Forest Entrances – Requirements for Mandatory Consultation (Feb. 2020). Department of Agriculture, Food & the Marine. See Circular 03 / 2020. gov.ie - Forestry Grants and Premium Schemes 2014 - 2022 Circulars (www.gov.ie);
- Forestry & Archaeology Guidelines. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford;
- Forestry & Water Guidelines. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford;
- Forest Harvesting & the Environment Guidelines. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford;
- Forest Service. 2000. Forestry and the Landscape Guidelines. Forest Service, Department of the Marine and Natural Resources; and
- Forest Service. 2000. Guidelines for forestry and biodiversity. Forest Service, Department of the Marine and Natural Resources, Dublin.

## B.1.5 Felling and Thinning

- Standards for Felling & Reforestation (v.Oct2019). Department of Agriculture, Food & the Marine. See Circular 14 / 2019. gov.ie - Forestry Grants and Premium Schemes 2014 - 2022 Circulars (www.gov.ie);

- Forest Harvesting & the Environment Guidelines. Forest Service (20000 Department of the Marine and Natural Resources; and
- Felling & Reforestation Policy. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford. gov.ie - Tree Felling Licences (www.gov.ie).

### B.1.6 Aerial Fertilisation

- DAFM. 2015. Aerial Fertilisation Requirements, July 2015. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford.

### B.1.7 Biodiversity

- AA Mitigation for Felling and Reforestation. July 2022. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford.
- Standard text for AA mitigation for Afforestation. May 2022. Department of Agriculture, Food & the Marine, Johnstown Castle Estate, Co. Wexford.
- Forestry Biodiversity Guidelines. Forest Service (2000) Department of the Marine and Natural Resources;
- Forestry & Otter Guidelines. Forest Service (2000) Department of the Marine and Natural Resources [76];
- Forestry & Kerry Slug Guidelines. Forest Service (2000) Department of the Marine and Natural Resources[77];
- Forestry & Hair Wood Ant Guidelines;
- Forestry & Freshwater Pearl Mussel Requirements: Site Assessment and Mitigation Measures Forest Service (2000) Department of the Marine and Natural Resources; and
- A Plan for Forests & Freshwater Pearl Mussel in Ireland (Draft).)[78] It is recommended that any mitigation and/or guidance on forestry related activities in relation to the freshwater pearl mussel arising from the finalised version be implemented.

[76] Forestry & Otter Guidelines Forest Service (2000) Department of the Marine and Natural Resources
[77] Forestry & Kerry Slug Guidelines. Forest Service (2000) Department of the Marine and Natural Resources
[78] Plan for Forests & Freshwater Pearl Mussel in Ireland (2021) Department of Agriculture, Food and the Marine