Commentary on NatureScot's objection in relation to the Priority Peatland habitats at the proposed Cloiche Windfarm

Alba Ecology Ltd.

Dr Kate Massey, MCIEEM

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Registered Office: Coilintra House, High Street, Grantown on Spey, Moray PH26 3EN Tel: 01479 870238, kate@albaecology.co.uk

Introduction

SSE Renewables (SSE) (the Developer) submitted an application on behalf of SSE Generation Ltd (the Applicant) for a 36 turbine wind farm at Cloiche south east of Fort Augustus in May 2020 accompanied by an Environmental Impact Assessment Report (EIAR). NatureScot objected to the proposal on 24th September 2020 stating:

"*We object to this proposal due to significant adverse impacts on the nationally important carbon-rich soils, deep peat and priority peatland habitat which are present on the site. In our view the significant effects of the proposal on this area have not been substantially "overcome through siting, design or other mitigation*".

However, the EIAR for the proposed Cloiche Wind Farm Site (hereafter Cloiche Site) predicted no likely significant residual effects on priority peatland habitats[1].

Post objection, the Developer identified several opportunities to improve the baseline data, provide some alterations to the design proposal and provided an improved and expanded habitat management in the form of peatland restoration. These documents are provided as a package of Additional Information (AI), including an update impact assessment for bog habitats, habitat and vegetation survey baseline reports, habitat loss calculations, habitat restoration opportunities report, an outline habitat management plan (oHMP) and Deer Management Plan (DMP).

This document is a technical appendix to **Chapter 4 – Ecology (Volume 1)** and considers the NatureScot objection and correspondence regarding the proposed Cloiche Wind Farm Application in relation to Scottish Planning Policy (SPP), CIEEM EcIA Guidance (CIEEM, 2019), NatureScot's recent guidance entitled "*Advising on carbon-rich soils, deep peat and priority peatland habitat in development management*" (NatureScot, 2020) as well as the recent Blarghour Wind Farm Determination (Scottish Ministers, 2021) and the draft update to the National Planning Framework (NPF4, 2021).

This document relies on the **AI Technical Appendix 4.2** (Habitat & Vegetation Surveys Report) as well as the Cloiche Wind Farm EIA Report.

Background

Table 1 of SPP identifies carbon-rich soil, deep peat and priority peatland habitat as "*Group 2 – Areas Requiring Significant Protection*". SPP requires "*further consideration*" of wind farm development proposals "*to demonstrate that any significant effects on the qualities of these areas [Group 2] can be substantially overcome by siting, design or other mitigation"*.

In Scotland the assessment of likely significant effects of a proposed development on potentially important ecological receptors is usually conducted through a process known as Ecological Impact Assessment (EcIA). Ecological practitioners are required to follow best

[1] The terms 'blanket bog habitat', carbon-rich soils', 'deep peat' and 'priority peatland habitat' all have specific meaning. Definitions are provided in a glossary at the end of the document.

practice guidance in relation to EcIA. Given the length of time the project has been going for, the best practice EcIA guidance has undergone several updates and changes, and this should be recognised by all parties. The current version of best practice EcIA guidelines is CIEEM, 2018, v1 (2019).

These CIEEM guidelines provide a common framework for users of EcIA, with a scientifically rigorous, objective and transparent approach for assessing the potential impacts of developments on important ecological receptors. The CIEEM EcIA guidelines are intended for use by ecologists undertaking EcIA, and regulators and decision makers, including NatureScot and the relevant planning authority/authorities.

The approach of conducting EcIA following CIEEM best practice guidance has been agreed at a national level with senior representatives of the key organisation and interest groups in Scotland, e.g. NatureScot and Scottish Environment Protection Agency (SEPA).

When considering carbon-rich soils, deep peat and priority peatland habitats in an EcIA, the starting place is likely to be the Carbon and Peatland Map (2016). The Carbon and Peatland Map was developed to provide an initial strategic planning tool that predicts likely areas of carbon-rich soils, deep peat and priority peatland habitat across Scotland. NatureScot notes that site-specific surveys will always be required to confirm the quality and distribution of peatlands across a site. The Carbon and Peatland Map *"is not a definitive guide to the distribution of Carbon-rich soils, deep peat and priority peatland habitat across Scotland*"…"*the location of a proposal in the mapped area does not, in itself, mean that the proposal is unacceptable, or that carbon-rich soils, deep peat and priority peatland habitat will be adversely affected"*, *"…the quality of peatland tends to be highly variable across an application site and a detailed assessment is required to identify the actual effects of the proposal, and to inform the location of site infrastructure*…" (SNH, 2015).

The predictive step of consideration of the Carbon and Peatland Map is therefore superseded by site-specific surveys, for example a National Vegetation Classification (NVC) survey. EcIA uses the site-specific surveys to determine the importance evaluation of the ecological resource and consider the potential impacts and any likely significant effects.

NatureScot's recently published guidance (2020) of development on peatland habitat details how NatureScot should respond to wind farm applications on areas with carbon-rich soils, deep peat and priority peatland habitats. In it they define a 'significant effect' on the qualities of the carbon-rich soils, deep peat and priority peatland habitat as likely to result from:

- *"The complete loss of the resource (for example by excavation, or by covering the area in concrete).*
- *The loss of function of the habitat, whereby the peat, or peatland habitat, is likely to be lost or significantly degraded as a result of the development"* (NatureScot, 2020).

They go on to state "*when a proposal will have significant effects we should advise on this in our response to the application. We should also recommend whether further mitigation is required. However, we will only use an objection when these effects are on peatland habitat which is deemed to be of national interest*".

'National Interest' is not a term used in EcIA. NatureScot state that *"To help determine when a proposal could have a significant effect that is of national interest, we have developed a new assessment framework. This framework starts from the position that national interest will only arise when peatland of the highest quality is lost or damaged. We want to:*

- *avoid any further loss of raised and montane bogs;*
- *minimise the loss of peat-forming blanket bog; and*
- *ensure no net loss of public benefit through effective restoration and management of damaged bog to compensate for any losses.*

Our focus is on peatland habitat. We will not raise national interest matters solely on the carbon implications of new developments, or the impacts on 'deep peat'. The framework adopts elements of the criteria used to select SSSIs and uses information collated from the Environmental Statement (mainly in the Ecology chapter and the Geology and Hydrogeology chapter, together with supporting Appendices) complemented by information on GeoView, aerial photography and other relevant data and additional field observations." (NatureScot, 2020).

It should be noted this NatureScot Guidance Note, and others references, have not been reconsidered in-light of the recent publication of draft NPF4 by Scottish Government.

In summary, an EcIA, using detailed site-specific surveys, is required to consider potential likely significant effects on peatland habitats. NatureScot, according to their guidance (2020), will only object to a wind farm application, if there is considered to be a complete loss of the peatland resource, or loss of function of the peatland resource and the peatland habitat is considered to be of the highest quality, meeting SSSI selection criteria.

Baseline Surveys

The EIA Report (April 2020) Technical Appendix 8.1 for the 36 Scheme provided a broad Phase 1 Habitat survey for the Cloiche Site. The survey identified that ca. 80% of the Site was 'bog'[2], mostly comprised of two Phase 1 Habitats 'blanket bog' and 'wet modified bog'.

NatureScot state in their objection letter that "*There are a number of issues with the information provided in the EIAR. Our scoping advice on mapping and species identification has not been adequately followed*". The EIAR does not provide a full NVC for the Cloiche Site, which would usually be expected on a site comprised mostly of Annex 1 habitats.

Given limitations in the information from the initial baseline survey, further habitat and vegetation surveys were required. Therefore, subsequent to the EIA Report (April 2020) submission and the objection from NatureScot, further vegetation surveys were conducted by Headley (2021) (See **Technical Appendix 4.2**). These provide greater detail and assessment

[2] The term 'bog' is used throughout this report to encompass all 'bog' habitats: blanket bog, wet modified bog and dry modified bog.

for the vegetation communities (to NVC level) and provide detailed comment on the condition of the habitat.

These surveys, along with the other sources of information, have resulted in a high number of experienced habitat surveyors having walked and surveyed the habitats in and around Cloiche Site.

These relevant surveys and reports include:

- Dr Kate Massey and Alastair Miller, 2021. AI Technical Appendix 4.4 Site visit report, Alba Ecology and Wood Plc;
- Dr Alastair Headley. 2021. AI Technical Appendix 4.2 Cloiche Wind Farm: Habitat and vegetation survey and condition assessment of Blanket bog and montane habitats. Plantecol Ltd;
- Ecologist from Ramboll. 2019. EIAR Technical Appendix 8.1 Methodologies and results; and
- Dr Kate Massey. 2011. Stronelairg Wind Farm Technical Appendix 11.2: Stronelairg Phase 1 Habitat Survey and National Vegetation Classification Report. Alba Ecology.

Therefore, there is a large volume of reports, figures, quadrat data, shapefiles and target notes relating to the habitats, plant communities at the Cloiche Site and the condition of the habitats and communities spanning c.10 years. As would be expected there is not full agreement between all surveyors and surveys on aspects such as the location and boundaries of habitats and communities or the naming of the communities and habitats.

This is a well-known and recognised inherent limitation of all habitat survey work, i.e. that independent surveyors interpret and map differently. For example, Hearn *et al*. 2011 demonstrated that when seven experienced NVC surveyors surveyed the same study area within a five-week period, the average proportion of the area that had the same NVC community for each pair-wise comparison of the maps produced by the seven surveyors was 34%. The level of agreement ranged from 5% to 70%. The average level of spatial agreement at the sub-community level was only 19% (9-29%). This clearly demonstrates that the mapping of NVC communities (which are themselves human constructs) has known inherent variation between surveyors. When you consider temporary variation (which spans c.10 years), the variation between surveyors would undoubtedly increase as the vegetation itself may well alter.

Despite the variation between different surveyors and surveys, over the past decade, there is an overall agreement in the prevalence of blanket bog and modified bog and a consistency in the descriptions of erosion and high grazing pressure features, most recently Headley (2021) concluded that the habitats surrounding Cloiche Site did not meet Common Standards Monitoring (CSM) targets and was degraded through high grazing pressure and erosion.

Ecological Impact Assessment (EcIA)

The Cloiche Wind Farm Application was submitted in April 2020. Chapter 8: Ecology completed by Ramboll UK Ltd., cited the CIEEM 2016 EcIA guidance which would have been

current at the time the project began. However, the CIEEM EcIA guidance was updated in 2018 and then again in 2019 (CIEEM) as the project progressed.

The EcIA considered the importance of all 'bog' habitats and assessed them all to be of county importance, which in this case would be Highland. Land-take calculations of the design footprint were conducted to consider the direct impacts on the blanket bog resource. Indirect impacts were calculated by giving a 10m buffer around the design footprint. The land-take calculations show an overall impact on 'bog' habitats as 87.31ha or 4% of the 'bog' resource at the site level.

There were several unexplained elements to these land-take calculations. For example, there was no buffer around the design layout for the operational loss, which would assume there was no impact beyond that of the road, i.e. there was no account of drainage ditches etc. The 10m buffer for indirect impacts would account for these additional impacts, however there was no explanation of why the 10m wide buffer was used universally. In some circumstances this was likely to be too large. For example, the EIAR stated that "*floating tracks would be used on areas of peat deeper than 1m, where practicable*. Floating tracks would likely have little impact beyond the track itself as there would likely be no associated drainage ditch and they would be unlikely to cause changes to the local hydrology.

Calculations of direct and indirect impacts have been recalculated by Plant Ecology using the new design layout and the updated baseline data. For details see **AI Technical Appendix 4.3**.

The original submitted EcIA demonstrated that the overall predicted loss of these habitats, within the Site context, was relatively small representing a loss of c. 4% of the Site resource and no likely significant negative effects were reported for 'bog' habitats. The 29 Turbine Proposed Development would result in a similarly small (4.9%) predicted loss of the Site resource of bog habitats (from a smaller overall Study Area than the previous application).

Peatland restoration proposals identified in EIA Report for the 36 Turbine Scheme were for the restoration and enhancement of a minimum of 13.92ha of blanket bog within the Cloiche Site. Given the predicted loss/modification of c.87ha of 'bog' habitat, the proposed offering was considered too limited. In light of NatureScot's comments, it is considered that a more substantial and ambitious package of peatland restoration and habitat management proposals would be required in order to provide sufficient assurance that adverse construction impacts could be adequately offset and biodiversity enhancement measures offered. A more ambitious peatland restoration package has been presented in **AI Technical Appendix 4.5 oHMP** which offers c. 150 ha of blanket bog restoration at the Cloiche Site and surrounds. This offer is orders of magnitudes greater than the original offer providing > 12.5 times greater area of for peatland restoration than the original offer.

NatureScot's Objection

NatureScot objected to the 36 Turbine Scheme in September 2020, stating:

"*We object to this proposal due to significant adverse impacts on the nationally important carbon-rich soils, deep peat and priority peatland habitat which are present on the site. In our view the significant effects of the proposal on this area have not been substantially "overcome through siting, design or other mitigation*.

We have not been able to identify any mitigation which will address the impacts leading to these objections".

There are clearly three elements to consider based on NatureScot's objection:(i) that nationally important carbon-rich soils, deep peat and priority peatland habitat are present on the site, (ii) consideration that there are 'significant effects', and (iii) that any significant effects cannot be substantially overcome by siting, design or other mitigation.

Quality of the EIAR

The quality of the EIAR in relation to habitats was questioned by NatureScot. An updated EcIA based on the revised 29 Turbine Proposed Development (with specific focus on bog habitats) is presented within the AEI package in **Chapter 4 - Ecology, Volume 1**.

Nationally Important carbon-rich soils, deep peat and priority peatland habitat

As stated in the NatureScot objection letter, much of the Cloiche Site is predicted to be 'Class 1' according to the Carbon and Peatland Map. The Carbon and Peatland Map predicts, c.68%[3]

[3] Using the Application Boundary which was 2082.5ha in size.

of the Cloiche Site is Class 1 and 2% of the Site is predicted to be Class 2, giving a combined, predicted total of 70%. This is all that it does, which essentially triggers the requirement for detailed and empirical site-specific survey information to inform the EcIA. As previously highlighted, the Carbon and Peatland Map is a high-level predictive tool for initial spatial considerations and site-specific habitat surveys supersede the Carbon and Peatland Map (which has no further role in the EcIA process) (Mills *et al.* 2021).

The most recent and detailed specific survey (**AI Technical Appendix 4.2**) identified that a total of c. 55%[4] of the Cloiche Site was 'bog' habitat, the priority peatland habitat of interest. This demonstrates that the Carbon and Peatland maps are not an accurate predictor of even the spatial extent of priority peatland habitats, and this is before quality is considered.

Importantly, there is no presumption against consenting or building wind farms on the mapped nationally important priority peatland resources, as evidenced by SPP, draft NPF4 and the recent consent of the Blarghour Public Inquiry in which Scottish Minsters stated:

"*The Scottish Ministers also agree with the Reporter that the siting of the proposed Development in an area of significant protection does not in itself apply a policy presumption against the proposed Development*" (Blarghour Wind Farm Determination - 29 October 2021).

National Interest

As previously noted, NatureScot's 2020 guidance states that they will only object to an application if there are significant effects on peatland habitats that are of the '*highest quality*' and so of National Interest and meet SSSI selection criteria. This is reflected in NatureScot's objection letter which states:

"*Our own assessment, drawn from information in the EIAR and our site visit, is that*:

- *the development site is dominated by nationally important carbon-rich soils, deep peat and priority peatland habitat, and most of it satisfies our criteria to be considered of National Interest. This is on account of the number of positive indicators and paucity of negative ones. There are also relatively frequent occurrences of Sphagnum fuscum and Betula nana, indicative of a relative absence of disturbance;*

Technical material pertaining to the Cloiche site, prepared by NatureScot following a site visit in 2020, were requested by the Developer in October 2021.Three documents were provided: the National Interest Panel (NIP) checklist; NatureScot's Assessment of Potential Peatland National Importance and National Interest for Cloiche Wind Farm and Cloiche Wind Farm Site Visit Proposed Turbine Locations – Notes.

NatureScot have provided substantially more material and detail for their considerations of the peatland resource at Cloiche Wind Farm than at many other sites which they have objected for similar reasons and the level of detail and consideration they have given is evident.

[4] Using the result from Headley, page 13 "*it appears that about 46% of the area has dry modified blanket bog and only 9% is wet modified bog*".

The NIP checklist and associated documents reveal that NatureScot assess the blanket bog at Cloiche to be of National Interest chiefly because:

- "*10 (of 11 turbines visited) would be on montane bog;*
- *The development is within continuous units of blanket bog >25Ha;*
- *9 of the 11 turbine locations visited were on vegetation capable of forming peat;*
- *the areas in and around the turbines visited have a low frequency of drains / peat cutting; species capable of forming peat and indicating lack of disturbance (e.g. dwarf birch* Betula nana*); natural surface patterns; no woodland/scrub invasion; and*
- *the areas visited contain relatively abundant rusty bog-moss* Sphagnum fuscum *[sensu lato] (which aren't identified in the EIAR)."*

These key aspects for NatureScot defining National Interest are in relation to the SSSI selection criteria (JNCC, 1994 and JNCC 1989) and Annex 2 of NatureScot's Guidance Note (2020) for peatland habitats.

Montane bog

According to Annex 2 of NatureScot's Guidance Note (2020), montane bog supporting 'typical' bog vegetation is '*Possible National Interest'*.

There is no further advice or guidance in the note to distinguish or determine between montane bog that is 'possible National Interest', and when it is of 'National Interest'. However, NatureScot, without any qualification, assume it is of National Interest at Cloiche and state:

"*SNH's guidance for Peatland National Interest identifies that all montane bog is of National Interest*".

This would appear to be in conflict with NatureScot's own Guidance Note (2020), avoiding, as it does, use of objective/scientific criteria.

The montane habitat SSSI selection criteria cover a range of montane habitat types (JNCC, 1989). Where it discusses blanket bog, it acknowledges that it is extensive and characteristic of the uplands. It does not intimate that all upland blanket bog is automatically considered to be of SSSI quality or importance. In NatureScot's Assessment of Potential Peatland National Importance and National Interest for Cloiche Wind Farm NatureScot staff have underlined the word all for emphasis, but there is no clear explanation as to why they have done this and importantly on what evidential basis.

Montane areas clearly have slower, colder growing seasons and impacts therefore can be more exaggerated, or slower to recover from and NatureScot's guidance note does state that "*We want to "avoid any further loss of … montane bogs.* However, in relation to SPP, there is no presumption against consenting or building wind farms on the mapped nationally important priority peatland resources even at high altitude; only that significant effects (which are determined through the EIA process) need to be overcome through siting design or other mitigation.

SSSI selection criteria

The series of bullet points that NatureScot base their National Interest objection on relate to the SSSI selection criteria for bogs and are extracted from the 'site visit template' of their Guidance Note (2020).

The 'site visit template' is an excel spreadsheet which provides a binary tick-box for NatureScot staff to consider conditions/circumstances at each turbine location. However, there are no accompanying definitions, or a transparent scientific approach provided for staff to follow to allow the tick-box exercise to be completed. For Cloiche it was completed at 11 turbine locations (out of 36). All the 11 locations were above 700m in altitude, and in the EIA Report had been identified as being on peat >1m deep.

According to the 'site visit template' NatureScot staff should consider the features of the blanket bog within a stated 250m buffer around the Development Footprint to answer the list of tick-box questions. Each of these questions and NatureScot's response are systematically considered in Table 1.

Criteria	NatureScot's Comment	Alba Ecology Comment
Within a continuous unit of blanket bog >25ha?	The development is within continuous units of blanket bog >25ha.	Agreed. The blanket bog within the Cloiche Site is greater than 25ha in extent. Given the Cloiche Site is set in the Scottish uplands, where bog habitats are ubiquitous, this is not surprising. The EIA Report (April 2020) provides the metric of 464.53ha of blanket bog and 1,650.06ha wet modified bog giving a total of 2114.59ha of the resources combined in a Study Area of 2,639.49ha (i.e. 80% of the Study Area was 'bog' habitat). This is considerably more than 25ha. However, Headley (2021) records a smaller proportion blanket bog habitat than was stated in the EIA Report, stating that "*the extent of the bog communities over-estimates the true extent of the blanket bog habitat…much of the area is a mosaic of these two habitat types [*wet heath and blanket bog*], as a consequence of erosion resulting in areas of wet heath habitat interspersed within the blanket bog habitat*." Figure 13 of **AI Technical Appendix 4.2** (Headley, 2021) clearly demonstrates, that whilst there is a large area of 'bog' it is interspersed with other habitat types, particularly wet heath. It is not a large, continuous expanse of wet active blanket bog.
Blanket bog support vegetation capable of peat formation?	9 of the 11 turbine locations visited were on vegetation capable of forming peat	According to NatureScot's Notes Site Visit (Coupar, 2020), this refers to 9 of the 11 turbines visited being on blanket bog vegetation [one location is referred to as blanket bog vegetation, not capable of forming peat, but the notes say that the grid reference was essentially bare peat]. Consideration of whether vegetation is capable of forming peat is complex. Very simply, the vegetation was of a type that could, given the right conditions form peat, i.e. bog habitat. However, whether the bog is in a condition where it is actually capable of forming peat, i.e. is active, is much more complicated. The term "*active*" is usually taken to indicate the presence of vegetation that is normally peat-forming. However, a vegetation survey provides only limited information to assess whether a blanket bog is actively peat-forming or not because the productivity of the vegetation that forms the peat is balanced by water-logging which normally prevents the complete decomposition of dead plant material. Bog activity is, therefore, dependent on the degree of water-logging (wetness) of a site, along with productivity, and is influenced by a range of other, local and global factors too. The activity of any particular bog is therefore likely to be on a continuum, rather than being either simply 'active' or 'inactive'. For example, bogs may be

Criteria	NatureScot's Comment	Alba Ecology Comment
		active at certain times of year, (e.g. wetter periods) but not in others (drier periods). Likewise, certain areas of a bog may be eroding while others accumulate peat. Within **AI Technical Appendix 4.2**, Headley (2021) states "*The blanket bog at Cloiche in its current state does not have a long-term future without some significant restoration work. This is because the habitat is gradually being eroded and wasted away through microbial oxidation of the peat, even under an intact layer of vegetation. This occurs where the water-table is reduced below the surface of the peat"*. This demonstrates that the water-table is generally too low for the bog to be active, and the 'bog' habitat is currently losing carbon, rather than sequestering it, i.e. the majority of bog in its current condition cannot be defined or classed as normally peat forming.
Few drains/peat cutting	The areas in and around the turbines visited have a low frequency of drains / peat cutting.	There was no evidence of recent peat cuttings at Cloiche. Drainage ditches were occasionally recorded by Longden (2020), but not by Headley (2021). However, drainage from the extensive natural erosion features has resulted in a dry bog surface and was shown to drain large areas of the surrounding blanket bog habitat. Headley (2021) states "*Although there are no drains or peat cuttings, the peatland at Cloiche is heavily drained through an extensive network of gullies and peat haggs*". Erosion features were reported every 50m according to Headley (2021). This causes dewatering of the surrounding bog. Headley (2021) reported impacts of dewatering for 15m either side of erosion features. However, this metric is quite precautionary. NatureScot's Peatland Condition Assessment assumes a 30m drainage influence either side of a feature which would result in most, or all, the blanket bog at the Cloiche Site being considered drained (assuming an erosion feature every 50m).
Peat forming species/low disturbance?	The areas in and around the turbines visited have species capable of forming peat and indicating lack of disturbance (e.g. dwarf birch Betula nana)	Headley (2021) states that "*The plant species indicative of peat formation capability would mostly be the various species of bog-moss and hare's-tail cottongrass. They are present, but in limited in quantity and extent. Using the PAA criteria the principal peat forming bog-mosses are only at sufficient abundance in 36, or 22% of the 165 quadrats assessed. Hare's-tail cottongrass is more widespread, but it is not particularly abundant, with it being present at a cover of 5% or more in only 62 (37%) of the same 165 quadrats"*. This demonstrates (once again) a general lack of species capable of forming peat across the site and indicates the potential limited activity in some areas.

Criteria	NatureScot's Comment	Alba Ecology Comment
		Headley (2021) states "*There is nothing in the selection criteria for biological Sites of Special Scientific Interest as to how much bog-moss cover is required or how many species need to be present for an area of bog to be considered Sphagnum-rich (NCC 1989). However, the CSM guidance for lowland raised bogs and lowland blanket bogs gives a target of at least two of the following species of bog-moss to be present at a frequency of at least 60% and to have a combined cover of at least 20%: S. capillifolium, S. magellanicum, S. papillosum and S. tenellum. An analysis of the data collected from the quadrats on deep peat gives a maximum possible average combined cover of these species of bog-moss of 8.4%. As mentioned above, S. capillifolium is the commonest bog-moss at Cloiche, but it only has a frequency of 42% in the areas of deep peat. Based on these criteria, the bog-moss cover is neither extensive, nor is it particularly species-rich*." This demonstrates that bog-mosses species, arguably the most important for peat formation, were present but had a low overall cover and were not particularly species-rich. Headley (2021) found evidence that most of the dwarf birch (*Betula nana*) within the Cloiche Site was on shallow peat <0.5m in depth. The Cloiche Site has evidently been disturbed by grazing, erosion and the drainage from erosion features and possibly also historical burning. NatureScot themselves note the presence of recent shooting butts. Therefore, the use of dwarf birch as an indicator of lack of disturbance in this case is invalidated by its ecological context. It perhaps demonstrates that there are small, remnant patches of habitat that have not been over grazed, and demonstrates the potential, and need, for restoration. Where feasible, micro-siting could be used to avoid, or minimise impacts upon, remnant patches of dwarf birch encountered during construction if the proposed Cloiche Wind Farm was to be given consent.
Natural surface pattern?	The areas in and around the turbines visited have natural surface patterns.	In near-natural, fully functioning bogs, the vegetation is dominated by peat-forming, wetland species such as bog-mosses and cottongrasses. As well as peat-forming species, the surface of a near-natural bog characteristically displays small-scale surface patterning termed 'micro-topography'. This patterning can be seen as a series of hummocks, lawns and hollows across the surface of the blanket bog, with different bog-moss species occupying different zones of the micro-topography in relation to the water-table (e.g. Lindsay *et al*., 1994a and b). Bog pools are usually a feature of natural surface patterning, especially in the west of Scotland. Bog pools are not noted to be a common feature of the Cloiche Site.

Criteria	NatureScot's Comment	Alba Ecology Comment
		Alastair Headley states "*There is no natural surface patterning of the bog due to the extensive erosion. There has clearly been significant disturbance in the past, almost certainly through high densities of sheep and deer, to result in the peat erosion.*" Appendix 3 – Bare peat map (**AI Technical Appendix 4.2**) demonstrates the extent of bare peat across the site. The surface at Cloiche Site reflects the decades (or likely centuries to millennia) of degradation through grazing and management practices of shooting and possibly historic burning resulting in widespread erosion. This evidence demonstrates that there is no natural surface pattern present at Cloiche Site.
Absence of invasion by woodland/scrub	The areas in and around the turbines visited have no woodland/scrub invasion.	Woodland and scrub invasion was not apparent at Cloiche Site. However, invasion of woodland and some forms of scrub is not an appropriate measure in this instance, given the altitude, the distance from plantation and the high grazing pressure makes it invalid.
Hummocks of *S.fuscum* or *S. austinii*	The areas visited contain relatively abundant rusty bog-moss *Sphagnum fuscum* [sensu lato]	Rusty bog-moss (*S. fuscum*) is generally understood to grow on undisturbed areas of bogs. It was not reported in the previous EIAR but has been reported on in **AI Technical Appendix 4.2**. The site has evidently been disturbed (by grazing, erosion and the drainage from erosion feature and possibly also historical burning) so the use of rusty bog-moss as an indicator of no disturbance in this case is invalidated by its ecological context. At Cloiche there were many examples of rusty bog-moss beside erosion features (e.g. Figure 12 of **AI Technical Appendix 4.2** (Headley, 2021). The presence of this species should be considered a relic of the former bog and potentially demonstrates the suitability of the site for restoration – not that it is a pristine bog, which it most certainly is not. Headley (2021) states: "*Austin's bog-moss is possibly more exacting in its requirement for significantly wet bogs. However, the climate associated with the high altitude nature of the Cloiche site, which results in a greater frequency of rain-days (Bosanquet 2015, Ratcliffe 1968), means that this species may be able to persist on an eroded blanket bog habitat that would not normally be able to support this species at lower elevations where the climate is not so wet and cloudy.*

Criteria	NatureScot's Comment	Alba Ecology Comment
		Where micro-siting of tracks and other wind farm infrastructure is feasible, it should be possible to avoid, or minimise impacts upon, specific locations with dwarf birch and Austin's bog-moss. Rusty bog-moss is sufficiently frequent across the site that the loss of a few hummocks of this species due to construction work, that their loss would not significantly affect the size of the population of this moss at Cloiche. To put the impact of the proposed development into context, the single biggest threat to the bog-mosses at Cloiche is the continued erosion of the blanket bog habitat." These statements demonstrate that that the infrequent hummocks of Austin's bog-moss are not indicating a lack of disturbance in this instance and micro-siting could be used where feasible to avoid, or minimise, impacts. Whereas rusty bog-moss is frequent and the Site population would likely withstand the impact of the 29 Turbine Proposed Development. The proposed restoration from the OHMP (**AI Technical Appendix 4.5**) would likely benefit these species as well as the wider bog community.

Table 2: Consideration of the 'site visit template'

It is clear from Table 1 that, when considered in detail, the only SSSI selection the 'bog' habitat at the Cloiche Site clearly met was that is extended beyond 25ha in size. Beyond that criterion the bog:

- Was not normally capable of forming peat;
- Although there was a low number of drains/peat cutting, there was extensive erosion features that act as drains;
- There was not a high frequency of peat forming species or an indication of a lack of disturbance;
- There was not a natural surface pattern
- Although there was no invasion of woodland or scrub species, this would not be expected on such a site and is invalid

There were however hummocks of rusty bog-moss and Austin's bog-moss. These species are not considered rare in Scotland and are not on the Scottish Biodiversity List. While in some ecological context they may be present in undisturbed habitats, this is not the case at Cloiche Site, as they are clearly in a disturbed setting of heavy erosion and grazing.

One of the SSSI selection criteria, according to JNCC (1994), is "*Blanket bog is a type which should be represented by the selection of exemplary sites showing the full range of ecological variation*". This SSSI selection criteria does not appear to have been considered by NatureScot. The heavily eroded and degraded Cloiche Site is a long way from being exemplary and requires significant peatland restoration to become a functioning bog.

Based on this evidence it is clear that the bog habitat within the Cloiche Site does not meet the SSSI selection criteria for blanket bog and therefore cannot be considered to be of "*the highest quality*" or of National Interest.

Erosion features

NatureScot's objection letter states that:

- *although the area includes numerous erosion features, particularly gullies, these are largely re-vegetated and, on the basis of the evidence, not having a significant effect on the species complement or habitat quality;*

This is despite their apparent need to relocate three of the turbine grid reference locations for comment on the bog vegetation by c.5-10m onto "*original bog surface*" because the grid location was in an area of eroded bare peat. For example, Turbine 35 was commented on as "*Bare peat with scattered tussocks of hare's tail cottongrass scattered shoots of common cottongrass*". It is clear that there were areas which were not 'largely re-vegetated', and the species compliment were impacted as evidenced by their own notes.

Inspection of the Cloiche Site quickly reveals the extensive erosion. Appendix 3 – Bare peat map (**AI Technical Appendix 4.2**) illustrates the extent and frequency of erosion and bare peat across the Cloiche Site.

Further evidence of the high degree of erosion across the Cloiche Site is found in **AI Technical Appendix 4.2** (Headley, 2021), which reports erosion features to be present on average every

50 meters, with the drying effect extending well beyond that. Headley (2021) reported that the "*significant areas of bare peat also mean much of the peatland is losing mass through microbial decomposition as well as losses of particulate and dissolved organic matter. Although areas that are being re-vegetated by cotton-grasses and other species of bog plant, it will take a long time for these areas to start accumulating peat if the water-table is not raised in these gullies and peat flats. In fact, many of the re-vegetated gullies have types of acid grassland vegetation that would not be considered to be capable of accumulating peat"*.

Unquestionably, the majority of the 'bog' habitat at the Cloiche Site has a high degree of erosion and bare peat. Some of which has some level of revegetation with common cottongrass the most commonly colonising species. The degree to which the erosion impacts the surrounding vegetation is therefore of importance.

The IUCN note on blanket bog erosion provides insight into the mechanisms and causes of erosion:

"*the fact that blanket mire erosion is so widespread in the UK originally led to the idea that collapse and erosion of these systems was a natural process and therefore unavoidable. However, little or no convincing evidence has been advanced to underpin this belief. In contrast, a body of evidence has since accumulated which links blanket bog weathering, erosion and instability to a variety of human-induced impacts including fire damage, atmospheric pollution, drainage, track construction, trampling and overgrazing, and even to Neolithic tree-removal from hill slopes on the margins of blanket bog systems*" (Lindsay *et al.*, 1994c).

The IUCN note cautions that "*blanket bogs which have been frequently burned, have been drained, and which have a high grazing and trampling pressure, tend to experience the most severe erosion because they have lost the protective peat-forming acrotelm layer. Perhaps more significantly given recent developments, unprotected catotelm peat tends to dry and crack during dry weather, providing routes for subsequent rainstorms to feed storm-water down to the interface between the overlying mass of peat and the underlying glacial till*". This is describing the situation within the Cloiche Site which is impacted by current and historic management practices, particularly overgrazing.

The IUCN note on drainage states that a common misconception of drainage (apparently held in NatureScot's objection) is "*that drainage impacts are largely confined to drain margins. In fact they can impact across a much wider area – in some cases, across the whole bog"* (Lindsay *et al.,* 1994d). A blanket bog surface, under natural conditions would show micro-topography with hummocks, hollows, lawns and a water-table maintained near the surface. After drainage, these micro-topographic features are lost, replaced with bog vegetation which has patchy bog-mosses and acrotelm (Lindsay *et al*, 1994d). The bog therefore, may "*appear to be largely unaffected*" by the erosion and subsequent drainage, and seem apparently species-rich. However, closer inspection will reveal the lack of the micro-topography, and a loss of diversity (IUNC, 1994b). A generally low abundance and diversity of bog-mosses at the Cloiche Site was reported by Headley (2021).

It is therefore strongly disputed that the extensive erosion features across the Cloiche Site have no impact on the surrounding vegetation.

Conclusion

Site-specific surveys found that the 'bog' habitat at Cloiche was impacted by current and historic land-use practices and was extensively eroded. It was generally considered to be made up of typical species, unlikely to be widely active (although, this does not preclude that peat-formation may occur at some locations under some circumstances) and lacking a natural surface pattern. Although some species that can be representative of low disturbance bog were present, they were not considered to demonstrate this at Cloiche Site due to the evidential disturbance.

The heavily eroded and degraded Cloiche Site did not meet the SSSI selection criteria for blanket bog and is a long way from meeting the SSSI selection criteria of being exemplary. Therefore it is considered that it cannot be of "*the highest quality*" or of National Interest.

Regardless of National Interest, blanket bog activity, the impacts of erosion features, species indicating lack of disturbance, there is no presumption against consenting or building wind farms on the mapped nationally important priority peatland resources even in the montane zone (SPP, Scottish Ministers, 2021). Only, that significant effects are overcome through siting design or other mitigation.

Significant Effects

NatureScot's objection letter (24th September 2020) states: "*The large majority of the habitat losses from the proposed development will be of nationally important, high quality priority peatland habitat*".

The land-take calculations presented in **Chapter 4 - Ecology, Volume 1** and in **Technical Appendix 4.3 – Calculations of direct and indirect impacts** demonstrate that the highest proportion of land-take from the 29 Turbine Proposed Development would be from wet heath 'bog' habitats, which are predicted to be Class 1 and Class 2 peatlands by the Carbon and Peatland map, and so in the context of SPP, these form part of the nationally important peatland resource. They are also Annex 1 habitats and are on the Scottish Biodiversity List. Whist the quality and condition of these habitats is mixed but generally degraded, the empirical land-take calculations clearly demonstrate that the habitat loss will largely be from 'bog' habitats.

However, as stated by SPP, by the recent consent of Blarghour Wind Farm and by NatureScot themselves, the presence of carbon-rich soils, deep peat and priority peatland habitats and impacts on them does not preclude a Wind Farm Application from being made and cannot in itself form the grounds for an objection. The relevant policy wording is that significant effects [if predicted] should be overcome through siting, design and mitigation (SPP, 2020).

The initial EcIA found no likely significant effects for 'bog' habitats neither before or after mitigation (EIA Report, Chapter 8).

Following more detailed baseline surveys and changes in the design layout, the EcIA in relation to 'bog' habitats was redone and is presented in **AI Chapter 4, Volume 1**.

This assessment followed the standard, robust, rigorous and agreed method of assessing likely significant effects through EcIA (i.e. CIEEM, 2019) required in Scotland. In EcIA potential

impacts on receptors are considered in terms of magnitude, extent, duration, frequency and timing, reversibility, sensitivity and whether the impact would likely be positive, negative or neutral.

In EcIA a "*significant effect*" is an effect that either supports or undermines biodiversity conservation objectives for important receptors (CIEEM, 2019). In CIEEM (2019) an ecologically significant effect is defined as "*an impact on the integrity of a defined site or ecosystem and/or the conservation status of habitats or species within a defined geographical area*".

It is clear that the majority of the habitat predicted lost as a result of the Development Footprint would be from wet heath and 'bog' habitats (Table 4.9 and Table 4.10 – **Chapter 4, Volume 1**). However, the widespread occurrence and high density of erosion gullies and peat haggs across the survey area suggests that all of the blanket bog is modified. As the drying out effect of these features can be expected to extend up to 15 metres either side, as estimated NatureScot (2019), over half of the blanket bog has been and continues to be dried out by the erosion.

The results of the assessment of the condition of the blanket bog habitat using the CSM guidance (JNCC 2009) showed that the blanket bog habitat is in poor condition as it failed at least one of the 13 targets at all 77 plots that were located on deep peat (See Table 19). Given the lack of surface water-logging features, and the conditions described, overall, it is considered that the blanket bog at the proposed turbine locations was likely to be largely inactive. Although, this does not preclude that limited peat formation may occur at some locations under some circumstances.

Following best practice CIEEM guidelines the re-assessed EcIA found no likely significant negative residual effects (post mitigation) on 'bog' habitats.

Only a small proportion of the Site resource of blanket bog is predicted to be lost (c. 4.79%) and c.95% of the 'bog' resource on the Cloiche Site remain unaffected.

The original EcIA does not predict any change in the function or structure of the surrounding blanket bog habitat stating that "*floating stone road would be used in areas of peat greater than 1m, where practicable. The track construction would ensure hydraulic connectivity is maintained by including measures such as the inclusion of a non-alkaline porous horizon within the track sub-base to prevent the track structure acting as a barrier to natural hydrogeological processes"*.

Additionally, the blanket bog habitat within the site boundary of the proposed Cloiche Wind Farm is in poor nature conservation condition due mainly to the levels of erosion. The drying effect has resulted in a lower than expected cover of bog-mosses that are required to maintain a good quality bog habitat that is self-sustaining. This extensive erosion means that the hydrological impact of the construction of the infrastructure is likely to be limited. This is because the hydrological units will be limited to the catchments of each erosion gully.

Approximately 2.2km of floating tracks will be installed in areas of deeper peat (>1km) and where bog habitats were identified in better condition, including the north western section of the Site (A' Chraidhleag) immediately adjacent to the existing Stronelairg scheme, and a section to the south of the scheme at Carn na Cloiche. Embedded mitigation could also

include micro-siting (50 m) which could be used where feasible to relocate infrastructure to further avoid, or minimise impact upon, any sensitive habitats, such as bog pools in these areas.

The 'bog' habitat across the Site has already been shown to be widely drained and so any additional drainage impacts would therefore be limited and the effects assessment should consider this fundamental aspect of the existing bog habitat. The drains associated with the tracks would be built to drain the road, and not the bog itself (i.e. they would not be moorland grips but function as drains to the road surface). Furthermore, the advice from the construction team (EIA Report Chapter 3) that "*including measures such as the inclusion of a non-alkaline porous horizon within the track sub-base to prevent the track structure acting as a barrier to natural hydrogeological processes"* and the hydrological assessment (Chapter 10 of the EIA Report) found no likely significant effects on the hydrology.

As the following reports - **AI Technical Appendix 4.2** (Headley (2021), **AI Technical Appendix 4.4** (Massey and Miller (2021)), Rambol (2019) and Massey (2011) demonstrate, the 'bog' habitat at the Cloiche Site is already substantially degraded over large parts (not all) of the Site. Whilst there will be some direct land-take losses to the habitat, and potential indirect impacts beyond that of the development due to small changes in drainage (in an already drained bog), beyond this there is no evidence that the remaining bog will be adversely impacted any further than it already has been through current and historic management practices.

Conclusion

An impact on part of a peatland resource (e.g. 4.7%) does not necessarily equate to a significant effect. Detailed assessment is required to determine likely significant effects. A robust, rigorous assessment of likely significant effects was carried out following CIEEM (2019) guidelines and no likely significant residual effects were reported.

Siting, Design and Mitigation

SPP requires significant effects to be overcome through to siting, design or other mitigation. In EcIA this is usually completed through the mitigation hierarchy as identified in CIEEM (2019):

- Avoid adverse ecological impacts, especially those that could be significant to important receptors.
- Minimise adverse impacts that could not be avoided.
- Compensate for any remaining significant residual impacts.

Best practice guidance recommends seeking to provide net benefits or enhancement for important biodiversity over and above design requirements for avoidance, minimisation or compensation (CIEEM, 2019) and this is substantiated in NPF4.

Detailed consideration of the developer's approach to siting, design or other mitigation is required in SPP (and also within CIEEM EcIA best practice guidance).

In NatureScot's objection letter they state that "*We advise that there will be significant adverse impacts on the nationally important carbon-rich soils, deep peat and priority peatland habitat. In our view the significant effects of the proposal on this area have not been substantially overcome through siting, design or other mitigation, and it is unlikely to be possible to overcome them with a wind farm of this size on this site.*"

Avoidance of impacts on priority peatland habitat is regarded as the first element considered in the mitigation hierarchy. However, avoidance is not the only option for mitigating the impacts for proposed wind farms (Scottish Ministers, 2021). Mitigation through design (i.e. minimisation) and mitigation through compensation are also required to be considered.

AI Chapter 4 (Volume 1) presents measures for avoidance and minimisation through the siting and design of the wind farm, taking into consideration other key constraints (e.g. landscape and visual, ornithology and peat stability). The Chapter 4 assessment of bog habitats also demonstrates mitigation in the form of peatland restoration in key areas.

The assessment demonstrates:

- the modification of three turbine locations in March 2020 to avoid areas of the deepest peat;
- the revised design of the 29 Turbine Proposed Development predicts a much smaller predicted total loss/modification of bog habitat of 43.04 ha, reducing the overall impact on bog habitats by over 50%.
- the use of 2.2km of floating track design; and
- A total of 150 ha of peatland restoration to mitigate impacts on blanket bog.

Based on the previous application for the 36 Turbine Scheme, peatland restoration limited to 13.92 ha was considered to be inadequate for a proposed development of this size and the Developer considered that a more substantial and ambitious package of peatland restoration and habitat management proposals were required. Therefore the AI revised the habitat management plans in the OHMP (Technical Appendix 4.5) which commits to peatland restoration orders of magnitude greater than originally offered.

Further measures for avoidance and minimisation have been identified through the updated baseline surveys and redesign. Further examples of avoidance and minimisation for peatland habitats include:

- Avoidance:
    - The previously proposed 36 Turbine Scheme predicted bog habitats to have the largest land-take, with a predicted total loss/modification of ca. 87 ha of 'bog' habitat. The revised design of the 29 Turbine Proposed Development predicts a much smaller predicted total loss/modification of bog habitat of 43.04 ha, reducing the overall impact on bog habitats by over 50%.
    - This revision also included the modification of three turbine locations in March 2020 to avoid areas of the deepest peat.
    - Borrow pits have wherever possible been located in historically used/disturbed borrow pit locations for the Stronelairg scheme, and thereafter have again

wherever possible sought to avoid blanket bog habitat, favouring wet heath, or a wet heath/blanket bog mosaic.

- Batching plants and the site compound have been sited on previously disturbed ground, and access between western and eastern sections of the Site would utilise existing Stronelairg tracks.

- Minimisation:
  - Approximately 2.2km of floating tracks will be installed in areas of deeper peat (>1km) and where bog habitats were identified in better condition, including the north western section of the Site (A' Chraidhleag) immediately adjacent to the existing Stronelairg scheme, and a section to the south of the scheme at Carn na Cloiche. Embedded mitigation could also include micro-siting (50 m) which could be used where feasible to relocate infrastructure to further avoid, or minimise impacts upon, any sensitive habitats, such as bog pools in these areas and elsewhere, including those supporting species such as dwarf birch and Austin's bog-moss.

Other mitigation, in the form of peatland restoration as both compensation and enhancement has been identified in the oHMP which provides an ambitious peatland restoration package. The oHMP aims to restore and enhance 150 ha of blanket bog habitat including habitats within the Monadhliath Special Area of Conservation (SAC). This is a 12.5x increase in the original peatland restoration offer. Proposals will help encourage vegetation cover of the peatland and limit peat erosion and carbon loss. The peatland restoration may also allow areas of the peatland to become actively peat forming again. Mitigation proposals, will improve the quality and extent of blanket bog and mitigate for habitat loss incurred as well as providing additional enhancement through improvements to the condition of blanket bog habitat within the SAC.

Success of any peatland restoration is considered likely to be heavily reliant on the close monitoring of deer numbers (which is discussed further within the Deer Management Plan (**AI Technical Appendix 4.6**). Currently the pressure on the peatland from deer in particular, within the off-site HMUs is such that they are likely to be a contributing factor towards the continued widespread peat erosion.

Deer will therefore continue to be culled annually on the two estates in line with the regional cull plan put in place by the MDMG. Some of that cull will inevitably be taken from land in and around the HMUs.

Should deer be clearly implicated in the failure of restoration work at a significant scale on these sites (based on annual monitoring), then the estates will consider taking a more targeted cull from in and around these restoration sites. In the first instance this should simply involve taking more of the planned cull from this area. In due course, should this not have the desired effect, the estate should consider culling additional animals from these areas, or if appropriate consider the installation of fencing around HMUs (subject to their considered effectiveness, given the exposure to heavy snow, damage and necessary maintenance required).

This is in line with SPP, CIEEM best practice guidelines as well as the recently published draft National Planning Framework 4 which states: "*that development proposals should provide significant biodiversity enhancements (supporting nature networks and connectivity), in addition to any proposed mitigation*" (draft NPF 4, 2021).

NatureScot state in their Guidance Note that "*We should encourage developers to undertake habitat management and enhancement when peatland habitat is lost to development. In some circumstances, where we consider the likely loss of peatland habitat is of National interest, we should use a conditional objection to ensure than any consent provide adequate compensation for any loss*".

We advise that there has been considerable effort to avoid deep peat and minimise impacts on peatland habitat through design, as evidenced in the recent design alterations. We advise that the large-scale peatland restoration on offer from the oHMP, would not only overcome the significant effect (before mitigation) of the proposed development on the 'bog' habitat, but also provide additional enhancement and benefit by restoring a large area of montane bog that is clearly rapidly degrading and losing peat.

We believe that the EIA Report and subsequent AI materials demonstrate beyond reasonable doubt that the 29 Turbine Proposed Development is in accordance with CIEEM EcIA Guidance, SPP, and NPF4 and that likely significant adverse effects on the Site's bog resource have been overcome through siting, design and other mitigation resulting in no likely significant residual effect on the bog resource. In light of the mitigation it could be argued that the 29 Turbine Proposed Development would have likely significant beneficial effect on the site bog resource and make a valuable contribution to tacking the climate emergency.

Conclusion

In conclusion, the newly submitted baseline data and evaluation of the quality and condition of the 'bog' habitat, the re-design of the Proposed Development, and the associated EcIA process undertaken, which includes mitigation in the form the oHMP with respect to CIEEM best practice guidelines, SPP and draft NPF4, demonstrates no likely significant effects on the Cloiche Site's bog resource.

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Glossary of Terms

The definition of these terms is taken from Mills, Massey and Trinick, 2021.

Blanket bog or 'bog': one of four peat-forming habitats considered to be a peatland, found across many of Scotland's uplands and occupying up to 23% of Scotland's land surface.

Carbon and Peatland 2016 Map: a publicly available map (the '2016 CPP map') showing the predicted distribution of carbon and peatland classes across Scotland (SNH, 2016a).

Carbon-rich soil: any soil with a surface organic layer (the O horizon as defined in the Scottish soil classification), including peaty soils and peat soil (SNH, 2016b).

Class 1: a 2016 CPP map class showing "Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas likely to be of high conservation value. Comprising 'peat soil' and 'peatland' vegetation" (SNH, 2016a).

Class 2: a 2016 CPP map class showing "Nationally important carbon-rich soils, deep peat and priority peatland habitat. Areas of potentially high conservation value and restoration potential. Comprising 'peat soil with occasional peaty soil' and 'peatland [vegetation] or areas with high potential to be restored to peatland" (SNH, 2016a).

Deep peat: a carbon-rich soil with a surface peat layer of greater than 0.5m thickness (in the context of the 2016 CPP map) or a peat layer of greater than 1m thickness (in the context of the Scotland Soil Classification).

Priority peatland habitat: blanket bog, lowland raised bog, lowland fens or uplands flushes, fens and swamps (part only) (SNH, 2016b).