

# Peatland Habitat Restoration Opportunities for Beinn Ghlas Wind Farm Repowering

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Alba Ecology Ltd.

***Dr Kate Massey, MCIEEM***

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*Registered Office: Coilintra House, High Street, Grantown on Spey, Moray, PH26 3EN  
Tel: 01651 851712, [kate@albaecology.co.uk](mailto:kate@albaecology.co.uk)*

## Background

This document has been provided to consider the peatland habitat and peatland restoration opportunities at the Beinn Ghlas Wind Farm Repowering project and to account for the <1:10 (loss:restored) ratio that has been offered as part of the Outline Biodiversity Enhancement and Habitat Management Plan (OBE-HMP). This document should be read alongside:

- Chapter 6: Ecology;
- Technical Appendix 6.2: Beinn Ghlas Wind Farm Repowering Habitat Survey Report;
- Technical Appendix 6.3: Beinn Ghlas Wind Farm Repowering Peatland Condition Assessment (PCA) Survey Report;
- Technical Appendix 6.9: Beinn Ghlas Wind Farm Repowering Vegetation Survey of the Turbine Locations;
- Technical Appendix 6.10: Beinn Ghlas Wind Farm Repowering OBE-HMP;
- Technical Appendix 6.11: Beinn Ghlas Wind Farm Repowering OBE-HMP Walkover Survey Report November 2023;
- Confidential Technical Appendix 6.14: Beinn Ghlas Wind Farm Repowering OBE-HMP Walkover Survey Report - March 2024;

A total of 7.8ha of blanket bog, is predicted to be lost from the Proposed Development (Chapter 6: Ecology). A total of 73.0ha of peatland restoration has been offered as part of the Proposed Development.

## NatureScots Guidance

NatureScot's (NS) guidance (2023) on peatland habitats and developments state that: *"Our current recommendation is that restoration to achieve offsetting (i.e. compensation rather than biodiversity enhancement) would be in the order of 1:10 (lost:restored), i.e. 1ha loss of peatland should result in measures to restore 10ha of peatland, using the same buffer to assess loss and restored areas (e.g. 30m). The basis of this recommendation is:*

*Peatland is an important habitat type, supports biodiversity, and is a key carbon store, especially in a climate and nature crises.*

*Peatland cannot be created in areas where it doesn't already exist. Peatlands only exist in limited situations where the physical (climatic, topographic, hydrology) and chemical (pH and low nutrient availability) conditions allow. In addition peat soils accumulate at a rate of approximately 1mm per year, as such take a long time to recover.*

*Degraded peatland can still be capable of storing carbon and supporting rare species. If the condition is assessed as being degraded, restoration to improve condition and functioning is recommended.*

*Peatland restoration can improve the condition and function of an existing peatland, but crucially it does not increase the extent of peatland. As such, restoration of an area of peatland to offset that which is lost, needs to be greater to that which is lost. It is also important that areas of restoration will restore equivalent habitat to that which will be lost as a result of the development, to ensure that it does not equate to the overall loss of a peatland.*

*Improving habitat and hydrological condition and function is a long-term objective as it can take many years to achieve. It is also not possible to guarantee successful restoration, even when following best practice".*

*We advise that applications proposing less than 1:10 restoration should clearly address the factors noted above as part of their reasoning.*

The reasoning and considerations of each of the factors listed in NS guidance (2023) is shown in Table 1.

According to NS guidance the type of peatland restoration which can be included in the calculation of the 1:10 (lost:restored) ratio metrics are:

- *“tree and scrub removal; and*
- *raising the water level and revegetating bare peat by blocking drains/installing dams/re-profiling peat hags/peat pan restoration”.*

Measures NS consider beneficial but, according to their guidance, should not be included in calculating the 1:10 (lost:restored) ratio metrics are:

- *“if carried out, the cessation of burning/peat cutting; and*
- *proposals to only manage/reduce grazing and browsing levels or other impacts on peatland is not considered as offsetting”.*

NS also recommends an additional 10% peatland restoration is provided as enhancement.

### **Peatland Restoration Opportunities**

During the production of the Proposed Development Application, a great deal of time and effort has been spent attempting to locate and/or acquire land management agreements that would provide a 1:10 (lost:restored) ratio for peatland restoration through tree scrub removal or by raising the water table via peatland restoration techniques (as per NS (2003) guidance). This effort to find potential peatland restoration opportunities is demonstrated in a series of surveys within and around the Application Boundary (e.g. Technical Appendixes 6.3, 6.11 and 6.14).

The initial PCA and OBE-HMP walkover survey identified drainage ditches and erosion features in the entire OBE-HMP Area identified for habitat management (Figure 1). These peatland restoration opportunities are reported on in Technical Appendixes 6.3 and 6.11.

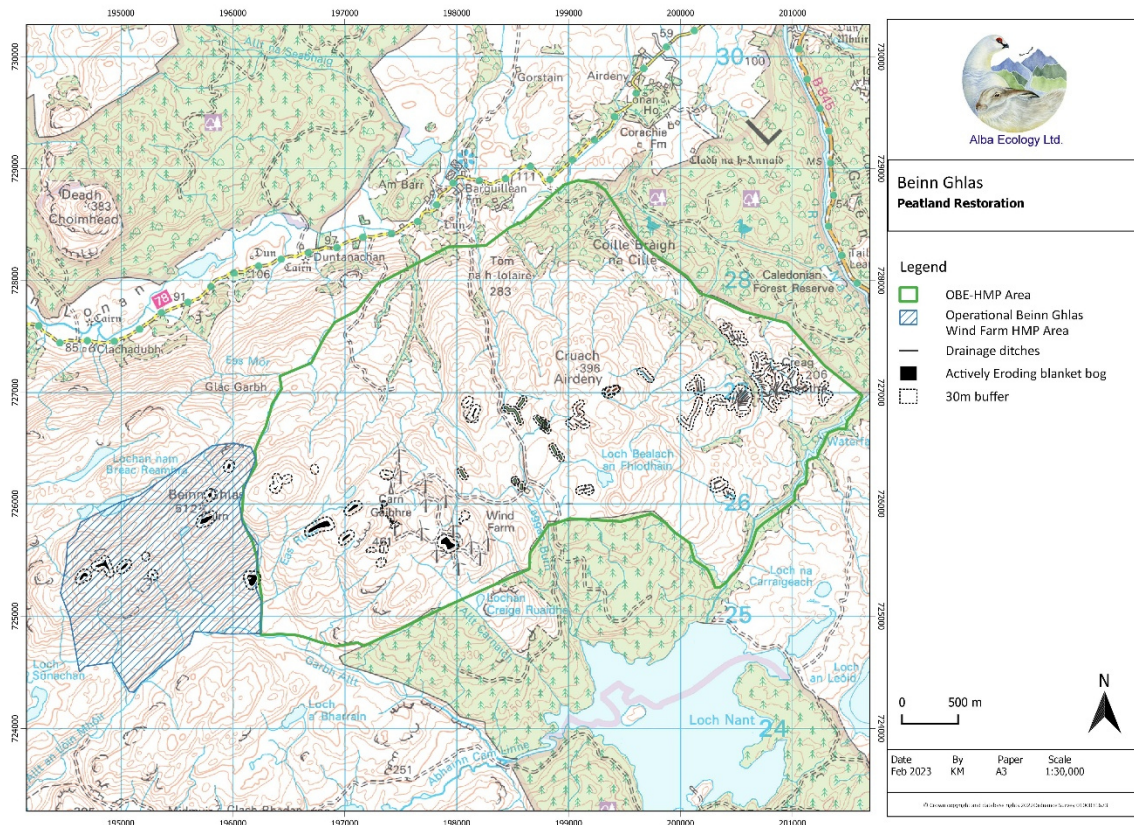


Figure 1: The OBE-HMP Study Area and Operational Beinn Ghlas Wind Farm HMP Area and all the drainage ditches and Actively Eroding bog identified with a 30m buffer.

It was reported that:

*There was a total of c. 720m of drainage ditches identified as part of the Beinn Ghlas PCA survey report. An additional c. 7,220m were identified in the November 2023 giving a total of 7,940m of drainage ditches with the potential for peatland restoration in the whole of the OBE-HMP Study Area (including the Application Boundary). Using a 30m buffer, a total of c. 43.5ha of surrounding habitat (including a mixture of blanket bog and wet heath) could potentially be rewetted as a consequence of drainage ditch blocking (Figure 3).*

*There was a total of 6.2ha of Actively Eroding blanket bog identified as part of the Beinn Ghlas PCA survey report. An additional 0.3ha were identified in November 2023 giving a total area of actively eroding blanket bog of 6.5ha that is suitable for peatland restoration in the whole of the OBE-HMP Study Area (including the Application Boundary) (Figure 3). Placing a 30m buffer around this area results in an additional c. 24.2ha of surrounding habitat that could potentially be re-wetted as a consequence of restoring the Actively Eroding blanket bog. (Technical Appendix 6.11).*

Therefore, there was a total peatland restoration opportunity of c. 73ha (note this is using a 30m buffer; as per Peatland ACTION metrics). There was an estimated blanket bog resource of 260.5ha. This demonstrates that whilst some peatland restoration opportunities were identified, much of the blanket bog was relatively intact with the main impacting factor being grazing pressure and likely historical burning.

A second walkover survey took place in March 2024, where some additional land was considered for peatland restoration opportunities (Technical Appendix 6.14). However, whilst some peatland was located, it was not considered equivalent to the peatland habitat that may



be impacted/lost by the Proposed Development i.e. it was in a lowland setting of rushes and purple moor-grass or wet heath habitat over deep peat and the extent of peatland restoration was relatively small. On the basis of this, and NS guidance (2023) that states “*It is also important that areas of restoration will restore equivalent habitat to that which will be lost as a result of the development*” this area was not considered suitable for compensation/offsetting predicted losses.

The upland habitat where the development is proposed has been, and is still, impacted by grazing pressure from deer and sheep and is largely modified with a reduced bog-moss layer and in some cases widely dominated by e.g. hare’s-tail cottongrass although some Near-Natural blanket bog has been retained (Technical Appendix 6.3). The blanket bog habitat has not been degraded through widespread drainage ditches or allowed to become widely eroded. This is partly due to the warm, wet westerly location where rainfall is high and maintains a relatively wet peatland and partly due to the long-term relatively sensitive management for generations by the landowners, who clearly did not dig 100’s of km of drainage ditches in the 1960’s and 1970’s when that management practice was so common elsewhere.

Delivering on the 10x multiplier is relatively straightforward where historically poor management has occurred on blanket bog habitats resulting in e.g. widespread erosion or multiple drainage ditches but is not possible where these habitats have been relatively sensitively managed.

After consideration of a large area of peatland habitat, only some potential peatland restoration was deemed suitable for inclusion in the lost:restored ratio as per NS (2023) guidance, because few restoration opportunities are readily available. The NS guidance does not appear to adequately consider the possibility (or provide context on what to do) when blanket bog habitats that have been overgrazed, but otherwise managed relatively benignly and so do not afford management opportunities to restore degraded habitats on a site<sup>1</sup>.

Although it is understood that NS guidance (2023) is likely to change/be replaced as a result of the Peat Expert Advisory Group (PEAG), such new guidance was not available at the time this document was produced (June 2025).

The Applicant is committed to restoring all the drainage ditches and Actively Eroding features of equivalent peatland habitat within the OBE-HMP Study Area as well as restoring peatland where the existing wind farm is being removed and utilising all the peat that is being dug up as part of a restoration plan (Technical Appendix 8.3).

Blocking the drainage ditches and reprofiling erosion features would help to re-wet the peatland habitat and likely establish a more natural drainage pattern. This would benefit not only the vegetation but the numerous species that depend upon it such as invertebrates and wading birds. Given the location of the site in the west of Scotland, and the remaining areas of Near-Natural blanket bog, it is likely that at least some of the peatland restoration would result in the creation of wet areas with numerous bog pools and bog-mosses undertaking carbon sequestration – i.e. would become high quality blanket bog and a carbon sink, probably over a relatively short space of time.

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<sup>1</sup> It is widely recognised amongst ecologists/land management professionals, that many Scottish policies and fiscal mechanisms are targeted to support land managers who may have historically poorly managed a resource (from a biodiversity conservation perspective). There is very little policy guidance or indeed financial support for those who have sensitively managed biodiversity on their land for decades/generations.

A total of 73ha of peatland restoration was identified. However, a total of 0.03ha of Actively Eroding bog is predicted to be lost by the permanent land-take (Technical Appendix 6.12) with a total loss of Actively Eroding bog at construction of 0.132. Removing these, and the associated 30m buffer resulted in a total of c. 6.1ha 6.2ha of Actively Eroding blanket bog suitable for restoration and 22.6ha of surrounding habitat that will be re-wetted.

It should be noted that in the land-take calculations a maximum of 10.5m buffer was used around the design layout and included as assessed as potential indirect impacts, whereas a 30m buffer has been used for the peatland restoration opportunities.

A total of c. 71.7ha of peatland restoration (blanket bog and wet heath) has been proposed (using the 30m buffer), which gives a 9.1x multiplier of lost:restored. This is the maximum total area of blanket bog restoration available. With 10.5m buffers this is reduced to c. 29.0ha or 3.7x multiplier. However, 30m is the standard metric used for peatland restoration in e.g. Peatland ACTION projects and so the 9.1x multiplier will be used here.

In addition to this 'active' peatland restoration a commitment to reduce grazing has also been proposed in the OBE-HMP. This includes fencing around the wind turbines to exclude sheep, and deer, plus a commitment to establish and implement a Deer Management Plan in the OBE-HMP Study Area and the operational Beinn Ghlas Wind Farm HMP Area (Figure 1; Technical Appendix 6.13).

- Fencing would lower grazing pressure on c. 146.2ha of land, much of which was either blanket bog habitat or blanket bog habitat in a mosaic with wet heath.
- The OBE-HMP Study Area and operational Beinn Ghlas Wind Farm HMP Area is 1,602ha in size and includes at least 260ha of blanket bog plus areas of wet heath and dry heath (note there has not been a full NVC of the whole of the OBE-HMP Study Area).
- Therefore, the blanket bog predicted to benefit from reduced grazing pressure is at least a 30x greater than the blanket bog predicted to be lost from the Proposed Development.
- The total of all habitats in the OBE-HMP (e.g. wet heath, dry heath and blanket bog) to benefit from reduced grazing pressure is c. 200x the amount of blanket bog to be lost.

A reduction in grazing intensity alone is known to have significant beneficial impacts not just on vegetation but on the wider ecosystem. For example, at Glen Finglas reduced sheep grazing intensity resulted in increased insect and spider species richness and increased mammal density. Recent studies have also demonstrated an increase in priority bird species richness and abundance in areas with reduced sheep grazing (Malm et al., 2020).

NS guidance (2023) states that "*proposals to **only** manage/reduce grazing and browsing levels or other impacts on peatland is not considered as offsetting*". At Beinn Ghlas, the OBE-HMP does not propose to only reduce grazing pressure in isolation but in conjunction with active peatland restoration where appropriate. Therefore, it is advocated that this reduction in grazing pressure measure should be included in the compensation calculations.

It is considered likely that the reduction in grazing pressure would be hugely beneficial for the biodiversity of the blanket bog, and in allowing areas to increase the bog-moss cover and potential sequester additional carbon, as well as being beneficial to many other habitat types. We advocate that this is appropriate peatland restoration for this specific area and should be considered as forming part of the peatland restoration package.

## Conclusion

In conclusion, whilst the Proposed Development has been unable to provide 1:10 (lost:restored) ratio of 'active' peatland restoration or an additional 10% within the available area, this is because the land-manger has historically undertaken relatively benign management across most of their blanket bog habitats. All possible active peatland restoration opportunities have been identified and secured, which amounts to a 9x (lost:restored) as is likely to result in areas of high-quality blanket bog. In addition, reduced grazing and a Deer Management Plan has been offered for a very large area (>30x lost:restored) which is likely to provide site-wide biodiversity enhancement for blanket bog and habitats such as wet and dry heath. Furthermore, additional, non-blanket bog habitat enhancement opportunities in the form of creating and strengthening nature networks, pond creation and target species actions provide an ambitious biodiversity package (in accordance with NPF4) which would not go ahead without the Proposed Development.

Factors to be considered as listed in NS guidance (2023)	Consideration
Peatland is an important habitat type, supports biodiversity, and is a key carbon store, especially in a climate and nature crises.	Peatland is important for the reasons stated. At Beinn Ghlas some of the blanket bog is in a Near-Natural condition and is likely to not just be a carbon store but also a carbon sink. These Near-Natural areas have been avoided by design (Chapter 7). The peatland restoration proposed includes areas where pools have dried out leaving bare exposed and redistributed peat. With sensitive peatland restoration this could be reversed and may result in additional areas with carbon sequestration potential.
Peatland cannot be created in areas where it doesn't already exist. Peatlands only exist in limited situations where the physical (climatic, topographic, hydrology) and chemical (pH and low nutrient availability) conditions allow. In addition peat soils accumulate at a rate of approximately 1mm per year, as such take a long time to recover.	Peatland cannot be created in areas where it hasn't previously existed. However, peatland can be lost. Where there are areas of exposed bare peat, the peat and peatland is currently being lost. Restoring the peatland through revegetation and re-wetting would allow the relatively small areas of peatland habitat currently being lost through erosion to become a carbon store or potentially (given its climatic situation) being a carbon sink.
Degraded peatland can still be capable of storing carbon and supporting rare species. If the condition is assessed as being degraded, restoration to improve condition and functioning is recommended.	All the blanket bog habitat in the OBE-HMP Study Area had been subject to some degree of modification e.g. through climate change and nitrogen deposition, historic burning and drainage and extensive grazing pressure. The condition of the blanket bog habitat was variable across the Study Area and was on a continuum from very wet bog exhibiting characteristics of Near-Natural blanket bog to highly Modified and Actively Eroding areas. Much of the blanket bog was considered to be a carbon store, with the Near-Natural blanket potentially being a carbon sink and areas of actively eroding bog being a carbon source.  The blanket bog supported a range of species, typical of upland and western Scotland. Peatland restoration, including widespread reduction in grazing pressure has been proposed

Factors to be considered as listed in NS guidance (2023)	Consideration
	and would likely improve the condition and functioning of the blanket bog, as well as other habitats including wet heath and dry heath across the OBE-HMP Study Area.
Peatland restoration can improve the condition and function of an existing peatland, but crucially it does not increase the extent of peatland. As such, restoration of an area of peatland to offset that which is lost, needs to be greater to that which is lost. It is also important that areas of restoration will restore equivalent habitat to that which will be lost as a result of the development, to ensure that it does not equate to the overall loss of a peatland.	The peatland restoration, including the 'active' restoration and the reduction in grazing pressure across the OBE-HMP Study Area would no doubt improve the condition and function of an existing peatland.
Improving habitat and hydrological condition and function is a long-term objective as it can take many years to achieve. It is also not possible to guarantee successful restoration, even when following best practice".	The Proposed Development would be involved in the monitoring and responding to the OBE-HMP objectives throughout its life-time (approximately 35 years) and so would be a long-term project. Whilst success is not necessarily guaranteed, the benefits of peatland restoration is widely recognised through large scale peatland restoration projects that Peatland Action and numerous wind farm applications have been involved in. Peatland Action have been developing restoration techniques there are skilled teams of professional peatland restoration operative which can provide on-the ground advice. It is considered likely that in the setting of the wet, warm west of Scotland, peatland restoration would have every opportunity of being successful.

Table 1: The reasoning and considerations of each of the factors listed in NS guidance (2023).