7 Ecology

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7 Ecology

7.1 Executive Summary

7.1.1 With the change in layout from the 2020 SEI, an updated impact assessment has been carried out for valuable acid grassland and blanket bog habitats. The assessment made in the 2019 EIA Report remains valid for all other non-avian important ecological features.

7.1.2 Similar to the conclusion in the 2020 SEI, no significant impacts are predicted for valuable acid grassland habitat.

7.1.3 The 2021 Layout (Figure 1.1 of SEI 2) has resulted in a reduction to the permanent loss of blanket bog from a predicted loss of 23.4 ha under the 2020 Layout to 17.5 ha under the 2021 Layout, i.e. a 25% reduction. Temporary losses have been reduced from a predicted loss of 18 ha under the 2020 Layout to 15.6 ha under the 2021 Layout, whereas predicted construction disturbance impacts have been reduced from 7.7 ha to 6 ha. Therefore, the 2021 Layout represents a very significant reduction in permanent loss, temporary loss and construction disturbance impacts to sensitive habitats. Blanket bog is of National importance and therefore the loss of this habitat during the construction phase would remain a significant effect in the absence of any compensation. This is unchanged from the 2020 SEI. The degradation and disturbance effect on blanket bog during operation has reduced and is now assessed as a non-significant effect as a result of the 2021 Layout. All other effects are unchanged from the 2020 SEI and remain non-significant.

7.1.4 A Draft Habitat Management Plan (HMP) for restoration of blanket bog off-site was included with the 2020 SEI. It set out the proposals for areas of off-site degraded blanket bog habitat to be made available for restoration to compensate for these impacts. An updated version of the document, entitled 'Draft Habitat Management Plan 3' is presented as Appendix 7.1. Overall, a net benefit of at least 51 ha blanket bog will be restored offsite, representing 2.9 times the amount being directly lost to the wind farm.

7.2 Introduction

7.2.1 This chapter provides an updated assessment of impacts on ecological features following the proposed change in layout. The 2019 Layout included 29 turbines and associated impacts on important ecological features (IEFs) were assessed in Chapter 7 of the 2019 EIA Report. The 2020 Layout included 23 turbines and associated impacts on IEFs were assessed in Chapter 7 of the 2020 SEI document.

7.2.2 The 2021 Layout and the changes from the 2020 Layout are described in Chapter 3 of this SEI 2.

7.2.3 This chapter of SEI 2 provides an updated impact assessment based on the 2021 Layout. It should be read in conjunction with Chapter 7 of the 2019 EIA Report and Chapter 7 of the 2020 SEI, including figures and technical appendices, where notably the baseline conditions, evaluations and identification of IEFs subject to assessment, which remain valid, are detailed.

7.3 Response to Consultation Responses

7.3.1 As detailed in Chapter 2 of this SEI 2, consultation responses have been received from a range of stakeholders. Points relevant to ecology are reproduced below.

Shetland Islands Council (SIC)

7.3.2 In their response dated 21 May 2021, SIC stated the following specifically related to ecology:

"*a) For the peatland restoration proposed some indication of how peat cutting and grazing will be controlled should be included. It would be useful to set out the details of an estimated programme of monitoring the restoration measures implemented with set benchmarks for when re-profiling of peat hags would be undertaken*."

Response to SIC Point a)

7.3.3 The Applicant acknowledges the points made and will add the detail requested to the final HMP which will be produced post-consent and in consultation with SIC and other key stakeholders.

SEPA

7.3.4 In their response dated 26 October 2020, SEPA made a number of points, including points regarding the offsite habitat management proposals. This was later followed up by a more specific response dated 24 May 2021. In that letter, SEPA stated the following specifically related to ecology[1]:

"*1.4. In order to understand the condition of what will be lost, and the condition improvement needed in the compensatory restoration, inclusion of assessment of the condition of the peat that will be affected by the development using the Strath Caulaidh classification model (e.g. see Tables 1 and 2, Appendix 7.1 Draft Habitat Management Plan, SEI 2020) would be appreciated. Ideally this should be presented as:*

a. *a summary table, with a row each for the permanent loss, the peatland surrounding infrastructure predicted to be subject to degradation during operation and for the area subject to disruption to flows;*

b. *itemised by infrastructural element (i.e. for each turbine/crane hardstanding, track section etc) and*

c. *A peat condition map showing the peat condition class and the infrastructure footprint where loss of peatland will be permanent, plus identifying the peatland that will be subject to disruption to flows and the peatland surrounding infrastructure predicted to be subjected to degradation during operation. It would be helpful if this took the form of a contour map, similar in form to Figure 5 of the Habitat Management Plan Options Areas document.*

[…]

1.7 The applicant should consider the likelihood of full recovery by affected habitats after temporary losses and disturbance during the construction phase, taking into consideration local experience. Where this is unlikely, or is more likely to be a partial recovery, then this should be factored into the requirements for compensation; this should also influence the target outcome for the reinstatement and actions taken to achieve that outcome. Experience on Shetland has shown that after reinstatement a dwarf shrub habitat is more likely to establish than a mire-type of habitat.

1.8 The applicant may wish to expand the objectives for blanket mire in the habitat management plan to include relevant aspects of condition used in the Strath Cauldaidh model of peat condition; in particular, the proportion of water table above main peat mass for majority of the year should be included as this is critical in relation to carbon losses from soil organic matter.

[…]

Comments on Habitat Management Plan Options Areas:

1.11 The condition class information is most welcome and helpful in understanding the potential benefit that may be provided by restoration at the sites at [Area A] *and* [Area B]*. This strongly suggests that the target post-restoration condition is Class 1 Excellent condition, therefore the progress of the restoration should be assessed against the full criteria used to assess the baseline condition (i.e. the aspects of condition in Table 2).*

1.12 Where baseline assessment clearly demonstrates that intervention beyond livestock control is needed to kickstart recovery then these measures should take place, without the need to wait for monitoring results. Measures to cover bare peat to prevent further erosion should be taken

[1]Details of the specific locations of the offsite HMP areas have been redacted owing to site confidentiality at the time of writing.

as soon as possible. Bare peat can become hydrophobic after drying, in which case it may not re-vegetate without intervention.

1.13 It may be necessary to address hydrology in the restoration areas. The presence of field drains within the [Area A] *and* [Area B] *restoration areas should be investigated, and measures to raise the water table must be proposed, where these are required to meet the water table criteria to achieve peat condition classes good or excellent.*"

Response to SEPA Point 1.4

7.3.5 The assessment included in the 2019 EIA Report and also in the 2020 SEI, already assumes that much of the site is high quality peat and peatland habitat. We have taken a precautionary approach and based the impact assessment on the reasonable worst case scenario i.e. to ensure more than adequate compensation. In addition, the Strath Caulaidh peatland classification tool is specifically meant for assessing degraded peatland, not for assessing peatland condition in general. For example, the 2019 Layout was based on good design principles whereby blanket bog with pool complexes were avoided. However, the Strath Caulaidh analysis would not distinguish between such particularly wet areas and other areas of intact blanket bog. It is therefore our opinion that a PCA of the proposed wind farm site is unnecessary. In a meeting with SEPA on 7 July 2021, this was clarified and SEPA agreed that the Strath Caulaidh approach was therefore not suitable for assessing the peatland with the site of the Proposed Development.

7.3.6 However, as agreed with SEPA in the meeting on 7 July 2021 (refer to Chapter 2), a figure is included with this chapter showing where the pool complexes occur in relation to the 2021 Layout, to demonstrate how, through design, impacts to sensitive habitats have been greatly minimised. This is included as Figure 7.1.

Response to SEPA Point 1.7

7.3.7 The Applicant acknowledges the points made. As described in Appendix 7.1 Draft HMP 3, the final HMP, which will be produced post-consent and in consultation with SEPA and other key stakeholders, will take into account experience with peatland restoration from other parts of Shetland and measures will be produced in consultation with the proposed Stakeholder Group which is likely to include SEPA, as well as NatureScot, SIC, the Royal Society for the Protection of Birds (RSPB), Scottish Water (SW) and Shetland Amenity Trust (SAT) in addition to the Applicant.

7.3.8 At the time of writing in August 2021, and in consultation with SEPA and NatureScot, the Applicant is finalising the offsite location of proposed habitat management measures. The characteristics of the two confidential offsite candidate areas are summarised in the Draft HMP 3 in Appendix 7.1, which also describes the management measures.

Response to SEPA Point 1.8

7.3.9 The Applicant acknowledges the point made and has added water table objectives to the Draft HMP 3 in Appendix 7.1. Further detail will be provided in the final HMP, which will be produced post-consent and in consultation with SEPA and other key stakeholders.

7.3.10 **Response to SEPA Points 1.11-13**

7.3.11 The Applicant acknowledges the point made and has added hydrological management to the Draft HMP 3 in Appendix 7.1, with further detail to be provided in the final HMP, which will be produced post-consent and in consultation with SEPA and other key stakeholders.

NatureScot

7.3.12 In their response dated 9 October 2020, NatureScot made a number of points, including points regarding the offsite habitat management proposals. These were later followed up by more specific responses in their response dated 21 May 2021, as follows:

"*We offer the following advice in relation to the proposed Habitat Management Plan Option Areas:*

- *The proposed sites at* [Area A] *and* [Area B] *seem appropriate in terms of the peatland habitats they support and their degraded state. That said, some areas of the* [Area B] *site look extremely eroded and will present significant challenges.*
- *The total area proposed for restoration at* [Area A] *is rather modest given the habitat fragmentation which will result from wind farm construction, the likelihood that not all restoration will be successful, and the time it will take for restored areas to function in the same way as the intact peatland that will be lost.*
- *No information is provided regarding ownership, the views of the owners or whether agreement has been reached over reinstatement. As both areas appear to be on common grazings it will be essential that the Grazings and individual shareholders agree to the terms of the Habitat Management Plan.*
- *Given the severity of the erosion at both sites and the work that will be required to reverse this, it is likely that total exclusion of grazing animals will be required for a number of years after restoration work is completed. If fencing is required to exclude stock then the impacts of that exclusion on the area that remains grazed will need to assessed and addressed."*

Response to NatureScot Bullet 1

7.3.13 The Applicant acknowledges the points made. At the time of writing in August 2021, the Applicant is finalising the locations of proposed offsite habitat management measures in consultation with SEPA and NatureScot. The final HMP will be produced post-consent and in consultation with NatureScot and other key stakeholders. It will include appropriate and realistic management measures for the site taken forward as an HMP management area.

Response to NatureScot Bullet 2

7.3.14 At the time of writing in August 2021, and in consultation with SEPA and NatureScot, the Applicant is finalising the offsite location of proposed offsite habitat management measures described in the Draft HMP 3 in Appendix 7.1. The Applicant is proposing habitat management which will deliver a net benefit of over 51 ha blanket mire restoration at the offsite location, which represents 2.9 times the amount of direct loss from the Proposed Development. It also exceeds the combined impacts from land take and temporary impacts and therefore provides a buffer in acknowledgement that restoration areas may take some time to recover to blanket bog.

Response to NatureScot Bullet 3

7.3.15 The Applicant acknowledges the point made and will add detail on shareholder agreements to the terms of the management works to the final HMP which will be produced post-consent and in consultation with NatureScot and other key stakeholders. We have drafted a condition to this effect that is reproduced in Section 7.6.5.

Response to NatureScot Bullet 4

7.3.16 The Applicant acknowledges the points made and has added assessment of fencing impacts to the Draft HMP 3 in Appendix 7.1. The final HMP, which will be produced post-consent following further site investigations and in consultation with NatureScot and other key stakeholders as per the draft condition reproduced in Section 7.6.5 will include an assessment of the effects of livestock exclusion on areas that remain grazed and how any significant effects will be addressed, or it will describe the process which will be followed if livestock exclusion is needed in the future.

7.4 Potential Effects

Overview

7.4.1 Following the change in design of the Proposed Development a re-assessment of the residual effects of the Proposed Development upon the receptors identified in the 2019 EIA Report and 2020 SEI

has been undertaken. This assessment assumes that all mitigation detailed within the 2019 EIA Report and 2020 SEI is undertaken.

7.4.2 The range of IEFs scoped into the assessment remains as identified in Section 7.7 of the 2019 EIA Report.

7.4.3 The main elements of the Proposed Development that have the potential to impact on IEFs during construction and operation remain the same as described in Section 7.9 of the 2019 EIA Report. However, as shown in Table 3.1 in Chapter 3 of this SEI 2, track construction for the 2021 Layout now involves 2.2 km of new cut track (up from 990 m in the 2020 Layout) and 8.4 km of permanent floating track (down from 12.5 km in the 2020 Layout).

7.4.4 The 2021 Layout includes the removal of five turbines from the 2020 Layout. The location of the remaining 18 turbines have not changed. The location and layout of the Proposed Development infrastructure in the 2021 Layout have only been adjusted slightly within the same habitat compared to the 2020 Layout. A comparison of the 2020 Layout and 2021 Layout can be seen in Figure 3.2. Detailed engineering analysis has enable the infrastructure to occupy a smaller footprint in many cases (as described in Chapter 3). Therefore, impacts on individual IEFs would not be higher than those identified in the 2020 SEI. As such, similar to the 2020 SEI, this chapter updates the assessment for the following IEFs only:

- unimproved acid grassland of the U5 *Nardus stricta-Galium saxatile* and U6 *Juncus squarrosus-Festuca ovina* community types – valued at the Local level; and
- blanket bog, present as M17 *Trichophorum caespitosum-Eriophorum vaginatum* blanket mire and as a variety of mosaic components, including the M1, M2 and M3 bog pool communities – valued at the National level.

7.4.5 Nevertheless, similar to the 2019 EIA Report and the 2020 SEI, all habitat loss calculations are included within Table 7.1.

7.4.6 Figure 7.1 of this SEI 2 shows the National Vegetation Classification map updated with the 2021 Layout. It also shows the locations of the very wet areas of blanket mire that contain pool complexes.

Habitat Loss

7.4.7 Habitat losses to the Proposed Development have been calculated using the assumptions stated in Sections 7.9.5-6 of the 2019 EIA Report. Table 7.1 summarises the permanent and temporary habitat losses, construction phase disturbance to habitats, as well as degradation (drying) of peatland habitats and disruption of water flows during the operational phase. These values are provided for both the 2020 and 2021 Layouts. For transparency, values are provided for all affected habitats, regardless of whether they are IEFs.

Table 7.1 - Summary of Habitat Lost to Proposed Development Footprint under the 2020 Layout and the 2021 Layout

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
IEFs												
Unimproved acid grassland and unimproved acid grassland-dominated mosaics												
Unimproved acid grassland	U5	50,352	2,867	2,988	0	0	435	462	n/a	n/a	n/a	n/a
	U5b/U5a	300,400	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U5b	8,612	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6a	19,358	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6a/U6d	56,594	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6d/U4a	8,644	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Unimproved acid grassland and acid	U6d/D1.1	5,517	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6d/H12c/U6a	5,030	0	0	0	0	0	0	n/a	n/a	n/a	n/a

[2] National Vegetation Classification codes are shown, where available, whereas Phase 1 habitat code are provided for habitats not included in the NVC or where the vegetation within a given polygon could not be ascribed to an NVC community. They include instances of D1.1 dry heath, E4 bare peat, G1.3 oligotrophic open water, G1.4 dystrophic open water, and J5 hardstanding. Mosaics are listed with codes in order of abundance.

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
dry dwarf shrub heath mosaic	U6d/U6a/U4a/ D1.1	16,363	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6d/U6a/U5a/ D1.1	15,970	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6a/U6d/H12c/ D1.1	14,754	510	0	0	0	215	0	n/a	n/a	n/a	n/a
	U6d/H12c/D1.1	22,495	1,213	1,268	0	0	497	501	n/a	n/a	n/a	n/a
Unimproved acid grassland and marshy grassland (rush pasture) mosaic	U6d/U6a/M23b	36,716	285	336	0	0	120	131	n/a	n/a	n/a	n/a
	U6d/U6a/M23b/ U5a/U5b	27,534	131	148	0	0	60	63	n/a	n/a	n/a	n/a
Unimproved acid grassland and blanket bog mosaic	U6d/M17c	2,779	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	U6d/M2	2,388	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Unimproved acid grassland and acid flush mosaic	U6d/U6a/M6c	4,912	0	0	0	0	0	0	n/a	n/a	n/a	n/a

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Total for grassland IEFs		*598,418*	*5,006*	*4,740*	*0*	*0*	*1,327*	*1,157*	*n/a*	*n/a*	*n/a*	*n/a*
Reduction in impact 2020-2021 (m^2)			*266*		*0*		*171*		*n/a*		*n/a*	
Reduction in impact 2020-2021 (%)			*5.31*		*0*		*12.85*		*n/a*		*n/a*	
Blanket bog and blanket bog-dominated mosaics												
Blanket bog	M17b	12,258,852	213,201	158,746	169,817	151,334	69,361	54,100	69,361	54,100	101,544	80,082
Bog pool	M1	1,064	0	0	0	0	0	0	n/a	n/a	0	0
	M2	3,163	206	143	0	26	63	56	n/a	n/a	88	87
Blanket bog and bog pool mosaic	M17b/M3/M2/ M1	103,435	0	0	0	0	0	0	0	0	0	0
	M17b/M3/M2	422,706	17,144	13,630	1,164	1,774	4,776	4,795	4,776	4,795	7,132	7,134
	M17b/M2	22,566	0	0	0	0	0	0	0	0	0	0
	M17b/M3	7,515	0	0	972	2,151	165	201	165	201	257	312
	M17b/M2/M3/ E4	84,515	0	0	532	308	145	126	145	126	233	212

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Blanket bog, bog pool and bare peat mosaic	M17b/M3/M2/ E4	8,474	0	0	0	0	0	0	0	0	0	0
	M17b/E4/M3	69,557	0	0	0	0	0	0	0	0	0	0
Blanket bog, bog pool and open water mosaic	M17b/M2/M3/ G1.4	449,635	0	0	0	0	0	0	0	0	0	0
	M17b/M3/M2/ G1.4	389,669	0	0	0	0	0	0	0	0	0	0
	M17b/M2/G1.4	129,955	0	0	0	0	0	0	0	0	0	0
	M17b/M3/G1.4	178,992	0	0	0	0	0	0	0	0	0	0
Blanket bog, bog pool, bare peat and open water mosaic	M17b/M2/M3/ E4/G1.3	549,364	3,598	2,105	7,826	0	1,985	776	1,985	732	2,918	1,022
	M17b/M3/G1.3	151,597	0	0	0	0	0	0	0	0	0	0
	M17b/M3/E4/ G1.4	76,021	0	0	0	0	0	0	0	0	0	0
Blanket bog and open water mosaic	M17b/G1.4	13,420	0	0	0	0	0	0	0	0	0	0

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Blanket bog and acid grassland mosaic	M17b/U5a	17,055	0	0	0	0	0	0	0	0	0	0
	M17b/U5b	18,171	0	0	0	0	0	0	0	0	0	0
	M17a/U6d	10,247	0	0	0	0	0	0	0	0	0	0
Blanket bog and dwarf shrub heath mosaic	M17b/D1.1	15,421	0	4	0	355	7	97	7	97	70	169
Total for blanket bog IEFs		*14,981,394*	*234,149*	*174,628*	*180,311*	*155,948*	*76,502*	*60,151*	*76,439*	*60,051*	*112,242*	*89,018*
Reduction in impact 2020-2021 (m^2)			59,521		*24,363*		*16,351*		16,388		23,224	
Reduction in impact 2020-2021 (%)			25.42		13.51		21.37		21.44		20.69	
Non-IEFs												
Grassland and grassland-dominated mosaics												
Unimproved acid grassland	U4a	2,616	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Improved acid grassland	U4b	1,957	0	0	0	0	0	0	n/a	n/a	n/a	n/a

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Marshy grassland (rush pasture) and acid grassland mosaic	M23b/U6a/U6d	8,761	183	197	0	0	89	92	n/a	n/a	n/a	n/a
Heath and heath-dominated mosaics												
Acid dry dwarf shrub heath	D1.1	204,893	2,209	2,416	154	304	889	818	n/a	n/a	n/a	n/a
	H12c	68,940	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Acid dry dwarf shrub heath and acid grassland mosaic	D1.1/U6d	47,492	1,694	3,725	10,961	9,584	1,267	1,496	n/a	n/a	n/a	n/a
	D1.1/U6d/U6a	22,660	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	D1.1/U6d/U6c	108,325	344	340	17,527	19,984	844	908	n/a	n/a	n/a	n/a
	H12c/U5b/U6a/U6d	65,983	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	H12c/U6a/U6d	34,565	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	H12c/U6d	1,481	0	0	0	0	0	0	n/a	n/a	n/a	n/a

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	2021	2020	2021	2020	2021	2020	2021	2020	2021
Acid dry dwarf shrub heath, acid grassland and marshy grassland (rush pasture) mosaic	D1.1/U6d/U6a/ U5a/M23b	56,351	452	475	0	0	192	191	n/a	n/a	n/a	n/a
Acid dry dwarf shrub heath and blanket bog mosaic	D1.1/M17b	21,224	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Acid dry dwarf shrub heath, acid grassland and blanket bog mosaic	D1.1/U6d/M17b	9,968	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Flush and spring												
Acid flush	M6	4,464	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Acid flush, bog pool and spring mosaic	M6/M1/M2/M3/ M29	3,712	0	0	0	0	0	0	n/a	n/a	n/a	n/a
	M6b/M29/M1	6,236	0	0	0	0	0	0	n/a	n/a	n/a	n/a

Broad habitat	Habitat/ vegetation code[2]	Extent within Site boundary (m^2)	Permanent loss (m^2)		Temporary loss during construction (m^2)		Construction disturbance (m^2)		Operational degradation of peat (m^2)		Disruption of water flows (m^2)	
			2020	**2021**	**2020**	**2021**	**2020**	**2021**	**2020**	**2021**	**2020**	**2021**
Spring	M29	8,499	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Open water												
Dystrophic open water	G1.4	598,248	0	0	0	0	0	0	n/a	n/a	n/a	n/a
Other												
Hardstanding	J5	39,729	4,469	5,036	n/a	n/a	n/a	n/a	n/a	n/a	n/a	n/a
Grand total for all habitats		**16,895,914**	**248,507**	**191,557**	**208,953**	**185,820**	**81,110**	**64,813**	**76,439**	**60,095**	**112,242**	**89,018**
Reduction in impact 2020-2021 (m^2) (all habitats)			56,949		23,133		16,298		16,344		23,224	
Reduction in impact 2020-2021 (%) (all habitats)			22.92		11.07		20.09		21.38		20.69	

Construction

7.4.8 During the construction phase habitat IEFs will be impacted through permanent loss, temporary loss and temporary disturbance of habitats.

Unimproved acid grassland

7.4.9 As detailed in Table 7.1, the cover of U5 and U6 acid grasslands (including mosaics dominated by either type) amounts to 598,418 m^2 (c.59.8 ha). This represents 3.5% of the area within the site boundary.

7.4.10 Following the assumptions listed in paragraph 7.9.5 of the 2019 EIA Report, as shown in Table 7.1 a total of 4,740 m^2 of the IEF will be permanently lost. This represents 0.79% of the IEF within the site boundary and is a 5.31% reduction from the predicted loss of 5,006 m^2 under the 2020 Layout. This permanent loss is a **low** impact and **not significant**.

7.4.11 Similarly to the 2020 Layout, no temporary loss of the IEF is predicted under the 2021 Layout.

7.4.12 Construction disturbance is predicted to temporarily affect 1,157 m^2. This is a 12.85% reduction from the predicted disturbance of 1,327 m^2 under the 2020 Layout and represents 0.19% of the grassland IEF within the site boundary. This temporary disturbance is a **barely perceptible** impact on this feature of Local value and the effect is **not significant** under the EIA Regulations.

Blanket bog

7.4.13 As shown in Table 7.1, the blanket bog IEF, including pure stands of M17 blanket mire, bog pools as well as blanket bog-dominated mosaics with other vegetation types, covers a total area of 14,981,394 m^2 (c.1,498 ha) within the site boundary. This represents 88.7% of the area within the site boundary.

7.4.14 Following the assumptions listed in paragraph 7.9.5 of the 2019 EIA Report, as shown in Table 7.1 a total of 174,628 m^2 (c. 17.5ha) of the IEF will be permanently lost. This represents 1.17% of the IEF within the site boundary and is a 25.42% reduction from the predicted loss of 234,149 m^2 (1.5% of the total extent of the IEF) under the 2020 Layout.

7.4.15 In addition to the permanent loss, there will be a temporary loss of 155,948 m^2 (15.6 ha) of blanket bog due to temporary borrow pit search areas, temporary floated hardstanding, temporary floated roads, and temporary floated construction compounds. This represents 1.04% of the IEF within the site boundary and is a 13.51% reduction from the predicted temporary loss of 180,311 m^2 (1.2% of the total extent of the IEF) under the 2020 Layout. In addition, 60,151 m^2 (6 ha) surrounding the footprint may be subject to construction disturbance. This represents 0.4% of the IEF within the site boundary and is a 21.37% reduction from the predicted construction disturbance of 76,502 m^2 (0.51% of the total extent of the IEF) under the 2020 Layout. Overall, 1.44% of the IEF will be temporarily lost or disturbed, but affected areas are expected to recover through implementation of the Peat Management and Restoration Plan (refer to the Outline Peat Management and Restoration Plan in Appendix 10.1) as well as the HMP (refer to Appendix 7.1).

7.4.16 While a limited extent of the IEF will be permanently or temporarily lost to the Proposed Development, the blanket bog habitat type is considered of particularly high value. The permanent loss will be a **low-medium** impact and in the absence of any compensation the effect remains **significant**, whereas the temporary changes are considered to be short-duration, low-level adverse impacts and **not significant** under the EIA Regulations.

Operation

7.4.17 As demonstrated in Table 7.1, there are no operation-phase impacts from the Proposed Development on acid grassland.

7.4.18 The primary effect during the operational phase relates to potential drying of peatland habitats as a result of the Proposed Development infrastructure, notably drains, changing the hydrological status of the adjacent peat substrate. The blanket mire system is characterised by being fed by precipitation and by occurring on a peat substrate of low permeability and, as a result, drying impacts from drainage may only be measurable in the immediate vicinity of infrastructure. We are not aware of relevant studies from Shetland, but in a study at Moor House - Upper Teesdale National Nature Reserve, County Durham, Coulson *et al.* (1991) concluded that the greatest effect of drainage and therefore desiccation would occur immediately downslope of drains, but there was no measurable change beyond 5 m in the composition of the flora relative to the position of the ditch. The wetter climate of Shetland is likely to mean that drying effects will operate on similar, small scales.

Blanket bog

7.4.19 Excavated bases and sections of cut track will interrupt or deflect the water flow through adjacent peat, which will cause relatively minor changes and generally result in localised drying-out of the peat and the development of more heath-like communities along track batters and around the turbine bases with changes likely be within to c.2-3 m (see habitat loss assumptions in paragraph 7.9.5 of the 2019 EIA Report).

7.4.20 Flows of water along the cable route may result in both localised drying and localised pooling of water. Such ongoing processes would result in a long-term low-level change, with affected plant communities potentially transitioning into different community types. However, the effect of this for a very small component of the overall area, is considered a **not significant** effect under the EIA Regulations.

7.4.21 As shown in Table 7.1, an estimated 60,095 m^2 of peatland surrounding the infrastructure will be likely subject to degradation. This is a 21.38% reduction from the predicted degradation estimate of 76,502 m^2 under the 2020 Layout and represents 0.4% of the blanket bog IEF within the site boundary. An additional 89,018 m^2 of peatland may be subject to disruption to flows. This figure is a 20.69% reduction from the 112,242 m^2 predicted under the 2020 Layout and represents 0.59% of the blanket bog IEF within the site boundary. Affected plant communities may potentially transition into different community types, including both drier and wetter communities. This is a long-term **low-level** effect on this feature of National value and the effect is considered **not significant** under the EIA Regulations.

Decommissioning

7.4.22 Decommissioning impacts are generally regarded as similar to those experienced during the construction phase, albeit less intrusive.

7.5 Additional Mitigation and Compensation

7.5.1 Embedded mitigation measures for the construction and operational phases of this Proposed Development were outlined in Chapter 17 of the 2019 EIA Report. Mitigation measures specifically for habitats were summarised in Chapter 7 of the 2019 EIA Report and included:

- Micrositing allowance to avoid or reduce impacts on sensitive habitats.
- Presence of an Ecological Clerk of Works (ECoW) to identify appropriate exclusion zones around sensitive features, to prevent construction vehicle tracking through these areas.
- Careful strip and retention of turves (with particular reference to both peatland and grassland vegetation), for re-use in the restoration of track and turbine batters.
- Operative awareness education, in the form of toolbox talks, to ensure the value of the habitat is understood.

- Careful wash-down of plant and other equipment will be mandatory prior to access to or egress from the Proposed Development site, to prevent potential biosecurity risks associated with plant movements; potentially contaminated materials will be identified and the handling of such strictly controlled.
- Exclusion of livestock from the restored temporary borrow pit areas, to permit habitat recovery free from grazing pressure (which otherwise has the potential to degrade the surface).

7.5.2 More detail is provided in Appendix 7.1 on the proposed blanket bog restoration measures that will be undertaken as part of the final HMP. It sets out the proposals for areas of off-site degraded blanket bog habitat to be restored, with an overall net benefit of at least 51 ha blanket bog to be provided at the offsite location. The HMP will be produced post-consent, following further site investigation and drawing upon relevant experience with peatland restoration from other parts of Shetland. Measures will be produced in consultation with the proposed Stakeholder Group which is likely to include SEPA, as well as NatureScot, SIC, the RSPB, SW and SAT in addition to the Applicant.

7.6 Assessment of Residual Effects

7.6.1 Following the change in design of the Proposed Development a re-assessment has been undertaken of the residual effects of the Proposed Development upon unimproved U5a and U6a acid grassland and blanket bog.

Construction

Unimproved U5a and U6a acid grassland

7.6.2 Assuming full implementation of the mitigation measures identified in Chapter 7 of the 2019 EIA Report, **no significant** residual effects are expected for this IEF.

Blanket bog

7.6.3 The permanent losses of blanket bog cannot be mitigated; the residual impact is therefore assessed to remain at least a **low level**, long-term **significant** effect on this feature of National importance. Compensation is therefore offered.

7.6.4 Significant off-site peatland restoration will be undertaken to compensate for the losses within the site. As described in Appendix 7.1, these measures will result in a net benefit of c.51-55 ha, thus out-weighing impacts within the site. As such, **no significant** residual effects are expected.

7.6.5 In consultation with SEPA (7th July 2021), the Applicant committed to agreeing an appropriately worded condition in order to tie the Applicant into securing the land prior to commencement of the Proposed Development. The following wording is proposed:

Condition X Habitat Management Plan

(1) No development shall commence until a Habitat Management Plan (HMP) has been submitted to, and approved in writing, by the Planning Authority in consultation with NatureScot and SEPA. The HMP shall include details outlined in the Draft Habitat Management Plan 3 in Appendix 7.1 of SEI 2 unless otherwise agreed with the Planning Authority.

(2) The HMP shall set out proposals for the management and monitoring of habitats on the wind farm during construction and operational periods. The HMP shall include:

(a) Restoration and management of blanket mire in borrow pits and construction compounds used for construction of the Proposed Development

(b) Red-throated diver habitat improvement measures

(c) Creation, protection, enhancement and maintenance of suitable wader habitats

(d) Restoration and maintenance of merlin habitat

(3) The HMP shall include details of an Off-site Peatland Restoration Plan (the OPRP) which will be written in accordance with the Draft Habitat Management Plan 3 in Appendix 7.1 of SEI 2. The OPRP shall include:

(a) Details of the locations for offsite peatland restoration including appropriate evidence that the landowners and occupiers of the relevant land agree to the works

(b) Measures to improve and/or restore degraded off-site peatland habitat

(c) Monitoring to be undertaken to measure success of 3(b)

(4) The objectives of the HMP and OPRP shall align with the habitat restoration objectives of the Peat Management Plan (PMP), where necessary.

The approved plan shall be implemented in full, unless otherwise agreed in writing by the Planning Authority and shall be reviewed every five years from its implementation to assess the effectiveness of the measures proposed, and if necessary, such measures shall be amended by the Developer following consultation with the Planning Authority, NatureScot and SEPA.

Operation

Blanket bog

7.6.6 **No significant** effects are anticipated during the Operational phase.

7.7 Assessment of Cumulative Effects

7.7.1 At time of writing, there are a number of wind farms projects on the Shetland Isles to take into consideration. Similar to the assessment in Chapter 7 of the 2019 EIA Report, this assessment considers wind farms within 10 km radius to be appropriate, as follows:

- Garth: five turbines operational since 2017; closest at c.1.5 km east of the Proposed Development site boundary; and
- Hill of Lusetter: approximately 8.5 km to the south, east of Mid Yell, on the southern shore of Mid Yell Voe. No details are available at time of writing, beyond a recording of "scoping" against the status (NatureScot, 2021).

7.7.2 Garth Wind Farm was constructed within an area of peatland and required excavation of up to 15,000 m^3 of peat. We have not been able to ascertain the loss of peatland within the Garth Wind Farm site, but we are aware that an area off site, Gutcher Quarry, was used as a peat receptor area. Because the peatland restoration proposals described in Appendix 7.1 outweigh the losses from the Proposed Development, the potential for significant cumulative impacts with Garth Wind Farm on blanket bog is unlikely to be significant.

7.7.3 No details are available for the potential wind farm at Hill of Lusetter. However, because the peatland restoration proposals described in Appendix 7.1 outweigh the losses from the Proposed Development, the potential for significant cumulative impacts is unlikely to be significant.

7.7.4 Overall therefore, no significant cumulative effects are anticipated.

7.8 Comparison of Effects

7.8.1 The reduction in the number of turbines from 23 in the 2020 Layout to 18 in the 2021 Layout and associated infrastructure has resulted in significant reductions to the permanent and temporary losses of peatland habitat, including a 25% reduction in the area of blanket bog to be permanently lost to the Proposed Development. However, acknowledging the high value of the blanket mire

within the site, effects remain significant as they cannot be mitigated. Therefore, offsite habitat management is proposed to compensate for the effects. Table 7.2 summarises the predicted effects.

Table 7.2 – Summary of Effects

Description of Effect	2020 SEI Effects		SEI 2 Effects	
	Significance	**Beneficial/ Adverse**	**Significance**	**Beneficial/ Adverse**
Construction phase				
Permanent loss of habitat: Acid grassland	Barely perceptible, **not significant** on Local scale	Adverse	Barely perceptible, **not significant** on Local scale	Adverse
Permanent loss of habitat: Blanket bog	Long-term low impact, **significant** on National area scale	Adverse	Long-term low impact, **significant** on National area scale However, compensation is offered that will deliver a minimum 51 ha of blanket bog restoration at an offsite location. This will offset effects.	Adverse
Temporary disturbance of habitat: Acid grassland	Barely perceptible, **not significant** on Local scale	Adverse	Barely perceptible, **not significant** on Local scale	Adverse
Temporary disturbance of habitat: Blanket bog	Long-term low impact, **not significant** on National area scale	Adverse	Long-term low impact, **not significant** on National area scale	Adverse

Description of Effect	2020 SEI Effects		SEI 2 Effects	
	Significance	**Beneficial/ Adverse**	**Significance**	**Beneficial/ Adverse**
Operation phase				
Hydrological change – cable routes in blanket bog	Barely perceptible, **not significant** on National area scale	Adverse	Barely perceptible**,** **not significant** on National area scale	Adverse
Degradation and disturbance of habitat: blanket bog	Low level impact, **significant** on National area scale	Adverse	Low level impact, **not significant** on National area scale	Adverse

7.9 References

CIEEM (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute of Ecology and Environmental Management. Available online at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.1.pdf. Accessed August 2021.

Coulson JC, Butterfield JEL and Henderson E (1990). The Effect of Open Drainage Ditches on the Plant and Invertebrate Communities of Moorland and on the Decomposition of Peat. Journal of Applied Ecology, 27, 549-561.

NatureScot (2021). GoogleEarth-compatible layer: windfarm_scotland_kml. NatureScot. Available online at: https://gateway.snh.gov.uk/natural-spaces/download?dsid=26&fmt=kml. Accessed August 2021.