

Craiginmoddie Wind Farm

Environmental Impact Assessment Report Chapter 13: Forestry

December 2020

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13 FORESTRY

Introduction

- 13.1 This chapter describes the forestry related aspects of the Proposed Development and was prepared by Fergus Tickell of Wood. He has been involved in the forestry sector for over 30 years with experience in direct forest management, integration of forestry with other sustainable land uses and policy development.
- 13.2 Commercially managed forests are dynamic environments continually changing both as a result of planned silvicultural and forest management interventions such as felling and restocking by the forest owner and by natural events such as windblow and pest outbreaks. In this respect therefore, forestry is not regarded as a receptor for the purposes of assessing environmental effects as a result of the Proposed Development. The forestry proposals will affect other receptors, for example ecological, and this aspect is therefore interrelated with the environmental effects which are assessed separately in the relevant chapters of the Environmental Impact Assessment (EIA) Report (EIA).
- 13.3 This chapter therefore focuses on the plans for integrating the Proposed Development into the forest environment together with plans for felling, restocking and other forestry management practices directly associated with the Proposed Development. It considers how these plans have been derived and the changes to the physical structure of the forest that would occur. It further discusses the issue of forestry waste arising as a result of the Proposed Development and requirements for compensatory planting in respect of permanent loss of woodland.
- 13.4 The responsibility for the management of the remainder of the forest outwith the Site lies with the landowners and therefore the wider felling operations, restocking, and aftercare operations do not form part of the Proposed Development for which consent is sought.
- 13.5 The Proposed Development lies predominantly within commercial forest plantations owned by four different owners and managed by forest management companies on their behalf. The proposals set out in this chapter have been developed to:
- Identify areas of forest to be removed for the construction and operation of the Proposed Development.
 - Identify those areas which may or may not be restocked as part of the Proposed Development.
 - Propose management practices for the forestry works.
- 13.6 This chapter is structured as follows:
- Legislation, Policy and Guidance.
 - Forestry Study Area.
 - Forest Plans.
 - Baseline Conditions.

- Wind Farm Forest Plan.
- Requirement for Compensatory Planting.
- Forestry Waste.
- Forestry Management Practices.
- Summary.

13.7 In general, throughout this chapter, data labelled 'baseline' refers to the current crop composition and the existing felling and restocking plans without any modification as a result of the Proposed Development. Data labelled 'wind farm' refers to the forestry plans incorporating the Proposed Development.

Legislation, Policy and Guidance

13.8 Relevant overarching planning policies for the Proposed Development are detailed in Chapter 5 A desktop study was undertaken drawing on published national, regional and local level publications, assessments and guidance to establish the broad planning and forestry context within which the Site is located. Forestry related policies and documents listed below have been considered within the forestry assessment. The following section provides an outline of those planning policies which are relevant to the Proposed Development and in particular to forestry.

Forestry and Land Management (Scotland) Act 2018

13.9 Until 1st April 2019, Scottish Ministers owned the National Forest Estate (NFE), provided funding and had responsibility for forestry strategy and policy. The management of the NFE and delivery of forest management functions was the responsibility of the Forestry Commissioners. The Forestry Commission was a cross-border public authority and a UK non-ministerial department with a statutory Board of Commissioners. The Commission was made up of a number of parts, including in Scotland:

- Forest Enterprise Scotland (FES), which carried out forestry operations and managed the NFE on Scottish Ministers' behalf; and
- Forestry Commission (FCS), which was responsible for the other forestry functions in Scotland.

13.10 When full devolution of forestry to the Scottish Government was completed on 1 April 2019, FCS and FES became two new agencies of the Scottish Government:

- Scottish Forestry (SF) with responsibility for regulatory, policy and support functions: and
- Forestry and Land Scotland (FLS) with responsibility for the management of the NFE and any other land managed for the purposes of the Forestry and Land Management (Scotland) Act 2018.

13.11 With the introduction of the Act and its associated Regulations on 1st April 2019 the previous regulatory regime set out in the Forestry Act 1967 was repealed in Scotland. From that date anyone wishing to fell trees in Scotland requires a Felling Permission issued by SF unless an exemption applies or another form of felling approval such as a felling licence

(including a Land Management Plan (LMP)) has been previously issued. Under the new Regulations felling, which is authorised by planning permission, continues to be exempt from the Regulations and does not require a Felling Permission from SF.

Scotland's Forestry Strategy 2019-2029

- 13.12 Scotland's Forestry Strategy 2019 – 2029 (SFS) was published in 2019 after a consultation period. The strategy provides an overview of contemporary Scottish forestry; presents the Scottish Government's 50-year vision for Scotland's forests and woodlands; and sets out a 10-year framework for action.
- 13.13 The vision is that *"...in 2070, Scotland will have more forests and woodlands, sustainably managed and better integrated with other land uses. These will provide a more resilient, adaptable resource, with greater natural capital value, that supports a strong economy, a thriving environment, and healthy and flourishing communities."*
- 13.14 It lists a number of objectives summarised below:
- increase the contribution of forests and woodlands to Scotland's sustainable and inclusive economic growth;
 - improve the resilience of Scotland's forests and woodlands and increase their contribution to a healthy and high-quality environment; and
 - increase the use of Scotland's forest and woodland resources to enable more people to improve their health, well-being and life chances.
- 13.15 It further describes the priorities as:
- ensuring forests and woodlands are sustainably managed;
 - expanding the area of forests and woodlands, recognising wider land-use objectives;
 - improving efficiency and productivity, and developing markets;
 - increasing the adaptability and resilience of forests and woodlands;
 - enhancing the environmental benefits provided by forests and woodlands; and
 - engaging more people, communities and businesses in the creation, management and use of forests and woodlands.
- 13.16 There are ambitious targets included within the strategy for new woodland creation:
- 10,000 hectare(ha) per year in 2018;
 - 12,000 ha per year from 2020/21;
 - 14,000 ha per year from 2022/23; and
 - 15,000 ha per year from 2024/25.
- 13.17 The stated objective is to increase Scotland's woodland cover from the current 18.5% to 21% by 2032.

The Land Use Strategy for Scotland 2016 – 2021

- 13.18 The Land Use Strategy for Scotland 2016 - 2021 sets out a strategic framework for getting the best out of Scotland's land resources. It looks at the potential of the land and the ways in which it is used, both now and in the future. Principles of sustainable land use are central to its vision for the future. With specific reference to forestry, the strategy acknowledges forestry's role as a key multipurpose land use and the role it has to play in terms of delivering the vision, objectives and principles of the Land Use Strategy in rural and urban Scotland. It comments that the sustainable management of Scotland's woodlands and forests makes an important contribution to Scotland's economy; it delivers health and wellbeing benefits for people and a range of other critical ecosystem services including climate change mitigation and adaptation.
- 13.19 To increase its role in addressing the challenge Scotland faces from climate change, a target of 100,000 ha of new woodland creation between 2012-2022 has been established. Within the UK, Scotland is leading the way in terms of areas of new woodland creation, however it is recognised that more needs to be done to achieve the planting target. To support this, Scotland's Forestry Strategy 2019 – 2029 emphasises the continued protection of Scotland's forest resource.

Third National Planning Framework

- 13.20 Scotland's Third National Planning Framework (NPF3) recognises that woodlands and forestry are an economic resource, as well as an environmental asset (NPF3, Paragraph 4.2). It further supports the continued expansion of Scotland's woodland and forestry resource (NPF3, Paragraph 4.23). A key action of NPF3 (NPF3, Paragraph 6.10) is a commitment to create on average 10,000 ha per annum of new woodland from 2015 onwards, a target which has been superseded by the Scottish Forestry Strategy.
- 13.21 Consultation is currently being undertaken for NPF4.

Scottish Planning Policy

- 13.22 The Scottish Planning Policy (SPP) includes a section on woodlands (SPP, Paragraphs 216 - 218). This refers to the Scottish Government's Control of Woodland Removal Policy (Forestry Commission Scotland, 2009) which is discussed in more detail below. The SPP states that woodland removal should only be permitted where it would achieve significant and clearly defined additional public benefits. It further states that where woodland is removed in association with development proposals, developers will generally be expected to provide compensatory planting and that the acceptability of woodland removal, in the context of the Control of Woodland Removal Policy, should be taken into account in determining applications.

Control of Woodland Removal Policy

- 13.23 In parallel with the SFS and other national policies on woodland expansion, there is a strong presumption against permanent deforestation unless it addresses other environmental concerns. In Scotland, such deforestation is dealt with under the Scottish Government's

'Control of Woodland Removal Policy'. The guidance relating to the implementation of the policy was revised and updated in 2019.

13.24 The purpose of the policy is to provide direction for decisions on woodland removal in Scotland. The policy document lays out the background to the policy, places it into the current policy and regulatory context, and discusses the principles, criteria and process for managing the policy implementation. The following paragraphs summarise the policy relevant to the Proposed Development.

13.25 The principal aims of the policy include:

- to provide a strategic framework for appropriate woodland removal; and
- to support climate change mitigation and adaptation in Scotland.

13.26 The guiding principles behind the policy include:

- there is a strong presumption in favour of protecting Scotland's woodland resources; and
- woodland removal should be allowed only where it would achieve significant and clearly defined additional public benefits. In appropriate cases a proposal for compensatory planting may form part of this balance.

13.27 Woodland removal, without a requirement for compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- Enhancing priority habitats and their connectivity.
- Enhancing populations of priority species.
- Enhancing nationally important landscapes, designated historic environments and geological Sites of Special Scientific Interest (SSSI).
- Improving conservation of water or soil resources.
- Public safety.

13.28 Woodland removal, with compensatory planting, is most likely to be appropriate where it would contribute significantly to:

- Helping Scotland mitigate and adapt to climate change.
- Enhancing sustainable economic growth or rural/community development.
- Supporting Scotland as a tourist destination.
- Encouraging recreational activities and public enjoyment of the outdoor environment.
- Reducing natural threats to forests or other land.
- Increasing the social, economic or environmental quality of Scotland's woodland cover.

13.29 The consequences of the policy are stated as:

- Minimising the inappropriate loss of woodland cover in Scotland.

- Enabling appropriate woodland removal to proceed with no net loss of woodland-related public benefits other than in those circumstances detailed in the policy; and facilitating achievement of the Scottish Government's woodland expansion ambition in a way that integrates with other policy drivers (such as increasing sustainable economic growth, tackling climate change, rural/community development, renewable energy and biodiversity objectives).

13.30 Addressing the policy requirements can be met through changes to forest design, increasing designed open space, changing the woodland type, changing the management intensity, or completing off site compensation planting.

United Kingdom Forestry Standard

13.31 The United Kingdom Forestry Standard (UKFS) is the reference standard for sustainable forest management in the UK. It outlines the context for forestry, sets out the approach of the UK governments to sustainable forest management, defines standards and requirements, and provides a basis for regulation and monitoring – including national and international reporting.

13.32 The UKFS approach is based on applying criteria agreed at international and European levels to forest management in the UK. However, because the history of forestry and the nature of the woodlands in the UK differ in fundamental ways from those of other European countries, a main purpose of the UKFS is to demonstrate that these agreements are applied in an appropriate way to the management of UK forests and woodlands.

13.33 The UKFS was first published in 1998 and revised in 2004, 2011 and 2017. This fourth edition, which now incorporates the previously separate supporting series of Guidelines, has been produced to:

- update relevant legislation and other regulatory requirements;
- update organisational details and mandates of the forestry authorities;
- reflect key policy changes arising from the increased devolution of forestry;
- incorporate recent developments in international agreements, and the way forestry activity is monitored and reported; and
- incorporate recent advances in the scientific understanding of forestry;

13.34 The UKFS has been developed by the forestry authorities in England, Scotland, Wales and Northern Ireland, through an open and consensual process in accordance with government guidance. This has involved many interested parties and the general public in a formal consultation. The UKFS has been endorsed by the UK and country governments and applies to all UK forests and woodlands. Together with the national forestry policies and strategies of England, Scotland, Wales and Northern Ireland, the UKFS provides a framework for the delivery of international agreements on sustainable forest management, alongside policies on implementation.

13.35 The standards for the planning, design and sustainable management of forests and woodlands in the UK use an approach based on internationally recognised science and best practice. The UKFS is the basis of forestry practice for the independent UK Woodland

Assurance Standard (UKWAS), which is used for voluntary independent certification. It can also be used for assessing compliance as part of an environmental management system such as ISO 14001.

- 13.36 By meeting the requirements of the UKFS, forest and woodland owners, managers and practitioners can demonstrate that forestry operations and activities are both legal and sustainable. The main bodies responsible for the regulation and monitoring of the UKFS are Scottish Forestry, Forestry Commission in England, Natural Resources Wales, and the Forest Service in Northern Ireland (the 'forestry authorities').
- 13.37 The UKFS is relevant to all those with an interest in UK forests and woodlands, particularly owners, managers and practitioners, and all organisations with responsibilities for forests and woodlands – including government agencies, local authorities, non-governmental organisations, charities and trusts.

The Ayrshire and Arran Forestry and Woodland Strategy

- 13.38 The approved Ayrshire and Arran Forestry and Woodland Strategy (AAFWS) was launched in October 2014 (Ayrshire Joint Planning Unit, 2014). It supports national policies whilst integrating with other Ayrshire Councils' strategies and plans. The strategy is intended to guide woodland management and expansion in Ayrshire and Arran, providing a policy and a spatial framework to maximise the contribution of woodland and forestry to the people, environment and economy of the region.
- 13.39 The strategy forms statutory Supplementary Guidance to the three Ayrshire Proposed Local Development Plans. It is therefore a material consideration in planning decisions involving development proposals affecting woodland. The strategy supports Scottish Ministers' desire to see an expansion in woodland cover, delivering multiple benefits across the country.
- 13.40 In parallel with national policies, there is a presumption against woodland loss. It is recognised that there has been pressure on woodland cover in the regions due to proposed development, principally wind farms. Under the theme of "Climate Change" the strategy states that one of the key priorities is to ensure that reductions in woodland cover resulting from restructuring and proposed development are more than compensated by new woodland creation elsewhere within Ayrshire and Arran. This in turn leads to a number of Priority Key Actions including:
- CC1: Implement the woodland removal policy, with compensation planting required within Ayrshire and Arran; and
 - CC5: Facilitate renewable energy proposed development.
- 13.41 The strategy also recognises the importance of peatlands in the region many of which were planted with conifer forests. This results in a further Priority Key Action:
- CC7: Encourage the restoration of peatlands during forest redesign and restructuring in locations with suitable hydrological and soil and vegetation conditions.

- 13.42 The strategy sets out regional priorities for woodland expansion and management by broad landscape zones.
- 13.43 The Proposed Development falls within the Ayrshire Upland zone. As this zone already holds a significant proportion of the region's woodlands, it is considered that ensuring an appropriate balance of land uses, particularly in relation to wind energy proposals, will be a key consideration. It is considered likely that much of the woodland expansion into this zone will largely be compensating for losses elsewhere due to wind energy proposals and restructuring of existing forests.

Forestry Study area

- 13.44 The Forestry Study Area (FSA) as shown in Figure 13.1 extends to 696.8 ha and is split into four separate privately owned forests, each of which is managed by professional management companies. The four separate forests are:
- Daljedburgh Forest is a commercial first rotation conifer plantation with no previous felling or replanting. The silvicultural management regime is "non thin" with clearfell planned around financial rotations. Some windblow has occurred which would potentially be cleared prior to the construction of the Proposed Development;
 - Dobbingsstone Forest is a commercial coniferous plantation which has recently entered into a restructuring phase with two coupes having been felled and replanting taken place. The silvicultural management regime is "non thin" with clearfell planned around financial rotations;
 - Doughty Hill is a first rotation coniferous plantation managed as a commercial forest on behalf of private investors. No restructuring has taken place. The silvicultural management regime is "non thin" with clearfell planned around financial rotations. A further area
 - Dalwyne Farm has been planted to current UKFS standards as a predominantly commercial forest with conifer species dominating.
- 13.45 Further information on the composition of the woodlands in the FSA is provided in the baseline description below.

Forest Plans

- 13.46 Over many years a key objective of the Forestry Commission was forest expansion, in both state and private forests, to produce a strategic reserve of timber and to set the foundations for a timber processing sector based on commercial softwood species. As a result, a limited range of species, with Sitka spruce dominating, was planted. More recently, greater emphasis has been placed on converting essentially monocultural plantations to multi-purpose forests. This is achieved through a restructuring of age and species in existing woodlands. Restructuring is achieved through the forest planning process.
- 13.47 A Forest Plan, previously known as a Long-Term Forest Plan (LTFP) or Forest Design Plan (FDP) and now termed a Land Management Plan (LMP) relates to individual forests or groups of woodlands. The Forest Plan (the term used throughout this chapter) describes the

woodlands, places them in context with the surrounding area, and identifies issues that are relevant to the woodland or forest. Forest Plans describe how the long-term strategy would meet the management objectives of the owner, the criteria of the UK Forestry Standard (UKFS) and the UK Woodland Assurance Standard 4th Edition (UKWAS), under which the woodlands would be managed if certificated.

- 13.48 The Forest Plan involves a scoping exercise whereby the views of Statutory Consultees, neighbours and stakeholders are sought, resulting in an agreed Scoping Report. The results of the scoping exercise are incorporated into the Forest Plan. The Forest Plan covers all aspects, such as conservation, archaeology, landscape and the local community in addition to forestry and silvicultural considerations. Restructuring of age class and species are important factors in this process to ensure proposals meet the current standards.
- 13.49 A Wind Farm Forest Plan is prepared along the same principles and will typically contain felling and restocking proposals for the Site covering a 10 year period in detail, with outline proposals for the remainder of the forest.
- 13.50 There is an existing Forest Plan for the Dobbingsstone Forest area within the FSA and it is anticipated that Forest Plans will be put in place in respect of the three other areas of commercial forest ownership in the next year or so to provide SF approvals for future felling and restocking.
- 13.51 Restructuring presents forest managers with many challenges and opportunities, particularly in relation to the management of potential catastrophic windblow. The forest planning process allows forest managers to review and revise proposals in a structured way to take account of such external factors. The inclusion of a wind farm within the forest is an example of one such external factor.
- 13.52 The current guidelines require diversification of species and woodland types as part of the forest planning process, specifically an increase in the proportion of broadleaf woodland, other conifers, and open ground. The incorporation of the Proposed Development into the forest would result in further minor restructuring of the crops.

Baseline Conditions

- 13.53 The baseline described in this chapter is based on information provided by forest owners or, in the absence of detailed information from some, estimated from other sources including site visits.

Baseline Planting Year/Age Class Structure

- 13.54 Many woodlands established in the 1980's were planted in large contiguous blocks, often over a limited number of years and with a limited range of species. Such woodlands develop poor structural diversity, especially on upland sites.
- 13.55 This is evident in the Daljedburgh, Dobbingsstone and Doughty Hill which were planted between 1980 and 1987. Restructuring the age class and species of such forests is desirable and would yield both forest management and environmental benefits. All these areas are at an age where felling is imminent, though only Dobbingsstone is currently covered by a

Forest Plan. It is anticipated that felling in the other areas is likely to commence within the next year or so.

- 13.56 It should be noted that in areas where significant felling is likely to be carried out in the short term by forest owners under the auspices of Forest Plans or Felling Permissions, baseline conditions described may not reflect conditions at the time construction of the Proposed Development.
- 13.57 The Applicant will continue to collaborate with the forest owners to ensure maximum integration of wind farm requirements into their forest management planning and specifically, felling plans.
- 13.58 A summary of the age class structure of the woodlands within the FSA is detailed in Table 13.1 below.

Table 13.1: Age class structure of woodlands within the FSA

Age (Years)	Area (ha)	Area (%)
1-10	167.07	23.97
11-20	0.00	0.00
21-30	0.00	0.00
31-40	484.74	69.56
Open ground	45.03	6.47
Total	696.84	100.00

- 13.59 Current recommendations within the UKFS include the requirement that for forest characterised by a lack of age diversity, stands adjoining felled areas should be retained until the restocking of the first coupe has reach a minimum height of 2 m. In practice this is likely to be around 5-10 years in the area of the Proposed Development.

Species Composition

- 13.60 The current species composition within the Site, which reflects the practice and guidance which prevailed at the time the individual forest areas were established, is detailed in Table 13.2.

Table 13.2: Species composition of woodlands within the FSA

Species	Area (ha)	Area (%)
Sitka Spruce	539.80	77.46
Other conifer	79.60	11.13
Mixed broadleaves	32.41	4.65
Open Ground	45.03	6.47
Total	696.84	100.00

- 13.61 The main commercial species is Sitka spruce with some areas of larch within the mature blocks and Norway spruce in the area of new planting. Sitka spruce also dominates within

the areas of recent restocking and new planting. These young crops have been planted to meet current UKFS standards and therefore incorporate areas of open ground and native broadleaved planting. The latter also occurs in scattered pockets in both Daljedburch and Doughty Hill forests.

- 13.62 As was common practice at time of planting in the 1980's, very few areas of open ground were retained. There is a significant area of bare ground to the west outside the forest boundary but within the Proposed Development area.

Wind Farm Forest Plan

Introduction

- 13.63 The location of turbines and infrastructure is strongly influenced by environmental constraints and technical considerations, e.g. topography, sensitive habitats, wind capture, ground conditions etc.
- 13.64 All turbines, compounds, borrow pits and substation are in forested areas and the details of the infrastructure of the Proposed Development have been amalgamated with the baseline forestry data outlined in paragraphs 13.53 to 13.62 to derive the forestry proposals. Land management requirements associated with the construction of the Proposed Development are also incorporated into the forestry proposals, where appropriate.
- 13.65 The felling programme would largely be driven by technical constraints with areas of crop which will require to be felled to accommodate the construction and operation of the Proposed Development.

Wind Farm Felling Plan

- 13.66 Felling required for a wind farm development can be divided into two categories. Firstly, that required during its construction phase, which for the purposes of this assessment has been anticipated as commencing in 2024; secondly, felling required during the operational period of the wind farm.
- 13.67 The crops were assessed to identify those areas which would require to be felled for reasons noted above. The key objective of this felling plan is to minimise the area felled and to work with the forest owners to develop their future felling plans in the context of the wind farm construction and operation.
- 13.68 In this case, taking into account technical and environmental constraints, a 3.14 ha (100 m radius) 'keyhole' has been adopted around each turbine location for construction, operation and environmental mitigation for the proposed candidate turbine.
- 13.69 Existing roads and ride lines will be used to provide wind farm access where possible, being upgraded as necessary. Due to the width of these existing routes, it is not anticipated that additional felling will be required to provide sufficient access road width. An indicative 25 m corridor has been applied to all new roads to be used for turbine delivery and construction purposes. This would be reviewed at the detailed design stage post consent

and prior to construction. Clearance will also be required to accommodate other infrastructure such as borrow pits and the substation.

- 13.70 The total area of mature forest to be felled is estimated to be up to 34.26 ha. However, existing track and rides that are proposed to be utilised are generally wide enough to accommodate movement of abnormal loads without felling so the actual figure will be less than this. All this felling will be carried out prior to the commencement of construction in a single harvesting operation. This will produce approximately 10,000 tonnes of merchantable timber.
- 13.71 It is recognised that a significant proportion of the development area is at or close to commercial maturity and therefore the keyholing strategy has the potential to result in significant endemic windblow in adjacent tree crops. Therefore, 142.04 ha of additional felling has been identified which would mitigate the risk by felling to wind firm edges. Indicative areas are shown in Figure 13.2. It is anticipated that collaboration with forest owners will result in these areas being incorporated into owners felling plans as part of their normal forest management operations, however, planning permission is sought as part of this Proposed Development to fell these areas in the event that it is required. These areas do not contribute towards the compensatory planting requirements as they would be replanted in situ.
- 13.72 Where young crops are present at 6 No. turbine locations (T3, T5, T8-11), trees will be removed to the 100 m radius from turbine towers, amounting to total removal of 18.84 ha of young crops. Such tree removal will not result in collateral impacts on adjacent crops.

Wind Farm Restocking Plan

- 13.73 The proposed clearfelled 100 m radii will not be restocked so that the long-term technical performance of the turbines is optimised. This permanent loss of woodland and the areas felled to accommodate other infrastructure will be mitigated by compensatory planting.
- 13.74 As noted in paragraph 13.55, a significant proportion of the forest in the area of the Proposed Development is at commercial maturity with felling programmes already underway. It is anticipated that the remaining areas will be the subject of felling by forest owners in the course of the normal forest management planning process. As noted above, the Applicant will collaborate with the forest owners in the execution of these felling plans to mitigate the impact of endemic windblow within the Proposed Development area. This collaboration will also be reflected in the design of proposed restocking in the vicinity of the turbines with restocking being designed in the context of wind turbine locations and technical requirements.
- 13.75 To ensure that turbine performance is maximised, a requirement to maintain a clearance of 10 m above the forestry canopy from the blade tip (i.e. when the blade is in a 6 o'clock position) is needed within the 100-200 m radius from the turbine. The candidate turbine model proposed would result in a clearance above ground level of 45 m i.e. there would be no requirement for felling within the 100 – 200 m radius from the turbine.
- 13.76 However, in order to allow that the final choice of a turbine with longer blades (within the 200 m to tip development parameter) would not be compromised by performance, the

Applicant seeks permission to fell within the 100-200 m area and subsequent canopy management to ensure trees do not grow any taller than 10 m below the 6.0 clock position. Final details around this could be confirmed pursuant to a planning condition. Should any crop exceed this height during the operational life cycle of the Proposed Development it would be considered for felling for wind yield optimisation purposes. In any case, as the majority of the current commercial forest area is close to felling age or is recently planted it is anticipated that this will be a minor issue for the majority of the life of the Proposed Development.

- 13.77 For access tracks, restocking of a 10 m corridor in total is proposed leaving a permanent felling requirement of up to 15 m.
- 13.78 In summary, the areas which will not be restocked are:
- Land required for the Proposed Development infrastructure subject to the buffer zones described above.
 - Land to be left unplanted for wind resource protection and turbine performance purposes.
 - Land to be left unplanted for forest management or forest design purposes, this to be agreed as part of the forest owners' forest management planning process.
- 13.79 In modifying the restocking plan, a number of points would be taken into account as detailed below:
- Fragmentation of coupes to be minimised as much as possible;
 - Coupe shapes would be modified to ensure that access for future forestry operations, principally
 - Harvesting and productivity, is maintained; and
 - Coupe shapes and edges would be modified to follow good practice.
- 13.80 Where relevant to other technical disciplines, the forestry proposals have been considered as part of the EIA process and the effects are reported in the relevant chapters of this EIAR.

Requirement for Compensatory Planting

- 13.81 As a result of the construction of the Proposed Development, there would be a net loss of woodland area. The area of stocked woodland in the study area would decrease 53.1 ha, equivalent to 7.62% of the Site.
- 13.82 In order to comply with the criteria of the Scottish Government's Control of Woodland Removal Policy, off-site compensation planting would be required. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting would be agreed with SF, taking into account any revision to the felling and restocking plans prior to the commencement of operation.

Forestry Waste

- 13.83 SEPA guidance document WST-G-027, "Management of Forestry Waste" (SEPA, 2013) highlights that all waste producers have a statutory duty to adopt the waste hierarchy as per the Waste (Scotland) Regulations 2012 (the Scottish Government, 2012)¹³, which amended Section 34 of the Environmental Protection Act (EPA) 1990 (duty of care) (UK Government, 1990)¹⁴. This places a specific duty on any person who produces, keeps or manages (controlled) waste to take all such measures available to them to apply the waste hierarchy in Article 4 (1) of the revised Waste Framework Directive¹⁵ (rWFD), which is:
- prevention;
 - preparing for re-use;
 - recycling;
 - other recovery, including energy recovery; and
 - disposal, in a way which delivers the best overall environmental outcome.
- 13.84 Further guidance is contained in the document LUPS-GU27, "Use of Trees Clear Felled to Facilitate Proposed Development on Afforested Land" (SEPA, 2014).
- 13.85 A hierarchy of uses for forestry materials is proposed, derived from the waste hierarchy contained within the Regulations, summarised as follows:
- prevention via the production of timber products and associated materials for use in timber and other markets;
 - re-use of materials on site for a valid purpose, where such a use exists e.g. road construction;
 - other recovery via collection and use as biomass for energy recovery or other markets, where not included above; and
 - where no valid on or off-site use can be found for the material, disposal would be in a way that is considered to deliver the best overall environmental outcome.
- 13.86 Where no valid on or off-site use or other disposal method can be found for the material, it should be regarded as waste and handled accordingly. Disposal of timber residues as waste in or on land requires a landfill permit or a waste exemption licence and will be considered the option of last resort.
- 13.87 Stumps would be left in situ as per good practice guidance, except where excavated as part of the construction activities. Excavated stumps would be treated in line with the proposed hierarchy described above.
- 13.88 As noted above, the Proposed Development's infrastructure would be keyholed. The objective would be to recover as much merchantable timber as possible and, failing that, to treat in line with the hierarchy outlined above. Where suitable, whole trees would be extracted and used in the biomass market. As a result, it is anticipated the forestry waste arising from the works would be minimal.

- 13.89 It is proposed that full consideration and further clarification on this issue should be included in a Forestry Waste Management Plan to form part of the Construction Environmental Management Plan (CEMP) during the detailed planning phase following receipt of consent.

Forestry Management Practices

Crop Clearance

- 13.90 Areas of crops of sufficient tree size and standing volume would be harvested conventionally. Timber operations would be undertaken with conventional harvesting and forwarding equipment utilising flotation tracks as required. The flotation devices would be fitted to each machine wheel which would give the machines very low ground pressure and minimises the ground disturbance during the forestry operations.
- 13.91 Stemwood down to 7 cm or below would be removed from site and sold into the timber markets. The harvester would maximise timber recovery wherever possible, this would result in the maximum timber volume being recovered to ensure the volume used in the brash mats would be kept to a minimum. On wetter ground the harvester would build stronger brash mats to ensure there would be minimal damage to the peat and soil structure by the forwarder during extraction. On soft ground, the bottom layers of brash mats become embedded into the soil and removal could result in more environmental damage than leaving the material to naturally degrade.
- 13.92 In areas of young or lower yield class crops, where little or no merchantable timber would be recovered, a number of options could be utilised depending on the factors prevailing at the time of clearance. The methodology used would depend on tree size; site conditions; the availability of suitable equipment; and the markets prevailing at the time of the works being carried out. Where there was suitable access and ground conditions, the trees could be whole harvested and extracted to roadside for chipping as biomass.
- 13.93 Where trees are very small due to age or poor growth, it may be more viable to fell the crop manually using scrub cutters or chainsaws. The end use of the material would depend on the factors mentioned above, but there would be no recoverable material from the young crops cleared.
- 13.94 Stumps would be left in situ as per the guidance contained in the Forestry Commission Research Note "Environmental effects of stump and root harvesting" (Forestry Commission, 2011)¹⁷ except where they would be removed for stone extraction areas, excavated roads, turbine bases and other infrastructure requiring excavation. Such material would be treated as described above.

Restocking & Planting Methodology

- 13.95 Restocking would be carried out to current standard practice and in accordance with the guidelines contained in the UKFS and UKWAS as a minimum, where applicable. Methodology would vary depending on the type of restocking being carried out. The following information is provided for guidance as to the restocking methodology which could be adopted.

13.96 On commercial conifer areas the methodology would normally include:

- Site preparation by machine cultivation and drainage.
- Manual planting.
- Subsequent follow-up establishment operations such as the replacement of failures, weeding and protection measures until the crops are satisfactorily established.
- Replanting would be carried out with the conifer species identified in the restocking plan at the minimum density of 2,500 trees/ha.

13.97 Restocking within the broadleaf woodland areas would be carried out to the same specification with the following changes:

- A lower planting density would be used of 1,600 trees/ha.
- The principal species would be mixed native broadleaves including, for example, downy and silver birch with small components of other species as appropriate to site such as oak, rowan, hazel, gean, grey willow, goat willow, alder and woody shrubs.

Aftercare Works

13.98 Aftercare establishment works would normally include, but are not limited to, the following:

- The woodlands would be beaten up (replacement of failures) to ensure satisfactory stocking levels by year 5, or by year 10 for areas of native broadleaves.
- The woodlands would be weeded as necessary to ensure satisfactory establishment by year 5, or by year 10 for areas of native broadleaves.
- The woodlands would be protected against pine weevils by management inspections and remedial treatment as necessary.
- The woodlands would be protected against browsing damage from wild and domestic animals.
- The woodlands would be protected against fire.
- Fertiliser would be applied as necessary to ensure satisfactory establishment and growth.
- Other works as reasonably required ensuring satisfactory establishment of the woodlands.

Standards and Guidelines

13.99 All forestry operations would be carried out in strict accordance with current good practice and guidelines. This would include, but not be limited to:

- UK Forestry Standard (Forestry Commission 2017);
- Forest Industry Safety Accord Guides¹⁸ (or equivalent) (FISA, 2014); and
- current relevant legislation including, but not limited to, Health and Safety at Work Act 1974 (UK Government, 2014).

Summary

- 13.100 The total study area extends to 696.8 ha and comprises areas of privately owned and managed woodlands. Felling would be carried out on 53.1 ha of woodland as a result of the requirements to construct the Proposed Development, representing a net loss of this area of woodland. Compensatory planting of an equivalent area will be carried out.
- 13.101 The forest area includes three areas close to or at commercial maturity with clearfelling having already been undertaken or planned in the next few years. Therefore, the integration of the Proposed Development with the owners felling programmes will be a dynamic process involving close collaboration with the forest owners.
- 13.102 It is recognised that the maturity of significant areas of tree crops presents a challenge to the keyholing of turbines without a significant risk of wind blow. Therefore, areas of additional felling have been identified which would mitigate the risk by felling to wind firm edges. It is anticipated that collaboration with forest owners will result in these areas being incorporated into owners felling plans as part of their normal forest management operations, however planning permission is sought to fell these areas in the event that it is required at the time of construction.
- 13.103 In order to comply with the Scottish Government's Control of Woodland Removal Policy, compensation planting would be required to mitigate for the loss of woodland area. The Applicant is committed to providing appropriate compensatory planting. The extent, location and composition of such planting would be agreed with SF, taking into account any revision to the felling and restocking plans prior to the commencement of operation.

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