

Key

- Site Boundary
- Forest Sub-compartment

Yield Class

- 0
- 4
- 6
- 8
- 10
- 12
- 14

Scale 1:22,000 @ A3

0 0.5 1 km



Figure 9.6.3
Yield Class Assessment Results (2019)

Strathy South Wind Farm
EIAR 2020

Key

- Site Boundary
- Turbine
- Access track
- Hardstand
- Substation
- Substation Temporary Laydown Area
- Batching Plant
- Amended Laydown Area
- Construction Compound
- Borrow Pit
- LiDAR Track
- Existing Yellow Bog Track, Surfacing to be Upgraded and Minor Localised Widening

Revised Felling Plan

- Construction Felling Year 1
- Year 2 Felling
- Year 3 Felling
- Year 4 Felling
- Year 5 Felling
- Site Investigation Works

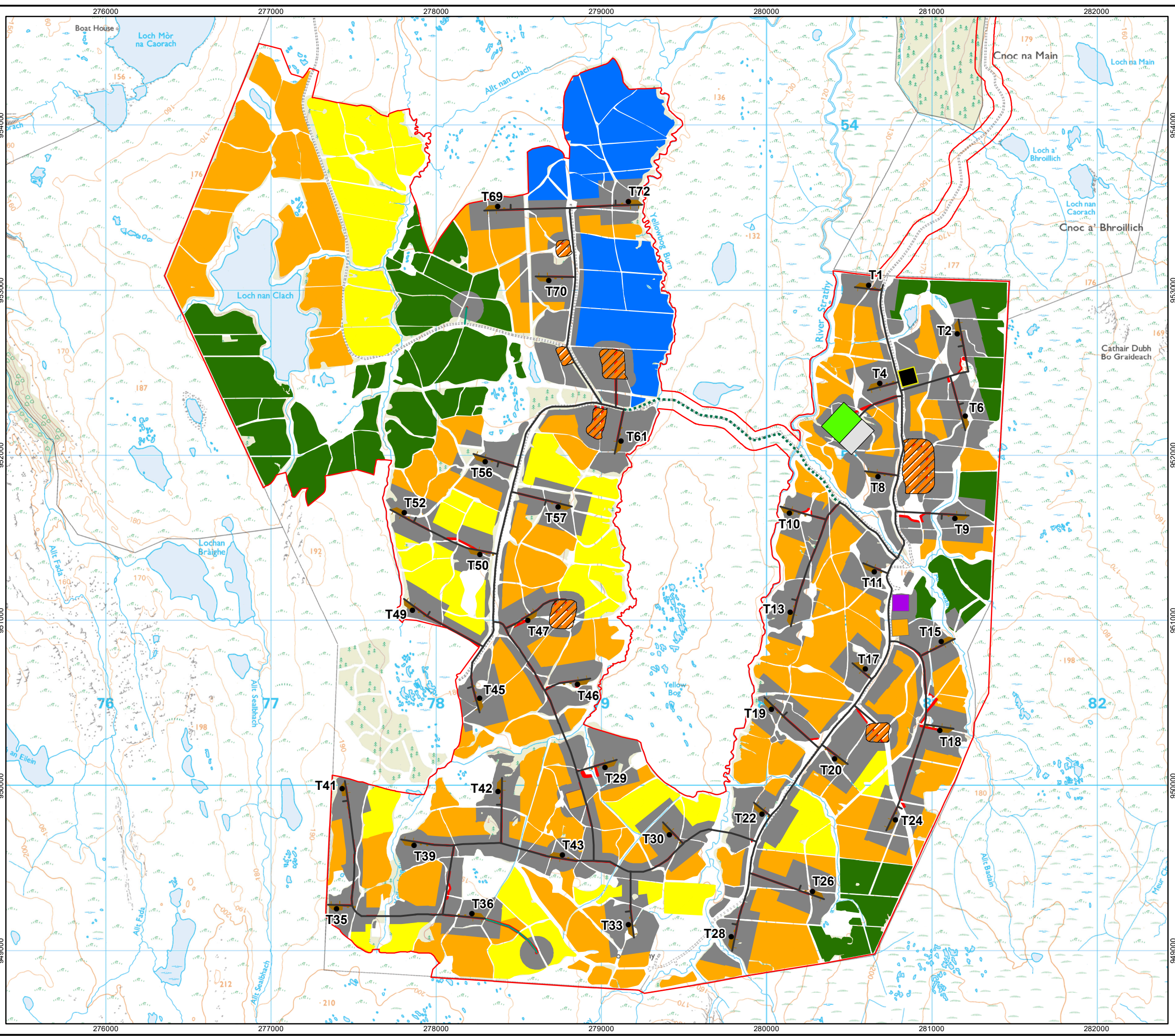


Figure 9.6.4
Phased Forest Removal Plan

Strathy South Wind Farm
EIAR 2020

Appendix 1

**Copy of 2013 ES Addendum: Volume 4: Technical Appendix A11.2:
Management at Strathy South: Forest Removal, Habitat Management
and an Assessment of the Effect on Birds Connected with the Caithness
and Sutherlands Peatlands Special Protection Area (SPA) (non-
confidential)**



STRATHY SOUTH WIND FARM

**TECHNICAL APPENDIX A11.2:
MANAGEMENT AT STRATHY SOUTH:
FOREST REMOVAL, HABITAT
MANAGEMENT AND AN ASSESSMENT
OF THE EFFECTS ON BIRDS
CONNECTED WITH THE CAITHNESS
AND SUTHERLAND PEATLANDS
SPECIAL PROTECTION AREA**

JULY 2013

NON-CONFIDENTIAL VERSION

16 July 2013

Project Number: SEC7232

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Current Status:	Final			
Issue Date:	16 July 2013	Revision Number:	1	
		Revision Notes:	-	
Project File Path:				

This report has been prepared within the RPS Planning and Development Quality Management System to British Standard EN ISO 9001 : 2008

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REPORT TEMPLATE	
TYPE:	Technical
ISSUE DATE:	18 May 2011
REVISION NUMBER:	1
REVISION DATE:	26 April 2012

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1 INTRODUCTION

1.1 Confidentiality Request

The original version of this report contains sensitive information on nesting locations of species protected by Schedule 1 of the Wildlife & Countryside Act 1981 (as amended) and/or Annex I of the EU Birds Directive. Its distribution has therefore been restricted to SSE, SNH and RSPB Scotland. This is the non-confidential version of the document.

1.2 Background

As explained in the Introduction of Technical Appendix A11.1, -Scottish Natural Heritage (SNH) (and the Royal Society for the Protection of Birds, RSPB Scotland) raised a number of objections and concerns in response to a SSE Generation Ltd (SSEG) proposal to build a 77 turbine (177 MW) wind farm at Strathy South, Sutherland in an area currently under commercial forestry plantation.

SSE Renewables (UK) Ltd (SSER) on behalf of SSEG (the applicant) commissioned RPS to carry out a range of studies to address SNH's requirements raised in their letters to SSE dated 25th September 2007 (dealing with habitat and protected species issues) and 2nd October 2007 (dealing with ornithological interests).

Technical Appendix A11.1 (2013 - Confidential) responds to SNH's first set of concerns on the methods and data (items 1-6 of these from their letter).

This document, Technical Appendix A11.2 (2013) is intended to address the following forest clearance concern highlighted by SNH, specifically:-

'A thorough assessment of the effects of forest clearance on bird populations connected with the SPA. There is a risk, not fully explored, that forest clearance and habitat improvement works will result in SPA populations being attracted onto the site and placed at risk of collision with turbine rotors. This is a significant omission. This is because the tree felling and proposed habitat improvement plans are likely to lead to changed use and ultimately increased collision risk to a number of qualifiers. In order to pass the third Natura step outlined in Annex 1 of the letter of 25 September 2007, it will be necessary to demonstrate that the changes in environment will not lead to an increase in risk to qualifiers of the SPA.'

Technical Appendix A11.3 (2013) presents theoretical collision risk modelling results for golden plover and greenshank to supplement collision risk estimates derived from the empirical data.

Technical Appendix A11.4 (2013) assesses the predicted impacts of the proposed wind farm on qualifying species of the Caithness and Sutherland SPA, in relation to the Conservation Objectives for the site. It provides information to inform the Appropriate Assessment by the competent authority and effectively replaces the original ornithological impact assessment contained in the 2007 Strathy North Wind Farm Environmental Statement (ES).

Finally, Technical Appendix A10.6 (2013) addresses the issues previously raised by SNH in relation to habitat impacts, notably on the Caithness and Sutherland Peatlands Special Area of Conservation (SAC) due to access track proposals.

1.3 Purpose of this Technical Appendix A11.2

This Technical Appendix provides a detailed examination of the effects of forest removal on bird species connected with the SPA, and explains how the wind farm site will be managed post-clearance to enable peatland restoration, to benefit other ecological receptors, and also to minimise collision risk to SPA qualifying species.

1.4 Considerations in Relation to Policy and Guidance

One of the main challenges in undertaking this report has been the recent shifts in policy and guidance provided by statutory consultees. Most notably, the Scottish Environmental Protection Agency's (SEPA) emerging policies on mulching has required particular consideration, to meet its requirements driven by waste management legislation, in combination with avian, non-avian and habitat interests.

Within this context, documents that have been taken into account when formulating the proposed approach to plantation removal and the Habitat Management Plan are:

- SNH (*in prep.*) A Review of the Impacts of Terrestrial Wind Farms on Breeding and Wintering Hen Harriers. Draft for Consultation (2nd Revision);
- SNH (2012) Planning for Development: What to Consider and Include in Habitat Management Plans.
- SEPA (2013) Guidance on the Management of Forest Waste.
- SEPA (*in prep.*) Principles for Use of Forest Residue for Peatland Restoration.
- SNH/SEPA/FCS Joint Agency Agreement on Forest Removal and Peatland Restoration;
- FCS (2009) The Scottish Government's Policy on Control of Woodland Removal;
- FCS (2006) Managing Brash on Conifer Clearfell Sites. Practice Note;
- FCS (2005) Protecting the Environment During Mechanised Harvesting Operations. Technical Note;
- FCS (2000) Forest and Peatland Habitats. Guideline Note; and
- FCS (2012) Guidance to Landowners on Forest Set-back for the Caithness and Sutherland Peatlands Natura Site (letter to landowners).

The main implication of this evolving policy and guidance background is a greater emphasis on removal off-site of harvestable timber, with mulching restricted to areas where trees are below a particular size. Further details are provided in Sections 4 and 5 of this Technical Appendix.

1.5 Structure of Technical Appendix A11.2

Section 1 gives the introduction, after which the Technical Appendix is divided into a further five Sections.

Section 2 provides a description of the physical characteristics of the site. To avoid repetition, this information is provided by extensive reference to material presented in the Strathy South Wind Farm 2007 ES and the 2013 Addendum.

Section 3 briefly presents the information collated on the land management in place prior to afforestation, to illuminate the potential breeding bird assemblage that may have been present. The section then details the nature of the afforestation, including site preparation, planting, aftercare, and the characteristics of the current plantation in terms of its composition, structure, yield class and windthrow susceptibility in order to inform management decisions on harvesting and likely post-felling habitats.

Section 4 explains the proposed construction schedule for the wind farm, and how the forest will be cleared as part of the construction process. Several options for forest clearance have been considered, taking into account Forestry Commission Scotland (FCS) policy, ecological, hydrological, landscape, technical, sustainability and financial considerations. The forest utilisation options considered are summarised and the justification given for the approach selected. This Technical Appendix identifies mulching as the preferred method, although there is on-going consideration to diverting a proportion of suitable timber volume for road foundations, and/or for biomass generation on-site or to local schemes if they became available. Whilst technical, financial and sustainability appraisals of these possible options continue, the preliminary indications are that the most suitable approach will be to mulch the low-yield forest and harvest as much of the remainder as possible, with mulching of brash. This has been used as the current basis from which to consider post-construction land management.

Section 5 describes the 25 year programme of land management that will be put in place on site, after plantation removal is complete. The emphasis of this Section is demonstrating it is both feasible and realistic to achieve the type of vegetation sward that will prove peatland restoration benefits without significantly increasing the risk to qualifying species from turbine collisions. In formulating this approach, RPS has consulted with SEPA and SNH to take into account their objectives for tree removal.

Section 6 provides evidence to demonstrate, beyond reasonable scientific doubt, that forest clearance will avoid an increased risk to SPA qualifying species' populations from collision. This answers SNH's seventh concern, by forecasting for each species, the likely character of breeding and foraging activity on site post-clearance, drawing on evidence from:

- The species' known ecology and behaviour from available literature;
- Breeding, foraging and flight activity data from the site, adjacent moorland, and RSPB's Forsinard Flows Reserve (where forest clearance and habitat restoration has been taking place); and
- From local sites where vegetation is comparable to desired characteristics to be achieved on site.

From this combination, it is intended to provide sufficient information to determine that the forest can be cleared and subsequently managed so there is no adverse impact on the integrity of the SPA by the Modified Scheme, either alone or in combination.

This helps to inform the subsequent RPS Technical Appendices, establishing a predicted baseline of bird activity on site, from which collision risk and a full ornithological impact assessment build (Technical Appendices 3 and 4 respectively) and responding to SNH points 8, 9 and 10 (see Technical Appendix A11.1, pp. 5).

1.6 Qualifying Species

Although given in Technical Appendix A11.1, the qualifying species of the Caithness and Sutherland Peatlands SPA are also presented here for ease of reference:-

This site qualifies under Article 4.1 of the Directive (79/409/EEC) by supporting the following important populations of bird species listed on Annex I of the Directive.

During the breeding season:

- Red-throated diver *Gavia stellata*, 89 pairs representing at least 9.5% of the breeding population in Great Britain (Two-year mean, 1993-1994);
- Black-throated diver *Gavia arctica*, 26 pairs representing at least 16.3% of the breeding population in Great Britain (11-year mean, 1986-1996);
- Hen harrier *Circus cyaneus*, 14 pairs representing at least 2.8% of the breeding population in Great Britain (5-year mean, 1993-1997);
- Golden eagle *Aquila chrysaetos*, 5 pairs representing at least 1.3% of the breeding population in Great Britain (Count, as at 1992);
- Merlin *Falco columbarius*, 54 pairs representing at least 4.2% of the breeding population in Great Britain (Count, as at early 1990s);
- Short-eared owl *Asio flammeus*, 30 pairs representing at least 3.0% of the breeding population in Great Britain (Count, as at mid-1990s);
- Golden plover *Pluvialis apricaria*, 1,064 pairs representing at least 4.7% of the breeding population in Great Britain (Count, as at mid-1990s);
- Wood sandpiper *Tringa glareola*, 5 pairs representing up to 50.0% of the breeding population in Great Britain (Two year mean, 1994-1995).

The site also qualifies under Article 4.2 of the Directive (79/409/EEC) by supporting populations of European importance of the following migratory species.

During the breeding season:

- Wigeon *Anas penelope*, 43 pairs representing <0.1% of the breeding Western Siberia/Northwestern/Northeastern Europe population (1994);
- Common scoter *Melanitta nigra*, 27 pairs representing <0.1% of the breeding Western Siberia/Western and Northern Europe/Northwestern Africa population (1996);
- Dunlin *Calidris alpina schinzii*, 1,860 pairs representing at least 16.9% of the breeding Baltic/UK/Ireland population (Count, as at 1994); and
- Greenshank *Tringa nebularia*, 256 pairs representing at least 0.4% of the breeding Europe/Western Africa population (1994/95).

Of these 12 qualifying species, there have been no records of **wigeon** during any of the 2003, 2004, 2007, 2008, 2009, 2010 and 2012 surveys. With regard to **common scoter**, sightings were made in just two years. There was a single record of a male bird on Loch Strathly (Loch ID 178) on the 27th June (although the 2007 ES does not mention the year, one of the 2003 fieldworkers does not recollect it being recorded that year, suggesting the record was from 2004). The only other records were from 2012, when two common scoter flights were recorded on 30th June and 27th July, both near to Loch ID 43 and 45, to the west of the application site (see Figure A11.1.30). No evidence of breeding was recorded in either year.

It is therefore considered valid from this evidence to conclude these species are either, not present, or very rare on site or in its hinterland, and therefore do not need to be considered further in this Technical Appendix.

2 PHYSICAL CHARACTERISTICS OF STRATHY SOUTH

2.1 Landform

The topography and physical features of Strathy South are shown in Technical Appendix A11.1 Figures A11.1.6 – A11.1.13. As can be seen, the site is relatively low lying (varying in altitude between approximately 130 m and 200 m) and is gently undulating. Its western and eastern 'arms' consist of two north/south spurs of land that converge at the site's southern end, to form the upper catchment of the River Strathy. The area surrounding Strathy South consists of open, undulating moorland dominated by blanket bog, lochans and pools.

2.2 Geology

The site's solid geology is described in the Strathy South 2007 ES, so for information, reference should be made to that document.

2.3 Soils

Soil distribution is a factor of topography, geology and drainage in the local area. Soils in the application site consist predominantly of modified blanket peat, with three main soil types:-

- Blanket peat: organic material with a consistently high water table;
- Peat gleys: slowly permeable, seasonally waterlogged clay-like soils with a peaty surface horizon; and
- Peaty podzols: leached soils with a peaty surface layer. The drainage of these soils is dependant on the level of leaching. Peaty podzols are normally free draining, however where strong leaching has occurred sufficient deposition of iron and aluminium in the lower soil horizons may cement the material into a hard impermeable layer, or ironpan, resulting in waterlogging of the profile above. The product of this is a soil intermediate between podzol and gley.

The site mainly comprises peat soils, which are of varying depths. Comprehensive additional peat survey work has been carried out for the 2013 ES Addendum, reported in Chapter A14.

2.4 Peat Characteristics

Strathy South Forest is surrounded by internationally important peatland landscapes and habitats. The site lies within an area of previously open blanket bog and heathland. The results of extensive peat probing and analysis of underlying peat depth, including a peat slide risk assessment are provided in Chapter 14. These surveys indicated that the peat deposits are variable in thickness across the site, ranging from approximately 0.1 to 4.7m.

2.5 Hydrogeology and Hydrology

Details of the hydrogeology and hydrology are contained in the 2007 ES and remain valid so will not be repeated here. In relation to bird interests, the key features are that the site has a small number of pool systems and lochans. Some of these are isolated within the forest, whilst others closer to the forest edge form part of wider wetlands that extend into the adjacent open peatland habitat.

The site lies entirely within the catchment of the River Strathy, which runs south to north through the centre of the site, fed by several small tributaries. These watercourses are flashy with high peak flows and rapid response rates during storm events, and low flows during prolonged dry spells. As shown in Figure A11.1.6 – A11.1.12, there are also a number of small pool systems, un-named and named lochs/lochans within the site boundary, the largest of which is in the north-west, Loch nam Clach.

SEPA have carried out water quality monitoring on the River Strathy which is classified A2 (good).

Anticipated climate change suggests slightly increased temperatures, an increased capacity for the atmosphere to hold water vapour and resultant increases in fluxes of precipitation and evaporation. It is thought this may result in a reduction of summer precipitation and an increase during winter. If this occurs it can be expected that the current hydrological regime of the rivers in the study area will be magnified, with lower low flows in summer and higher and more frequent peak flows in winter.