Consideration of Afforestation

Statutory Overview

The United Nations Framework Convention on Climate Change, the Kyoto Protocol, the Paris Agreement and the recent Glasgow Climate Pact have as their ultimate objective the stabilisation of greenhouse gas concentrations in the atmosphere at a level that will prevent dangerous human interference with the climate system, in a time frame which allows ecosystems to adapt naturally and enables sustainable development.

The Forest Service of the Department of Agriculture, Food & the Marine is Ireland's national forest authority. It is responsible for national forest policy, the promotion of private forestry, the administration of the forest consent system and forestry support schemes, forest health and protection, the control of felling, and the promotion of research in forestry and forest products.

The strategic goal of Ireland's forest policy is: "To develop an internationally competitive and sustainable forest sector that provides a full range of economic, environmental and social benefits to society and which accords with the Forest Europe definition of sustainable forest management."[1] Benefits accruing from this policy are an increase in the sustainable production of forest biomass for use in domestic markets and for renewable energy production, and an increase in levels of carbon sequestration contributing towards climate change mitigation.

The level of forest cover in Ireland is at 11% which is well below the European average of 38%. National forest policy has a goal of increasing Ireland's forest cover to 18% of total land area. Further policies underpinning this goal are a national afforestation programme of at least 8,000 hectares per annum and a requirement to replant areas following final harvesting of tree crops ("clearfelling")[2]. Where areas are being permanently clearfelled arising from a change in land use (for example, during wind farm construction), forest policy dictates that these must be replaced by afforestation of an alternative site on a hectare-per-hectare basis anywhere in the State (see Section 5.3 of the Forest Service Felling and Reforestation Policy[3] as shown in Appendix 1 - note only Infrastructure or Construction felling proposed for this project).

Areas of forestry proposed to be permanently clearfelled for this wind farm are located in upland, marginal land locations. Some of these areas are of low forest productivity due to the nature of the environment and will be replaced by alternative afforestation which will be of higher forest productivity, corresponding to the latest afforestation guidelines, thus providing increased carbon sequestration.

The clearfelling of trees in the State requires a felling licence. The legislative provisions governing such licences are set out in the Forestry Act 2014 (as amended) and the Forestry Regulations 2017 (as amended).

The associated afforestation of alternative lands equivalent in area to lands being permanently clearfelled (in this case, for wind farm construction) can occur anywhere in the State and is also subject to licencing by the Forest Service ('afforestation licencing').

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1 https://www.agriculture.gov.ie/media/migration/forestry/forestpolicyreviewforestsproductsandpeople/00487%20Forestry%20Review%20-%20web%2022.7.14.pdf

2 https://www.irishstatutebook.ie/eli/2014/act/31/section/17/enacted/en/html#sec17

3 https://assets.gov.ie/96814/4830fc08-0227-4504-83fa-2fd90a7942f2.pdf

Section 11(d) of the Forestry Act requires the Minister, in the performance of his functions, to determine whether screening for EIA or AA is required and whether EIA or AA are required and, if so, to ensure that they are carried out. This obligation applies to both forestry felling and afforestation licencing.

As the Board is aware section 34(13) and section 37H(6) of the Planning and Development Act 2000 (as amended) make clear that a person is not entitled to carry out a development merely because they have obtained planning permission, i.e. the planning permission does not obviate the need to have all other statutory and legal consents required to carry out the proposed development.

Afforestation Licence

The requirements for afforestation licencing are set out in the Forestry Regulations 2017 - this includes consideration of EIA and AA as set out in parts 7 and 8 respectively. Further detail is set out in the Environmental Requirements for Afforestation (DAFM, 2016)[4], copy included in Appendix 2. This ensures that afforestation takes place in a way that complies with environmental legislation and enhances the contribution new woodlands and forests can make to the environment and to the provision of ecosystem services, such as water protection and landscape enhancement.

The typical environmental effects of afforestation include potential effects on biodiversity, soils and geology, hydrology and hydrogeology, cultural heritage, landscape and visual, and air and climate.

In regard to biodiversity there are potential effects on existing habitats and species present at and in the vicinity of the site. In regard to soils and geology there are potential effects on the existing soil environment resulting from ground preparation, the construction of drains and tree planting. In relation to hydrology and hydrogeology there are potential effects on existing drainage patterns and water quality during site preparation. In relation to cultural heritage there are potential effects on the known and unknown cultural heritage features in the environment. In relation to landscape and visual there are potential effects on visual amenity and the landscape character of the area. In relation to air and climate there are potential effects on atmospheric carbon balances. There are also potential effects on the existing land use.

As part of the comprehensive environmental review and documentation to support any licence application, any potential negative effects arising are fully considered and avoided where possible or reduced where appropriate to an acceptable standard through mitigation measures. With careful management, and mitigation measures such as careful site selection, set-back from streams, careful drainage design and management, etc. afforestation can be carried out at appropriate locations without significant effects on the environment or adverse effects on the integrity of European sites. Before a license is granted the Minister as competent authority will carry out an EIA, if required, for the purposes of the EIA Directive and an appropriate assessment, if required, for the purposes of the Habitats Directive.

The Environmental Requirements for Afforestation sets out the typical sequence of tasks to be undertaken in order to proceed with afforestation activities (pre-application design, Forest Service licencing, site works and on-going management). It identifies key environmental issues namely water, biodiversity, archaeology, and landscape and sets objectives for their protection during design as follows:

[4] https://www.gov.ie/en/publication/642e6-forestry/#environmental-requirements

Water Objective:	To protect water and aquatic habitats and species, during afforestation and throughout the remainder of the forest rotation.
Biodiversity Objectives:	To ensure that afforestation does not adversely impact designated conservation areas, protected habitats, or protected species of fauna or flora and their habitat. To enhance the biodiversity value of the new forest throughout its rotation.
Archaeology and built heritage objective:	To seek to ensure that proposed afforestation development projects do not adversely impact directly or indirectly on known or suspected archaeological sites and monuments or on other important built heritage structures or features. This includes protecting their amenities and where relevant, their wider landscape setting, in particular, their relationship with other roughly contemporary or determinably linked sites, monuments, structures or features. Where afforestation is approved near known or suspected archaeological sites and monuments or other important built heritage structures or features, to seek to ensure that: (i) appropriate exclusion zones, fencing, access paths and other relevant measures are incorporated into the project design; (ii) there is an appropriate response should any previously unrecorded archaeological site, monument, object, structure or feature be discovered during site work; and (iii) any approved design is sympathetic to and provides an appropriate visual setting for such sites, monuments, structures or features.
Landscape Objective:	To ensure that the proposed forest is designed so that it is visually acceptable and in keeping with landscape and amenity sensitivities.

Design considerations and parameters are also set out in the document and include for example:

- Examination of the proximity and connectivity of the lands to Designated Conservation Areas or Priority 8 Freshwater Pearl Mussel Catchment areas
- Examination for the presence of Protected Habitats or Protected Species of fauna or flora and their habitat
- Retention of Protected Areas as well as other notable biodiversity features such as existing hedgerows, existing broadleaf scrub/woodland, veteran trees or other ecologically important features such as water flushes, etc.
- Provision of water setbacks, appropriate site drainage design and acceptable ground cultivation techniques to protect aquatic zones both during afforestation and throughout the remainder of the forest rotation
- Provision of other environmental setbacks (unplanted/undisturbed open spaces) to buffer retained habitats, archaeological features, public roads or ROWs, cultural features or utilised buildings
- Identification and protection of any existing (or later discovered) archaeological or cultural features, including setbacks, provision for future access to/protection of the site by fencing
- Sensitive planting design so that the proposed forest is visually acceptable and in keeping with the local landscape and local amenities

It should be noted that the granting of all afforestation licences is subject to conditions, including environmental conditions, that must be adhered to.

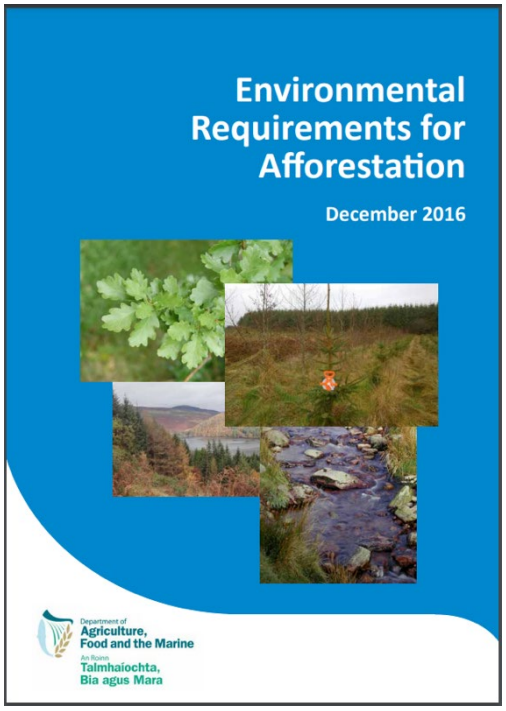

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Figure 1: Forest Standards Manual Nov. 2015; Environmental Requirements for Afforestation Dec 2016.

Consideration of Afforestation in the Context of Planning Submissions

The developer is seeking a ten-year planning permission which incorporates time to secure a grid connection agreement, a route to market (RESS or equivalent Power Purchase Agreement), select the preferred equipment suppliers and put the necessary capital funding in place to allow construction and delivery to commence. This application for planning permission considers the environmental impacts of the felling activities required to deliver the project infrastructure and operate the proposed wind farm.

While the environmental impacts of the felling activities are considered at this application stage it is noted the felling of trees at the site for the purposes of the wind farm is subject to and can only occur following the grant of a felling licence by the Forest Service. Planning permission for the project may not be granted or, if granted, may have amendments introduced by condition(s). Therefore, the extent of felling required to be licensed for the purpose of giving effect to the windfarm project can only be determined once planning permission for the windfarm project has been granted. Furthermore, it will be a condition of the felling licence that an equivalent area of land required to be felled shall be replanted as per Forest Service Felling and Reforestation Policy. Thus, the extent of the lands required for afforestation can also only be known once planning permission has been granted for the windfarm project. In these circumstances, the application for the licence can, in practical terms, only be made once planning permission has been granted.

It is, in any event, environmentally prudent to progress the felling and afforestation licences closest to the time when the proposed felling activities are required, rather than long in advance during the wind farm planning submission stage, when the project programme remains uncertain and the exact areas cannot be fully confirmed.

If a licence was obtained prior to seeking and/or obtaining planning permission, it is highly likely that any licencing approvals sought from the Forest Service would have expired before it could be taken up due to the time required for the planning processes and post-planning delivery preparations. The Forest Service Afforestation Licences expire after 3 years from when they are consented.

Critically given the dynamic nature of the receiving environment, the identification and licensing of alternative afforestation lands at a later point in time (post planning consent) has the added benefit of ensuring that the licensing process fully reflects current legislative requirements, and, more importantly, the most up-to-date environmental information and that the cumulative / in-combination assessment considers the wider environmental impacts at that point in time

As mentioned above, key environmental issues relating to afforestation include water, soils, biodiversity, archaeology, landscape and climate. Each is subject to regular updates in terms of best practice, guidelines, standards and national policies. For example, the EPA regularly update the water quality status of rivers across the country, and planning authorities review their landscape strategies in line with their review of County Development Plans every six years. Delaying the identification of alternative afforestation lands until such time as they are required enables identification of optimum lands available (from an environmental) perspective for afforestation at that time.

In light of the foregoing and for the purposes of this project, the developer commits that the location of any replanting (alternative afforestation) associated with the project will be greater than 10km from the wind farm site and also outside any potential hydrological pathways of connectivity i.e. outside the catchment within which the proposed project is located. On this basis, it is reasonable to conclude that there will be no more than imperceptible indirect or in-combination effects associated with the replanting.

In addition, the developer commits to not commencing the project until both a felling and afforestation licence(s) is in place and therefore (as discussed above) this ensures the afforested lands are identified, assessed and licenced appropriately by the relevant consenting authority.

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Appendix 1

Section 5.3 of the Felling and Reforestation Policy (DAFM, 2017)

5.3 Supporting renewable energy and energy security

5.3.1 Overview

The development of renewables is at the heart of the Government's energy policy, as laid out in the document *Strategy for Renewable Energy: 2012-2020* (Department of Communications, Energy & Natural Resources, 2012). Under Directive 2009/28/EC, Ireland is legally obliged to ensure that by 2020 at least 16% of all energy consumed in the State is from renewable sources. Ireland must ensure that there is a steady, progressive and measurable increase between now and the year 2020, in the amount of renewable energy consumed in the electricity, heat and transport sectors, commensurate with the achievement of the national target.

Underpinning the Government's energy and economic policy objectives are five Strategic Goals reflecting the key dimensions of the renewable energy challenge to 2020. The first Strategic Goal refers to wind and aims to have "*Progressively more renewable electricity from onshore and offshore wind power for the domestic and export markets.*"

It is Forest Service policy to facilitate wind energy as much as possible within the context of sustainable forest management and efforts to expand the national forest estate.

5.3.2 Policy on felling licences for wind farm development

Where a developer intends to construct a wind farm that is within or partially within a forest or that will require tree felling, it is extremely important that the developer consults the Forest Service at the *earliest possible stage* of the project. This may help to develop a collaborative approach that will ensure that all forestry issues are identified and mitigated at the earliest opportunity.

In line with general Forest Service policy, where grant-aided forestry is to be used for wind farm development, any grants and premiums already paid out by the Forest Service in relation to the areas felled for the turbine bases, roads and infrastructure must be repaid where the forest is still in receipt of afforestation premiums and / or still in contract under the Afforestation Scheme.

Photo 8 *A wind farm within a forest plantation. Forest Service policy is to facilitate wind energy within the context of SFM and the expansion of the national forest estate.*

Wind farm construction typically encompasses three categories of tree felling: infrastructure; construction; and turbulence. Each category requires a felling licence. Table 6 and the following sections detail the specific requirements regarding each category. Also, Case Study 2 provides for three worked examples of wind farm development, and associated licensing issues.

5.3.2.1 General requirements

Notwithstanding any requirement for the wind farm developer to produce an Environmental Impact Statement (EIS) in respect of the development and the requirement to assess the impact of tree felling / reforestation proposals in an EIS, when felling licence applications are made, the Forest Service may require the developer 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. Potential impacts to be reported on and assessed may also include site stability, water quality, habitats and species, landscape, archaeology, and other issues that may be deemed appropriate by the Forest Service.

If Planning Permission has been granted for the development by the local authority or by an Bord Pleanála, a copy of the full Planning Permission should be submitted to support the felling licence application. Also, if an EIS or a Natura Impact Statement have been prepared, these need to be submitted to support the felling licence application.

Table 6 Requirements for each category of felling associated with wind farm development, regarding reforestation, alternative afforestation, and the refunding of grant and premiums.

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% turbulence fell area – see Section 5.3.2.4	No

Note 1 If 'YES', the alternative site must be of an area equivalent in size. Section 5.7 sets out the procedures 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, 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.

5.3.2.2 Infrastructure felling

Infrastructural felling relates to trees that are permanently removed from the site in order to make way for infrastructure associated with the wind farm, such as access roads and turbine bases.

For infrastructure felling, the afforestation of alternative land and the repayment of grant and premium payments are required – see Table 6 and Section 5.7 for details. In addition, where the infrastructure fell area is still in receipt of premiums, then premium payments will cease, i.e. the felled area will not continue to receive premium payments.

5.3.2.3 Construction felling

During the construction phase of the wind farm development, there are forest areas that require the temporary removal of tree cover to facilitate construction, e.g. 'borrow pits' for stone. Once construction is completed, the land is reforested.

For construction felling, the afforestation of alternative land and the repayment of grant and premium payments are not required – see Table 6. In addition, where the construction fell area is still in receipt of premiums, then premium payments will cease, i.e. the felled area will not continue to receive premium payments.

5.3.2.4 Turbulence felling

Turbulence felling is deemed to be felling in the vicinity of 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 turbine by reducing turbulence in the airflow, and to reduce vibrations through the turbine blades, thereby lowering stress on the turbine components.

Turbine manufacturers assess the forest layout, age profile and management plans for the forest along with topography and wind mast data. Based on that assessment, some manufacturers will require turbulence felling as part of the terms of supplying turbines for a particular site. In the case of many wind farms, the manufacturer's requirements are therefore not known until late in the planning of the project, as no turbine will have been selected. In general, manufacturers recommend that tree height is restricted within 300 metres, in the dominant wind direction.

Turbulence felling may be allowed in certain cases, and subject to reforestation requirements. For completeness and to ensure that the EIS itself is valid, it is important that the EIS takes into account the maximum turbulence felling that could potentially occur under the project.

Felling Licence requirements in relation to turbulence felling include the following:

1. The repayment of afforestation grants and premiums already paid out by the Forest Service is not required. In addition, where the turbulence fell area is still in receipt of premiums, then premium payments will cease, i.e. the felled area will not continue to receive premium payments.
2. The granting of a licence for a turbulence felling will be subject to the normal checks carried out by the Forest Service in respect of silvicultural, environmental and landscape considerations, etc. A felling coupe is defined for this purpose as a contiguous or adjacent area, any part of which is felled in a 2 (calendar) year period.
3. A distinction is made between turbulence felling ≤20 ha and >20 ha. Excluding the area

for the turbine bases, etc. from the limit, the 20 ha limit specified in this section is a total limit for the entire wind farm development. The limit is not interpreted as 20 ha per turbine or any other interpretation that is deemed by the Minister to be in excess of a total of 20 ha per wind farm development. In terms of reforestation, the following applies:

- Where the felling coupe area for turbulence felling is less than or equal to 20 ha, this is considered consistent with sustainable forest management. Where the cumulative total area of 20 ha or less is adjacent to one or more turbines and it is proposed to fell this area in accordance with normal good forest practice, such felling will not be considered turbulence felling. There is no requirement to afforest additional land. The area where the trees are being felled must be reforested.

Case Study 2: Windfarm development

The following tables provide examples of typical windfarm applications.

Site 1 Sitka spruce, 10 yrs. Reforest with North Coastal Lodgepole pine.

Felling type	Area (ha)	Reforest felled site	Alternative afforestation	Refund Afforestation Grant & Premium
Infrastructure	10	No	Yes (10 ha)	Yes
Construction	2	Yes	No	No
Turbulence	35	Yes	Yes (3.5 ha)	No

Site 2 Sitka spruce, 25 yrs. Reforest with Sitka spruce.

Felling type	Area (ha)	Reforest felled site	Alternative afforestation	Refund Afforestation Grant & Premium
Infrastructure	5	No	Yes (5 ha)	No
Construction	0.5	Yes	No	No
Turbulence	16	Yes	No	No

Site 3 Sitka spruce, 14 yrs. Reforest with Sitka spruce.

Felling type	Area (ha)	Reforest felled site	Alternative afforestation	Refund Afforestation Grant & Premium
Infrastructure	5	No	Yes (5ha)	Yes
Construction	0.5	Yes	No	No
Turbulence	16	Yes	No	No

- Where the felling coupe area for turbulence felling is greater than 20 ha, the applicant is required to reforest the area. In addition, 10% of the turbulence felling coupe area must be afforested on an alternative site to allow for the increase in soil carbon emissions at afforestation and the loss of potential carbon sequestration due to the proposed method of forest management. See Section 5.7 for details regarding the afforestation procedure.
- Subsequent to a licence being granted for 20 ha or less, any cumulative felling applied for above the 20 ha limit will be considered to be turbulence felling. Therefore, the original area of 20 hectares or less that was licensed will also then be regarded as turbulence felling. For example, if 20 hectares are felled in the first year and a further 12 hectares of felling is applied for in (e.g.) Year 3, then the additional 12 ha (if granted) and the original 20 ha will be treated as 32 ha of turbulence felling. The rules for turbulence felling will then apply to all 32 ha.

Appendix 2

Environmental Requirements for Afforestation (DAFM, 2016)

Environmental Requirements for Afforestation

December 2016

Department of Agriculture, Food and the Marine

An Roinn Talmhaíochta, Bia agus Mara

The Forest Service of the Department of Agriculture, Food and the Marine is responsible for ensuring the development of forestry within Ireland in a manner and to a scale that maximises its contribution to national socio-economic well-being on a sustainable basis that is compatible with the protection of the environment. Its strategic objectives are:

1. To foster the efficient and sustainable development of forestry
2. To increase quality planting
3. To promote the planting of diverse tree species
4. To improve the level of farmer participation in forestry
5. To promote research and training in the sector
6. To encourage increased employment in the sector

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Illustrations by Aislinn Adams

December 2016

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Section 1
Introduction

1.1 Context

National forest policy - as set out in *Forests, Products and People* (2014) - is to increase the forest area in accordance with sustainable forest management (SFM) principles, in order to support a long-term sustainable roundwood supply, and associated employment and economic activity. As the consenting authority for afforestation, the Forest Service of the Department of Agriculture, Food & the Marine must ensure that this increase takes place in a way that complies with environmental legislation and that enhances the contribution new woodlands and forests can make to the environment and to the provision of ecosystem services, such as water protection and landscape enhancement.

The overall aim of these *Environmental Requirements for Afforestation* is to ensure that the establishment of new woodlands and forests is carried out in a way that is compatible with the protection and enhancement of our environment, including water quality, biodiversity, archaeology and landscape. (Sites proposed for afforestation must also meet the minimum timber productivity requirement set out in the Forest Service *Land Types for Afforestation* document, and this assessment should be carried out by the Registered Forester before advancing to application stage.)

In assessing an application for afforestation, the Forest Service is required to consider potential impacts across a range of issues and sensitivities. This includes in-combination impacts regarding water, biodiversity, landscape, social issues, etc. The following lists the primary components of the legal, regulatory and funding framework that apply:

- European Communities (Forest Consent & Assessment) Regulations 2010 (S.I.558 of 2010), as amended
- European Union rules governing the Forestry Programme

Sensitively sited, designed and established plantations adding to Ireland's expanding forest resource.

- Forestry Programme
- Legally protected species and habitats and associated designations (e.g. Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas) and procedures (e.g. Appropriate Assessment)
- Water Framework Directive
- Legislation regarding archaeology and built heritage, including the National Monuments Acts 1930 to 2014
- Forest Service requirements, procedures and protocols, e.g. the terms and conditions of the Afforestation Scheme (if grant aid is being sought), the *Forestry Standards Manual*; the *Forestry & Freshwater Pearl Mussel Requirements*; the *Forestry & Kerry Slug Guidelines*; the *Forestry & Otter Guidelines*; and the *Forest Protection Guidelines*.

(For further details, refer to the **SUPPORTING DOCUMENT** on the Forest Service website - see below for details.)

Any statutory approval (with or without grant aid) for afforestation is conditional on adherence to the measures set out in these *Environmental Requirements for Afforestation*, to the conditions of approval, and to the standards and procedures set out in the *Forestry Standards Manual*. Where a parallel approval for grant aid has been issued, the Afforestation Scheme Terms & Conditions also apply.

Any divergence from the measures set out in these Requirements must be fully described in the initial application and depicted clearly on the Biodiversity Map, for consideration by the Forest Service.

1.2 About these Environmental Requirements

The *Environmental Requirements for Afforestation* replace those measures relating to afforestation contained within the following Forest Service Environmental Guidelines: *Forestry & Water Quality Guidelines*, *Forestry & Archaeology Guidelines*, *Forestry & the Landscape Guidelines*, and *Forest Biodiversity Guidelines*. (Note, however, that these guidelines still apply to other Forest Service regulated activities, as specified in any approval, consent or licence issued.)

The *Environmental Requirements for Afforestation* are set out in three stages. These reflect the typical sequence of activities undertaken by an Applicant and her / his Registered Forester and the corresponding environmental requirements that apply, throughout afforestation and up to the end of the premium period (or 15 years, for non-grant aided forests). These three stages are as follows:

1. Pre-Application Design
2. Site Works
3. Ongoing Management

This document is accompanied by a web-based document entitled *Environmental Requirements for Afforestation: SUPPORTING DOCUMENT* (see www.agriculture.gov.ie/forestservice/grantsandpremiumschemes2015-2016/). This web-based document is an integral part of the Requirements and is referred to throughout, as the '**SUPPORTING DOCUMENT**'.

Section 2
Design

2.1 Overview

During Stage 1: Pre-Application Design, the Registered Forester assesses the site and carries out various checks, and subsequently designs the afforestation proposal in a way that addresses the various environmental features and sensitivities identified. This design is then reflected in the subsequent application (Form 1) for technical approval (and financial approval, if sought) submitted to the Forest Service for assessment. Please note, it is the responsibility of the Applicant to provide the relevant information needed to enable the Forest Service to make a full assessment of the application.

2.2 Background checks

Various sources of information can be checked by the Registered Forester early in the pre-application design stage, to identify environmental features and sensitivities. Relevant safeguards can then be incorporated into the design to avoid possible negative impacts and to enhance positive impacts. Potentially, this may also shorten and streamline the assessment process.

iNET provides the primary source of information and provides a platform for mandatory Form 1 checks regarding water, designated sites, archaeology, etc. However, other important sources of environmental information are available - see the **SUPPORTING DOCUMENT**. Dialogue with the Applicant may also reveal more subtle sensitivities that might exist.

2.3 Basic requirements at design stage

The basic design-stage requirements in relation to water, biodiversity, archaeology and landscape are set out below. Note the following:

- If faced with a particularly sensitive and complex site in relation to a particular environmental feature or sensitivity, a Registered Forester may propose measures above and beyond the minimum requirements set out in this document. Examples include wider-than-normal water setbacks due to a downstream Special Area of Conservation (SAC).
- Furthermore, a relevant expert (e.g. hydrologist, ecologist, archaeologist, landscape architect) may be engaged early in the process, to assess the feature / sensitivity and to propose appropriate measures. This may result in a more refined application and may avoid complexities and delays in the application process. For example, it may avoid the need for the Forest Service to seek further information, and may allay the concerns of local people and statutory consultees.
- An individual site or part of a site may be deemed eligible from a productivity perspective (following the Land Types for Afforestation assessment process) but unsuitable from an environmental perspective. These sites may become apparent to Registered Foresters at the early design stage, following his / her onsite assessment and background checks, and *should not be advanced to application stage*.

2.4 Water

OBJECTIVE: TO PROTECT WATER AND AQUATIC HABITATS AND SPECIES, DURING AFFORESTATION AND THROUGHOUT THE REMAINDER OF THE FOREST ROTATION.

The Registered Forester must assess the potential risk of sedimentation and nutrient runoff entering into 'receiving waters' (streams, rivers, lakes), both during afforestation and throughout the remainder of the rotation, and adapt the forest design and planned operations accordingly. Key factors include soil type, slope, available pathways for water, the erodibility of the soil and subsoil, downstream SACs, and the status objective of the waterbody itself. Regarding the latter, particular regard is needed if the proposed afforestation site is within the catchment area of a high status objective waterbody or a waterbody at risk of decline in status.

For guidance, the **SUPPORTING DOCUMENT** gives examples of scenarios that (alone or in combination) can heighten the risk to water.

During site assessment, identify and map (on the required Biodiversity Map) the water features defined in Table 1, each of which require a water setback.

2.4.1 Water setback

A water setback(*) is an area of a defined width, positioned adjoining the water features defined in Table 1, and left largely undisturbed during afforestation and throughout the remainder of the rotation, specifically for the protection of water. All new drains installed as part of the afforestation project must terminate in sediment traps *outside* the water setback. The relevant setback for each water feature is set out in Section 2.8.

(* Formerly referred to as 'aquatic buffer zone'.)

The protection of water quality and aquatic habitats and species is a key requirement for all new afforestation projects.

Table 1 Water features requiring water setbacks.

Type of water feature	**Definition**
Aquatic zone	A permanent or seasonal river, stream or lake shown on an Ordnance Survey 6 inch map. (Note, the EPA water layer on iNET may not capture all aquatic zones onsite.)
Relevant watercourse	A watercourse that is not shown on an OS 6 inch map but which: ➢ is connected to an aquatic zone onsite, adjoining the site or elsewhere; and ➢ has the potential to carry significant amounts of sediments / nutrients, or shows evidence of erosion / deposition. Relevant watercourses are often artificial, and include existing drains and channels and other potential pathways that may contain flowing water during and immediately after rainfall. Note, not every watercourse may be a 'relevant watercourse'. For example, a well-vegetated agricultural drain on moderately sloping ground may not be a relevant watercourse.
Hotspot	An area (often localised) that is a potential source for sediment / nutrient loss during afforestation and / or future forestry operations. Examples include soft wet ground, flushes and springs, and pockets where machine access is difficult due to low ground-bearing capacity.
Water abstraction point	Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme.

2.4.2 Drainage and cultivation

Drainage and cultivation are necessary on most afforestation sites, to enable establishment. Typical methods include conventional mounding (with mound drains), ripping, inverted mounding and scrap mounding. Key factors are as follows:

- It is critical that water collected within drains flows slowly, both during afforestation and throughout the remainder of the forest rotation. This minimises the potential for erosion and the transport of sediments and nutrients to receiving waters. This requires an assessment of soil, slope and likely rainfall, and the selection and refinement of the most appropriate option(s), incorporating correct drain alignment, spacing and depth, and the proper deployment of sediment traps. Refer to the *Forestry Standards Manual* for specifications regarding drains, sediment traps, mounding, ripping, etc. Additional information is contained in the *Forest Road Manual* and *Forest Drainage Engineering: A Design Manual*. For details on operational safeguards (e.g. sediment trap distribution), see Section 3.7.1.
- All new drains must terminate in an appropriately-sized sediment trap located *outside* the water setback. New drains *must not* enter into or traverse the water setback itself (an exception exists for flat difficult-to-drain sites – see Section 3.7.1 for details.)

A well-defined water setback early in the afforestation process, with natural ground vegetation emerging.

- Match drainage and cultivation to the specific conditions that exist in different parts of the site, selecting the least intensive options and specifications needed to successfully establish and grow the forest. Where site conditions allow (e.g. on naturally free-draining sites), consideration should first be given to the least impacting techniques, such as ripping and inverted mounding. In water-sensitive parts of the site, inverted mounding or simple pit planting should be considered.
- The drainage and cultivation proposed for different plots must be determined during the design stage and accurately depicted on the submitted Biodiversity Map. Also depict any additional safeguards deemed necessary (see Section 3.7.1).
- Of particular concern are peat soils, steep slopes capable of generating higher water velocities, and old land drains and other possible pathways that may become reactivated. Also of particular concern is the capacity of the new drainage network to withstand high rainfall events, without the failure of sediment traps and water setbacks.

2.4.3 Water crossings

Water features may need to be crossed for site development works and ongoing site management. Crossings may be temporary in nature or may comprise permanent structures intended to link in with a future forest road.

The following requirements apply:

- Any work in an aquatic zone should be limited to the period May to September, inclusive.
- Crossings should be designed so that:
  - the number of crossings over a given aquatic zone is minimised;
  - disruption to the bank, bed and adjacent water setback is minimised;
  - the water flow is crossed at a right angle;
  - cement or uncured concrete is kept out of the aquatic zone, with 'cast-in-place' concrete isolated from any water which might enter the aquatic zone, until the

concrete is cured;

- local stone is used for bridge kerbs and end treatments for culverts;
- all timber treatment is carried out off-site.

- Consult with the Inland Fisheries Ireland at least 6 weeks prior to constructing any crossing of an aquatic zone.
- If planning a permanent structure intended to link in with a future forest road, consider whether or not the location of the crossing is environmentally appropriate for that future use.
- Bridge construction is necessary where culverts may restrict fish migration.
    - All supports and buttresses should be completely out of the stream.
    - Do not create shallow or shooting flow at the bridge aprons, to ensure that water velocities do not impede fish movement.
- Fords are not desirable and should only be used where the design is approved by Inland Fisheries Ireland.
- All culverts should be well-bedded and of sufficient size to carry normal flow, to accommodate 25-year storm events, and to avoid blockages and washouts. Ends should be tapered to match the embankment slope. If greater than 1.0 metre in diameter, culverts should be buried to a depth of 30 cm or 20% of their height (whichever is greater) below the streambed, and the original bed material placed in the culvert.

If proposing a crossing, submit full design details with the afforestation application, and clearly indicate the proposed location on the Biodiversity Map. Also provide details regarding removal and site restoration, where the proposed crossing is temporary in nature.

2.5 Biodiversity

OBJECTIVES:

- **TO ENSURE THAT AFFORESTATION DOES NOT ADVERSELY IMPACT DESIGNATED CONSERVATION AREAS, PROTECTED HABITATS, OR PROTECTED SPECIES OF FAUNA OR FLORA AND THEIR HABITAT.**
- **TO ENHANCE THE BIODIVERSITY VALUE OF THE NEW FOREST THROUGHOUT ITS ROTATION.**

Biodiversity is the variety of living organisms, including: (i) the diversity of species; (ii) the genetic diversity or variation within the species; and (iii) the ecosystems in which species live. Conifer, broadleaf and mixed woodlands and forests can contribute greatly to biodiversity, both within their boundaries and as wildlife corridors and refuges in the wider landscape.

2.5.1 Protected habitats and species

Afforestation can impact of a range of habitats and species protected under various legislation. Table 2 sets out various scenarios that may apply, and the likely outcome regarding any proposed afforestation application. Applicants are encouraged to seek ecological input early in the design stage in situations where one or more of these scenarios apply, and to tailor any subsequent application accordingly before submission to the Forest Service.

Yellow brimstone. Sensitive design at afforestation will enhance the forest's biodiversity value throughout the entire rotation.

Table 2 Various scenarios that may apply regarding protected habitats and species, and the likely outcome regarding the proposed afforestation application. (Note, the use of the term 'the project' below relates to afforestation and management of the forest rotation.)

1. Is the plot(s) within a Special Area of Conservation (SAC), Special Protection Area (SPA), a Natural Heritage Area (NHA) or proposed NHA, a Nature Reserve, a National Park, or a Refuge for Flora and Fauna? These sites are designated for the conservation of habitats and species. For example, SACs are designated under the Habitats Directive to create a coherent European ecological network in order to ensure the restoration or maintenance of habitats (Annex I) and animal and plant species (Annex II) of Community interest at a favourable conservation status. *Relevant legislation:* EU Habitats Directive; EU Birds Directive; Wildlife Act 1976; Wildlife (Amendments) Act 2000; European Communities (Birds and Natural Habitats) Regulations 2011 (S.I.477 of 2011)	If '*Yes*', the Forest Service may require an ecological report demonstrating how the project can take place in a manner compatible with the ecological objectives of the designation. ➢ In relation to NATURA sites (SACs and SPAs), the Forest Service will undertake screening and where necessary, appropriate assessment, and can only approve the project if it is satisfied that it will not adversely affect the integrity of the NATURA site, either alone or in combination with other plans or projects. See the Forest Service *Forestry Standards Manual* for details of this Appropriate Assessment Procedure. ➢ *Do not submit any area of a habitat listed as a qualifying interest of the SAC*. ➢ The Forest Service is not in a position to approve afforestation applications within Hen Harrier SPAs, pending the completion of the Threat Response Plan. ➢ In relation to proposed afforestation within NHAs, the Forest Service requires the submission of a completed Notifiable Action Form (which documents National Parks & Wildlife Service consent) with the initial Afforestation Application (Form 1).
2. In non-designated areas, is there a habitat listed in Annex I of the Habitats Directive, known to be present or observed within the plot(s)? See **SUPPORTING DOCUMENT** for a list of Annex I habitats (and the corresponding Fossitt (2000) habitat classification) that may occur on afforestation sites. *Relevant legislation:* Habitats Directive.	If '*Yes*', the Forest Service may require an ecological report assessing the habitat and its extent and identifying mitigation measures capable of ensuring that the project can take place in a manner compatible with the maintenance or restoration to a favourable conservation status of that habitat. NOTE, at a site level, the Forest Service will not approve the afforestation of a non-designated Annex I habitat that is deemed to be a favourable condition, based on an assessment of its area, structure and function, and future prospects. Such habitat must be excluded from the application or incorporated as a retained habitat. In both cases, an appropriate habitat setback will also be required so as not to impact on future prospects.

3. Is the plot(s) within one of the Priority 8 Freshwater Pearl Mussel (FPM) Catchments (as listed in the SUPPORTING DOCUMENT)? FPM is a freshwater shellfish that is highly vulnerable to siltation and nutrient runoff and other water impacts, and is a highly threatened species of European importance. The *Strategy for Conservation of the Freshwater Pearl Mussel* (September 2011) prioritises the conservation of FPM populations within 8 sub-basin catchments. See the **SUPPORTING DOCUMENT** for details. *Relevant legislation:* Habitats Directive; European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009 (S.I.296 of 2009)	If '*Yes*', afforestation approval is dependent *inter alia* upon the submission and subsequent evaluation by the Forest Service, of a Form A (Site Assessment) and Form B (Mitigation Measures) from the *Forestry & Freshwater Pearl Mussel Requirements*. The Forest Service may also request a NATURA Impact Statement (NIS). Note that, if approved, afforestation within these catchments is likely to be limited to native woodland establishment under GPC9 and GPC10.
4. Is the plot(s) within the 6 km zone of any other Freshwater Pearl Mussel Catchment listed in the SUPPORTING DOCUMENT? For details of FPM, see above. *Relevant legislation:* Habitats Directive; European Communities Environmental Objectives (Freshwater Pearl Mussel) Regulations 2009.	If '*Yes*', afforestation approval is dependent *inter alia* upon the submission and subsequent evaluation by the Forest Service, of a Form A (Site Assessment) and Form B (Mitigation Measures) from the *Forestry & Freshwater Pearl Mussel Requirements*. The Forest Service may also request a NIS.
5. Is there an Annex IV species or its habitat (if in the species range) known to be present or observed within the plot(s)? Species listed in Annex IV of the Habitats Directive are strictly protected. It is an offence to deliberately disturb the species or damage or destroy its breeding or resting places wherever it occurs, whether inside or outside designated areas. Annex IV species include otter, Kerry slug and bats. *Relevant legislation:* Habitats Directive.	➢ If *'Yes'* for otter, follow the requirements set out in the Forest Service *Forestry & Otter Guidelines*. ➢ If *'Yes'* for Kerry slug, follow the requirements set out in the Forest Service *Forestry & Kerry Slug Guidelines* ➢ If *'Yes'* for any other Annex IV species, the Forest Service may require an ecological report demonstrating how the project can and will be designed and implemented in a manner compatible with the protection of the species and its habitat.

6. Is there an Annex II species and / or its habitat known to be present or observed within the plot(s)? Species listed in Annex II of the Habitats Directive are animal and plant species of Community interest whose conservation requires the designation of SACs. Outside of SACs, these species are protected against damage that impacts their favourable conservation status (or ability to achieve that status) (for example, damage that reduces the natural range of the species). There are a number of Annex II species, included the Killarney Fern, Yellow Marsh Saxifrage and River Lamprey. *Relevant legislation:* Habitats Directive; Environmental Liability Directive; European Communities (Environmental Liability) Regulations 2008 (S.I.547 of 2008).	If '*Yes*', the Forest Service may require an ecological report confirming the presence of the species or its known habitat, a determination regarding whether or not the project would impact on the species' favourable conservation status (or its ability to achieve that status), and if so, required mitigation.
7. Is the application located on sandstone geology in West Cork or Kerry, as illustrated in Figure 1 of the Forest Service *Forestry & Kerry Slug Guidelines*? As an Annex IV species under the Habitats Directive, the Kerry slug (*Geomalacus maculosus*) is strictly protected wherever it occurs. It is an offence to deliberately disturb the species or damage or destroy its breeding or resting places wherever it occurs, whether inside or outside designated areas. It is also an offence under national legislation (Wildlife Act 1976, Wildlife (Amendment) Act 2000) to deliberately destroy or damage the slug or its habitat. *Relevant legislation:* Habitats Directive; Wildlife Act 1976; Wildlife (Amendment) Act 2000.	If '*Yes*', follow the decision path set out in the Forest Service *Forestry & Kerry Slug Guidelines*. Detail both the outcome of this process and any resulting amendments to forestry operations required (as set out in these Guidelines) in the proposed application for afforestation.
8. Is there a population of a species protected under the Flora (Protection) Order 2015 (S.I.356 of 2015) known to be present or observed within the plot(s)? The Flora (Protection) Order 2015 protects various plants (see **SUPPORTING DOCUMENT**). It is an offence (save under a licence granted under Section 21 of the Wildlife Act 1976) to (*inter alia*) wilfully alter, damage, destroy or interfere with the habitat or environment of these plants. This applies to wherever the plants are found, whether inside or outside designated areas. See SUPPORTING DOCUMENT for relevant sources of information. *Relevant legislation:* Wildlife Act 1976; Wildlife (Amendment) Act 2000; Flora (Protection) Order 2015 (S.I.356 of 2015).	If '*Yes*', the Forest Service may request the submission of an ecological report confirming the presence (or otherwise) of the species, and required mitigation.
Note regarding species of animal protected under the Wildlife Act 1976 and the Wildlife (Amendment) Act 2000 Mammal, amphibian, reptile and invertebrate species protected under the Wildlife Act 1976 and the Wildlife (Amendment) Act 2000 (see **SUPPORTING DOCUMENT** for list) are protected from injury, or from disturbance / damage to their breeding or resting place, wherever these occur. The majority of these species are considered by other scenarios listed above. Further cover is provided by specific Forest Service requirements for Kerry slug and otter and guidance for bat species, Therefore, to avoid duplication, the above does not contain a specific question dealing directly with the Wildlife Act 1976 and the Wildlife (Amendment) Act 2000.	

2.5.2 Areas for Biodiversity Enhancement

During onsite assessment, identify Areas for Biodiversity Enhancement, or ABEs. Their function is (*inter alia*) to conserve existing habitats and biodiversity features onsite and to promote the development of biodiversity generally within the new forest.

ABEs comprise environmental setbacks, future operational areas and retained habitats, as described below.

- An **environmental setback** is a (largely) unplanted and undisturbed open space of a defined width (as set out in Section 2.8) installed to protect a particular environmental feature or sensitivity. Different types apply (as listed below) depending on the feature or sensitivity involved:
    - water setback
    - retained habitat setback
    - archaeological setback
    - public road setback
    - utilised building setback
    - landscape setback

  In addition to their main protective role, these environmental setbacks are important biodiversity features in their own right, providing open and edge habitats along the forest margin. As described later, this role can be enhanced further through simple design and additional planting.
- A **future operational area** is an open space left unplanted in order to facilitate the future management of the plantation (e.g. a rideline) or to accommodate future infrastructure (e.g. a forest road or landing bay). In addition to their primary management function, these operational areas are also important biodiversity features in their own right, and this value can be enhanced further through simple design and additional planting.
- A **retained habitats** is an existing onsite habitat selected for retention within the future forest. These can be area-based features (e.g. a localised flush), linear features (e.g. a hedgerow) or point features (e.g. a veteran tree). Design must aim to protect and enhance these habitats throughout the forest rotation, and to allow associated native flora and fauna to develop. This may involve the addition of a habitat setback, to prevent future impacts (e.g. overshadowing) from the growing forest canopy – see Section 2.8 for details.

  (Note, it may be necessary to exclude from the afforestation application, areas containing certain habitats or species that require grazing to persist. Otherwise, these areas will become overgrown as the result of fencing.)

Ensure that future operational areas for future forest roads do not overlap with environmental setbacks for water, archaeology and retained habitats.

Tables 3 and 4 list the various features that are eligible as ABEs for the purpose of grant and premium calculation.

Table 3 Site features and their eligibility as ABEs. (Also see Table 4 regarding woody habitats.)

Site features	**Eligible as ABE?**
Water setback	Yes
Retained habitat setback	Yes
Archaeological setback	Yes
Public road setback	Yes
Utilised building setback	Yes
Landscape setback	Yes
Hedgerows and other woody habitats	See Table 4
Created lakes / reservoirs	Yes
Railway setbacks	Yes
Drains	Yes
Future operational areas left for planned forest roads, turning bays, ridelines, etc.	Yes
Unplantable areas	No
Areas of shallow, rocky soil	No
Rock and scree	No
Aquatic zones (as defined in Table 1)	No
Rights-of-way held by 3rd parties	No
Areas with turbary or grazing rights held by 3rd parties	No
Major water mains	No
Power line corridors	No
Gas pipeline corridors	No
Public roads	No
Other features	If deemed appropriate by the Forest Service

Table 4 Woody habitat types, their eligibility as ABEs, and available options.

Type of woody habitat	Eligibility as ABE and available options(*)	Comment
Area of scrub (e.g. elder) and non-high forest species (e.g. blackthorn, hawthorn, willow)	Eligible as ABE. Therefore, either: ➢ include as retained habitat; OR ➢ clear(**) and plant; OR ➢ exclude from the application.	Non-high forest species often have a high biodiversity value.
Individual high forest trees (e.g. oak, ash, beech, hazel(***), birch, pine)	Eligible as ABE. Therefore, include as retained habitat (i.e. point features).	Individual trees such as these can have a high biodiversity value.
Areas of high forest trees (see above examples) less than 0.1 ha in size	Eligible as ABE. Therefore, either: ➢ include as retained habitat; OR ➢ exclude from the application.	Groups comprising trees such as these can have a high biodiversity value.
Areas of high forest trees (see above examples) 0.1 ha or greater in size	Not eligible as ABE. Therefore, exclude from the application.	Such areas meet the definition of a forest, and existing forests cannot receive afforestation payments.
Hedgerows	Eligible as ABE. Therefore, either: ➢ include as retained habitat *plus* setback; OR ➢ include as retained habitat.	Apply habitat setback as per Section 2.5.4. Otherwise, no habitat setback required.
Rhododendron / laurel	Not eligible as ABE. Therefore, either: ➢ clear and plant, OR ➢ exclude from the application.	These are non-native invasive species and must not be retained as ABE.

* Each relevant option can be applied to all of the corresponding woody habitat type onsite, or to different sections of it.

** Under a Felling Licence, if required. Note, the retention of alluvial woodland comprising willow may require prioritisation within the wider landscape, due to ecological considerations and water protection.

*** Hazel may be classed as 'scrub' where it has encroached in the last 5 years.

2.5.3 ABE criteria

ABE eligibility criteria are as follows:

- Between 10-15% of the afforestation site must be treated with particular regard to biodiversity, comprising a combination of open spaces (i.e. environmental setbacks and future operation areas) and retained habitats. Where ABEs add up to more than 15% of the total area, the claim area must be reduced accordingly, as set out in the *Forestry Standards Manual*.
- ABEs must comprise areas suitable for planting, but where the potential for a commercial forest crop is foregone for the purpose of retaining habitats and creating open spaces in order to (*inter alia*) promote biodiversity within the future forest. Areas that are unsuitable for planting are not eligible as ABEs.
- ABEs must be an integral part of the site. For example, an ABE plot cannot be in an adjoining field / land parcel or in a separate plot away from the main area of the plantation.

- Generally, identify ABEs using the following sequence:
  - Step 1: Identify environmental setbacks (for water, archaeology, landscape, etc.) and future operational areas, to allow for the environmental features / sensitivities identified and management needs envisaged.
  - Step 2: Select the 'best quality' habitats(*) onsite for retention, together with any habitat setbacks deemed necessary to prevent future impacts (e.g. overshadowing) from the growing forest canopy.
- Applicants must not remove habitats prior to submission of the afforestation application. Otherwise, the application may be refused.
- The submitted Biodiversity Map must show any proposed ABEs (i.e. environmental setbacks, future operational areas and retained habitats) as Bio Plots and as linear or point features, and state the equivalent area. The *Forestry Standards Manual* sets out the mapping requirements. It is critical that the Biodiversity Map accurately depicts all relevant environmental features and sensitivities (including biodiversity features), proposed cultivation and drainage, and the location of setbacks and other protective measures.

  (* A basic level of ecological assessment by the Registered Forester will help to identify which habitats will have the greatest biodiversity value. When identifying and mapping retained habitats, use the Level 2 (or Level 3, if possible) habitat classification in Fossitt's *A Guide to Habitats in Ireland* (2000) (PDF available at www.heritagecouncil.ie).)

2.5.4 Hedgerows

Hedgerow networks are one of the most widespread semi-natural habitats in the countryside, due to their extent, connectivity, structure and composition. In addition to their biodiversity value, hedgerows form part of the cultural and historic heritage of the country, and are important landscape features. As such, they must be regarded carefully during pre-application design and subsequent site works.

All hedgerows must be retained. In general, do not break through hedgerows during afforestation. Similarly, do not use hedgerow trees as makeshift straining posts for fencelines.

A habitat setback (5 metres minimum) should also be considered in relation to particular hedgerows onsite, to ensure their continued presence as the surrounding canopy develops. This decision should be informed by the quality of the hedgerow (in terms of its age, species composition and structure), its landscape importance, and other attributes (e.g. whether or not the hedgerow represents a townland boundary or if it is associated with another habitat such as a stream).

Other situations can arise where a hedgerow setback is desirable, e.g. to create a future wind-firm edge to enable staggered felling later, or to realise the potential role of a hedgerow as part of water management onsite.

Hedgerows with setbacks will also act as links and corridors for many species of flora and fauna between other areas of semi-natural habitat within the wider landscape. Therefore, consider applying setbacks to one or more contiguous lengths of hedgerow that run from one side of the afforestation site to the other, to promote this habitat connectivity.

2.6 Archaeology and built heritage

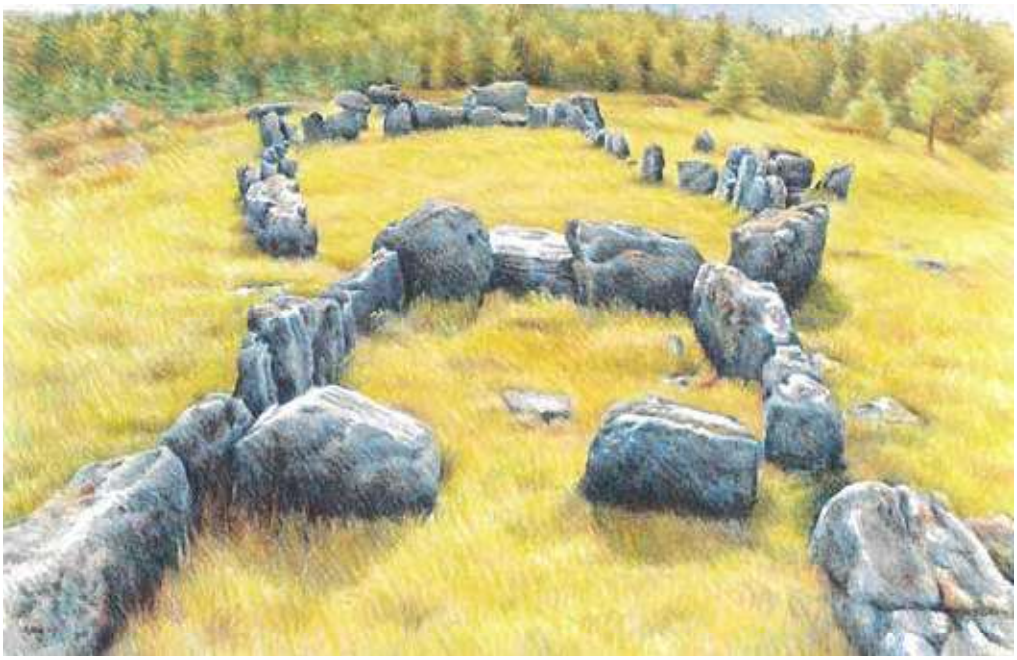
OBJECTIVES:

- **TO SEEK TO ENSURE THAT PROPOSED AFFORESTATION DEVELOPMENT PROJECTS DO NOT ADVERSELY IMPACT DIRECTLY OR INDIRECTLY ON KNOWN OR SUSPECTED ARCHAEOLOGICAL SITES AND MONUMENTS OR ON OTHER IMPORTANT BUILT HERITAGE STRUCTURES OR FEATURES. THIS INCLUDES PROTECTING THEIR AMENITIES AND WHERE RELEVANT, THEIR WIDER LANDSCAPE SETTING, IN PARTICULAR, THEIR RELATIONSHIP WITH OTHER ROUGHLY CONTEMPORARY OR DETERMINABLY LINKED SITES, MONUMENTS, STRUCTURES OR FEATURES.**
- **WHERE AFFORESTATION IS APPROVED NEAR KNOWN OR SUSPECTED ARCHAEOLOGICAL SITES AND MONUMENTS OR OTHER IMPORTANT BUILT HERITAGE STRUCTURES OR FEATURES, TO SEEK TO ENSURE THAT: (I) APPROPRIATE EXCLUSION ZONES, FENCING, ACCESS PATHS AND OTHER RELEVANT MEASURES ARE INCORPORATED INTO THE PROJECT DESIGN; (II) THERE IS AN APPROPRIATE RESPONSE SHOULD ANY PREVIOUSLY UNRECORDED ARCHAEOLOGICAL SITE, MONUMENT, OBJECT, STRUCTURE OR FEATURE BE DISCOVERED DURING SITE WORK; AND (III) ANY APPROVED DESIGN IS SYMPATHETIC TO AND PROVIDES AN APPROPRIATE VISUAL SETTING FOR SUCH SITES, MONUMENTS, STRUCTURES OR FEATURES.**

2.6.1 Potential impacts

The Irish countryside is rich in the physical remains of human activity stretching back over the millennia. These vary from the more obvious and iconic monument types such as megalithic tombs, standing stones, ringforts, crannógs, churches and graveyards, burial grounds and medieval castles, to the less well-known and less visible or entirely below-ground surface monument types such as ancient timber and gravel roadways (toghers), cooking places (fulachta fiadh) and settlement sites. All archaeological sites and monuments can have or may survive solely as associated artefacts and features. Examples include stone or metal tools, pottery sherds, post holes or refuse pits. These are often only uncovered during ploughing, drainage works, construction or turf cutting.

Archaeological sites and monuments and other important built heritage structures and features are part



A central court tomb, Magheraghanrush or Deerpark, Co. Sligo (Coillte property). (Illustration Aislinn Adams)

of our national heritage. There is a wealth of information to be gathered from such sites, monuments, structures and features, both from those which are visible above the ground and from those which have little or no surface expression. In addition to their educational value in terms of informing current and future generations and visitors about the history and development of our culture and society, they are also important recreational and tourism resources at local, regional and national levels.

2.6.2 Procedures

Land proposed for afforestation may contain or be located adjacent to archaeological sites and monuments and built heritage structures and features. For the purpose of these Requirements, these are grouped into three categories:

- **'Designated' archaeological sites and monuments**, which include those: entered onto the Record of Monuments and Places (RMP) or the Register of Historic Monuments (RHM); National Monuments in the ownership or the guardianship of the Minister for Arts, Heritage, Regional, Rural & Gaeltacht Affairs or a Local Authority; or those subject to a Preservation Order (PO) or a Temporary Preservation Order (TPO). Also included are sites and monuments newly discovered at the pre-application design stage or during the site works stage, post-approval. Examples include megalithic tombs, cairns, barrows, mounds, ringforts, enclosures, churches and graveyards, castles, tower houses and children's burial grounds.
- **'Designated' buildings and structures or parts of structures which form part of the architectural heritage and which are of special interest**, i.e. those entered onto the Record of Protected Structures (RPS) in the relevant County Development Plan or those entered into the National Inventory of Architectural Heritage (NIAH). Examples include vernacular cottages and houses, country houses and lodges, designed gardens and parklands, parish churches, historic creameries, military fortifications, mine engine houses, water mills, canals, locks and lock houses, and old school houses.
- **'Non-designated' built heritage structures**, e.g. lime kilns, sheep folds, creamery stands, stiles, townland boundaries, pumps and pump houses, mill ponds, and derelict dwellings / farm buildings.

Given the nature of afforestation (site selection, ground preparation operations, canopy development, and making provisions for future management operations), the potential for damage to our archaeological and built heritage clearly exists. For example, soil cultivation and drainage works can directly or indirectly disturb or impact both upstanding and sub-surface archaeological sites and monuments and associated features and artefacts. Even the digging of drains and sediment traps near such sites or monuments may cause organic deposits and artefacts (e.g. structural timbers, wooden artefacts or leather) preserved by anaerobic conditions to decay quicker as the soil deposit dries out. Similarly, changes caused to soil chemistry (e.g. from needle fall) may cause metal artefacts or ceramics to decay quicker.

The early identification of the nature, extent, setting, visual envelope and linkages of archaeological sites and monuments or other important built heritage structures or features, and the incorporation of these considerations both at the pre-application design stage and during site works (where afforestation is approved near known or suspected archaeological sites and monuments) will help to avoid or minimise the risk of damage.

Examples of measures to avoid, reduce or mitigate adverse impacts include:

- avoidance of areas of known or suspected elevated archaeological potential;
- incorporation of appropriate archaeological setbacks;

- access routes;
- unplanted lines of sight;
- arranging for in-works supervisory safeguards such as archaeological monitoring; and
- the sensitive design of the forest edge adjoining archaeological setbacks, to provide an appropriate setting.

The Registered Forester must identify known archaeological sites and monuments or other important built heritage structures or features, on and adjoining a site proposed for afforestation, through review of the relevant layers on iNET, and through a thorough onsite assessment.

The Forester should also utilise readily accessible sources of information. For example, the online digital service - the Historic Environment Viewer - provided by the Department of Arts, Heritage, Regional, Rural & Gaeltacht Affairs, facilitates access to the databases of the National Monuments Service (NMS) Sites and Monuments Record (SMR) and the NIAH. In addition, the RPS for each county is normally accessible on-line, and can usually be found as an appendix to the published County Development Plan. See the *Forestry Standards Manual* for further details.

Where possible, include all reference numbers (e.g. RMP number) on the Biodiversity Map submitted with the application. Doing so may expedite the Forest Service assessment of the application.

Once the various archaeological sites and monuments and other important built heritage structures or features (including those both 'designated' and 'non-designated') have been identified, the relevant minimum archaeological setbacks detailed in Section 2.8 apply, as well as any other measures proposed to address considerations such as the nature, extent, setting, visual envelope and linkages of these sites, monuments, structures or features.

2.6.3 Conditions attached to or further information required in approvals

As a general rule, the archaeological conditions that may be attached to any approval for afforestation will be taken from, but are not limited to, one or more of a tiered hierarchy of archaeological mitigation responses. These include:

- archaeological setbacks (including fenced-off exclusion zones);
- access routes;
- unplanted lines of sight;
- increasing the size of the archaeological setbacks;
- the exclusion of a larger area or areas of archaeological potential;
- archaeological monitoring of specified areas by an independent archaeological consultant retained by the Applicant or the Registered Forester;
- refusal of either part or all of the development, pending the consideration by the Forest Service and NMS of an archaeological assessment and an archaeological impact statement prepared by an independent archaeological consultant retained by the Applicant or the Registered Forester; or
- refusal after submission, where warranted due to significant adverse impacts that are evident at the very outset of the Forest Service assessment, or which become so as the assessment continues.

Note, as explained above, where it is evident to the Forest Service at the outset or where it becomes

Ogham Stone, Knickeen, Co. Wicklow (Coillte property).

evident as the assessment progresses, that a proposed development is likely to have significant adverse impacts on archaeological, historical or cultural sites or features, and which in its opinion cannot be adequately addressed by conditions based on the tiered hierarchy of archaeological mitigation responses listed above, the application may be refused entirely.

2.6.4 Archaeological finds at the pre-application design stage

Note that, during the onsite assessment or with local knowledge, the Registered Forester may also encounter a previously unrecorded archaeological site or monument at the pre-application design stage. If discovered, the location of any new or suspected new archaeological site or monument must be included on the Biodiversity Map, and a clear reference included in the map's table legend. Furthermore, a clear description must be provided in the 'Other Environmental Considerations' section of the Afforestation Application Form 1.

The Forest Service will consider such reports as part of its assessment of the application. Following referral to the NMS, it may impose one or more relevant archaeological conditions, with a default position being to favour preservation *in situ* of any new archaeological site or monument so identified (in accordance with the principles and approach as set out in Part III of *Framework and Principles for the Protection of the Archaeological Heritage* (Department of Arts, Heritage, Gaeltacht and the Islands, 1999)).

Where an archaeological object is discovered at this stage, it must by law be reported within a reasonable time period (and not longer than 96 hours) to the Garda Síochána or the National Museum of Ireland. Also, unless there is reasonable cause to believe that removal or interference is necessary to preserve it or to keep it safe, it must not be disturbed. The unsupervised recovery of archaeological objects by untrained persons can greatly diminish or entirely eliminate any knowledge or research value that might be gained from a particular discovery. It is important that, wherever possible, archaeological objects are recovered in a structured scientific manner, with careful recording made of their association with other objects, structures, features and soil layers.

(Note, see Section 3.8 for details regarding archaeological finds discovered during site works.)

2.7 Landscape

Objective: To ensure that the proposed forest is designed so that it is visually acceptable and in keeping with landscape and amenity sensitivities.

The predominantly open landscape of Ireland is a result of the progressive clearance of the natural woodland cover through the centuries, primarily for agriculture. In such an open landscape, afforestation is a major change. Registered Foresters should therefore apply attention to shape, scale, species diversity, margins, open spaces and views, to ensure that the new forest complements the character of the landscape, and to avoid intrusive and monotonous plantations. Careful design of forests at the pre-application design stage is important, as only limited improvements can be made later on.

The Registered Forester should consult with the relevant County Development Plan (both Draft and Final Plans), which will identify areas of particular landscape sensitivity and important views. The Registered Forester should also view the site from various vantage points and approaches, to identify how best to design the forest(*).

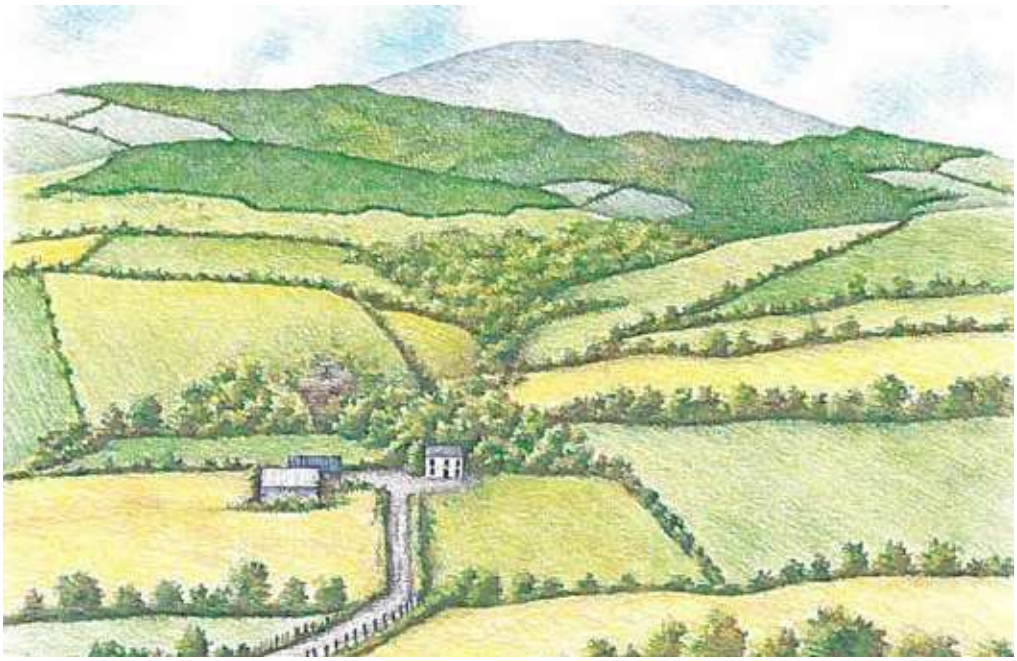
(* Within sensitive landscapes, it may be advisable for Registered Foresters to submit a series of photographs of the site, as viewed from various approach roads and local vantage points, together with an OS Discovery map indicating where each photo was taken. This will enable to Forest Service to assess how the afforestation will fit into the landscape, as viewed from these positions. Some digital cameras and smartphones have a function to take panoramic photographs, which are ideally suited for this purpose.)

Achieving an acceptable landscape design can be a subjective exercise. However, the following measures can be applied as required, taking account of the size of the proposed plantation, its position in the landscape, and its visibility from key vantage points, near and far. For example, a plantation on a visible hillside within a sensitive landscape will require a greater degree of design compared to a plantation within a lowland area with hedgerows, where measures may be limited to well-designed setbacks adjoining dwellings and public roads.

It is important that any measure applied is done so at an appropriate scale, in order to have the desired impact.

When appropriately sited and with sensitive layout and design, new woodlands and forests make a significant contribution to the landscape. (Photo Gillian Mills)

Shape, margins and diversity are key considerations in forest landscape design. (Illustration Aislinn Adams)



2.7.1 Shape

- Shape is the dominant landscape feature. It refers to the forest outline and also to the pattern of different species within it.
- Overall straight or horizontal lines and geometric or regular shapes should be avoided, where possible. These are often imposed by property boundaries, but can be mitigated by landscape setbacks (see Section 2.8).
- The planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) along the forest edge or within any environmental setback will also add visual interest – see Sections 3.5.3 and 3.5.4.
- On hillsides, planting should conform to the overall pattern in the landscape, whether natural landforms or field patterns, and follow the same rounded or irregular shapes.
- Large open landscapes are more suited to relatively large forested areas, while smaller and more regular shapes fit in better within a lowland pattern of fields and hedgerows.

2.7.2 Margins

- Avoid abrupt margins between the forest and open ground, between different species and between different Grant & Premium Category (GPC) plots.
- On sites approaching the skyline, the upper margin should be in line with the predominant landscape characteristics, be they irregular or smooth. Avoid leaving a narrow parallel band of open ground near the skyline. The open ground should reflect the scale of the hill or ridge. At lower points, planting can be carried right over the skyline.
- In upland areas, long straight vertical boundaries should be avoided. Instead, a diagonal trend should be maintained.
- Along highly visible forest margins, localised areas of spruce and pine trees towards the outer 10-15 metres of the forest can be planted at wider and irregular spacing. This measure, when

used in conjunction with forest edge planting, can promote the sense of a natural tree line, therefore softening the external margin.

- In lowland areas, straight boundaries can be acceptable where they reflect the agricultural field pattern.
- On lower margins, plantations can be blended into the agricultural landscape by introducing and extending broadleaf plots and additional broadleaves upwards in amongst conifer plots, especially following hollows in the landform.

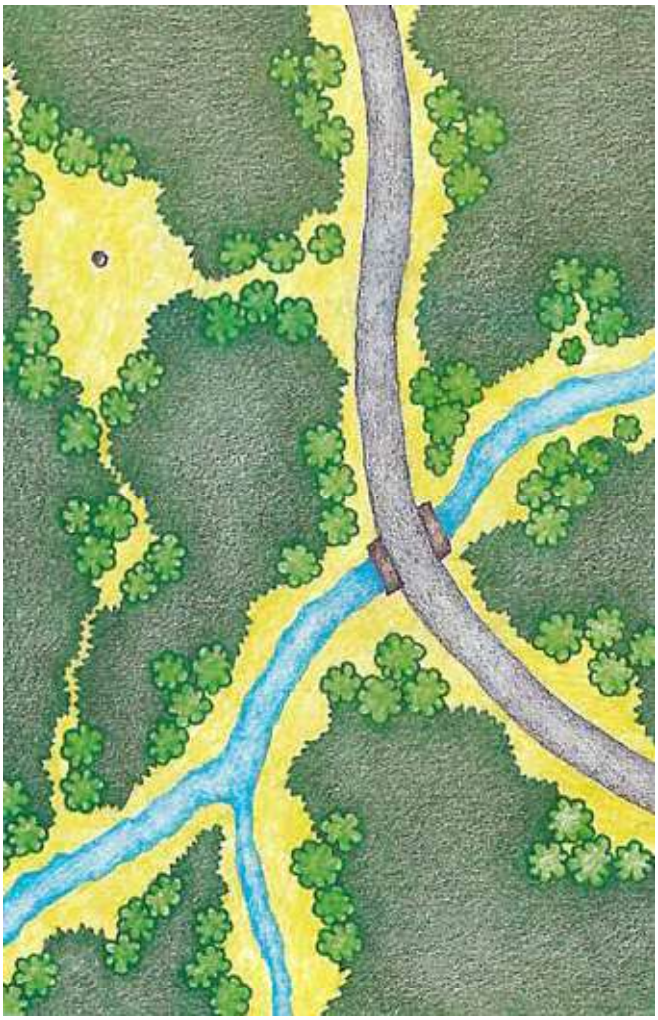
2.7.3 Diversity

- Diversity can be promoted by using a variety of species and by incorporated and reinforcing open spaces and retained habitats.
- Too much variety, however, should be avoided. It is usually desirable that one species dominates by about two-thirds.
- To be considered eligible under the Afforestation Scheme, the proposed plantation must have a minimum of 10% broadleaves, either as plots of minimum width and / or as single, small groups and irregular belts of additional broadleaves. Furthermore, each plot must comply with one of the GPCs described in the *Forestry Standards Manual*, and its corresponding requirements, including species composition.
- Promote an interlocking pattern along the margin between plots of different species. This can be achieved by extending groups and single trees of one species into the other, within the scope allowed under the GPCs involved.
- Avoid creating long rows of single species or rows or blocks of alternate species.
- Avoid species boundaries crossing the skyline.
- Plot outlines and group planting should follow ground vegetation patterns – this will help maintain a natural appearance.
- Reinforce the outline of retained woody habitats, by planting broadleaves in adjoining tongues or groups.
- The planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) along the forest edge or within any environmental setback will add visual interest – see Sections 3.5.3 and 3.5.4.

2.7.4 Environmental setbacks and future operational areas

Within the overall plantation boundary, the pattern created by environmental setbacks and future operation areas must be taken into account. The layout and design of these open spaces is set out elsewhere in this document. As an overall measure, where these features intersect with each other, introduce appropriately-scaled bell mouths in order to eliminate stark junctions and corners that may be visible from outside the plantation. The use of forest edge planting and environmental setback planting (see Sections 3.5.3 and 3.5.4) can also soften harsh angles.

Integrate environmental setbacks and future operational areas, to create a more natural landscape design. (Illustration Aislinn Adams)



2.7.5 Other considerations

- Where possible, ridelines and firebreaks through forests should follow landform and make use of natural features. They should follow an irregular route that avoids dividing a plantation into equal parts, and they should not be sited at right angles or parallel to contours.
- Landscape setbacks and appropriate edge design for public roads and dwellings are important – see Section 2.8 for requirements.

2.8 Environmental setbacks

An environmental setback is a (largely) unplanted and undisturbed open space of a defined width, installed to protect a particular environmental feature or sensitivity. Different types apply, depending on the feature or sensitivity involved, i.e.

- water setback
- retained habitat setback
- archaeological setback
- public road setback
- utilised building setback
- landscape setback

Table 5 describes the minimum setback width (as measured horizontally) and setback treatment for each of the above. Note, the Forest Service may stipulate, on a site-specific basis, greater setback widths than those prescribed, or setbacks in relation to other types of features or sensitivities (e.g. swallow holes).

In all cases:

- Where different setbacks overlap, the greater setback width applies.
- The setbacks described in Table 5 are eligible as ABEs.
- In general, setbacks are to remain undisturbed at afforestation and throughout the remainder of the rotation, and allowed to develop naturally. Setbacks will typically develop a sward of natural ground vegetation accompanied over time by (potentially) pockets of native woody growth.
- The ongoing treatment of setbacks during Site Works and Ongoing Site Management are detailed in those chapters.

Water setbacks and setbacks from other environmental features and sensitivities are a key part of forest design. (Illustration Aislinn Adams)

Table 5 Environmental setback type and purpose, and corresponding minimum setback distance and additional design requirements.
Note, all setbacks are measured in metres *horizontally*.

WATER SETBACK

Purpose: To create at the outset, a buffer of natural ground vegetation positioned between defined water features and the forest crop and associated operations, in order to protect water quality and aquatic ecosystems from possible sediment and nutrient runoff from the site at afforestation and throughout the remainder of the forest rotation.

Minimum setback width, as measured from the nearest bank / edge of the water feature, as observed on-the-ground (setback applies to each side of the water feature, e.g. to both banks of an aquatic zone):

Aquatic zone (as per Table 1):

Slope leading to the aquatic zone (apply as appropriate, where slope varies over the site)	**Setback width**	**Setback width for peat soils and for sites within the catchment area of high status objective waterbodies (see note opposite)**
Moderate (even to 1-in-7 / 0-15%)	10 metre	20 metre
Steep (1-in-7 to 1-in-3 / 15-30%)	15 metre	25 metre
Very steep (1-in-3 / >30%)	20 metre	25 metre

Relevant watercourse: 5 metre

Hotspot: 5 metre

Drinking water abstraction point: 20 metre

Additional design:

- Widen the water setback at various points along its length, to include adjoining wet hollows and other low-lying areas where water gravitates towards as it drains from the land.
- Based on the immediate landform / topography, vary the setback to avoid artificial lines and to create a naturally undulating forest edge.

NOTE, if the afforestation site is within the catchment area of a high status objective waterbody, the required setback width (as per the 3rd column opposite) can be reduced by 10 metres (from the landward side) if an appropriate GPC9 or GPC10 plot is included instead of this 10 m strip. For example, where a 25 m setback applies, this can be reduced to 15 m by applying the following sequence: aquatic zone → 15 m unplanted water setback → GPC9 or GPC10 plot. Standard requirements for GPC9 & GPC10 plots apply, as per *NWS Establishment GPC9 & GPC 10: Silvicultural Standards.*

HABITAT SETBACK

Purpose: To create adequate space adjoining a retained habitat to avoid or reduce any impacts arising from the emerging forest and its canopy.

Different habitats identified as retained habitats (either as biodiversity plots or as linear or point biodiversity features) may require an unplanted habitat setback to prevent undue impact (such as shading) from the emerging forest. Setback width depends on the habitat and the potential impact(s). Apply careful design, e.g. focus the habitat setback mainly on the south-western, southern and south-eastern side of the habitat, to minimise the blockage of sunlight as the adjoining forest canopy grows. Note that the retained habitat itself must remain undisturbed (unless otherwise agreed or prescribed).

ARCHAEOLOGICAL SETBACK

Purpose: To physically separate the archaeological site or monument or other important built heritage structures or features from afforestation works, the emerging forest, and future forest operations.

Site, monument, building, structure	Minimum setback from the outermost extent of the archaeological site, monument, important built heritage structures or features, as evident onsite
'Designated' archaeological sites and monuments (see note opposite)	20 metre exclusion zone
'Designated' buildings and structures or parts thereof which form part of the architectural heritage and which are of special interest (see note opposite)	30 metre exclusion zone for upstanding structures (e.g. building) Otherwise, 20 metre exclusion zone
Non-designated built heritage structures, e.g. lime kilns, sheep folds, creamery stands, stiles, pumps and pump houses, mill ponds, and derelict dwellings / farm buildings	10 metre unplanted setback (demarcating fencing not required) Where there is a cluster of such structures (e.g. a ruined dwelling and a number of out-buildings, often enclosed in a yard or by a boundary wall), the 10 metre unplanted setback to be measured from the enclosing boundary wall, or edges of the outermost buildings. Where there are associated features such as boundary walls, mill races, or historic foot paths, 5 metre unplanted setbacks may also be applied to those features. Similarly for townland boundaries.

NOTE, for designated archaeological sites and monuments and for designated buildings and structures (as defined in Section 2.6), the following applies:

- It is essential that the full extent (i.e. the outermost extent) of these features is known, so that the exclusion zone can be correctly identified. Where there is any doubt, the Registered Forester should seek advice from the relevant designating authority or the Forest Service Archaeologist.
- The boundary of the exclusion zone must be clearly demarcated by fencing, and pedestrian access routes must also be maintained or established (see Section 3.5.1 for details).

PUBLIC ROAD SETBACK

Purpose: To ensure adequate clearance to prevent tunnelling along the public road, to retain sightlines, and to create visual diversity for road users.

Minimum setback, as measured from the surfaced edge of the public road:

10 metre (average, within any one application) (For conifer plots, note the additional requirement regarding edge planting – see Section 3.5.3.)

Additional design:

- Based on the immediate landform / topography, vary the setback to avoid artificial lines and to create a naturally undulating forest edge.
- Provisions for future extractions should be planned and associated open spaces retained along the forest edge. Retain locally important views from the public road, by introducing open spaces through the forest. Also introduce open spaces that highlight natural features visible along the roadside.
- Increase setback, where appropriate, to allow for greater visibility at bends in the road.

UTILISED BUILDING SETBACK

Purpose: To prevent encroachment and isolation, the blocking of light and the curtailment of views in relation to dwellings, associated buildings, and roofed farm buildings.

Minimum setback, as measured from the outer wall of the roofed building:

Dwelling houses:

- 60 metre minimum
- Smaller setback allowable (to a minimum of 30 metre), if written agreement of the neighbouring dweller is provided at Form 1 stage

Roofed farm buildings: 10 m

Temporary buildings (e.g. timber sheds, kennels & buildings less than 25 m^2): No setback required

Additional design:

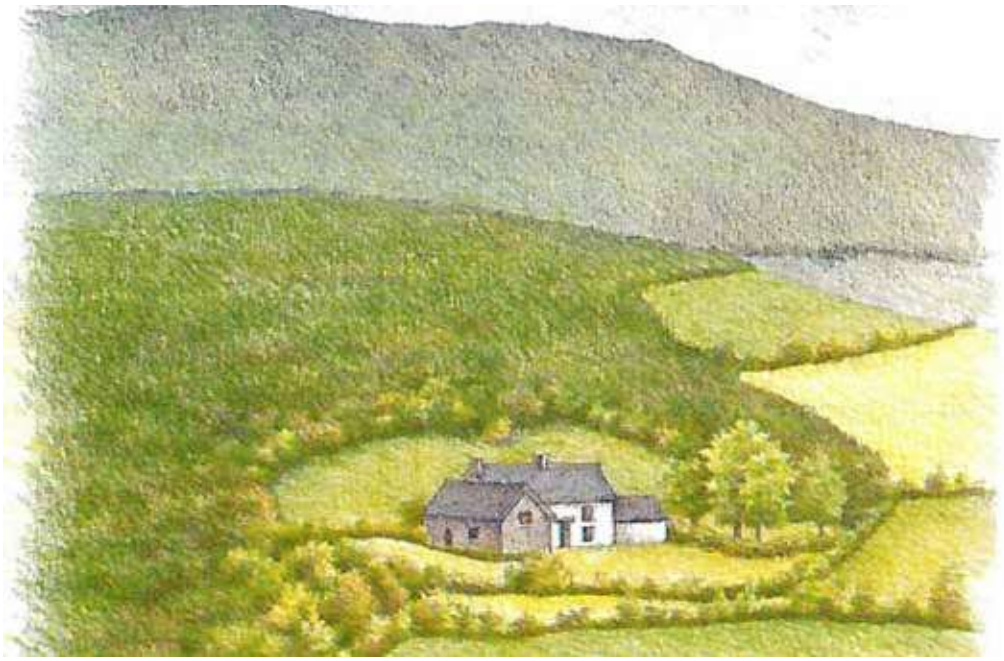
- Setback distance is most critical when a building is surrounded by forest on two or more sides.
- Based on the immediate landform / topography, vary the setback to avoid artificial lines and to create a naturally undulating forest edge.
- Consider retaining locally important views from the dwelling, by introducing open spaces through the forest. Also introduce open spaces that highlight natural features visible from the dwelling.
- In relation to setbacks from dwellings, setback planting is encouraged within the 30 m to 60 m zone, if agreed to by the neighbouring dweller.

LANDSCAPE SETBACK

Purpose: To disrupt artificially straight lines and sharp angles along other visible sections of the plantation's outer perimeter, and to create stronger visual 'tie-in' with adjoining hedgerows and other semi-natural / natural features.

Setback and design as appropriate. Will vary, depending on site details – see Section 2.7.

Appropriate setbacks from dwellings, designed with appropriate edge planting with native broadleaf species, will avoid overshadowing and a sense of isolation. (Illustration Aislinn Adams)



2.9 Future operational areas

Future operational areas are areas left unplanted in order to facilitate the future management of the plantation (e.g. a rideline) or to accommodate future infrastructure (e.g. a forest road or landing bay). In addition to their primary management function, these operational areas are also important biodiversity features in their own right, and this value can be enhanced further through simple design and additional planting. The following applies:

- Edge design should take account of good landscaping practices and the local topography. Avoid creating an unnaturally straight forest edge. Instead, taking account of the immediate landform, create a more naturally undulating edge.
- Where possible, orientate in an east-west direction, to maximise sunlight throughout the day and the seasons.

2.10 Open spaces and deer management

Forest design at afforestation should incorporate measures to facilitate future deer management. Environment setbacks and future operational areas may provide suitable open spaces to apply control, complete with appropriate shooting positions and safe back stops. However, these may need to be augmented by additional future operational areas, specifically for this purpose. Also, in the case of open spaces likely to be used for deer management purposes, avoid landscape and biodiversity planting within these spaces and along the adjoining forest edge, in order to retain clear lines of sight.

A deer hide overlooking an open space. During afforestation, incorporate features that will facilitate deer management in the future.

2.11 Site inputs

At design stage, planned site inputs such as fertilisers and herbicides should be tailored to the specific requirements of each plot. Aim to achieve successful establishment with the minimal level of artificial inputs possible.

Regarding fertilisers, phosphorus (P) is the main nutrient fertiliser applied at afforestation, with nitrogen (N) and potassium (K) occasionally applied as remedial fertilisation. Note that peaty soils have a very low capacity to bind phosphorus. Slow-release formulations may be appropriate on more sensitive parts of the site.

The afforestation application must detail:

- the proposed fertiliser type and application rate; and
- the proposed method of vegetation control (including herbicide type and application rate, if applicable).

Note that further operational safeguards regarding fertiliser and herbicide application are set out in Section 3.7.

2.12 Further environmental assessment

Stage 1: Design culminates in the submission of a Form 1 for afforestation approval. This triggers the Forest Service assessment of the proposal. In some situations, the Forest Service may seek specific environmental information regarding the proposal, before it can continue with its assessment. In such cases, a request for further information will be sent to the Applicant and his / her Registered Forester.

In a minority of cases, the information sought may entail the following, which typically involve the input of a specialist:

- Ecological Report

- Archaeological Assessment / Archaeological Impact Statement
- Water Management Plan
- Visual Impact Assessment
- NATURA Impact Statement (NIS)
- Environmental Impact Statement (EIS)

See the **SUPPORTING DOCUMENT** for further details.

Section 3
Site Works

3.1 Overview

Stage 2: Site Works spans the period between the receipt of the technical approval for afforestation up to the completion of initial site works and (where grant-aided) Form 2 submission.

The technical approval will set out conditions that must be adhered to. If uncertainty exists regarding any condition, contact the Forest Service for clarity before proceeding with any work.

Note the following:

- Site works can only commence after receipt of the technical approval (note, in order to be eligible for grant aid, projects submitted under the Afforestation Scheme must await financial approval, before commencing.)
- The Registered Forester must secure written Forest Service agreement before pursing any material change to a project post-approval. Not doing so may invalidate the technical approval and the financial approval (where relevant) issued.

3.2 Site management

The Registered Forester must ensure that all operators are fully aware of, and properly implement, all relevant measures set out in these Requirements and all environmental conditions attached to the technical approval issued. This should be carried out *via* onsite management and supervision. 'Tool box' meetings are encouraged, whereby the Registered Forester reviews the various sensitivities and safeguards during an onsite meeting with the operators before operations commence.

Onsite activities should also be reviewed periodically during the site works, to ensure that related safeguards are in place and that contingency planning (see below) is functioning.

3.3 Oversight by other specialists

Conditions attached to the technical approval may stipulate the onsite presence of a specialist during site works. For example, a condition may stipulate the archaeological monitoring of specified areas. Archaeological monitoring involves having a suitably qualified archaeologist present during certain operations, or during the course of the carrying out of certain parts of approved development works, in order to identify and protect archaeological deposits, features or objects that may be uncovered or otherwise impacted by those operations. In such cases:

- an independent archaeological consultant must be retained by the Applicant or Registered Forester to carry out the monitoring;
- as set out in Section 3.8, the archaeologist will be empowered by the approval conditions to stop any works in the immediate area of any new discoveries *inter alia*, so as to ensure the timely notification of the relevant authorities, the proper recording of any exposed archaeological material, and the preservation by record or preservation *in situ* of the

elements of the archaeological heritage, as appropriate;

- there will be a condition requiring the archaeological consultant to submit a full report on the results of the archaeological monitoring (including any discoveries made and any subsequent archaeological work undertaken) to the Forest Service, the NMS and the National Museum of Ireland; and
- failure to ensure that the archaeological monitoring is undertaken during the course of the carrying out of the specified parts of approved development or to submit the required report on this monitoring before or at latest at Form 2 stage, may be deemed to be:
  - a breach of the statutory approval for afforestation; and / or
  - a breach of the specific environmental conditions attached to the approval for grant aid and may: (i) delay the progress of the Form 2 (Application for 1st Grant Instalment); and (ii) be subject to a penalty.

Sanctions may also applied, as set out in the *Terms & Conditions for the Registration of Foresters and Forestry Companies*.

3.4 Contingency measures

Ensure that an adequate contingency plan is prepared. This plan must clearly inform operators how to react and who to contact, should an unexpected event arise that may create a risk to the environment, e.g. a period of intense rainfall, an accidental spillage of chemicals, the discovery of an unidentified archaeological site, monument or object. The plan should be readily available onsite and all operators should be made familiar with its content.

The **SUPPORTING DOCUMENT** contains a template contingency plan, to be completed as relevant.

3.5 Treatment of setbacks

As set out in Stage 1: Design, the following setbacks, comprising (largely) unplanted and undisturbed open spaces of a defined width, are required to protect different environmental features and sensitivities:

- water setbacks
- retained habitat setbacks
- archaeological setbacks
- public road setbacks
- utilised building setbacks
- landscape setbacks

See Table 5 for setback widths and design details. The treatment of these setbacks during Stage 2: Site Works is set out below.

The Registered Forester must ensure that all operators are aware of the importance of any environmental setbacks required onsite, their location and extent, and what is and is not permitted within them (as per Table 6 below). An environmental setback must not be used for any forest operation or for any other purpose which could compromise its protective function or which could

damage the environmental feature or sensitivity being protected.

Under the* Forestry Schemes Penalty Schedules*, failure to adhere to the required environmental setbacks can incur significant penalties.

3.5.1 Installing environmental setbacks

It is good forest practice to mark out environmental setbacks *before* operations commence, to avoid incursions. The following guidance applies:

- Mark off the setback using temporary markers, e.g. posts or bamboos with hi-vis tape, securely driven into the soil with approximately 1.5 metres remaining visible above ground.
- Marker spacing will vary depending on setback shape, e.g. 10 metre spacing for setbacks which vary in width; 30 metre spacing for long linear setbacks.
- Linear setbacks (e.g. archaeological sight lines) can be demarcated by markers set along the centre line.
- Also use markers to indicate the position of any additional enhancement planting proposed along the forest edge or within the setback itself (see below).

Note that specific requirements apply regarding 'designated' archaeological sites and monuments and 'designated' buildings and structures or parts of structures which form part of the architectural heritage and which are of special interest:

- Unless the conditions attached to the technical approval specify otherwise, erect a permanent fence comprising two strands of plain wire on the outer edge of the archaeological / built heritage exclusion zone. Adhere to the standard Forest Service fencing specifications, including the use of IS 436 stakes (see the *Forestry Standards Manual*)(*). Note, where the outer edge of an archaeological monument / built heritage structure or feature is not evident on-the-ground, the advice of the Forest Service Archaeologist or a consultant archaeologist retained by the Applicant or her / his Registered Forester should be sought. (*This fence must be stock proof, if it represents an external boundary of the plantation.)
- Existing access routes to an archaeological site must be left unplanted and undisturbed, and must be left open for pedestrian access by archaeological officials throughout the rotation. If there is no existing access route, leave an unplanted 4 metre wide route suitable for pedestrian access from the direction of the nearest public road, forest road or track.

3.5.2 Subsequent treatment

Table 6 details what is and is not permitted within the various environmental setbacks.

Table 6 Treatment of environmental setbacks during site works. Note, if setbacks overlap, the more environmentally stringent set of requirements apply.

	Operation						
Setback type	***Forest edge planting***	***Environmental setback planting***	***Demarcation fencing with stakes and wire***	***Machine traffic***	***Cultivation / Drainage***	***Fertiliser application / Vegetation management***	***Temporary onsite storage of fertiliser, fuel, etc. associated with afforestation***
Water setback	Encouraged – see Section 3.5.3.	Encouraged – see Section 3.5.4.	Not required	Exclude	Exclude. New drains must not enter into or traverse the water setback, or discharge directly into the aquatic zone or into an existing drain (with an exception detailed in Section 3.7.1).	Permitted if required to establish setback planting, based on the following requirements: ➢ Fertiliser application limited to the manual application of an appropriate slow-release formulation into the planting pit. ➢ Regarding vegetation management, herbicide use is prohibited. Use non-herbicide methods instead, such as trampling, mulches and mats.	Exclude
Habitat setback	Encouraged – see Section 3.5.3.	Exclude	Not required	Exclude	Exclude	Exclude	Exclude
Archaeological setback	Encouraged – see Section 3.5.3.	Exclude	Required for designated archaeological features – see Section 3.5.1 for details.	Exclude	Exclude	Exclude	Exclude

Setback type	*Forest edge planting*	*Environmental setback planting*	*Demarcation fencing with stakes and wire*	*Machine traffic*	*Cultivation / Drainage*	*Fertiliser application / Vegetation management*	*Temporary onsite storage of fertiliser, fuel, etc. associated with afforestation*
Public road setback	Mandatory for roadside conifer plots – see Section 3.5.3.	Exclude	Not required	Permitted	Exlude	Exclude	Permitted, subject to safeguards under Section 3.7.5.
Utilised building setback	Mandatory for setbacks from dwellings – see Section 3.5.3.	In relation to setbacks from dwellings, setback planting is encouraged within the 30 m to 60 m zone, if agreed to by the neighbouring dweller. See Section 3.5.4.	Not required	Permitted	Exclude	Permitted if required to establish setback planting, based on the following requirements: ➢ Fertiliser application limited to the manual application of an appropriate slow-release formulation into the planting pit. ➢ Regarding vegetation management, herbicide use is prohibited. Use non-herbicide methods instead, such as trampling, mulches and mats.	Permitted, subject to safeguards under Section 3.7.5. However, if within a setback from a dwelling, exclude the preparation and storage of herbicides (and other pesticides, if used).
Landscape setback	Encouraged – see Section 3.5.3.	Encouraged – see Section 3.5.4.	Not required	Permitted	Permitted, for setback planting.	Permitted, for setback planting.	Permitted, subject to safeguards under Section 3.7.5.

3.5.3 Forest edge planting

- Forest edge planting comprises the planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) along the outer edge of conifer GPC plots, typically those adjoining environmental setbacks.
- This measure enhances the landscape and biodiversity value of the forest edge.
- Forest edge planting is mandatory within conifer plots adjoining:
  - utilised building setbacks created for dwellings; and
  - public road setbacks, where the strip 10 metres to 20 metres from the road must be planted with broadleaf trees, to give a minimum two-thirds coverage within this strip.
- Forest edge planting is encouraged in relation to all other environmental setbacks, as site conditions allow - see Table 6.
- Where applied, forest edge planting must not encroach into the environmental setback itself, in order to maintain the necessary setback width. Forest edge planting forms part of the GPC plot.
- Where applied as single trees, ensure that the tree is adequately protected against grazing, using a standard tree shelter or a deer guard, as necessary.
- Where applied as groups, adopt a robust planting design using trees with compatible growth rates, planted with necessary protection against grazing. Group size may vary from 5-10 trees to 50 trees and over, depending on landscape scale. In deer-prone areas, wider spacing and the use of deer guards may be appropriate - specify details on the Certified Species Map.

3.5.4 Environmental setback planting

- Environmental setback planting comprises the planting of single, small groups and irregular belts of native species (e.g. birch, rowan, oak and Scots pine, as site conditions allow) ***within*** an environmental setback.

Forest edge planting, using deer shelters.

- This measure enhances the environmental role of the setback itself, e.g. planting within a landscape setback will create better visual 'tie-in' between the surrounding landscape and the forest edge.
- Apply environmental setback planting as per Table 6 and as site conditions allow.
- Where applied as single trees, ensure that the tree is adequately protected against grazing, using a standard tree shelter or a deer guard, as necessary.
- Where applied as groups, adopt a robust planting design using trees with compatible growth rates, planted with necessary protection against grazing. Group size may vary from 5-10 trees to 50 trees and over, depending on landscape scale. In deer-prone areas, wider spacing and the use of deer guards may be appropriate - specify details on the Certified Species Map.
- Environmental setback planting should not exceed 20% of the area of the setback.
- Note, setback planting may be counter-productive within setbacks likely to be important for deer management, as it may obstruct sight lines.
- The following applies specifically in relation to planting within water setbacks:
    - Strategic planting within water setbacks may help to deliver direct in-stream ecosystem services such as bank stabilisation, cooling / shading, and food drop into the aquatic ecosystem.
    - Pursue water setback planting only where agreed in advance with Inland Fisheries Ireland and (where relevant) NPWS.
    - Limit to single or small groups (5-10 trees) of native riparian species (birch, willow, and occasional alder and pedunculate oak) at strategic points within the water setback.
    - Such trees should be pit-planted and protected from grazing, as necessary.

3.6 Treatment of future operational areas

Treat future operational areas (as described in Section 2.5.2) as follows, to enhance their landscape and biodiversity value:

- As per good practice, mark out these areas *before* operations commence (see Section 3.5.1).
- Based on the immediate topography, vary their width to avoid artificially straight lines and to create a naturally undulating forest edge.
- Consider forest edge planting (see Section 3.5.3).

3.7 Operational safeguards

Mandatory measures to protect the environment during operations are set out below. Conditions attached to the technical approval may also contain additional measures to be adhered to. Also note Section 3.1 (regarding material changes post-approval) and Section 3.4 (regarding contingency planning).

3.7.1 Drainage and cultivation

A key requirement regarding drainage and cultivation is the protection of aquatic zones (streams, rivers and lakes) from any sediment and nutrients contained in water draining off the site, both during afforestation and throughout the remainder of the forest rotation. The following measures apply.

- Review Section 2.4.2 regarding key factors dictating selection and design.
- It is critical that water collected in drains flows slowly, both during afforestation and throughout the remainder of the rotation.
- Adhere to the overall drainage and cultivation plan approved for the project, and to the specifications set out in the *Forestry Standards Manual*.
- Select machinery based on soil, drainage and slope, to minimise the risk of rutting.
- In relation to water setbacks for aquatic zones and other water features (see Section 2.8):
    - Ensure that all new drains end in an appropriately-sized sediment trap or an interceptor drain(*) positioned ***outside*** of the water setback. This will allow discharged water to seep through the water setback, enabling ground vegetation to filter out sediments and nutrients.
    - Do not carry out any cultivation within the water setback itself.
    - New drains must not enter into or traverse the water setback, or discharge directly into the aquatic zone or into an existing drain(**).

  (* Interceptor drains are constructed along the outer edge of the water setback. They collect the discharge from the drained area and allow it to overflow into the water setback. See *Forestry Standards Manual* for details.)

  (** An exception applies to flat difficult-to-drain sites, where it may be necessary to link drains directly into the aquatic zone or an existing drain, provided it can be assured (based on site factors and / or sediment traps and other safeguards) that sediment and nutrients will not enter the aquatic zone. (If linking into an existing drain, the following applies: Existing drains may be 'greened over' to varying degrees, and this vegetation plays an important role in filtering out sediments and nutrients. Therefore, if the existing drain needed to be cleaned out, consider doing so in sections over several years, as opposed to a single operation.) Note, no linkage into aquatic zones and existing drains is permitted where the *Forestry & Freshwater Pearl Mussel Requirements* apply or anywhere within the Priority 8 Freshwater Pearl Mussel Catchments. This restriction may result in the site falling under the category 'Unsuitable Land Type' (see FS-DAFM *Land Types for Afforestation*) and therefore ineligible for funding under the Afforestation Scheme.)
- In general, do not carry out any drainage or cultivation within any other environmental setback. See Table 6 for details.
- Collector drains that receive water from mound drains should be no more than 80 metres apart. The angle of descent within these collector drains, as measured within the channel of the drain itself, should be no greater than 2 degrees (1-in-30). Collector drains should be excavated to a depth no more than 15 cm below the depth of the mound drains. The

Conventional mounding (left) and invert mounding for more sensitive sites (right).

intersection between mound drains and collector drains must be offset along the length of the collector drains, to ensure that individual mound drains do not continue in long unbroken runs down the slope.

- Regarding sediment traps:
  - The number, design and size of sediment traps must be sufficient to protect against the sedimentation of any receiving aquatic zone during afforestation and throughout the remainder of the forest rotation.
  - In order to capture sediment as close to the source as possible, sediment traps must be installed *throughout* the drainage network. The number of sediment traps installed must reflect the risk of sediment becoming mobilised.
  - Sediment traps are required at the end of all new drains leading to the water setback. These sediment traps must be located ***outside*** the water setback.
  - Sediment traps should be located on level ground (where possible) and should be rectangular in nature, with the longer side orientated parallel to the flow.
  - Sediment traps can represent a site hazard and may require specific health and safety measures such as fencing.
  - Monitor sediment traps throughout operations. If sediment traps are filling up, clear out the built-up sediment and deposit it on level ground several meters away.
- Stop all drainage and cultivation operations during periods of rainfall, in situations where rainfall level and site conditions create the risk of sediment becoming mobilised onsite. Operations can only recommence once an adequate period of time has elapsed for the risk to abate. This safeguard is triggered by tracking weather forecasts and by contingency planning.
- Where the drainage network and sediment traps are under pressure and signs of failure are evident, additional measures will be required, often in the form of additional sediment traps. In complex situations, the input of a hydrologist or an engineer may be required.

In-drain sediment trap (left) and a sediment trap adjoining a water setback (foreground) (right).

Additional safeguards include the following:

- Small dams positioned within drains and comprising timber, stone or staked geotexile, can be used to slow water flow and to encourage sediment deposition. These should have a 'V'-shape in their centre, to control the overflow of water and to prevent the scouring out of the sides of the channel during flood events.
- It may be necessary to install large settling ponds into which site drains flow. These settling ponds must be appropriately sized (i.e. sufficient to contain flow from high rainfall events), strategically located within the main body of the plantation and away from aquatic zones, and properly maintained.
- Favour plots of more species-diverse GPCs in areas adjoining water setbacks, where site conditions allow.
- Design the drainage network in a way that will eliminate or reduce water-related risks during operations later in the forest rotation, e.g. roading, thinning.
- Develop windfirm edges within the forest (e.g. using ridelines or retained hedgerows with habitat setbacks) to enable the future harvesting of smaller coupe sizes over staggered periods of time.

3.7.2 Fertiliser application

A key consideration regarding fertiliser application during site works is to eliminate the risk of run-off into receiving waters. The following apply:

- Match fertiliser type and application rate to specific plots – aim to achieve successful establishment with the minimal level of fertiliser input possible. Do not apply fertiliser if it is not needed.
- Where available, granular formulations should be used to reduce the potential for drift and wash-off into receiving waters.
- Fertiliser application is not permitted within the water setback (some exceptions apply - see Table 6) or within 20 metres of the aquatic zone, whichever is greatest. Manual fertiliser application only is permitted from this point back to 50 metres from the aquatic zone.
- In general, fertiliser application is not permitted within water setbacks or other environmental setbacks. However, some exceptions apply - see Table 6.
- Do not apply fertiliser if heavy rainfall is predicted, or during heavy rainfall and / or high winds. Following heavy rainfall, commence application only after the site has dried out sufficiently for runoff not to pose a risk.
- Apply fertiliser manually, where possible.
- Consider using alternative slow-release fertilisers in more sensitive parts of the site.

3.7.3 Vegetation management using herbicides and other methods

Vegetation management during afforestation typically involves the use of herbicide. Regarding the use of pesticides, including herbicides:

- The use of pesticides is governed by the European Communities (Sustainable Use of Pesticides) Regulations 2012 (S.I.155/2012). Users of pesticides should familiarise themselves with these Regulations and adhere to them.
- Only a registered professional user can apply pesticides authorised for professional use. A professional user is any person who applies / sprays professional use products (regardless of the quantity or method of application), including operators, technicians, employees and self-employed people, both in the farming and other sectors.
- All users of pesticide products registered for professional use must follow the principles of Good Plant Protection Practice, available for download at www.pcs.agriculture.gov.ie/sud/professionalusersprayeroperators/
- Appendix I to the above Good Plant Protection Practice document sets out general principles of integrated pest management, which all professional users are required to follow. Appendix II sets out other legal requirements relating to the safe use of plant protection products.
- Any pesticide to be used in forestry must be approved for use in Ireland. Details of approved products can be checked on the Pesticide Control Service section of the DAFM website (see www.pcs.agriculture.gov.ie).

Herbicide application within the forestry context must foll must follow the principles of Good Plant Protection Practice.

A key consideration regarding herbicide application during site works is to eliminate the risk of runoff into receiving waters. The following apply:

- Aim to achieve successful establishment with the minimal level of herbicide input possible. Do not apply herbicides if they are not required.
- Do not apply herbicide if heavy rainfall is predicted, or during heavy rainfall and / or high winds. Following heavy rainfall, only recommence application after the site has dried out sufficiently for runoff not to pose a risk.
- Fully adhere to the manufacturer's instructions and also measures set out in the Forest Service *Forest Protection Guidelines* and *Guidelines for the Use of Herbicides in Forestry*.
- Do not apply herbicides within the following areas, relying instead on non-herbicide methods such as trampling, mulches and mats:
    - within the water setback or within 20 metres of the aquatic zone, whichever is greatest;
    - within the water setback of a relevant watercourse or hotspot;
    - within specified distances from different types of water abstraction points, as prescribed by S.I.155/2012 - see Table 7;
    - within 15 metres of a landscape feature known to be a groundwater vulnerable area, including karst areas, sinkholes and collapse features; or
    - within a utilised building setback created for a dwelling.
- Herbicides are not permitted in sites within SACs and SPAs without completing a risk assessment (this may form part of a NIS, where sought). Preference should be given to low risk plant protection products or biological and cultural control measures in cases where their use is unavoidable.

Table 7 Distances from different types of water abstraction points, within which pesticide (including herbicide) application is prohibited under Schedule 2 of S.I.155/2012.

Type of abstraction point	***Prohibited distance***
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 1 m^3 or less of water per day or serving 10 or less persons	5 metres
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme 25 m supplying 1 - 10 m^3 of water per day or serving 10 - 50 persons	25 metres
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme 100 m supplying 10 m^3 or more of water per day or serving 50 - 500 persons	100 metres
Abstraction point of any surface waters, borehole, spring or well used for the abstraction of water for human consumption in a water scheme supplying 100 m^3 or more of water per day or serving 500 or more persons	200 metres

3.7.4 Other pesticide use

Other pesticides may be needed on rare occasions within the context of afforestation. In such cases, the above requirements regarding herbicides apply at a minimum, and more stringent measures may also be required. Regarding the risk of Pine Weevil outbreak (e.g. an afforestation site adjoining a recent conifer clearfell), any necessary dipping of planting stock must be carried out off-site in the forest nursery, with onsite application permitted only in response to an ongoing outbreak. Alternative control measures are encouraged, e.g. the use of larger planting stock.

3.7.5 Preparation, storage and use of potentially hazardous material

Spillage or leakage of fertilisers, herbicides (and other pesticides), fuel and machine oils can be highly damaging to the environment, especially water. The following apply regarding these materials:

- Minimise onsite storage and preparation.
- If unavoidable, store and prepare (if relevant) at a dry, elevated location at least 50 metres from any aquatic zone and at least 20 metres from all other water features (as listed in Table 1). This also applies to all machine refuelling, maintenance and repair work.
- Do not discharge any substance into an aquatic zone, relevant watercourse or hotspot, or into any drain or sediment trap.
- Do not rinse out containers onsite.
- Do not clean equipment within 50 metre of any aquatic zone or within 20 metres of any other water feature (as listed in Table 1). All wash waters must be disposed of carefully.
- Collect and retain spent machine oil for appropriate disposal off-site.
- Remove all empty fertiliser bags, pesticide and oil containers, and all general refuse, from the site during and after site works, for appropriate disposal off-site.
- Regarding pesticides (including herbicides), adhere to the principles of Good Plant Protection Practice (see Section 3.7.3) and to relevant sections of the *Forest Protection Guidelines* and *Guidelines for the Use of Herbicides in Forestry*.

3.8 Archaeological finds discovered during site works

Previously unidentified archaeological sites or artefacts may be exposed during the course of site work, particularly during cultivation and drainage. These include artefact scatters, objects such as pottery, flint and other stone artefacts, bronze or iron tools and quern stones, as well as burials and structural features such as the foundations of buried structures or trackways. For example, the presence of a spread of black soil or charcoal and burnt and heat-shattered stone is likely to indicate the presence of a levelled cooking place (i.e. a fulacht fiadh) or other human activity in the past.

If an archaeological find is discovered, the following applies:

- The Garda Síochána, the National Museum of Ireland or the National Monuments Service must be notified immediately.
- The archaeological object(s) or feature(s) must be left undisturbed. A minimum exclusion zone 20 metres in radius centred on its location, and preferably larger, must be immediately created until the site of the find has been investigated.
- Where an archaeological object is discovered other than by a qualified archaeologist operating under an excavation licence issued by the NMS, it must be reported in the same way as described in the Section 2.6.4.
- Where feasible, all operations should be switched to some other part of the afforestation site, as far away as practically possible, until the investigation is complete.

As outlined above, clear contingency planning must be in place covering the possibility whereby an unidentified archaeological site or object is discovered during site works.

3.9 Burning

The burning of woody vegetation may occasionally be necessary to facilitate afforestation. This is normally carried out during the season prior to planting.

Note that, under the Wildlife (Amendment) Act 2000, it is an offence to cut, grub, burn or otherwise destroy, during the period 1st March to the 31st August inclusive, any vegetation growing on any land not then cultivated.

Furthermore, under no circumstances should such material be burned on or near a known or suspected archaeological site or monument or other important built heritage structure or feature or within the archaeological setback / exclusion zone, as this could cause damage to the site, monument, structure or feature as well as to underlying archaeological deposits.

For details, see the Forest Service *Prescribed Burning: Code of Practice - Ireland* (www.agriculture.gov.ie/forestservice/firemanagement/)

3.10 Form 2 submission

Where the project has received financial approval and the 1st grant instalment is being sought, the Registered Forester must walk the site within 2 months prior to submitting the relevant Form 2, and satisfy her- / himself that the plantation is compliant (*inter alia*) with all relevant measures set out in these Requirements and with all environmental conditions attached to the technical approval issued. If not, rectify any outstanding issue(s) before submitting the Form 2.

As set out in the *Forestry Standards Manual*, a subsequent Forest Service inspection may stipulate remedial works is cases where the plantation is not compliant.

Section 4
Ongoing Management

4.1 Overview

Stage 3: Ongoing Management spans the period from the completion of initial site works (and payment of the 1st grant instalment, if grant-aided) up to Year 15 (i.e. the end of the premium period, if applicable).

During this part of the forest rotation, there are generally no major site inputs required. However, basic environmental measures apply, in addition to any specific conditions attached to the original approval. Other silvicultural requirements also apply during the premium payment period, as set out in the *Forestry Standards Manual* (e.g. the maintenance of stocking levels, fence lines and fire breaks, fertiliser application) all of which must be carried out appropriately to prevent environmental impacts.

Key will be the ongoing monitoring of the site, to ensure compliance with silvicultural and environmental standards, requirements and conditions and also to check that potential threats to the environment do not emerge (particularly in relation to drains and sediment traps) and that various protective measures (principally setbacks) are functioning as intended.

4.2 Site inputs

Site inputs during Stage 3 are generally limited to the first 4 years up to submission of the Form 3 (if grant-aided). At this point, the forest should be fully established(*), with all plots having at least 90% of the original stocking spread evenly throughout the plot, with originally approved species represented proportionately, and with trees free from competing vegetation and free-growing (see the *Forestry Standards Manual*). Such inputs include herbicide application and possible fertiliser application, if nutrient deficiencies arise. Both inputs must adhere to measures set out in Sections 3.7.2 and 3.7.3 of these Requirements. (*Note, establishment may take longer on some sites.)

Regarding fertiliser application, assess exact requirements through a foliage analysis, following the procedures set out in the *Forestry Standards Manual*.

(Over larger areas, aerial fertilisation may be required. No aerial fertilisation can be undertaken unless an Aerial Fertilisation Licence as been obtained from the Forest Service. Refer to the separate *Aerial Fertilisation Requirements* for details.)

Ensure that any necessary filling-in prior to Form 3 submission reflects the diversity of the original planting, in relation to biodiversity and landscape.

4.3 Drains and sediment traps

Check drains and sediment traps regularly up to Year 4 and periodically thereafter, particularly during and after heavy rainfall, in order to assess how effectively they are working.

If sediment traps are filling up, clear out the built-up sediment and dispose of it on level ground several meters away. Where the drainage network and sediment traps are under pressure and signs of failure are evident, additional measures will be required, often in the form of additional sediment

traps. In complex situations, the input of a hydrologist or an engineer may be required.

In most cases, drains will stabilise and 'green-up' with colonising vegetation over time.

4.4 Treatment of setbacks

As set out in Stage 1: Design and Stage 2: Site Works, the following setbacks, comprising (largely) unplanted and undisturbed open spaces of a defined width, are required to protect different environmental features and sensitivities:

- water setbacks
- retained habitat setbacks
- archaeological setbacks
- public road setbacks
- utilised building setbacks
- landscape setbacks

The treatment of these setbacks during Stage 3: Ongoing Management is as follows:

1. The intended protective function of these setbacks must be maintained throughout this stage of the forest's development. This generally entails leaving these areas undisturbed and allowing natural ground vegetation to develop. Management may be required in some cases, e.g. to control woody growth within a setback adjoining a dwelling, to retain an important view or to prevent fire risk.
2. Monitor the development of forest edge planting and environmental setback planting (where undertaken) and maintain trees as appropriate (e.g. vegetation management, replacement of mortalities, adjustment and eventual removal of tree shelters) until the trees are established and free of grazing pressure.

A well-established water setback adjoining a broadleaf plot.

3. Adhere to the specifications set out in Table 6 regarding permitted operations within setbacks.
4. The type of natural vegetation that will emerge within the various setbacks will vary according to soil, elevation, aspect, grazing pressure, etc. On most sites, a mosaic of natural ground vegetation and pockets of woody growth will typically emerge throughout this stage.
5. Monitor and apply appropriate control to prevent the colonisation of setbacks by rhododendron and other exotic invasives. This requirement also applies to paths required in relation to 'designated' archaeological sites and monuments and 'designated' buildings and structures, to maintain access by archaeological officials.
6. The colonisation of the water setback with exotic invasives, in particular, Japanese knotweed, Himalayan balsam and rhododendron, is of significant concern regarding water quality. Where best practice involves herbicide use, consult with Inland Fisheries Ireland and other relevant bodies in advance. Controlling such species is difficult and expensive, and often requires a wider catchment approach for progress to be sustained.

Note, 2 and 5 above also apply to the treatment of future operational areas (see Section 2.9) during this stage of the rotation.