

Technical Appendix 6.6: Peatland Habitat Restoration Opportunities for Neshion Energy Park



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Introduction

This document has been provided to consider the peatland habitat and peatland restoration opportunities at the Neshion Energy Park ('the Proposed Development') and to account for the <1:10 (loss:restored) ratio of active peatland restoration that has been offered as part of the Outline Biodiversity Enhancement and Habitat Management Plan (OBEHMP). This document should be read alongside:

- **Chapter 6: Ecology (EIAR Volume 2);**
- **Technical Appendix 6.2: Habitat Survey Report (EIAR Volume 4);**
- **Technical Appendix 6.3: Vegetation Assessment Report (EIAR Volume 4); and**
- **Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4).**

A total of 23.3ha of bog habitat is predicted to be directly lost from the Proposed Development with a further c. 15.0ha of bog habitat predicted to be indirectly impacted due to the Proposed Development (**Chapter 6: Ecology (EIAR Volume 2)**), giving a total of c. 38.3ha. A total of 247.9ha of active peatland restoration has been offered as part of the Proposed Development within the OBEHMP.

The Proposed Development is a renewable energy development comprised of up to eight wind turbines, a Battery Energy Storage System (BESS) and associated infrastructure adjacent to Sullom Voe Oil Terminal (SVT) and the Shetland Gas Plant in Shetland, Scotland. The Proposed Development is described in **Chapter 2: Proposed Development (EIAR Volume 2)**.

NatureScot's Guidance

NatureScot's (NS) guidance (2023, 2026) on peatland habitats and developments states that: *"Our current recommendation is that restoration to achieve offsetting (i.e. 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) unless it is clearly detailed as to why this has been deviated from. 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 or setting 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, 2026) is provided in **Table 1**.

According to NS guidance the types 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 haggs/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 additional peatland restoration is provided as enhancement.

Peatland Restoration Opportunities

During the production of the Proposed Development EIAR a great deal of time and effort has been spent attempting to locate and secure land management agreements that would provide a 1:10 (lost:restored) ratio for peatland restoration raising the water table via peatland restoration techniques (as per NatureScot (2023, 2026) guidance). Effort to find potential peatland restoration opportunities around the Land Under Applicant's Control is illustrated in **Annex 1**.

Whilst peatland restoration opportunities were not lacking, securing some offsite land management agreements within a suitable time frame has not been possible to date.

Nevertheless, the Applicant is committed to securing additional off-site peatland restoration, along with additional offsite biodiversity enhancement. This is demonstrated in Objective 7 of the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**). The Applicant has shown initiative, by contacting Peatland Action and RSPB and attempting to secure suitable peatland restoration that would benefit the wider community. Dialogue for this is still on going at the time of writing (May 2026). It is considered that any secured restoration and/or enhancement would be submitted as Additional Information.

The Applicant is committed to restoring all the bog habitat within the Land Under Applicant's Control, including Actively Eroding features, drainage ditches, peat cuttings and reseeded grassland on deep peat. The cessation of peat cutting has been agreed. For details see the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat**

Management Plan (EIAR Volume 4)). These measures 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 breeding waders. Given the climatic condition of the Site in Shetland, 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 likely become high quality blanket bog and a carbon sink, probably over a relatively short space of time.

A total of 247.9ha of peatland restoration has been identified to offset the potential loss of 38.3ha of peatland habitat.

It should be noted that the land-take calculations used a 10m buffer for potential indirect impacts. A 2m buffer for cabling and trenching and the cut and fill were already included as temporary but direct impacts. This demonstrates the predicted impacts are likely to be an over estimation of actual impacts; for example the uphill gradient was taken into account, and dewatering is unlikely to reach 10m on an uphill gradient. Also, much of the blanket bog potentially impacted by the Proposed Development would have already been drained by the multiple erosion features and historic drainage ditches present across the Site.

It is noted that a 30m buffer is often used for peatland restoration in Peatland ACTION projects. If a 30m buffer was used for the peatland restoration offered within the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**) a total of 425.2ha¹ of peatland restoration would be predicted. This is 11x the predicted losses from the Proposed Development.

In addition to this ‘active’ peatland restoration a commitment to remove all sheep grazing has also been proposed in the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**) for the first 2-5 years post restoration. The Applicant is willing to support a condition that secures removal of sheep for the first 2 years, post restoration, and that monitoring of the condition of the bog is undertaken to inform future stocking densities (the Applicant would welcome NatureScot’s input into determining sheep stocking densities after 5 years). This equates to a commitment to remove all sheep for the first two to five years and then have substantially reduced grazing pressure within the Land Under Applicant’s Control going forward. This amounts to a total of c. 505ha of bog habitat benefiting from reduced grazing pressure². This is 13x the predicted losses from the Proposed Development.

A reduction in grazing intensity alone is known to have significant beneficial impacts not just on vegetation but on the wider ecosystem function. 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 herbivore impacts (for example grazing, browsing and trampling impacts) on peatland is not considered as offsetting on its own.*” In regard to the Proposed Development, the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**) does

¹ This metric is using a 30m buffer around all erosion features, drainage ditches, peat cuttings and historic ‘flushes’, clipped to within the Land Under Applicant’s Control. Note that indirect drainage impacts would not be impacted by the land boundary and so, using a 30m buffer indirect benefits may be wider than this.

² 505ha is the total amount of bog habitat within the Land Under Applicant’s Control. This metric includes all the bog that would be restored through active peatland restoration techniques.

not propose to only reduce grazing pressure in isolation but in conjunction with other active peatland restoration measures. Therefore, we advocate that this reduction in grazing pressure measure should be legitimately included in the compensation calculation metrics.

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 *Sphagnum*-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 a key 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 Land Under Applicant's Control, the Applicant is seeking to increase this metric with off-site restoration as part of Objective 7 of the OBEHMP (**Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)**).

All possible active peatland restoration opportunities have been identified and secured, within the Land Under Applicant's Control. This amounts to a 6.4x (lost:restored) of peatland restoration using a 10m buffer, or 11x (lost:restored) using a 30m buffer. This 'active' restoration is likely to result in areas of high-quality blanket bog. In addition, removal of all sheep for 2-5 years has been offered, followed by reduced grazing pressure for the life-time of the project. This amounts to (13x lost:restored) of peatland restoration which is likely to provide site-wide biodiversity enhancement for blanket bog and other habitats such as wet heath. Furthermore, additional, non-blanket bog habitat enhancement opportunities in the form of creating and strengthening nature networks, provide an ambitious biodiversity package (in accordance with NPF4) which would not go ahead without the Proposed Development.

Table 1: The reasoning and considerations of each of the factors listed in NatureScot guidance (2023, 2026).

Factors to be considered as listed in NS guidance (2023, 2026)	Consideration
Peatland is an important habitat type, supports biodiversity, and is a key carbon store, especially in a climate and nature crises.	We agree that peatland is important for the reasons stated. At the Site, 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 in some areas. These Near-Natural areas have been avoided by design (Chapter 6: Ecology (EIAR Volume 4)). 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.	We agree that 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, and where there is currently reseeded grassland over deep peat, the habitat has been lost. Restoring the peatland through revegetation and re-wetting would allow the large areas of peatland habitat currently being lost through erosion to become a carbon

Factors to be considered as listed in NS guidance (2023, 2026)	Consideration
	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 Land Under Applicant's Control had been subject to some degree of modification e.g. through climate change and nitrogen deposition, historic burning and drainage, grazing pressure and peat cutting. 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 Shetland. Peatland restoration, including widespread reduction in grazing pressure has been proposed and would likely improve the condition and functioning of the blanket bog, as well as other habitats including wet heath across the Land Under Applicant's Control.
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 Land Under Applicant's Control would no doubt improve the condition and function of the 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 Applicant would be involved in the monitoring and responding to the OBEHMP objectives (Technical Appendix 6.5: Outline Biodiversity Enhancement and Habitat Management Plan (EIAR Volume 4)) throughout its life-time 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 has been developing specific restoration techniques suitable for Shetland. There are skilled, Shetland based teams of professional peatland restoration operatives who can provide on-the ground advice and support. It is considered likely that in the setting of the Shetland (with grazing controlled),

Factors to be considered as listed in NS guidance (2023, 2026)	Consideration
	peatland restoration on the Site would have every opportunity of being successful.

References

Malm, L.E., Pearce-Higgins, J.W., Littlewood, N.A., Karley, A.J., Karaszewska, E., Jaques, J., Pakeman, R.J., Redpath, S.M., Evans, D.M. 2020. *Livestock grazing impacts components of the breeding productivity of a common upland insectivorous passerine: Results from a long-term experiment*. Journal of Applied Ecology. 2020: 00: 1-10.

NatureScot. 2023, updated 2026. Advising on peatland habitats and carbon-rich soils in development management. <https://www.nature.scot/doc/advising-peatland-habitats-and-carbon-rich-soils-development-management>.

Annex 1: Target Notes

Additional opportunities for peatland restoration and other ecological enhancement opportunities were searched for in December 2025.

No.	Grid	Note	Illustrative photo
1	HU 42383 76378.	Downslope from sheiling. Potential site for new a new wader-pool in thick rushy sward. Might attract breeding black-tailed godwit, a high priority species.	
2	HU 42226 76831	Potential bog pool restoration through permanent rewetting. Block far end of pool to stop water leaving and flowing downslope.	
3	HU 43318 76894	Area by existing silage dump potentially suitable for a new wader-scrape.	
4	HU 42876 77991	Grassy riparian corridor potentially suitable for scrub planting. c. 100m in length, 5-10m wide and 1-2m deep height from mineral soil base to adjacent blanket bog surface. Planting possible on non-blanket bog habitats.	
5	HU 41440 78049	Lots of plastic debris along SAC shoreline in Ay Wick (Orka Voe), within c. 20m of otter holt. Could be cleared up regularly as part of biodiversity enhancement. Old fishing nets and pots washed up etc. could pose threat to birds and otters.	

No.	Grid	Note	Illustrative photo
			
6	HU 41459 78022	Location for artificial otter holt. Small unnamed burn runs down slope and enters sea c. 50m from where new holt proposed. Lots of other potential locations present.	
7	HU 41317 77865	Potential riparian broadleaved planting along watercourse corridor, starting 20m up from beach. Corridor heading upstream into sheltered valley from prevailing wind direction. c. 5-10m wide corridor, potentially planting scrub on both sides of this small unnamed burn.	  
8	HU 41210 77183	Example photos of linear ditch feature, suitable for blocking. Although vegetated, still clearly drying out and adversely affecting surrounding bog habitat. Photos taken up and downslope from this location. Restoration potential. Other ditches exist and these	

No.	Grid	Note	Illustrative photo
		photos are illustrative of these potential restoration features.	
9	HU 42673 77777	Extensive area of peat hags near mast. Off-site, but recommend including. Some surface pools, but lots of erosion and bare peat. Hags typically 1m deep, 5-10m in length, some vegetated, some not. Restoration potential.	 
10	HU 42776 77902	Three large erosion channels joint together here. These photos were taken looking east, north and west from this grid reference. At confluence c. 20m wide, 2m deep, with undercut blanket bog edges. The undercut edges created/used by sheep sheltering based on amount of wool present on heather overhangs. Restoration potential.	  

No.	Grid	Note	Illustrative photo
11	HU 427751 77951	Hagging extends in a westerly direction. Restoration potential throughout this very large, heavily eroded area.	
12	HU 42702 77900	Gully (4-10m wide, 1-2m deep) and extensive hagging. Edges unvegetated, lots of bare peat and clearly continually damaged by sheep looking for shelter. Restoration potential.	
13	HU 42601 77817	Extent of wide gully in this area. Restoration potential.	
14	HU 42614 77767	Vegetated gully, with lots of bare hagged edges from sheltering sheep. Although gully base well vegetated, still draining surrounding blanket bog habitat, so needs blocking/infilling. Restoration potential.	

No.	Grid	Note	Illustrative photo
15	HU 42732 77594	Large extensive area of haggging, typically 1-2m deep. Restoration potential in this area.	
16	HU 42819 77604	In the heart of extensive hagged area, with many erosion gullies >2m deep. Some with standing water and vegetated with a little <i>Sphagnum</i> but many just bare peat. Restoration potential.	
17	HU 42857 77606	Some of the largest hags >3m deep from vegetated edge to base. Restoration potential.	
18	HU 42892 77633	Hags close to mast very deep (c. 3m) and extensive. Some pools vegetated with <i>Sphagnum</i> but most not, just bare peat with shallow water. Restoration opportunities.	
19	HU 42964 77610	Looking south towards ferry terminal from near mast. Some hags in distance and the occasional shallow gully. Restoration potential.	

No.	Grid	Note	Illustrative photo
			
20	HU 43308 74625	Riparian planting opportunity. Left channel, parallel to main road. Riparian broadleaved scrub planting potential. Two channels meet here, and both hold suitable grass/rushy riparian habitats for c. 150m upstream from this location c. 5-10m wide and sheltered from prevailing wind direction.	 
21	HU43157 74474	Right-hand channel, suitable from riparian scrub. Planting could go up to c. HU 43096 74491 if no deep peat present.	 
22	HU 43234 74348	Extent of suitable habitat for riparian planting along left channel. However, only potentially suitable, need to avoid deep peat areas.	

No.	Grid	Note	Illustrative photo
			
23	HU 41279 74287	Reseeded grass field, with rushes. Potential for a small wader pool/scrape.	
24	HU 42067 73932	Reseeded grass field. Two potential options. Firstly, create a small wader pool/scrape to help bolster local breeding waders. Or secondly, the field is in a peatland dominated landscape and it is possible the reseeded and liming have changed its surface vegetation only but underlying it lies intact deep peat. If so, could try to restore blanket bog habitats as part of ambitious peatland restoration plans.	
25	HU 42425 74207	Burn of Sandwater. Some of riparian habitat is suitable for native broadleaved scrub planting.	

No.	Grid	Note	Illustrative photo
26	HU 42918 73958	Burn of Sandwater. Some potentially suitable riparian habitats for native broadleaved scrub planting.	
27	HU 43171 73899	Burn of Sandwater. Some suitable riparian habitats for native broadleaved scrub planting.	
28	HU 42436 74168	Burn of Sandwater. Some suitable riparian habitats for native broadleaved scrub planting.	
29	HU 42646 73905	Burn of Sandwater. Some potentially suitable riparian habitats for native broadleaved scrub planting. Variable width, sometimes the Burn of Sandwater disappears for e.g. 25m before reappearing again as @ HU 42748 73906.	

No.	Grid	Note	Illustrative photo
30	HU 42085 73918	Fenceline grazing effects. Note the reseeded grass field in a peatland landscape in the far distance to illustrate how incongruous such fields are. Drainage ditch (vegetated) running across the field. Could be blocked if restoring field to its original peatland habitat.	 The top photograph shows a wide, vegetated drainage ditch running across a grassy field. In the far distance, a reseeded grass field is visible, contrasting with the surrounding peatland landscape. The bottom photograph shows a similar view of a grassy field with a drainage ditch, highlighting the incongruity of the reseeded field in the distance.
31	HU 42251 73859	Potential for small wader pool/scrape in depression in the corner of this grassy field.	 The photograph shows a grassy field with a small depression in the corner, which is identified as a potential site for a small wader pool or scrape. The field is surrounded by a fence line.