Technical Appendix 2-2 Forestry Report

EIAR – Volume 3

Muingmore Wind Farm

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VEON Forestry, Ecology & Environment

Forestry Report

For the Proposed Muingmore Wind Farm,
Co. Mayo

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Scope of contribution:	Preliminary desk study; Field assessment; Data analysis; Completion of final report.

Definition of Terms

- **Afforestation:**
  The establishment of a forest in areas where the preceding vegetation or land use was not forest - defined in the Forestry Act 2014 as: "*the conversion of land to a forest with a minimum area of 0.1 hectares and tree crown cover of more than 20 per cent of the total area, or the potential to achieve this cover at maturity*".
- **Aquatic zone:**
  Any natural river, stream or lake (but not an artificial drain) illustrated on an Ordnance Survey 6-inch map.
- **Brash mat:**
  A protective layer comprised of residual woody debris from harvested trees that is laid along machinery routes to preserve soil quality and to spread out the weight of harvest machinery.
- **Check (trees in…)**
  Trees showing signs of stunted growth due to environmental factors, nutrient deficiencies or disease.
- **Clear-felling:**
  The final stage in a typical commercial forestry crop cycle, where an entire standing crop of trees is removed from an area (also known as clear-cutting or clearcut logging).
- **Construction felling:**
  Relates to the construction phase of a wind farm development, where the temporary removal of trees is required to facilitate the construction works (e.g. borrow pits for stone; temporary site compounds).
- **Coupe:**
  A designated area of forest (which can vary in size and shape) where the felling of trees is planned or has occurred.
- **Eutrophication:**
  A process where a high concentration of nutrients has been introduced into a watercourse which promotes excessive growth of algae and can deplete oxygen levels in water and deleteriously affect aquatic life.
- **Exclusion zone:**
  An exclusion zone is an area where harvesting machines are not permitted for environmental protection.
- **Fireline:**
  A strip of land that has been cleared of vegetation and other combustible materials to prevent the spread of wildfires. Woodland managers create fire lines by digging down to the bare soil, removing all leaves, twigs, and other debris that can fuel fires.
- **Forest:**
  Defined in the Forestry Act 2014 as "*land under trees with—(a) a minimum area of 0.1 hectare, and (b) tree crown cover of more than 20 per cent of the total area, or the potential to achieve this cover at maturity*."
- **Hectare:**
  A unit of land area equal to 10,000 square metres, or 2.4711 acres.
- **Infrastructure felling:**
  Relates to trees that are permanently removed from a site in order to make way for infrastructure associated with a wind farm, such as turbine bases and access roads.
- **Mounding:**
  A ground cultivation technique where an excavator digs out drains at regular intervals and heaps the excavated soil in mounds. Trees are then planted into the mounds which provide an elevated vegetation-free zone.

- **Pallet wood:**
  Wood cut from the middle section of trees – used for packaging, panels and garden furniture.
- **Plantation:**
  A forest stand established by planting or seeding during afforestation or reforestation.
- **Pulpwood:**
  Wood cut from the top of section of trees during first and second thinning – used for wall panels.
- **Relevant watercourse:**
  Any other watercourse that has the potential to act as a pathway for the movement of significant amounts of sediment and/or nutrients from the site to an aquatic zone. These include existing drains/channels and other potential pathways that may contain flowing water during and immediately after periods of rain.
- **Rotation:**
  The period of years required to establish and grow a timber crop to a specified condition of maturity, when it may be harvested, and a new tree crop started.
- **Stand:**
  An aggregation of trees occupying a specific area and uniform enough in composition (species), age and arrangement to be distinguishable from forestry in adjoining areas.
- **Silviculture:**
  The science of cultivating and managing forests to meet the diverse needs of landowners and society, which incorporates a number of activities that influence the function, structure and growth of forest stands.
- **Stakewood:**
  Wood taken from the middle section of a tree during first thinning – used for stakes and fencing products.
- **Top height:**
  The average height of a number of top height trees in a stand, where one top height tree is the tree of largest diameter at breast height (DBH) in a 0.01 ha sample plot.
- **Turbulence felling:**
  Felling in the vicinity of wind turbines for the purpose of avoiding air turbulence that can be created by the forest canopy. It is carried out in order to increase the efficiency of the turbines and to reduce stress on the turbine components.
- **Water hotspot:**
  An area of potential source of sediment or nutrient loss during harvesting and/or afforestation works (e.g. flushes, springs and areas of soft ground).
- **Windblow (or windthrow):**
  The uprooting/overturning of trees by wind.
- **Yield Class (YC):**
  An estimate of the productivity of a forest, expressed as cubic metres per hectare per year (m^3/ha/year).

1. Introduction

1.1 Project Overview

This report has been prepared to assess the impact of a proposed wind farm development at Muingmore, Co. Mayo, upon existing forests within the Main Wind Farm Development Site. Full details of the Proposed Project are provided in Chapter 2 of the EIA Report, with a list of defined terms being provided in Chapter 1. The Main Wind Farm Development Site comprises approximately 454 hectares, of which circa 178 hectares is forest, and the installation of thirteen turbines with a tip height between 179 – 180m is planned. The Main Wind Farm Development Site will also consist of infrastructure, such as access tracks, an electricity substation, Battery Energy Storage (BESS) and a permanent meteorological mast.

This report provides an assessment of the baseline forest environment contained within the Main Wind Farm Development Site, and the potential effects of construction of the wind farm upon existing forests. An overview of forestry harvesting operations is also presented, including the relevant mitigation measures and the associated tree planting obligations for felling associated with wind farm development.

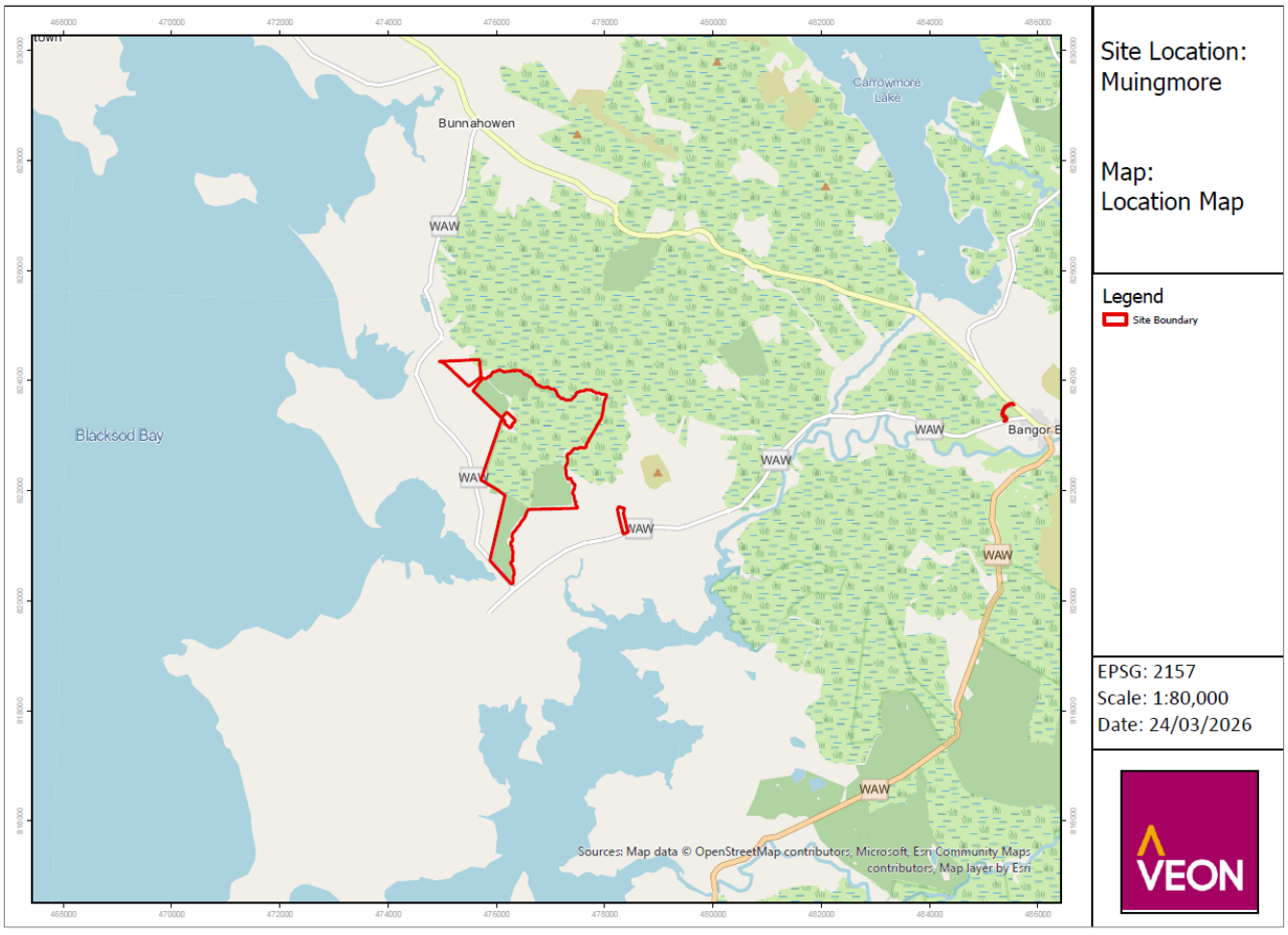

Figure 1.1: Location of Proposed Project.

1.2 Assessment Methodology

1.2.1 Desk Study

A desktop study of the Main Wind Farm Development Site was carried out as part of this report, which involved a review of the relevant policy and guidance documents, including the *Felling and Reforestation Policy* (DAFM, 2017), *Standards for Felling & Reforestation* (DAFM, 2019) and the *Forestry and Water Quality Guidelines* (Forest Service, 2000c).

A number of additional resources were used in the preparation of this report, including:

- IFORIS iNET online mapping system - Department of Agriculture, Food and the Marine (DAFM)
- GIS spatial datasets: Special Areas of Conservation (SACs), Special Protection Areas (SPAs) and Natural Heritage Area (NHAs) – National Parks and Wildlife Service (NPWS)
- EPA Maps application – Environmental Protection Agency (EPA)
- Heritage Maps Viewer – Heritage Council of Ireland

1.2.2 Field Assessment

A field assessment was carried out in February 2025 to assess existing forests that overlap with the infrastructural footprint of the Main Wind Farm Development Site. A number of parameters were recorded during the field visit, including tree species, top height, thinning status, ground conditions and previous cultivation. Photographs were also taken at each location.

1.3 Site Description

The Main Wind Farm Development Site incorporates the townlands of Muingmore and Doolough and is located approximately 0.5 km from the village of Gweesalia, and approximately 8 km from the settlement of Bangor Ennis.

The Main Wind Farm Development Site lies north of the intersection of roads L1205 and L1206. The L1206 borders the southern edge of the Main Wind Farm Development Site, while the L1205 runs westward and leads to the R313, located approximately 4km north of the Main Wind Farm Development Site. The R313 provides connections to more extensive road networks, as indicated below. The Main Wind Farm Development Site is traversed by a local road (L5252) branching from the L1206. The land types in the region are dominated by agricultural land and blanket peat. According to national soil maps, the Main Wind Farm Development Site is underlain entirely by lowland blanket bog.

The Proposed Development Site is located within the Blacksod-Broadhaven catchment [ID 33], and aquatic zones run through the Main Wind Farm Development Site and along its boundaries. To the north of the Main Wind Farm Development Site, the Doolough [33D02] and An Mhoing Mhór [33M23] streams, and an unnamed first order stream, run adjacent to and through forest as they flow westward. Unnamed streams also interact with forests to the south and southeast of the Main Wind Farm Development Site.

The Main Wind Farm Development Site also features a recorded crannog [MA025-004----][1], which is contained within coniferous forest to the southeast of the site, though outside of the planned felling areas.

1.4 Baseline Forest Description

There are approximately 178 hectares of existing forest within the Main Wind Farm Development Site, as illustrated in Figure 1.2. The majority of the existing forest is plantation forestry, which is being managed on a commercial basis, and which would be converted to construction timber and other wood products (e.g. pulpwood, stakewood or pallet wood)

[1] *Data from the [NMS SMR] dataset accessed through the Heritage Maps Viewer at www.heritagemaps.ie*

over the course of each respective rotation. Beyond timber production, the range of services that these types of forests typically provide would generally be low but would encompass carbon sequestration and some (limited) biodiversity. Much of the forest present is under private ownership (circa 73%), with the remainder owned by Coillte. The forests in the main are between 13 – 26 years of age and primarily comprise conifer tree species. These include Sitka spruce, (*Picea sitchensis*), Scots pine (*Pinus sylvestris*), Lodgepole pine (*Pinus contorta*) and Japanese larch (*Larix kaempferi*). Pockets and strips of conifer forest also feature around the perimeter of the Main Wind Farm Development Site.

Figure 1.2*: Existing forest within Main Wind Farm Development Site.*

The elevation of the existing forest varies from approximately 24m – 12m above the Ordinance Datum (AOD) to the northwest, circa 20m – 13m AOD to the southeast and circa 19m – 3m AOD to the south of the Main Wind Farm Development Site. There is no overlap between the Main Wind Farm Development Site and designated national or European conservation areas (i.e. NHAs, SACs, SPAs), though several can be found within 20 km of the forested areas within the Main Wind Farm Development Site boundary (Table 1.1, Figure 1.3).

Table 1.1*: NHAs, SACs and SPAs within 20 km of forests within Main Wind Farm Development Site.*

#	Name	Site Code
1	Tristia Bog NHA	001566
2	Mullet/Blacksod Bay Complex SAC	000470
3	Blacksod Bay/Broad Haven SPA	004037
4	Tullaghan Bay And Bog NHA	001567
5	Bangor Erris Bog NHA	001473
6	Carrowmore Lake Complex SAC	000476
7	Carrowmore Lake SPA	004052
8	Ederglen Bog NHA	002446

Table 1.1: *NHAs, SACs and SPAs within 20 km of forests within Main Wind Farm Development Site (cont.)*

#	Name	Site Code
9	Broadhaven Bay SAC	000472
10	Owenduff/Nephin Complex SAC	000534
11	Owenduff/Nephin Complex SPA	004098
12	West Connacht Coast SAC	002998
13	Pollatomish Bog NHA	001548
14	Glenturk More Bog NHA	002419
15	Mullet Peninsula SPA	004227
16	Slieve Fyagh Bog SAC	000542
17	Doogort Machair/Lough Doo SAC	001497
18	Doogort Machair SPA	004235
19	Doogort East Bog NHA	002381
20	Erris Head SAC	001501
21	Glenamoy Bog Complex SAC	000500
22	Termoncarragh Lake and Annagh Machair SPA	004093
23	Croaghaun/Slievemore SAC	001955
24	Duvillaun Islands SAC	000495
25	Duvillaun Islands SPA	004111
26	Inishglora and Inishkeeragh SPA	004084
27	Inishkea Islands SPA	004004
28	Inishkea Islands SAC	000507
29	Bellacorick Bog Complex SAC	001922
30	Keel Machair/Menaun Cliffs SAC	001513
31	Lough Gall Bog SAC	000522
32	Bellacragher Saltmarsh SAC	002005

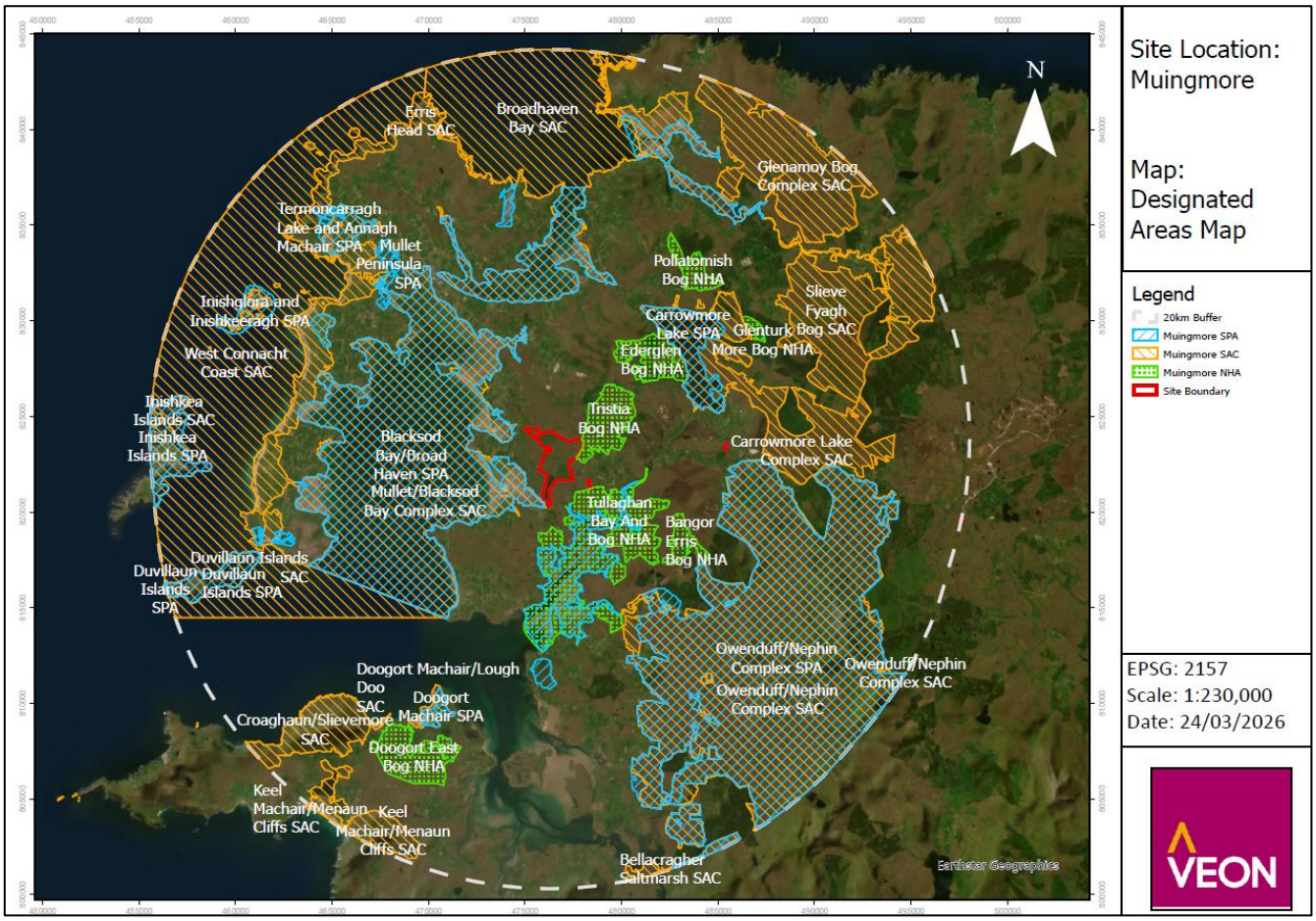

Figure 1.3: *NHAs, SACs and SPAs within 20 km of forests within Main Wind Farm Development Site.*

1.4.1 Forests Interacting with Proposed Project

To enable the construction of the Main Wind Farm Development Site, areas of existing forest and any trees outside of forests that overlap with the planned infrastructural footprint of the wind farm will first need to be removed by felling. The planned infrastructural footprint of the Main Wind Farm Development is illustrated in Figure 1.4.

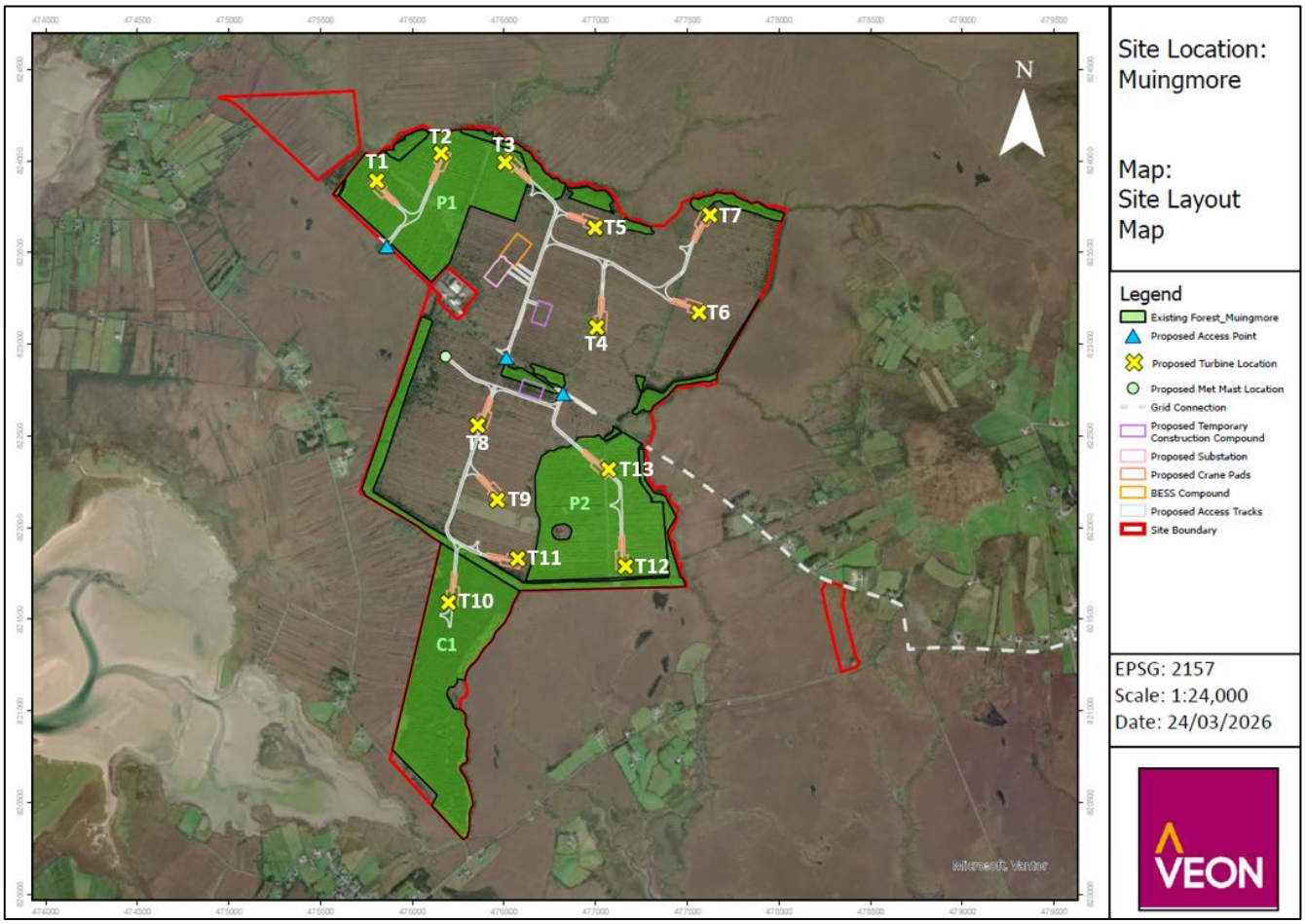

Figure 1.4: *Infrastructural footprint of Main Wind Farm Development.*

A summary of the main forests that would be affected during the construction of the Main Wind Farm Development Site is presented in Table 1.2, where felling would occur to facilitate the construction of physical infrastructure and the required environmental mitigation (i.e. bat buffer zones).

Table 1.2: *Overview of main forests interacting with Main Wind Farm Development.*

Forest plot	Tree Species*	Planting Year	Estimated Yield Class
P1	SS	2010	18
	SP	2010	14
	LP	2010	12
P2	SS	2010	20
	SP	2010	14
C1	LP	1999-2000	12
	SS	2000	16

*SS = Sitka spruce, SP = Scots Pine, LP = Lodgepole Pine

Plate 1 illustrates the existing forest in plot P1 where felling associated with turbines T1, T2 and T3 would occur. This plot was planted in 2010 and comprises Sitka spruce (*Picea sitchensis*), Scots pine (*Pinus sylvestris*) and Lodgepole pine (*Pinus contorta*). Japanese larch (*Larix kaempferi*) is also present but has mostly died off. An average top height of 7.5 meters was recorded, with heights varying from 3m – 10m across the plot. No thinning has occurred here to date, and tree growth is variable with pine overgrowing the spruce trees in areas. A fireline (Plate 2) features in this plot and *Rhododendron ponticum* was observed in the area.

Plate 1

Plate 2

Plates 3 and 4 illustrate the forest present in plot P2 where felling associated with turbines T12 and T13 would occur. This plot was previously mounded and comprises Sitka spruce, Scots pine and a small proportion of Japanese larch. A maximum top height of 11 meters was recorded across tree species, with an average top height of 8 metres. Tree growth is inconsistent within this block with many areas displaying poor growth, and some trees in check. There is an access route lined with broadleaves near the centre of the plot. The Sitka spruce adjoining this route was observed to be growing better with top heights varying between 9 – 11 metres.

Plate 3

Plate 4

Plates 5 and 6 illustrate a belt of mature conifer trees (primarily Sitka spruce) as seen from the laneway adjoining the northern boundary of forest plot C1, where felling for a new access track leading to turbine T10 would occur, where some trees have previously blown over.

Plate 5

Plate 6

Plate 7 illustrates forest plot C1 where felling associated with turbine T10 would occur. This is a Coillte-owned forest, which was previously mounded and is underlain by peat. The trees are 25-26 years old at this location and comprise Lodgepole pine and Sitka spruce. Tree growth is mixed to the north of the plot where the trees have a top height of 13 metres: trees further south were observed to be growing well.

Plate 7

2. Assessment of Effects

2.1 "Do-Nothing" Scenario

The majority of the affected forests are being managed as part of commercial rotations and would thus be due for harvesting in the future, irrespective of whether the Main Wind Farm Development Site is being constructed or not. Given the age profile of the forests present, it is estimated that the commercial forests on the Main Wind Farm Development Site would not be clear-felled for another 10-20 years (+). Any forests felled in the future under a "Do-nothing" scenario would be replanted in situ on the Main Wind Farm Development Site as part of typical forestry management.

2.2 Construction Phase

While the effects of the felling activities are considered at this, the application stage, it is noted that the felling of trees for wind farm construction is subject to and can only occur following the granting of a felling licence by the Department of Agriculture, Food and the Marine (DAFM).

2.2.1 Felling and Removal of Trees

Mature and semi-mature forests containing merchantable timber will be harvested conventionally by a mechanical harvester (Figure 3.1), and felled logs will be extracted to the roadside by a specialised wheeled forwarder (Figure 3.2). Manual felling by chainsaw may also be required in some areas. Timber will be transported from the Main Wind Farm Development Site using industry standard timber lorries.

During the construction phase of the Main Wind Farm Development, 'keyhole'-type felling will be carried out where the planned infrastructure overlaps with existing forest. This approach describes removing trees solely from infrastructural footprint of the wind farm and may result in smaller felling coupes than what would otherwise arise during normal forestry management of the affected forests.

The forests due for felling at the proposed locations of turbines T1, T2, T3, T7, T11, T12, and T13, should not be impacted by the construction of the turbines. These trees should have time to stabilise and adapt to the new conditions arising from the felling works.

Considering the proximity to the western coast, the underlying peat soil, and the current height of the trees, infrastructure felling at the proposed location for turbine T10 may result in future windblow in the remaining trees of plot C1.

2.2.2 Other Potential Effects Associated With Tree Felling

Beyond the risk to remaining forests, there are a number of other potential effects to consider with regard to the required felling works:

• **Soil quality:** harvesting and extraction of timber could affect soil quality, with the potential for erosion, sedimentation and rutting where works are not carefully managed — this risk is also applicable to future timber harvesting that would occur on the site under a "Do-nothing" scenario. Potential effects on soils are assessed in detail in Chapter 6 of the EIA Report (EIAR).

• **Water quality:** tree felling could affect water quality via sediment or nutrient inputs into environmental receptors such as aquatic zones (e.g. eutrophication) — this risk is also applicable to a "Do-nothing" scenario. Potential effects on hydrology and water are assessed in detail in Chapter 7 of the EIAR.

• **Habitats:** the harvesting of forest coupes could lead to a disturbance or loss of wildlife habitats — this risk is also applicable to a "Do-nothing" scenario. Potential effects on biodiversity are assessed in detail in Chapter 5 of the EIAR. The draft habitat management plan (HMP) for the Proposed Project focuses on restoration of bogs and peatlands. In open areas this will involve ditch block and enhancement in condition of existing bogs. In the afforested peatlands, bogs would be re-created following felling of the keyhole areas in forest around the turbines. It is envisaged that forest-to-bog restoration would be successful, but the bog would only reach poor condition due to drainage influences from infrastructure and the remaining forest, as well as potential issues with forest self-set and regeneration. This would contribute to the overall value of the biodiversity enhancement measures for the site. See the HMP (Technical Appendix 5-5) for more detail.

• **Archaeology:** tree harvesting involving the movement of heavy machinery could cause structural damage to archaeological sites where operations are not properly managed (Forest Service, 2000d). Potential effects on archaeology are assessed in detail in Chapter 12 of the EIAR.

• **Road traffic and noise disturbance:** the felling of merchantable trees will involve mechanised harvesting machinery, and timber lorries will be required to transport logs from the Main Wind Farm Development Site. This will increase road traffic in the locality and could give rise to potential noise disturbance — this risk is also applicable to a "Do-nothing" scenario where harvesting will occur as part of typical forestry management of these forests. Potential effects of noise and traffic are assessed in detail in Chapters 9 and 14 of the EIAR respectively.

• **Carbon sequestration:** following the permanent removal of trees the carbon sequestration capacity of the existing forests would be reduced — this risk is not applicable to a "Do-nothing" scenario, where the felled areas would generally be replanted within a period of two years as part of typical commercial forestry management. Potential effects on Climate are assessed in detail in Chapter 8 of the EIAR. However, concerning the Proposed Project, the following observation is made. The *Felling and Reforestation Policy* (DAFM, 2017) requires that equivalent areas of alternative land(s) are afforested in lieu of all infrastructure felling areas required for wind farm development, where newly planted trees would serve as a carbon sink as they grow. Furthermore, trees felled as part of this development would be converted to timber products where carbon would be stored long-term, and the operational wind farm would assist in the reduction of emissions.

2.3 Operational Phase

All areas that will be subject to infrastructure felling will remain unplanted throughout the Proposed Project operational phase. No operational phase effects upon forests are therefore predicted.

3. Forest Harvesting Operations

Harvesting within a forestry context typically describes the cutting down of standing trees during thinning or clear-felling operations, the cutting of felled logs into size categories, the extraction of timber from the forest, and the stacking of log assortments by the roadside for loading onto timber lorries.

The felling of trees is regulated in Ireland under the Forestry Act 2014, and in most instances, a tree felling licence is required. A tree felling licence is granted by the Minister for Agriculture, Food, and the Marine, and provides authority under the Forestry Act 2014 to fell or otherwise remove a tree, or trees, or to thin a forest for silvicultural purposes. The Forestry Act 2014 prescribes the functions of the Minister and details the requirements, rights, and obligations associated with tree felling licences. The Forestry Regulations 2017 (S.I. No. 191 of 2017) are the principal set of regulations giving further effect to the Forestry Act 2014.

3.1 Proposed Harvesting Methods

3.1.1 Mechanised Felling of Trees

Mechanised harvesting is currently the predominant method of tree felling in Ireland and involves purpose-built ground-based machines called harvesters. These are self-propelled machines, fitted with specialised cutting heads that are capable of cutting down and processing trees. The machine operator controls the movement of the harvester from a cab, which contains an onboard computer system that can be programmed to cut standing trees to the size and length specified by the customer. The harvester will process trees down to 7 cm in size. The remainder of the tree will be placed on the rack in front of the harvester, along with the branches, to act as a brash mat for the harvester to travel on, reducing the risk of soil damage. A typical forestry harvester is illustrated in Figure 3.1.

Figure 3.1*: A typical forestry harvester machine*

As a harvester works down a rack, the operator will place processed logs to the side where they will be easily accessed for extraction to the roadside. In conifer stands, as the harvester cuts each tree, a urea solution is applied to the surface of the remaining tree stumps. Urea is applied to prevent the potential colonisation of *Heterobasidion annosum* fungal spores: this is a serious fungal disease (otherwise known as conifer root and butt rot) that can grow into root

stumps and cause extensive decay in the lower stems of conifer trees[2]. The application of Urea is generally a condition of a felling licence where the soil type is mineral soil or where a peat soil is less than 25cm (excluding the litter layer). The application of urea is not permitted within 10 metres of any aquatic zone or relevant watercourse (DAFM, 2019).

3.1.2 Timber Extraction

To retrieve timber from forests, specialised wheeled machines called forwarders (Figure 3.2) are the most widely used extraction method in the Irish forestry industry. A forwarder, containing a base machine similar to a harvester, also comprises a powered trailer with a hydraulic grapple arm attached for picking up logs. A forwarder follows a harvester to collect and transport logs to the roadside, where timber is then stacked for loading onto timber trucks. Forwarders can typically remove circa 9 – 12 tonnes of timber per journey (Teagasc, n.d.).

Figure 3.2*: A typical forestry forwarder machine*

[2] Conifer root and butt rot (*Heterobasidion annosum*) - Forest Research

4. Mitigation (Forestry)

4.1 Construction Phase

Harvesting on the Main Wind Farm Development Site will require the use of specialised machinery to fell trees and remove timber from areas where physical infrastructure and bat buffers are planned. Other areas of forest may need to be clear-felled earlier than the planned rotation length to prevent the remaining areas of trees from becoming unstable and blowing over due to wind: these areas would be replanted in situ around the footprint of the Main Wind Farm Development. While the period that such felling would be brought forward is not considered significant, various measures should be taken to minimise any potential adverse effects.

Draft mitigation measures for forestry harvesting operations is provided below, based on existing standards and guidelines — additional measures may be required within the conditions of a felling licence if approved:

- Proposed works to be carried out in strict adherence with all relevant standards/guidance, including:
    - Forest Biodiversity Guidelines (Forest Service, 2000a)
    - Forest Harvesting and the Environment Guidelines (Forest Service, 2000b)
    - Forestry and Water Quality Guidelines, (Forest Service, 2000c)
    - Forestry and Archaeology Guidelines (Forest Service, 2000d)
    - Forestry and the Landscape Guidelines (Forest Service, 2000e)
    - Forest Protection Guidelines (Forest Service, 2002)
    - Felling and Reforestation Policy (DAFM, 2017)
    - Standards for Felling & Reforestation (DAFM, 2019)
    - Environmental Requirements for Afforestation (DAFM, 2025)
    - Forestry Standards Manual (DAFM, 2026)
- Contingency plans to be prepared according to Section 5 of the *Standards for Felling & Reforestation* (DAFM, 2019), and to contain all relevant contact details and necessary actions for contractors/operators in case of an unexpected event that poses an environmental risk (e.g. an accidental fuel spillage or the discovery of an unidentified archaeological feature, etc.)
- Responsible forester to erect all relevant safety signage and to walk the harvest site with contractors/machine operators to highlight any environmental sensitivities or site risks.
- All relevant timber harvesting exclusion zones (DAFM, 2019) to be identified/clearly marked on site maps and on the Main Wind Farm Development Site before any works commence:
    - **10m-wide exclusion zone** to be established from the edges of any **aquatic zones** or **water hotspots**.
    - **5m-wide exclusion zone** to be established from the edges of any **relevant watercourses**.
    - **Appropriate exclusion zone** to be established from the outer edges of any **archaeological features** located within or contiguous to the harvesting area – see *Environmental Requirements for Afforestation* (DAFM, 2025, p.34). In the event that an unrecorded archaeological feature is found during harvesting, the discovery must be immediately reported to the National Museum of Ireland, The National Monuments Service or the Garda Síochána. A minimum exclusion zone of 20m must be established around the feature until the site of the find has been investigated (Forest Service, 2000d).
    - **Appropriate exclusion zone** to be established for any **wildlife habitats** present within the harvesting areas, and the location of such exclusion zones to be well known by all operators on site.

- Works scheduled to occur near overhead electricity lines (OELs) to be conducted according to Section 7 of the *Forestry Standards Manual* (DAFM, 2026). Goalposts and safety signage to be erected where machinery or vehicles pass under an OEL on or near a harvesting site.
- Prior to harvesting works, silt traps to be installed within existing forest drains that connect with aquatic zones, either directly or indirectly through other relevant watercourses. Silt traps to be installed along the length of drains and placed outside exclusion zones, and to be monitored and maintained as required throughout works.
- Temporary bridging points to be used where machinery routes must cross existing water features. Water features to be crossed at a right angle to the flow of water and any crossing to be via an appropriate structure – see *Standards for Felling & Reforestation* (DAFM, 2019, pp. 5–6).
- Maintenance, refuelling and storage areas to be sited in dry and sheltered locations, at least 50m from aquatic zones and 20m from relevant watercourses. No rinsing of fuel, chemical or oil containers to occur on the site.
- Harvesting machinery to be fitted with up-to-date spill kits to mitigate against an accidental spillage.
- Dense brash mats to be laid along all machinery routes. Additional brash to be deployed on any sections of soft ground that are subject to high levels of machinery passage. Brash mats to be replaced as soon as they exhibit signs of wear.
- Stacking areas to be located at least 50m from aquatic zones, and at least 100m from dwellings where possible.
- On-site supervision to be present to ensure operations are carried out according to standards, and to confirm mitigation measures are effective.
- Felling and extraction to cease during and after periods of rainfall that could result in the surface mobilisation of silt, until conditions improve, and the risk is minimised.
- Harvesting works to adhere to the designated working hours as specified in the Construction Environmental Management Plan (CEMP), and operators to wear all relevant Personal Protective Equipment (PPE) at all times.
- Harvesting machinery must not enter any exclusion zones: trees standing within an exclusion zone that are outside the reach of the harvester to be felled manually by an experienced chainsaw operator and removed for processing and stacking outside of the exclusion zone. Trees to be directionally felled away from sensitive features.
- Contractors to monitor machinery routes and to use extra brash (where available) to pre-empt the risk of soil damage. Where ground conditions begin to visibly deteriorate, a new track to be promptly established containing a new brash mat layer.
- Regular visual monitoring of relevant watercourses and aquatic zones to occur to check for any sediment discharge from harvesting works.
- Forwarder load sizes to be monitored during timber extraction to ensure no overloading occurs, and monitoring of hauliers to occur to ensure timber stacks are left in a safe and stable condition during timber loading.
- Temporary bridging points to be removed when no longer required and relevant areas restored to their original condition, with due care afforded to avoid the release of any sediment/residues.
- Waste or hazardous materials that accumulate throughout operations to be removed from the Main Wind Farm Development Site once harvesting is complete for appropriate off-site disposal.
- Any harvesting debris evident within drains or silt traps to be removed and forest infrastructure to be inspected for signs of damage and to be repaired if necessary.

4.2 Operational Phase

- Any associated planting works to be carried out in accordance with the measures set out in the *Felling and Reforestation Policy* (DAFM, 2017), the *Standards for Felling & Reforestation* (DAFM, 2019), the *Environmental Requirements for Afforestation* (DAFM, 2025), and the *Forestry Standards Manual* (DAFM, 2026).
- Forest drains to be kept free of cleared tree saplings or harvested plant materials which may arise during the maintenance of buffer areas to ensure no drainage issues arise for remaining trees.

4.3 Compensatory Afforestation

The *Felling and Reforestation Policy* (DAFM, 2017) outlines different tree removal scenarios. Table 4.1 outlines the six main scenarios where permanent tree removal may be considered, and whether alternative afforestation and/or the repayment of grants and premiums is required in each instance (where approved). The felling required for the Main Wind Farm Development relates to 'Scenario 2' in Table 4.1 and would thus require the submission of a tree felling licence application to the Forest Service (DAFM).

Table 4.1: *Scenarios where permanent removal of forest may be considered (DAFM, 2017).*

Scenarios	Felling Licence application required?	Alternative afforestation required?	Refunding of grant & premiums required?
1. Overriding environmental considerations (e.g. to protect habitats/species listed as qualifying interests within SPAs and SACs)	Yes	No	No
2. Supporting renewable energy and energy security (e.g. wind farm installation)	Yes	See Table 4.5	See Table 4.5
3. Commercial development (e.g. development of an industrial park)	Yes	Yes	Yes
4. Conversion to agricultural land	Yes	Yes	Yes
5. Public utilities (e.g. erection of an electricity power line)	No	No	Yes
6. Other land use change (may be considered on a case-by-case basis)	Yes	Case-by-case	Case-by-case

Note: Adapted from *Felling and Reforestation Policy* (DAFM, 2017), pp. 30. © Forest Service, Department of Agriculture, Food & the Marine.

To facilitate the construction of the Main Wind Farm Development, either 27.17, 31.37, or 27.25 hectares of existing forest will require infrastructure felling, contingent upon which candidate turbine model is selected. This includes the areas to be felled for physical infrastructure and the associated buffers (see Chapter 5 of the EIAR for the associated bat buffer calculations). The three candidate turbine models for the project are the Nordex N149, Nordex N163 and the Vestas V150. The estimated total area of forest that would be removed for each respective turbine model is presented in Tables 4.2 – 4.4.

Table 4.2: *Total areas of forest to be removed – assuming Nordex N149 turbine model.*

Turbine	Infrastructural Element	Forest to be removed (ha)	Compensatory planting (ha)
Nordex N149	T1	2.42	2.42
	T2	2.58	2.58
	T3	2.58	2.58
	T7	0.45	0.45
	T8	0.01	0.01
	T10	2.58	2.58
	T11	0.05	0.05
	T12	2.51	2.51
	T13	2.58	2.58
	Non-turbine infrastructure	11.40	11.40
	Total:	**27.17**	**27.17**

Table 4.3: *Total areas of forest to be removed – assuming Nordex N163 turbine model.*

Turbine	Infrastructural Element	Forest to be removed (ha)	Compensatory planting (ha)
Nordex N163	T1	3.10	3.10
	T2	3.44	3.44
	T3	3.33	3.33
	T7	0.69	0.69
	T8	0.04	0.04
	T10	3.44	3.44
	T11	0.28	0.28
	T12	3.28	3.28
	T13	3.44	3.44
	Non-turbine infrastructure	10.33	10.33
	Total:	**31.37**	**31.37**

Table 4.4: *Total areas of forest to be removed – assuming Vestas V150 turbine model.*

Turbine	Infrastructural Element	Forest to be removed (ha)	Compensatory planting (ha)
Vestas V150	T1	2.43	2.43
	T2	2.60	2.60
	T3	2.59	2.59
	T7	0.45	0.45
	T8	0.01	0.01
	T10	2.60	2.60
	T11	0.06	0.06
	T12	2.52	2.52
	T13	2.60	2.60
	Non-turbine infrastructure	11.40	11.40
	Total:	**27.25**	**27.25**

As illustrated in Table 4.5, all forest within the Proposed Development Site to be subject to infrastructure felling would need to be replaced through the afforestation of an equivalent area of alternative land. The afforestation of any alternative land would first require written 'Technical Approval' from the Department of Agriculture, Food & the Marine under the Forestry Act 2014. A technical approval confirms that a proposed afforestation application is in keeping with the environmental and silvicultural requirements of the Afforestation Scheme.

Table 4.5: *Requirements for each felling category associated with wind farm development (DAFM, 2017).*

Category of tree felling		Reforestation of felled area required?	Alternative afforestation required? (See Note 1)	Refunding of grant & premiums required? (See Note 2)
Infrastructure felling		No	Yes	Yes
Construction felling		Yes	No	No
Turbulence felling	**≤ 20 ha**	Yes	No	No
	> 20 ha	Yes	Yes, 10% of turbulence fell area	No

Note 1: If 'YES', the alternative site must be of an area equivalent in size (see Section 5.7 of '*Felling and Reforestation Policy*'). If the forest area proposed for permanent removal is still in receipt of premiums and/or is still in contract under the Afforestation Grant & Premium Scheme, the alternative site may be eligible under the Afforestation Grant & Premium Scheme.

Note 2: If 'YES', the refunding of any afforestation grants and premiums already paid out by the Forest Service is required if the forest area proposed for permanent removal is still in receipt of premiums and / or is still in contract under the Afforestation Grant & Premium Scheme. Also, if 'YES' or 'NO', if premiums are still being paid, premium payments on the area will cease.

Note: Adapted from *Felling and Reforestation Policy* (DAFM, 2017), pp. 33. © Forest Service, Department of Agriculture, Food & the Marine.

The Applicant is fully committed to the sourcing of suitable alternative lands for compensatory planting to ensure that a net forest loss would not occur as a result of the Main Wind Farm Development. Technical approval will be sought, and a non-grant-aided afforestation licence application will be submitted to the Forest Service (DAFM) for any proposed alternative land sites. The relevant details of alternative planting sites will also be provided when applying for a felling licence for the project.

The Forest Service may also require the Applicant to report on the potential loss of soil and biomass CO_2 and the reduction in productivity of the forest area associated with different wind farm forest management and landscape plans. The following will also apply with regard to the afforestation of any alternative land:

- The proposed afforestation of alternative land must be evaluated and approved by the Forest Service under the Forestry Act 2014 and associated Regulations before the associated felling licence can be granted.
- An application for Technical Approval to plant under the Afforestation scheme must be made online by a registered forester using DAFM's iFORIS iNET system: the applicant and Registered Forester must complete all required forms, maps and declarations and compile any relevant supporting information for online submission.
- All afforestation applications must be made up of a minimum of 20% broadleaves by area.
- The standard procedures regarding the evaluation of afforestation applications will generally apply, regarding protocols, referrals, Appropriate Assessment (AA) screening, EIA determination etc.
- An afforestation licence granted by the Department is only valid up to and including the expiry date specified in the Technical Approval letter.
- It will be a condition on the felling licence (where issued) that any alternative land approved for afforestation is planted and managed as forest land, as per the relevant standards set out in the *Forestry Standards Manual* (DAFM, 2026).

5. Conclusion

To facilitate the construction of the Main Wind Farm Development Site at Muingmore, Co. Mayo, the permanent removal of areas of existing forest is planned, totalling between 27.17 – 31.37 hectares, contingent on the chosen candidate turbine model. This would entail felling at the locations where turbines and other physical infrastructure is planned, including the clearance of linear strips of forest for access tracks, and the felling of radii around the proposed turbine locations to function as buffer areas for bats. Under the proviso that the relevant mitigation measures are adopted, no significant residual effects on forests are expected.

5.1 Summary of Effects

Table 5.1: *Summary of effects*

Receptor	Effect	Mitigation	Residual Effect
Forestry	Permanent removal of 27.17 – 31.37 hectares of existing forest for wind farm construction (dependant on chosen turbine model)	Compensatory afforestation of 27.17 – 31.37 hectares of alternative land (dependant on chosen turbine model)	Not significant

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