Skye Reinforcement Project

Appendix V2-4.7:
Kinloch and Kyleakin Hills Special Area of Conservation

Shadow Habitats Regulations Appraisal

Date: 14 September 2022

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Document Quality Record

Version	Status	Person Responsible	Date
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CONTENTS

LIST OF TABLES

LIST OF APPENDIX FIGURES

1 INTRODUCTION

Scottish & Southern Electricity Networks Transmission (SSEN Transmission) (the Applicant) seeks consent under section 37 of the Electricity Act 1989 to construct and operate approximately 110 kilometres (km) of new double circuit steel structure 132 kV overhead transmission line (OHL) between Fort Augustus Substation and Edinbane Substation, and approximately 27 km of new single circuit trident H wood pole (H pole) OHL between Edinbane Substation and Ardmore Substation. This electricity transmission project would also comprise approximately 24 km of underground cable[1], proposed by the Applicant to mitigate likely significant landscape and visual effects, or as a means of rationalising the existing OHL network. In total, the transmission connection extends over a distance of approximately 160 km.

For the purposes of reporting within the EIA Report that accompanies the application for consent, given its length, the route for the new 132 kV transmission connection has been split into seven defined geographical 'Sections' to describe more easily the Proposed Development and baseline environmental factors. Of particular sensitivity and relevance to this document is Section 3 – Broadford to Kyle Rhea, where the Proposed Development is routed through the Kinloch and Kyleakin Hills Special Area of Conservation (SAC) and associated Kinloch and Kyleakin Hills Site of Special Scientific Interest (SSSI).

The Proposed Development comprises a Proposed Alignment and an Alternative Alignment within Section 3 of the project, see **Figure 1**. Both options pass through the SAC and are the subject of assessment within this Shadow HRA.

The site's SAC status means that the requirements of The Conservation of Habitats and Species Regulations 2017 ("the Habitats Regulations"), apply to the application for consent under the Electricity Act 1989. Consequently, as the Competent Authority, the Scottish Ministers will be required to consider the effect of the proposal on the SAC to establish whether the Proposed Development would have an 'Adverse Effect on the Site's Integrity' before it can be consented (commonly known as Habitats Regulations Appraisal (HRA)).

In order to inform the decision-making process, MacArthur Green has been commissioned by ASH design+assessment (ASH), on behalf of the Applicant, to carry out a Shadow HRA for the Proposed Development.

This report uses the currently available data and information to undertake the Shadow HRA of each option to provide an assessment of whether any likely significant effects may occur, and if so, whether the proposals would have an adverse effect on the Site's integrity. The report also aims to provide a comparison between each option with respect to the relative magnitudes of effect to inform final route selection and the determination of Scottish Ministers.

2 NATURESCOT CONSULTATION BACKGROUND

Throughout the consultation process for the Proposed Development, including route and alignment selection, the advice of NatureScot (formerly Scottish Natural Heritage (SNH)) has been

[1] Deemed planning consent under Section 57(2) of the Town and Country Planning Act 1997 would be sought for the installation and operation of underground cables.

sought. Summarised responses with regards Section 3 of the project through the Kinloch and Kyleakin Hills SAC are provided in Table 2-1 below.

Table 2-1 Summarised NatureScot Responses on Section 3 Options[2]

NatureScot Correspondence	Summary of Response
Letter of 10/04/2018 in response to September 2016 Consultation Document	The preferred route 3B Glen Arroch includes sections within the Kinloch and Kyleakin Hills SAC and SSSI. Some significant adverse effects on SAC qualifying habitats seem inevitable (at least in the short term) and therefore an appropriate assessment will be required. Whether it can be demonstrated that there will be no adverse effect on Site integrity will depend on the exact route chosen, whether new access tracks are required and construction methods. Initial discussions with SSE suggest that methodologies are available which would allow full recovery of construction impacts, albeit that they may be more expensive. However, if such safeguards cannot be integrated into the proposal then it is possible that we might object to a new overhead line on route 3B. The potential impact of route 3B on the qualifying features of the SAC is, however, likely to be of lesser magnitude than route 3A where felling of SAC woodland habitat and the subsequent maintenance of a wayleave would potentially be required. SSE have also indicated that this route would be likely to require a lengthy permanent access track which is also likely to have permanent adverse effects on qualifying open ground habitats. It is therefore possible that we might object to a new overhead line on route 3A.
Letter of 10/04/2018 in response to March 2018 Consultation Document	Likely significant effects on the features of the Kinloch and Kyleakin Hills SAC potentially resulting in adverse impacts on the Site integrity.
Letter of 25/10/2018 following submission of results of NVC surveys of the Kinloch and Kyleakin Hills SAC	All of the proposed routes are likely to have a significant effect on qualifying features of Kinloch and Kyleakin Hills SAC. However, further information is required in relation to construction methods and on-going operational management practices to inform an Appropriate Assessment and determine whether any of the alignment options will avoid an adverse impact on the Site integrity. The statement in the pre-application report that "*All habitats designated as qualifying features of the designation are afforded equal status and levels of protection*" is not strictly correct and this has implications for decisions regarding the route and its impacts. The report does, however, recognise that blanket bog and broadleaved woodland are the most sensitive habitats to disturbance, albeit this distinction seems to relate to the structure and function of these habitats, rather than their designation status. All alignment options considered will have some impact on these two features, which will result in loss and damage. However, the anticipated extent of loss and damage of each habitat type is unclear. We require this information to accompany any application to enable us to undertake a full appraisal. The NVC report largely supports our earlier advice that Option 3B Glen Arroch is likely to be the least damaging of the options to the SAC qualifying features and remains our preferred route. The route put forward [3A] in the report as the preferred option has greater adverse impacts on both the woodland and peatland features of the SAC (and its associated SSSI) and, based on the information

[2] During the route and alignment stages of the project, the Proposed Alignment referred to in this Shadow HRA was known as Route Option 3A, and the Alternative Alignment referred to in this Shadow HRA was known as Route Option 3B. Reference to Route Options 3A and 3B is included in Table 2.1.

NatureScot Correspondence	Summary of Response
	available to date, is likely to have an adverse impact on the Site integrity and therefore result in an SNH objection.
Letter of 29/05/2020 in response to March 2020 Consultation Document	The route has the potential to result in an adverse impact on the Site integrity of Kinloch to Kyleakin Hills SAC. Based on the current detail we are of the view that the preferred route through Kinloch and Kyleakin Hills SAC (through Glen Arroch (3B)) is the least worst option. However, likely significant effects on the features of the Site are still probable, and these may result in an adverse impact on Site integrity. If this is the case we will have to object. An experienced ecologist will be required to assess the various options at each stage (especially pros and cons of different options). Someone with upland habitat specialisms and knowledge of bryophytes would be sensible. Consideration and assessment of access tracks will need to be made. Woodland restoration - removal of the old OHL would enable the woodland wayleave to recover. Woodland is the highest-ranking habitat on this Site (category B versus category C for all other habitats[3]) so potentially there may be a net benefit.
Letter of 13/01/2022 in response to September 2021 Consultation Document	A new OHL with the preferred route proposed in the Consultation Document has the potential to adversely affect the Kinloch and Kyleakin Hills SAC. Our previous advice on the sensitivity of the route through the SAC and the difficulty of demonstrating 'no adverse effect on Site integrity' has not changed. Further information will be required to inform our advice on the optimal design solution for this protected area. We understand that a final solution is still to be determined for Section 3. You have confirmed that route option 3B remains under consideration, and that the route and alignment to be taken forward within the consent application will be determined following further consultation, survey and assessment. The 2021 consultation document recognises the challenges associated with both route options, and we continue to advise that all options are kept open for this section of the route (including the possibility of undergrounding part or all of route 3B) until further detailed assessment and a shadow HRA has been concluded. Detailed habitat and species assessment is requested for both route options and we would welcome continued dialogue on Section 3 as the proposals progress. The consultation report outlines why route 3B is no longer favoured and raises several issues related to both the SAC and wider considerations. We agree that it is important to consider all these issues but advise that they be clearly weighted according to the current legislative and policy context. It is also important to be clear about common aspects between the two routes and the reasons behind any differences. The consultation document notes that while helicopters may be used to facilitate construction on route 3A this will not avoid the need for temporary construction

[3] Natura 2000 standard data forms include a section for a number of site assessments. Two of which relate to 'Degree of Conservation' and 'Global Assessment' respectively, and these are categorised from A to C. Degree of Conservation relates to "*Degree of conservation of the structure and functions of the natural habitat type, concerned and restoration possibilities*" and Global Assessment relates to "*Global assessment of the value of the site for conservation of the natural habitat type concerned*". The western acidic oakwood within the SAC is listed as Category B for both Degree of Conservation and Global Assessment (i.e. good conservation and good value respectively). All other habitat qualifying features of the SAC are Category C for both Degree of Conservation and Global Assessment (i.e. average or reduced conservation and significant value respectively). Full details on these assessment categories are located at https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX%3A32011D0484&from=EN.

NatureScot Correspondence	Summary of Response
	tracks, and there is no detail provided on operational access requirements for this route. Details of how removal of the existing overhead line would be carried out (including access requirements) should also be considered. A detailed restoration plan would be required. Our initial assessment suggests that route 3B is likely to traverse the least amount of the most sensitive habitats (blanket bog and broadleaved woodland), based on the habitats present and the shorter overall route length within the SAC. Although our final view will depend on the results of detailed survey and assessment, it is therefore likely that route 3B would result in less damage to the SAC and may therefore have better prospects for complying with the requirements of the Habitats Regulations. Our initial appraisal suggests that route 3A would have a likely significant effect on the SAC blanket bog, dry heath, wet heath and oak woodland habitats, as well as otter. We have previously discussed that it is unlikely that mixed base-rich woodland on rocky slopes would be affected based on your chosen alignment and commitment to over-sail the ravines, but you will need to consider that aspect in your detailed assessment. Further information would be required in relation to construction methods and on-going operational management practices, as well as the extent of loss/damage to each qualifying habitat, to inform an Appropriate Assessment and determine whether any of the route and alignment options will avoid an adverse effect on the Site integrity. If the Appropriate Assessment does not ascertain that the integrity of the Site will not be adversely affected, we are likely to object to the proposal. For the project to proceed in this situation the Habitats Regulations require that there are no alternative solutions; imperative reasons of over-riding public interest; and compensatory measures are in place.
Scoping Response dated 11/03/2022	'The proposal will have a likely significant effect on the qualifying interests of the Kinloch and Kyleakin Hills Special Area of Conservation (SAC). While further information will be required to inform a detailed assessment of impacts, at this early stage we advise that it may not be possible to demonstrate that there will be no adverse effect on the integrity of the Site. We advise that the focus should be on clarifying the impacts of all the options, both in terms of routing and construction techniques. We continue to advise that the sensitivity of the route through the SAC means that, based on the information available to date, it is likely that this proposal will not be able to meet the conservation objectives for the SAC. If the Appropriate Assessment is unable to demonstrate 'no adverse effect on Site integrity' we would object to the proposal, and the Energy Consents Unit would need to consider whether the provisions of Regulations 49 and 53 of the Habitats Regulations could be met. We agree that results of detailed habitat survey and assessment should be used to select a route and design option that minimises impacts to the qualifying interests of the SAC. Our initial assessment, based on the habitats present and the shorter overall route length within the SAC, is that an alternative route through Glen Arroch would traverse the least amount of the most sensitive habitats (blanket bog and broadleaved woodland). Although our final view would depend on the results of detailed habitat survey and assessment, it is therefore likely that a route through Glen Arroch route would result in less damage to the SAC qualifying habitats, including priority blanket bog habitat. We continue to advise that all alternative route options and design solutions are kept open (including the possibility of undergrounding part or all of the Glen Arroch route) until further detailed assessment and a shadow HRA have been undertaken.

NatureScot Correspondence	Summary of Response
	Our initial appraisal suggests that the Applicant's preferred route would have a likely significant effect on the SAC blanket bog, dry heath, wet heath and oak woodland habitats. As currently described, it seems possible that significant effects on *Tilio-acerion* woodland can be avoided but a HRA would need to confirm this. We advise that an Appropriate Assessment would be required to consider both permanent and temporary, direct and indirect impacts to each of the SAC qualifying habitats including the amount of habitat expected to be lost, damaged or modified as a result of the proposals. This should include assessment of peat slide risk and any potential changes to hydrology. We advise that the EIAR includes full details of the habitat survey results to NVC sub-community level supported by peat depth survey where relevant. Smaller polygons with fewer communities and % cover would be preferable to improve the resolution of the surveys and precision of the HRA. We recommend that maps of the NVC polygons are included with all infrastructure and access routes overlain. Detailed information on the construction process within the SAC should also be provided, including the location, extent and type of infrastructure, and description of methods. Where access is to be taken over unsurfaced ground details of the plant type, number of journeys and ground conditions should be considered in assessing potential impacts. Where there is uncertainty, we advise that the worst-case scenario is assessed. Assessment should also consider operational management practices within the SAC (e.g., access and maintenance, include any wayleave maintenance). Mitigation measures to minimise impacts should be provided. We recommend details of the proposed reinstatement and restoration works to allow any damaged habitats to recover are also set out in the EIAR. We agree that, with appropriate restoration, removal of the existing overhead line is likely to have a positive effect on the SAC in the long term. However, we advise that the EIAR considers the potential for impacts associated with the dismantling and removal of the existing overhead line, including vehicle tracking, ground preparation, etc. We recommend full details of how the existing overhead line would be removed, including infrastructure requirements, any aspects which would be left in situ, and details of reinstatement and proposed restoration works are included. There could also be a significant effect on otter as a result of this proposal. We advise that an otter protection plan is likely to be required.'

3 THE HABITATS REGULATIONS PROCESS

Under the Habitats Regulations 1the Competent Authority must consider whether any plan or project will have a 'likely significant effect' on a Natura site, either alone or in combination with other plans or projects. In Scotland, SACs and Special Protection Areas (SPAs) are Natura sites given legal protection by the Habitats Regulations.

The Habitats Regulations ensure that any plan or project that is likely to have a significant effect on a Natura site is assessed and can only go ahead if certain strict conditions are met, via an HRA.

If required, the Competent Authority must carry out an 'appropriate assessment' to decide whether there is sufficient evidence to conclude that the proposals will not adversely affect the

Site's integrity. This Shadow HRA provides the relevant information to inform the Competent Authority's appropriate assessment.

Regulation 63 of the Habitats Regulations indicates a number of steps to be taken by the Competent Authority before granting consent to a project. In order of application, the first four steps of the HRA process are:

- Step 1. Consider whether the project is directly connected to or necessary for the management of the designated Site (Regulation 63 (1b)).
- If not, Step 2. Consider whether the project, alone or in combination with other plans or projects, is likely to have a significant effect on the designated Site (Regulation 63 (1a)).
- If so, Step 3. Make an Appropriate Assessment of the implications for the designated Site in view of that designated Site's conservation objectives (Regulation 63 (1)).
- Step 4. Consider whether it can be ascertained that the proposal would not adversely affect the integrity of the designated Site ('Integrity Test') having regard to the manner in which it is proposed to be carried out or to any conditions or restrictions subject to which they propose that the consent, permission or other authorisation should be given (Regulation 63 (5 & 6)).

It has already been established that the Proposed Development does not meet the criteria for Step 1. The Step 2 assessment of the likely significant effects on the SAC in relation to the Proposed Development is presented in this report. Where likely significant effects are predicted, information to inform an appropriate assessment (Step 3) is then provided, along with consideration of whether the integrity of the Site would be adversely affected (Step 4).

In exceptional circumstances a plan or project may still be allowed to proceed despite a conclusion of adverse effect on Site integrity, provided there are no alternative solutions, and the plan or project is considered to be justified for 'imperative reasons of overriding public interest' (IROPI) (Article 6(4) of the Habitats Directive/Regulation 49 of the Habitats Regulations).

The second paragraph of Article 6(4)[4] concerns the special circumstances relating to 'priority habitats'. Priority habitats and species (as defined in the Habitats Directive) are given a greater level of protection under the Article 6 process than other Annex I habitats and Annex II species, and the implications of loss and/or damage to these habitats are greater than for other qualifying habitats.

Should the Scottish Ministers agree to the proposal to undertake a plan or project where an adverse effect on the integrity of the Site cannot be ruled out, they have a duty to secure any appropriate compensatory measures necessary to ensure the overall coherence of the Natura 2000 network is protected (compensation is discussed further in Section 13 below).

[4] *"Where the site concerned hosts a priority natural habitat type and/or a priority species, the only considerations which may be raised are those relating to human health or public safety, to beneficial consequences of primary importance for the environment or, further to an opinion from the Commission, to other imperative reasons of overriding public interest"*.

4 THE PROPOSED DEVELOPMENT

4.1 Proposed Development Overview

The Applicant has proposed a new 132 kV OHL between the existing Substations at Fort Augustus and Ardmore via Edinbane, Broadford and Quoich to replace the existing 132 kV circuit which currently comprises steel lattice towers from Fort Augustus to Broadford and Trident wood-pole from Broadford to Ardmore. The existing crossing towers at Kyle Rhea would be incorporated into the proposed design solution. On commissioning of the new 132 kV OHL, the existing 132 kV OHL will become redundant and will be dismantled.

4.2 Project Elements

The following elements of the Proposed Development are required:

- Between Fort Augustus Substation and Edinbane Substation, the Proposed Development would primarily comprise the construction of a new double circuit steel structure 132 kV OHL, totalling approximately 110 km in length. In two distinct areas within this part of the Proposed Development, in Section 2 within the vicinity of the Cuillins, and in Section 6 between Loch Lundie and Fort Augustus Substation, an underground cable is proposed to either mitigate a likely significant effect (in the case of Section 2) or rationalise the existing OHL network (in the case of Section 6). The existing OHL would be dismantled and removed once the new transmission connection is operational.
- Between Edinbane Substation and Ardmore Substation, the existing single circuit wood pole trident 132 kV OHL would be replaced with a new higher capacity 132 kV trident wood pole OHL. During construction, the existing OHL and its replacement would run in tandem but on energisation of the new OHL, the existing OHL would be dismantled and removed.

The total length of the new transmission connection would be approximately 160 km in length. A detailed overview of the Proposed Development is provided in **Volume 1, Chapter 3: Project Description**.

Section 3 (Broadford to Kyle Rhea) will therefore require a new double circuit 132 kV OHL comprising steel structures.

In order to fully understand the potential permanent, temporary, direct and indirect effects on the SAC resulting from the Proposed Development, it is important to understand the infrastructure elements to be incorporated into the design and the associated construction processes. Furthermore, any operational maintenance and access requirements should be considered. A summary is provided below.

4.3 Construction Process

The outline construction process for the Proposed Development in Section 3 will comprise the following key stages:

- Access construction including bell mouths, passing places and other road improvements;
- Establishment of temporary construction compounds;

- Installation of tower foundations;
- Construction of towers;
- Conductor stringing including construction of any temporary scaffolding;
- OHL commissioning;
- Dismantling and removal of existing redundant equipment, conductors and towers; and
- Removal and reinstatement of temporary roads, tower location sites and decommissioning of bell mouths into passing places.

4.4 Towers & Underground Cabling

The steel lattice towers to be used for this project would be constructed from fabricated galvanised steel and would be grey in colour. The towers would likely comprise a 'L7' series of steel lattice tower (**Technical Appendix V1-3.2**).

Generally, prior to erection of a tower, a stone crane pad and laydown area served by an access track need to be created to provide a stable working platform for lifting operations. Tower steelwork is transported via Hi-ab wagon and placed within dedicated laydown areas ready for assembly. The tower sections are lifted into position with a 360 Roto telehandler, however for sections that a 360 Roto cannot erect, an 80t all-terrain mobile crane is deployed to complete tower erection.

In certain circumstances it is possible to install towers using helicopters, avoiding the need for cranes, however access tracks would still be required to transport the workforce and certain items of plant to and from tower locations. Helicopters are also discussed in Section 4.7.4 below.

4.4.1 Proposed Alignment

Towers for the Proposed Alignment would be built using helicopters, and whilst this does not remove the need for access tracks to get operatives, plant and materials to tower locations, it does reduce the volume of traffic and track journeys required, as well as removing the need to bring in cranes. Tower assembly undertaken by helicopter also removes the requirement for a stone crane pad, however this does not affect the size of associated construction compounds required.

4.4.2 Alternative Alignment

All towers for the Alternative Alignment would be erected as per the typical crane method described above. It is not proposed to use helicopters for the construction of the Alternative Alignment. Typical crane method is the standard approach followed where access allows, it is safer and reduces programme risks to construction, with helicopter build there is typically still a form of access required for plant and personnel. Additionally, there is the potential for high winds in the Glen Arroch valley which may elevate public safety and construction risks if utilising helicopters (see also Section 4.7.4).

4.4.3 Underground Cabling

As noted in Section 4.4 of this report, underground cabling has been considered in targeted areas for the project, to mitigate a likely significant effect or to facilitate rationalisation of the electricity network.

Within Section 3 of the project, given the location and terrain present along the Proposed Alignment, underground cabling is not considered a feasible design solution within the SAC.

It is theoretically possible that parts of the route of the Alternative Alignment could be considered for underground cabling. However, the potential impacts on the SAC qualifying habitats, and the significance of these impacts is much greater from underground cabling in comparison to the construction of steel lattice towers. Therefore, from an HRA and ecological perspective, underground cabling would not be considered as a preferred construction method for the Alternative Alignment within the boundaries of the SAC. To verify this, and determine the difference in magnitude of effect on direct habitat loss and/or modification between an OHL option and an underground cable option within the SAC, a comparative analysis of the predicted permanent and temporary direct habitat loss and disturbance/modification associated with a wholly OHL option along the Alternative Alignment and a combined OHL and underground cable option along the Alternative Alignment was undertaken (the preliminary design of the combined OHL and underground cable route would consist of an underground section from Bealach Udal to Kylerhea, with the remainder of the route being typical tower and OHL construction). This comparative analysis is provided in **Annex A**.

In summary, the main, and greater, adverse effects resulting from underground cabling arise from the larger working corridor and increased habitat loss/disturbance required for underground cable works, which is typically approximately 37 m in width along the length of the full cabling alignment to accommodate tracks, trenches and excavated spoil; however, this working corridor may need to extend locally dependent on slopes and prevailing environmental conditions. This larger continuous and partially excavated working corridor also increases the risk of pollution events and watercourse contamination and increases the requirement for watercourse crossings or drilling under watercourses to install cables (although best practice construction and appropriate mitigation measures can be implemented to minimise and mitigate effects). The working corridor for an OHL is typically much less with stone tracks between approximately 4 to 6 m in running width (see below), and the 'island' approach of spread-out towers rather than a continuous underground cable.

Furthermore, the hydrological effect of underground cable works in wetland or peatland areas typical of the SAC are generally considered greater than tower/OHL construction methods. In particular, the more granular and free draining backfill materials and sands required for much of the cable trenches can effectively act as a sub-surface drain resulting in disruption to hydrological flow paths, drainage of water, and result in longer term drying effects in the surrounding habitats. These drying effects can be further exacerbated by the heat that is radiated out from the cables.

Cable trenches also generally require the use of cement bound sand (CBS) in their formation, this can be prone to leaching in wetland environments with leachate of a high (alkaline) pH which would negatively affect the acidic habitats which dominate the SAC. Cabling would generate more excavated peat than the tower/OHL method, with potentially greater risks of peat failures, with this peat requiring careful management.

For the reasons discussed above (see also **Annex A**), underground cabling is not considered to be a suitable construction method within the SAC due to the notably greater impacts compared to towers/OHL, and consequently underground cabling is not discussed further within this report.

4.5 Tower Foundation Construction

Tower foundation type selection is generally determined by the ground conditions encountered. Subject to ground conditions, a typical arrangement at each tower comprises a raft foundation with neck extension for each of the four lattice tower legs. Dependent on ground conditions, alternative piled or rock anchor solutions may also be selected.

Three main foundation construction methods are likely to be employed for the Proposed Development, these are briefly summarised further below. Further detailed site investigation surveys will determine the most appropriate construction method at each tower location.

The tower locations used in this Shadow HRA will be subject to small-scale micrositing movements within the Limit of Deviation (LoD)[5] as the detailed design is progressed, and subsequently the specific type of foundation subsequently required at each individual tower is not yet known. It is therefore assumed for this Shadow HRA that the foundations of all towers located within the SAC, for both options, will be of the pad and column type. This approach will ensure consistency at this stage to enable a comparative assessment of the relative magnitude of effects between the two options.

4.5.1 Pad & Column

Prior to construction for typical build towers, a 50 m x 50 m compound is established complete with stone access and laydown area for welfare, plant and materials (see also Section 4.6). For helicopter build towers, a 50 m x 50 m compound is still required for welfare and storage/laydown/assembly areas; however, there is no requirement for a stone crane pad at these towers. Following ground investigation surveys, the size of compound areas will be reduced where possible (likely to 40 m x 40 m, or smaller, where possible) and their orientation may change, however for the purposes of this assessment it is assumed a 50 m x 50 m compound is required at each tower location and is orientated on a north/south and east/west axis centred on the tower location.

Each foundation is excavated to a typical depth of 4 m with temporary shoring installed to allow for safe working. On average, beneath ground dimensions for each foundation are 4 m x 4 m x 0.5 m. Due to restricted working room, no more than two excavations are open at any time. Upon completion the above ground portion of the foundations relates to the four tower feet, which amounts to four concrete footers/stubs per tower. Each concrete foot is 0.6 m x 0.6 m in size (i.e., 1.44 m^2 per tower).

[5] A LoD defines the maximum extent within which a development can be built. In the case of the Proposed Development, a LoD is required for all key components of the project e.g., in Section 3 this would relate to each of the new towers being installed and access track routes. The LoD for the Proposed Development is generally 40 m either side of the OHL and 25 m either side of access tracks; however, in certain locations the LoD varies in response to local constraints, either narrowing to protect known nearby sensitive features or widening to allow more flexibility to microsite around potentially sensitive areas of features. The LoD is more fully described and detailed in **Volume 1, Chapter 3: Project Description** of the EIA Report.

Major items of plant required to construct the foundations include a 20t excavator to excavate to formation and place the shoring system. Concrete is supplied via concrete wagon and placed by concrete skip with the excavator.

4.5.2 Micro Pile

Prior to construction, a stone piling pad will be required, typically 625 m^2 and located within the overall 50 m x 50 m compound area to provide a stable working platform for the piling rig. Major items of plant required to install the piles include a 20t excavator and vibrating roller for the piling pad and a 14t piling rig with a supply of cement and potable water to form the piles. A 20t excavator will then be required to excavate to formation for the construction of the pile cap. Concrete is supplied via concrete wagon and placed by concrete skip with the excavator.

4.5.3 Rock Anchor

Rock anchors are considered if suitable hard rock is encountered up to a depth of 2.5 m and is proven to have sufficient frictional and lateral resistance. Beyond this depth, pad and column foundations are utilised. A similar working area is required to that of micro piling, however in this instance the area is excavated down to rockhead and an access ramp formed with a nominal layer of stone placed to create a level working platform.

Major items of plant required to install the anchors include a 20t excavator and vibrating roller for the piling pad and a 14t piling rig with a supply of cement and potable water to form the piles. A 20t excavator will then be required to erect formwork and place concrete for the construction of the pile cap. Concrete is supplied via concrete wagon and placed by concrete skip with the excavator.

4.6 Site Compounds

For typical tower construction, each tower site construction compound is usually a fenced-off 50 m x 50 m area and includes a 20 m x 25 m crane pad/laydown area within, and which also incorporates vehicle and plant parking areas, welfare units, and storage and assembly facilities (e.g., COSHH containers). The compounds will be used to provide welfare and allow operatives to carry out their work safely. The construction compound area also provides for spur road access, turning head, concrete washout facilities, and segregated bunded storage areas for excavated peat and soils which will be reinstated following tower erection. Following construction and reinstatement of the tower foundations, the crane pad would be utilised in preparation of tower erection. The general site compound layout for foundation installation and lattice tower erection is provided in **Annex B**. For helicopter build towers, there is no requirement for crane pads.

4.7 Access Requirements

To permit construction and heavy plant access to each of the towers, access tracks have been proposed as the primary and most appropriate engineering solution. Where feasible, existing non-public roads or tracks are to be utilised and upgraded if required to suitable standard for the required construction traffic and minimise environmental impact as much as possible.

For the Alternative Alignment only, public road improvement (PRI) works would also be required on the C1239 minor road from its junction with the A87 through Glen Arroch to a point at Bealalch

Udal. These works indicatively involve the widening of the public road on average 1 m in width on each side.

In addition to the above proposals there is a requirement to create new access tracks for both options.

Permanent stone access tracks are proposed by the principal designers (MSVE Transmission[6]) for tower access along both options (see **Figure 1**). **Figure 1** also indicates the different types of tracks and access proposed.

4.7.1 Stone Tracks

Stone tracks are the principal designers preferred method where new tracks or upgraded tracks are required as they are designed to suit the heavy plant loads (e.g., cranes, concrete deliveries and other construction materials delivered on articulated lorries) required to construct the foundations and towers and to suit the ground conditions, with soil types expected to vary throughout the route and include areas of soft and wet peatland.

Generally, the stone tracks are proposed to be of floating track design where this is possible, as determined by the engineering team and with input from geotechnical specialists. Floating tracks would consist of laying a geotextile material on top of the existing ground surface, and then building up a layer of imported stone to form a running track. However, sections of cut and fill track will also be required in areas where floating road design is impractical or poses an increased risk of peat slide or failure. In these instances, the track would be cut into the surface of the existing ground and built onto the existing subsurface geology, with excavated material stored locally in designated storage areas.

The initial determination of sections of track likely to be of floating design and those to be cut and fill is presented in **Figure 1**, however as further data and site investigation works progress, this detail will be refined in an updated proposed access track strategy and associated figures/drawings post-consent and pre-construction. This Shadow HRA assumes the location of tracks and their construction type is as per **Figure 1**.

There will also likely be varying requirements for drainage implementation and management and pollution prevention, as well as the need for culverts or temporary bridges over watercourses in several locations.

The stone tracks for the Proposed Alignment during construction would have a running width of approximately 4 m, with an overall track working corridor where there may be additional disturbance and drainage and pollution prevention measures of approximately 6 m. For the Alternative Alignment, stone tracks would have a running width of approximately 6 m, with an overall track working corridor where there may be additional disturbance and drainage and pollution prevention measures of approximately 8 m. The narrower track requirements for the Proposed Alignment are due to the proposed helicopter build, which removes the need for large cranes with greater track width requirements to access tower locations. As noted in other sections,

[6] A Joint Venture partnership between Morgan Sindall and Vinci Energies.

a helicopter build is not proposed for the Alternative Alignment and crane assembly is the preferred method, with the corresponding increase in track width requirements.

The construction period for both options is anticipated to last for approximately 6-9 months, after which the tracks are proposed to be retained permanently for safe operational access to the OHL in the case of emergencies, failures, and maintenance.

Operational access is essential for the maintenance and repair of the OHL and to ensure SSEN Transmission comply with their legislative obligations, particularly in relation to the Health and Safety at Work Act 1974[7] and Construction (Design and Management) Regulations 2015[8]. Parts of the existing OHL, which was built prior to these obligations being in force, do not comprise adequate access, meaning that operatives are often flown as near as practicable to tower locations for inspection and maintenance tasks, with access from helicopter drop off locations on foot over difficult terrain. At present, where more significant works required to the existing OHL, temporary tracks may need to be built to facilitate works, with the potential for outages until works were completed. Such constraints to access across parts of the existing OHL do not meet the standard or expectation for safe access under existing legislation and current working practices and serve to highlight the requirement for permanent access along parts of the route of the Proposed Development.

Where operational access is required, this would likely range from all-terrain vehicle (ATV) routes with no formal track to a stone road suitable for 4x4 vehicle access, approximately 2.5 m in width.

4.7.2 Temporary Trackway

Temporary trackway panels are an alternative method of providing access, whereby panels are usually placed on an initial geotextile layer. There may be certain local areas where trackway is considered, for example for wiring operations (Section 4.8). However temporary trackway is not considered an appropriate general solution for wider and long-term construction access or for areas with soft and wet peaty ground.

Any use of temporary trackway would be dependent on gradients of less than 4° and suitable ground conditions to support heavy construction plant. Trackway still generally requires levelling and preparation of the ground, and on steeper gradients the trackway would require to be cut into the hillside. Given the likely duration that trackway would be installed for, it is likely to have largely similar effects to that of floating stone tracks, however trackway is easier to remove and overall would have a slightly lesser impact compared to floating stone tracks.

Trackway panels may be utilised at towers along the Proposed Alignment to provide laydown areas for any materials flown in by helicopter (see Section 4.7.4 below).

4.7.3 All Terrain or Wide Tracked Vehicles/Excavators

An access track strategy utilising ATVs and wide-tracked vehicles/excavators has been explored. Such plant is only likely to be suitable in certain ground conditions, as in soft or wet areas there

[7] https://www.legislation.gov.uk/ukpga/1974/37/contents - accessed 08/07/2022
[8] https://www.legislation.gov.uk/uksi/2015/51/contents/made - accessed 08/07/2022

would be a significant risk in using low-bearing plant without prior ground preparation. This is particularly the case for locations where there would be high ground pressure, such as crane lifting operations.

The vehicle tracks can also cause ground damage and scarring, particularly when performing turning operations and in soft or wet ground, or due to multiple vehicle trips in the same area (multiple daily trips would be required throughout the anticipated 6–9 month construction period to access tower locations).

Given the amount of ATV tracking that would be required both daily and throughout the construction period for the Proposed Development, it is considered that ATV routes would quickly deteriorate resulting in significant disturbance of the vegetation and underlying peat and soils, resulting in areas of heavily disturbed and scarred ground. It is likely, given the duration of the works, this would necessitate multiple ATV routes across the site to allow safe access, that would exacerbate the negative effects of tracking and scarring over a larger area. Consequently, an ATV access strategy during the construction period is not considered an appropriate access solution for either alignment option, with stone tracks likely to minimise habitat damage and ground disturbance effects to a smaller and more restricted area.

4.7.4 Helicopters

Helicopters are often used during OHL construction where access is restricted, unsafe or impractical due to difficult terrain. Helicopter solutions can also be used in conjunction with other access strategies. This may mean all, or a proportion of, plant equipment and materials would need to be flown into each tower location for all (or certain) phases of the works.

For the Proposed Alignment, within the SAC, it is proposed that tower components will be flown in, and tower erection undertaken, by helicopter. Whilst this does not remove the need for access tracks, it does avoid the need to transport cranes along the route and reduces the overall volume of traffic as well as the width of track required (see Section 4.7.1). It also avoids the need for crane hardstandings.

For the Alternative Alignment the proposed method of construction involves access tracks and tower erection using cranes. Helicopters are not proposed as a construction method for the Alternative Alignment. This decision was taken with reference to SSEN Transmission's responsibilities under the Construction (Design and Management) Regulations 2015 (the "CDM Regulations").

Under the CDM Regulations SSEN Transmission is both the client and principal designer of the Proposed Development. As set out in Health and Safety Executive guidance[9] the CDM Regulations require that SSEN Transmission as designer must "[w]hen preparing or modifying designs … take account of the general principles of prevention, and the pre-construction information provided to them, with the aim, as far as reasonably practicable, of eliminating foreseeable risks. Where this is not possible they must take reasonably practicable steps to reduce the risks or control them through the design process…".[10] [underline added]

[9] L153 *Managing health and safety in construction*, HSE (2015).

[10] L153 *Managing health and safety in construction*, HSE (2015) at para.81.

SSEN Transmission's CDM Regulations responsibilities are shared with other parties. As the client, SSEN Transmission have appointed a competent principal contractor, who is also competent as a designer under the CDM Regulations, with the skills, knowledge, experience and capabilities that are best placed to provide the detailed design and construction methods to safeguard the construction workers, operations and maintenance personnel and third parties. This is done by the contractor planning, managing and monitoring construction work "…to ensure that, so far as is reasonably practicable, the work is carried out without risks to health and safety".[11]

In reference to both route options therefore, in complying with the CDM Regulations and, in particular, the taking account of the general principles of prevention, the design has selected the most appropriate construction method for each. For the Proposed Alignment this is through use of helicopters; their use here eliminates, reduces and controls the risks caused by the remote and steep terrain that are not present at the Alternative Alignment.

4.8 Wiring Operations

Prior to wiring operations, Equi-Potential Zones (EPZ) pulling positions need to be identified and levelled by 20t excavator, if required. The typical size of working area required for an EPZ pulling location is 8 m x 12 m and which is likely to be set up on trackway panels. The trackway panels would be deployed by flatbed wagons and then fixed into position. As conductors are required to be pulled in opposite directions, two EPZ 8 m x 12 m trackway panelled pulling locations are required at each respective pulling tower (one on the upside and one on the downside of the tower).

Winches and cable drums would then be deployed via Hi-Ab flatbed wagon for the pulling operation, which will require a puller/tensioner with ancillary equipment for pulling operations and a telehandler for mounting conductor drums.

4.9 Operational Maintenance & Access

During the operational period of the Proposed Development there may be a need to periodically access tower locations and the line of the conductors to carry out essential maintenance, or to carry out repair works following damage to, or faults in, the OHL. To allow safe access to the OHL, particularly for remote sections, permanent tracks are required. These operational tracks would comprise the construction phase tracks, but at the end of construction they would be reduced in running width down to 2.5 m, to be suitable for 4x4 operational vehicular access. The former track areas, and areas around tracks, would be reinstated and restored.

5 SECTION 3 ALIGNMENT OPTIONS

Previous route selection work and various consultation exercises have considered several route options within Section 3 of the project and through the SAC, i.e., Route Options 3A to 3E, with all options traversing qualifying features of the SAC.

The Consultation Document (Alignment Selection) September 2021, published by the Applicant, confirmed that the preferred alignment and design solution within Section 3 of the project follows Route Option 3A (i.e. the route of the Proposed Alignment). However, the Consultation Document

[11] CDM Regulations, Regulation 15(2).

acknowledges that the sensitivities of Section 3 of the project through this SAC are such that Route Option 3B through Glen Arroch (i.e. the Alternative Alignment) must remain under consideration whilst the adverse effects on the SAC, and other factors, are fully determined. Other route options in Section 3 included Route Option 3C, a variation to Route Option 3A outwith the SAC, and still requiring to pass through the SAC / SSSI to connect with the existing crossing towers at Kyle Rhea. Route Options 3D and 3E were other options within the SAC but discounted for a number of technical and environmental reasons, including traversing one of the main areas of sensitive alpine and boreal heath within the SAC. Route Options 3A (the Proposed Alignment) and 3B (the Alternative Alignment) are the only options considered in this Shadow HRA (**Figure 1**). The Applicant's view is that there are no other feasible alternatives to the Proposed Development.

5.1 The Proposed Alignment (Mudalach)

This alignment runs north from the Kylerhea overhead line crossing, roughly following the route of the existing OHL, before turning west around the coast towards Mudalach. To the west of Mudalach the alignment is located south (and uphill) of the existing OHL, before entering the commercial forestry plantation southwest of Kyleakin and then running southwest to the Abhainn Lusa.

The route through Mudalach crosses an area that contains a mosaic of woodland and open upland habitats, including areas of blanket bog, wet heath, and dry heath. Certain woodland areas will require a 30 m operational wayleave corridor across sections of the woodland, which would need to be maintained in the long-term.

5.2 The Alternative Alignment (Glen Arroch)

This alignment runs south from the Kyle Rhea overhead line crossing, through commercial forestry plantation to Kylerhea and into Kylerhea Glen. The alignment then runs uphill to the west to a high point at Bealach Udal, before continuing west, and downhill through Glen Arroch. The route then crosses the Allt Mor watercourse and passes through the commercial forestry plantation southwest of Kyleakin and on to Abhainn Lusa.

This route largely avoids extensive areas of woodland and primarily traverses wet heath habitats and smaller areas of blanket bog and dry heath.

6 DATA SOURCES FOR THE SHADOW HRA

6.1 Desk-based Study

A desk-based study was undertaken to gather and review data and available baseline information on habitats and protected species pertinent to the SAC. Data sources reviewed that are relevant to this Shadow HRA are:

- NatureScot SiteLink for designated site information[12];

[12] https://sitelink.nature.scot/home

- NatureScot Carbon and Peatland Map 2016[13];
- NatureScot National Vegetation Classification (NVC) Scotland data (1993 and 2001) and associated technical report (2002) covering the SAC;
- Ancient Woodland Inventory (AWI) (Scotland) for ancient woodland sites within the SAC;
- Heritage Environmental Limited (HEL) (February 2018). Quoich to Broadford (QB1) 132 kV OHL Step Bolt Replacement Project. Otter Survey: Towers 54 – 87. A Report to Cnoclee Limited;
- Forestry and Land Scotland (FLS) (2019). Inverness Ross and Skye Forest District. Kinloch Hills and Broadford Land Management Plan (LMP) 2019-2029;
- Forestry Commission Scotland[14] (2018). Inverness, Ross and Skye Forest District SSSI Designated Sites Management Plan: Kinloch & Kyleakin Hills; and
- FLS (2021). Forestry and Land Scotland, Inverness, Ross, and Skye Ancient Semi-Natural Woodland (ASNW) and Herbivore Impact Assessment (HIA) surveys 2020-21. Summary of Key Findings.

6.2 Field Surveys

6.2.1 Habitats

NVC surveys for the Proposed Development were conducted from June to August 2018 by Blairbeg Consulting on behalf of ASH and the Applicant, covering a survey corridor around the respective alignment options at that time and which were summarised in a briefing note provided to NatureScot[15].

Further NVC surveys have been undertaken by MacArthur Green in October 2021 for the Proposed Alignment and March and April 2022 for the Alternative Alignment, to fill gaps created by the iterative design process, ensure sufficient survey buffers have been surveyed, and to increase the resolution in some areas. The results of the contemporary NVC surveys are provided in **Appendix V2-4.3: National Vegetation Classification (NVC) and Habitats Survey Report** of the EIA Report.

A specialist bryophyte (i.e., mosses, liverworts and hornworts) and lichen survey has also been carried out for the Proposed Alignment and the Alternative Alignment within the SAC, focussing on recording Nationally Rare, Nationally Scarce, and oceanic species. Surveys were undertaken by Ben and Alison Averis in April 2022 and full details and results can be found within **Appendix V2-4.6: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey Report** of the EIA Report.

[13] https://www.nature.scot/professional-advice/planning-and-development/natural-heritage-advice-planners-and-developers/planning-and-development-soils/carbon-and-peatland-2016

[14] Now known as Forestry and Land Scotland (FLS).

[15] SSEN (2018). Results of NVC Surveys through the Kyleakin and Kinloch Hills Special Area of Conservation and Site of Special Scientific Interest. Fort Augustus – Skye Project. September 2018.

6.2.2 Otter

Otter surveys were undertaken in 2018 within the vicinity of the Proposed and Alternative Alignments[16].

Further protected species surveys were undertaken by MacArthur Green in October and November 2020 along the Proposed Alignment, with surveys for otter including a buffer of up to 300m either side of the proposed OHL (i.e., a 600 m survey corridor). These surveys also covered a short section of the Alternative Alignment from the existing Kyle Rhea OHL crossing south to the area around the Kyle Rhea ferry crossing.

Further survey gaps along the Proposed Alignment created by the iterative design process, following the previous surveys, were surveyed for protected species in March 2022.

The previously un-surveyed portion of the Alternative Alignment from Kylerhea to Abhainn Lusa via Glen Arroch was surveyed for protected species in March 2022, with surveys for otter including a buffer of up to 300m either side of the OHL (i.e., a 600 m survey corridor).

Full details and results of the MacArthur Green protected species surveys are provided in **Appendix V2-4.4: Protected Species Survey Report** of the EIA Report.

6.3 Data Gaps Relevant to the Shadow HRA

Following the completion of surveys, further engineering design work has indicated the need for PRI works on the C1239 minor road through Glen Arroch, between its junction with the A87 and Bealach Udal (grid reference NG 75396 20688). These works apply to the Alternative Alignment and would only occur if consent were granted for the Alternative Alignment as opposed to the Proposed Alignment. The PRI design work indicates the road would likely need verge widening/upgrading works extending up to 1 m either side of the existing surfaced carriageway.

Not all of the road verge area identified as requiring PRI works within the SAC has been field surveyed, to date. Therefore, any contemporary NVC field data road verge gaps along the Alternative Alignment due to PRI proposals were assigned a Non-Surveyed Area (NSA) code so these areas are accounted for in the habitat loss calculations and associated assessments below. The PRI NSA extends to 0.48 ha as per Table 8-5.

With respect to this 0.48 ha of NSA, a review of the aerial and street view imagery, knowledge of the area from previous surveys, contemporary survey results from other adjoining sections of the road which have been surveyed, and a review of NatureScot's 2001 designation NVC data, would suggest this narrow NSA is likely to comprise a variety of habitat types, including SAC qualifying habitats. In the absence of contemporary NVC data an exercise was undertaken to determine if the 2001 designation NVC data covered any of this NSA; this data only covered a further 0.08 ha of the NSA, leaving 0.4 ha still unknown. A further desk-based exercise was undertaken on this 0.4 ha of NSA to map as best possible the area using a combination of aerial and street view imagery as noted above. This exercise split up and characterised the narrow strips of NSA into general Phase 1 habitat types which could then be correlated to SAC qualifying habitats, allowing their extents to

[16] SSEN (2018). Results of Protected Species Surveys (Otter) through the Kyleakin and Kinloch Hills Special Area of Conservation and Site of Special Scientific Interest. Fort Augustus – Skye Project. October 2018.

be apportioned and considered in the assessment below. The 2001 designation NVC data and desk-based mapping exercise on this NSA indicates the verges comprise a number of SAC qualifying habitats (i.e., wet heathlands with cross-leaved heath, dry heaths, and to a much lesser extent wet modified bog) and non-SAC qualifying habitats (such as bracken and acid grassland); see Section 8.5.1 for further details.

6.3.1 Limitations

Ecological surveys can be limited by lack of safe access and Health and Safety concerns, such as the steep gullies and ravines present in parts of the survey area. Some of the steep ravines and gullies within the vicinity of the Proposed Alignment could not be safely accessed and were surveyed as far as safely practicable. No further notable access limitations were experienced with regards to surveys.

As detailed above, some NVC surveys for Section 3 were undertaken in the months of October and March. These months are generally considered to be outside the optimal survey period for vegetation and habitats (i.e., April to September). However, despite the time of year, the overall character and type of vegetation was still readily recognisable and could still be accurately attributed a NVC community due to the surveyor knowledge of the survey area and the persistent and still easily identifiable vegetation present in many areas such as various sub-shrubs, remnant vegetation, bryophytes etc. It should also be noted that most areas were also surveyed earlier in June to August 2018. The timing of the surveys is not considered here to be a notable limitation.

Notwithstanding the minor data gap mentioned above regarding PRI works for the Alternative Alignment, limitations exist with regard to the knowledge base on how some species, and the populations to which they belong, react to particular effects associated with a development; a precautionary approach is taken in these circumstances.

Ecological surveys are also limited by factors which affect the presence of plants and animals such as the time of year, migration patterns and behaviour. The ecological surveys undertaken have not therefore produced a complete list of plants and animals and the absence of evidence of any particular species should not be taken as conclusive proof that the species is not present or that it will not be present in the future.

Therefore, whilst some limitations have been identified, it is considered that there is sufficient information to enable an informed decision to be taken in relation to the identification and assessment of likely significant environmental effects on ecology.

7 DETERMINATION OF LIKELY SIGNIFICANT EFFECTS

Step 2 of the HRA process considers whether the project, alone or in combination, is likely to have a significant effect on the designated site.

NatureScot guidance (page 11)[17] details the purpose of this step:

"*This step acts as a screening stage, removing from the assessment process, plans or projects which* ***clearly have no connectivity to a site's qualifying interests or those where it is very obvious that the***

[17] NatureScot (May 2021). European Site Casework Guidance: How to consider plans and projects affecting Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

conservation objectives for the site's qualifying interests will not be undermined despite a connection*. All other plans or projects, including those where there is reasonable doubt as to the magnitude and nature of their impact, should be passed through to the next stage (appropriate assessment).''*

Both options pass through the Kinloch and Kyleachin Hills SAC and will require the physical construction of infrastructure and land-take/disturbance of habitats. It can therefore be ascertained that there is connectivity between the Proposed Development and the SAC and that a likely significant effect on its qualifying features concluded.

The consideration provided in **Volume 2, Chapter 4: Ecology** of the EIA Report enables the conclusion of 'no likely significant effects' for the under-noted qualifying features or impacts on qualifying features. This conclusion was reached on the basis of the information provided within **Volume 2, Chapter 4: Ecology** which includes proposed standard, proven, and embedded mitigation measures:

- Alpine and Subalpine Heaths;
- Mixed Woodland on Base Rich Soils Associated with Rocky Slopes;
- Otter;
- Peat failure or peat slide; and
- All pollution impacts on all qualifying features.

For clarity within this Shadow HRA, these are considered within Section 8 below 'Information to inform an Appropriate Assessment'.

8 INFORMATION TO INFORM AN APPROPRIATE ASSESSMENT

8.1 Scope of the Appropriate Assessment

Based on the above discussion, impacts on the qualifying features (Table 8-1) of the SAC, with respect to effects on their conservation objectives (Section 8.3), require further consideration in an appropriate assessment to determine whether there may be an adverse effect on Site integrity. This section considers the baseline conditions for the qualifying features of the SAC, the likely impacts on qualifying features, and assesses the likely effect on Site's conservation objectives with respect to the qualifying features (Page 44 of Nature Scot 2021[18] and section 4.6.3 of European Commission 2018[19]).

Table 8-1 Qualifying Features of Kinloch and Kyleakin Hills SAC

Feature	Identified Pressures	Condition & Date Last Assessed	Description
Alpine and subalpine heaths	Overgrazing (deer)	Unfavourable Recovering 17 February 2015	Annex I habitat

[18] NatureScot (May 2021). European Site Casework Guidance: How to consider plans and projects affecting Special Areas of Conservation (SACs) and Special Protection Areas (SPAs).

[19] European Commission (2018). Managing Natura 2000 Sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. ISBN 92-828-9048-1

Feature	Identified Pressures	Condition & Date Last Assessed	Description
Blanket bog	No negative pressures	Favourable Maintained 13 November 2014	Annex I priority habitat
Dry heaths	Invasive species (bracken)	Favourable Maintained 17 February 2015	Annex I habitat
Mixed woodland on base-rich soils associated with rocky slopes	Invasive species Overgrazing	Unfavourable Recovering 9 October 2013	Annex I priority habitat
Western acidic oak woodland	Invasive species Overgrazing	Unfavourable Declining 9 October 2013	Annex I habitat
Wet heathland with cross-leaved heath	Overgrazing	Unfavourable Declining[20] 11 September 2009	Annex I habitat
Otter	Dumping/storage of materials Forestry operations Other	Favourable Maintained 21 August 2011	Annex II species

8.2 Potential Impacts on Qualifying Features

Based on the information on the Proposed Development presented in Section 4 above, the potential impacts on SAC qualifying features are as follows:

- Habitats - direct habitat loss and modification, i.e., derived from land-take and disturbance;
- Habitats - indirect effects and habitat loss, e.g., changes caused by effects to supporting systems such as groundwater or overland flow, or deposition of airborne dust/pollution;
- Otter - direct loss of life as a result of the Proposed Development, loss of key habitat, displacement from key habitat, barrier effects preventing movement to/from key habitats, and general disturbance;
- Otter - indirect effects such as loss/changes of/to food resources, population fragmentation, degradation of key habitat (e.g., as a result of pollution); and
- Habitats & otter - in-combination effects of the Proposed Development with other projects.

8.3 Conservation Objectives

In order to conduct the appropriate assessment under Step 3 of the HRA process, it is necessary to ascertain whether the Proposed Development would clearly not adversely affect the integrity

[20] Management measures are in place that should, in time, improve the feature to Favourable condition (Unfavourable Recovering Due to Management).

of a Natura site ('Integrity Test'). NatureScot advises that, "*There are no concrete rules about what constitutes 'no adverse effect on site integrity'. Each case should be judged on its own merits*"[21].

It is necessary to consider the effect of the identified impacts on the Site's Conservation Objectives to establish whether the Proposed Development will have an adverse effect on the integrity of the Site.

8.3.1 Habitats

The Conservation Objectives of Kinloch and Kyleakin Hills SAC for qualifying habitats are:

1. To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
2. To ensure for the qualifying habitats that the following are maintained in the long term:
    a. Extent of the habitat on Site;
    b. Distribution of the habitat within Site;
    c. Structure and function of the habitat;
    d. Processes supporting the habitat;
    e. Distribution of typical species of the habitat;
    f. Viability of typical species as components of the habitat; and
    g. No significant disturbance of typical species of the habitat.

As the Proposed Development overlaps with the SAC, all Conservation Objectives are considered relevant to the appropriate assessment.

8.3.2 Species

The Conservation Objectives of Kinloch and Kyleakin Hills SAC for qualifying species (i.e., otter) are:

1. To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the Site is maintained, and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and
2. To ensure for the qualifying species that the following are maintained in the long term:
    a. Population of the species as a viable component of the Site;
    b. Distribution of the species within Site;
    c. Distribution and extent of habitats supporting the species;
    d. Structure, function and supporting processes of habitats supporting the species; and

[21]https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra/habitats-regulations-appraisal-hra

e. No significant disturbance of the species.

As the Proposed Development overlaps with the SAC, all Conservation Objectives are considered relevant to the appropriate assessment.

8.4 Baseline Conditions

8.4.1 Habitats

8.4.1.1 Desk-Based Information

Over 95% of the SAC is on land owned by Forestry and Land Scotland, the remainder is private land around Loch na Dal in the south and Abhainn Lusa/Allt Mor in the mid-west[22]. The SAC was primarily selected for its western acidic oak woodland, although it is designated for several Annex I habitats, including priority habitat types (see Table 8-1).

As per the SAC citation[23], the Site is an extensive upland site on Torridonian sandstone which extends from sea level to over 700 m, where the lower slopes contain several areas of rocky woodland and wooded ravines varying from acidic oak–birch woodland, to base-rich ash–hazel woodland with a herb-rich ground flora. Many of the oak and ash trees within the component woods of the Site are veterans and are now growing within an infilled wood pasture, which has regenerated as woodland. Several of the component woods support a rich bryophyte flora, both as epiphytes and on the block scree within the wood, with an internationally important representation of oceanic species, especially in ravines deeply cut into the sandstone. The woods are also important for epiphytic lichens.

The majority of the woodland around Mudalach is ancient birchwoods; birch is dominant within the canopy, frequently accompanied by rowan with occasional oak, holly, ash, hazel and eared willow. Much of the upland oak woodland feature in the north of Kinloch Hills is on steep, rocky shelves with a ground flora dominated by heather and patches of bryophytes, woodrush and ferns. On more accessible, deeper soils the ground flora is dominated by grasses and bracken. The canopy here is quite open. In some areas abundant natural regeneration of native trees has taken place and an understorey of young trees and saplings are now visible[22]. The species-rich ash woodland near Mudalach has a diverse lower plant flora and occurs in a steep narrow gorge above Corran na Mudlaich, according to NatureScot's designation NVC data, the W9 here covers an area of approximately 0.44 hectares (ha). Patches of wet woodlands are common in flushes and along the lower margins of the main birch woodland[22].

NVC baseline surveys of the area were initially undertaken in 1993[24], and these were updated, built upon and refined in 2001 on 1:10,000 scale maps[25]; this data was used for SAC designation. As described and indicated throughout Averis & James (2002)[25], the open habitats form mosaics and

[22] Forestry Commission Scotland (2018). Inverness, Ross and Skye Forest District SSSI Designated Sites Management Plan: Kinloch & Kyleakin Hills.

[23] https://sac.jncc.gov.uk/site/UK0030176

[24] Averis, A.B.G. (1993). The vegetation of the Kylerhea area of eastern Skye, Scotland. Commissioned Report for Scottish Natural Heritage.

[25] Averis, A.B.G. & James, P. (2002). A Botanical Assessment for the Kinloch Hills Wilderness Forest Project, Isle of Skye, Scotland. Commissioned Report for Forestry Commission Scotland.

transitional areas across the SAC, with the numerous mire and heath communities intertwined. A wide range of communities and sub-communities are present, and for the most part these appear to be in a largely natural condition and are oceanic in character. The lower ground is mainly wet heath with frequent areas of bog, and some patches of dry or damp heath, bracken, *Molinia* dominated habitats and native woodland (often with heath or bracken dominated glades), and many small flushes varying from acidic and heathy to base-rich with various sedges, forbs and mosses. The more elevated and hilly terrain is dominated by a range of wet heath and blanket bog communities, with smaller areas of short dry heath, subalpine/moss heath and grassland. On steep shallow soils and well-drained ground above approximately 500/550 m alpine heath occurs on several slopes within the SAC. Prostrate heather with extensive carpets of moss (montane heaths) is frequent on the highest and most exposed ground.

The blanket bog is in an apparently natural or near natural state which occurs over a wide altitudinal range and, in parts, on relatively steep slopes. It is widespread and extensive on lower ground, mainly occurring on the gentle to moderate slopes. Higher up, blanket bog is more patchy but still widespread in hollows, basins and on terraces and it is frequently found in mosaics with both dry and wet heath. Much of the blanket bog is classed as 'valleyside mire', with 'saddle mires' in the depressions between higher slopes[26].

The wet heath is widespread and abundant covering large areas within the gentle and steep slopes of shallower peat.

The SAC's Natura 2000 standard data form[27] indicates the SAC covers an area of 5275.63 ha. The extent of the respective qualifying habitats, according to this data form, is detailed in Table 8-2 below.

Table 8-2 Extent of Qualifying Habitats within the SAC

SAC Qualifying Feature	Annex I Code	Annex I Description	Extent (ha)
Alpine and subalpine heaths	4060	Alpine and Boreal heaths	89.68
Blanket bog	7130	Blanket bog	965.41
Dry heaths	4030	European dry heaths	448.41
Mixed woodland on base-rich soils associated with rocky slopes	9180	*Tilio-Acerion* forests of slopes, screes and ravines	33.24
Western acidic oak woodland	91A0	Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	168.81
Wet heathland with cross-leaved heath	4010	Northern Atlantic wet heaths with *Erica tetralix*	2215.69

According to Table 8-2 above, SAC qualifying habitats account for 3921.24 ha of the Site, which according to this information would indicate that the remaining 1354.39 ha of the SAC is comprised on non-SAC qualifying habitats.

[26] As per the SSSI citation.

[27] https://jncc.gov.uk/jncc-assets/SAC-N2K/UK0030176.pdf

A review of NatureScot's NVC data and associated report[25] for the SAC indicates these non-SAC qualifying habitats include, for example, inland waterbodies, flushes, acid grassland, calcareous grassland, marshy grassland, rock/scree, and bracken.

NatureScot's AWI was reviewed to identify areas of ancient woodland within and around the SAC. The definition of ancient woodland is land that is currently wooded and has been continually wooded, at least since 1750. It is not related to the age of the trees that are currently growing there; they do not have to be ancient or elderly, it is the historical continuity of the woodland habitat that makes a woodland ancient. The AWI holds information on the location and extent of ancient woodland within Scotland, and categorises each stand as follows:

- **Ancient Woodland (1a and 2a)** - Interpreted as semi-natural woodland from maps of 1750 (1a) or 1860 (2a) and continuously wooded to the present day. If planted with non-native species during the 20th century they are referred to as Plantations on Ancient Woodland Sites (PAWS);
- **Long-established woodlands of plantation origin (LEPO) (1b and 2b)** - Interpreted as plantation from maps of 1750 (1b) or 1860 (2b) and continuously wooded since. Many of these sites have developed semi-natural characteristics, especially the oldest stands, which may be as rich as Ancient Woodland; and
- **Other woodlands on Roy maps (3)** - Shown as un-wooded on the 1st Edition of the Ordnance Survey maps (produced in circa 1850) maps but as woodland on the Roy maps (produced in circa 1750). Such sites have, at most, had only a short break in continuity of woodland cover and may still retain features of Ancient Woodland.

The AWI indicates all the North Kinloch woodland around Mudalach is ancient woodland (**Figure 2**). The majority of the woodland is classified as ancient of semi-natural origin (1a) with one stand in the west of Mudalach classified as ancient of semi-natural origin (2a), one further small area in the west of Mudalach is classified as other woodlands on Roy maps (3).

The NatureScot Carbon and Peatland Map was reviewed to determine the likely peatland classes present within the SAC and in proximity to the route options. The map provides an indication of the likely presence of peat at a coarse scale. The Carbon and Peatland map has been developed as "*a high-level planning tool to promote consistency and clarity in the preparation of spatial frameworks by planning authorities*"[28]. It identifies areas of "*nationally important carbon-rich soils, deep peat and priority peatland habitat*" as Class 1 and Class 2 peatlands. Class 1 peatlands are also "*likely to be of high conservation value*" and Class 2 "*of potentially high conservation value and restoration potential*".

The Carbon and Peatland Map indicates that a large area of Class 1 peatland is present along the Proposed Alignment to the south and southwest of Mudalach. There is no Class 1 peatland along the Alternative Alignment, however there is a relatively small area of Class 2 peatland along the Alternative Alignment at the head of Glen Arroch (see **Figure 2**). Most of the SAC is comprised of

[28] https://www.nature.scot/professional-advice/planning-and-development/general-advice-planners-and-developers/planning-and-development-soils/carbon-and-peatland-2016-map.

Class 0[29], Class 3[30], and Class 4[31] soils. The Mudalach woodlands are present on Class 0 soils. The part of the Alternative Alignment that passes through the SAC is predominately categorised as Class 3 soils.

8.4.1.2 Ongoing & Future Land Management

As noted above, over 95% of the SAC is on land owned by Forestry and Land Scotland. Therefore, the baseline and future baseline conditions should also consider the ongoing and future planned management of the SAC by Forest and Land Scotland (FLS). A number of documents provide more information on management of the site[32], however, a brief summary of key points of relevance to this Shadow HRA are noted below.

The overarching aims of the Kinloch Hills and Broadford LMP 2019-2029 state the open habitat and native woodland will be managed to enhance the SAC qualifying features and peatland restoration will be undertaken to expand the open habitat areas surrounding the SAC. It also notes peatland that has been planted in the past will be restored in accordance with FLS peatland guidance (both inside and outside the SAC).

Some of the FLS management objectives of relevance to the HRA include:

- To allow the existing native woodland resource to expand from its existing location through natural regeneration of tree species. In the short term, management will continue to monitor and remove the secondary regeneration of non-native conifers.
- To restore some of the blanket bogs outwith the immediate boundary of the designated site at Lochan na Saile, Glen Arroch and Kyle Farm (i.e., areas as shown on Map 17 of Kinloch Hills and Broadford LMP 2019-2029)[33]. In the longer term it is proposed to assess further peatland within the SAC for potential restoration programmes.

[29] Class 0 - Mineral soil - peatland habitats are not typically found on such soils.

[30] Class 3 - Dominant vegetation cover is not priority peatland habitat but is associated with wet and acidic type. Occasional peatland habitats can be found. Most soils are carbon-rich soils, with some areas of deep peat. Indicative soil - predominantly peaty soil with some peat soil. Indicative vegetation – peatland with some heath.

[31] Class 4 - Area unlikely to be associated with peatland habitats or wet and acidic type. Area unlikely to include carbon-rich soils. Indicative soil - predominantly mineral soil with some peat soil. Indicative vegetation – heath with some peatland.

[32] For example, FCS (2018). Inverness, Ross and Skye Forest District SSSI Designated Sites Management Plan: Kinloch & Kyleakin Hills; and FLS (2019). Inverness Ross and Skye Forest District. Kinloch Hills and Broadford Land Management Plan 2019-2029.

[33] The identified peatland restoration area by Glen Arroch, outwith the SAC, is located to the southwest of Glen Arroch and northwest of An Sgùlan as shown on Map 17 of Kinloch Hills and Broadford LMP 2019-2029. An application was made to The Highland Council (THC) on 25 May 2021 (planning reference 21/02579/PNO) to undertake restoration works in this identified area as the 'Glen Arroch 2 Peatland Restoration Project'. The application was withdrawn on 20 December 2021 as THC deemed the application to not fall within permitted development, and prior approval would be required for the scheme. Two further peatland restoration applications have been submitted to THC by FLS in June and July 2022 covering land in the Kyle Farm area, i.e., the Kyle Farm III Peatland Restoration Project (planning reference 22/02790/PNO) and Choire Bhuidhe Peatland Restoration Project (planning reference 22/03016/PNO). Further details on these are provided in Section 11.

- To continue the FLS policy for the eradication of rhododendron and other invasive non-native plant species (INNS).

In the past the main priority has been to remove non-native conifers from the SAC and to encourage native woodland regeneration. The removal of non-native commercial plantation within the SAC has been completed within the SAC area.

From 2001 – 2008 FLS received funding for a woodland expansion project, the majority of which is located within the SAC, as part of a Scottish Forestry Alliance (SFA)/BP Kinloch & Kyleakin Hills Restoration Project to establish 486 ha of new native woodland for carbon storage. The new woodland was to be realised through a combination of planting proposals and natural regeneration proposals in regeneration zones around existing stands of woodland (see **Figure 3**).

The associated Environmental Statement (2004) recognised the dynamic nature of habitats and that improvement in priority woodland habitat within the SAC could not be achieved without a consequent impact on other qualifying features. Given the priority for woodland expansion, potential impacts were considered acceptable so long as they met the overall conservation objectives for the Site[22]. The scheme resulted in an agreement from the Scottish Executive that woodland features would be favoured over open ground features on this Site[34].

Map 8 of the FLS (2019) Kinloch Hills and Broadford LMP 2019-2029 details the areas that were part of this woodland expansion project. Parts of the Proposed Alignment and Alternative Alignment overlap with some of these areas, as shown in **Figure 3**.

Where the Proposed Alignment passes through the SAC, the majority of this alignment and associated towers and permanent access tracks pass through and weaves in and out of a contiguous zone identified for natural regeneration along the edge of the Mudalach woodlands (**Figure 3**). Furthermore, the Proposed Alignment passes through two larger areas that were planted as part of the scheme, one to the west of Mudalach (northwest of Glas Choire) and one to the east of Mudalach (northeast of Carn an t-Seachrain and north of Inbhir Ghualann) (**Figure 3**). With respect to where the Alternative Alignment passes through the SAC, one tower location and approximately 347 m of proposed permanent new access track currently overlaps with areas identified for natural regeneration as part of this scheme (**Figure 3**).

The success of the planting across the SFA scheme planting areas has been variable, some areas are reported to have established well, and some areas have failed. Of particular relevance is the 64 ha area of planted woodland west of Mudalach. FLS note that since planting it has become clear that a proportion of this west Mudalach site was wrongly identified as being suitable for planting, due to poor ground conditions and the presence of deep peat. The revised proposals here seek to convert 41 ha of this failed planted woodland back to peatland bog habitat during the period 2019-2024 by not replanting and assessing whether furrow flattening and drain blocking would be appropriate (as part of this proposal a compensatory area of 41 ha has been allocated for natural regeneration at Am Meallan, in the south of the SAC). The planting area east of Mudalach and around the headland has also failed, FLS plan to survey the peat depth in this area and replant where possible. More generally, FLS over the 2019-2029 LMP period intend to restock failed areas

[34] Noted in consultation letter with NatureScot dated 25 October 2018.

through planting, where appropriate (i.e., as per FLS peatland guidance, areas of deep peat will not be planted; see also Map 23 of the LMP).

Additionally, in 2015 and in 2016 an FLS survey of the natural regeneration on open and previously felled areas within Kinloch Hills Forest was undertaken to record the extent and density of tree regeneration. Within the north Kinloch survey area at Mudalach, the survey highlighted abundant regeneration of oak and aspen localised on steep ground where a seed source was present. Within the birchwoods, the survey highlighted highly localised birch saplings standing at 1800 stems/ha. Some of these birch saplings have colonised part of the wet heath within the western areas leading to an increase in extent of the western acidic oak woodland feature within the SAC, at the expense of the wet heathland with cross-leaved heath SAC qualifying feature. Throughout the north Kinloch survey area, it was recorded that within the ground flora palatable species to deer were well represented suggesting that in general the threat from red and roe deer browsing impacts were low-medium throughout the survey area. However, some browsing from red deer was found on saplings on part of the palatable tree species. Therefore, the survey emphasised the importance of continuing deer management within this northern part of the SAC. Within the east of Mudalach birchwoods, in some of the area's deer fenced in the past (N.B. there are no longer deer fences in or bordering the SAC), good natural regeneration of saplings and young trees at relatively high densities were recorded. More recently, forestry surveys for the Proposed Development have also recorded abundant natural regeneration of native woodland within the SAC; see **Volume 2, Chapter 9: Forestry** of the EIA Report for details.

In 2020/2021 FLS commissioned a suite of Herbivore Impact Assessment (HIA) and Ancient Semi-Natural Woodland (ASNW) condition assessment surveys in the Inverness, Ross and Skye district[35]. This included surveys of the Mudalach woodlands in February and March 2020. The HIA of the Mudalach woodland ascertained, of the plots surveyed, the herbivore impact was 'Medium' for approximately 75% of plots; with around 5% assessed as 'Medium-High'. The remaining 20% of plots had a HIA rating of 'Low-Medium' or 'Low'.

A summary of the ASNW condition survey noted threats to the native woodland here from expanding non-native conifer regeneration (Sitka spruce and lodgepole pine) and invasive species (cotoneaster bushes recorded, in addition to the already known rhododendron). The ASNW survey also indicated that the browsing impacts vary across the Site, some areas of open birchwood were assessed as having sparse regeneration and were considered to be approaching a threatened status for regeneration density; with patches of dense bracken also recorded developing in these areas. The browsing patterns on established young trees and saplings also suggest increasing impacts from deer[35].

There are also two areas of known slope stability risk within the SAC[22]. One of these areas is on the north side of Kylerhea Glen above the public road where land slips have occurred in the past. The establishment of woodland here had been recommended to reduce the risk of future landslides. This area was subsequently planted with broadleaves in 2006 but this planting has failed, and the area is currently a hillside dominated by heather, purple moor-grass and bracken. In addition to this it is known that there have been two landslides in the Mudalach area.

[35] FLS (2021). Forestry and Land Scotland, Inverness, Ross, and Skye Ancient Semi-Natural Woodland (ASNW) and Herbivore Impact Assessment (HIA) surveys 2020-21. Summary of Key Findings.

8.4.1.3 *Field Surveys*

8.4.1.3.1 NVC Surveys

As the baseline NVC surveys for the SAC were undertaken in 2001 and built upon the 1993 surveys, detailed NVC surveys of alignment options in 2018 have re-mapped the habitat types and NVC communities present along the respective routes to provide an updated baseline[15]. Further surveys have been undertaken by MacArthur Green in 2021 and 2022 with field survey maps utilising high resolution and up to date aerial imagery at a scale of 1:5000 to fill in survey gaps along both alignment options. However, as noted in Section 6.3 above, some minor contemporary data gaps remain for the Alternative Alignment as a result of proposed PRI works. A high-level summary of the contemporary NVC surveys is provided below (N.B. a data comparison exercise has also been undertaken between the 2001 NVC data and the contemporary 2018-2022 NVC data, see **Annex C** for full details and discussion).

Broadleaved woodland areas are generally located along the banks of watercourses or along the lower slopes of Mudalach. These stands are largely dominated by W11 *Quercus petraea - Betula pubescens - Oxalis acetosella* woodland, W17 *Quercus petraea - Betula pubescens - Dicranum majus* woodland, or mosaics of W11 and W17. There are also smaller areas of W4 *Betula pubescens - Molinia caerulea* woodland and W7 *Alnus glutinosa - Fraxinus excelsior - Lysimachia nemorum* woodland. Further smaller and more fragmented patches of woodland or scrub are generally comprised of regenerating birch species, rowan and willows, or scattered trees along cliff edges, ravines or through a number of open habitat types.

The majority of the open ground is comprised of wet heath, usually in complex and transitional mosaics with blanket bog, dry heaths and some non-qualifying habitats such as bracken, there are also a number of intermediate communities. All wet heath has been recorded as various sub-communities of M15 *Trichophorum germanicum - Erica tetralix* wet heath. Dry heaths are prevalent on steeper ground, gullied banks of watercourses, and knolls. The most common community is H10 *Calluna vulgaris - Erica cinerea* dry heath, typically on shallow soils. On more humid slopes, watercourse banks and knolls H21 *Calluna vulgaris - Vaccinium myrtillus - Sphagnum capillifolium* dry heaths are common. H12 *Calluna vulgaris - Vaccinium myrtillus* dry heaths are present but generally less common within the area surveyed.

Blanket bog is typically comprised of M17 *Trichophorum germanicum - Erica tetralix* blanket mire and M19 *Calluna vulgaris - Eriophorum vaginatum* blanket mire communities. All communities identified as blanket bogs within the survey area were typically intact with high cover of Sphagna and often punctuated by bog pools also with abundant Sphagna. In some instances, pockets of blanket bog communities can be found between small knolls and hummocks dominated by M15 wet heath and is often present as a wet heath/blanket bog mosaic or as an intermediate community. Modified bog communities are present also, typically M25 *Molinia caerulea – Potentilla erecta* mire, but in some cases also M20 *Eriophorum vaginatum* blanket mire.

Other common habitat types recorded during the surveys were stands of bracken (U20 *Pteridium aquilinum - Galium saxatile* community) and, less so, acidic flush communities (M6 *Carex echinata - Sphagnum fallax/denticulatum* mire). There are occasional base-rich M10 *Carex dioica - Pinguicula vulgaris* flushed mires on the north-facing slopes near Mudalach.

The contemporary NVC data have also been cross-referenced to the Phase 1 Habitat Survey Classification[36] to also allow a broader characterisation and easier visualisation of habitats along the routes. The survey results are displayed in **Figure 4** which combines the Phase 1 symbology with detailed NVC data. As is evident in **Figure 4**, many areas are complex mosaics of a different habitat and community types, many of which are transitional and intermediate, and most of which are qualifying features of the SAC.

The broad correlation between SAC qualifying features, Annex I habitats, Phase 1 habitats and NVC communities in the SAC survey area is summarised in Table 8-3 below. Note, in Table 8-3, based on the precautionary principle and likely connectivity the M20 and M25 NVC communities within the SAC, which in isolation could be considered wet modified bogs, are considered here to also be a component part of the overall blanket bog qualifying feature - as these communities are often part of mosaics with blanket bog (and wet heath) habitats and are often intricately linked to them through hydrological connectivity or being part of the same peatland macrotope.

Table 8-3 Correlation between Habitat Classifications/Categorisation

Qualifying Feature	Annex I Habitat	Phase 1 Habitat	NVC Communities Recorded
Mixed woodland on base-rich soils	9180 *Tilio-Acerion* forests of slopes, screes and ravines	A1.1.1 Broadleaved Semi-Natural Woodland	W9[37]

[36] Joint Nature Conservancy Council. (2010). Handbook for phase 1 habitat survey – a technique for environmental audit. JNCC, Peterborough.

[37] 9180 *Tilio-Acerion* forests of slopes, screes and ravines are woodlands that usually occur towards the bases of slopes and ravines, being found on calcareous substrates associated with typically inaccessible coarse scree, cliffs, steep rocky slopes and ravines. This Annex I type in Scotland is typically characterised by W9 *Fraxinus excelsior – Sorbus aucuparia – Mercurialis perennis* woodland. It often occurs as a series of scattered patches grading into other types of woodland or as narrow strips along stream-sides. No W9 was recorded within the survey area during the 2018/2021/2022 surveys, although it may be present and/or under recorded due to the typical habit of this woodland, and the inaccessibility and health and safety concerns with surveying deeply incised gorges or ravines. It has therefore been assumed on the basis of the precautionary principle that there may be small patches of unrecorded W9 woodland within the gorges around Mudalach. The NatureScot 2001 NVC data[25] of the SAC was also reviewed. This NVC data indicates no areas of W9 along or in proximity to the Alternative Alignment. With respect to the Proposed Alignment, there are four polygons where W9 was recorded in the vicinity of this option, as follows: i) the main Mudalach stand located below waterfalls on the lower Allt na Plaide at Corran-na Mudlaich which is approximately 188 m from the proposed OHL alignment and 205 m from the nearest tower; ii) a 0.55 ha mosaic of W7 (50%) and W9 (50%) on the coast by Sròn an Tairbh, located approximately 269 m from the proposed OHL alignment and 222 m from the nearest proposed access track; iii) a 0.93 ha mosaic of W17 (90%) and W9 (10%) on the Allt na Pairce-fraoich, this mosaic is mostly outwith the SAC and located approximately 30 m from the proposed OHL alignment and 115 m from the nearest proposed tower; and iv) a 4.30 ha mosaic of W17 (90%) and W9 (10%) on the Allt a'Ghleannain. The conductors for the Proposed Alignment would traverse the mosaic stand on the Allt a'Ghleannain, and some crown reduction is predicted here (see Section 8.5.1.1). However, the woodland type to be affected at this specific crossing location is *Betula* spp. dominated W17 (based on the contemporary NVC data, a bryophyte survey target note at this location describing the W17 (**Appendix V2-4.6: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey** Report of the EIA Report) and forestry data and photographs collected here of the *Betula* spp. woodland (see **Volume 2, Chapter 9: Forestry**); consequently no W9 (i.e., mixed woodland on base-rich soils associated with rocky slopes) within the SAC is

Qualifying Feature	Annex I Habitat	Phase 1 Habitat	NVC Communities Recorded
associated with rocky slopes			
Western acidic oak woodland	91A0 Old sessile oak woods with *Ilex* and *Blechnum* in the British Isles	A1.1.1 Broadleaved Semi-Natural Woodland and A3.1 Scattered Broadleaved Tree	W4, W11, W17, SBT[38]
Alpine and subalpine heaths	4060 Alpine and Boreal heaths	D3 Lichen/bryophyte heath and D4 Montane heath/dwarf herb	H14, H20, U7, U10, U13[39]
Dry heaths	4030 European dry heaths	D1.1 Dry Dwarf Shrub Heath (Acid)	H9, H10, H12, H21, H10-M25 intermediate, H12-M25 intermediate
Wet heathland with cross-leaved heath	4010 Northern Atlantic wet heaths with *Erica tetralix*	D2 Wet Dwarf Shrub Heath	M15, M15-M17 intermediate
Blanket bog	7130 Blanket bog	E1.6.1 Blanket Bog	M1, M2, M3, M17, M19, M17-M25 intermediate, M19-M25 intermediate
		E1.7 Wet Modified Bog	M20, M25, M20-M25 intermediate

The Proposed Alignment – the habitats along and in proximity to the Proposed Alignment within the SAC are dominated by broadleaved woodlands, dry heaths, wet heaths, blanket bogs, and bracken (or various mosaics thereof, particularly mosaics of blanket bog and wet heath). Most habitats along and surrounding this alignment are qualifying features of the SAC. Habitat components of note include the stands of broadleaved woodland which contain mature trees along the watercourses west of Mudalach, and the expanse of woodland along the unnamed watercourse west of the Allt Mor Ghuaidhre, which lies to the east of Mudalach. These larger woodland stands all lie in deeply incised gorges. The alignment also traverses several small areas of blanket bog and wet heath/blanket bog mosaics. Dry heaths are generally avoided along the majority of the Proposed Alignment, with the remainder and much of the of the alignment generally crossing wet heath areas.

The Alternative Alignment – the habitats along and in proximity to the Alternative Alignment within the SAC are mostly dominated by wet heath with some smaller patches of dry heath, blanket bog, acid flushes and bracken (and mosaics thereof). Again, the majority of habitats along and surrounding this alignment are qualifying features of the SAC. Habitat components of note include

predicted to be affected by the Proposed Development. According to NatureScot's 1993 and 2001 NVC data the main locus of W9 is in the southern extent of the SAC in coastal locations at Leitir Fura, Rubha Guail, Sgier Ghobhlach and Meall Port Mhealaraigh.

[38] SBT is a non-NVC category and refers to 'Scattered Broadleaved Trees', whereby there are often a few widely scattered trees within an otherwise open and non-wooded polygon, usually *Betula* spp. at this site. Their extent is too small and sparse to be mapped as a woodland NVC community.

[39] These NVC communities listed correspond to alpine and subalpine heath communities that have been recorded in the SAC as indicated within NatureScot's 1993[24] and 2001[25] NVC data sets, however none of these communities were recorded within the respective 2018/2021/2022 survey areas for either alignment option.

wet heath/blanket bog mosaics at Bealach Udal, around Allt Mòr, and in lower Kylerhea Glen. Larger expanses of blanket bog are generally avoided. The alignment crosses the Allt Mor where there is a riparian strip of broadleaved woodland along the watercourse banks, however, other than this broadleaved woodland in the SAC is avoided along the Alternative Alignment.

8.4.1.3.2 Bryophyte and Lichen Surveys

A specialist rare/scarce bryophyte (i.e., mosses, liverworts and hornworts) and lichen survey was carried out for both alignment options within the boundary of the SAC in April 2022. The survey covered a 100 m survey corridor around the OHL alignments and a 60 m survey corridor around all proposed new and upgraded, permanent and temporary, tracks. Full details and results of this survey can be found within **Appendix V2-4.6: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey Report** of the EIA Report.

In summary, a total of 25 oceanic bryophyte species were recorded during the survey. Among the bryophytes found in the survey the mosses *Campylopus setifolius, C. shawii* and *Dicranodontium uncinatum* are classed as Nationally Scarce (Pescott, 2016[40]). Among the lichens *Leptogium dendriscum* is classed as Nationally Rare and (threat category) Vulnerable, and *Nevesia sampaiana* is Nationally Scarce and Near Threatened[41].

The habitats of greatest importance for bryophytes and lichens in the areas surveyed are woodland, scrub and steep north to east facing rocky habitats. Native woodland and scrub in this area, including very small patches of eared willow *(Salix aurita)* scrub, is good for epiphytic bryophytes and lichens, and also for oceanic bryophytes on rocks, banks and logs beneath the tree canopy. The richness of woodland here reflects the high humidity that is the result of a combination of shade/shelter beneath the tree canopy and the location in an area with a wet and relatively equable (i.e., oceanic) climate. These habitats at this site can therefore be regarded as examples of temperate rainforest.

Steep rock outcrops on north to east facing slopes are generally at least moderately rich in western bryophyte species. The northerly to easterly slope aspect leads to favourably shaded and sheltered conditions and an associated high level of humidity. This is reflected in the good representation of oceanic bryophytes; overlapping a lot with what is seen in woodlands in this area.

Nationally Rare and Nationally Scarce species were recorded at nine locations within the respective survey area: five along the Proposed Alignment, two along the Alternative Alignment and the remaining two on a section of the Proposed Development common to both options (see **Figure 4** for specific locations). In a number of these locations the species are located in the LoD or close to infrastructure, and may be, in the absence of mitigation, at risk from direct impacts.

8.4.1.3.3 Peat Depth Surveys

SLR consulting has carried out peat depth probing along sections of both options (see **Volume 2, Chapter 7: Geology and Soils Environment**). The data indicates that typically peat and soil depths are shallow and less than 0.5 m in depth, therefore technically not peat and more appropriately

[40] Pescott, O. (2016). Revised lists of nationally rare and scarce bryophytes in Britain. Field Bryology 115, 22-30.

[41] https://britishlichensociety.org.uk/resources/lichen-taxon-database

classified as organo-mineral or peaty soils. Within the peat survey area in the SAC, a few deeper pockets of peat were recorded during these surveys.

Along the Proposed Alignment an area of peat between 1.0 m - 2.20 m was recorded in an area of relatively flat blanket bog to the west of Mudalach (between proposed towers BF52 and BF53). East of this location and towards Mudalach there are a number of further smaller pockets of peat in the region of 1 m - 2 m in depth.

Along the Alternative Alignment there are several small pockets of peat in the region of 1 m - 2 m in depth scattered along the length of the alignment from Bealach Udal northwest through Glen Arroch, along the valley bottom of the Allt Mòr watercourse and adjoining and lower slopes.

Further details regarding peat depth surveys and results, and associated Figures are provided within **Volume 2, Chapter 7: Geology and Soils Environment**.

8.4.2 Otter

8.4.2.1 Desk-Based Information

The SAC citation notes otter was not a primary reason for SAC site selection. The Site supports an otter population which is representative of the Scottish west coast and encompasses a large number of holts used for shelter and breeding, intertidal and inland feeding areas, and freshwater pools.

Surveys undertaken by HEL in 2018 for the Quoich to Broadford Step Bolt Replacement Project[42] included an otter survey along the route of the existing OHL within the SAC. Surveys were undertaken in suitable habitat up to 250 m from the OHL. The survey recorded a minimum of 24 holts and 54 couches/hovers within the respective survey corridor, many of which were in proximity to existing towers and within potential disturbance zones. Evidence of otter was predominantly recorded along the coast, with little evidence found in suitable habitat, e.g., along watercourses and in boulder piles, beyond 50 m from the shore; see **Figure 5**.

8.4.2.2 Field Surveys

2018 surveys: Protected species surveys undertaken in 2018 covered a 200 m alignment buffer (i.e., 400 m survey corridor) off the alignments within the SAC at that time, including the full lengths of both alignment options. The surveys recorded a total of seven holts and six couches. Spraint or sprainting sites were recorded at a further 27 locations within the respective survey area. Almost all signs and holts/couches were recorded within 50 m of coastal locations or along larger watercourses (see **Figure 6**).

During this survey, two holts and up to six spraints/sprainting sites were recorded around the existing OHL crossing location at Kyle Rhea. Along the Proposed Alignment five holts, one couch, one holt/couch and up to ten spraints/sprainting sites were recorded. All signs were recorded around the headland, with the majority present along the coast.

The area from the existing Kyle Rhea OHL crossing south to the area around the RSPB hide/Kylerhea would be utilised to varying degrees for both alignment options; the Proposed

[42] Heritage Environmental Limited (HEL) (February 2018). Quoich to Broadford (QB1) 132 kV OHL Step Bolt Replacement Project. Otter Survey: Towers 54 – 87. A Report to Cnoclee Limited.

Alignment would require minor upgrading to the existing tracks here, whereas in this area the Alternative Alignment would require construction for towers and new tracks as well as these same track upgrades. Surveys in 2018 in this area recorded four couches and up to eight spraints/sprainting sites, all signs were recorded on the coast. Along the remainder of the Alternative Alignment from Kylerhea, up Kylerhea Glen and Glen Arroch only three spraints/sprainting sites were recorded, all were present on the lower sections of the Kylerhea River (**Figure 6**).

2020/2022 surveys: Protected species surveys were undertaken along the Proposed Alignment with surveys for otter including a buffer of up to 300 m either side of the proposed alignment (i.e., a 600 m corridor) in October and November 2020. Survey gaps created by the iterative design process on the Proposed Alignment were surveyed in March 2022.

No updated protected species surveys were undertaken along the Glen Arroch stretch of the Alternative Alignment in 2020; however, surveys did cover a small portion of the Alternative Alignment from the existing Kyle Rhea OHL crossing south to the area around the Kyle Rhea ferry crossing. The Glen Arroch stretches of the Alternative Alignment not surveyed in 2020, from Abhainn Lusa to around the coast at Kyle Rhea was surveyed for protected species in March 2022, with surveys for otter including a buffer of up to 300 m either side of the OHL alignment. The extent of the 2020/2022 otter survey area and respective results are shown in **Figure 7**.

Full details and results of these 2020/2022 protected species surveys are provided in **Appendix V2-4.4: Protected Species Survey Report**. In summary, with respect to otter, the 2020 surveys around the existing OHL crossing location at Kyle Rhea recorded, one holt, four couches, three separate spraint locations (with more found at couches etc), five feeding signs, and one slide/run.

North of the existing OHL crossing and along the remainder of the Proposed Alignment, surveys in 2020 and 2022 recorded three holts, two couches, ten spraint locations, five feeding signs and two slide/runs. The majority of these otter signs and features were present along the coast and around the headland, but some signs were also present further up adjoining watercourses (**Figure 7**).

South of the existing OHL crossing to Kyle Rhea slipway, the surveys here in 2020 recorded one couch, three spraints and two feeding signs, with all signs, except one spraint on the Allt Grianach, being recorded on the coastline (**Figure 7**). The closest proposed infrastructure for the Proposed Development to these features and field signs is a stretch of existing track that will require some upgrading, and this track is proposed as part of both alignment options. During 2022 surveys for the Alternative Alignment from Kyle Rhea slipway up Glen Arroch and to Abhainn Lusa no protected features or field signs for otter were recorded (and therefore these areas are not shown on **Figure 7** as there were no field signs).

8.5 Impacts on Qualifying Features and Assessment of Effect on the Site's Conservation Objectives

As per Section 8.2 above, there are a number of potential permanent and temporary, and direct and indirect impacts associated with the construction and operational maintenance of the Proposed Development, and subsequent dismantling and removal of the existing OHL. Impacts associated with the construction and operational maintenance of the Proposed Development are

discussed in turn in Sections 8.5.1 to 8.5.5 below. Impacts associated with the dismantling of the existing OHL are discussed in Section 9.

To assist with the comparison of the relative magnitudes of impact of construction for the Proposed Alignment and the Alternative Alignment, Table 8-4 below provides a summary of the infrastructure proposed within the SAC boundary for each option.

Table 8-4 Summary of Infrastructure within the SAC Boundary

Infrastructure	Proposed Alignment (Mudalach)	Alternative Alignment (Glen Arroch)
Length of OHL	5,467 m	4,270 m
Number of towers	22	17
Length of existing access track - no upgrades required[43]	0 m	271 m
Length of existing access track - upgrades required[44]	874 m	874 m
Length of new access track[45] – permanent	193 m	20 m
Length of new access track – floating construction - permanent[46].	4,064 m	3,652 m
Length of new access track – cut & fill construction - permanent[47]	3,249 m	1,013 m
Length of new access track - temporary	0 m	500 m (primarily comprised of temporary spurs to towers)
Number of EPZ pulling locations	4 (indicatively two each at towers BF53 and BF69	4 (indicatively two each at towers BF50B and BF68B)
Area of EPZ pulling locations[48]	389 m^2	330 m^2 (smaller area as one EPZ location straddles SAC boundary)
EPZ track length – trackway (temporary)	134 m	0 m

[43] A track which is suitable to be reused in its current state.

[44] This is an existing vehicle track which is not up to haul road standard, will need some upgrading and widening for construction vehicles. The value stated here is the same for both alignment options as it relates to a stretch of track north of Kylerhea to the existing OHL crossing which would be utilised regardless of which route option is selected.

[45] Proposed new stone haul road (no existing road or track exists).

[46] Floating tracks up to 4 m wide running width for the Proposed Alignment, and up 6 m running width for the Alternative Alignment, includes the spurs to towers to be served by main floating haul roads. Tracks to be retained after construction and reduced in running width to 2.5 m for the operational period (both options).

[47] Cut and fill construction type tracks, up to 4 m wide running width for the Proposed Alignment, and up 6 m running width for the Alternative Alignment, includes the spurs to towers to be served by main cut & fill haul roads. Tracks to be retained after construction and reduced in running width to 2.5 m for the operational period (both alignment options).

[48] EPZ areas and associated EPZ access (comprising 4 m wide tracks) are temporary infrastructure that will be removed upon completion of construction and the areas reinstated and restored.

Infrastructure	Proposed Alignment (Mudalach)	Alternative Alignment (Glen Arroch)
EPZ track length – floating (temporary)	114 m	26 m
EPZ track length – cut & fill (temporary)	0 m	61 m
Number of site compounds/assembly areas	22	17
Number of watercourse crossings[49]	18	13
Number of borrow pits	0	0
Helicopter use proposed	Yes	No
Area of Public Road Improvements (PRI) on Glen Arroch Road	0	13,268 m^2 (or 1.3268 ha)

Using the information presented in Table 8-4 above, it can be seen the proposed length of OHL within the SAC along the Proposed Alignment is 28% longer than compared to the Alternative Alignment.

It is proposed that newly constructed haul tracks will be retained permanently within the SAC as part of the Proposed Development to allow safe operational access (track width will be reduced to 2.5 m for the operational period). The total length of permanent track to be newly constructed (floating and cut & fill) for the Proposed Alignment is 7.506 km. The total length of permanent track to be constructed (floating and cut & fill) for the Alternative Alignment is 4.685 km, with a further 0.5 km of new temporary tracks required: a combined total of 5.185 km. The amount of track requiring cut and fill construction is 3.2 times greater along the Proposed Alignment compared to the Alternative Alignment (Table 8-4). Temporary track requirements for EPZ access (trackway, floating, and cut & fill) total 248 m for the Proposed Alignment and 87 m for the Alternative Alignment, respectively.

There are 22 towers within the SAC along the Proposed Alignment, compared to 17 for the Alternative Alignment. With the assumed 50 m x 50 m compound required at each tower location this equates to temporary compound area land-take/disturbance of 5.5 ha for the Proposed Alignment and 4.25 ha for the Alternative Alignment, although as noted in Section 4.6 compound areas would be reduced in size where possible following further site investigation works post-consent.

Overall, five key construction and operational impacts have been identified, however for some of these there are a range of proven good practice mitigation measures that will be put in place as a standard requirement of the construction programme to remove or reduce impacts to a negligible level. Further information on the mitigation to be applied is provided in Section 10.

It is assumed throughout the assessment below that where micrositing may be required within the LoD, the micrositing would not result in the movement of infrastructure into habitats of greater

[49] Determined as the number of times an access track (of any kind except 'existing - no upgrades required') crosses a watercourse on 25k Ordnance Survey mapping. No distinction has yet been made between new watercourse crossings that are required and existing watercourse crossings required to be upgraded.

value than the current assessed locations[50], and therefore the assessment is based on a worst-case scenario.

The following sections consider these potential impacts on relevant qualifying features of the SAC in more detail.

8.5.1 Impact 1: Habitat Loss/Modification

Loss or modification of qualifying habitats, which will consequently result in potential effects to their conservation objectives, may occur in the following ways and is described in detail in the following sections:

- Impact 1a: Direct habitat loss or modification arising during construction (from tracks, compounds, tower foundations, creating an operational wayleave etc).
- Impact 1b: Direct habitat modification during operation (from cutting/pruning trees to maintain a safe operational wayleave).
- Impact 1c: Indirect habitat loss and modification (arising from hydrological drying effects to wetland habitats.

A further habitat loss or modification impact could arise from peat failures or peat slides in peatland areas, triggered by construction activities associated with the Proposed Development. A Peat Landslide Hazard and Risk Assessment (PLHRA) has been prepared for the Proposed Development, see **Appendix V2-7.1 Peat Landslide Hazard and Risk Assessment** of the EIA Report. The PLHRA concludes that overall, there is negligible to low risk of peat instability over the majority of the Proposed Development, including both alignment options, although some limited areas of medium and high risk have been identified (no high-risk locations in Section 3). The PLHRA states with the implementation of standard mitigation measures in medium to high-risk areas there is minimal peat slide risk. Given the conclusions of the PLHRA this potential impact is scoped out and is not discussed further in this Shadow HRA.

8.5.1.1 Impact 1a: Direct Habitat Loss and Modification – Construction

Description of Impacts

Direct habitat loss, disturbance and modification associated with the Proposed Development would occur due to the requirement to strip vegetation and soils/peat for permanent tower foundations and permanent access tracks.

Additionally, habitat would be modified as a consequence of temporary infrastructure. Vegetation and soils would be stripped and stored, or disturbed or covered (e.g., by floating tracks or trackway panels), as part of the wider construction process in establishing temporary site access tracks (i.e., those for EPZ access) and associated verge drainage, site compound/assembly areas and EPZ pulling locations. Such features would generally be temporary within the SAC and removed

[50] During construction a micrositing log will be maintained to record any requirements to microsite infrastructure and the reason why micrositing was deemed necessary. Any micrositing within the LoD would only be permissible after any required surveys or inspections by the ECoW and/or other specialist as required, and confirmation the micrositing proposal does not impact habitats of greater value.

following construction with the locally stored material restored as part of a site reinstatement programme.

The temporary infrastructure would be in place during the construction phase. Current indicative estimates of the construction phase within Section 3 are in the region of 6-9 months, including temporary infrastructure removal.

Given the ecological sensitivity and complexity of the habitats present within the SAC, there may be difficulties in achieving successful restoration of certain, or all, SAC qualifying habitats to their pre-disturbance condition, or in successfully and fully restoring the associated structure and function of supporting ecological systems, for instance due to disrupted peatland hydrology and/or the quantity and quality of groundwater or overland flow. It is generally considered very difficult to exactly replicate the lost habitat because of the unique physical and ecological features of every site. Factors which influence the difficulty of habitat creation and/or restoration include, but are not limited to[51]: hydrological requirements, seed source or biological material requirements, future constraints (e.g., climate change), soil nutrient status, water quality, and ongoing management requirements. Where careful restoration is successful this may take several years, sometimes decades, to materialise to the desired target condition from the point of restoration and only become evident in the longer term. The influencing factors are often site dependent but can include soil nutrient status, soil types and pH, site preparation, climate, aspect, altitude, and the neighbouring habitats and species matrix available to colonise the new or restored habitat[51]. The DEFRA Biodiversity Metric 3.1[51] gives a relative indication of the difficulty in creating and restoring priority habitats, for instance blanket bog is considered much more difficult to create or restore compared to upland heathland, or woodland. The DEFRA Metric also provides further guidance on, for example, the average time estimates for certain types of habitat creation or restoration to meet target condition, accepting that there will be variation from this central estimate due to site-specific factors as noted above; further information relevant to SAC qualifying habitats is provided in **Annex D**. Despite the difficulty in creating, restoring and/or enhancing certain SAC qualifying habitats, and the time taken to reach target condition (see **Annex D**), in most cases this is feasible, and a high certainty of success can be assumed in the longer term provided restoration is carried out appropriately, with proper application and management, and using proven and best available techniques and methods. There are several examples from around the UK with respect to the restoration of blanket bog where habitat restoration/enhancement has been successful[52,53,54].

It is also possible, if subsequent restoration management is inadequate, that some of the disturbed and subsequently reinstated ground on areas of SAC qualifying habitat may irreversibly transition

[51] Panks, S., White, N., Newsome, A., Nash, M., Potter, J., Heydon, M., Mayhew, E., Alvarez, M., Russell, T., Cashon, C., Goddard, F., Scott, S.J., Heaver, M., Scott, S.H., Treweek. J., Butcher, B. & Stone, D. (2022). Biodiversity Metric 3.1. auditing and accounting for biodiversity. Natural England Joint Publication JP039. http://publications.naturalengland.org.uk/publication/6049804846366720

[52] Cris, R., Buckmaster, S., Bain, C. & Bonn, A. (Eds.) (2011). UK Peatland Restoration — Demonstrating Success. IUCN UK National Committee Peatland Programme, Edinburgh.

[53] https://www.nature.scot/climate-change/nature-based-solutions/peatland-action/peatland-action-resources/peatland-action-case-studies

[54] Short, R. & Robson, P. (2016). An Innovative Approach to Landscape-Scale Peatland Restoration. CIEEM In Practice Issue 93: Upland Ecology (Sept 2016).

to a different habitat type, in particular blanket bog, which for example may become modified and transition to wet or dry modified bog and dominated by less desirable species, or wet or dry heath over time. If inadequately managed, disturbed and subsequently restored areas may potentially also transition to non-SAC qualifying habitat types, for instance allowing the colonisation of rushes (*Juncus* spp.) or bracken on disturbed soils.

Therefore, considering the above discussion with regards the complexities involved and the timescales expected to target habitat condition for the creation or restoration of various SAC qualifying habitat types, where excavated or floated infrastructure is to be built, even if it is temporary for the construction phase, it is considered here to initially be a direct loss. As even though these temporary areas would be restored and there would be no notable overall loss in long-term habitat extent resulting from temporary works areas, there are likely effects that result in uncertainty around future habitat composition, condition, structure, and function that may last into the medium to long-term (depending on habitat type), as well as the usually long-term timescales for restoration to be deemed successful.

The key infrastructure features and dimensions considered in these direct losses are as follows:

- Tower leg foot supports – four concrete footers per tower at ground surface level, each concrete foot is 0.6 m x 0.6 m in size resulting in 1.44 m^2 of long-term permanent surface land take per tower;
- Site compound area for each tower location with associated hardstandings, storage, welfare, laydown and assembly areas – comprises a 50 m x 50 m works area as per **Annex B**[55] (temporary land take and to be reinstated after construction);
- Stone access tracks (new and upgraded, both floating and cut & fill construction types as per Table 8-4) – for the Proposed Alignment the running width is expected to be 4 m, however a 6 m working corridor is assumed to account for associated verges, passing places, drainage or other trackside disturbance of habitats. For the Alternative Alignment the running width is expected to be 6 m with an associated working corridor of 8 m due to crane requirements, as described above (permanent land take within the SAC[56] except for 500 m of temporary track associated with the Alternative Alignment);
- PRI works on the C1239 Glen Arroch minor road, permanent (applies to the Alternative Alignment only);
- EPZ pulling locations require a working area of 8 m x 12 m to be levelled either side of each pulling location, and stone access tracks from the main haul tracks to EPZ locations would be temporary as per Table 8-4 (temporary land take within the SAC and to be reinstated after construction); and

[55] Where possible the 50 m x 50 m compound will be reduced in size following site investigation results (likely to 40 m x 40 m, or less where practicable). Furthermore, it has been assumed in the assessment of habitat loss below that each compound is orientated north/south and east/west, following site investigation results the orientation of compounds may also change to suit ground conditions or avoid sensitive habitats/features.

[56] N.B. At the end of construction tracks are to be reduced in size to 2.5 m running width and verges reinstated for operational access requirements.

- Length and area of temporary trackway required.

Direct and permanent habitat losses and modifications affecting woodland habitats may also potentially extend along the length of the OHL alignment due to the requirement to create and/or maintain an operational 3-dimensional (3D) wayleave corridor through woodland during construction and throughout the lifetime of the OHL. Where this wayleave crosses woodland and wooded ravines and felling or lopping/crown reduction is required, then there may also be losses/modification to the underlying bryophyte and lichen interest which relies on the humidity and shade in the woodland and wooded gullies. The removal of trees may affect the levels of light penetration and localised humidity which support particular bryophyte and lichen species, similar effects may materialise from crown reduction works, which would involve the removal of up to a third of the existing crown. The loss of trees and loss of limbs due to crown reduction can also result in the physical loss of epiphytic species.

This operational wayleave requirement is anticipated to be 30 m in width through woodland within the SAC (i.e., 15 m either side of the OHL alignment centreline). Surveys have been undertaken by independent forestry consultants (Galbraith) to gather site-specific data on tree heights along the OHL alignment and proposed wayleave corridor to ascertain where felling, lopping, or crown reduction may be required (see **Volume 2, Chapter 9: Forestry** for full details). The results of these surveys have indicated no felling is required for creation of the wayleave corridor for the Proposed Alignment (although some limited felling for track construction is required); however, two areas within the SAC along the Proposed Alignment have been identified where crown reduction will likely be required during construction and the first years of operation (discussed further below). For the Alternative Alignment the forestry data indicates felling is required to create a wayleave where the Alternative Alignment passes over the Allt Mòr watercourse, no operational crown reduction areas were identified (**Volume 2, Chapter 9: Forestry**).

The following section and Table 8-5 below detail the predicted direct habitat losses and modifications on SAC qualifying features as a result of the Proposed Development.

Habitat Loss and Modification Calculations – Construction

This section deals with the extent of habitat losses and modification predicted during construction considering the above discussion. The focus here is on losses and modification to qualifying habitats of the SAC and not non-SAC qualifying habitat types. As noted above, there are currently some minor field survey data gaps within the SAC along the Alternative Alignment associated with potential PRI works, therefore for this data gap the habitat losses have been categorised as 'Non-Surveyed Area' (NSA). This NSA is narrow existing road verge habitat and as determined through further desk-based exercises it includes a variety of habitat types, including some SAC qualifying habitat features, as already discussed in Section 6.3.

Habitat losses and modification due to infrastructure have been calculated in GIS and have been based on the detailed 2018/2021/2022 NVC data[57], and then subsequently grouped as the broader

[57]There is around 20 years of difference in the designation NVC data (collected in 2001 by Averis & James, 2002[25]) and the contemporary NVC data collected for the Proposed Development. Considering the potential for natural vegetation changes, and vegetation changes in response to deer and forestry management undertaken within the SAC in the intervening years, a comparison of the 2001 and contemporary NVC data

Phase 1 habitat and SAC qualifying feature classification categories. The habitat loss calculations take account of any mosaic percentages of every NVC community (and sub-communities) within each polygon traversed by proposed infrastructure.

The additional woodland habitat modification values for the proposed wayleave have been determined from the forestry data and the results of where crown reduction works would be required during construction or in the first years of operation (as per **Volume 2, Chapter 9: Forestry**). Crown reduction areas have been classed here as modification, as the tree would not be felled, but instead up to a third of the crown reduced, thus modifying the tree as well as potential secondary losses and/or modification to the bryophyte and lichen interest. The predicted requirements for, and locations of, wayleave crown reduction has been modelled out to four years, with the surveys having been undertaken in January 2022 (**Volume 2, Chapter 9: Forestry**). The results indicate that crown reduction to varying degrees would likely be required along the Proposed Alignment in two areas, between proposed towers BF50 - BF51 and BF57 – BF58 either during construction or within the four-year modelled period. However, given the time frames involved before any anticipated start date for construction of the Proposed Development in Section 3, it is considered that the crown reduction areas modelled for a four-year period would effectively constitute the construction period crown reduction requirements. Consequently, these known crown reduction requirements are presented here in the construction habitat loss and modification discussion.

Table 8-5 details the extent of direct habitat losses and modification predicted to SAC qualifying habitat features as a result of infrastructure and wayleave creation requirements, this includes temporary construction areas to be restored after construction, areas of permanent infrastructure, and crown reduction requirements, as detailed in the preceding sections.

Table 8-5 Estimated Direct Loss and Modification of SAC Qualifying Features

Qualifying Feature	Extent within SAC (Table 8-2)	Phase 1 Habitat	NVC Communities Affected	Direct Habitat Loss (Proposed Alignment) (ha)	Direct Habitat Loss (Alternative Alignment) (ha)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Proposed Alignment)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment)
Mixed woodland on base-rich soils associated with rocky slopes	33.24 ha	A1.1.1 Broadleaved Semi-Natural Woodland	W9	0	0	0	0

has been undertaken to determine if there are any notable differences between the data. This comparative analysis is provided in **Annex C** below, which concludes that differences in habitat composition between the two data sets are likely due to a combination of both inter-observer classification differences and real habitat changes over the past 20 years, especially considering the management undertaken and ongoing within the SAC. Taking into account the general similarity in habitat types and NVC communities recorded across both surveys, and real changes in habitat compositions and extents in the past 20 years, then the contemporary NVC data is considered to be a robust and suitable baseline data set for the assessment of impacts associated with the Proposed Development (see **Annex C** for detailed information).

Qualifying Feature	Extent within SAC (Table 8-2)	Phase 1 Habitat	NVC Communities Affected	Direct Habitat Loss (Proposed Alignment) (ha)	Direct Habitat Loss (Alternative Alignment) (ha)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Proposed Alignment)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment)
(priority habitat)							
Western acidic oak woodland (primary reason for site selection) – **Loss** associated with infrastructure	168.81 ha	A1.1.1 Broadleaved Semi-Natural Woodland	W4	0.022	0.002	0.23	0.14
			W7	0	0.005		
			W11	0.110	0.048		
			W17	0.177	0.153		
		A3.1 Scattered Broadleaved Tree	SBT	0.077	0.027		
		A1.1.1/A3.1	Total	0.386	0.235		
Western acidic oak woodland (primary reason for Site selection) – **Modification** due to crown reduction	168.81 ha	A1.1.1 Broadleaved Semi-Natural Woodland	W11, W17	0.37	0	0.22	0
Alpine and subalpine heaths	89.68 ha	D3 Lichen/ bryophyte heath D4 Montane heath/dwarf herb	H14, H20, U7, U10, U13	0	0	0	0
Dry heaths	448.41 ha	D1.1 Dry Dwarf Shrub Heath (Acid)	H9	0	0.002	0.20	0.08
			H10	0.515	0.297		
			H12	0.077	0.008		
			H21	0.280	0.052		
			H10-M25 intermediate	0.016	0.015		
			Total	0.888	0.374		
Wet heathland with cross-leaved heath	2215.69 ha	D2 Wet Dwarf Shrub Heath	M15 (M15a, M15b & M15c)	4.882	5.607	0.22	0.25
			M15-M17 intermediate	0	0.0002		
			Total	4.882	5.607		
Blanket bog (priority habitat)	965.41 ha	E1.6.1 Blanket Bog	M1, M2, M3	0.092	0.022	0.22	0.22
			M17	1.073	0.647		
			M19	0.170	0.432		
			M17-M25 intermediate	0	0.016		

Qualifying Feature	Extent within SAC (Table 8-2)	Phase 1 Habitat	NVC Communities Affected	Direct Habitat Loss (Proposed Alignment) (ha)	Direct Habitat Loss (Alternative Alignment) (ha)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Proposed Alignment)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment)
			M19-M25 intermediate	0	0.134		
		E1.7 Wet Modified Bog	M20	0.014	0.021		
			M25	0.816	0.849		
		E1.6.1/E.7	Total	2.165	2.121		
NSA	N/A	NSA	NSA	0	0.481	N/A	N/A
TOTAL DIRECT - LOSS				**8.321**	**8.818**		
TOTAL DIRECT - MODIFICATION				**0.37**	**0**		
TOTAL LOSS + MODIFICATION				**8.691**	**8.818**		

Table 8-5 above indicates that, for SAC qualifying habitats only, there is currently predicted to be a total habitat loss/modification due to infrastructure of 8.321 ha for the Proposed Alignment, or 8.818 ha for the Alternative Alignment; this is on the precautionary assumption that all 0.481 ha of PRI NSA is SAC qualifying habitats. This precautionary assumption regarding NSA has been used given the likely composition and extents of habitats within NSA has been determined and apportioned using desk-based methods and not field verified.) There is a further 0.37 ha of crown reduction modification effect associated with woodlands on the Proposed Alignment; meaning the combined Proposed Alignment loss and modification value is predicted to be 8.691 ha compared to 8.818 ha for the Alternative Alignment.

As noted above, in the absence of contemporary field data all PRI NSA on the Alternative Alignment has initially been assumed to be SAC qualifying habitat, however this is likely an overestimate. The desk-based analysis on this NSA (as detailed in Section 6.3) indicates that it is approximately comprised of 0.322 ha of wet heathland with cross-leaved heath, 0.059 ha of dry heaths, 0.025 ha of blanket bog/wet modified bog and 0.078 ha of non-SAC qualifying habitats (e.g., bracken and grassland). Taking this apportionment of NSA into account and assuming it is representative of the onsite conditions, then the total SAC qualifying habitat loss on the Alternative Alignment would reduce from 8.818 ha to 8.740 ha. This results in a difference of 0.049 ha compared to the combined Proposed Alignment predicted loss and modification value of 8.691 ha.

The total habitat loss due to infrastructure (i.e., not including crown reduction on the Proposed Alignment) for each option within the SAC boundary, i.e., also including non-qualifying habitats such as grasslands, flushes, and bracken etc., (but excluding existing roads) equates to 10.057 ha for the Proposed Alignment and 10.026 ha for the Alternative Alignment (0.19% of the total SAC area respectively, for both options).

Impacts on Qualifying Habitats and Effects on the Site's Conservation Objectives

As can be seen from the results in Table 8-5, the following four qualifying habitats are impacted by direct habitat loss or modification and there are therefore adverse effects arising on the Site's conservation objectives with respect to direct habitat loss:

- Western acidic oak woodland (primary reason for Site selection);
- Dry heaths;
- Wet heath with cross-leaved heath; and
- Blanket bogs (priority habitat).

The following two qualifying habitats are not impacted by direct habitat loss or modification.

- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat); and
- Alpine and subalpine heaths.

Table 8-6 below details the effect on the conservation objectives of the Site by reference to the direct and permanent habitat loss and modification for both routes. Each conservation objective is considered in turn to ensure a comprehensive assessment of the effects. However, it is recognised that each impact may lead to varying levels of effect on the different conservation objectives, therefore 'primary conservation objective(s)' are identified where these are considered to be the of most relevance to the impact under consideration.

Table 8-6 Effects on the Site's Conservation Objectives of Direct Habitat Loss and Modificaiton – Construction

Conservation Objective		Effect
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	For both options, the direct, permanent loss to the four qualifying habitats results in deterioration of these habitats within the Site. This adversely effects the integrity of the Site as further detailed below under Conservation Objective 2.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	-
2a	Extent of the habitat on Site;	**This is considered to be the primary conservation objective which direct habitat loss effects. This in turn leads to knock-on effects to objectives 2b-2g.** The extent of the four qualifying habitats would not be maintained in the long term for both options as a consequence of the predicted direct losses. The magnitude of effect is greater for the Proposed Alignment for all qualifying habitats with the exception of Wet heath with cross-leaved heath for which the Alternative Alignment results in a greater loss. This conclusion remains when the apportioned NSA data is considered although the Alternative Alignment habitat loss marginally increase for dry heath, wet heath and blanket bog.

Conservation Objective		Effect
2b	Distribution of the habitat within Site;	Due to the linear nature of the Proposed Development and relatively small % of habitat loss across the entire SAC (as detailed in Table 8-5 above), the effect on the distribution of the qualifying habitat within the Site is limited (e.g., the relatively small loss is distributed over a large narrow corridor from west to east across the northerly part of the Site). The loss individually from both options does however affect the distribution of qualifying habitats within the northern portion of the Site to a greater extent, with the Proposed Alignment resulting in a greater effect on distribution than the Alternative Alignment due to the higher habitat loss (with the exception of Wet heath with cross-leaved heath). Therefore, distribution of these four qualifying habitats is not maintained in the long-term for both options.
2c	Structure and function of the habitat;	The direct loss of qualifying habitats would consequently result in a direct loss to the structure and function of these habitats at the impacted locations in addition to impairment of structure and function to the connected adjacent qualifying habitat (indirect loss considered in Section 8.5.1.3below). The planned 0.37 ha of crown reduction would also have a further effect on the structure and function of western acidic oak woodland habitat leading to effects on 2d, 2e and 2f. The magnitude of effect is greater for the Proposed Alignment for all qualifying habitats with the exception of Wet heath with cross-leaved heath for which the Alternative Alignment results in a greater effect.
2d	Processes supporting the habitat;	The direct loss of qualifying habitats would consequently result in a loss of soil/peat, and disruption of hydrological processes at the impacted locations in addition to impairment of these processes of the connected adjacent qualifying habitat (considered under indirect loss in Section 8.5.1.3 below). The magnitude of effect is greater for the Proposed Alignment for all qualifying habitats with the exception of Wet heath with cross-leaved heath for which the Alternative Alignment results in a greater effect.

Conservation Objective		Effect
2e	Distribution of typical species of the habitat;	Similar to objective 2b above, the effect on the distribution of typical species of the qualifying habitats is likely to be minimal. The loss from both options does however affect the distribution of typical species of the qualifying habitats within the northern portion of the Site to a greater extent, with the Proposed Alignment resulting in a greater effect on distribution than the Alternative Alignment due to the higher habitat loss (with the exception of Wet heath with cross-leaved heath which incurs a greater loss from the Alternative Alignment). Therefore, distribution of these four qualifying habitats is not maintained in the long-term for both options.
2f	Viability of typical species as components of the habitat; and	The direct loss of qualifying habitat is not likely to lead to the viability of typical species of the qualifying habitats being lost. An exception to this however could be the impact of habitat loss and modification to Western acidic oak woodland where extents of Nationally Rare or Nationally Scarce bryophyte and lichens could be lost thereby affecting their long-term viability. The Proposed Alignment would have a greater effect on this conservation objective than the Alternative Alignment due to the greater extent of habitat loss predicted for Western acidic oak woodland and the higher number of locations recorded with Nationally Rare or Nationally Scarce bryophyte and lichens.
2g	No significant disturbance of typical species of the habitat.	Similar to objective 2f above, it is predicted that the Proposed Alignment would have a greater effect on this conservation objective than the Alternative Alignment due to the greater extent of habitat loss predicted for Western acidic oak woodland.

The majority of qualifying habitat losses for both options are attributed to wet heath, followed by blanket bog, dry heath, and then western acidic oak woodland.

With respect to the potential woodland loss figures presented in Table 8-5, the Proposed Alignment results in the loss of more oak woodland qualifying feature (i.e., including small woodland glades/open areas within stands of woodland) than the Alternative Alignment due to proposed infrastructure. The values presented here for woodland loss are generated and determined in GIS where proposed infrastructure (tracks, compounds and towers) overlap with polygons mapped as, or including, woodland NVC communities, or areas including some scattered broadleaved trees. Many of these mapped woodland areas have sections which are treeless or are more open and scattered woodlands, and through which proposed infrastructure may pass without the need for undertaking tree felling. The infrastructure has been sited within, and tracks have been designed to pass through, the treeless sections of these polygons as far as practicable considering other environmental, topographical and engineering constraints; however, some

felling is required for tracks on the Proposed Alignment (as confirmed in **Volume 2, Chapter 9: Forestry**). Small scale micrositing on the ground within the LoD during construction would aim to ensure any tree felling is minimised[50]. As noted above, wayleave creation would also lead to additional woodland modification effects on 0.37 ha of Western acidic oak woodland on the Proposed Alignment via crown reduction works.

With the Alternative Alignment, no proposed tracks pass through areas mapped as woodland, with the only overlap between proposed infrastructure and woodland being the compound associated with proposed tower BF45B. At this location, using the standard assumptions set out above, the north/south and east/west compound orientation would partially overlap with an area of riparian woodland on the Allt Mòr (as well as the watercourse itself), however in this area following further pre-construction site investigation work it is anticipated that the compound location would be adjusted to avoid overlap with the woodland and watercourse, and as such the woodland loss value on the Alternative Alignment associated with towers or tracks is zero. However, wayleave creation is predicted to result in the felling of 0.235 ha of woodland where it crosses the Allt Mòr (no crown reduction works predicted to be required; **Volume 2, Chapter 9: Forestry**).

With respect to the Proposed Alignment, the infrastructure requires to pass through more woodland polygons. In these areas, even if no trees are required to be felled, the infrastructure would still pass through the patches of associated open ground habitat amongst the trees, which may be woodland glade habitats or habitats that contain species that are intricately linked to the surrounding and nearby trees and patches of woodland. As such, these small patches of open ground are still considered part of the wider woodland feature, and even though no trees may be felled, there are losses predicted to the underlying areas of open ground/woodland glade on the Proposed Alignment, as per Table 8-5 above.

With respect to blanket bog (priority habitat), comprised here of E1.6.1 blanket bog and E1.7 wet modified bog (as per Table 8-5), the predicted level of direct habitat loss is relatively equal between the Proposed Alignment (2.165 ha) and the Alternative Alignment (2.121 ha). Specifically with regards to the better-quality and active mire within this blanket bog category, i.e., the E1.6.1 communities, the Proposed Alignment results in the loss of 1.335 ha compared to 1.251 ha for the Alternative Alignment; a difference of 0.084 ha. Of these E1.6.1 blanket bog communities, M17 is generally considered the highest quality community of those recorded (Table 8-5) and is generally wetter and contains more bog pools and carpets of Sphagna. The losses of M17 on the Proposed Alignment are predicted to be 1.073 ha compared to 0.647 ha on the Alternative Alignment: a difference of 0.426 ha. Despite these subtle differences at the NVC community level, the overall SAC qualifying blanket bog feature is considered here to be active peatland and equally important between routes.

As noted in Section 8.5.1.1 above, reduced width tracks and towers would be permanent infrastructure, with all other temporary infrastructure removed following construction, with the ground reinstated to be as close to the original form and condition as possible. However, as also noted in Section 8.5.1.1 above, reinstatement and restoration of the ground following removal of temporary infrastructure does not necessarily equate to, nor guarantee, the restoration of the structure and function of certain habitat types, and their supporting environmental requirements. This is especially true of peatland habitats and their underlying complex hydrology, which are more difficult to restore and take longer to restore compared to dry heath or grassland habitats, for

example. The estimated average length of time to achieve successful restoration for SAC qualifying habitat types is detailed further in **Annex D**.

The woodland losses calculated above in Table 8-5 are based on the 2018/2021/2022 NVC survey mapping data, which provides a snapshot of woodland distribution and extent at the time of survey. As discussed in Section 8.4.1.2 above, the SFA woodland expansion project aimed to increase the extent of qualifying woodland within the SAC through a scheme of planting and natural regeneration; this is discussed further below in Section 11: In-combination effects.

As discussed above, the forestry data collected has indicated that in two areas, covering 0.37 ha, the current height of the trees (or height within four years) would necessitate some crown reduction in order to maintain the 3.5 m electric safety clearance zone from conductors. These areas of crown reduction would likely need further maintenance in the medium to long term during the operational period. However, to avoid double counting impacts, these specific areas of expected crown reduction during construction are not considered during the operational period. Impact 1b below considers additional areas of potential future crown reduction of existing woodland during the operational period.

8.5.1.2 Impact 1b: Direct Habitat Loss and Modification – Operation

Description of Impacts

During the operational period, trees underneath and immediately adjacent to the OHL which are outwith the required electric safety clearance zone of 3.5 m from conductors would not require to be felled or lopped, i.e., trees can grow freely vertically or horizontally to within 3.5 m of a conductor before it becomes a safety issue. Should trees encroach within the 3.5 m safe electrical clearance zone of the conductors, then there would be a requirement for maintenance and the possible cutting back or crown reduction of some of the trees/branches.

It is important to note that the electric safety clearance distance of 3.5 m is not directly related to the height of the tree itself but rather the distance between the tree and the OHL conductors, therefore depending on prevailing terrain and subsequently the height the conductors are above ground level, the maximum tree height allowed underneath the OHL will be variable, and in some areas will allow for full height mature or semi-mature trees to develop. For instance, where the OHL passes over deep gullies, ravines or depressions trees below may grow unhindered to normal climax community heights for the area due to the distance between the OHL and ground, whereas in flatter terrain or where the OHL passes over localised hummocks or high points the tree heights may naturally encroach within electric safety clearance zone and require maintenance. Therefore, allowable tree heights under the OHL are likely to vary along the route of the alignments.

Along the Proposed Alignment Galbraith (see **Volume 2, Chapter 9: Forestry**) recorded a total of two locations where some form of woodland treatment would be required within the next four years. Crown reduction is required at these two locations and these are considered within Impact 1a as detailed in Section 8.5.1.1 above. These areas are not considered further here to avoid 'double-counting' impacts that have been considered already under Impact 1a above. One additional location (between BF 56) of 0.1 ha is noted where no crown reduction is required during construction but may potentially be required during the operational period – this impact is considered in this section. Although this is uncertain and depends on future tree growth which is dependent on a number of environmental factors (see discussion in section 11).

In addition to the above impacts, there is also potential future crown reduction impacts that would occur as a result of new regenerating woodland encroaching on the 3.5 m safe electrical clearance zone. These impacts are uncertain and dependent on the success of the SFA Natural Regeneration and Planting Areas as detailed above and shown in **Figure 3**. They are considered within Section 11 below (In-combination Effects).

Undertaking 0.1 ha of crown reduction along the Proposed Alignment in the area identified by Galbraith (**Volume 2, Chapter 9: Forestry**), which would be an ongoing and periodic requirement during the operational period, may have negative habitat modification effects on the associated western acidic oak woodland qualifying feature (as the wayleave only passes through this qualifying woodland type). As discussed above, crown reduction would require the physical removal of sections of the upper tree, up to one third of the crown would be removed. In a dense woodland habitat this could in turn modify the levels of shade, light and heat penetration and subsequently may affect the microclimate and humidity within the tree canopy and on the woodland floor. With increasing light penetration and reduced humidity and moisture, the oceanic woodland bryophytes and lichens that rely on these conditions, which are a component part of the woodland qualifying feature, may be negatively affected. However, due to the scattered nature of trees at this location (as shown in **Volume 2, Chapter 9: Forestry**) and likely future stature of woodland it is considered that such microclimate effects would be negligible (see discussion in Section 8.5.2).

Impacts on Qualifying Habitats and Effects on the Site's Conservation Objectives

The only qualifying habitat which potentially could be affected by the maintenance of the electric safety clearance zone during the operational period of the OHL is western acidic oak woodland (primary reason for Site selection).

The following five qualifying habitats are not impacted by direct habitat loss or modification during the operational period and there are therefore no adverse effects arising on the Site's conservation objectives with respect to direct habitat loss/modification during the operational period:

- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat);
- Alpine and subalpine heaths;
- Dry heaths;
- Wet heaths; and
- Blanket bogs (priority habitat).

Table 8-7 below details the effect on the conservation objectives of the Site by reference to the modification during operation that will occur as a consequence of crown reduction for the Proposed Alignment (no impact is predicted for the Alternative Alignment during the operational period). Each conservation objective is considered in turn to ensure a comprehensive assessment of the effects. However, it is recognised that each impact may lead to varying levels of effect on the different conservation objectives, therefore 'primary conservation objective(s)' are identified where these are considered to be of most relevance to the impact under consideration.

Table 8-7 Effect on the Site's Conservation Objectives of Direct Habitat Loss and Modification during Operation of the Proposed Alignment

Conservation Objective		Effect
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	Yes – habitat quality likely to be reduced by future crown reduction operations in the identified location.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	-
2a	Extent of the habitat on Site;	Crown reduction at one location is not likely to reduce the extent or the distribution of habitat within the Site.
2b	Distribution of the habitat within Site;	
2c	Structure and function of the habitat;	**2c is considered to be the primary conservation objective which direct habitat loss and modification during operation effects. Impacts on objectives 2d, 2f and 2g occur as a consequence of this effect.** By removal of up to approximately 1/3 of the tree, crown reduction will impact the structure and function of the woodland directly on a permanent basis.
2d	Processes supporting the habitat;	Crown reduction may affect the specific microclimate that develops in more mature woodland areas. It is considered that this effect is likely to be negligible given the likely lower density woodland the exists at this altitude. None the less, there is uncertainty over the future baseline structure of this woodland and so it is assumed on a precautionary basis that an effect would occur.
2e	Distribution of typical species of the habitat;	Crown reduction at one location of 0.1 ha is not likely to reduce the extent or the distribution of typical species within the Site.
2f	Viability of typical species as components of the habitat; and	Crown reduction could lead to the disturbance of and loss of epiphytic species which have established on more mature trees and this loss and disturbance will persist in the long-term.
2g	No significant disturbance of typical species of the habitat.	

8.5.1.3 Impact 1c: Indirect Habitat Loss and Modification (construction and operation)

Description of Impact

There may also be some indirect habitat losses or modifications to wetland habitats due to drainage and drying effects associated with the creation of permanent tower foundations and

access tracks, which potentially may create preferential drainage pathways and disrupt the volume and flow direction of the supporting hydrological processes. Although the infrastructure would be installed during the construction period, the indirect effects on wetland habitats would largely occur during the operational period as the potential drying effects take effect, such effects can materialise both upslope and downslope of infrastructure features. As noted above in Section 4.7.1, there will be a preference in favour of utilising a floating track design, rather than cut and fill, where possible within the SAC as floating tracks overall tend to be less disruptive to local hydrology. The floating track design will also follow best practice construction guidelines and include regularly spaced sub-surface cross track drainage pipes to allow the natural flow of water to be maintained from one side of the track to the other.

The actual distance of the effects of drainage on a peatland is variable and depends on various factors such as the type of peatland and its characteristics and properties of the peat; the type, size, distribution and frequency of drainage feature; and whether the drainage affects the acrotelm, penetrates the catotelm, or both. Consequently, drainage effects can be restricted to just a few metres around the feature or extend out to tens of metres, or further (e.g., see review by Landry & Rochefort (2012[58])). The hydraulic conductivity of the peatland is one of the key variables which affect the extent of drainage. In general, less decomposed more fibric peatlands (which tend to be found commonly in fen type habitats) generally have a higher hydraulic conductivity and drainage effects can extend to around 50 m, whilst in more decomposed (less fibrous) peat drainage effects may only extend to around 1-2 m. Blanket bog habitats commonly are associated with more highly decomposed peats[59].

In the carbon balance assessments for wind farm developments, it is generally assumed that wetland habitat losses due to indirect drainage effects may extend out to 10 m from excavated permanent infrastructure, which is in keeping with the indirect drainage assumptions used within the carbon calculator tool for these assessments[60]. As much of the infrastructure to be used in the Proposed Development has similarities with infrastructure used in wind farms (e.g., foundation excavations, cut & fill and floating stone tracks) it is assumed this would be a reasonable assumption to make here with respect to indirect drainage effects around permanent infrastructure.

With respect to areas of temporary infrastructure, with appropriate construction methods, mitigation, and restoration any indirect drainage effects are generally considered temporary and short-term. However, there may be some localised medium to longer term disruption to peatland hydrology in blanket bog and wet heath areas. Despite this, given the time taken for potential indirect drainage effects to materialise and affect the surrounding habitats, and that the temporary working areas will be restored as soon as practicably possible and within 6-9 months (worst case assumption of 12 months) with the aim of restoring the area and its hydrological conditions as best as reasonably possible to its pre-disturbance condition, it is assumed any indirect

[58] Landry, J. & Rochefort, L. (2012). The Drainage of Peatlands: Impacts and Rewetting Techniques. Peatland Ecology Research Group, Université Laval, Quebec.

[59] Nayak, R.A., Miller, D., Nolan, A., Smith, P., Smith, J. (2008). Calculating carbon savings from wind farms on Scottish peatlands - A New Approach. http://www.gov.scot/Publications/2008/06/25114657/0

[60] Windfarm Carbon Calculator Web Tool User Guidance https://informatics.sepa.org.uk/CarbonCalculator/assets/Carbon_calculator_User_Guidance.pdf

drainage effects associated with temporary infrastructure will be minimal and not lead to long-term habitat losses. Therefore, this assessment focuses on indirect effects associated with permanent infrastructure only, i.e., permanent access tracks and tower foundations.

Furthermore, it is expected that any indirect drainage effects would only impact wetland habitats, which for SAC qualifying features are blanket bog and wet heath. No indirect drainage effects are expected to impact or alter the quality or composition of non-wetland SAC qualifying habitats, i.e., dry heath, alpine and subalpine heath, and woodlands; as such only direct habitat loss applies to those habitat types.

Should indirect drainage effects materialise, it is considered unlikely that effects of this scale (i.e., out to 10 m either side of infrastructure) would occur or would have such an effect on the habitat as to result in any notable effect on the type of peatland present or shifts to a non-SAC qualifying feature or lower conservation value habitat type (such as acid grassland or bracken for example). For instance, in one study on upland moor drainage[61] it was ascertained that a lowering of the water table next to drains was slight and confined to just a few metres either side of the drain, on sloping ground the uphill zone of drawdown was even narrower. Subtle variations in plant species abundance were noted, with species dependent on high water-tables having a lower cover-abundance near to drains, and species with drier heathland affinities having higher cover than at places farther away. However, there were no wholescale changes in vegetation or the species assemblage; for instance, declines in Sphagna cover were localised and took nearly 20 years to achieve statistical significance. Therefore, the evidence suggests that if some drainage effects materialise locally around infrastructure due to the Proposed Development, the most likely effect will not be a major change in overall blanket bog or wet heath habitat type but rather a potential change in vegetation micro-topography, certain species cover, or abundance that may result in a subtle NVC sub-community shift and which may only be apparent in the long term in the immediate vicinity of the drainage feature. In the unlikely scenario of substantial indirect drying effects occurring long term, then blanket bog may transition to wet/dry modified bog or wet heath, and wet heath may transition to dry heath. These habitats are still habitats of conservation interest and are SAC qualifying features also, although their conservation importance vary.

To allow a comparative assessment of a worst-case scenario where indirect drainage effects do materialise around all permanent infrastructure within the SAC, Table 8-8 below details the predicted indirect habitat loss/modification of blanket bog and wet heath out to 10 m from infrastructure. The 10 m indirect drainage zone applied here is considered suitably precautionary as the peatland habitats within the Site (blanket bog and wet heath) are ombrogenous blanket peat habitat types as determined from the NVC surveys and most likely consist of humified peat (i.e., not 'fen' peat with associated high hydraulic conductivity). In this case, the indirect drainage zone may only extend to 1-2 m if it materialises at all, therefore 10 m has been applied in line with relevant guidance[60] and on the precautionary principle.

Indirect Habitat Loss and Modification Calculations

Table 8-8 below details the additional potential indirect habitat losses/modification over and above the direct losses stated above predicted as a result of permanent infrastructure and using the

[61] Stewart, A.J.A. & Lance, A.N. (1991). Effects of Moor Draining on the Hydrology and Vegetation of Northern Pennine Blanket Bog. Journal of Applied Ecology 28: 1105-1117.

assumption that indirect drainage effects may materialise out to 10 m from infrastructure in wetland habitats, as discussed above.

Table 8-8 Estimated Indirect Loss/Modification of SAC Qualifying Features

Qualifying Feature	Extent within SAC (Table 8-2)	Phase 1 Habitat	NVC Communities Affected	Indirect Habitat Loss (Proposed Alignment) (ha)	Indirect Habitat Loss (Alternative Alignment) (ha)	Indirect Habitat Loss as a % of Qualifying Feature Type in SAC (Proposed Alignment)	Indirect Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment)
Wet heathland with cross-leaved heath	2215.69 ha	D2 Wet Dwarf Shrub Heath	M15a, M15b, M15c, M15-M17 intermediate	5.499	4.150	0.24	0.19
Blanket bog	965.41 ha	E1.6.1 Blanket Bog	M1, M2, M3, M17, M19, M17-M25 intermediate	1.775	1.046	0.26	0.16
		E1.7 Wet Modified Bog	M25	0.753	0.481		
		E1.6.1/E1.7	Total	2.527	1.527		
TOTAL INDIRECT				**8.026**	**5.677**		

Should indirect drainage effects fully materialise along the Proposed Developments infrastructure, Table 8-8 indicates that there would be larger potential indirect impacts on wet heath and blanket bog on the Proposed Alignment than the Alternative Alignment.

Impacts on Qualifying Habitats and Effects on the Site's Conservation Objectives

The following two qualifying habitats would be affected by indirect habitat or modification loss:

- Wet heathland with cross-leaved heath; and
- Blanket bog (priority habitat).

The following four qualifying habitats are not impacted by indirect habitat loss or modification and there are therefore no adverse effects arising on the Site's conservation objectives with respect to indirect habitat loss:

- Western acidic oak woodland (primary reason for Site selection);
- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat);
- Alpine and subalpine heaths; and
- Dry heaths.

Table 8-9 below details the effects on the conservation objectives of the Site by reference to the indirect habitat loss or modification during construction and operation for both options. Each

conservation objective is considered in turn to ensure a comprehensive assessment of the effects. However, it is recognised that each impact may lead to varying levels of effect on the different conservation objectives, therefore 'primary conservation objective(s)' are identified where these are considered to be of the most relevance to the impact under consideration.

Table 8-9 Effect on the Site's Conservation Objectives of Indirect Habitat Loss and Modificaiton - Construction and Operation

Conservation Objective		Effect
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	For both options, the indirect long-term loss and modification to wet heath with cross-leaved heath and blanket bog qualifying habitats results in deterioration of these habitats within the Site. This adversely effects the integrity of the Site as further detailed below under Conservation Objective 2.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	-
2a	Extent of the habitat on Site;	As described above, indirect loss is unlikely to lead to the actual loss in extent of blanket bog and wet heath habitats across the Site. A more likely scenario is that subtle sub-community shifts occur in close proximity to the permanent infrastructure. Nonetheless, uncertainty remains over the extent of this impact and therefore an adverse effect cannot be ruled out. The extent of blanket bog and wet heath with cross-leaved heath will not be maintained in the long term for both options as a consequence of the predicted indirect losses. The magnitude of effect is greater for the Proposed Alignment than the Alternative Alignment for both blanket bog and wet heath with cross-leaved heath.
2b	Distribution of the habitat within Site;	Due to the linear nature of the Proposed Development and relatively small % of indirect habitat loss across the entire SAC (as detailed in Table 8-8 above), the effect on the distribution of the qualifying habitat within the Site is limited (e.g., the relatively small loss is distributed over a large narrow corridor from west to east across the northerly part of the Site). The loss from both options does however affect the distribution of qualifying habitats within the northern portion of the Site to a greater extent, with the Proposed Alignment resulting in a greater

Conservation Objective		Effect
		effect on distribution than the Alternative Alignment due to the higher indirect habitat loss. Therefore, distribution of blanket bog and wet heath with cross-leaved heath is not maintained in the long-term for both options.
2c	Structure and function of the habitat;	**2c and 2d are considered to be the primary conservation objectives relevant to indirect habitat loss.** Indirect habitat loss is likely to occur to blanket bog and wet heath with cross-leaved heath as a consequence of the infrastructure disrupting hydrological processes and in turn, the structure and function of qualifying habitats. The magnitude of effect is greater for the Proposed Alignment for both blanket bog and wet heath with cross-leaved heath qualifying habitats.
2d	Processes supporting the habitat;	
2e	Distribution of typical species of the habitat;	Similar to objective 2b above, the effect on the distribution of typical species of the qualifying habitats is likely to be minimal. The loss from both options does however affect the distribution of typical species of the qualifying habitats within the northern portion of the Site to a greater extent, with the Proposed Alignment resulting in a greater effect on distribution than the Alternative Alignment due to the higher indirect habitat loss. Therefore, distribution of the typical species of blanket bog and wet heath with cross-leaved heath is not maintained in the long-term for both options.
2f	Viability of typical species as components of the habitat; and	The indirect loss and modification of qualifying habitat is not likely to lead to the viability of typical species of the qualifying habitats being compromised.
2g	No significant disturbance of typical species of the habitat.	Similar to objective 2f above, it is predicted that neither option would lead to significant disturbance of typical species of the habitat which would compromise the habitat integrity in the long-term.

8.5.2 Impact 2: Habitat Fragmentation – Construction and Operation

Description of Impact

Qualifying habitats may be directly affected by habitat fragmentation as a result of the direct and indirect impacts noted above. This could in turn lead to a number of effects on the Site's conservation objectives as considered below and within Table 8-10.

Point features such as pylons would not lead to fragmentation effects, however large linear features such as permanent tracks could lead to effects on oak woodland, dry heaths, wet heaths and blanket bogs. In addition, woodland felling and crown reduction for operational wayleave creation and maintenance may give rise to fragmentation effects on western acidic oak woodland.

Temporary infrastructure will be removed within 12 months and the soil/peat and habitats reinstated and restored. This is a short-term impact that is unlikely to result in significant habitat fragmentation effects considering good practice measures and the mitigation to be implemented (see also Section 10). The typical extents of the temporary infrastructure, for example EPZ track running widths of a maximum of 4 m, are also unlikely to result in any barrier effects, especially considering these will be removed following construction.

In terms of the permanent infrastructure to be retained after the construction period within the SAC, this comprises the tower structures, conductors, and reduced width (2.5 m) stone access tracks. The direct and indirect land take and/or modification of habitats associated with permanent tracks and towers during construction and operation of the Proposed Development have been detailed in Section 8.5.1 above.

The operational wayleave has the potential to result in woodland fragmentation effects on both options. As discussed in Section 8.5.1.1 above, the creation of the operational wayleave is considered unlikely to result in whole tree felling for the Proposed Alignment due to the location and design of the OHL, whereas a small amount of felling is required for wayleave creation on the Alternative Alignment. Section 8.5.1.1 also details the initial predicted wayleave crown reduction requirements of 0.37 ha on the Proposed Alignment (none required on the Alternative Alignment). The future wayleave is not considered likely to notably hinder the expansion of woodland locally, with woodland allowed to remain in and around the wayleave corridor when outwith the electric safety clearance zone. This will allow woodland to persist around the OHL. However, as detailed in Section 8.5.1.2, there are likely to be some medium to longer term ongoing crown reduction and tree maintenance requirements during the operational period. The associated physical loss of sections of the tree and likely secondary effects on microclimate have the potential to result in fragmentation effects on associated and intrinsically linked flora of the woodland qualifying feature, in particular the bryophyte and lichen interest.

With regard to blanket bog and wet heath, fragmentation could involve the creation of smaller areas of habitat which in turn could impair the functioning and reduce the resilience of essential hydrological processes. This could make the impacted habitat more vulnerable to future decline in condition and potentially lead to a transition to a different habitat type (as explained in Section 8.5.1.3, blanket bog to wet heath or wet heath to dry heath for example).

For blanket bog and wet heath, fragmentation effects are a function of the extent of the hydrological unit, location of impact within the unit and magnitude of direct and indirect impact in

the context of the hydrological unit. It is clear from **Figure 4** that blanket bog and wet heath habitats exist together and with other habitats (mire, flushes and marshy grasslands) in large expansive hydrologically connected mosaics across the Site. The large scale of these wetland habitat mosaics reduces the likelihood that small, fragmented habitat patches will be created. As illustrated in **Figure 4**, no small-scale habitat fragments appear to be created by the location of permanent tracks and other infrastructure along either option.

It is therefore unlikely that the potential impact of fragmentation will lead to further loss of blanket bog and wet heath in addition to that predicted to occur as a result of direct loss and precautionary indirect loss figures detailed above.

Fragmentation effects are considered unlikely for dry heath due to the negligible hydrological interference from infrastructure.

The unique damp microclimate created by western acidic oak woodland supports many associated species such as some of the rare and scarce bryophyte and lichens detailed in Section 8.4.1.3.2. Fragmentation impacts which reduce habitat extent/island size can therefore lead to changes in the woodland microclimate causing a loss of dependent species and reduction in woodland condition and resilience to future change.

As detailed in Section 8.5.1.1 the permanent tracks have been designed to minimise the felling of woodland, although a small amount of track felling is required on the Proposed Alignment. In addition, the 0.235 ha of wayleave creation felling for the Alternative Alignment and the 0.756 of loss and modification for the Proposed Alignment (0.386 direct loss and 0.37 ha modification) during the construction period could potentially create fragmentation effects.

The survey by Galbraith's (**Volume 2, Chapter 9: Forestry**) notes that along the Proposed Alignment, most woodland areas consist of scattered, open birch woodland with occasional rowan. The design process of the Proposed Alignment has led to the OHL being moved uphill to avoid the larger and denser areas of woodland and this is the reason for the dominance of open ground and areas of scattered birch and small pockets of woodland – the route is effectively skirting the edge (or above) the western acidic oak woodland qualifying feature in most locations. These areas of scattered trees and small pockets of dense trees will not currently maintain the stable damp woodland microclimate referred to above, therefore fragmentation effects arising from construction are likely to be negligible, if they occur at all. However, Galbraith (**Volume 2, Chapter 9: Forestry**) notes that birch natural regeneration is present at every location and these tie in with the SFA Natural Regeneration Areas (**Figure 3**). Future fragmentation effects, if it is assumed the expansion of woodland in these areas is successful, requires consideration. This impact is considered in Section 11 below (In-combination Effects).

The area of woodland impacted on the Alternative Alignment is a narrow strip of largely birch along the side of the Glen Arroch minor public road. This narrow strip of trees will not maintain a woodland microclimate and fragmentation effects are therefore not likely to occur during construction or operation.

<u>Impacts on Qualifying Habitats and Effects Site's Conservation Objectives</u>

All qualifying habitats are not impacted by habitat fragmentation during the construction and operational period and there are therefore no adverse effects arising on the Site's conservation objectives with respect to habitat fragmentation during construction and operation.

- Western acidic oak woodland (primary reason for Site selection);
- Wet heathland with cross-leaved heath;
- Blanket bogs (priority habitat);
- Dry heaths;
- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat); and
- Alpine and subalpine heaths.

Table 8-10 below details the effects on the Site's conservation objectives for habitat fragmentation for both options. Each conservation objective is considered in turn to ensure a comprehensive assessment of the effects. However, it is recognised that each impact may lead to varying levels of effect on the different conservation objectives, therefore 'primary conservation objective(s)' are identified where these are considered to be of most relevance to the impact under consideration.

Table 8-10 Effects on Site's Conservation Objectives of Habitat Fragmentation

Conservation Objective		Effect
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	No effect. Fragmentation effects are unlikely as detailed in Section 8.5.2.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	No effects. Fragmentation effects are unlikely as detailed in Section 8.5.2above.
2a	Extent of the habitat on Site;	
2b	Distribution of the habitat within Site;	
2c	Structure and function of the habitat;	
2d	Processes supporting the habitat;	
2e	Distribution of typical species of the habitat;	
2f	Viability of typical species as components of the habitat; and	
2g	No significant disturbance of typical species of the habitat.	

8.5.3 Impact 3: Indirect Pollution of Habitats

Description of Impacts

Indirect pollution impacts during construction may occur because of the accidental release or spillage of contaminants such as oils and chemicals from plant machinery, tools, refuelling bowsers and storage areas. These pollutants have the potential to result in the pollution of local watercourses and the quality of water in the supporting hydrological systems of wetland habitats. This could in turn result in the damage of loss of plants, with subsequent habitat modification, through the uptake of contaminants.

Concrete will be required for the foundation construction of each tower, with concrete transported to each location by a succession of multiple trucks from a local quarry/batching plant. A mobile concrete batching plant may be required locally dependent on travel times from the batching plant to facilitate the surety of concrete supply required to avoid cold joints and defective pours. The main risk from concrete during construction is generated by the aqueous solution created from concrete washout (i.e., the washing out of trucks and associated plant with water). Concrete washout can have several negative environmental impacts on vegetation and water (including groundwater via leaching) due to its extremely high alkalinity and high concentration of certain contaminants. The soils and vegetation of the SAC are acidic in nature, and therefore any effects from highly alkaline concrete washout would be exacerbated.

Construction activities may also increase the risk of sediment mobilisation and silt runoff from construction areas, which may also affect the water quality of local watercourses and/or cause localised smothering of plants.

Furthermore, during periods of prolonged dry weather, habitats may be affected by the deposition of airborne construction dust on vegetation and soils. Dust would most likely be generated via vehicular movements along stone tracks, however there is also the potential for generation of dust from any drilling operations into rock, or from mobile concrete batching plant (if utilised).

Dust may affect photosynthesis, respiration, transpiration and allow the penetration of phytotoxic gaseous pollutants. Visible injury symptoms may occur and generally there is decreased productivity. Many plant communities can be affected by dust deposition, however as per further below epiphytic lichen and *Sphagnum* dominated communities appear the most sensitive of those studied[62].

Dust can have both a physical and a chemical impact. Dust falling onto plants may physically smother the leaves and block stomata, causing physical injury to tree leaves and bark, reduced seed setting and a general reduction in growth. The chemical effects of dust may be evident either on the soil or directly on the plant surface. With respect to acidic habitats (such as those found within the SAC), the deposition of alkaline dust could affect the soil surface or upper soil horizon with reductions in calcifuge species and increase in calcicolous species, in some examples this has resulted in a decline of the Ericaceous species[62].

The amount of dust derived from a track surface is a function of the composition and moisture state of the surface, number of vehicle movements, and such vehicle-related variables as size,

[62] Farmer, A.M. (1993). The effects of dust on vegetation - a review. Environmental Pollution Volume 79, Issue 1, 1993, Pages 63-75.

weight, and speed[63]. For unpaved tracks there is generally a rapid decline in dust particle size and level of deposition in the first 8 m[64] to 10 m[63] from the track edge, with the deposition of particles from 20 m - 30 m from track edges being notably less, and of smaller particle size[62,63,64]. However, there are many factors which may affect deposition rates and distances on a local and site level[62] with instances of deposition still recorded up to 1 km away from tracks[64]. Additionally, the chemical elements in track dust tend to be concentrated in the smaller dust particles which means the decline in elemental deposition away from a track is not, therefore, as rapid as the decline in the mass of particulate matter[64].

The most sensitive habitats are considered to be those dominated by *Sphagnum* spp. and lichens. Walker & Everett (1987)[63] found a decline in a range of acidophilous species, especially *Sphagnum* spp., close to the track in their study (the Sphagna were replaced by minerotrophic bryophyte species). They also found road dust killed lichens, both ground dwelling and epiphytic, in proximity to the track. Everett (1980)[64] found the bryophytes *Hylocomium splendens*, *Pleurozium schreberi* and *Dicranum* spp. also exhibited poor tolerance to dust deposition (these species are particularly common in the heath and mire communities to be found within the SAC (e.g. see floristic tables within Rodwell *et al*. (1991)[65] and report by Averis & James (2002)[25]).

Although there is the potential for the generation of dust during construction of the Proposed Development, the typical traffic levels will be of a lower volume and frequency than in the cited studies and examples above. It should also be noted some dusts are relatively inert in their chemical effects, e.g., those from hard acidic rock quarries[62]. Stone for the construction of tracks and hardstand areas will be locally sourced from suitable local quarries (there is the potential for borrow pits to be used for the Proposed Development, however none would be located within the SAC). Imported stone to be used within the SAC will seek to be as chemically inert as available or of an acidic rock type and thereby sympathetically reflecting the rock and soil conditions within the SAC and reducing the potential chemical impact. Indicative proposals are to use locally sourced sandstone, which is an acidic rock type, and the underlying rock type within the SAC (sandstone is to be preferred over the limestone and marbles also available on Skye, as those rock types are alkaline).

The various potential indirect pollution sources identified above, and the associated pollution pathways, are likely to be relatively similar between both options, as all pollution sources identified above are applicable to both options. However, as per Table 8-4 above, there are potentially more source areas associated with the Proposed Alignment, given the higher number of towers and longer length of access tracks required. However, it should also be noted that due to the proposed helicopter delivery of towers on the Proposed Alignment, this will remove the requirement for associated crane traffic. Furthermore, by not requiring cranes on the Proposed Alignment, this reduces the areas of stone hardstanding required within each tower compound area, and it has

[63] Walker, D. A. & Everett, K. R. (1987). Road dust and its environmental impact on Alaskan taiga and tundra. Arctic & Alpine Research, 19, Pages 479-89.

[64] Everett, K. R. (1980). Distribution and properties of road dust along the northern portion of the haul road. In Environmental Engineering and Ecological Baseline Investigations along the Yukon River-Purdhoe Bay Haul Road, Ed. J. Brown & R. Berg. US Army Cold Regions Research and Engineering Laboratory, CRREL Report 80-19, pp. 101-28.

[65] Rodwell, J.S. (Ed) *et al*. (1991). British Plant Communities. Volume 2 Mires and Heaths. Cambridge University Press, Cambridge.

been calculated by the Applicant that this would reduce traffic levels on the Proposed Alignment in the order of 44 stone delivery wagons per tower location.

With respect to the potential physical and chemical effects of dust, as described above, *Sphagnum* based habitats (e.g., blanket bog) and lichens, including epiphytic lichens, are the most sensitive. Blanket bog (*Sphagnum*) habitats are equally prevalent along both options. However, the Proposed Alignment is more in close proximity to the epiphytic lichen and bryophyte communities that form a component part of the SAC qualifying woodland areas around Mudalach, many of which are potentially in the zone of influence, particularly when considering the location of the Proposed Alignment and how prevailing south-westerly winds may transport dust towards, and over, the Mudalach woodlands. Conversely, the Alternative Alignment largely lacks these woodlands and appears to generally contain fewer lichen and bryophyte sensitivities and less suitable habitat, although Nationally Rare or Scarce species are present in some areas, such as eared willow scrub. The bryophyte and lichen survey (see Section 8.4.1.3.2) indicates more Nationally Rare or Scarce species were found along the Proposed Alignment, and with further populations likely nearby and present outwith the respective survey corridor to the south in the Mudalach woodlands and local ravines/gullies (full details and results of the survey are provided in **Appendix V2-.4.6: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey Report** of the EIA Report).

Impacts on Qualifying Habitats and Effects on the Site's Conservation Objectives

The following six qualifying habitats may potentially be affected to varying degrees by indirect pollution impacts.

- Western acidic oak woodland (primary reason for Site selection);
- Dry heaths;
- Wet heathland with cross-leaved heath;
- Blanket bogs (priority habitat);
- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat); and
- Alpine and subalpine heaths.

The potential adverse impacts of pollution on qualifying habitats have been detailed above. These impacts can be reduced to an acceptable level through the implementation of standard proven mitigation measures to be included within a Construction Environmental Management Plan (CEMP) for the Site (Section 10). In taking account of this standard mitigation, any adverse pollution effects on the Site's conservation objectives can be discounted.

Table 8-11 below details the effects on the qualifying habitat's conservation objectives arising from indirect pollution impacts for both options. Each conservation objective is considered in turn to ensure a comprehensive assessment of the effects. However, it is recognised that each impact may lead to varying levels of effect on the different conservation objectives, therefore 'primary conservation objective(s)' are identified where these are considered to be of most relevance to the impact under consideration.

Table 8-11 Effect on the Site's Conservation Objectives of Indirect Pollution Impacts

Conservation Objective		Effect
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	No adverse effect. Impacts considered negligible after the consideration of a CEMP for the Proposed Development.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	No adverse effect. Impacts considered negligible after the consideration of a CEMP for the Proposed Development.
2a	Extent of the habitat on Site;	
2b	Distribution of the habitat within Site;	
2c	Structure and function of the habitat;	
2d	Processes supporting the habitat;	
2e	Distribution of typical species of the habitat;	
2f	Viability of typical species as components of the habitat; and	
2g	No significant disturbance of typical species of the habitat.	

8.5.4 Impact 4: Otter Direct – Death or Injury/Disturbance/Displacement of Otter

Description of Impacts

During construction of the Proposed Development there is the potential for otter to be directly affected negatively in a number of ways, including:

- Accidental injury or death by machinery, tools, vehicles, or as a result of construction works (e.g., unattended excavations);
- Damage to, or destruction of, a protected feature (i.e., holt/couch/hover);
- Abandonment of a protected feature due to disturbance;
- Abandonment of dependant young due to disturbance;
- Disturbance that results in behaviour that negatively impacts their life stage;
- Loss of extent, or reduced distribution, of habitats supporting the species as a result of land-take; and
- Infrastructure elements and/or construction disturbance resulting in displacement, fragmentation of territories, or creating barrier effects preventing movement to/from key habitats.

Potential impacts during operation of the Proposed Development are limited. During operation maintenance of the OHL would be occasional and typically carried out by small number of maintenance staff, most likely during normal working hours, and in line with SSEN access plans and an operational species protection plan, therefore given the wide-ranging and mobile nature of

otter this is unlikely to result in any operational effects on otter or their key habitats. Consequently, operation of the Proposed Development is not discussed further with respect to otter.

The desk-based information and otter surveys carried out in 2018 and 2020/2022 as discussed above highlight there are high levels of otter activity in the local area (both within and outwith the SAC boundary), with a large number of holts and couches/hovers. However, the majority of this activity and the protected features are located along the coastline, or within 50 m of the mean high-water level, with few field signs or protected features found further inland; see **Figures 5**, **6** and **7**. All the evidence from the otter surveys indicates the SAC and local population is likely to be predominantly coastal based, with the sea being the primary foraging resource, key habitat and refuge, with the rocky coastline being the principle area for the location of holts and couches/hovers. The sea offers abundant fish, crustacean and mollusc food sources. Further inland within the SAC does not appear to be a key habitat or foraging area for otter, as although some areas further inland may be suitable for holts and couches/hovers, the opportunities are not as plentiful as along the coast and are further from their primary food sources. Foraging opportunities inland are also much more limited with the most likely prey items being amphibians and small fish, likely brown trout, that may be present in typically low densities in some of the rocky and steep minor watercourses which drain the SAC. Some of these watercourses may contain low populations of small trout in their lower reaches, however, Kylerhea River may offer slightly more of a foraging resource, although still much more limited than the sea. During surveys, it was considered that many of the minor watercourses within the SAC are likely to be fishless due to the very steep gradients, flashy flow regimes, and abundant obstacles, shallow water and lack of pools.

Table 8-12 below summaries the combined number of holts and couches/hovers recorded in the HEL 2018 existing OHL surveys[42] and in the SSEN/ASH 2018[16] and MacArthur Green 2020/2022 route alignment protected species surveys for the Proposed Development, within a number of buffer zones from proposed infrastructure[66] (N.B. distances were measured from construction infrastructure such as tower locations and access tracks, and not the OHL conductors). There is much overlap in survey areas between these three separate surveys (see **Figures 5 – 7**) and therefore many protected features recorded in different surveys are in the same locations or very close proximity to each other and as such are likely to be the same feature. As a result, some of the protected features are likely to have been 'double-counted', however the total number is included based on the precautionary principle. Furthermore, there is infrastructure that is common to both route options, for example the re-use of the existing OHL crossing location, and as such otter features in proximity to such locations are relevant to both options.

Table 8-12 Summary of Otter Holts/Couches in Proximity to the Proposed Development

Protected Feature	Year	Proposed Alignment	Alternative Alignment
Holts within 30 m	2018	0	0
	2020/2022	0	0
Couches/hovers within 30 m	2018	1	0
	2020/2022	1	1
Holts within 31 m – 100 m	2018	5	4

[66] Holts and couches/hovers are not limited to the SAC boundary but include all such features within the respective buffer zones, regardless of juxtaposition with the SAC area.

Protected Feature	Year	Proposed Alignment	Alternative Alignment
	2020/2022	1	1
Couches/hovers within 31 m – 100 m	2018	5	3
	2020/2022	2	2
Holts within 101 m – 200 m	2018	10	0
	2020/2022	2	0
Couches/hovers within 101 m – 200 m	2018	16	6
	2020/2022	2	2

As is shown in Table 8-12 above, during the two surveys in 2018 a single protected feature was recorded within 30 m of proposed infrastructure (see also **Figures 5**, **6** and **7**). This feature was a couch/hover recorded inland on a minor watercourse in 2018 and located 22 m from a proposed track on the Proposed Alignment. However, this feature and nearby proposed infrastructure is outwith the SAC, the SAC boundary at its closest being 415 m from the couch/hover. The 2020/2022 surveys also recorded one feature within 30 m of proposed infrastructure for both options, however this is the same feature and is located by an area of the Proposed Development common to both options, i.e., by the existing OHL crossing location. The feature is located 29 m from the existing tower location and a section of existing track needing minor upgrades. Strengthening works will be required at this existing tower and a working compound area will be required, which may bring temporary infrastructure closer to this feature, if it is still in use.

As detailed in Table 8-12 above, many more protected features for otter were recorded within the respective 31 m – 100 m and 101 m – 200 m buffers around proposed infrastructure and works. A number of these features are common to both options, being located around the existing OHL crossing location and south of here along the coast (see **Figures 5**, **6** and **7**). However, on the whole, more protected features for otter are in proximity to the Proposed Alignment due to the abundance of coastal otter records north of the existing crossing and around the Rubha Buidhe headland to Sròn an Tairbh (**Figures 5**, **6** and **7**). Very little evidence of otter, and no protected features, have been recorded in repeat surveys through the Abhainn Lusa to Kylerhea and Glen Arroch portion of the Alternative Alignment.

Based on the current data no protected features for otter would be lost because of direct overlap with either option. This will be ensured through a Species Protection Plan (see Section 10 below).

Given the otters preference for utilising the coastal habitats and narrow coastal shore zone for foraging and shelter and the distances of the Proposed Development to the shore, for the most part, then it is unlikely there would be many interfaces between otters and construction activities that could lead to accidental death or injury, or significant levels of disturbance that would result in any of the effects above materialising. Additionally, given the generally steep nature of the coastal terrain and dense vegetation cover between the coast and the Proposed Alignment and the coastal section of the Alternative Alignment, a degree of natural screening/buffering from the Proposed Development is likely to be present in most cases.

The Proposed Development will also not alter the distribution or extent of the habitats supporting otter. The most likely area of interface is around the existing OHL crossing location at Kyle Rhea,

however mitigation, particularly in the form of a Species Protection Plan will ensure that all reasonably practicable measures are taken during construction so that provisions of the relevant wildlife legislation are complied with in relation to otter for the entirety of the Proposed Development (see Section 10 with regards mitigation). The Species Protection Plan will also include various measures to avoid harm and remove/reduce potential disturbance sources and effects, as well as incorporating pre-construction otter surveys and ongoing otter monitoring during the construction period. Should otter be affected by minor and non-significant levels of disturbance and/or temporarily displaced during construction there are abundant foraging and sheltering opportunities locally for this mobile and wide-ranging species that would ensure there are no risks to the otters' population viability or overall distribution within the SAC and locally. The Proposed Development is also not considered likely to result in any otter population or territory fragmentation, nor create any barrier effects with respect to the movement of otters within the SAC or around the coast and their key habitats.

Impacts on Otter and Effects on the Site's Conservation Objectives

The potential adverse impacts on otter through direct impacts have been detailed above. These impacts can be reduced to an acceptable level through the implementation of standard proven mitigation measures to be included within a Species Protection Plan for the Site. In taking account of this mitigation any adverse effects on the Site's conservation objectives for otter can be discounted.

Table 8-13 Effect on the Site's Conservation Objectives for Otter – Direct Impacts

Conservation Objective		Effect
1	To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	No adverse effect. Impacts considered negligible and short-term after the consideration of a Species Protection Plan for the Site.
2	To ensure for the qualifying species that the following are maintained in the long term:	
2a	Population of the species as a viable component of the Site;	
2b	Distribution of the species within Site;	
2c	Distribution and extent of habitats supporting the species;	
2d	Structure, function and supporting processes of habitats supporting the species; and	
2e	No significant disturbance of the species.	

8.5.5 Impact 5: Otter Indirect – Loss/Degradation/Alteration of Key Habitat/Food Resources

Description of Impact

During construction of the Proposed Development there is the potential for otter to be indirectly affected negatively in a number of ways, including:

- Damage to navigation/commuting routes within the SAC (i.e., watercourses);

- Damage or degradation of foraging areas (e.g., areas containing amphibians, fish, and/or crustaceans/molluscs in the case of otter); and
- Contamination of water (leading to loss or reduction in the availability or amount of food resources).

As per Section 8.5.4, it is not expected there would be any notable indirect effects during operation of the Proposed Development, and this is not discussed further with respect to this potential impact.

The discussion on potential direct impacts on otter above provides much of the context in assessing the likelihood of whether there are likely to be any notable adverse indirect impacts on otter. As noted above, the otter population here appears to be largely coastal based, and potential indirect effects of the Proposed Development is unlikely to alter the extent or structure and function of the key coastal habitats.

The minor watercourses with the SAC and along the routes of proposed alignments also do not appear to be key habitats, commuting/navigation routes, or foraging resources for SAC otter. Several watercourse crossings are likely to be required during construction (see Table 8-4), however these can be easily traversed or circumvented by otter in the lower likelihood of them being used as commuting routes within the wider landscape.

Construction activities have the potential to generate pollution events which may result in adverse impacts on watercourses within the respective catchment. However, as already stated, the minor watercourses within the SAC and in proximity to the route alignment options are not considered to be the key foraging habitats, furthermore the suite of mitigation measures to be put in place, including a robust construction environmental protection plan (CEMP) incorporating a pollution prevention plans etc. (see Section 10) will ensure the risk of significant pollution events are minimised. If minor pollution events do occur within the SAC, and materialise within the respective watercourses, it is unlikely that any discernible effects on food sources or habitat deterioration would be evident within the marine environment and subsequently affect the otters key foraging habitat or food resources within.

Impacts on Otter and Effects on the Site's Conservation Objectives

The potential adverse impacts on otter through indirect impacts have been detailed above. These impacts can be reduced to an acceptable level through the implementation of standard proven mitigation measures to be included within a Species Protection Plan for the Site. In taking account of this mitigation any adverse effects on otters' conservation objectives can be discounted.

Table 8-14 Effect on the Site's Conservation Objectives for Otter – Indirect Impacts

Conservation Objective		Effect
1	To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	No adverse effect. Impacts considered negligible and short-term after the consideration of a Species Protection Plan for the Site.

Conservation Objective		Effect
2	To ensure for the qualifying species that the following are maintained in the long term:	
2a	Population of the species as a viable component of the Site;	
2b	Distribution of the species within Site;	
2c	Distribution and extent of habitats supporting the species;	
2d	Structure, function and supporting processes of habitats supporting the species; and	
2e	No significant disturbance of the species.	

9 DISMANTLING (IMPACT 6)

On commissioning of the new 132 kV OHL, the existing 132 kV OHL would become redundant and would be dismantled. This means the existing OHL through the SAC would be removed. No new tracks or other infrastructure would be required to dismantle and remove the exiting OHL, with towers and components within the SAC dismantled *in-situ*. For all existing towers within the SAC operatives, dismantling equipment and winches are anticipated to be flown in by helicopter and the resultant dismantled infrastructure also removed via helicopter (see **Appendix V1-3.8: Dismantling Plan for the Existing OHL** of the EIA Report). Within the SAC the preferred foundation removal option will be to cut the towers down to ground level but leave the concrete foundation in place to prevent the need to break up the foundation and in doing so avoid the need to bring in heavier tracked excavators and ATVs to each tower which may result in vegetation damage and ground scarring. Further details on dismantling proposals are provided within the dismantling plan (**Appendix V1-3.8: Dismantling Plan for the Existing OHL** of the EIA Report). With the proposals outlined in the dismantling plan and incorporation of the relevant mitigation measures noted in Section 10, it is not expected that dismantling and removal of the existing OHL would result in negative impacts leading to an adverse effect on Site integrity.

The existing OHL passes through the SAC for approximately 5.91 km, of which the majority (5.64 km) is from the Kyle Farm area to Rubha Buidhe. Here it generally runs at low altitude, parallel to the coast, and through the lower slopes of the Mudalach woodlands, after which it crosses generally more open ground to the east of Allt Sròn an Tairbh before changing direction around Rubha Buidhe and then heading south to the Kyle Rhea crossing. SSEN has advised that an operational wayleave of around 30 m is maintained through the woodland areas for the existing OHL which predominately passes through the qualifying habitat of western acidic oak woodland, which here is mainly adjacent stands of W17, or mosaics of W17 with usually lesser amounts of W11 and/or W4, according to NatureScot data[25] (the contemporary NVC data for the Proposed Development in this area covers a relatively small proportion of the existing OHL wayleave but covers the surrounding Mudalach woodland, where it does cover the existing wayleave it also indicates that the surrounding woodland is western acidic oak woodland, being predominately W17, with some areas of W4). The existing OHL also passes through a short section (approximately 104 m) of mosaic coastal woodland by Sròn an Tairbh that according to the NatureScot 2001 NVC data[25] 50% of which is W9 *Fraxinus excelsior – Sorbus aucuparia – Mercurialis perennis* woodland, i.e.

woodland corresponding to 'mixed woodland on base-rich soils associated with rocky slopes' (priority habitat type).

Given the time since the existing OHL was constructed, this wayleave is in places largely functioning as an artificial woodland glade habitat with associated flora and fauna. Glades are a key component of healthy woodlands; they are more open and with higher light levels and so support a range, and often greater diversity, of woodland plants, and they are often important areas for insects and birds. Naturally, woodland glades would be created by large trees falling and often kept open by grazing and trampling. Averis & James (2002)[25] noted many natural glades within the SAC woodlands. In natural settings glades are dynamic, closing over time, as new ones form elsewhere. Averis & James (2002)[25] considered the OHL wayleave to act as a glade, and they more generally noted Scottish wood ant (*Formica aquilonia*) colonies in the Mudalach woodlands. These are the only known records of wood ant on Skye and in the Hebrides[25,67,68].

Whilst the existing wayleave is likely to be functioning as a large artificial woodland glade habitat which has intrinsic ecological value, by removing the disturbance associated with maintaining the wayleave, the integrity of the woodland would be enhanced. As explained in the guidance 'Managing Natura 2000 sites' (EC, 2018)[69] '*A site can be described as having a high degree of integrity where the inherent potential for meeting site conservation objectives is realised, the capacity for self-repair and self-renewal under dynamic conditions is maintained, and a minimum of external management support is required*'. Leaving the wayleave to regenerate naturally will facilitate a slower return to woodland in a more natural manner with trees over time finding the best areas for natural regeneration and woodland glade habitats being maintained instead by natural processes.

The dismantling of the existing OHL can therefore be regarded as a potential beneficial impact on western acidic oak woodland and mixed woodland on base-rich soils associated with rocky slopes (i.e., W9). The following paragraphs present an analysis of the likely magnitude of impact on these two qualifying features.

1) As noted above, the full length of the existing OHL within the SAC is 5.91 km.
2) The existing OHL passes through woodland habitat (where a created/maintained wayleave is visible), scattered trees (no clearly visible wayleave), and open habitat (where there is no visible wayleave). GIS analysis was undertaken using aerial imagery and available NVC data which apportioned the existing OHL between these three Categories as follows:
    A. Woodland habitat (wayleave visible): 1.349 km.
        i. Due to the clearly visible wayleave through the woodland, it is reasonable to assume that woodland has been felled and re-growth prevented by subsequent clearance.
    B. Scattered trees (wayleave unclear): 1.430 km.

[67] https://www.woodants.org.uk/species/scottishwoodant
[68] https://species.nbnatlas.org/species/NHMSYS0000875949
[69] European Commission (2018). Managing Natura 2000 Sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. ISBN 92-828-9048-1

i. It is unclear whether felling has been required of scattered trees due to the lack of an obvious wayleave.

C. Open ground (no wayleave): 3.127 km.

i. It is unlikely that any felling has been required due to the lack of regenerating trees and largely open nature of the habitat.

3) Category A and B were taken forward into the analysis of the likely magnitude of positive impact. Category C was discounted from the analysis as an area which is unlikely to have been affected by the existing OHL.

4) The width of the existing OHL wayleave which requires maintenance through woodland is 30 m according to SSEN. However, measurements were taken using GIS and aerial photos which suggests an average wayleave width as low as 10m and up to 30m in places. This however could be misleading due to the angle and resolution of the aerial imagery and difficulty with differentiating between regenerating trees and mature trees. Therefore, a precautionary assumption of 20 m wayleave width was assumed.

5) Using the estimated lengths in Categories A and B and a width of 20 m, estimates of potential woodland regeneration areas were generated (Table 9-1).

Table 9-1 Potential Benefical Impact (Woodland Regeneration) of Dismantling the Existing OHL

Wayleave Category	Estimated Length (km)	Width	Area (ha)
Category A	1.349	20 m	2.70
Category B	1.430	20 m	2.86
Total	**2.779**	**-**	**5.56**

6) In terms of type of woodland likely to regenerate, it is estimated that this would almost exclusively be western acidic oak woodland, given the adjacent prevailing NVC communities, likely mostly comprising W17 and lesser amounts of W11 and W4 dependent on ground conditions, as seen in the surrounding areas in the existing NatureScot NVC 1993[24] and 2001[25] data, and contemporary NVC data (**Figure 4**). However, as noted above one small section of the existing OHL traverses a patch of woodland by Sròn an Tairbh including W9 (which falls within Category A), and therefore if it is assumed W9 regenerates in the whole wayleave in this same location (rather than a mosaic of woodland communities) then there may be up to 0.31 ha of W9 regeneration.

7) A total area of 5.25 ha (5.56 – 0.31) could therefore regenerate to western acidic oak woodland. However, it is important to consider the likelihood of natural woodland regeneration (with no additional management such as bracken control) given the prevailing conditions and provide a lower and upper estimate to reflect the uncertainty surrounding this analysis. The percentages used below are based on professional opinion and adopt a precautionary approach.

a. Lower Estimate of Western Acidic Oak Woodland Regeneration: Category B is excluded from this estimate due to the uncertainty over whether any woodland

clearance has been undertaken. It is assumed that only 50% of Category A would re-establish as woodland due to encroachment by bracken which wayleave creation and maintenance would have favoured. This generates a realistic worst-case estimate of 1.35 ha western acidic oak woodland regeneration.

b. Upper Estimate of Western Acidic Oak Woodland Regeneration: It is assumed that 25% of Category B is subject to some form of tree management and would therefore establish as woodland if this management was removed. It is also assumed that 75% of Category A would re-establish as woodland. This generates a realistic best-case estimate of 2.74 ha of western acidic oak woodland regeneration.

8) Adopting a similar approach for mixed woodland on base-rich soils associated with rocky slopes. The maximum estimate of 0.31 ha would generate a lower estimate of 0.155 ha and an upper estimate of 0.235 ha.

9) As noted above, ecological integrity of woodland qualifying features will be improved through the removal of management intervention necessary for the current wayleave. It is not possible to represent this improvement in ecological integrity through the area estimates noted above, however it forms part of the beneficial impact. Furthermore, it is also implicitly assumed in this analysis that areas that do not regenerate do not contribute to the beneficial impact. This will lead to an under valuing of the benefit as some remaining open areas will function as natural woodland glades within the dynamic woodland complex.

Therefore, the removal of the existing OHL and the natural regeneration of the existing wayleave benefits the Site's conservation objectives as they apply to the qualifying features of western acidic oak woodland and mixed woodland on base-rich soils associated with rocky slopes, and it is also equally a benefit associated with either alignment option.

Impacts on Qualifying Habitats and Effects on the Site's Conservation Objectives

The following two qualifying habitats may potentially be beneficially affected to varying degrees by woodland regeneration resulting from existing OHL dismantling:

- Western acidic oak woodland (primary reason for Site selection); and
- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat).

The existing OHL managed wayleave does not contain communities associated with the alpine and subalpine heaths or blanket bog (priority habitat) qualifying features (according to NatureScot designation NVC data[25]), and as such they would not be affected by dismantling and regeneration of the wayleave.

The existing OHL wayleave includes areas of NVC communities associated with the dry heaths and wet heathland with cross-leaved heath qualifying features. These areas are largely artificially maintained by the operational requirements of the existing wayleave. With woodland regeneration of the wayleave as part of dismantling, then it is expected that over time some woodland would likely encroach into these areas of dry heaths and wet heaths, however this is considered to be a natural dynamic successional response with the local habitat matrix seeking to

return to a their natural climax communities representative of the area before the OHL existed; this is not considered an adverse effect.

Table 9-2 and Table 9-3 below detail the effect on the Site's conservation objectives arising from the dismantling of the existing OHL. Each conservation objective is considered in turn to ensure a comprehensive assessment of the effects. However, it is recognised that each impact may lead to varying levels of effect on the different conservation objectives, therefore 'primary conservation objective(s)' are identified where these are considered to be of most relevance to the impact under consideration.

Table 9-2 Impact on the Site's Conservation Objectives of Dismantling - Habitats

Conservation Objective		Impacted?
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	Yes – beneficial. Removal of wayleave maintenance will improve naturalness of habitat by allowing dynamic natural processes to return and will improve the ecological integrity of these woodlands.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	-
2a	Extent of the habitat on Site;	**2a is considered to be the primary conservation objective which dismantling would result in a beneficial effect for Western acidic oak woodland and Mixed woodland on base-rich soils associated with rocky slopes. The positive effects identified on objectives 2b, 2c, 2e, 2f and 2g occur as a consequence of this primary effect.** The removal of the wayleave may allow between 1.35 to 2.74 ha of oak woodland and 0.155 to 0.235 ha of mixed woodland to establish thereby increasing the extent of these habitats within the Site. This effect would consequently lead to improved habitat distribution, more resilient processes and improved structure and function of the surrounding woodland (by creating larger contiguous woodland areas). The distribution and viability of species associated with these habitats would also benefit as a result of the improved ecological integrity of the woodland.
2b	Distribution of the habitat within Site;	
2c	Structure and function of the habitat;	
2d	Processes supporting the habitat;	
2e	Distribution of typical species of the habitat;	
2f	Viability of typical species as components of the habitat; and	
2g	No significant disturbance of typical species of the habitat.	No effect.

The potential adverse impacts on otter through direct impacts have been detailed within Section 8.5.4 above – these also apply to the dismantling of the existing OHL. As detailed in Section 8.4.2, otter utilising the SAC and local area are predominately coastal based with most evidence recorded

along the coast or within 50 m of the shoreline, with little evidence of otter using habitats further inland within the SAC (see also **Figures 5 – 7**). The existing OHL is closer to the coastal zone and therefore is generally located closer to the various otter field signs and protected features found during surveys. Due to this proximity effect the area around the existing OHL may be considered more sensitive to potential impacts on otter. However, the nature of dismantling works at each tower location, which will be of shorter duration, unintrusive, with less operative and plant requirements, means fewer possible sources of disturbance than construction of the Proposed Development (see also **Appendix V1-3.8: Dismantling Plan for the Existing OHL** of the EIA Report). The use of helicopters is proposed for dismantling works in the SAC. The use of helicopters could be considered an additional disturbance risk; however, they will be used for short periods of time and the helicopter flight paths proposed in dismantling works have been designed to avoid the coastal zone where otter presence is more likely. As shown in **Plate 1.1** of **Appendix V1-3.8: Dismantling Plan for the Existing OHL** of the EIA Report), the flight path from each existing tower is initially southwest, uphill and away from the coastal zone before heading west to an identified laydown area outwith the SAC by Kyle Farm where tower sections will be broken down further before removal to a recycling facility. The dismantling works will also not alter the distribution or extent of the habitats supporting otter. The potential impacts on otter, as discussed above, can be reduced to an acceptable level through the implementation of standard proven mitigation measures to be included within a Species Protection Plan for the Site (see also Section 10). In taking account of this mitigation any adverse effects on the Site's conservation objectives with regard to otter can be discounted.

Table 9-3 Impact on Site's Conservation Objectives of Dismantling - Otter

Conservation Objective		Effect
1	To avoid deterioration of the habitats of the qualifying species or significant disturbance to the qualifying species, thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	No adverse effect. Impacts considered negligible and short-term after the consideration of a Species Protection Plan for the Site.
2	To ensure for the qualifying species that the following are maintained in the long term:	
2a	Population of the species as a viable component of the Site;	
2b	Distribution of the species within Site;	
2c	Distribution and extent of habitats supporting the species;	
2d	Structure, function and supporting processes of habitats supporting the species; and	
2e	No significant disturbance of the species.	

10 MITIGATION

When a plan or project may have an adverse impact upon the Site's Conservation objectives and an adverse effect upon the integrity of a Site, but this can be eliminated by modifications to the proposal, or by insertion of conditions (for instance related to working methods, timing of works,

monitoring etc.), then these fall under the term of 'mitigation'. Such mitigation can occur within or outwith the Site and is not to be confused with 'compensatory measures' (see Section 13).

A number of impacts, and potential impacts, on SAC qualifying features have been identified above. Several mitigation measures and mitigation plans will be put in place before, during, and following construction of the Proposed Development to reduce or avoid the potential impacts on their conservation objectives. Furthermore, good practice construction measures and further details on working methods, plant requirements, types of materials to be used, access and storage plans, defined working corridors, use of helicopters, reinstatement and restoration plans etc will form part of the Proposed Development's Construction Method Statement (CMS).

Table 10-1 below details the mitigation plans required for each qualifying feature as identified in the sections above.

Table 10-1 Mitigation Plans

Qualifying Habitat / Species	Mitigation
Western acidic oak woodland (primary reason for Site selection)	• CEMP and General Environmental Management Plan (GEMP) (see below) to avoid pollution impacts. • Detailed design and CMS to avoid felling and damaging trees, associated epiphytes and bryophyte rich boulders. • Operational wayleave maintenance plan. • Dismantling plan (existing OHL).
Dry heaths	• CEMP and GEMP (see below) to avoid pollution impacts.
Wet heathland with cross-leaved heath	• CEMP and GEMP (see below) to avoid pollution impacts. • CMS to reduce indirect impacts on hydrology.
Blanket bogs (priority habitat)	• CEMP and GEMP (see below) to avoid pollution impacts. • CMS to reduce indirect impacts on hydrology.
Mixed woodland on base-rich soils associated with rocky slopes (priority habitat)	• CEMP and GEMP (see below) to avoid pollution impacts • Dismantling plan (existing OHL)
Alpine and subalpine heaths	• CEMP and GEMP (see below) to avoid pollution impacts.
Otter	• CEMP and GEMP (see below) to avoid pollution impacts. • Species Protection Plan.

The Applicants GEMP is provided in **Appendix V1-3.5: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)** of the EIA Report. It is expected the site-specific CEMP, prepared by the Applicant and Principal Contractor as a condition of consent, would include mitigation plans including but not limited to the following (only plans of relevance to the impacts above and this Shadow HRA are noted):

- Pollution Prevention Plan;
- Water & Drainage Management Plan;
- Water Quality Monitoring Plan;
- Concrete Washout Plan;
- Waste Management Plan;
- Traffic and Access Management Plan;
- Peat & Soils Management Plan;
- Dust Suppression and/or Air Quality Management Plan;
- Construction Noise Management Plan;
- Restoration and Reinstatement Plan (including provisions for post-construction monitoring of restored areas);
- Invasive Non-Native Species Management and Biosecurity Plan; and
- Environmental Incident & Emergency Response Plan.

An overarching site-specific Species Protection Plan would be implemented during construction and would also apply to maintenance activities during operation; where necessary this will build upon the Applicant's standard Species Protection Plans (see **Appendix V1-3.5: General Environmental Management Plans (GEMPs) and Species Protection Plans (SPPs)** of the EIA Report). This plan will detail measures to safeguard the resident protected species populations known or likely to be in the area and ensure compliance with the relevant nature conservation legislation. It will also include pre-construction and ongoing surveys, good practice measures, and monitoring during construction, including further detail on species-specific protection and monitoring plans, procedures, and make provisions for species licencing if required. The Species Protection Plan will also include provisions for the safeguarding of any rare plants recorded within the LoD, including the Nationally Rare and Nationally Scarce bryophytes and lichens recorded during baseline surveys (see Section 8.4.1.3.2 and **Appendix V2-4.6: Kinloch & Kyleakin Hills SAC/SSSI Bryophyte and Lichen Survey Report** of the EIA Report).

The presence of an Ecological Clerk of Works (ECoW) during construction will be required, who may also be supported by other relevant specialists as required (e.g., a bryologist or lichenologist). The ECoW will advise the Applicant and the Principal Contractor on ecological matters as well as carry out monitoring of works and briefings with regards to any ecological sensitivities onsite to the relevant staff of the Applicant, the Principal Contractor and any subcontractors. The EcoW will also be able to advise on any micrositing of infrastructure that may be required during the construction period (within the limits of any imposed related planning conditions).

It is also expected that a Geotechnical Risk Register (considering in particular the risk of peat slide) will be implemented and maintained throughout the construction period.

11 IN-COMBINATION EFFECTS (IMPACT 7)

NatureScot advises that a plan or project should be considered "*in-combination with the effects of other plans and projects on the same Natura site. This is to check whether an effect that would not be*

significant, or likely, on its own might become significant, likely, or both when checked in combination with the effects of other proposals"[70].

This in-combination test must consider both:

- The potential effects of other plans published for consultation and projects seeking consent; and
- Any ongoing negative effects of completed plans or projects.

A map search of the planning portal on The Highland Council (THC) website[71] was undertaken on 18 July 2022, providing details of all planning applications validated or decided within the previous five years. Only three planning applications not associated with the Proposed Development[72] were noted within the boundaries of the SAC within the past 5 years, as follows:

- Reference 22/01325/FUL: Erection of 25 m lattice tower and associated infrastructure for 4G and 5G electronic communications base station, and removal of 17 m tower. Land at Bealach Udal, Kylerhea: Under Consideration.
- Reference 21/00355/PDENQ: Installation of underground cable and pole. Located on existing forestry track on land 200 m north-west of Kinloch Lodge (located in very southern tip of the SAC) by Aird na Meacan: Under construction.
- Reference 18/04087/FUL: Installation of a 20 m high lattice mast with antennas and transmission dishes and ancillary equipment cabinets. Located on Kinloch forestry track 370 m northeast of Ardnameacan (located in very southern tip of the SAC) by Aird na Meacan: Application Permitted.

Additionally, planning applications outwith, but within 500 m of, the SAC were reviewed to account for possible indirect impacts from other projects or planning applications. A small number of other planning applications were present in this area, with the types of projects mainly comprising:

- Building of single dwelling houses;
- Alterations or extensions to existing dwelling houses;
- Creation of new parking facilities;
- Upgrading existing footpaths and parking facilities;
- Change of use from existing laydown area to parking area;
- Replacement of public convenience block;
- Formation of forestry road; and

[70] https://www.nature.scot/professional-advice/planning-and-development/environmental-assessment/habitats-regulations-appraisal-hra/habitats-regulations-appraisal-hra-likely

[71] https://wam.highland.gov.uk/wam/spatialDisplay.do?action=display&searchType=Application

[72] Planning application 21/04141/PNO concerns proposals for ground investigation works associated with the Proposed Development and for the purposes of this HRA is not considered here to be a separate plan or project. Approval has been granted for this planning application on 12/11/2021. Application 22/00339/SCOP regards the scoping of the Proposed Development.

- Siting of a caravan.

In addition to the above minor applications surrounding the SAC, two recent applications have been made by FLS which abut the SAC and concern peatland restoration works. These are as follows:

- Reference 22/02790/PNO: Peatland restoration, Land 1690 m southwest of Allt-An-Avaig Kyleakin (the 'Kyle Farm III Peatland Restoration Project'). Application Validated 30/06/2022. Status: Under Consideration; and
- Reference 22/03016/PNO: Peatland restoration, Choire Bhuidhe, Kinloch Hills Forest (the 'Choire Bhuidhe Peatland Restoration Project') Application Validated 11/07/2022. Status: Under Consideration.

In addition, a further recent FLS application abutting the SAC boundary (planning reference 21/02579/PNO) regarding another FLS peatland restoration project (the 'Glen Arroch 2 Peatland Restoration Project') was withdrawn on 20 December 2021 as THC deemed the application to not fall within permitted development, and prior approval would be required for the scheme. Each of these peatland restoration schemes proposes returning formerly afforested conifer plantation back to peatland habitat. Such restoration schemes abutting the SAC would have beneficial effects should they, in all likelihood, proceed.

A further notification for the Sròn an Tairbh fish farm was also located (sited in Loch Alsh, by Sròn an Tairbh, north-east of Mudalach) for farm related building works (approval not required).

None of these projects were on a scale or type that would require a full EIA, also no HRAs were required, and as such it is considered that they would not have any potential adverse effects on the integrity of the SAC.

The NatureScot SiteLink website[12] lists 85 casework items associated with the SAC (as of 18 July 2022). Details are not available on the casework items, but they primarily relate to the provision of advice/information. There are a few cases of development objections, and of consents given or no objection (subject to modifications/conditions). Despite the details not being available for specific cases, it is assumed that none of the NatureScot consents would result in an adverse effect on the integrity of the SAC.

11.1 Woodland Expansion Project

The SFA woodland expansion project, which was initiated in 2001, aims to increase the extent of qualifying woodland within the SAC through a scheme of planting and natural regeneration (Section 8.4.1.2). The Proposed Alignment (in particular) and the Alternative Alignment overlaps with areas identified as part of this scheme (**Figure 3**), and which will continue to be managed as part of the FLS LMP 2019-2029.

It is necessary to undertake an analysis, which considers various factors that may influence the success of the woodland expansion project, to allow a prediction of the potential future impact of both options on the project.

The future beneficial impact of the woodland expansion scheme, if successful, would lead to an improvement in the condition of the qualifying feature of western acidic oak woodland and

potentially mixed woodland on base-rich soils associated with rocky slopes. As described in **Table 11-1**, the condition of the western acidic oak woodland qualifying feature was considered to be in 'Unfavourable Declining' in 2013 although signs of regeneration and lower deer impacts described in section 8.4.1.2 indicate that the condition may have improved to 'Unfavourable Improving'. Mixed woodland on base-rich soils was considered to be in Unfavourable Declining condition in 2013 and this is assumed to still be the case.

As a result of permanent infrastructure and wayleave, the Proposed Development could lead to the loss and/or modification of future woodland expansion areas. Therefore, the relevant impact on woodland qualifying features considered is whether the Proposed Development would prevent the qualifying features achieving favourable condition as a result of the potential beneficial impact of the woodland expansion project, which covers a total area within the SAC of 724ha (**Figure 3**). This is achieved by considering the potential extent of the woodland expansion project impacted by the Proposed Development.

As a consequence of the uncertainty surrounding the influencing factors, the following analysis represents a realistic precautionary scenario where: there is 100% success of the woodland expansion project within the SFA and Planting Zone; wayleave felling is not limited to the minimum of 3.5m electrical clearance zone from conductors, regenerating trees on peatland will be low stature and low density, bracken dominated areas and other non-peatland habitats will transition to tall mature oak woodland rather than lower stature woodland which is more likely to establish.

11.1.1 Analysis of Potential Future Impact of both options on the Woodland Expansion Project

1. In GIS, a 30 m wayleave (15 m either side of the alignment centreline and referred to here as the Future Wayleave) was created along both options where this overlaps with the SAC and the SFA Planting and Natural Regeneration Areas. The failed planting area sited on peat and located to the west of Mudalach, and which will be restored to peatland and not replanted as per the LMP (as detailed in Section 8.4.1.2 above) was removed from this analysis. All other SFA planting and regeneration areas were included.
2. Current baseline habitat calculations were completed for this area. This details the existing habitat extents and composition within the Future Wayleave using the contemporary NVC data; this is summarised in **Table 11-1**.
3. Future baseline habitat calculations were completed which assumed 100% success of natural regeneration and planting within the SFA and Natural Regeneration Areas. This involved assuming that all non-woodland habitats (dry heath, wet heaths, blanket bog and non-qualifying habitats) would all change to western acidic oak woodland habitat (**Table 11-2**).
4. Direct future habitat loss (assuming natural regeneration and planting is successful) of qualifying habitats was calculated for each route within the Future Wayleave and outwith the Future Wayleave where permanent infrastructure overlaps (i.e., 2.5 m width

operational access tracks and tower footprints[73]) with regeneration and planting areas within the SAC (**Table 11-3**).

5. Total potential future crown reduction (habitat modification) areas were calculated based on the overlap between the Future Wayleave and SFA Regeneration and Planting Areas. Direct and permanent future habitat loss as detailed above was deducted from these values to avoid double counting (**Table 11-4**).
6. Maximum future crown reduction was estimated using the full Future Wayleave width of 30 m (**Table 11-5**).
7. The Minimum future crown reduction requirement is 55% of the Maximum future crown reduction value. This was estimated using the following approach: Three types of towers are proposed in the SAC (i.e., L7: D, D30, D60). The distance between the outermost conductors for these tower types ranges from 9.4 m to 9.9 m (**Technical Appendix V1-3.2**). Assuming a minimum 3.5 m clearance distance is then required from conductors then the minimum corridor to be kept clear of trees/branches is 16.4 m (9.4+3.5+3.5) to 16.9 m (9.9+3.5+3.5). The proposed wayleave is 30 m; therefore 55%-56% of the wayleave must remain clear (**Table 11-5**).
8. The average (Mean) of the minimum and maximum figures is used as a realistic worst-case scenario for crown reduction. Given the position that the OHL will sit in the wayleave (i.e., along the centreline), when the minimum corridor to be kept clear is applied, then the remaining zone between the 3.5 m clearance zone and the edge of the wayleave is 6.55 m-6.80 m. This is based on the minimum required. Given the practicalities of wayleave maintenance, the nature of these narrow zones and the difficulty in on-the-ground determination of these, and other potential existing or future environmental considerations, such as topographical constraints or factors, or potential overlap/overhang into these zones from trees/branches outwith the 16.4 m to 16.9 m corridor, and based on the precautionary principle, it is assumed that maintenance activities and tree clearance/future crown reduction requirements would likely not achieve the minimum reduction. However, it is reasonable to assume that some crown reduction will be avoided within the wayleave due to the flexibility allowed by the 3.5 m clearance allowance. Therefore, a mean of the minimum and maximum is used.

Table 11-1 Baseline Habitat Calculations within Future Wayleave

Phase 1	Habitat	SAC Extent per citation (ha)	Future Wayleave Current Baseline (ha)	
			Proposed Alignment	Alternative Alignment
A1.1.1 + A3.1	Western acidic oak woodland	168.81	0.724	0.001
D1.1	Dry heaths	448.41	0.968	0.298
D2	Wet heaths	2215.69	5.580	0.560
E1.6.1 + E1.7	Blanket bog	965.41	1.546	0.209

[73] Tower footprints were determined for each tower type using information provided in Plate 3.1 of **Volume 1, Chapter 3: Project Description**.

Phase 1	Habitat	SAC Extent per citation (ha)	Future Wayleave Current Baseline (ha)	
			Proposed Alignment	Alternative Alignment
Other	Non SAC-Qualifying habitat[74]	1354.39	1.585	0.183
	Total	**5152.71[75]**	**10.403**	**1.251**

Table 11-2 Future Wayleave Habitat Calculations if Woodland Expansion Project Successful

Phase 1	Habitat	Future Wayleave Habitat Extents (ha)			
		Proposed Alignment	Change	Alternative Alignment	Change
A1.1.1 + A3.1	Western acidic oak woodland	10.403	+9.679	1.251	+1.250
D1.1	Dry heaths	0.000	-0.968	0.000	-0.298
D2	Wet heaths	0.000	-5.58	0.000	-0.560
E1.6.1 + E1.7	Blanket bog	0.000	-1.546	0.000	-0.209
Other	Non-SAC Qualifying habitat	0.000	-1.585	0.000	-0.183
	Total	**10.403**	**0**	**1.251**	**0**

Table 11-3 Direct Habitat Loss on Baseline Calculations within and outwith the Future Wayleave (where overlap exists between SFA Scheme Area and SAC)

Phase 1	Habitat	Within Future Wayleave		Outwith Future Wayleave		Total permanent Loss	
		Proposed Alignment	Alternative Alignment	Proposed Alignment	Alternative Alignment	Proposed Alignment	Alternative Alignment
A1.1.1 + A3.1	Western acidic oak woodland	0.02	0.00	0.04	0.01	0.06	0.01
D1.1	Dry heaths	0.03	0.00	0.09	0.02	0.12	0.02
D2	Wet heaths	0.13	0.00	0.61	0.06	0.74	0.06
E1.6.1 + E1.7	Blanket bog	0.03	0.00	0.17	0.02	0.20	0.02
Other	Non-SAC-Qualifying habitat	0.07	0.03	0.20	0.05	0.27	0.08
	Total	**0.27**	**0.03**	**1.10**	**0.15**	**1.37**	**0.18**

[74] The non-SAC qualifying habitats present in the Future Wayleave are predominately areas of bracken, although there are some smaller areas of flush and former clear-fell.

[75] The SAC covers an area of 5275.63 ha as per the SAC citation. The 122.92 ha not accounted for in this table equates to 89.68 ha of Alpine and subalpine heaths and 33.24 ha of Mixed woodland on base-rich soils associated with rocky slopes (i.e., the SAC qualifying habitats not affected).

Table 11-4 Future Wayleave Habitat Calculations if Woodland Expansion Project Successful – Minus Permanent Infrastructure

Phase 1	Habitat	Future Wayleave Habitat Extents (ha) Minus Permanent Infrastructure	
		Proposed Alignment	Alternative Alignment
A1.1.1 + A3.1	Western acidic oak woodland	10.132	1.219
D1.1	Dry heaths	n/a	n/a
D2	Wet heaths	n/a	n/a
E1.6.1 + E1.7	Blanket bog	n/a	n/a
Other	Non-SAC Qualifying habitat	n/a	n/a
	Total	**10.132**	**1.219**

Table 11-5 Future crown reduction/maintenance requirements in Future Wayleave – Permanent Loss Excluded

Phase 1	Habitat	Future Wayleave Habitat Extents (ha)					
		Proposed Alignment Min	Proposed Alignment Mean	Proposed Alignment Max	Alternative Alignment Min	Alternative Alignment Mean	Alternative Alignment Max
A1.1.1 + A3.1	Western acidic oak woodland	5.573	7.852	10.132	0.670	0.944	1.219

The key conclusions from the above analysis for both options are:

- The Proposed Development results in no impact on the woodland expansion project with respect to the future condition of the qualifying feature of mixed woodland on base-rich soils associated with rocky slopes.
- The Proposed Development could potentially give rise to an adverse impact on the woodland expansion project with respect to the future condition of the western acidic oak woodland qualifying feature as considered further below.
- The total impact of the Proposed Alignment on the woodland expansion project (including permanent loss and habitat modification via crown reduction) is **9.22ha** (1.37 ha permanent loss + 7.85 ha crown reduction/habitat modification (mean value)). To avoid double counting impacts (if all losses from the project were to be summed), it is important to note that 1.1 ha of the 1.37 ha figure of permanent loss includes direct loss of qualifying habitat accounted for in Impact 1a above. Removing this would give a total impact figure of 8.12ha (0.27 ha permanent loss + 7.85 ha crown reduction/habitat modification).
- The total impact of the Alternative Alignment on the woodland expansion project (including permanent loss and habitat modification via crown reduction) is **1.12ha** (0.18 ha permanent loss + 0.944 ha crown reduction/habitat modification (mean value)). To avoid double counting impacts (if all losses from the project were to be summed), it is important to note that 0.1 ha

of the 0.18 ha figure of permanent loss includes direct loss of qualifying habitat accounted for in Impact 1a above. Removing this would give a total impact figure of 1.02 ha (0.08 ha permanent loss + 0.944 ha crown reduction/habitat modification).

There are a number of areas of uncertainty regarding this analysis which are relevant to consider when coming to a view on the likely future magnitude of impact for both routes. These are considered in turn below:

- The likelihood that the woodland expansion area will succeed:

  There are no details within the FLS LMP 2019-2029 or associated appendices on how the SFA regeneration zone was defined. From review of the LMP figures however it appears that this has been broadly established by creating a 100 m buffer along the existing woodland edge and pockets of woodland along the edge. This basic approach means that some of the habitats included within the woodland expansion zone are not typically associated with native woodland – such as peat-based habitats like wet heath and particularly priority blanket bog. Given appropriate management, native woodland is more likely to establish on non-peat habitats such as acid and neutral grasslands, bracken and dry heath. Nonetheless, regeneration has been recorded within wet heath and blanket bog areas by a number of surveys undertaken by FLS (2015, 2016 and 2020 – Section 8.4.1.2) and has been noted in recent surveys for the Proposed Development by Galbraith in 2022 (**Volume 2, Chapter 9: Forestry**). Given the variability in habitat suitability, ground conditions and the higher altitude of much of the woodland expansion zone for native tree growth, and the existing evidence of regeneration, a reasonable assumption would be that regeneration will continue in these SFA areas leading to the ultimate establishment and expansion of western acidic oak woodland of the following types: Given the prevailing site conditions it is likely this woodland will mostly form W17 woodland over lower altitude and drier heathy and bracken areas, potentially with some W11 in bracken areas with shallow mineral soils, however in wetter areas (and higher altitude areas), such as those characterised by flush vegetation or blanket bog, the woodland can be expected to be dominated by lower density and lower growing trees, largely dominated by birch and willow and ultimately leading to the establishment of lower density W4 woodland. Any small open spaces that do not readily regenerate, or take a long time to do so, could be expected to act as woodland glades in the long-term. As indicated by the 2020 FLS HIA survey discussed in section 8.4.1.2, ongoing deer control will be essential to the success of the woodland expansion project. The latest survey concludes that impacts at 80% of sample locations were in the medium or medium-high category, indicating that deer browsing still presents a key risk to future woodland expansion.

- The likelihood that permanent habitat loss will lead to loss of woodland expansion:

  Following on from the discussion above, a higher degree of certainty can be assumed on permanent loss of habitats and therefore loss of future woodland expansion areas (1.37 ha for the Proposed Alignment and 0.18 ha for the Alternative Alignment) as this will occur during construction and will be permanent. The success of future regeneration that could have occurred in these areas is still however uncertain.

- The likelihood that crown reduction will be required:

  The estimated extent of future habitat modification via potential crown reduction for both options noted above is uncertain. Along the Proposed Alignment and Alternative Alignment,

69% and 63% (respectively) of the woodland expansion area that may require crown reduction is currently peat-based habitat (wet heath or blanket bog often in higher altitude areas). As explained above, it is likely that woodland in these areas will be lower density and lower height and therefore will not likely require crown reduction.

- Furthermore, recently collected forestry data (**Volume 2, Chapter 9: Forestry**) notes that for much of the Proposed Development there is a low likelihood of trees encroaching within the electric safety clearance distance from conductors during the operational stage due to the height of them above the ground and their expected growth. Due to this, only one area of 0.1 ha has been identified for potential future crown reduction during the operational period for the Proposed Alignment.
- Considering the above points, it can be concluded that crown reduction is highly unlikely to be required within the entire area estimated for the Proposed Alignment (7.852 ha) and the Alternative Alignment (0.944 ha). A more realistic but still precautionary scenario would be to assume that the wetter peat-based habitats (wet heath and blanket bog) are unlikely to require future crown reduction due to the type and stature of woodland that may develop. This would reduce estimates by 69% for the Proposed Alignment and 63% for the Alternative Alignment. This would mean that 2.43 ha (the Proposed Alignment) and 0.35 ha (the Alternative Alignment) may be subject to habitat modification due to crown reduction if the woodland expansion plan is successful. In the context of the woodland expansion area within the SAC of 724ha, this represents affected areas of 0.335% (Proposed Alignment) and 0.048% (Alternative Alignment).
- Both alignment options could potentially lead to adverse impacts on the woodland expansion project. However, having regard to the relatively limited areas affected in the context of the total woodland expansion project area (planting areas and natural regeneration areas with the exception of the area west of Mudalach – **Figure 3**), it is considered that the Proposed Development would not prevent the woodland expansion project from improving the condition of the qualifying feature of western acidic oak woodland and achieving favourable conservation status. It is therefore concluded that the impact of the Proposed and Alternative Alignments on the woodland expansion project would not have an adverse effect on the conservation objectives of the Site with regard to the western acidic oak woodland qualifying feature.

The only other plan of relevance for potential in-combination effects on the SAC is the FLS Kinloch Hills and Broadford LMP 2019-2029. However, the overarching aims of the LMP with respect to the SAC state that the open habitat and native woodland will be managed to enhance the SAC qualifying features and peatland restoration will be undertaken to expand the open habitat areas surrounding the SAC (see further details in Section 8.4.1.2, also planning application references 22/02790/PNO, 22/03016/PNO and 21/02579/PNO noted above). With the exception of the woodland expansion project, the Proposed Development would not give rise to other in-combination effects with the LMP.

Given the discussion above, it can be reasonably concluded that there would be no adverse in-combination effects on the Site for any of the impacts considered above.

Impacts on Qualifying Habitats and Effects on the Site's Conservation Objectives

The following qualifying habitat will be affected by in-combination impacts:

- Western acidic oak woodland (primary reason for Site selection).

The following five qualifying habitats are not impacted by in-combination effects and there are therefore no adverse effects arising on the Site's conservation objectives with respect to in-combination impacts.

- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat);
- Alpine and subalpine heaths;
- Dry heaths;
- Wet heathland with cross-leaved heath; and
- Blanket bogs (priority habitat).

Table 11-6 Effect on Site's Conservation Objectives of In-Combination Effects

Conservation Objective		Impacted?
1	To avoid deterioration of the qualifying habitats thus ensuring that the integrity of the Site is maintained and the Site makes an appropriate contribution to achieving favourable conservation status for each of the qualifying features; and	No - whilst the Proposed Development will potentially lead to a small extent of modification to the future potential expansion of western acidic oak woodland, this would not lead to the deterioration of the qualifying habitat and would not impede efforts to achieve favourable conservation status.
2	To ensure for the qualifying habitats that the following are maintained in the long term:	-
2a	Extent of the habitat on Site;	No - whilst the Proposed Development will potentially lead to a small extent of modification to the future potential expansion of western acidic oak woodland, this would not prevent improvements to these conservation objectives as a result of the woodland expansion scheme.
2b	Distribution of the habitat within Site;	
2c	Structure and function of the habitat;	
2d	Processes supporting the habitat;	
2e	Distribution of typical species of the habitat;	
2f	Viability of typical species as components of the habitat; and	
2g	No significant disturbance of typical species of the habitat.	

12 INTEGRITY TEST

12.1 Overview

An appropriate assessment must show whether an adverse effect on the integrity (AEOI) of the Site from the proposal can be ruled out or not. A proposal will pass the integrity test if the appropriate assessment can demonstrate that there is no reasonable scientific doubt remaining that the proposal will not adversely affect the integrity of the Site.

The integrity of a Site will be adversely affected if a proposal could, for example[76]:

- Destroy, damage or significantly change all or part of a designated habitat;
- Significantly disturb the population of a designated species;
- Harm the Site's ecological connectivity with the wider landscape, for example, harm a woodland that helps to support the designated species from a nearby European Site;
- Harm the Site's ecological function, or its ability to survive damage, and reduce its ability to support a designated species;
- Change the Site's physical environment, for example, by changing the chemical makeup of its soil, increasing the risk of pollution or changing the Site's hydrology;
- Restrict access to resources outside the Site that are important to a designated species, for example, food sources or breeding grounds; and/or
- Prevent or disrupt restoration work, or the potential for future restoration, if it undermines the Site's conservation objectives.

In applying the integrity test, the following should also be considered[76]:

- The ecological requirements, conservation objectives and the current conservation status (if known) of the Site's designated features that might be affected by the proposal;
- Each potential effect on the European Site, including the risk of combined effects with other proposals, and how they might impact on the Site's conservation objectives;
- The scale, extent, timing, duration, reversibility and likelihood of the potential effects;
- The certainty of the effects occurring;
- Mitigation measures that have been proposed to avoid or limit the effects; and
- The certainty that mitigation measures will be effective over the lifetime of the proposal – for example, the effects of construction, operation and dismantling.

Each proposal is required to be considered on a case-by-case basis and there are no defined thresholds where effects are considered acceptable.

[76] https://www.gov.uk/guidance/habitats-regulations-assessments-protecting-a-european-site#appropriate-assessment

12.2 Qualifying Features

The preceding assessment has identified that adverse effects on the Site's conservation objectives may occur.

The XLS Shadow Matrix (**Annex E**) provides a summary of the various impacts identified for each qualifying habitat and species and whether an AEOI can be ruled out. Factors considered include: condition of feature, impact spatial magnitude (where relevant), impact temporal magnitude, conservation objectives impacted, and whether mitigation can reduce or avoid impacts.

The following sections consider each qualifying habitat and species in turn and provides a consideration of the difference in impact between both options. All impact types are similar for both options (except for Impact 1b which affects the Proposed Alignment only) although the magnitude of impacts is generally greater for the Proposed Alignment.

12.2.1 Western acidic oak woodland (primary reason for Site selection)

- Western acidic oak woodland is the primary reason for Site selection and is attributed a 'global grade' of B[77].
- The feature condition is Unfavourable Declining.
- Five impacts have been identified that may undermine the conservation objectives of this feature:
    a. Impact 1a Direct Habitat Loss or Modification - Construction
    b. Impact 1b Direct Habitat Loss or Modification – Operation (the Proposed Alignment only)
    c. Impact 2 Habitat Fragmentation – Construction & Operation
    d. Impact 3 Indirect Pollution
    e. Impact 7 In-combination plans or projects
- It is considered that Impact 3 can be mitigated to avoid adverse effects through project design or through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.
- It is concluded that Impact 2 (Fragmentation) is not likely to result in adverse effects on the Site's conservation objectives during construction or operation.
- It is concluded that impact 7 (in-combination) will not prevent western acidic oak woodland achieving favourable condition status in the future and therefore does not lead to an adverse effect on the Site's conservation objectives.
- Impacts 1a and 1b cannot be mitigated. They undermine seven conservation objectives and will lead to the permanent and irreversible loss of habitat on both options.

[77] Natura 2000 data forms assess the importance of qualifying features using three criteria (representivity, relative surface and conservation). An average ('Global') grade is given based on these three individual scores. A = Excellent Value, B = Good Value, C = Significant Value.

- Impact 6 (Dismantling) would result in a long-term beneficial effect on the conservation objectives of the Site with regard to western acidic oak woodland and will improve the naturalness and ecological integrity of the woodland onsite. The wayleave area most likely suitable for woodland regeneration does have ecological value and function as a type of glade/ride habitat, however, this is artificially maintained and undermines the naturalness of the site. Furthermore, it will be adversely affecting the structure and function of the woodland due to the size of this area dissecting a significant proportion of woodland. Overall, therefore, the regeneration of the wayleave (between 1.35 to 2.74 ha) and removal of artificial management intervention, will lead to significant improvements in woodland integrity of the SAC over the longer-term.

In conclusion, the dismantling of the existing OHL would lead to net-beneficial effects on the qualifying feature of western acidic oak woodland in the longer term for both alignment options. However, it is considered that an AEOI on the Site cannot be ruled out as a consequence of the certain permanent habitat loss and modification during construction which will further contribute to the Unfavourable and Declining status of this feature through the short to medium-term.

12.2.2 Dry heaths

- Dry heath is not the primary reason for site selection and is attributed a 'global grade' of C[77].
- The feature condition is Favourable Maintained.
- Three impacts have been identified that may undermine the conservation objectives of the Site with regard to this feature:
    a. Impact 1a Direct Habitat Loss or Modification - Construction
    b. Impact 2 Habitat Fragmentation – Construction & Operation
    c. Impact 3 Indirect Pollution
- It is considered that Impact 3 can be mitigated to avoid adverse effects through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.
- It is concluded that Impact 2 (Fragmentation) is not likely to result in adverse effects on the Site's conservation objectives, with respect to dry heath, during construction or operation.
- Impact 1a cannot be mitigated. The impact will undermine five conservation objectives and will lead to the permanent and irreversible loss of habitat on both options.

In conclusion, it is considered that an AEOI of the Site cannot be ruled out as a consequence of permanent habitat loss which undermines five conservation objectives and will result in a decline in the feature condition.

12.2.3 Wet heathland with cross-leaved heath

- Wet heath is not the primary reason for Site selection and is attributed a 'global grade' of C[77].
- The feature condition is Unfavourable Declining.
- Four impacts have been identified that may undermine the conservation objectives of the Site with regard to this feature:

a. Impact 1a Direct Habitat Loss or Modification - Construction

b. Impact 1c Indirect Habitat Loss or Modification - Construction & Operation

c. Impact 2 Habitat Fragmentation – Construction & Operation

d. Impact 3 Indirect Pollution

- It is considered that Impact 3 can be mitigated to avoid adverse effects through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.
- It is concluded that Impact 2 (Fragmentation) is not likely to result in adverse effects on the Site's conservation objectives, with respect to wet heath, during construction or operation.
- Impacts 1a and 1c cannot be mitigated. They will undermine seven conservation objectives and will lead to the permanent and irreversible loss of habitat on both options.

In conclusion, it is considered that an AEOI of the Site cannot be ruled out as a consequence of permanent habitat loss and indirect habitat loss which will further contribute to the Unfavourable Declining status of this feature.

12.2.4 Blanket bogs (priority habitat)

- Blanket bog is not the primary reason for Site selection and is attributed a 'global grade' of C[77]. Blanket bog is however recognised as a priority habitat (defined by Article 1d of the Habitats Direct as 'natural habitats in danger of disappearance').
- The feature condition is Favourable Maintained.
- Four impacts have been identified that may undermine the Site's conservation objectives for this feature:

a. Impact 1a Direct Habitat Loss or Modification - Construction

b. Impact 1c Indirect Habitat Loss or Modification - Construction & Operation

c. Impact 2 Habitat Fragmentation – Construction & Operation

d. Impact 3 Indirect Pollution

- It is considered that Impact 3 can be mitigated to avoid adverse effects through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.
- It is concluded that Impact 2 (Fragmentation) is not likely to result in adverse effects on the Site's conservation objectives, with respect to blanket bog, during construction or operation.
- Impacts 1a and 1c cannot be mitigated. They will undermine six conservation objectives and will lead to the permanent and irreversible loss of habitat on both options.

In conclusion, it is considered that an AEOI of the Site cannot be ruled out as a consequence of permanent and indirect habitat loss which will further contribute to a decline in feature condition.

12.2.5 Mixed woodland on base-rich soils associated with rocky slopes (priority habitat)

- Mixed woodland on base-rich soils is not the primary reason for Site selection and is attributed a 'global grade' of C[77]. It is however recognised as a priority habitat (defined by Article 1d of the Habitats Direct as 'natural habitats in danger of disappearance').
- The feature condition is Unfavourable Recovering.
- The habitat is not directly affected by construction activities.
- One impact has been identified that may undermine the conservation objectives of the Site for this feature:
    a. Impact 3 Indirect Pollution
- It is considered that Impact 3 can be mitigated to avoid adverse impacts through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.
- Impact 6 (Dismantling) will result in a minor but long-term beneficial effect on the conservation objectives of the Site, with respect to mixed woodland on base-rich soils associated with rocky slopes and will improve the naturalness and ecological integrity of the woodland on site. The wayleave area most likely suitable for woodland regeneration does have ecological value and function as a type of glade/ride habitat, however this is artificially maintained and undermines the naturalness of the Site. Overall, therefore, the regeneration of the wayleave (between 0.155 to 0.235 ha expected to be mixed woodland on base-rich soils associated with rocky slopes) will lead to improvements in woodland integrity of the SAC over the longer-term.

In conclusion, it is considered that an AEOI of the Site can be ruled out based on the application of standard good practice mitigation measures. Furthermore, in the longer term there will be beneficial effects due to OHL dismantling and woodland regeneration.

12.2.6 Alpine and subalpine heaths

- Alpine and subalpine heaths is not the primary reason for Site selection and is attributed a 'global grade' of C[77].
- The feature condition is Unfavourable Recovering.
- The habitat is not directly affected by construction activities.
- One impact has been identified that may undermine the conservation objectives of this feature:
    a. Impact 3 Indirect Pollution
- It is considered that Impact 3 can be mitigated to avoid adverse effects through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.

In conclusion, it is considered that an AEOI of the Site can be ruled out based on the application of standard good practice mitigation measures.

12.2.7 Qualifying Species (Otter)

- Otter is not the primary reason for Site selection and is attributed a 'global grade' of C[77].

- The feature condition is Favourable Maintained.
- Two impacts have been identified that may undermine the conservation objectives of the Site for feature:
    a. Impact 4: Otter Direct – Death or Injury/Disturbance/Displacement of Otter
    b. Impact 5: Otter Indirect – Loss/Degradation/Alteration of Key Habitat/Food Resources, in-combination effects
- However, it is considered that due to the short-term impacts on otter and avoidance of protected sites that impacts are likely to be negligible.
- Nonetheless, risks of Impacts 4 and 5 can be mitigated through the implementation of the standard mitigation plans detailed in Section 10 above. These plans will require agreement with NatureScot and SEPA.
- Impact magnitudes are considered to be negligible for both options.

In conclusion, it is considered that an AEOI of the Site can be ruled out due to the short-term nature of impacts. The application of standard good practice mitigation measures will reduce risks further and ensure compliance with relevant wildlife legislation.

12.2.8 Comparison of Alignment Options

As detailed in the (**Annex E**) the four key impacts, that cannot be mitigated, which are considered to undermine the Site's conservation objectives and lead to an AEOI are:

- Impact 1a Direct Habitat Loss or Modification – Construction (western acidic oak woodland, wet heathland, dry heath, and blanket bog).
- Impact 1b Direct Habitat Loss or Modification – Operation (western acidic oak woodland).
- Impact 1c Indirect Habitat Loss or Modification (blanket bog and wet heathland with cross-leaved heath).
- Impact 7 In-Combination Effects (western acidic oak woodland).

These impact types, their temporal magnitude and the conservation objectives affected, are the same between both options (with the exception of impact 1b which only applies to the Proposed Alignment due to a potential, and uncertain, 0.1 ha of future crown reduction). However, the spatial magnitude of impacts are all greater for the Proposed Alignment (with the exception of direct wet heat loss) due to the infrastructure footprint and amount of infrastructure within the SAC being greater for the Proposed Alignment (Table 8-4).

The difference between alignment options in terms of the spatial magnitude of direct habitat loss, habitat modification, and indirect habitat loss is summarised in Table 12-1 below.

Table 12-1 Difference in Direct Habitat Loss, Modification and Indirect Loss between options

Qualifying Feature	Proposed Alignment Spatial Impact (ha)	Alternative Alignment Spatial Impact (ha)	Difference in ha between Proposed Alignment and Alternative Alignment	Proposed Alignment as a % of Qualifying Habitat	Alternative Alignment as a % of Qualifying Habitat	Difference in % of Qualifying Habitat Lost
Western acidic oak woodland - Direct Loss	0.386	0.235	0.151	0.229	0.139	0.089
Western acidic oak woodland - Modification	0.370	0.000	0.370	0.017	0.000	0.017
Dry heaths	0.888	0.374	0.514	0.198	0.083	0.115
Wet heathland with cross-leaved heath (direct)	4.882	5.607	-0.725	0.220	0.253	-0.033
Wet heathland with cross-leaved heath (indirect)	5.499	4.150	1.349	0.248	0.187	0.061
Blanket bog (priority habitat) (direct)	2.165	2.121	0.044	0.224	0.220	0.005
Blanket bog (priority habitat) (indirect)	2.527	1.527	1.000	0.262	0.158	0.104
NSA	0.000	0.481	-0.481			0.000
TOTALS	**16.717**	**14.495**	**2.222**	**1.398**	**1.041**	**0.357**

- Overall, the Proposed Alignment would result in the loss of an additional 2.22 ha of SAC qualifying habitat over the Alternative Alignment (or 2.30 ha if the estimated 0.078 ha of non-qualifying NSA habitat is removed. A difference of 0.357% in the sum of qualifying habitat impacted.
- Direct habitat loss and modification is marginally greater for the Proposed Alignment (8.691) than the Alternative Alignment (8.337) by 0.354 ha (or if NSA estimated qualifying habitats are included then 3B direct loss and modification is marginally greater than 3A by 0.052 ha).
- Indirect habitat loss and modification is greater for the Proposed Alignment (8.026 ha) than the Alternative Alignment (5.677 ha) by 2.349 ha.
- Western acidic oak woodland: Combining both direct loss and modification, the Proposed Alignment would result in the loss of an additional 0.521 ha (0.37 ha (71%) of which is not loss but modification via potential crown reduction) over the Alternative Alignment. A difference of 0.106% of the total extent of qualifying habitat within the Site.
- Dry heaths (direct loss): the Proposed Alignment would result in the loss of an additional 0.514 ha over the Alternative Alignment (0.455 ha if using apportioned NSA data). A difference of 0.115% of the total extent of qualifying habitat within the Site.
- Wet heaths (direct and indirect loss): the Proposed Alignment would result in the loss of an additional 0.624 ha over the Alternative Alignment (0.302 ha if using apportioned NSA data). A difference of 0.028% of the total extent of qualifying habitat within the Site.

- Blanket bogs (direct and indirect loss): the Proposed Alignment would result in the loss of an additional 1.044 ha over the Alternative Alignment (1.019 ha if using apportioned NSA data). A difference of 0.108% of the total extent of qualifying habitat within the Site.
- Predicted future adverse operational impacts and beneficial dismantling impacts are highly uncertain. Due to this uncertainty over future impacts, it is important to consider them separately from the more certain direct, indirect and modification impacts detailed above. Therefore, Table 12-2 below details the certain and uncertain spatial impacts (both adverse and beneficial) for western acidic oak woodland.

Table 12-2 Difference in all Impacts on Western Acidic Oak Woodland between options – Including Uncertain Future Precautionary Estimates

Western Acidic Oak Woodland	Proposed Alignment - Spatial Impact (ha)	Alternative Alignment - Spatial Impact (ha)	Difference in Spatial Impact (ha) between Proposed Alignment and Alternative Alignment
Western acidic oak woodland - Direct Loss	0.386	0.235	0.151
Western acidic oak woodland - Modification (construction)	0.370	0.00	0.370
Western acidic oak woodland - Modification (operations) **Uncertain impact – future precautionary estimate**	0.10	0.00	0.10
Western acidic oak woodland – Dismantling# **Uncertain impact – future precautionary estimate**	2.045 (gain)	2.045 (gain)	No difference
TOTAL (Including future precautionary estimates)	1.189	1.810	0.621

Mean value of lower and upper limit used.

Grey cells: Uncertain impacts based on precautionary estimates.

- Considering direct loss and certain (construction) + uncertain (operation) modification impacts only (and not including the beneficial dismantling impact), the Proposed Alignment would result in an additional 0.621ha of habitat loss and modification on western acidic oak woodland. 76% of this difference is modification and 24% is estimated direct loss of woodland polygons (see note below on woodland polygons).
- Proposed Alignment: Considering direct loss and certain + uncertain modification impacts only (0.856ha) (not including the beneficial dismantling impact), 55% of this difference is modification and 45% is estimated direct loss of woodland polygons.
- Alternative Alignment: Considering direct loss and certain + uncertain modification impacts only (0.235ha) (not including the beneficial dismantling impact): 100% of this impact is habitat loss.
- The above consideration focusses on the spatial extent of the various impacts on the qualifying feature of western acidic oak woodland. A limitation of this form of analysis is that the nature (NVC community, structure, stature) of qualifying woodland impacted can fall out of consideration. As detailed within section 8.5.1.1 and 8.5.2 it is clear from the NVC surveys (**Appendix V2-4.3: National Vegetation Classification (NVC) and Habitats Survey Report** of the EIA Report) and forestry surveys completed by Galbraith **Volume 2, Chapter 9: Forestry**) that most woodland habitat polygons consist of scattered, open birch woodland with occasional rowan where tree felling or modification is unlikely to be required due to sparse tree densities. Therefore, the estimates of woodland loss relate largely to open woodland habitat rather than

dense mature woodland. This is because, the design process of the Proposed Alignment has led to the OHL being moved uphill to avoid the larger and denser areas of woodland and this is the reason for the dominance of open ground and areas of scattered birch and small pockets of woodland – the route is effectively skirting the edge (or above) the western acidic oak woodland qualifying feature in most locations.

- The predicted in-combination impact of the Proposed Development on the woodland expansion project, with respect to the western acidic oak woodland qualifying feature, is not included in Table 12-2 above as it does not affect the existing woodland feature. The predicted impact relates to a 724ha area of potential future woodland that is yet to be established through the woodland expansion scheme. As concluded in section 11.1.1, it is considered that the Proposed Development would not prevent the woodland expansion project from improving the condition of the qualifying feature of western acidic oak woodland and achieving favourable conservation status.
- Dismantling the existing OHL would potentially result in a benefit to the existing western acidic oak woodland feature in the longer-term as a consequence of the cessation of artificial wayleave maintenance, which in turn would allow the re-instatement of woodland and improve the naturalness and ecological integrity of the woodland onsite. This benefit applies to both alignment options equally, with a mean estimate of 2.045 ha for western acidic oak woodland. Whilst this benefit would lead to an overall longer-term net-beneficial impact (1.189ha for the Proposed Alignment and 1.810 ha for the Alternative Alignment), it is considered that an AEOI cannot be ruled out as a consequence of the certain permanent habitat loss and modification during construction which will further contribute to the Unfavourable and Declining status of this feature through the short to medium-term.
- Dismantling of the existing OHL is predicted to lead to a beneficial impact of 0.195 ha of additional mixed woodland on base-rich soils associated with rocky slopes.

12.3 Conclusion

With the application of standard good practice mitigation measures, AEOI of the Site can be ruled out for the following features for both options:

- Mixed woodland on base-rich soils associated with rocky slopes (priority habitat);
- Alpine and subalpine heaths; and
- Otter.

After the consideration of mitigation, an AEOI of the Site cannot be ruled out for the following four qualifying features for the Proposed Alignment and Alternative Alignment.

- Western acidic oak woodland (primary reason for Site selection). Whilst a net-benefit is predicted in the longer-term for both alignment options (1.189ha for the Proposed Alignment and 1.810 for the Alternative Alignment) due to the beneficial effects of dismantling the existing OHL, an AEOI cannot be ruled out as a consequence of the certain permanent habitat loss and modification during construction which will further contribute to the Unfavourable and Declining status of this feature through the short to medium-term;

- Dry heaths;
- Wet heathland with cross-leaved heath; and
- Blanket bogs (priority habitat).

13 COMPENSATION

When a plan or project must be carried out (in the absence of alternative solutions) for imperative reasons of over-riding public interest (IROPI), appropriate compensatory measures must be put in place to ensure that the overall coherence of the Natura network and contribution to favourable conservation status is maintained (Article 6.4 and Regulation 53 of the Habitats Regulations). Compensatory measures should only be considered in this context, whereas mitigation measures are an integral part of the specifications of a plan or project and are designed to reduce or remove negative impacts and can be considered in the appropriate assessment, compensatory measures are independent of the project and are intended to offset remaining negative impacts in cases where it has not been possible to conclude no adverse effect on Site integrity.

As has been determined above, four key impacts would result in an adverse effect on Site integrity for the Proposed Alignment, and three key impacts would result in an adverse effect on Site integrity for the Alternative Alignment. Therefore, assuming one of these options gains consent because of IROPI, compensation would be required to offset the adverse effect regardless of route selection (although the precise compensation areas and measures may differ according to final route selection).

The European Commission state, compensatory measures "*…aim to offset the negative impact of a project and to provide compensation corresponding precisely to the negative effects on the species or habitat concerned*"[78].

Compensatory measures can include:

- Designation of an alternative site;
- Extension of the same or another site to include habitat equivalent to that lost or damaged;
- Creating or restoring the same or very similar habitat on areas of little or no conservation value within the same site (if it exists) or at a suitable location outwith the site; and/or
- Restoration of non-qualifying habitat to qualifying standard on the affected, or another, site.

As such, European Commission guidance[79] provides an element of flexibility, recognising that compensation of a 'like for like' habitat and/or in the same designated site may not be practicable. However, ideally and if possible, compensation should be 'like for like' and targeted towards the habitats or species affected.

[78] European Commission (2007). Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC (paragraph 1.4.4, page 11).

[79] European Commission (2018). Managing Natura 2000 sites. The provisions of Article 6 of the 'Habitats' Directive 92/43/EEC. Brussels, 21.11.2018 C(2018) 7621 final.

The aim should be to fully offset and achieve a benefit at least equivalent to the extent or standard of the area of loss or damage incurred by the site's qualifying interests. One of the principles in European policy is 'no net loss' of biodiversity[80]. This can only be achieved by an obligation to take quantitative compensatory measures in cases where a part of a Natura 2000 site is lost or damaged as a result of allowing development on that land. However, as it may take several years for compensatory areas to reach the target habitat condition (see **Annex D**) due to a variety of influencing factors, or for compensatory measures to take effect, or due to uncertainty in the success of proposed compensatory measures or the wider ecological functionality of the habitats, a compensation ratio is often applied to facilitate the implementation of a greater level of compensatory measures in order to reflect this time lag and/or uncertainty.

With respect to compensation ratios, the European Commission guidance note for Natura 2000 sites on Article 6.4 of the Habitats Directive[81] is helpful in explaining the relevant compensation ratios to be adopted in certain circumstances. The guidance explains that the likely effectiveness, geographical location of measures relative to the loss, and time for compensation to fully develop, are the key factors which should determine a compensation ratio. It also explains that ratios are best set on a case-by-case basis as they are dependent on site-specific circumstances. The guidance sates that, "*There is wide acknowledgement that ratios should be generally well above 1:1. Thus, compensation ratios of 1:1 or below should only be considered when it is demonstrated that with such an extent, the measures will be 100% effective in reinstating structure and functionality within a short period of time (e.g. without compromising the preservation of the habitats or the populations of key species likely to be affected by the plan or project)*".

Furthermore, in some cases, different compensation ratios have been applied to different habitat types affected by the same proposal within a Natura site reflecting the differing certainty of success of recreating or restoring a particular habitat type, or the time required to recreate different habitat types[82].

Considering the construction phase habitat loss/modification calculations presented in Section 8.5.1 above, compensatory measures would be required for either route option. A compensation ratio would also need to be applied, particularly given the difficulties in creating or restoring a number of the habitat types to be affected by the Proposed Development and the typical time lag between creation/restoration and target condition, structure and functionality for these same habitat types (**Annex D**). However, this is also largely dependent on the area(s) selected for the compensatory measures with respect to their current condition and the restoration techniques proposed. For example, restoring an area of poor and checked forestry on peatland back to blanket bog that has retained much of its typical active bog vegetation will be easier to restore,

[80] European Commission (2011). Our life insurance, our natural capital: an EU biodiversity strategy to 2020 (2011/2307(INI))
https://ec.europa.eu/environment/nature/biodiversity/comm2006/pdf/EP_resolution_april2012.pdf

[81] Guidance document on Article 6(4) of the 'Habitats Directive' 92/43/EEC. Clarification of the concepts of: alternative solutions, imperative reasons of overriding public interest, compensatory measures, overall coherence, opinion of the Commission. 2007/2012.
https://ec.europa.eu/environment/nature/natura2000/management/docs/art6/new_guidance_art6_4_en.pdf

[82] van Hoorick, G. (2014). Compensatory Measures in European Nature Conservation Law. Utrecht Law Review. Volume 10, Issue 2.

take less time to reach target condition, and has a greater certainty of success than trying to restore an area of mature commercial forestry back to blanket bog where the effects of drainage, shading, and aeration of the peat profile have been longer term and the active peatland vegetation has been lost to result in a moribund bog.

Compensatory measures should primarily be concerned with the habitat types affected; however, it should also be noted previously for this SAC that woodland features have been favoured over open ground features on this site (see Section 8.4.1.2).

The above discussion on compensation ratios and compensatory areas are primarily concerned with the creation or restoration of SAC qualifying habitats and the inherent difficulties in doing so. However, smaller ratios are more likely to be acceptable in cases where the SAC can be extended to incorporate existing, connected, and functioning areas of habitat of the same, or better-quality, equivalent to those SAC qualifying habitats to be lost or damaged. Should this be the preferred option, then reduced and appropriate compensation ratios may be acceptable.

Initial high-level options for compensatory measures for this SAC could include some, or combinations, of the following, all of which would require further detailed consideration and an assessment as to the certainty of success and the timescales for success, as well as further consultation and agreements with relevant consultees and landowners:

- Extension of the SAC to include further adjoining areas of existing habitat types of the same, or better-quality, equivalent to that lost or damaged;
- Create SAC qualifying habitats within areas of non-qualifying habitat within the SAC, for example bracken control and management and subsequent replanting and management for qualifying woodland;
- Restore SAC qualifying habitats within areas of degraded or potential qualifying habitat within the SAC;
- Create or restore qualifying habitats within the non-designated land parcels that are completely enclosed by the current SAC extent, and designate these as part of the SAC;
- Extend the SAC into adjoining areas where it is feasible to create or restore equivalent SAC qualifying habitat types, for example extending into former or existing commercial plantation areas and undertaking peatland and heathland restoration or native woodland expansion;
- Extension of another but nearby SAC to include further adjoining areas of existing habitat types of the same, or better-quality, equivalent to that lost or damaged.; and/or
- Restoration of non-qualifying habitat to qualifying standard on another local SAC.

Compensatory measures applied to the site, or areas contiguous to the site, are preferred over compensatory measures that are not connected to, or distant to, the affected site.

It may also be possible, and desirable, to align some of the compensatory measures with FLS LMP 2019-2029 proposals to increase the extent of certain habitats locally, increasing their resilience to change and increasing habitat connectivity and networks. For example, changes in environment and forest policy in relation to peat have meant that large areas of the undesignated land at Kinloch Hills (especially around Kyle Farm) have been assessed as having better potential to be restored to blanket bog, rather than be restocked to productive forest. Much of this restoration work will take

place immediately adjacent to the SAC (see Map 17 of the LMP) which will help to make the designated feature more robust and link it into a wider habitat network. Therefore, compensatory measures should seek to take a joined up and coherent approach with other habitat improvement works ongoing or planned in and around the SAC.

The habitat loss/modification calculations presented in Section 8.5.1 provide estimated loss values which can then be used to determine the area of compensation dependent on agreed compensation ratios. However, as also noted in Section 8.5.1.2, there are possible future wayleave maintenance losses associated with woodland that are currently difficult to determine with confidence. To compensate for this unknown level of operational period future loss, it is proposed that the woodland compensation ratio/areas could be increased further, over and above what may be agreed for the known direct losses. The key aim of increasing the level of woodland compensation at the outset is to futureproof and offset possible future woodland maintenance by undertaking additional compensation and habitat management during the pre-construction/construction period. Initiating this compensatory measure at the outset will allow, for example, any planted trees several years (perhaps decades) to establish and mature, so that when maintenance is required trees losses are more 'like for like' with the compensatory woodland.

The above is a high-level discussion on compensation, on the assumption that compensation will be required under IROPI for either option. Preliminary analysis of possible compensation options and compensation areas indicate there are a number of potential options in and around, and contiguous with, the SAC for the four qualifying habitats predicted to be adversely affected by the Proposed Development. These include extension of the SAC to include further adjoining areas of existing qualifying habitat types, create or restore qualifying habitat types on non-designated land within or adjacent to the SAC and extend the SAC to cover these, and bracken control and management in the SAC and subsequent replanting and management for qualifying woodland. These possible compensation areas are located within the local FLS landownership boundary (i.e., the main landowner for the SAC, also). Initial, and ongoing, discussions with FLS on delivering compensation on FLS land adjoining the SAC has, in principle, been agreed to. A range of surveys are programmed to take place in 2022 in these compensation option areas in order to gather baseline information and assess further their suitability for delivering compensation for the relevant SAC qualifying habitats. With FLS agreements in place, this survey and assessment information will form part of a detailed compensation plan proposal on which NatureScot will be consulted throughout, to agree on compensation ratios, types of compensation for each habitat affected, and the detailed compensation area and associated management prescriptions and subsequent monitoring.

ANNEX A. ALTERNATIVE ALIGNMENT – DIRECT HABITAT LOSS/MODIFICATION CALCULATIONS – OHL VERSUS COMBINED OHL & PART UNDERGROUND OPTION

Table 13-1 below provides a comparison of the permanent and temporary direct habitat losses and modification predicted as a result of a wholly OHL option on the Alternative Alignment versus a combined OHL and underground cable option within the SAC (the preliminary design of the combined OHL and underground cable route would consist of an underground section from Bealach Udal to Kylerhea, with the remainder of the route being typical tower and OHL construction).

As can be seen in Table 13-1 below the combined OHL and underground option results in significantly more loss of SAC qualifying habitats compared to an entirely OHL option, and the following observations/notes are made with regards this analysis:

- There was 0.48 ha of Non-Surveyed Area (NSA) for the OHL option relating to proposed PRI works to the Glen Arroch minor road; this 0.48 ha of NSA also applies to the underground option. The habitat composition of this 0.48 ha of NSA has been determined and apportioned as described above in Section 6.3 and Section 8.5.1. The apportioned habitat types have been included in Table 13-1 with the contemporary NVC data.
- There was an additional 7.33 ha of NSA associated with the underground option, which arose due to the underground corridor extending beyond the contemporary NVC survey area. A review of the aerial imagery and knowledge of the specific area from previous surveys indicated this additional 7.33 ha outwith the survey area would likely to be all (or nearly all) SAC qualifying habitats, with the majority being wet heath. To account for this NSA the 2001 designation NVC data[25] was used to determine the habitats within this NSA, the designation data providing full NVC coverage of this area. The apportioned habitat types from the 2001 designation data for this NSA has been included in Table 13-1 with the contemporary NVC data (the majority of this NSA is M15 wet heathland with cross-leaved heath).
- The OHL and underground option would result in much greater direct losses of wet heathland with cross-leaved heath (18.78 ha compared to 5.93 ha) and blanket bog habitats (7.87 ha compared to 2.14 ha) than the wholly OHL option.
- Western acidic oak woodland losses would be greater for the underground option, 0.44 ha compared to 0.24 ha. The additional loss is due to where the underground corridor would pass through riparian woodland on the upper reaches of the Kylerhea River.
- The OHL and underground option would also result in more losses to dry heath than the wholly OHL option, 1.11 ha compared to 0.43 ha.
- The habitat loss predictions for the underground option did not include the locations of HDD compounds that would be needed where drilling under watercourses is required. HDD compounds are typically 50 m x 50 m in size and two are required for each watercourse crossing (one either side of the watercourse). A review of the underground cable route against 25k OS mapping indicates a minimum of 10 watercourse crossings, and therefore 20 HDD compounds would likely be required in the SAC (including crossing the Kylerhea river twice). Some of these compounds would overlap with the 37.4 m underground cable construction corridor, but given the number, sizes, and locations of possible HDD compounds these would

add to SAC habitat loss over and above that presented in Table 13-1 (N.B., this has not been quantified and is not presented in Table 13-1).

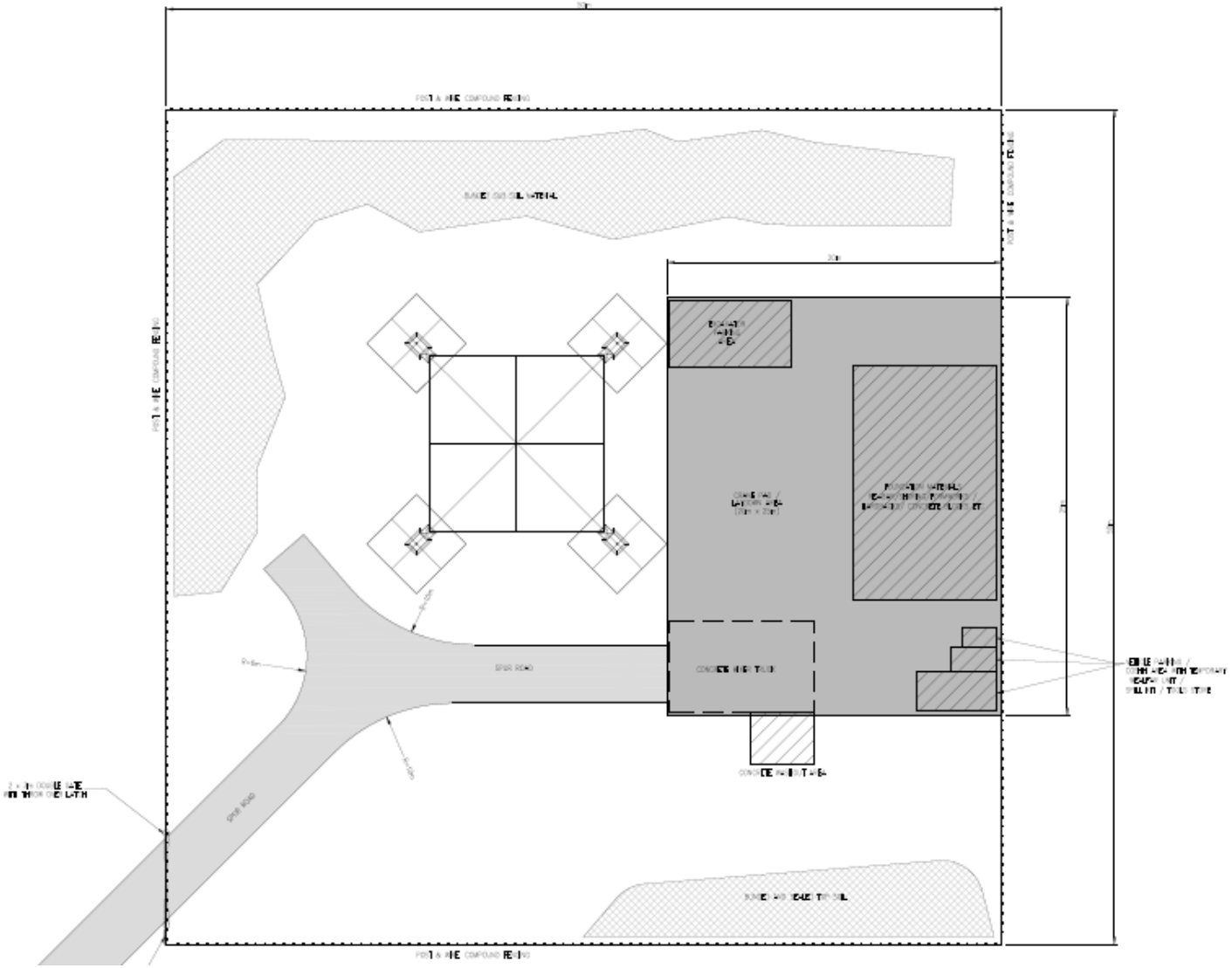
- The habitat loss and modification (noting the exclusion of HDD compounds) for all SAC qualifying habitats is 28.20 ha for the combined OHL and underground option and 8.74 ha for the OHL option.

Table 13-1 Alternative Alignment Estimated Direct Loss and Modification of SAC Qualifying Features – OHL versus combined OHL & Underground Option

Qualifying Feature	Extent within SAC (Table 8-2)	Phase 1 Habitat	NVC Communities Affected	Direct Habitat Loss (Alternative Alignment OHL & U/G) (ha)	Direct Habitat Loss (Alternative Alignment OHL) (ha)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment OHL & U/G)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment OHL)
Mixed woodland on base-rich soils associated with rocky slopes (priority habitat)	33.24 ha	A1.1.1 Broadleaved Semi-Natural Woodland	W9	0	0	0	0
Western acidic oak woodland (primary reason for site selection) – Loss associated with infrastructure	168.81 ha	A1.1.1 Broadleaved Semi-Natural Woodland and A3.1 Scattered Broadleaved Trees	W4, W7, W11, W17	0.44	0.24	0.26	0.14
Alpine and subalpine heaths	89.68 ha	D3 Lichen/ bryophyte heath D4 Montane heath/dwarf herb	H14, H20, U7, U10, U13	0	0	0	0
Dry heaths	448.41 ha	D1.1 Dry Dwarf Shrub Heath (Acid)	H9, H10, H12, H21, H10-M25 intermediate	1.11	0.43	0.25	0.10
Wet heathland with cross-leaved heath	2215.69 ha	D2 Wet Dwarf Shrub Heath	M15 (M15a, M15b & M15c), M15-M17 intermediate	18.78	5.93	0.85	0.27
Blanket bog (priority habitat)	965.41 ha	E1.6.1 Blanket Bog	M1, M2, M3, M17, M19, M17-M25 intermediate, M19-M25 intermediate	3.74	1.25	0.82	0.22
		E1.7 Wet Modified Bog	M20, M25	4.13	0.89		
		E1.6.1/E.7 Combined	Total	7.87	2.14		

Qualifying Feature	Extent within SAC (Table 8-2)	Phase 1 Habitat	NVC Communities Affected	Direct Habitat Loss (Alternative Alignment OHL & U/G) (ha)	Direct Habitat Loss (Alternative Alignment OHL) (ha)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment OHL & U/G)	Direct Habitat Loss as a % of Qualifying Feature Type in SAC (Alternative Alignment OHL)
TOTAL DIRECT – LOSS/MODIFICATION				**28.20**	**8.74**		

ANNEX B. GENERAL TOWER SITE COMPOUND LAYOUT PLAN



ANNEX C. SAC NVC DATA COMPARISON

The area covering the Kinloch and Kyleakin Hills SAC (designated in 2005) has been NVC surveyed a number of times, initially by Ben Averis (1993)[24] and then again by Averis & James (2002)[25]; the Averis & James surveys were undertaken in October and December 2001. The habitat data from these surveys were used in the designation of the Kinloch and Kyleakin Hills SAC and are the baseline reference data for NatureScot, this data hereafter is referred to as the 'NS data'.

More recently there have been contemporary NVC surveys covering part of the SAC undertaken for the Proposed Development. The surveys for the Proposed Development were undertaken by Blairbeg Consulting on behalf of ASH/SSEN in the summer of 2018, and these were added to by MacArthur Green[83] in October 2021 and March/April 2022. Ben Averis (and Alison Averis) working with MacArthur Green carried out a small proportion of the April 2022 NVC surveys in the SAC at Glen Arroch. These contemporary surveys were undertaken on behalf of SSEN and this 2018-2022 NVC data is hereafter referred to as the 'SSEN data'.

As there is around 20 years of difference in the two NVC data sets and considering the potential for natural vegetation changes, and vegetation changes in response to deer and forestry management undertaken within the SAC in the intervening years, a comparison of the NS and SSEN NVC data has been undertaken to determine if there are any notable differences between the data, and to confirm the SSEN data is robust to provide the new baseline information for the Proposed Development.

The area covered by the SSEN data clipped to the SAC boundary equates to 496.05 ha. To allow a direct comparison of this total surveyed area with the NS data, the exact same area was isolated from the NS data to provide a 496.05 ha (this 496.05 ha is hereafter referred to as the study area). This study area and the two data sets provides the basis of this comparison exercise.

The key high-level information in the two data sets for this area are detailed in Table 13-2.

Table 13-2 NS and SSEN Data Comparison – Polygons

	NS Data	SSEN Data
Study Area (ha)	496.05	496.05
No. of Polygons	307	1126
Polygon Size: Min (ha)	0.0051	0.0038
Polygon Size: Max (ha)	23.58	18.81
Polygon Size: Average (ha)	1.54	0.44

[83] N.B. The two MacArthur Green NVC surveyors are experienced, have worked together for over 10 years on NVC surveys across Scotland, and have been trained in vegetation and NVC surveys by Ben Averis since 2010 (with numerous additional and refresher in-house training courses since). Ben Averis and MacArthur Green have also worked together on many NVC surveys, including on Skye for the Proposed Development, in the last 10 years and generally adopt the same survey approach and conventions, which will reduce inter-observer survey and classification variation.

As can be seen in Table 13-2 above the SSEN data contains 3.66 times more polygons for the same area, the minimum, maximum and average size of polygons is also smaller in the SSEN data. This would indicate the SSEN mapping is at a greater resolution, and in principle potentially more accurate in terms of polygon boundaries. This premise is reinforced by the types of survey maps used in the respective surveys. The NS data polygons were mapped on 1:10,000 OS survey maps (which in areas built upon the earlier 1993 polygons mapped on a mixture of 1:10,000 and 1:25,000 OS maps) whereas the SSEN data was mapped on high resolution 1:5,000 aerial survey maps allowing accurate mapping, the clear definition of boundaries, and the identification of often small features.

With respect to the habitat composition within the study area the two data sets were also compared. This comparison is detailed in Table 13-3 below. In undertaking this analysis, a number of minor difficulties were encountered which required some assumptions to be made, the key points in this comparison analysis and assumptions made are as follows:

- NVC communities were also cross-referend to their best fit Phase 1 habitat type to allow a broader comparison. NVC communities were attributed the same Phase 1 classification across both data sets.
- The NS GIS shapefiles provided only included true NVC communities and percentages within the polygon data. There were no detailed data provided within the shapefiles for non-NVC communities or features. For example, Averis & James[25] note they mapped and classified conifer plantations in various ways, they also recorded other non-NVC communities/features including clear-fell, *Salix aurita* scrub, bare rock, scree and open water. However, these data are not in the shapefiles and instead such polygons or proportions of respective mosaic polygons have blanks. To account for these blanks the respective polygons or percentage of mosaic polygons has been attributed the classification 'Unknown' (N.B. 49 of the 307 NS polygons had varying percentages of 'Unknown', amounting to a total aera of 33.25 ha). It is likely a large proportion of these unknown areas relate to conifer plantation. No 'Unknown' values are present within the SSEN data, as all areas have been fully attributed NVC and applicable non-NVC communities/features.
- 25.83 ha of the SSEN SAC study area considered here was not covered by the NS data, this has been attributed the value 'NSA' in the NS data to represent the 2001 'Non-Surveyed Area'. The majority of this NSA concerns the carriageway of the minor Glen Arroch Road where it passes through the SAC boundary and some smaller forestry tracks by the RSPB hide at Kylerhea.
- In both data sets there are a large number of mosaic polygons, reflecting the complex and often transitional nature of the habitats within the study area. In both cases polygons contain estimated percentage covers for each respective community type recorded, however as Averis & James[25] also note, the percentage figures are only estimates at the time of survey and should not be taken as absolute.
- In both surveys, given the survey time available and to some degree the time of year, it is not possible to examine all of the vegetation in sufficient detail to always determine NVC types to sub-community level, so in several polygons some stands were mapped at the

community level only. To avoid misrepresentation of sub-communities in the analysis below these have been grouped alongside the overarching community.

Notwithstanding the limitations on the analysis noted above, it is still possible to compare the data in a meaningful way.

The NS data for the study area contains 19 NVC community types, the SSEN data for the same area contains 26 NVC community types. The SSEN data also a contains a further six intermediate (or transitional) communities. With respect to these intermediate/transitional communities, e.g., M19-M25, characteristics of one community are present in the other, with the first habitat code reflecting the 'parent' or original community type. In the analysis further below, intermediate communities are grouped with the first habitat code.

As noted above the NS data doesn't include the detailed breakdown with respect to non-NVC communities or features (classified here as Unknown), but as per the report by Averis & James[25] these areas will most often relate to stands of conifer plantation. The SSEN data recorded 13 non-NVC communities or features within the study area.

With respect to NVC communities recorded or not recorded within the respective data sets, the following observations are made:

- There are 17 communities that were recorded in both data sets (i.e., W4, W7, W11, W17, W25, U4, U5, U20, M1, M6, M10, M15, M17, M19, M25, H10, and H21).
- The NS data contains very small areas of W9 and CG10 which are not present in the SSEN data.
- The SSEN data includes small areas of W18, U16, U19, M2, M3, M4, M20, M23, H9, and H12 which are not present in the NS data.

The breakdown of the habitat composition recorded in the two data sets is summarised in Table 13-3 below.

Table 13-3 NS and SSEN Data Comparison – Habitat Composition

Habitat/Community		NS Data		SSEN Data	
Phase 1 Type (Code)	NVC & Non-NVC codes	Phase 1 Area (ha)	NVC Area (ha)	Phase 1 Area (ha)	NVC Area (ha)
Broadleaved Semi-Natural Woodland (A1.1.1)	W4	29.81	6.39	47.23	9.49
	W7		0.37		1.05
	W9		0.45		0
	W11		3.41		8.80
	W17		19.18		27.89
Coniferous Semi-Natural Woodland (A1.2.1)	W18	-	-	0.05	0.05
Coniferous Plantation Woodland (A1.2.2)	CP	-	-	6.58	6.58
Dense/Continuous Scrub (A2.1)	W1x	-	-	0.48	0.48

Habitat/Community		NS Data		SSEN Data	
Scattered Broadleaved Tree (A3.1)	SBT	-	-	1.36	1.36
Scattered Coniferous Tree (A3.2)	SCT	-	-	0.03	0.03
Recently Felled Coniferous Woodland (A4.2)	CF	-	-	17.94	17.94
Unimproved Acid Grassland (B1.1)	U4	1.99	1.97	1.09	1.01
	U5		0.03		0.08
Semi-Improved Acid Grassland (B1.2)	U4b	-	-	0.13	0.13
Unimproved Calcareous Grassland (B3.1)	CG10	0.02	0.02	-	-
Marsh/Marshy Grassland (B5)	M23	0.19	-	7.13	0.02
	M25 (M25, M25b, M25c)		0.19		6.08
	Je		-		1.02
	Mx		-		0.01
Continuous Bracken (C1.1)	U20	18.11	18.04	35.82	35.80
	W25		0.06		0.02
Non-Ruderal (C3.2)	U16	-	-	0.07	0.004
	U19		-		0.06
	Daff		-		0.01
Acid Dry Dwarf Shrub Heath (D1.1)	H9	58.42	-	44.90	0.05
	H10, H10-M25		18.65		24.28
	H12, H12-M25		-		7.13
	H21		39.78		13.45
Wet Dwarf Shrub Heath (D2)	M15, M15-M17	248.69	248.69	227.17	227.17
Blanket Bog (E1.6.1)	M1	68.59	0.22	54.92	0.08
	M2		-		1.08
	M3		-		0.63
	M17, M17-M25		30.54		30.45
	M19, M19-M25		37.83		22.69
Wet Modified Bog (E1.7)	M20, M20-M25	10.23	-	34.69	0.75
	M25a		10.23		33.94
Acid/Neutral Flush (E2.1)	M4	0.8	-	6.44	0.002
	M6, M6-M25		0.8		6.44
Basic Flush (E2.2)	M10	0.12	0.12	0.53	0.53
Bare Peat (E4)	ExP	-	-	0.01	0.01
Standing Water (G1)	SW	-	-	0.97	0.97

Habitat/Community		NS Data		SSEN Data	
Running Water (G2)	RW	-	-	2.02	2.02
Building (J3.6)	BD	-	-	0.14	0.14
Intertidal Boulders/Rocks (H1.3), Other Exposure – Acid/ Neutral (I1.4.1), and Bare Ground (J4)	BG	-	-	6.34	6.34
Other Habitat (J5)	Unknown	33.25	33.25	-	-
NSA	Non-Surveyed Area	25.83	25.83	-	-
TOTALS		**496.05**	**496.05**	**496.05**	**496.05**

With such a complex survey methodology and variable expansive unenclosed upland site such as the study area, coupled with the usual suite of survey constraints, no two surveys would likely ever yield the same results, even if conducted by the same surveyors, and especially given the time between surveys. Surveys of this kind offer a snapshot of the prevailing conditions at the time of survey, and generally cannot be relied upon as a static long-term reference (N.B. there are also differences in the 1993 and 2001 NVC data which was collected by the same surveyor).

However, despite this, in some cases the area of certain habitat types, or specific NVC communities is similar between surveys. For example, the amounts of acid grassland (B1.1/B1.2) are very similar between both surveys, and the specific NVC community M17 amounted to 30.54 ha in the NS data and 30.45 ha in the SSEN data, remarkably similar. Other habitat types such as wet heath are also quite similar between surveys. However, for other habitat types there are notable differences in respective extents between the data sets, for example broadleaved semi-natural woodland, bracken, marshy grassland, and wet modified bog. There are also lesser differences between blanket bog and dry heath.

There are several factors which can lead to the differences in habitat composition values as detailed in Table 13-3 above, these fall into two main categories, 1) survey and surveyor variability/bias inherent due to survey methodology, and 2) actual real changes in habitat composition given the time between surveys. Both considerations are discussed below with respect to the data above.

Survey and Surveyor Variability

The NVC is a complex classification system used to describe the semi-natural plant communities in Britain, each systematically named and arranged and with standardised descriptions for each. The NVC contrasts with broader-scale classifications, notably the Phase 1 Habitat Classification, as the Phase 1 method does not break down broad habitat types into such detailed constituent parts as the NVC does.

The NVC comprises 286 community types subdivided amongst 12 major types of vegetation[84].Furthermore many, but not all, of the NVC communities are broken down further into sub-communities, which total 578 in all. A very small number of especially complex communities have a third level of sub-division, into variants. Considering the lowest sub-division of each type, except variants, the NVC comprises 681 vegetation classification units/types. However, as noted above, the NVC system does not cover all possible semi-natural vegetation or habitat types that may be found. Since the NVC was adopted for use in Britain in the 1980s further survey work and an increased knowledge of vegetation communities has led to several gaps being identified and additional communities being described that do not fall within the NVC system (e.g., Rodwell *et al*., 2000[85], Averis *et al*., 2004[86], Mountford, 2011[87], and Averis and Averis, 2020[88]).

The above highlights the inherent complexity in assigning NVC communities with this methodology. Many of these communities are very similar in appearance and separated by only a few key indicator species that may or may not be conspicuous at the time of survey or hidden in vegetation sub-layers or present in the basal layer (in the case of bryophytes and lichens).

Classification differences will inevitably arise between different surveyors using this methodology on the same area, particularly on a large unenclosed upland site such as the study area. The Phase 1 survey method is a much broader and simpler classification system than the NVC with just eight major habitat types[89] and these contain a small number of sub-divisions (many times less than the NVC). Despite the relative simplicity of the Phase 1 method compared to NVC, several academic studies have examined the reliability, repeatability and between-observer variation or bias in carrying out a Phase 1 survey of the same area (e.g., Cherrill and McClean, 1995[90] 1999a[91], 1999b[92];

[84] i.e., woodland and scrub; mires; heaths; mesotrophic grassland; calcicolous grasslands; calcifugous grasslands and montane communities; aquatic communities; swamps and tall-herb fens; shingle, strandline and sand-dune communities; saltmarsh communities; maritime cliff communities; and vegetation of open habitats.

[85] Rodwell, J., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, AJ.C., Schaminee, J.H.J. and Dargie, T.C.D. (2000). Review of coverage of the National Vegetation Classification. JNCC Report, No. 302. JNCC, Peterborough, ISSN 0963-8091.

[86] Averis, A., Averis, B. Birks, J., Horsfield, D., Thompson, D. and Yeo, M. (2004). An Illustrated Guide to British Upland Vegetation. Pelagic, Exeter.

[87] Mountford, E. (2011). A compilation of proposed additions and revisions to vegetation types in the National Vegetation Classification, JNCC Report No. 448. JNCC, Peterborough, ISBN 0963-8091

[88] Averis, B. and Averis, A. (2020). Plant Communities found in surveys by Ben and Alison Averis but not described in the UK National Vegetation Classification. http://www.benandalisonaveris.co.uk/wp/wp-content/uploads/2020/11/non-nvc_vegetation_types_found_by_ben_and_alison_averis_2020-06__version_with_image_resolution_reduced_.pdf

[89] i.e., woodland and scrub; grassland and marsh; tall herb and fern; heathland; mire; swamp, marginal and inundation, coastland; and miscellaneous.

[90] Cherrill, A. and McClean, C. (1995). An investigation of uncertainty in field habitat mapping and the implications for detecting land cover change. Landscape Ecology 10, 5-21.

[91] Cherrill, A. and McClean, C. (1999a). Between-observer variation in the application of a standard method of habitat mapping by environmental consultants in the UK. Journal of Applied Ecology 36, 989-1008.

[92] Cherrill, A. and McClean, C. (1999b). The reliability of `Phase 1' habitat mapping in the UK: the extent and types of observer bias. Landscape and Urban Planning 45, 131-143.

Stevens *et al.* 2004[93]; Cherrill (2013)[94]). These studies have all highlighted notable differences in habitat classifications (i.e., classification errors) between professional ecological surveyors, although spatial errors in the positioning of habitat boundaries were less apparent, but present. These studies also found the range of vegetation types which were confused with each other was numerous, but ecologically related vegetation types were most often confused.

Given the above reported variations and inter-observer differences in Phase 1 classification it can be safely assumed that the repeatability and inter-observer differences in an NVC survey, given its much greater complexity and much higher number of possible vegetation classifications (many of which are closely related and visually similar), may result in a greater degree or greater likelihood of classification errors. Few studies have examined the repeatability of, and variations in, an NVC survey; however, one such study has been undertaken by Hearn *et al.* (2011)[95]. As above, this study noted notable variation between surveyors with the majority of variation between results due to discrepancies in vegetation classification, with vegetation types containing similar species structure, composition and richness most often confused (such as in shrub-dominated heaths or grasslands).

Given the above discussion and information in academic literature, it appears inter-observer error is unavoidable and as such there are some inevitable classification differences between the NS and SSEN data sets. However, despite this the overall correspondence in broad habitat types and NVC communities recorded is good, as shown in Table 13-3, with both surveys largely agreeing on the main habitat and NVC types recorded.

- As well as some inter-observer variation as noted above, there are other survey factors which could lead to differences in mapping or classification in the study area, for instance:The NS polygons were mapped on 1:10,000 OS survey maps (which in areas built upon the earlier 1993 polygons mapped on a mixture of 1:10,000 and 1:25,000 OS maps) whereas the SSEN data was mapped on high resolution 1:5,000 aerial survey maps. The aerial mapping makes it easier to draw accurate polygon boundaries, rely less on mapping larger areas of mosaics, and allows the surveyor to more easily identify any conspicuous stands of vegetation (for instance stands dominated by bracken or *Molinia caerulea* can generally be easily picked out on survey maps).
- On a large unenclosed upland site with difficult terrain the routes walked by surveyors and different vantage points and views taken of the wider area can influence how the many habitat mosaics of visually and structurally similar communities are interpreted, and the mosaic percentages given, which are only best estimates and likely to vary by surveyor.
- The time of year may influence surveyor classification if certain species are more conspicuous in the sward, many communities are very similar in general appearance (e.g., dry heaths typical of this area) with the distinction between communities often more

[93] Stevens, J. P., Blackstock, T.H., Howe, E.A. and Stevens, D.P. (2004). Repeatability of Phase 1 habitat survey. Journal of Environmental Management 73, 53–59.

[94] Cherrill, A. (2013). Repeatability of vegetation mapping using Phase 1 and NVC approaches: implications for professional practice and surveyors training requirements. CIEEM In Practice, September 2013, 41-45.

[95] Hearn, S., Healey, J., Mcdonald, M.A, Turner, A., Wong, J., Stewart, G. (2011). The repeatability of vegetation classification and mapping. Journal of environmental management. 92. 1174-84. 10.1016/j.jenvman.2010.11.021.

hidden in the sub-shrub layer or in the bryophyte basal flora and therefore it can be relatively easy to unintentionally miss, or over- or under-represent certain communities or the percentages attributed to mosaics.

- In a survey it is not possible to survey or ground truth every area in detail and so, depending on time available and survey routes taken, it is possible to miss small stands of low growing communities hidden by taller communities, e.g., many springs and small flushes can be easily hidden in an area's with otherwise tall heath and mire vegetation.

Real Change in Habitat Composition

Notwithstanding survey and inter-observer variability and possible classification errors as discussed above it remains that there is around 20 years of difference between the two surveys. Over such a period there are likely to be some natural vegetation changes or fluctuations. However, with respect to the study area the biggest changes in vegetation composition are considered attributable to active management prescriptions and intervention undertaken within the SAC in the past 20 years, and which are ongoing. The key major contributing factors to change within the study area since the surveys undertaken in 2001 include:

- Forestry and Land Scotland's (FLS) programme of felling and removal of non-native conifers and conifer plantation from the SAC[96].
- Increased deer control and management within the SAC to reduce deer damage and browsing impacts, in response to overgrazing pressures being responsible for certain SAC qualifying habitats not being in Favourable condition.
- Implementation of the SFA Kinloch & Kyleakin Hills Woodland Restoration Project to establish 486 ha of new native woodland locally, which has involved native woodland planting and promoting natural woodland regeneration within the SAC. The associated Environmental Statement (2004) recognised the dynamic nature of habitats and that improvement in priority woodland habitat within the SAC could not be achieved without a consequent impact on other qualifying features. Given the priority for woodland expansion, potential impacts were considered acceptable so long as they met the overall conservation objectives for the site[97]. The scheme resulted in an agreement from the Scottish Government (Scottish Executive at the time) that woodland features would be favoured over open ground features on this site[98].

The above key factors will have undoubtedly resulted in some real habitats change in the past 20 years, and the following main observations are made with respect to this, and the data comparison summarised in Table 13-3 above:

- Much of the 33.25 ha of 'Unknown' habitat in the NS data is attributed to conifer plantation. There is only a small amount of area mapped as conifer in the SSEN data, due to the FLS policy or removing conifers from the SAC. Some of this conifer removal evidently

[96] FLS (2019). Inverness Ross and Skye Forest District. Kinloch Hills and Broadford Land Management Plan 2019-2029.

[97] Forestry Commission Scotland (2018). Inverness, Ross and Skye Forest District SSSI Designated Sites Management Plan: Kinloch & Kyleakin Hills.

[98] Noted in consultation letter with NatureScot dated 25 October 2018.

took place quite a while ago and the resulting clear-felled areas have now regenerated to such an extent as to have been mapped in the SSEN surveys as having reverted back to open upland habitats. The main habitat types recorded in these more historic clear-felled areas were bracken (U20), marshy grasslands (M25 at the community level, and *Juncus effusus* acid grassland 'Je') and wet modified bog (M25a), which to an extent accounts for the notable increases in these overarching habitats and NVC community types since 2001.

- The combined factors of native woodland planting and regeneration promotion associated with the SFA scheme and increased deer management reducing browsing levels and damage on young trees has generally allowed the regeneration and expansion of native woodland within the study area. The success of the SFA scheme has been variable, however FLS surveys in 2015/2016 have noted abundant woodland regeneration and commented on the expansion of the woodland feature within the SAC at the expense of other habitat types, such as wet heath[96,97]. The SSEN surveys also noted native woodland regeneration in some areas with patches of, mainly, young birch colonising other habitats and expanding out from patches of older woodland. Ben Averis also noted reduced grazing pressure and woodland regeneration and expansion in this area while undertaking bryophyte and lichen surveys here for the proposed Development in April 2022 (compared to his surveys in 2001). Forestry surveys for the Proposed Development (**Volume 2, Chapter 9: Forestry**) have also noted abundant native woodland regeneration in this area. As a result, it appears the woodland area has expanded since the surveys in 2001, and with woodland expansion there is an associated commensurate reduction in the extent of other habitat types. This will explain the much larger broadleaved woodland extent value in the SSEN data, as per Table 13-3, and this expansion will have been partially at the expense of other habitat types such as wet heath (as noted in FLS surveys), dry heath and blanket bog, and which may partially explain the reduced areas of these habitat types with the SSEN data.

Conclusion

It is therefore likely, considering the discussion above, that the differences in habitat composition between the two data sets is a combination of both inter-observer classification differences and real habitat changes over the past 20 years, especially considering the management undertaken and ongoing within the SAC. Taking into account the general similarity in habitat types and NVC communities recorded across both surveys, and real changes in habitat compositions and extents in the past 20 years, then the contemporary SSEN data is considered to be a robust and suitable baseline data set for the assessment of effects associated with the Proposed Development.

ANNEX D. INFORMATION FROM DEFRA BIODIVERSITY METRIC 3.1

Table 13-4 below summarises information from the DEFRA Metric 3.1[51], with some information also taken form Version 2.0[99], on the assessment of difficulty of creation or enhancement of the habitat types that correlate most closely to the SAC qualifying features. This is also provided in Table 13-5 which also includes information on the habitat's distinctiveness[100] and the average time estimates to reach target condition levels for habitat creation. Table 13-6 then then summarises the information relating to the average time estimates to reach target condition for enhancement or restoration. It also provides estimates on the time taken to enhance or restore that habitat type to the same distinctiveness level or elevate it to a higher distinctiveness level.

The average time to target condition estimates provided in these tables are largely based on expert opinion and build upon the considerations that shaped judgements of the difficulty to create or restore a habitat. They were additionally informed by field experience, industry case studies, a body of practical experience, and feedback responses on the 2019 Version 2.0 of the Metric.

Table 13-4 Difficulty of Creating and Restoring Priority Habitat types[101]

Priority Habitat Type	Technical difficulty of Restoration	Technical difficulty of Creation	Hydrological Requirements	Seed / Biological Material Requirements	Future Constraints	Low Soil Nutrient Status	Trophic status[102]	Water Quality Needs	Ongoing Management Requirements
Blanket bog	High	High	Complex	Initial Seeding & Natural Succession	Medium	Important	Oligotrophic	Good WQ	Low - Medium
Ancient Woodlands	Low	N/A	Basic	Natural Succession[103]	Low	Critical	Mesotrophic	N/A	Low
Deciduous Woodland	Low	Low	Basic	Tree Planting	Low	Important	Mesotrophic	N/A	Moderate
Upland heathland	Low	Low	Low	Natural Succession	Low	Important	Oligotrophic	N/A	Moderate

[99] Crosher, I., Gold, S., Heaver, M., Heydon, M., Moore, L., Panks, S., Scott, S., Stone, D. and White, N. (2019). The Biodiversity Metric 2.0: Auditing and accounting for biodiversity value. (Beta version, July 2019). http://publications.naturalengland.org.uk/publication/5850908674228224?category=2439110

[100] The distinctiveness of habitats is a concept built into DEFRA Metric 3.1 and earlier iterations. Habitats have been assigned one of five distinctiveness bands (very high, high, medium, low, very low) based on several criteria relating to those habitats distinguishing features, including for example, rarity, percentage of habitat protected in designated sites, UK priority habitat status, and European red list habitats.

[101] Based on the most relevant correlation between SAC qualifying habitat features and UK Priority Habitats presented within DEFRA Metric 2.0.

[102] Trophic state is a classification system designed to rate bodies of water based on the amount of biological activity they sustain.

[103] Over a long time (100 + years).

Table 13-5 Distinctiveness, Difficulty of Creation and Enhancement and Average Time to Target Condition - Habitat Creation

Habitat Type	Corresponding SAC Habitat	Distinctiveness	Difficulty of Creation	Difficulty of Enhancement / Restoration	Time (years) to target condition for habitat creation				
					Good	Fairly Good	Moderate	Fairly Poor	Poor
Heathland & shrub - Mountain heaths and willow scrub	Alpine and subalpine heaths	Very High	High	High	30+	30+	25	23	15
Heathland & shrub - Upland Heathland	Wet heathland with cross-leaved heath and Dry heaths	High	Medium	Medium	30	25	20	15	10
Blanket bog	Blanket bog	Very High	Very High	High	30+	30+	30+	30+	30+
Woodland & forest - Upland birchwood	Western acidic oak woodland	High	Medium	Medium	30+	30	25	20	10
Woodland & forest - Upland mixed ashwoods	Mixed woodland on base-rich soils associated with rocky slopes	High	High	High	30+	30+	30+	25	10
Woodland & forest - Upland oakwood	Western acidic oak woodland	High	High	High	30+	30+	30+	25	10

Table 13-6 Time to Target Condition for Enhancement and Restoration

Habitat Type	SAC Habitat	Time to target condition (years) for enhancement or restoration														
		With elevation to higher distinctiveness habitat					Condition change									
		Poor	Fairly Poor	Moderate	Fairly Good	Good	Poor – Fairly Poor	Poor - Moderate	Poor – Fairly Good	Poor - Good	Fairly Poor - Moderate	Fairly Poor – Fairly Good	Fairly Poor - Good	Moderate - Fairly Good	Moderate - Good	Fairly Good - Good
Heathland & shrub - Mountain heaths and willow scrub	Alpine and subalpine heaths	15	23	25	30+	30+	20	30+	30+	30+	20	30+	30	20	30+	20
Heathland & shrub - Upland Heathland	Wet heathland with cross-leaved heath & Dry heaths	10	15	20	25	30	10	20	30	30+	10	20	30	10	20	10
Blanket bog	Blanket bog	15	25	30	30+	30+	10	20	30+	30	10	30+	30+	30	30+	30
Woodland & forest - Upland birchwood	Western acidic oak woodland	10	20	25	30	30+	10	15	20	30+	15	20	25	10	15	10
Woodland & forest - Upland mixed ashwoods	Mixed woodland on base-rich soils associated with rocky slopes	10	25	30+	30+	30+	10	15	20	30+	15	20	25	10	15	10
Woodland & forest - Upland oakwood	Western acidic oak woodland	10	25	30+	30+	30+	25	30+	30+	30+	30+	30+	30+	30+	30+	30+

ANNEX E. XLS SHADOW HRA MATRIX - HABITATS

	Beneficial Impact on SAC Qualifying Features Integrity
	No Likely Significant Effect
	No Adverse Effect after suitable mitigaiton
	Adverse Effect that cannot be mitigated

Kinloch and Kyleakin Hills SAC

	Qualifying Habiat	Alpine and subalpine heaths		Blanket bog		Dry heaths		Mixed woodland on base-rich		Western acidic oak woodland		Wet heathland with cross-	
	Condition of Feature	Unfavourable Recovering		Favourable Maintained		Favourable Maintained		Unfavourable Recovering		Unfavourable Declining		Unfavourable Declining	
		3A	3B	3A	3B	3A	3B	3A	3B	3A	3B	3A	3B
Impact 1a	Direct Habitat Loss/Modification Construction/Operation (Hectares)	0	0	2.165	2.121	0.888	0.374	0	0	0.756	0.235	4.882	5.607
	Duration (Short-term, Medium Term, Long-Term, Permanent)	None		Long Term & Permanent	Long Term & Permanent	Long Term & Permanent	Long Term & Permanent	None		Long Term & Permanent	Long Term & Permanent	Long Term & Permanent	Long Term & Permanent
	Conservation Objectives Affected	None	None	1, 2a, 2b, 2c, 2d, 2e		1, 2a, 2b, 2c, 2e		None	None	1, 2a, 2b, 2c, 2d, 2e, 2f, 2g		1, 2a, 2b, 2c, 2d, 2e	
	Mitigation Measures Possible to Avoid Impact	None	None	No	No	No	No	None	None	No	No	No	No
	Mitigation Measures to Reduce/Minimise Impact	None	None	No	No	No	No	None	None	No	No	No	No
	Adverse Effect on Integrity of Site?	No Impact	No Impact	Adverse	Adverse	Adverse	Adverse	No Impact	No Impact	Adverse	Adverse	Adverse	Adverse
Impact 1b	Direct Habitat Loss/Modification Operation Only (Hectares)	oha	oha	oha	oha	oha	oha	oha	oha	0.1	0	0	0
	Duration (Short-term, Medium Term, Long-Term, Permanent)	None	None	None	None	None	None	None	None	Long-Term	None	None	None
	Conservation Objectives Affected	None	None	None	None	None	None	None	None	1, 2c, 2d, 2f, 2g	None	None	None
	Mitigation Measures Possible to Avoid Impact	None	None	None	None	None	None	None	None	No	None	None	None
	Mitigation Measures to Reduce/Minimise Impact	None	None	None	None	None	None	None	None	No	None	None	None
	Adverse Effect on Integrity of Site?	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	Adverse	No	No	No
Impact 1c	Indirect Habitat Loss/Modificaiton Construction/Operation (Hectares)	None	None	2.527	1.527	None	None	None	None	None	None	5.499	4.15
	Duration (Short-term, Medium Term, Long-Term, Permanent)	None	None	Long-Term	Long-Term	None	None	None	None	None	None	Long-Term	Long-Term
	Conservation Objectives Affected	None	None	1, 2a, 2b, 2c, 2d, 2e		None	None	None	None	None	None	1, 2a, 2b, 2c, 2d, 2e	
	Mitigation Measures Possible to Avoid Impact	None	None	No	No	N/A	N/A	None	None	None	None	No	No
	Mitigation Measures to Reduce/Minimise Impact	None	None	Yes	Yes	N/A	N/A	None	None	None	None	Yes	Yes
	Adverse Effect on Integrity of Site?	No Impact	No Impact	Adverse	Adverse	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	Adverse	Adverse
Impact 2	Habitat Fragmentation (Hectares)	0	0	0	0	0	0	0	0	0	0	0	0
	Duration (Short-term, Medium Term, Long-Term, Permanent)	None	None	None	None	None	None	None	None	None	None	None	None
	Conservation Objectives Affected	None	None	None	None	None	None	None	None	None	None	None	None
	Mitigation Measures Possible to Avoid Impact	None	None	None	None	None	None	None	None	None	None	None	None
	Mitigation Measures to Reduce/Minimise Impact	None	None	None	None	None	None	None	None	None	None	None	None
	Adverse Effect on Integrity of Site?	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact
Impact 3	Indirect Pollution of Habitats Likely	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Duration (Short-term, Medium Term, Long-Term, Permanent)	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium	Short to Medium
	Conservation Objectives Affected	1, 2a, 2b, 2c, 2d, 2e, 2g		1, 2a, 2b, 2c, 2d, 2e, 2g		1, 2a, 2b, 2c, 2d, 2e, 2g		1, 2a, 2b, 2c, 2d, 2e, 2g		1, 2a, 2b, 2c, 2d, 2e, 2g		1, 2a, 2b, 2c, 2d, 2e, 2g	
	Mitigation Measures Possible to Avoid Impact	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Mitigation Measures to Reduce/Minimise Impact	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes	Yes
	Adverse Effect on Integrity of Site?	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse	Not Adverse
Impact 6	Dismantling Existing OHL (Hectares)	0	0	0	0	0	0	-0.155 to -0.235	-0.155 to -0.235	-1.35 to -2.74	-1.35 to -2.74	0	0
	Duration (Short-term, Medium Term, Long-Term, Permanent)	None	None	None	None	None	None	Permanent	Permanent	Permanent	Permanent	None	None
	Conservation Objectives Affected	None	None	None	None	None	None	1, 2a, 2b, 2c, 2d, 2e, 2f, 2g	1, 2a, 2b, 2c, 2d, 2e, 2f, 2g	1, 2a, 2b, 2c, 2d, 2e, 2f.	1, 2a, 2b, 2c, 2d, 2e,2f.	None	None
	Mitigation Measures Possible to Avoid Impact	None	None	None	None	None	None	N/A	N/A	N/A	N/A	None	None
	Mitigation Measures to Reduce/Minimise Impact	None	None	None	None	None	None	N/A	N/A	N/A	N/A	None	None
	Adverse Effect on Integrity of Site?	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	Beneficial	Beneficial	Beneficial	Beneficial	No	No
Impact 7	In-Combination (Hectares)	None	None	None	None	None	None	None	None	2.43	0.35	None	None
	Duration (Short-term, Medium Term, Long-Term, Permanent)	None	None	None	None	None	None	None	None	Long-Term & Permanent	Long-Term and Permanent	None	None
	Conservation Objectives Affected	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	1, 2a, 2c, 2d, 2e, 2f, 2g	1, 2a, 2c, 2d, 2e, 2f, 2g	N/A	N/A
	Mitigation Measures Possible to Avoid Impact	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	N/A	N/A
	Mitigation Measures to Reduce/Minimise Impact	N/A	N/A	N/A	N/A	N/A	N/A	N/A	N/A	No	No	N/A	N/A
	Adverse Effect on Integrity of Site?	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	No Impact	Adverse	Adverse	No Impact	No Impact