Forestry and Land Scotland
Coilltearachd agus Fearann Alba

Appendix 5 - Peatland Restoration Plan

See Peatlands and Habitats, Assessed and Restock Maps.

The proposed forest-to-bog restoration is evidenced below and aligns with following key Scottish Government and Scottish Forestry and practice:

- Forestry Commission Scotland (2009). Scottish Government's policy on control of woodland removal: implementation guidance: Annex 3 woodland removal without the requirement for compensatory planting
- Forestry Commission Scotland (2015). Deciding future management operations for afforested deep peatland
- Forest Research (2000). Forests and Peatland Habitats
- Forestry Commission (2017). UK Forestry Standard
- Tackling the Nature Emergency - Scottish biodiversity strategy to 2045

Long Term Vision

The long-term vision for the areas of peatland identified in Strathdon is to restore an area of 8c *Juncus effusus* bog habitat located in the centre of the Bunzeach block for carbon sequestration benefits. Smaller areas of peaty soil were assessed as being too small for peatland restoration works and have been converted to wet woodland habitat with native mixed broadleaves. Two areas that were situated in open managed habitat will continue to be managed as open habitat.

Management objectives

1. Restore and assess the full hydrological unit of the deep peat found in the centre of the Bunzeach to maximise restoration benefits and act as a long-term carbon store, increasing its value for biodiversity and water quality.
2. Produce timber products from the current conifer crop while balancing this with the primary objective of peatland habitat restoration.
3. Control the regeneration of non-native conifers on this peatland restoration area.

Critical success factors

- Utilise appropriate harvesting techniques to minimise ground impacts and so protect the carbon storage potential of the *Juncus effusus* bog habitat.
- Where practical realise the biomass potential of all scrub and harvesting waste, leaving as clean a site as possible to help facilitate peatland restoration.
- Minimise road or track construction and utilise low impact forwarding track methods to minimise surface damage.
- Apply current best practice and expertise in peatland restoration operations, using the NatureScot, Peatland Action Technical Compendium.
- Maintain a level of deer browsing conducive to regeneration of native species.

FLS approach to peatland management

FLS's approach to peatland management is different to the rest of the forest industry. FLS's objectives and legislative framework have an added dimension. Being a Scottish Government agency, FLS has an added 'Biodiversity Duty,' as stated in the Nature Conservation Scotland Act (2004). Protection of conservation values is required as part of UKWAS certification and principles of sustainability are required under the UKFS. This means that for afforested peatlands restoration is considered before deciding if replanting is appropriate. This is set out in Making future management decisions of afforested peatlands Practice Guide. This practice guide outlines how to manage afforested peatlands that are not going to be restored for biodiversity reasons. It states that replanting must be justified by considering if the crop will achieve YC 8 or more for Sitka Spruce. The default is to not replant unless there is evidence it will achieve a good growth rate of harvestable timber. If YC 8 or above is not achievable then restocking peatlands is unsustainable. A slow growing crop will not result in a profit; it will be acting as a carbon source thus contributing to climate change and so society would be disadvantaged or threatened based on current scientific information.

The following tables present current and future management of afforested peatlands for Elchies. Set out in 'Forestry Commission Scotland (2015). Deciding future management operations for afforested deep peatland' are three Scenarios detailing peat types, characteristic habitat, and vegetation. For the tables below, Scenario A peat types are considered as 'presumption to restore' peatlands and Scenario B and C peat types are considered as 'assessed peatlands'.

Table 1: summary current management of peatlands in the LTP area.

Current management of peatlands in the LTP area	Hectares (ha)	Comments
Afforested peaty soils deep peatland	43.7	Total area of afforested peatlands based on analysis of aerial images and soil surveys (ha).
Existing open habitat peaty soils on deep peat	7	Total area of open peatland (ha).
TOTAL – All peaty soils deep peat soils	50.7	Total area size (ha) of deep peaty soils within the forest block area based on the soils data. Deep peat soils are defined as per the SF Practice Guide: Scenario A, B and C soils. Presence of peat soils confirmed via soil surveys.

Table 2: summary of future management of afforested peatlands within the plan period (2026 and 2035).

Future management of afforested peatlands	Hectares (ha)	Comments
'Presumption to restore' peatlands. Forest-to-bog restoration of afforested peatlands including the hydrological catchment	0	Only includes afforested peatlands which lie next to open existing peatlands, or Scenario A peatland types, as per the SF Practice Guide.
'Assessed' peatlands. Forest-to-bog restoration to secure carbon store and sequestration and maximize ecosystem services.	9.5	Only includes Scenario B peatland types, as per the SF Practice Guide. Total area of afforested peatlands that will be restored following an assessment of predicted growth (YC). This is where no evidence found to support the conclusion that the next rotation stand would grow Sitka spruce YC8 or more with minimal disturbance and low level of peatland modifications. The areas of the hydrological units are also included.
Peat Edge Woodland	2.2	Area of native mixed broadleaved planting on Scenario B soils not suitable for peatland restoration (NJ 3675 1049).
Peatland to be restocked	0	
Peatland to be partially restocked	0	

To the south of the Bunzeach block there is approximately 6 ha of 11b [Calluna, *Eriophorum vaginatum* Blanket Bog] which is hydrologically connected to a large expanse of peaty soils on Tillypronie Estate. The condition of the 6 ha is degraded in places. However, given its location and small size restoring the peatland habitat in isolation would be ineffective and challenging to access. If Tillypronie Estate were to undertake peatland restoration works on the adjacent land and funding was available, we would be interested in working with them to restore this area of peatland. At present Tillypronie Estate does not have peatland restoration on its agenda, so there are no plans to undertake any work in the next few years. FLS will continue to explore opportunities to work with neighbours.

Table3: only relevant for Assessed Peatlands (Scenario B and C peat types) where there needs to be clear evidence that restocking on peat soils will produce a yield class equivalent to Sitka spruce 8 or more. Within the plan period.

Attribute described	Description	Location of described attribute
ESC statement, respective to peat types	Soil Nutrient Regime (SNR) is generally poor, SMR (Soil Management Regime) is wet. The harvesting yield class (YC) for the Sitka spruce was variable ranging from 14 -18 YC.	Burn of Blackhillock NJ 3745 0908
Accumulated Annual Temperature	865 (cool)	Burn of Blackhillock NJ 3745 0908
DAMs score	12 (Sheltered)	Burn of Blackhillock NJ 3745 0908
Crop deficiencies (needles, colour, leader length)	The site included an area which was not performing at the predicted Yield Class (14) and had failed despite being ploughed and drained. Given the failing of a second rotation crop, a third rotation would be even more nutrient depleted.	Burn of Blackhillock NJ 3745 0908
Location and extent, proportion of healthy crops (no signs of deficiencies) and reason	For the surveyed site, some of the crop was performing as per the predicted Yield Class (14) as indicated by the harvested yield class for the Sitka spruce which ranged from 14 -18 YC.	Burn of Blackhillock NJ 3745 0908
Statement of correction factors used to predict of next rotation from ESC outputs (drainage, fertilising, flushing, heather control, peat compaction, and the combination of all of these per peat type)	YC predictions in ESC are overly optimist for peat soils, based on several assumptions that appear to be inaccurate. The variable tree sizes means that normal mensuration methods will over-state the actual volume of timber produced, and therefore the actual amount of carbon sequestered over the length of the rotation. In addition, the soil compaction from the first rotation is not considered in the ESC prediction.	Burn of Blackhillock NJ 3745 0908
Statement of actions required to limit carbon loss from peatland soil. For example, partial re-wetting, referencing average water table height and density of drains.	Stump flip and ground smooth all furrows and drains with the addition of peat dams where there is sufficient peat.	Burn of Blackhillock NJ 3745 0908

Attribute described	Description	Location of described attribute
Where Peat Edge Woodland is proposed, confirm, and explain why restoration of deep peatland is not possible	This area was assessed as being too small once operational buffers were applied to the watercourses to merit full restoration. The peaty flushes along the watercourse will be restocked with NMB at 50% with 50% open to create low density wet woodland in matrix with open space. Ground prep will be minimal in this area and opportunities taken to block drains.	Thom a' Chaorainn NJ 3675 1049

Table 4: restoration proposals. Describes the restoration techniques to be applied to the proposed restoration areas.

Attribute described	Description	Location of described attribute
Treatments used to restore the hydrology.	Block artificial drainage features (drains, grips) to re-instate a more natural hydrology and retain more water on a peatland. Any conifer regeneration present will be mulched and removed to prevent further drying of the restoration areas.	Burn of Blackhillock NJ 3745 0908
Treatments used to restore the topography (remove afforestation modifications, and previously hagged sites)	Ground smoothing, to remove the ridges and furrows on previously afforested sites, and to create a flatter topography like near natural peatlands. This aids re-wetting to produce conditions conducive to the recovery of peatland species. The technique must, be used in conjunction with peat dams wherever peat depths allow, to ensure that water preferential pathways do not develop along the base and sides of the drains in the future.	Burn of Blackhillock NJ 3745 0908
Treatments used to counter-act peat cracking or other modifications caused by the afforestation of the peatland	No peat cracking noted on the survey.	Burn of Blackhillock NJ 3745 0908