

RWE

Clachaig Glen Wind Farm

Environmental Impact Assessment Report

Volume 2a

Main Report

Chapter 9: Ecology

9. Ecology

9.1 Introduction

- 9.1.1 This chapter of the Environmental Impact Assessment Report (EIAR) provides baseline ecological information and assesses the potential impacts and effects of the Proposed Development on ecological features. Where appropriate, it provides details of proportionate mitigation and enhancement measures to avoid, minimise, reverse or compensate for adverse effects. This chapter concerns non-avian ecological features only. An assessment of impacts and effects on ornithological features is considered separately in Chapter 10 of this EIAR: Ornithology.
- 9.1.2 Also relevant to this chapter is the Habitats Regulations Appraisal (HRA) Screening Report, a separate document accompanying the Section 36 application and prepared to facilitate provide the information necessary to facilitate the determining authority (in this case, the Energy Consents Unit (ECU) acting on behalf of the Scottish Ministers) in determining potential effects on the qualifying features of European Sites.
- 9.1.3 Throughout this chapter, species are given their scientific names when first referred to and their common names only thereafter. Where no common name is available to distinguish between species (for example, within the *Sphagnum* genus of mosses), these are referred to by their scientific name on every mention. All distances are cited as the shortest boundary to boundary distance 'as the crow flies' unless otherwise specified. In order to distinguish the area in which the turbines and associated infrastructure are located, from the access route to this area along the existing track from the A83 (where minimal works would be required), the former is referred to as the 'main Development Site'.
- 9.1.4 This assessment has been informed by the consultation detailed in Section 9.3.

9.2 Legislation, Policy and Guidance

- 9.2.1 This assessment has been carried out within the context of the following relevant legislative instruments, planning policies and guidance documents:
- Conservation (Natural Habitats, &c.) Regulations 1994 (as amended) (the 'Habitats Regulations'),
 - Convention on Wetlands of International Importance ('Ramsar convention'),
 - Council Directive 2000/60/EC establishing a framework for Community action in the field of water policy (the 'Water Framework Directive'),
 - Regulation 1143/2014 on invasive alien species ('Invasive Alien Species Regulation'),

- Wildlife and Countryside Act 1981 (as amended) (the 'WCA'),
- Nature Conservation (Scotland) Act 2004 (as amended),
- Wildlife and Natural Environment (Scotland) Act 2011 (as amended),
- Protection of Badgers Act 1992 (as amended),
- Salmon and Freshwater Fisheries (Consolidation) (Scotland) Act 2003,
- Scottish Planning Policy (SPP) 2014,
- The Argyll and Bute Local Development Plan (LDP) 2015,
- The Argyll and Bute Proposed Local Development Plan 2 (LDP2) 2019,
- Argyll and Bute Local Biodiversity Action Plan 2010 – 2015 (LBAP), which lists priority habitat and species, and the subsequent Biodiversity Duty Action Plan (2016-2021) prepared by Argyll and Bute Council to comply with their Biodiversity Duty,
- Guidelines for Ecological Impact Assessment in the UK and Ireland: Terrestrial, Freshwater, Coastal and Marine (Chartered Institute of Ecology and Environmental Management (CIEEM), 2018), and
- Assessing the Cumulative Impact of Onshore Wind Energy Developments (Scottish Natural Heritage (SNH), 2021).

9.2.2 Of particular relevance to nature conservation, note that SPP states in paragraph 194 that the planning system should:

- *conserve and enhance protected sites and species, taking account of the need to maintain healthy ecosystems and work with the natural processes which provide important services to communities,*
- *promote protection and improvement of the water environment, including rivers, lochs, estuaries, wetlands, coastal waters and groundwater, in a sustainable and co-ordinated way,*
- *protect and enhance ancient semi-natural woodland as an important and irreplaceable resource, together with other native or long-established woods, hedgerows and individual trees with high nature conservation or landscape value,*
- *seek benefits for biodiversity from new development where possible, including the restoration of degraded habitats and the avoidance of further fragmentation or isolation of habitats.*

9.2.3 The Argyll and Bute LDP (2015) deals with nature conservation under Policies LDP STRAT1, LDP 3 (and supplementary guidance documents LDP ENV 1 to 11), LDP 6 and LDP 10. These set out the requirements for protected sites, protected species, trees/woodland, general biodiversity and green networks. There is also a technical note to guide planners and developers in meeting biodiversity requirements (Argyll and Bute, 2017).

- 9.2.4 Argyll and Bute Council are currently in the process of preparing the replacement LDP2, which is anticipated to be adopted in January 2023. As LDP2 is not yet adopted, LDP (2015) remains the primary policy consideration. Policies 04, 30, 59, 73 to 78 of LDP2 are the equivalent policies to those referenced in Paragraph 9.2.3. These replacement policies do not contain any additional assessment requirements of relevance to this chapter of the EIAR.
- 9.2.5 Relevant priorities listed in Appendices 2 and 3 of the Argyll and Bute LBAP include blanket bog (also a European and national priority), upland flushes / fens / swamps and adder *Vipera berus*. Within the Argyll and Bute Biodiversity Duty Action Plan 2016-2021, 'Outcome 1' requires "*Biodiversity action to maintain and enhance within a range of developments*", with the linked on-going action to "*where appropriate ensure protection, positive management and enhancement opportunities are taken into account*" (page 6).
- 9.2.6 Further information on relevant planning policy can be found in Chapter 6 of this EIAR: Planning and Energy Policy Context, as well as the Planning Statement submitted as part of the Section 36 Application for the Proposed Development.

9.3 Methodology

Assessment Scope

- 9.3.1 The scope of survey and assessment described in this chapter was informed by the responses of consultees and by the results of the detailed study completed for the 2016 EIA (AECOM, 2016).
- 9.3.2 Table 9-1 summarises the information and recommendations provided by the relevant consultees who submitted a response as part of the ECU Scoping Opinion (October 2020) and the associated section of this EIAR where comments have been addressed. The Scoping Opinion is attached in full as Appendix 5.2: Scoping Opinion (EIAR Volume 3).

Table 9-1 Summary of Consultation

Consultee	Summarised Information / Recommendations Relevant to Ecology	Response in this EIAR
Argyll and Bute Council	<p>The Council's Local Biodiversity Officer (LBO) provided comments as part of the Scoping Opinion. The LBO noted that:</p> <ul style="list-style-type: none"> • watercourse culverting required – silt catchment and checking that culverts are clear to be provided, design to be passable to fish / otter / water vole, and details to be included in Construction Environment Management Plan (CEMP), • some updating of 2013-2016 surveys expected, which may run into 2021 owing to COVID-19, • Phase 1 habitat / National Vegetation Classification (NVC) surveys to extend to 250 metres (m) of the Proposed Development or 110m of main access track, • no designations within the Development Site, but native woodland present south west of the site, • priority Scottish Biodiversity List (SBL) habitats present – blanket bog, wet heath and dry heath, • existing hydrological regime to be maintained, particularly in blanket bog and groundwater dependent terrestrial ecosystems, • Peat Management Plan to be produced, • Habitat Management Plan to be produced, and, • detail of treatment and storage of borrow pit soil and vegetation to be provided. 	<ul style="list-style-type: none"> • A CEMP will be produced, which will incorporate a Peat Management Plan, Habitat Management Plan, culvert details / silt management, maintenance of hydrological regime and treatment / storage of borrow pit soil / vegetation. • There were no limitations arising from COVID-19. Surveys continued uninterrupted whilst adhering to COVID-19 restrictions. • Blanket bog / Groundwater Dependent Terrestrial Ecosystems (GWDTE) hydrology have been considered. • Native woodland and other habitats / species noted by the LBO have been considered.

Consultee	Summarised Information / Recommendations Relevant to Ecology	Response in this EIAR
NatureScot (formerly SNH)	<p>With respect to ecology (ornithological comments being made separately), NatureScot made the following comments:</p> <ul style="list-style-type: none"> Noted that upgrade works are likely to the existing forestry access track to accommodate larger turbine components, with potential for effects on protected habitats / species, and as such there should be appropriate survey of the access track, Content with the scope of surveys set out in the Scoping Opinion (see Appendix 5.2: Scoping Opinion, EIAR Volume 3), and, Requested that limitations arising from COVID-19 restrictions be summarised in the EIAR. 	<ul style="list-style-type: none"> Minimal changes are required to the existing access track. Notwithstanding legal obligations concerning protected species that can be addressed through conditioned pre-construction surveys, and in view of information given in the 2016 EIA, it is highly unlikely that residual effects on protected habitats / species from minor access track work would be significant under the terms of the EIA regulations. Therefore, full surveys of the access track have not been repeated, but relevant information in the 2016 EIA has been referenced. There were no limitations arising from COVID-19. Surveys continued uninterrupted whilst adhering to COVID-19 restrictions.
Scottish Environment Protection Agency (SEPA)	<p>SEPA made the following comments relevant to ecology:</p> <ul style="list-style-type: none"> Mapping should be provided showing that shallow excavations (less than 1m) and deep excavations (more than 1m) have been avoided within 100m and 250m respectively of GWDTE. Where this is not possible, qualitative and/or quantitative risk assessment will be required, Key-holing must be used rather than large scale clear felling, except where peatland restoration is proposed, and, Detail to be provided on where and how soils / overburden at borrow pits will be stored for restoration purposes, and details of the restoration. 	<ul style="list-style-type: none"> Infrastructure has been located as far as possible according to these criteria. A figure showing GWDTE overlaid with infrastructure has been provided. Where not possible, information has been provided on the quality of the affected habitat, likelihood of adverse effect and appropriate mitigation. Clear felling will take place, but under a Forestry and Land Scotland (FLS) woodland management strategy, the updated Carradale Forest Land Management Plan (LMP), prior to and not as a result of the Proposed Development (see Chapter 17 of this EIAR: Forestry). Felling under this management plan includes the majority of locations where infrastructure is required. The management plan incorporates restoration of large areas of forestry to peatland, however FLS will also implement re-planting in specific areas in accordance with the management plan. Mitigation measures for the

Consultee	Summarised Information / Recommendations Relevant to Ecology	Response in this EIAR
Royal Society for the Protection of Birds (RSPB)	<p>RSPB Scotland provided a consultation response to the Scoping Opinion. On non-avian matters, they commented regarding blanket bog loss and associated carbon impacts, and recommended:</p> <ul style="list-style-type: none"> • that turbines WTG01 and WTG03 be moved eastward from open ground into plantation forestry, and WTG04 further from the edge into forestry, • borrow pits to be situated in existing forestry rather than open ground habitats, away from deep peat, • detailed peat probing to be carried out, • restoration / positive management of peatland, • low density native tree planting in suitable areas, and, 	<p>Proposed Development include commitment to carry out part of the restoration of forestry to peatland. For the minority of infrastructure locations where key-hole felling will take place in areas that FLS intend to retain woodland, compensatory planting will be provided.</p> <ul style="list-style-type: none"> • Of the six borrow pits, all but one are now located in commercial forestry of low ecological value that will be clear-felled by FLS by the time of construction as part of their woodland management strategy, which includes peatland restoration. Five of the six borrow pits will be restored to open peatland and in accordance with the FLS (<i>unpublished</i>) Carradale Land Management Strategy. One of the borrow pits is currently in use by FLS and it is likely that they will continue this use following construction of the Proposed Development. Details of management of soil/overburden and restoration of borrow pits will be set out in the CEMP. • For reasons of development viability and on balance with other constraints within the Development Site, it has not been possible to remove Turbines T01 and T03 from the north west moorland, and T04 remains at the edge. However, it should be noted that previous design iterations included up to 6 turbines in this area, which resulted in a higher amount of peat loss than is the case for the Proposed Development. Additionally, the location of the turbines retained within this area have been carefully considered to avoid the wettest areas of blanket bog (which are located toward the north west edge of this area) and are instead mostly on sloping ground in a drier blanket bog form.

Consultee	Summarised Information / Recommendations Relevant to Ecology	Response in this EIAR
	<ul style="list-style-type: none">indicative grid connection route to be given.	<ul style="list-style-type: none">Detailed peat probing was carried out to inform the 2016 EIA and that data is referenced in this EIAR. Peat conditions will not have changed significantly since the peat probing data was obtained.The majority of infrastructure is located in current forestry rather than open peatland. Infrastructure in the north-west moorland avoids the wettest areas of blanket bog on lower ground towards the north-west of this area. This has been an area of development across some previous iterations of the Proposed Development.Whilst previous design iterations have included borrow pits in open blanket bog, either within the forestry or in the north-west moorland, there are now no borrow pits in open blanket bog.It has been agreed with FLS that management will be undertaken to restore a substantial area of current forestry on peat to open peatland following the felling of the trees by FLS under their own Land Management Plans (see Section 9.7), in association with wider peatland restoration being undertaken by FLS following clear felling as part of their woodland management strategy.With regard to tree planting in suitable areas, there will be compensatory planting for the expected minimal loss of existing broadleaved woodland along the access track from the A83. However, the FLS (<i>unpublished</i>) updated Carradale LMP, within which the Proposed Development is located, includes significant areas of appropriate native tree planting (see Figure 17.5, EIAR Volume 2b) following phased clear felling.

Consultee	Summarised Information / Recommendations Relevant to Ecology	Response in this EIAR
Scottish Forestry	Scottish Forestry commented that as a result of national policy, woodland (of all types) should not be removed unless there are significant and clear public benefits. Where tree removal is proposed, the justification should be set out and mitigation provided.	<ul style="list-style-type: none"> <li data-bbox="1240 268 2078 384">• The grid connection is not part of the Proposed Development. However, the route is expected to be an underground cable from the on-site substation to Carradale and is likely to be installed in 2025. <li data-bbox="1240 411 2078 911">• Clear felling will take place, but largely by FLS under the updated Carradale LMP prior to and not as a result of the Proposed Development (see Chapter 17 of this EIAR: Forestry). Felling under this management plan includes the majority of locations where infrastructure is required. The management plan incorporates restoration of large areas of forestry to peatland, however FLS will also implement re-planting in specific areas in accordance with the management plan. Mitigation measures for the Proposed Development include a commitment to carry out part of the restoration of forestry to peatland. For the minority of infrastructure locations where key-hole felling will take place in areas that FLS intend to retain woodland, compensatory planting will be provided.

9.3.3 NatureScot has devised 21 'Natural Heritage Zones' (NHZ), covering the whole of Scotland, which reflect biogeographical differences across the country. This assessment has been carried out in the context of the Argyll West and Islands Natural Heritage Zone (NHZ 14), within which the Proposed Development is located. This includes the assessment of potential in-combination effects arising due to other wind farm developments and land use changes within NHZ 14.

9.3.4 For the purposes of this assessment and associated desk study and field surveys, target protected and notable species comprised:

- qualifying non-avian features of Special Areas of Conservation (SACs) or other international designations within 10 kilometres (km) (or further where connectivity exists) of the Proposed Development,
- notified non-avian features of Sites of Special Scientific Interest (SSSIs) or other national designations within 2km (or further where connectivity exists) of the Proposed Development,
- species listed on Schedules 2 and 4 of the Habitats Regulations,
- species listed on Schedules 5 and 8 of the WCA,
- badger *Meles meles*, afforded protection under the Protection of Badgers Act,
- priority species and habitats listed on the SBL,
- species or habitats listed or indicated to be priorities in the Argyll and Bute LBAP, and
- invasive non-native species listed on Schedule 9 of the WCA (although this no longer legally applies in Scotland) and those considered to be of European Union (EU) concern under the Invasive Alien Species Regulation.

9.3.5 Other species or habitats, that may be rare, scarce or otherwise notable, are included where deemed appropriate through available information and/or professional judgement.

Ecological Impact Assessment

9.3.6 This assessment was informed by the Ecological Impact Assessment (EclA) guidelines published by CIEEM (2018). The principal steps involved in the CIEEM approach are:

- baseline conditions are determined through targeted desk study and field survey to identify existing ecological features that might be affected (both at the time works begin, and for comparison, at a set time in the future),
- the importance of existing ecological features is evaluated to place their relative biodiversity and nature conservation value into a geographic context, determining those that need to be considered further within the impact assessment,
- potential impacts on relevant ecological features are described, taking into account established best practice, legislative requirements and embedded design measures,

- likely effects (adverse or beneficial) on relevant ecological features are assessed and, where possible, quantified,
 - measures to avoid or reduce (or, if necessary, compensate) any predicted significant effects, if possible, are developed in conjunction with other elements of the design (including mitigation for other environmental disciplines),
 - residual effects and their significance are reported, and
 - scope for enhancement is considered.
- 9.3.7 A detailed description of the CIEEM method for impact assessment is provided in Appendix 9.1: Method for Assessment of Ecological Impacts (EIAR Volume 3). Note that after establishing baseline conditions, it can become apparent that there is no possibility of effect on certain ecological features, and in this case such features are scoped out of further assessment at the beginning of the assessment of effects (Section 9.6).
- 9.3.8 However, CIEEM impact terminology and the geographical scale employed for sensitivity and significance of effect have been translated in this assessment into more widely-used terms, in keeping with other chapters of the EIAR and following the approach and definitions set out in Chapter 2 of this EIAR: Approach to EIA. Full descriptions of the definitions of impact magnitude and significance of effect can be found in Tables 2.5 and 2.6, respectively, in Chapter 2. However, in short, the terms used are as follows:
- Sensitivity has been translated to the terms ‘Very High’, ‘High’, ‘Medium’, ‘Low’ and ‘Negligible’ as referenced in Chapter 2,
 - Magnitude of change (severity of impact, accounting for parameters such as duration and frequency, as well as magnitude or extent, as described in Appendix 9.1, EIAR Volume 3, and employing professional judgement as necessary) has been translated to the terms ‘High’, ‘Medium’, ‘Low’ or ‘Negligible’ as referenced in Chapter 2, and
 - Significance of effect has been translated to the terms ‘Major’, ‘Moderate’, ‘Minor’ or ‘Negligible’ as referenced in Chapter 2. Significance of effect can either be adverse or beneficial.
- 9.3.9 Impacts are assessed in view of the conservation status of the species and habitats under consideration. NatureScot defines the conservation status of a species as “*the sum of the influences acting on it which may affect its long-term distribution and abundance, within the geographical area of interest*” (SNH, 2018). A species’ conservation status is considered to be ‘favourable’ when:
- population dynamics indicate that the species is maintaining itself on a long-term basis as a viable component of its habitats,
 - the natural range of the species is not being reduced, nor is it likely to be reduced for the foreseeable future, and

- there is (and probably will continue to be) a sufficiently large habitat to maintain its population on a long-term basis.
- 9.3.10 NatureScot recommends that the favourable conservation status concept should be applied at a national (Scottish) level in order to determine the level of significance of an effect arising from the impact(s) of development (SNH, 2018). However, as highlighted above, this assessment has also been conducted in the regional context of NHZ 14 within which the Proposed Development lies, and under CIEEM (2018) guidance, where significance at lower geographical levels may still be relevant and require mitigation. Therefore, even where an impact may not affect the conservation status at the national level, the potential for effects on conservation status at lower geographical levels has also been considered.

Zone of Influence

- 9.3.11 The 'zone of influence' (Zol) of the Proposed Development is the area over which ecological features may be subject to significant effects as a result of construction, operation or associated activities. The Zol can extend beyond the boundary of the Proposed Development.
- 9.3.12 The Zol varies depending on the sensitivity of ecological features to environmental change and connectivity with the Proposed Development. It is therefore appropriate to identify different Zol for different features. As recommended by CIEEM (2018), professionally accredited or published studies and guidance, where available, were used to help determine the likely Zol, as well as professional judgement. However, CIEEM (2018) also highlights that establishing the Zol should be an iterative process informed by further desk study and field survey. Where limited information is available, the precautionary principle was adopted in defining the Zol.
- 9.3.13 Considering the nature of the Proposed Development and having reviewed published literature, in addition to the results of desk study and field survey carried out to establish the baseline conditions, Zol were estimated for each relevant ecological feature. The Zol adopted in this EIA are given in Table 1 in Appendix 9.2 (EIA Volume 3).

Desk Study

- 9.3.14 A desk study was carried out to identify nature conservation designations and protected and notable species potentially relevant to the Proposed Development. A stratified approach was taken when defining the desk study area, based on the likely Zol of the Proposed Development on different ecological features, and an understanding of the maximum distances typically considered by statutory consultees. Accordingly, the desk study sought to identify:
- international nature conservation designations within 10km of the Development Site,
 - national statutory nature conservation designations within 2km,
 - local non-statutory nature conservation designations within 1km, and

- records of protected and/or notable species within 2km.

9.3.15 The desk study was carried out using the data sources detailed in Table 9-2.

Table 9-2 Desk Study Data Sources

Data Source	Date Accessed	Data Obtained
NatureScot SiteLink website (https://sitelink.nature.scot/home)	20 September 2021	<ul style="list-style-type: none"> • International statutory designations within 10km; and, • Other statutory designations within 2km.
NBN Atlas Scotland (commercially-available records only)	20 September 2021	<ul style="list-style-type: none"> • Commercially-available biological records of observations made since the year 2000 (inclusive).
Argyll and Bute Council website (https://www.argyll-bute.gov.uk/home)	20 September 2021	<ul style="list-style-type: none"> • Local Development Plan policies relevant to nature conservation; • Local non-statutory nature conservation designations within 1km of the Site; and, • Argyll and Bute LBAP information.
Ordnance Survey (OS) 1:25,000 maps and aerial photography	20 September 2021	<ul style="list-style-type: none"> • Habitats and connectivity relevant to interpretation of planning policy and potential protected / notable species constraints.

9.3.16 The Highland Biological Recording Group (HBRG) advised that all records of protected and notable species they currently hold can be found on the NBN Atlas Scotland. All desk study records of protected and notable species were extracted from the commercially-available records provided by the NBN Atlas Scotland, from 2000 onwards.

Field Survey

9.3.17 All surveys were carried out by suitably experienced AECOM ecologists with expertise in the relevant subject areas.

Habitat Survey

9.3.18 A Phase 1 Habitat survey was carried out in accordance with the standard survey method published by the Joint Nature Conservation Committee (JNCC, 2010), by which areas of land are assigned standard habitat types and ecological notes are recorded. Notes were made for each habitat of dominant, typical and notable plant species, and any relevant ecological characteristics (particularly where relevant to habitat condition). These reflect conditions at the time of survey.

- 9.3.19 Concurrently with the Phase 1 Habitat survey, homogenous vegetation stands were classified according to the NVC as described in the relevant original NVC volumes (Rodwell 1991a, 1991b, 1992, 1995, 2000), with reference also to the NVC review and other guidance (Rodwell *et al*, 2000; Averis *et al*, 2004; Hall *et al*, 2004) that describe some additional vegetation types not covered in the original NVC volumes or provide additional advice. Vegetation was assigned to sub-community except where it did not fit published descriptions well, where close access was not possible, or where vegetation was of negligible ecological value (for example, bracken *Pteridium aquilinum* stands were not closely inspected). Since NVC communities often occur in patches too small to map amongst more extensive communities, or in complexes that cannot be feasibly mapped within a reasonable timescale, NVC polygons were described as mosaics where necessary. Where habitats lacked vegetation, or the vegetation did not correspond to a community described in the NVC volumes or other guidance, a brief descriptive term was given (for example, 'open water').
- 9.3.20 The survey was carried out on 4 and 5 June 2020 by a suitably qualified AECOM ecologist with extensive habitat survey experience, including in upland NVC. Habitat types were mapped with the aid of aerial photography and Global Positioning System (GPS) as necessary. The habitat survey extent covered the entire main Development Site, with the caveat that more distant parts of the site far from any part of the Proposed Development (including areas 800m to 1,000m or more south east of the Proposed Development, and more than 300m north west of the Proposed Development in the north-western moorland part of the site) were largely viewed from a distance with binoculars supplemented by inspection of aerial photography. For the access track from the A83 to the main Development Site, information in the 2016 EIA has been referenced, supplemented where necessary by observations from the track whilst accessing the main Development Site.

Bat Activity – Walked Transect Survey

- 9.3.21 A walked transect was planned and carried out according to standard guidance in Collins (2016). The transect route is shown on Figure 9.5 (EIA Volume 2b).
- 9.3.22 The transect route covered, within safety limitations for night work, potentially suitable habitats for bat foraging / commuting within the Development Site that are liable to be impacted by the Proposed Development or are representative of such habitat. In practice, given that the larger part of the Development Site is commercial forestry and that forestry rides and open moorland without tracks were deemed unsafe to walk across at night, the transect route followed the existing forestry track from the entrance of the main Development Site to Clachaig Water. This was in common with the transect survey informing the 2016 EIA.
- 9.3.23 This transect route passes numerous forestry rides of varying width as well as small watercourses, as well as passing by or near actual locations of proposed infrastructure. The track itself is situated in a particularly wide break in the mature forestry than connects the north east edge of the plantation with the semi-natural habitats along Clachaig Water, and is therefore amongst the more likely corridors in the Development Site along which bats might

forage or commute. Therefore, the transect route is considered highly representative and suitable in most respects. It did not, for the above-mentioned safety reasons, incorporate the open moorland part of the Site to the north west – this area was however subject to static detector monitoring (see Paragraphs 9.3.27 to 9.3.31).

- 9.3.24 In common with previous surveys informing the 2016 EIA, listening point locations were incorporated into the transect route, covering a range of features and habitats within the Development Site including watercourses, forest rides, areas of open clear-fell, and the dominant mature forestry plantation. At each of the ten listening points employed, surveyors stopped to listen and observe for bats for three minutes. The listening point locations are shown on Figure 9.5 (EIA Volume 2b).
- 9.3.25 The transect route was surveyed on foot three times, once per month in May, June and July 2020. Three visits were considered sufficient given the dominance of low suitability bat habitat in the Development Site. The transect was walked in different directions on different surveys in order to minimise the potential for temporal bias, and the pre-determined listening points were repeated on each transect. As far as possible, the surveys were spaced approximately four weeks apart. Survey details are provided in Table 9-3. Batlogger bat detectors were used during the transects, operating in full-spectrum mode.
- 9.3.26 Analysis of recorded bat calls was carried out using Kaleidoscope Pro software. As explained further below, no bat calls were recorded during the transects; however, 10% of the recorded noise files were checked by a competent bat call analyst as quality assurance to verify absence of bat calls.

Table 9-3 Bat activity transect details

Date	Start	End	Sunset	Weather
13/05/2020	21:06	22:48	21:25	No cloud, dry, no wind initially becoming gusty later, 4°C. Daytime beforehand was hot and dry; showers the previous night.
10/06/2020	22:09	23:25	22:05	Cloudy, gusty, drizzle at first becoming dry at approx. halfway point, 10°C.
16/07/2020	22:00	00:22	21:55	Clear, dry and warm with light wind, 16°C

Bat Activity – Static Detector Survey

- 9.3.27 Automated bat detectors were deployed at proposed turbine locations, or in nearby forest openings where proposed turbines were located in dense forestry. Owing to a change in layout design after the surveys were completed, detector 7 is further from the associated turbine T13 than was intended; however, the revised T13 location is in current dense forestry, and although there is a closer woodland ride than the clearing where detector 7 was placed,

the ride and clearing are connected by a nearby short ride, such that bat activity at detector 7 is likely to be little different from that of the ride nearer the revised T13 location.

- 9.3.28 Eight static detectors were deployed covering over two deployment periods. The detector locations covered all the habitat types in which the turbines are located as well as typical rides and clearings representative of habitats that would be created during keyholing or large-scale tree removal under the FLS (*unpublished*) updated Carradale LMP, and were spread through the Development Site. The locations of the static detectors are shown in Figure 9.5 (EIA Volume 2b). A combination of Wildlife Acoustics Song Meter SM2 and Song Meter SM4 automated detectors were used (detectors with reference numbers 3, 5, 7 and 8 were SM4 detectors, and the others were SM2 detectors). Sufficient detectors of precisely the same model were not available, however the SM4 is similar to and an upgrade of the SM2, and all were calibrated and set to record over the same time nightly periods. The locations included three on or beside the open moorland in the north west of the Development Site (dominated by blanket bog) and in other areas which could not for safety reasons be subject to a night-time walked transect (see Paragraph 9.3.22), near proposed turbines. The detectors were set to record from at least one hour before sunset to at least one hour after sunrise, and in all cases the microphone was located between 1m and 2m off the ground, secured to fencing if available or to a wooden stake or tree.
- 9.3.29 There were three detector failures during the static detector monitoring, which are set out in Table 9-4 along with details of deployment. However, no single detector failed on both deployments, therefore there is data from every detector. Note that the deployment periods shown are not derived from the dates that the detectors were put out and retrieved, but from the actual active recording periods, established from the summary / temperature logs of each detector. The number of recording nights is calculated from this information. The number of recording nights in May and June (excepting the above-mentioned failures) was 10 or more consecutive nights (mostly much more) apart from one detector which recorded for 9 consecutive nights; in July, differences in battery longevity resulted in recorded periods of 6 to 16 consecutive nights (excepting the above-mentioned failures).

Table 9-4 Static detector deployment details, number of recording nights each month, and habitat notes

Detector	Nearest turbine	Deployment 1	Deployment 2	Nights in May	Nights in June	Nights in July	Habitat
1 (SM2)	T01	11 May - 07 June	09 June – 08 July	21	29	8	Open moorland with blanket bog / flush, and small stream c.100m away.
2 (SM2)	T03	11 May - 08 June	09 June – 06 July	21	30	6	Open moorland with blanket bog, and small stream c.50m away.
3 (SM4)	T04	11 May - 10 June	Failed	21	10	0	Sitka plantation edge next to open moorland with small stream c.60m away.
4 (SM2)	T08	Failed	11 June - 07 July	0	20	7	By drain near edge of Sitka plantation, with marshy vegetation and bracken nearby.
5 (SM4)	T06	11 May - 10 June	10 June – 15 July	21	30	15	On forest ride within Sitka plantation.
6 (SM2)	T11	13 May - 09 June	Failed	19	9	0	Edge of Sitka plantation in the Clachaig Water valley, stream c.60m away.
7 (SM4)	T13	11 May - 10 June	10 June – 16 July	21	30	16	Edge of Sitka plantation by large opening within wider plantation including bog/marsh.
8 (SM4)	T05	11 May - 10 June	10 June – 15 July	21	30	15	Edge of Sitka plantation along wide ride with track through the wider plantation.

9.3.30 Night-time temperatures during the second static detector deployments were always above 7°C for all detectors, except at detector 1 (on the open moorland) on the night of 07/08 July when the overnight temperature dropped to a minimum of 5°C. For the first deployments, overnight temperatures fell below 7°C on several occasions (in particular between 11 and 15 May and 04 and 08 June, and in particular at detectors 1 and 6), but the majority of recording time was at 7°C or higher as summarised below:

- Detector 1: 71% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for 3.7%,
- Detector 2: 95% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for 2.3%,
- Detector 3: 84% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for 5.11%,
- Detector 4: 94% of nightly temperature log $\geq 7^{\circ}\text{C}$, never $<4^{\circ}\text{C}$,
- Detector 5: 98% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for $<0.1\%$,
- Detector 6: 76% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for 3.6%,
- Detector 7: 92% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for 2.6%,
- Detector 8: 89% of nightly temperature log $\geq 7^{\circ}\text{C}$, $<4^{\circ}\text{C}$ for 4.0%.

9.3.31 The SM2/SM4 detectors were set with standard settings such that a bat pass (or 'registration' in Ecobat – see below) equated to presence of any bat call in a 15 second sound file. Analysis of recorded bat calls was carried out using Kaleidoscope Pro software. Pipistrelle calls are generally reliably identified automatically by this software, however 10% of automatically-identified pipistrelle calls were checked by an ecologist competent in bat call analysis. All recordings identified by the software of other bat species were inspected to confirm identity, and 10% of noise files were also checked. A second stage of quality assurance was carried out in which a second bat call specialist checked all recordings identified during the initial analysis as problematic, and 10% of calls of each bat species.

Bat activity – Ecobat Analysis

9.3.32 All data collected by static detectors was uploaded to the Mammal Society Ecobat online tool (<http://www.ecobat.org.uk/>). This was carried out in September 2021. This tool compares bat activity data collected on the Development Site against other relevant bat activity records held within a large online database. It provides an objective assessment of the level of bat activity at the Development Site, relative to bat activity levels in the area within 100km. Relative activity levels are categorised into five percentiles groups. These are:

- low activity: 0 - 20th percentiles,
- low to moderate activity: 21st - 40th percentiles,
- moderate activity: 41st - 60th percentiles,
- moderate to high activity: 61st - 80th percentiles, and
- high activity: 81st - 100th percentiles.

- 9.3.33 Percentile analysis is based on the total number of bat passes each night for each species, compared to the values in the Ecobat reference database. Only nights when activity was recorded are included in the analysis (so the number of nights with bat activity will not necessarily match the number of nights the static detectors were deployed as shown in Table 9-4). The user can set parameters to refine the Ecobat reference records used in the analysis (the 'Reference Range') which for the purposes of this assessment included records using any bat detector but only within 30 days of the field survey dates shown in Table 9-4, and within 100km of the Site survey locations. Ecobat analysis results are considered reliable where the Reference Range comprises 200 or more records.

Otter and Water Vole Survey

- 9.3.34 Survey for otter *Lutra lutra* and water vole *Arvicola amphibius* was carried out between 11 and 15 May 2020 by suitably experienced AECOM ecologists along suitable water features within 200m of the Proposed Development, as far as access permitted. The survey followed guidance in published literature (Chanin, 2003; Liles, 2003; Strachan, 2007; Strachan *et al*, 2011; Dean *et al*, 2016) where appropriate to a site survey. Evidence of otter searched for included refuges (holts and lie-ups¹), spraints (droppings), footprints, trails and foraging signs. Spraints were recorded as fresh, recent or old according to their apparent age. Evidence of water vole searched for included latrines, individual droppings, burrows, trails and foraging evidence. The survey extended further than 200m from the Proposed Development where evidence of water vole was reported further afield in the 2016 EIA.
- 9.3.35 As described in the baseline in Section 9.4, some vole droppings were found during the survey that were intermediate in size between those of typical water vole and field vole *Microtus agrestis* and in viable water vole habitat. Samples of these were collected and sent to SureScreen Scientifics for eDNA analysis, the results of which are described in Section 9.4.

Badger, Pine Marten and Wild Cat Survey

- 9.3.36 Survey for badger, pine marten *Martes martes* and wild cat *Felis sylvestris* was carried out in suitable and accessible habitat within a minimum of 100m of all parts of the Proposed Development, between 11 and 15 May 2020. The potential of habitats to support these species was assessed, including their suitability for refuges and foraging, and field signs were searched for and recorded. The badger survey followed guidance in published literature (Scottish Badgers, 2018; Harris *et al*, 1989). Evidence of badger searched for included refuges (setts), spoil heaps, bedding, guard hairs, latrines, footprints, trails, scratch marks and foraging signs. Where found, possible setts were classed as main, annexe, satellite or outlier, and holes described as well-used, partially used or disused. The pine marten and wild cat surveys followed recommendations in Cresswell *et al* (2012), and evidence searched for included refuges (dens), scats (droppings), footprints, trails and potential foraging evidence.

¹ A holt is a well-enclosed otter refuge, such as a burrow. A lie-up (or couch) is semi-enclosed and of less importance.

Other Species

- 9.3.37 No dedicated red squirrel *Sciurus vulgaris* survey was carried out for the reasons given in the Limitations section below. However, any sightings of red squirrels or evidence of them (such as squirrel-eaten spruce cones) were noted if encountered during all fieldwork.
- 9.3.38 Observations of reptiles and notable invertebrates were recorded as encountered during all fieldwork. This is in common with the approach taken for the 2016 EIA.
- 9.3.39 Similarly, where fish were seen in streams the type (for example, salmonid) or species was noted where possible. However, a detailed fish survey was carried out by Argyll Fisheries Trust in 2015 to support the 2016 EIA, which has been referenced in this EIAR. Given that there has been no apparent change to the watercourses within the Development Site since 2015, and that the 2015 fish survey also considered the fish population to be likely landlocked, it is unlikely that there would have been any significant changes to the local fish populations and the results of the 2015 fish survey are still considered valid.

Limitations

- 9.3.40 Desk study information is dependent upon people and organisations having submitted records for the area of interest. As such, a lack of records for particular species does not necessarily mean that they are absent from the study area. Likewise, the presence of records for particular species does not automatically mean that these still occur within the area of interest or are relevant to the Proposed Development.
- 9.3.41 The likelihood of deviations from the baseline conditions reported in this Chapter increases with elapsed time since survey. While the baseline is not expected to change sufficiently to alter the impact assessment, the precise situation regarding protected / notable species may nevertheless differ at the time of construction.
- 9.3.42 As noted above, during the habitat survey those parts of the Development Site that are distant from the Proposed Development (including areas 300 to 1,000m or more south east of the Proposed Development, and more than 300m north west of the Proposed Development in the north-western moorland part of the Development Site) were largely viewed from a distance with binoculars supplemented by inspection of aerial photography and the previous survey informing the 2016 EIA. This is not a significant limitation, because habitats in these areas will not be affected directly or indirectly by the Proposed Development owing primarily to their distance from it and lack of hydrological or other connectivity.
- 9.3.43 No dedicated red squirrel *Sciurus vulgaris* survey was carried out. This is because the main Development Site is dominated by dense Sitka spruce *Picea sitchensis* plantation, which a) renders access within the plantation blocks very difficult, b) effectively conceals squirrel dreys (nests), and c) is of known low value to red squirrels (compared to other woodland types) and for which estimates of the typically-associated low red squirrel density are available in

published literature (such as in Harris and Yalden, 2008). This is not therefore considered to significantly affect the impact assessment.

- 9.3.44 There were some equipment failures during the bat activity static detector survey, which are detailed in the baseline in Section 9.4. However, given the low detected bat activity in both the transect and static detector surveys, which concurs with the findings of the 2016 EIA, this is not considered to significantly affect the impact assessment.
- 9.3.45 There were no other significant limitations to the desk study, field survey or subsequent analysis which could affect the reliability of this impact assessment. Note that COVID-19 did not limit the 2020 field surveys, which were progressed unhindered whilst adhering to all COVID-19 restrictions.

9.4 Baseline Environment

Designated Sites

Statutory Designations

- 9.4.1 International sites with solely ornithological interests (including Special Protection Areas (SPAs) and Ramsar sites with only bird interests) are dealt with in Chapter 10: Ornithology. There is one European site with non-avian interests within 10km of the Development Site. This is the Inner Hebrides and the Minches SAC, an extremely large marine site of almost 14,000km² located, at closest, approximately 8.5km north of the main Development Site, and 6.5km north of the access track. The sole qualifying feature is harbour porpoise *Phocoena phocoena*. This SAC is shown on Figure 9.1 (EIA Volume 2b).
- 9.4.2 There are no other European sites or other international nature conservation designations relevant to this Chapter within 10km of the Development Site. There are also no such designations at greater distances with significant connectivity (for example, via connected watercourses).
- 9.4.3 There are also no national statutory nature conservation designations within 2km of the Development Site, nor are there any located along watercourses connected to the Development Site.

Non-statutory Designations

- 9.4.4 There are no non-statutory local nature conservation sites (such as Local Nature Conservation Sites or similar) within 2km of the Development Site.
- 9.4.5 The Ancient Woodland Inventory (AWI) indicates that there is no type of ancient woodland within the Development Site or within 300m of it. The nearest woodland in the AWI is located approximately 340m north of the main access track at the closest point and this consists of

long-established plantation that is not considered native in the Native Woodland Survey of Scotland (NWSS). The nearest indicated semi-natural ancient woodland (the most valued type of woodland) is approximately 1km south west of the Development Site and approximately 2km from the Proposed Development itself, with intervening upland habitat and forestry. Ancient woodland is shown on Figure 9.2 (EIAR Volume 2b).

- 9.4.6 The NWSS indicates that there are native and nearly-native woodlands (that are not regarded as ancient in the AWI) immediately beside or very close to the lower section of the main access track, and also at the extreme western edge of the Development Site along Clachaig Water. The former clearly appears to be largely or entirely semi-natural broadleaved woodland along the often-steep banks of the Killean Burn, and the NWSS indicates that this is partly mature and dominated by birch *Betula* sp. The small narrow section of native woodland along Clachaig Water at the western extremity of the Development Site is also indicated to be birch-dominated. Other native woodlands in the NWSS are 400m or more from the Development Site boundary, and much further from the Proposed Development with intervening hills. NWSS native/nearly-native woodland is shown on Figure 9.2 (EIAR Volume 2b).

Habitats

- 9.4.7 Habitats are shown on Figure 9.3 (EIAR Volume 2b). Those habitats constituting moderate or high potential groundwater dependent terrestrial ecosystems (GWDTE) are shown on Figure 9.4 (EIAR Volume 2b). Excluding the access track between the A83 and the main Development Site, which utilises an existing large track regularly used by large forestry vehicles and existing wind farm traffic, the majority of the Proposed Development sits within commercial plantation dominated by Sitka spruce. Various openings and rides through this plantation primarily comprise fragmentary blanket bog, wet heath, species-poor purple moor-grass *Molinia caerulea* and acidic rush-dominated flush vegetation. Infrastructure at and leading to three turbines (T01, T03 and T04) lies within the non-wooded open moorland area to the north west. This is dominated by intact blanket bog (often a drier type, but very wet in places particularly in the farther west away from infrastructure), with localised but often substantial rush-dominated flushes. Blanket bog vegetation is also present near and occasionally at infrastructure in openings in the southern part of the plantation.
- 9.4.8 Note that in the southern part of the plantation (which was likely dominated by blanket bog before it was drained and planted) it was not always certain whether deep peat was present during the habitat survey. Many rides in this area contain blanket bog vegetation, and whilst some non-bog vegetation has been coded as degraded bog where demonstrably located on deep peat (which may be indicated by streams deeply incised into peat), peat probing results combined with factors such as slope and connectivity to other bog were employed to assist designation of degraded bog categories elsewhere in the plantation.
- 9.4.9 Areas within the Development Site but beyond the Proposed Development include the majority of the Clachaig Water valley (for the most part dominated by wet heath and rush-dominated vegetation), and extensive open moorland on hill ground to the east. The majority

of the latter is intact blanket bog, mostly a naturally drier type extending onto sloping ground, but including locally extensive very wet flatter areas with very abundant sphagnum.

Woodland and Scrub

- 9.4.10 Other than the commercial conifer plantation dominated by Sitka spruce, there is almost no woodland in the Development Site. At the extreme west of the Development Site, along Clachaig Water, there is a small amount of semi-natural woodland identified in the NWSS as upland birchwood; this is distant from any proposed infrastructure and was not inspected during the field survey. There are very localised patches of grey willow *Salix cinerea* scrub, mostly along Clachaig Water. Most of the grey willow scrub corresponds to NVC type W4, with, for example, rushes, occasional sphagnum and lower herb diversity; occasionally on steeper rocky sections it is closer to W7 with, for example, marsh hawksbeard *Crepis paludosa*, meadowsweet *Filipendula ulmaria* and (very rarely, east of turbine T07) beech fern *Phegopteris connectilis*. There is also a very small patch of hazel *Corylus avellana* beside Clachaig Water west of the proposed crossing, grassy beneath and therefore closest to NVC type W11. However, none of these patches of scrub are near proposed infrastructure.
- 9.4.11 Broadleaved woodland adjacent to or near the lower part of the main access track between the A83 and the main Development Site is largely birch-dominated and semi-natural, as indicated by the NWSS dataset and shown in the 2016 EIA. The upper part of the access route to the main Development Site is dominated by commercial conifer plantation dominated by Sitka spruce.

Blanket Bog

- 9.4.12 Outside the plantation and, in the southern part, along openings within it, blanket bog is the most common habitat. For the most part it is intact. The most frequent type is dominated by thick heather *Calluna vulgaris* and hare's-tail cottongrass *Eriophorum vaginatum*, with a more limited diversity and abundance of sphagnum in which *Sphagnum papillosum* is scarce and *Sphagnum capillifolium* the most common, and other large mosses of acid conditions abundant. This corresponds to the NVC type M19, which is a drier more boreal bog type. Both M19a and M19b are common at the Development Site. The former is in effect a transitional type towards the more oceanic M17, in this case with scattered purple moor-grass and occasionally cross-leaved heath *Erica tetralix*, but otherwise conforming to M19 in the lower abundance of sphagnum, abundance of other large mosses of acid conditions such as *Pleurozium schreberi*, and dominance of heather / hare's-tail cottongrass. M19b is more typical and acts as the default sub-community, here containing frequent to abundant bilberry *Vaccinium myrtillus*. M19a and M19b are both present in the north-western open moorland at the infrastructure locations. In particular M19b is abundant in the eastern open moorland. Where intact blanket bog vegetation occurs along plantation rides, it is almost always a form of M19.

- 9.4.13 M19c was also very locally recorded in the eastern open moorland. This is a higher altitude form which is here indicated by the regular presence of cowberry *Vaccinium vitis-idaea*.
- 9.4.14 The wetter oceanic blanket bog type, M17, occurs on more level waterlogged areas in both the north-western and eastern open moorlands. Mostly it is M17a, which is very wet with reduced heather vigor, more cross-leaved heath and much more *Sphagnum papillosum*, often in substantial sheets. The M17a often also contains much bog asphodel *Narthecium ossifragum*. A small proportion of the eastern moorland was classified as M17b – in these areas, there tends to be a moderate hummock-hollow development, with the drier hummocks often supporting the moss *Racomitrium lanuginosum* and sphagnum in the hollows. Deergrass *Trichophorum germanicum* can be present in M17, but it is rare at the Development Site, generally only occurring where there is some pressure from grazing or regularly-walking livestock.
- 9.4.15 It should be noted that these blanket bog types grade into each other and are floristically similar, such that the mapped boundaries are often necessarily approximations, and should not be regarded as sharp separations, since in many cases the transition is not sudden but gradual.
- 9.4.16 Within the plantation, some forest rides (particularly near turbine T13) have been largely coded as degraded bog. Vegetation here mostly corresponds in NVC terms for wet heath (M15b) and purple moor-grass (M25a), but was demonstrably on deep peat as shown by stream / ditch incisions, or suggested by the results of the peat probing given in the 2016 EIA. Where such vegetation communities occur on deep peat, the habitat is degraded bog.
- 9.4.17 The uppermost part of the existing access track from the A83 to the main Development Site passes through another area of intact blanket bog, as shown in the 2016 EIA.

Heathland

- 9.4.18 Heathland mostly occurs in the survey area as wet heath of NVC type M15, and mostly as the typical sub-community M15b, which is a very common vegetation type in western Scotland. All wet heath is potential GWDTE. In this case, it is usually dominated by heather and purple moor-grass, with frequent to abundant cross-leaved heath. It is normally not species-rich, although there is occasionally bog asphodel. It occurs most frequently along plantation rides (where it is sometimes on deep peat constituting degraded blanket bog) and on more steeply sloping ground on the open moorland.
- 9.4.19 In one location in the north of the survey area, well beyond any infrastructure, a small amount of M15a was found. This is a flushed form of wet heath, and was mapped as flush, here containing abundant carnation sedge *Carex panicea*, as well as bog asphodel and sharp-flowered rush *Juncus acutiflorus*.
- 9.4.20 Dry heath is rare at the Development Site and is confined to small patches and strips on the steepest and/or driest ground. Mostly it is H12, dominated by heather and rather species-

poor, with acid mosses and often bilberry. More occasionally there is H10, in which essentially similar vegetation is supplemented by bell heather *Erica cinerea* with less or no bilberry; this is mostly on slopes with a more southerly aspect. Also present in very small quantity is H21, on a few north-facing steep slopes; this is similar to the H12, but owing to the degree of shade includes a significant amount of *Sphagnum capillifolium* amongst the other mosses (whilst lacking other species that would indicate true wet heath).

- 9.4.21 The only heathland likely to be affected by the Proposed Development is small amounts of standard relatively species-poor M15b wet heath. Along the existing forest track such vegetation has often already been subject to disturbance.

Flush and Fen

- 9.4.22 All flush vegetation is potential GWDTE. Acidic flush vegetation dominated by rushes is common throughout the Development Site, although often in patches too small to map. More substantial areas have been mapped. In almost every case the flush vegetation is acid and dominated by either soft rush *Juncus effusus* or sharp-flowered rush, typically with at least some sphagnum, usually *Sphagnum palustre* and/or *Sphagnum fallax*, less often (at this site) also with the large moss *Polytrichum commune*. This vegetation corresponds to NVC types M6c (with soft rush dominant) and M6d (with sharp-flowered rush dominant). The associated flora is limited with species such tormentil *Potentilla erecta*, marsh violet *Viola palustris*, marsh thistle *Cirsium palustre* and sometimes common sorrel *Rumex acetosa*. There is sometimes little difference between this vegetation and M23 neutral rush-dominated vegetation (see Grassland and Marshy Grassland below), aside from the absence of sphagnum and usually also of tormentil, and the two types sometimes occur in close proximity and grade into each other.
- 9.4.23 The largest such flush is in the vicinity of turbine T01. This is mainly M6d, but there is also a minor component of M17 bog vegetation in mosaic here with *Sphagnum papillosum* and hare's-tail cottongrass. On the north side of the stream in this vicinity there is also a significant amount of M10 flush – this is a more local type of basic flush, here with abundant dioecious sedge *Carex dioica*, a typical M10 species. Whilst M10 can be rather open and mossy, this flush is densely vegetated, the moss component is not large and it grades outwards into M6d acid flush vegetation with sharp-flowered rush dominant. However, the proposed infrastructure is on the opposite side of the stream from this basic flush.
- 9.4.24 M10 basic flush with dioecious sedge was also noted in a low wet area in the substantial clearing south-west of turbine T13. Connected to this wetland is a small amount of M4 flush – this is similar to M6 acid flush, but dominated by bottle sedge *Carex rostrata*. Connected to this is an unusual but very small patch of transitional vegetation resembling wet heath but with common reed *Phragmites australis* growing through it. M4 was also noted in small quantity elsewhere, but not near proposed infrastructure.

- 9.4.25 In the eastern moorland there are a number of mapped larger flushes running down to the plantation, which are typically M6d with smaller areas of M6c, rarely also containing a very small amount of M10 basic flush vegetation.

Grassland and Marshy Grassland

- 9.4.26 The majority of grassland in the Development Site is marshy grassland, which is potential GWDTE. In most cases this is visually similar to M6 flush vegetation, typically with sharp-flowered rush also dominant (occasionally soft rush), but here lacking sphagnum and usually also lacking tormentil. Typical associates include marsh violet, marsh bedstraw *Galium palustre* and marsh thistle. The base status of the vegetation can vary over short distances such that this marshy grassland grades into M6 acid flush vegetation with sphagnum and/or *Polytrichum commune*. Some M23a in forest rides includes lesser celandine *Ficaria verna*, a woodland species which is likely present owing to the extensive shade given by the conifer plantation.
- 9.4.27 Occasionally there are occurrences of marshy grassland comprising NVC type M25 invariably along forest rides. The forms present are overwhelmingly dominated by purple moor-grass. Most corresponds to M25a, which is closely allied to wet heath, but has a low cover of ericoids and is generally species-poor. Some is particularly species-poor with very little other than purple moor-grass, which has been coded as 'M25sp'. Where this vegetation occurs on deep peat, it is degraded bog and has been coded as such.
- 9.4.28 Dry grasslands are localised in the main Development Site, and usually sub-components of mosaics. Mostly they comprise acid grassland corresponding to NVC type U4a, with the key vascular plant indicators of heath bedstraw *Galium saxatile* and/or tormentil, and grasses such as common bent *Agrostis capillaris* and sweet vernal-grass *Anthoxanthum odoratum*. The largest single extent of such acid grassland is at abandoned pasture in the vicinity of a ruined shieling west of turbine T11, which notably contains large swathes of bluebell *Hyacinthoides non-scripta*.
- 9.4.29 There are also rare occurrences of NVC type U5, another acid grassland dominated by mat-grass *Nardus stricta*. These were only found in the eastern open moorland, on slopes above the plantation, and included small amounts of a heathy form with fragmentary heather, and a very small amount of a flushed and moderately rich form containing carnation sedge *Carex panicea* and bog asphodel.
- 9.4.30 Occasionally, small patches of vegetation were recorded that were dominated by soft rush but without indicators of marsh or flush, and instead plants associated with dry acid grassland such as heath bedstraw and common bent. This type of vegetation has been recorded elsewhere (see e.g. Averis *et al* 2004) and is best regarded as a form of acid grassland.

Other Habitats

- 9.4.31 Bracken stands occur in some drier forest openings, most extensively along the Allt Achadh a'Choirce. These correspond to NVC type U20a, and are closely related to U4 acid grassland. Bracken stands are not of any particular note.
- 9.4.32 Very locally on the eastern open moorland, small amounts of vegetation were recorded on steeper slopes dominated by great woodrush *Luzula sylvatica*. These are species-poor, correspond to NVC type U16, and indicate a reduction in grazing pressure.
- 9.4.33 There is an old quarry, with negligible vegetation, beside the entrance to the main Development Site. Natural rock exposure occurs occasionally on the eastern moorland. The rock exposures are largely bare, and no notable species were observed there.

Protected Species

Bats

- 9.4.34 No trees with bat roost suitability were found in the Development Site. This is not unexpected given that Sitka spruce is the dominant tree, and broadleaved trees are few and small (mainly grey willow, with fewer small birches and extremely rarely hazel). Visible structures in the Development Site comprise historic ruined shielings with no roofs and for the most part only fragmentary walls, which were concluded to have negligible bat roost suitability.
- 9.4.35 No bat activity was detected during any of the walked transect surveys. This is similar to the results of the surveys informing the 2016 EIA which recorded only one pass (detected only visually but considered to be a pipistrelle *Pipistrellus* sp., in June 2015) during walked and driven surveys along the same transect line.
- 9.4.36 Limited bat activity was recorded by the static detectors. The static detectors mostly recorded common pipistrelle *Pipistrellus pipistrellus* and soprano pipistrelle *Pipistrellus pygmaeus* (together representing approximately 80% of registrations). The remainder largely comprised *Myotis* sp. calls, with a very small number (five registrations) of brown long-eared bat *Plecotus auritus*. The exact identity of the *Myotis* calls could not be determined from the recordings with certainty; however, they were considered likely to include both Daubenton's bat *Myotis daubentonii* and Natterer's bat *Myotis nattereri*.
- 9.4.37 Ecobat analysis provided the percentage of nights during which bat activity fell into each of the percentile bands described in Paragraph 9.3.32, for each species recorded, as shown in Table 9-5. Note that Ecobat recommends a Reference Range value of 200 or higher to be confident in the relative activity level provided, however the Ecobat Reference Range was sufficient in all cases (4245 for common pipistrelle, 6649 for soprano pipistrelle, 1819 for *Myotis* spp. and 207 for brown long-eared bat).

Table 9-5 Percentage of nights at different activity levels per detector and species

Detector	Species	Percentage of nights of each activity band				
		High	Moderate to high	Moderate	Low to moderate	Low
1	Common pipistrelle	-	-	1.7	-	1.7
	Soprano pipistrelle	-	-	1.7	-	1.7
2	Common pipistrelle	1.8	1.8	1.8	-	3.5
	Soprano pipistrelle	-	-	-	-	7.0
3	Myotis sp.	-	9.7	6.5	-	12.9
	Common pipistrelle	16.1	9.7	3.2	-	-
	Soprano pipistrelle	3.2	9.7	3.2	-	6.5
	Brown long-eared bat	-	-	3.2	-	3.2
4	Common pipistrelle	-	14.8	11.1	-	7.4
	Soprano pipistrelle	-	11.1	-	-	22.2
5	Myotis sp.	-	6.1	6.1	-	16.7
	Common pipistrelle	3.0	7.6	4.5	-	9.1
	Soprano pipistrelle	-	3.0	1.5	-	4.5
	Brown long-eared bat	-	-	-	-	1.5
6	Common pipistrelle	3.6	3.6	14.3	-	10.7
	Soprano pipistrelle	-	3.6	3.6	-	7.1
7	Myotis sp.	-	6.0	14.9	-	13.4
	Common pipistrelle	7.5	11.9	6.0	-	6.0
	Soprano pipistrelle	-	1.5	1.5	-	10.4

Detector	Species	Percentage of nights of each activity band				
		High	Moderate to high	Moderate	Low to moderate	Low
8	Brown long-eared bat	-	-	-	-	1.5
	Myotis sp.	-	19.7	13.6	-	16.7
	Common pipistrelle	1.5	6.1	7.6	-	10.6
	Soprano pipistrelle	1.5	4.5	4.5	-	4.5

9.4.38 Ecobat summary information for all eight static detectors together is shown in Table 9-6.

Table 9-6 Ecobat summary activity levels per species

Species	Median percentile	95% CI	Max percentile	Nights recorded
Myotis sp.	46	32 – 53.5	77	84
Common pipistrelle	46	68.5 – 93.5	98	88
Soprano pipistrelle	3	3 – 53.5	87	51
Brown long-eared bat	3	24.5 – 24.5	46	4

9.4.39 The Ecobat analysis suggests that common pipistrelle activity on Development Site is Moderate when compared to the surrounding 100km area. Median percentile is low for soprano pipistrelle, suggesting Low activity level, but given the particularly wide confidence interval for this species and on a precautionary basis the activity level of soprano pipistrelle is considered best treated as Moderate. *Myotis* sp. activity is also Moderate compared to the surrounding area, whilst brown long-eared bat activity is Low, with five registrations on three nights only.

9.4.40 Ecobat analysis of the timing of registrations compared to sunset suggested that bats likely did not originate from nearby roosts, which is expected given the negligible roost suitability of habitats in the area discussed above.

9.4.41 The greatest proportion of *Myotis* sp. registrations were along the existing access track through the main Development Site, in the forest break containing Allt Achadh a'Choirce (near T10), and at a larger forest clearing near turbine T13. These are clear potential commuting routes and connect to Clachaig Water and from there downstream to lower altitude habitats. Smaller numbers were recorded higher up the Allt Achadh a'Choirce at the forest edge (near T04). Common pipistrelle registrations were most frequent at this last location, and also at the clearing near T013. Soprano pipistrelle was considerably less commonly recorded than common pipistrelle, and was more generally distributed, with the most registrations along the

existing access track, and the least at detectors 1 and 2 (on the open moorland). Brown long-eared bats occurred rarely at three detectors only, along the existing access track, at the clearing near T13 and at the forest edge by the Allt Achadh a'Choirce (near T04).

- 9.4.42 The least amount of activity for all species occurred at detectors 1, 2, 4 and 6. Detectors 1 and 2 were located near turbines T01 and T02 on the open moorland in the north west of the Development Site, which would be unlikely to record a great deal of activity unless species specialising in foraging in large open areas were present, such as noctule *Nyctalus noctula*, which were not recorded. Detectors 4 and 6 were at the nearest available opening to turbines T08 and T11 in the plantation, and although these were in forest breaks containing streams, where bat activity may be more concentrated, these breaks are wide and the detectors at the forest edge closest to the proposed turbine locations.

Otter

- 9.4.43 The otter survey found no confirmed otter refuges (holts or lie-ups/couches). However, the presence of spraints and footprints clearly indicates that otters forage or commute along several of the watercourses in the Development Site.
- 9.4.44 Eighteen otter spraints were found within the Development Site (see Figure 9.6; EIA Volume 2b). Seventeen of these were along Clachaig Water, which is most closely approached by, but approximately 100m from, turbine T11. The majority of the spraints were old. Clachaig Water is the largest watercourse in the Development Site (although still rather small), and is known to contain brown trout *Salmo trutta*, which were seen during the field surveys. The local population of brown trout likely represents a good foraging resource for otters. Although no evidence of otter refuges was found along this watercourse (or any others), there is opportunity for otters to lie up in the many adjacent densely rushy areas of vegetation. Cavities beside watercourses which offer potential for use by otters, but where no evidence was found of such occupancy at the time of survey, are also shown on Figure 9.6 (EIA Volume 2b). They are shown because they would be relevant to pre-construction surveys.
- 9.4.45 The only other spraint recorded was found on the Allt Achadh a'Choirce, which runs through the north west moorland area before dropping through a wide forest ride to Clachaig Water, but several otter footprints were also found along this watercourse indicating recent presence. Although, again, no otter refuges were found, occasional larger steep slopes beside or near the watercourse offer potential for holt establishment, and more densely vegetated areas of rushes and bracken offer potential good shelter for lie-ups. This stream probably also contains brown trout, since they were seen along Clachaig Water upstream of the confluence, and this prey resource is probably why otters are travelling along it.
- 9.4.46 The main access track from the A83 to the main Development Site passes near Killeen Burn. Two otter holts were found along this stream during surveys informing the 2016 EIA, and it is likely that they are still present given the steep slopes and wooded environment. It is also

possible that other otter refuges may be present. However, this could not be investigated during the 2020 otter and water vole site survey due to issues with accessing this area.

Water Vole

- 9.4.47 The surveys found that several sections of watercourse within the survey area were potentially suitable for water vole, with partially peaty banks, reasonably slow water flow, small to very small stream size, and potential for foraging amongst rushes *Juncus* spp. However, water depth was often not sufficient for a water vole to dive into and only locally deep. The better stretches were in particular noted along parts of a) Clachaig Water, b) a few small tributaries that cross the existing forestry track through the Development Site, and c) the uppermost part of the Allt Achadh a'Choirce.
- 9.4.48 In many cases, the only vole latrines / droppings found during the survey were without any doubt those of field vole, owing to small dropping size, with no other possible suggestion of water vole, such as larger burrows, runs, footprints or foraging remains. Field voles commonly occur in the same types of damp bankside habitat that water vole prefer, such as rush-dominated vegetation, but the droppings of field vole are typically 6-7 x 2-3mm in size, compared to a typical size of 8-12 x 3-4mm for water vole (see, for example, Harris and Yalden, 2008).
- 9.4.49 No burrows were found of convincing water vole size. However, three locations were found with larger droppings than is typical for field vole, including some around 9mm long and slightly more than 3mm in width. Two of these locations were close together either side of the existing forestry track in extensive rush-dominated wet vegetation containing a very small stream culverted under the track, where there were also some rather large foraging fragments. The other was more distant from the Proposed Development, in the same location as water vole evidence had been reported in surveys informing the 2016 EIA. These locations are marked as water vole eDNA sample locations 2 and 3 on Figure 9.6 (EIAR Volume 2b). Such dropping measurements were considered large for field vole, but at the lower end of the scale for water vole, and not considered conclusive. Consequently, sample sets of droppings from all of these locations were sent to SureScreen Scientifics for eDNA analysis. There were also three other locations, none particularly close to the Proposed Development, with droppings likely to be those of field vole but towards the upper end of the size range, and two sample sets of such droppings were also sent for eDNA analysis, marked as water vole eDNA sample locations 1 and 4 on Figure 9.6 (EIAR Volume 2b).
- 9.4.50 The eDNA tests identified all the samples as field vole. The similarity of the sections of amplified DNA sequences from the gathered samples to the laboratory field vole reference samples ranged from 95% to 100%, with no reported issues affecting the analyses or the conclusions. This is regarded as conclusive that the samples originated from field vole and not water vole.

Badger

- 9.4.51 No evidence of badger was found anywhere in the main Development Site. The dominant habitats of commercial Sitka spruce plantation and blanket bog are highly sub-optimal for badger, offering little in the way of foraging resources, and in particular will lack earthworms or contain a very low density of them. Such habitat extends for some distance around the main Development Site, such that the likelihood of badgers occurring there is slim. Badgers may occasionally enter the open areas of the main Development Site when berries are available on plants such as bilberry, which represents a possible foraging resource. Such plants occur in the eastern open part of the main Development Site, and in the north west open area, and are in fruit in quantity for parts of the late summer and autumn. Badgers would be likely to avoid the wetter areas of bog and flush regardless. Since this resource is highly seasonal, and there is little other reason for badgers to enter the main Development Site, it is highly unlikely that badger setts would be established within it. Although badger setts occasionally occur in spruce plantation, this would typically be within close distance of reliable foraging resources.
- 9.4.52 Habitat along the lower parts of the access track, nearer the A83, are more suitable for badger, with areas of pasture and broadleaved woodland likely to support, at least in places, good earthworm foraging resources, and with potentially good sett establishment habitat in the sloping lower woodlands. However, no badger evidence was reported in the 2016 EIA in this area, and it is likely that badger density in the region remains low.

Pine Marten

- 9.4.53 Mammal scats were frequently found along the existing forestry track through the main Development Site. Many were old, and although often having some resemblance to pine marten scats in being narrow and exhibiting twisting, they were often rather large and not reliably assigned to either pine marten or fox *Vulpes vulpes*. Two scats, however, bore close similarity to those of pine marten in size, darkness and faint scent. Acknowledging that use of scent for this purpose, even by specialists, is known not to be fully reliable, it is nevertheless thought likely that these particular scats were deposited by pine marten (see Figure 9.6; EIA Volume 2b).
- 9.4.54 The habitat in the main Development Site, and along much of the access track from the A83, offers good potential for pine marten. The blanket bog areas to the south east were noted to often contain frequent burrows of field vole, which is also known to be present along forestry rides and beside watercourses through the plantation. Field vole is a one of the primary foraging resources for pine marten. The forestry plantation itself is likely to offer less in terms of foraging, although other small mammals and small bird nests will occur here and it provides good cover. The trees are unsuitable for pine marten refuges because they contain no large cavities, and there do not appear to be any substantial natural rock exposures with possible rock cavities in the plantation. One ruined stone structure of man-made origin (see Figure 9.6;

EIAR Volume 2b) was noted to contain cavities that a pine marten could potentially rest within, although no evidence was found of this.

- 9.4.55 However, the sloping ground to the south east of the plantation, rising to hilly blanket bog, includes small rock exposures, boulders and in places dense heather, amongst which pine marten could establish dens. A pine marten den was found in this setting, at the location shown on Figure 9.6 (EIAR Volume 2b). The den consisted of highly worn areas beneath the low overhangs of two very large boulders and amongst rushes / heather, including 'tunnels' through the vegetation leading from the boulders to a nearby cavity in the peat hidden amongst thick heather, and a possible second cavity under the rear of one of the large boulders. The identity of this refuge as a pine marten den rather than a refuge of another mammal was arrived at for the following reasons: a) one of the worn areas under the boulders contained scats but was far too low for a fox to access and deposit scats; b) the 'tunnels' through the vegetation were in places also too small to have been made by fox; c) the scats (of which approximately twenty were found in the den vicinity) were very small for fox but large for stoat *Mustela erminea*, and certainly not otter spraints; and d) the scats were typical of pine marten being very dark, twisted and (where fresh) not badly-scented. There is therefore considered to be little doubt that this is a pine marten den.
- 9.4.56 However, the above den is located approximately 740m from the nearest part of the Proposed Development, with extensive intervening forestry. It is not likely that pine marten dens will occur in proximity to the Proposed Development for the reasons given above. Aside from the discovery of the pine marten den on the hillside, the above findings broadly agree with those of the 2016 EIA.

Wild Cat

- 9.4.57 No evidence of wild cat was found during the fieldwork. The Development Site is within the known distribution of wild cat (see, for example, Harris and Yalden, 2008), but is not, as noted in the 2016 EIA, a critical area. Favoured wild cat habitat comprises a mixture of natural open and wooded habitats, which does not apply to the main Development Site owing to a lack of native woodland. However, the field vole populations on the open moorland areas and along forest rides provide, as they do for pine marten, a foraging resource. Small birds, particularly when nesting in the breeding season, are also potential prey. Wild cat may therefore occasionally occur within the Development Site. However, there appears to be negligible opportunity for wild cat dens in the plantation or near the Proposed Development. It is possible that wild cat could establish a den amongst rocks, etc., on the hillside to the south east, in a similar manner to the discovered pine marten den, but this would be similarly remote to the Proposed Development. Wild cat could also occur in habitat adjacent to the existing main access track from the A83, which runs past native broadleaved woodland.

Red Squirrel

- 9.4.58 No sightings or evidence of red squirrel were recorded during the fieldwork. The area is within the distribution of red squirrel, but Sitka spruce plantation is less favourable than other types of woodland for red squirrel, and densities in such woodland are known to be low (see, for example, Harris and Yalden, 2008). Red squirrel may occur near the main access track from the A83, which runs past broadleaved woodland. The lack of records of red squirrel accords with the findings of the surveys informing the 2016 EIA.

Notable Species

Fish

- 9.4.59 A fish survey was carried out by Argyll Fisheries Trust in 2015 to support the 2016 EIA, comprising electrofishing sampling and a thorough habitat suitability assessment in accordance with Scottish Fisheries Coordination Centre and SEPA guidance. There does not appear to have been any change to the watercourses in the Development Site since that time, nor is this likely for such remote upland watercourses. The 2015 fish survey also considered that the fish population was likely to be landlocked (see next paragraph). The results of the 2015 fish survey are therefore still considered valid.
- 9.4.60 The 2015 fish survey found brown trout at most sampling sites on Clachaig Water and Allt Achadh a'Choirce (which runs through the north west moorland area). These were considered likely to be landlocked owing to a number of bedrock waterfall and cascade obstacles that were considered impassable in an upstream direction. Fine sediment (peat) was prevalent in low gradient sections, and bedrock in high gradient sections, which are less favourable for salmonids than the moderate gradient sections with mixed coarse sediments. Habitat for spawning and young juvenile salmonids was limited. Pools suited to adult fish were mostly recorded on Clachaig Water. Smaller tributaries of Clachaig Water and Allt Achadh a'Choirce were generally unsuitable for fish but might in places be used for recruitment. The density of brown trout was relatively low but similar to other landlocked populations in such habitat.

Reptiles

- 9.4.61 The 2016 EIA recorded occasional occurrences of adder, as well as common lizard *Zootoca vivipara*. Adder was again found in 2020, but in a different location, as well as both common lizard and slow worm *Anguis fragilis*. These three species comprise all the native reptiles that exist in Scotland. Adder is by far the most notable of these owing to overall national declines, although Argyll is amongst the places where adder is still relatively common. Common lizard is a common and widespread species, and in combination with the observed sightings it can be assumed to be present in all suitable habitat where there is potential for basking, dense ground cover and foraging. These conditions are met in all open moorland areas as well as other areas with thick ground vegetation and reasonable exposure to direct sunlight, including wider forest rides (especially those with a southerly aspect) and the existing track through the main Development Site (where the track itself was observed to be used by a lizard for basking,

and adjacent thick vegetation for cover). Although slow worm was only sighted once, this species is also widespread and can also be assumed to be likely present in the open moorlands and along suitable forest rides / track.

Amphibians

- 9.4.62 The desk study did not find any evidence of the presence of rare or notable species of amphibian in or near the Development Site. There are no bodies of standing water suitable for great crested newt *Triturus cristatus* in or within 500m of the Development Site. Standing water is rare in the Development Site, and no ponds or pools are located near the Proposed Development, thus there is limited potential for the more common amphibian species.

Freshwater Pearl-Mussel

- 9.4.63 A freshwater pearl-mussel *Margaritifera margaritifera* survey was carried out by Argyll Fisheries Trust in 2015 to support the 2016 EIA, in line with NatureScot guidance. There does not appear to have been any change to the watercourses in the Development Site since that time, nor is this likely for such remote upland watercourses. The results of the 2015 freshwater pearl-mussel survey are therefore still considered valid.

- 9.4.64 The 2015 freshwater pearl-mussel survey found no favoured habitat for this species. Favoured habitat comprises sand and gravel that are protected from scouring by boulders. Boulders were common in the watercourses, but rarely with sand or gravel. Therefore, it is unlikely that any recruitment of freshwater pearl-mussel takes place. No live or dead freshwater pearl-mussels were seen.

Other Invertebrates

- 9.4.65 The butterfly green hairstreak *Callophrys rubi* was noted in several places during the 2020 field surveys, on moorland to the south and on large open forest rides towards that area. The Development Site is within the known distribution of this species, which is not red-listed (Fox *et al* 2010) but is considered to be of 'medium' priority by Butterfly Conservation.

- 9.4.66 The forestry plantation, largely of Sitka spruce, that dominates the main Development Site is not likely to support an invertebrate assemblage of note. Significant invertebrate assemblages are more likely to occur in the better quality and more natural habitats identified in the habitat survey, such as the open moorland areas, larger forest rides with marshy grassland, flush and moorland habitats, and Clachaig Water and Allt Achadh a'Choirce watercourses.

Future Baseline

Baseline at Time of Construction

- 9.4.67 Construction of the Proposed Development is anticipated to commence in 2023/24. Prior to the commencement of construction, the majority of the conifer plantation woodland within which the Proposed Development is sited will be clear felled by FLS (with the exception of

small areas around T02, T04, T05, T06, T08, T11 and T13, several of the proposed borrow pits, other compound hard-standings and access tracks) (see Figures 17.4 and 17.6; EIAR Volume 2b). This FLS felling is being undertaken for timber harvesting purposes as part of the planned commercial management of the forest, as set out in the updated Carradale Land Management Plan (FLS, *unpublished*), covering the Development Site. To facilitate the Proposed Development, the Applicant will conduct additional felling as set out in Chapter 17 of this EIAR: Forestry (see especially Figure 17.6 EIAR Volume 2b).

9.4.68 Timber harvesting by FLS within the construction boundary of the Proposed Development is scheduled in the updated Carradale Land Management Plan (FLS, *unpublished*) to take place between 2022 and 2030, with an intervening period potentially of up to two years between felling and construction in some places. There is consequently the potential possibility for there to be varying degrees of natural regeneration of vegetation across areas opened up through tree removal.

9.4.69 However, in a study of clear-felled plantation forests in upland locations in the UK, Spracklen et al (2013) found that mean vascular plant coverage of the ground was 19% two years after clear felling, compared to 111% (a value of more than 100% coverage can be achieved by overlapping of different layers of vegetation) ten years after felling. Vegetation after clear felling was largely composed of wavy hair-grass *Avenella flexuosa* and tufted hair-grass *Deschampsia cespitosa* and did not include species more typical of open moorland habitats, such as heather and heath bedstraw, until later. Particularly in wetter oceanic areas of Scotland, soft rush is also a likely species to colonise clear-felled areas.

9.4.70 At the time of construction, therefore, the Development Site will potentially be substantially different from the situation in the 2014 to 2020 survey period, in that most of the forestry in areas identified in Figure 17.6 (EIAR Volume 2b) will be felled, and the clear-felled area, although in many cases intended to be restored to open peatland, will likely contain only limited amounts of vegetation. However, most of the protected and notable species identified in the baseline desk study and field surveys are not reliant on the Sitka-spruce dominated plantation. Indeed, there is frequently a paucity of evidence of protected and notable species in the Development Site, with the exception of otter and pine marten. The status of the following taxa would be expected to remain similar at the time of construction, despite the tree felling, for the reasons given:

- Badger – there is no current evidence of badger in the main Development Site, and although they may enter it at times to forage on moorland for seasonal berries, this would remain the case after felling. The felled areas would not have any particular value to badgers, similarly to the existing spruce-dominated plantation. Therefore, the status and distribution of badger would likely remain similar to the existing baseline,
- Otter – otter is largely confined to the vicinities of watercourses and waterbodies, and this would remain the case after felling. Since the more substantial watercourses run through existing and often wide breaks in forestry, and there are no bodies of standing

water in the forestry area, the status and distribution of otter would likely remain similar to the existing baseline,

- Water vole – there is no current evidence of water vole in the Development Site, and this would likely remain the same at the time of construction,
- Pine marten – the Sitka spruce-dominated plantation offers little opportunity for refuges, and given the recorded pine marten den in the south-eastern open moorland and the observed abundance of field vole prey in that area, it is likely that pine marten spends more time foraging in this moorland and other non-wooded parts of the main Development Site than the forestry. It would certainly not be dependent on the forestry, and although it may currently use it to forage for small birds, etc., prey abundance appears likely to be higher in the open habitat areas. The felled forestry areas may eventually be colonised by small mammals, such as field vole, as vegetation develops, but, as noted above, vegetation growth would likely not be sufficient for this to be significant by the time of construction. Therefore, the distribution and status of pine marten would likely remain similar to the existing baseline,
- Wildcat – if present, the same reasoning given above for pine marten also applies to this species, and its distribution and status would likely remain similar,
- Reptiles – the felled forestry areas would eventually develop reasonable vegetation cover and would then likely provide a reasonable invertebrate foraging resource for reptiles, as well as basking and refuge opportunities. However, as noted above vegetation growth is unlikely to be sufficient by the time of construction for this to be significant, therefore reptiles will likely be largely confined to the same open habitat areas that currently exist,
- Amphibians – there is little potential for amphibians in the Development Site, given the shortage of suitable standing water, and this would remain the same,
- Fish – the felling operations by FLS would be expected to be carried out under appropriate protocols to avoid gross sedimentation or other pollution of watercourses. Therefore, the existing complement of fish species, which includes brown trout, would likely remain unchanged, and,
- Invertebrates – there is no evidence of freshwater pearl-mussel in the Development Site and this would remain the same. Habitat utilised by green hairstreak butterflies would remain intact. Habitat that could support significant invertebrate assemblages (watercourses and moorland, flush and marshy grassland habitats) would be unaffected or largely unaffected. Therefore, no significant change from the baseline is likely for notable invertebrates.

9.4.71 For the following taxa, however, there is likely to be a change in distribution:

- Bats – the FLS woodland management strategy will result in a net reduction in woodland cover at the time of construction, in preference to the best-practice restoration of open peatland where the existing plantation is on deeper peat. In addition to peatland restoration, native tree planting is planned by FLS in several areas and this would in time

increase the favourability of the Development Site for bats. However, at the time of construction any such planting, if it has been undertaken, would comprise only very small recently-planted trees, which would likely have only a limited positive effect on bat numbers. Given also that only low numbers of bats were detected in the baseline field surveys, in common with the 2016 EIA, it is anticipated that the numbers of bats using the Development Site at the time of construction would remain low and not be significantly different from the baseline. However, since the recorded bat species often tend to follow woodland edges and rides (and watercourses), their local distribution would likely change to be biased towards the retained woodland edges (and watercourses). Where infrastructure passes through wide clear-felled areas, this will likely reduce the already-low numbers of bats near that infrastructure, and

- Red squirrel – this species, whose current presence is likely to be minimal given the lack of evidence and known lower densities in Sitka spruce-dominated plantation, is dependent on woodland and will necessarily have previously altered its local distribution according to the felling and replanting that will have taken place periodically over many decades, and would necessarily do so again. At the time of construction, given the proposed extensive felling, there would be expected to be a further reduction in red squirrel presence near infrastructure, with the majority of infrastructure not in forestry.

9.4.72 No designated nature conservation sites or other nature conservation designations (such as ancient woodland) would be affected by the tree felling. In respect of habitats, the existing open habitats would be expected to largely remain intact and as described in the current baseline, notwithstanding some disturbance along forest rides. Large parts of the conifer plantation constituting the existing forestry would however be felled conifer plantation, either in the very early stages of restoration to open peatland, or potentially in some areas with very young planted trees.

9.4.73 The assessment of impacts on ecological features presented in this chapter has therefore been conducted in the following context:

- That clear felling will have been carried out in advance of construction by FLS at all locations with the exceptions noted in Paragraph 9.4.67 (and shown on Figures 17.4 and 17.6; EIAR Volume 2b). Felling in these areas will be limited to small areas required to enable construction only. Therefore, impacts of clear felling itself are not considered by this assessment, and
- That small areas of felling specifically for the Proposed Development will be carried out for T02, T04, T05, T06, T08, T11, T13, four borrow pits (if all used), the construction compound and the substation location. As this felling is being done to accommodate the Proposed Development (and not independently for commercial forest management purposes), the impacts of felling in these areas is considered by this assessment.

9.4.74 In conclusion, therefore, although baseline conditions at the main Development Site will be different from the 2014 to 2020 survey period, changes to ecological features are unlikely to

be significant except for a reduction in local red squirrel abundance / distribution and bat distribution, which are however already known to be present in only limited numbers. Consequently, the assessment of impacts in the context of felling having been carried out by FLS is still deemed reliably informed by the above baseline data.

Baseline in the Absence of the Proposed Development

- 9.4.75 For the purposes of considering the baseline in the absence of the Proposed Development for this chapter, a point twenty years in the future has been adopted. If the Proposed Development were not to be constructed, the baseline in the absence of it would likely be as described in the section above, which explains that large-scale felling activities will be undertaken by FLS irrespective of the wind farm. An exception would be that, with the implementation of the updated Carradale Land Management Plan (FLS, *unpublished*), it is expected that the Sitka spruce dominated plantation would have been diversified to include areas of native woodland, and that some of the plantation would be in the process of restoration to open moorland in and around the southeast of the wind farm and to the south of the Development Site.
- 9.4.76 It has been assumed that the Consented Development (see Chapter 1 of this EIAR: Introduction) would not be constructed in the absence of the Proposed Development.

9.5 Embedded Mitigation

- 9.5.1 Embedded mitigation measures are incorporated into the design of a development and aim to avoid or reduce adverse effects, including those on ecological features. Embedded mitigation can be considered at the impact assessment stage, whereas specific mitigation measures that are not part of the design and are developed after the initial impact assessment, are assessed at a later stage when considering the residual effects.
- 9.5.2 Bat collision risk mitigation is embedded into the design and comprises appropriately-sized key-holing of turbines in forestry. As stated in SNH *et al* (2019), separation of turbine blade tips from adjacent woodland by 50m or more is considered effective mitigation in Britain at significantly reducing collision risk for species at higher risk of collision that tend to fly near woodland edges, which can include pipistrelles, the most frequent bat species at the Development Site. Data for the possible turbine types indicates that maximum rotor radius is 77.5m (diameter 155m), and lowest (unlikely) rotor hub height would be around 105m. The Sitka spruce adjacent to keyholed turbines could be expected to reach around 25m at typical felling height, but on a precautionary basis a height of 35m has been used, which is unlikely to be exceeded. With these worst-case figures, the rotor blades would reach the tops of adjacent trees with a horizontal distance of approximately 33m between turbine base and woodland. Therefore, the minimum required distance between the turbine base and woodland to achieve 50m separation of blade tips from the trees is approximately 84m. This assumes level ground, and on a precautionary basis a wider clearance area is advisable. All key-holed

turbines (whether through felling by FLS during implementation of the initial phase of the updated Carradale LMP, or subsequently by the Applicant before construction) therefore employ a 100m radius for keyhole felling. This key-hole radius will be maintained for the life of the wind farm. This is considered sufficient to mitigate the bat collision risk, which primarily concerns common and soprano pipistrelle, which are common species but more vulnerable to collision, and whose activity levels at the Development Site are comparable with bat activity in the surrounding region.

9.5.3 The following embedded mitigation is also relevant to this chapter:

- The number of turbines and associated access track in the north-western area of open moorland in the Development Site, which contains blanket bog, is now two, with the laydown area for a third turbine extending partly into the south edge of this area, situated largely on sloping ground in a drier blanket bog form. In contrast, previous design iterations considered up to 6 turbines on the north west moorland, including in the wettest blanket bog. The overall number of turbines in the Proposed Development is now twelve, and this is also a reduction from earlier design iterations which considered up to 58 turbines,
- The majority of turbines and associated infrastructure are located in areas of existing forestry, rather than open blanket bog and other moorland, and there are no turbines or other infrastructure on the extensive open moorland dominated by blanket bog in the south-eastern part of the Development Site. Additionally, T13 has been moved into forestry, whereas the previous location was an area of intact blanket bog on deep peat in a larger forest clearing,
- The access track to the main Development Site utilises an existing large track for forestry vehicles and vehicles attending another wind farm. A large part of the principal access track through the main Development Site also utilises for much of its length the substantial existing forest track,
- Access tracks across flatter blanket bog in the north-western open moorland will be constructed as floating tracks in accordance with best practice, whereby peat will be left *in situ* under the track providing hydrological connectivity between blanket bog on either side, and
- A proposed borrow pit that was located on a low open hilltop supporting intact blanket bog, surrounded by forestry south of borrow pit BP05, has been removed. The one remaining borrow pit in non-forestry habitat is on the north-western moorland near turbine T01. This has been located at the edge of the moorland on higher ground dominated by drier blanket bog (rather than wet blanket bog rich in bog-moss).

9.6 Assessment of Effects

Features Scoped Out of Further Assessment

9.6.1 Relevant ecological features are those that are considered to be 'important' and have the potential to be affected by the Proposed Development (CIEEM, 2018). In view of the baseline data obtained through desk study and field survey, the following features have been excluded from further assessment because: a) they have been found to be likely absent from the zone of influence of the Proposed Development; or b) it is clear that no effect from the Proposed Development is possible:

- European sites – the only such site with non-avian interests within 10km of the Development Site is Inner Hebrides and the Minches SAC, an extremely large marine SAC (covering almost 14,000km²) located 8.5km from the main Development Site at its closest point, for which harbour porpoise is the sole qualifying species. There is no possibility of an adverse effect on qualifying harbour porpoise because there is no reasonable pathway by which the likely minimal emissions from the construction, operation and decommissioning phases of the Proposed Development could reach and cause significant indirect effects on this species in or near this SAC, particularly given its marine nature and very great size. There are no other European sites with non-avian interests within 10km or further afield with connectivity (such as via watercourses). This conclusion was similarly reached in the HRA Screening report. European sites with ornithological interests are dealt with in Chapter 10: Ornithology,
- Ancient woodland – there is no ancient woodland within 300m of the Development Site, and owing to the topographical situations of ancient woodland further afield, there is no likelihood of unmitigated waterborne pollution from the Proposed Development reaching any ancient woodland (see locations of ancient woodland on Figure 9.2, EIA Volume 2b). There is also no possibility of significant airborne pollution of ancient woodland, because the Proposed Development itself will not produce any appreciable amount, and vehicular emissions during construction, operation and decommissioning will be insufficient and too distant to be significant (see Highways England, 2019 – significant airborne pollution of habitats by vehicles is only likely within 200m and where vehicular activity is more than 1000 vehicles or 200 heavy vehicles per day). Therefore, no effect on ancient woodland is possible,
- Conifer plantation – the Sitka spruce plantation currently dominating the main Development Site and adjacent to a large part of the access track from the A83 is non-native, species-poor and has very low ecological value. Any other form of woodland would have greater ecological value. It is also abundant on the Kintyre peninsular. Moreover, the majority of spruce plantation in the vicinity of infrastructure will have been felled at the time of construction under the updated Carradale LMP, and a large part of this felled area is not intended to be restocked but to be restored to peatland (see Section 9.7). Therefore, no significant effect involving conifer plantation is considered possible,

- Badger – there is no evidence of badger within the main Development Site. Although badgers may occasionally enter the main Development Site for foraging during the seasonally-restricted availability of berries (such as bilberry), the Sitka-spruce dominated conifer plantation, clear-fell at the time of construction and open moorland frequently dominated by blanket bog, generally offer limited foraging for badgers and are not favoured habitats. Badger may occur on lower ground near pastures and broadleaved woodland adjacent to the lower parts of the access track from the A83, but there will be limited work to this track which is already used by forestry vehicles and vehicles attending an existing wind farm, therefore there is not likely to be a significant effect on badgers in respect of the access track, and pre-commencement survey can address the low risk of badger setts occurring beside it,
- Water vole – there is no evidence of water vole in the main Development Site. eDNA testing of the most promising vole droppings found during the field surveys, which were at the lower end of the scale for water vole droppings and slightly larger than normal field vole droppings, concluded that all the sample droppings were from field vole. There are not likely to be any water voles in close proximity to the access track from the A83, because where watercourses closely approach it they are unfavourably steep and fast-flowing, and partly within woodland,
- Amphibians – there is little potential for amphibians near the Proposed Development owing to a lack of standing water, and no standing water within 500m of the Proposed Development that could support great crested newt. Therefore, no significant effect on amphibians is possible, and,
- Invertebrates – There are not known to be any notable invertebrates in the Development Site. Freshwater pearl-mussel has been found to be absent. Green hairstreak is considered of 'Medium' priority by Butterfly Conservation but records pertain to the extensive south-eastern moorland and nearby forest breaks which are distant from and unaffected by the Proposed Development. Much of the Development Site is spruce plantation (or clear-fell at the time of construction) which is ecologically poor and would not support significant invertebrate assemblages. Such assemblages may occur in intact areas of flush, marsh and watercourse, but are not likely to be regionally significant given the limited extent of such habitats and the small size of the watercourses, and there will not be significant impact on such habitats. Therefore, no significant effect on invertebrates is considered possible.

Importance of Ecological Features

- 9.6.2 The assessed importance of those ecological features identified in the baseline conditions, and which have not been scoped out above, is set out in Table 9-7, together with rationale. Ecological importance has been assessed using a geographic scale (as per CIEEM guidelines) and is used in this chapter as a surrogate for 'sensitivity' as defined in Chapter 2 of this EIAR: Approach to EIA. The approach to assigning importance to ecological features is described in detail in Appendix 9.1.

- 9.6.3 When considering geographic scale, for the purposes of this assessment three levels have been used below 'National' level: 'Regional' is defined as the area encompassed by the Argyll West and Islands NHZ, 'Local' as the Kintyre Peninsula between the Mull of Kintyre and Tarbert, and 'Development Site' as the Development Site.

Table 9-7 Importance of Ecological Features

Ecological Feature	Importance (Sensitivity)	Rationale
Broadleaved woodland	Local (Low)	Broadleaved woodland is confined to the vicinity of the access track from the A83, in the lower parts only (and also at the extreme western edge of the Development Site along Clachaig Water). It is partly semi-natural and birch-dominated, but not categorised as ancient in the AWI. NWSS data indicates that semi-natural broadleaved woodland occupies a small proportion of the NHZ, as would be expected for a mountainous region, but is common and widespread along coasts and lower altitude watercourses. It is therefore not considered important on the scale of the NHZ, but is clearly more than of Development Site importance (which would imply negligible ecological importance), thus Local importance is considered appropriate.
Blanket bog	National (High)	Blanket bog areas in the open north-western and south-eastern parts of the main Development Site, and adjacent to the uppermost part of the access track from the A83, are intact and constitute sustainable and largely unfragmented substantial areas (over 100ha in the north-west moorland area, and 280ha elsewhere within the red line boundary) of a priority Annex I habitat and priority Scottish habitat (including wetter and likely peat-forming areas of approximately 20ha and 30ha respectively) with very abundant bog-moss. For comparison, SSSI selection criteria include that there be 25ha or more peat-forming vegetation, unless there are other notable features. On balance, National importance is considered appropriate.
Heath	Local (Low)	Areas of heath are small in extent and do not include rare types. The types present, with rare and very localised exceptions that are not near proposed infrastructure, are very common and widespread in Scotland including the NHZ. Therefore, although the wet and dry heaths are Annex I habitats and priority Scottish habitats, and wet heath is potentially moderately groundwater-dependent, Local importance is nevertheless considered most appropriate. Note that wet heath on deep peat constitutes and is considered as degraded bog.
Basic flush	Regional (Medium)	Basic flush constitutes an Annex I habitat and is part of the upland flush, fen and swamp Scottish priority habitat. Its occurrence in the Development Site is extremely localised, but the main location in the

Ecological Feature	Importance (Sensitivity)	Rationale
		NW open moorland is substantial and intact. Basic flushes are widespread but local in Scotland, and large basic flushes are more scarcely distributed in the landscape. This warrants higher than Local importance, but it would be disproportionate to assign National importance, therefore Regional importance is assigned.
Other semi-natural terrestrial habitats	Local (Low)	Other semi-natural habitats in the Development Site, including potentially groundwater-dependent acid flush and marshy grassland, and acid grassland and bracken, almost entirely comprise types of vegetation that are common and widespread in Scotland, and are often rather species-poor. Occasional occurrences of slightly more notable habitat, such as flushed forms of acid grassland and wet heath, are extremely localised and small in extent. Therefore, Local importance is considered most appropriate.
Watercourses	Local (Low)	The Clachaig Water and Allt Achadh a'Choirce, as well as the Killean Burn near the access track from the A83, are unpolluted upland watercourses that are, however, small to very small with a limited fish population. They do not therefore warrant Regional importance, but do constitute locally notable freshwater features.
Bats	Local (Low)	Bats are European Protected Species. The activity level of bats found to be using the main Development Site is however Moderate to Low and rare or specially-notable species were not found. The activity level through Ecobat analysis appears typical in comparison to the surrounding area, therefore Local importance is justified.
Otter	Local (Low)	Otter is a European Protected Species. Evidence of otter was found along the main watercourses in the Development Site, which included holts along the Killean Burn near the access track from the A83. Although no refuges were found in the main Development Site, potentially usable features were found, and dense vegetation such as rush and bracken stands offer potential as lying-up habitat. The presence of brown trout in the main streams also means that otters are likely to regularly enter the Development Site. However, the streams are small and a small number of otters is likely to utilise them, and given the abundance of otters in Argyll the population using the Development Site, is likely to be Locally important only.
Pine marten	Local (Low)	Pine marten is a Schedule 5 protected species under the WCA. Pine marten is known to be present in the Development Site, which is within the core distribution of this species. Pine martens are however relatively common in northern and western Scotland, including Argyll,

Ecological Feature	Importance (Sensitivity)	Rationale
		therefore the population in the Development Site is considered Locally important.
Wildcat	Regional (Medium)	Wildcat is a Schedule 5 protected species under the WCA. Wildcat has not been conclusively demonstrated to be present in the Development Site, but desk study information indicates that occasional presence is possible. The Development Site does not comprise optimal habitat for this species, particularly given the expected extent of clear-felling as part of the FLS management strategy, therefore there is likely to be a lower frequency of occurrence. Wildcat is however a highly localised species, therefore the limited possible presence in the Development Site is still considered regionally important.
Red squirrel	Low (Local)	Red squirrel is a Schedule 5 protected species under the WCA. However, it is widespread and common in suitable habitat in Argyll. The Sitka spruce that dominates the Development Site is one of the least favourable types of woodland for red squirrel, which typically occurs in lower densities in such woodland. At the time of construction there will also be much less woodland present owing to clear-felling by FLS as part of a woodland management strategy which includes extensive restoration of open moorland. Therefore, the population of red squirrels in the Development Site at the time of construction is likely to be very small and would not exceed Local importance.
Reptiles	Low (Local)	All three reptile species native to Scotland are present in the Development Site. None are specially-protected, and although adder is the most notable (and an LBAP priority) owing to overall national declines, it is widespread in Argyll. Therefore, Local importance is considered appropriate.
Fish	Low (Local)	The fish population in the Development Site has been shown to be limited with no notable species, but is typical of landlocked upland fish populations in small streams. Therefore, Local importance is appropriate.

Potential Effects on Broadleaved Woodland

Construction – Direct Loss of Broadleaved Woodland

- 9.6.4 The main Development Site does not impact upon existing broadleaved woodland, because there is no existing woodland of this type within or close to the footprint of the infrastructure (the closest is at the extreme west of the Development Site over 1km from the nearest infrastructure).

- 9.6.5 However, the access track from the A83 will require upgrade works, and this will result in minor loss of mature broadleaved woodland, none of which is ancient and only a small part of which is listed in the NWSS as nearly-native (none is listed as fully native). The amount of loss of nearly-native woodland (dominated by birch) would be at most approximately 0.08ha. The amount of loss of other broadleaved woodland along the lowest parts of the track from the A83 would be at most approximately 0.71ha. This assumes complete loss of any broadleaved woodland within a 10m buffer both sides of the existing access track, and a wider area at the A83 junction (see Chapter 14: Transport, Traffic and Access). Although the detailed access track design will be finalised as part of discharging of planning conditions, it is known that broadleaved woodland land take for upgrading the access track will not be this extreme, because expansion of the track to the south is restricted due to downward slopes to the watercourse and therefore it is expected any widening will take place mainly northwards. To provide a conservative and robust assessment, it is assumed that approximately 0.5ha mature broadleaved woodland, including a small proportion of nearly-native birch-dominated woodland, will be lost to the access track upgrades.
- 9.6.6 In addition, although most felling in infrastructure locations will have been carried out by FLS under the updated Carradale LMP, a limited amount of additional felling (26.5 ha) will be required to be undertaken in advance of construction of the Proposed Development within the main Development Site, as described in Chapter 17 of this EIA: Forestry. This felling is proposed by FLS at a later date; however, would be conducted by the Applicant at an earlier stage for construction purposes.
- 9.6.7 In terms of existing woodland, this will mainly impact Sitka spruce plantation of negligible ecological importance.
- 9.6.8 Note that felling between 100m and 135m from the turbines is only required temporarily for ground investigations, if any micro-siting is required, and will be replanted as per the updated Carradale LMP, with no net effect. Five of the six borrow pit locations will be restored to open ground as per the updated Carradale LMP, again with minimal net effect.
- 9.6.9 The remaining additional felling within 100m of turbines and adjacent to the construction compound / battery storage facility, substation and met mast would remain clear of woodland for the life of the Proposed Development, which is reflected in the updated Carradale LMP (FLS, *unpublished*).
- 9.6.10 The Proposed Development will not alter the restock plans within the updated Carradale LMP (FLS, *unpublished*), including native planting. Although accounted for in the Carradale LMP, in total, the felling required within the construction boundary of the Proposed Development in the main Development Site and for the area of peatland restoration has been calculated as 102.32 ha within Chapter 17 of this EIA: Forestry. Restocking amounts to 83.73 ha.

9.6.11 Compensatory planting for the outstanding 18.59 ha within the main Development Site and the approximately 0.5 ha mature broadleaved woodland along the access track from the A83 is not considered to be appropriate, because:

1. the loss of future native woodland is very small compared to the total expanded native woodland, as per the updated Carradale Land Management Plan (FLS, *unpublished*),
2. the 56.2 ha of peatland restoration to be implemented by the Applicant in the main Development Site is a critical part of the FLS strategy in the area, and
3. this constitutes a holistic approach, delivering overall woodland, peatland and general ecological benefits.

9.6.12 Local importance is assigned to broadleaved woodland because it is common and widespread in this region. The conservative estimate of loss of existing broadleaved woodland along the access track from the A83 is considered an adverse Medium magnitude change. Given the assigned Local importance, this constitutes a Permanent Minor Adverse effect, which is **Not significant** under the terms of the EIA Regulations.

Construction – Pollution of Woodland

9.6.13 Woodland adjacent to or close to the Proposed Development could be adversely affected by waterborne or airborne pollution.

9.6.14 The theoretical source of airborne pollution would be construction traffic. Chapter 14 of this EIA: Traffic, Transport and Access, uses a worst-case scenario to assume that there would be an average of 200 single, daily vehicle movements throughout the construction period (all vehicles), 140 of which would be heavy goods vehicles. However, the assessment presented in Chapter 14 does not account for the use of the proposed borrow pits, which would reduce the number of heavy goods vehicle movements by approximately 75%. This is average daily flow over the construction period only; however, traffic pollution effects on habitats are generally not regarded as significant more than 200m from the source, or where traffic flow is less than 1000 vehicles or 200 heavy vehicles per day (Highways England, 2019). Therefore, airborne pollution is not considered relevant to this assessment.

9.6.15 Waterborne pollution could theoretically damage woodland or other habitats through transfer of pollutants in surface run-off. However, the proposed access tracks (existing to be upgraded, or to be constructed) incorporate standard pollution controls such as interception ditches and settling pools, and the CEMP will incorporate standard measures to control pollution in accordance with SEPA guidance on pollution prevention and wind farm construction good practice. Standard surface water treatment and other standard pollution controls incorporated into a CEMP are considered embedded mitigation. Therefore, it is improbable that polluted surface run-off would cause significant damage to woodland. Consequently, there is predicted to be no effect on broadleaved woodland habitats as a result of pollution, which is **Not significant** under the terms of the EIA Regulations.

Construction – Hydrological Effects on Broadleaved Woodland

- 9.6.16 Infrastructure is considered by SEPA to be capable of causing adverse changes to wet habitats by changing hydrology (principally, drying) up to 100m from shallow excavations (such as tracks) or 250m from deep excavations (such as turbine bases). However, at the time of construction, following clearance for peatland restoration or restocking under the initial stages of the updated Carradale LMP, existing woodland will be largely Sitka spruce plantation. A zone between 100m and 135m from turbines will be felled for construction purposes but then replanted (see Chapter 17: Forestry; the 100m radius around turbines will remain unplanted), and some of this will include newly-planted native woodland (see Figure 17.5). However, such planting is situated downslope from turbines and it is therefore improbable that there would be a significant drying effect on planted trees in these areas. New native woodland planting may also be present at the time of construction along the sloping sides of the Clachaig Water. However, this will be crossed by using or upgrading the existing bridge, such that no significant hydrological effect on adjacent native tree planting is likely. With regard to the access track from the A83, this already exists and will be subject to relatively minor upgrading only, and most of the adjacent woodland steeply slopes downwards from the access track such that hydrological effects on any wet woodland within it would not be likely. Consequently, there is predicted to be Negligible change to broadleaved woodland through hydrological effects, which is of Negligible significance and is **Not significant** under the terms of the EIA Regulations.

Operation – Pollution of Broadleaved Woodland

- 9.6.17 Pollution during operation of broadleaved woodland would be applicable only to the woodland adjacent to the lower access track from the A83, and is improbable owing to the infrequency of maintenance vehicles using the track during operation, and pollution controls that are standard and can be expected to be implemented such as the carrying of spill kits in vehicles to contain any very rare fuel, oil or chemical spills. Consequently, there is expected to be no effect by this means, which is **Not Significant** under the terms of the EIA Regulations.

Decommissioning

- 9.6.18 Decommissioning is not expected to give rise to any impacts on woodland. There will therefore be Negligible effect on woodland during the decommissioning phase.

Potential Effects on Blanket Bog

Construction – Direct Loss of Blanket Bog

- 9.6.19 Direct loss of existing intact blanket bog habitat will be largely limited to the footprint of infrastructure in the north-western open moorland area. There may also be very slight loss of marginal blanket bog habitat immediately adjacent to the final section of the existing access track from the A83, which passes through an area of intact blanket bog prior to entering the main Development Site. Habitat loss typically exceeds the exact infrastructure footprint, owing

to factors such as: cut-and-fill construction (where required to support tracks on sloping ground); incorporation of passing places; works alongside tracks for interception/drainage ditches, cable trenching and verge finishing; and creation of silt settlement ponds.

- 9.6.20 For these reasons, a precautionary infrastructure buffer of 10m has been used, giving a worst-case area of blanket bog loss (included both intact and degraded bog) of 7.8ha, of which 6.3ha is in the north west moorland, and the remainder mainly degraded bog within forestry rides and clearings. For comparison, the area of blanket bog within the north-western open moorland area is approximately 112ha, and the area of blanket bog with the red line boundary as a whole is approximately 380ha. The means that in the worst case approximately 5.6% of the intact blanket bog in the north-western open moorland area would be lost, and approximately 2.1% of the total blanket bog within the red line boundary. Although this would mainly affect drier M19 blanket bog forms, with negligible effect on wetter M17 blanket bog containing more abundant bog-moss, this is an appreciable loss. This is considered an adverse Low magnitude change to a feature of High importance, constituting a Permanent Moderate Adverse effect, which is **Significant** under the terms of the EIA Regulations. Under the CIEEM assessment method, it is Regionally significant.

Construction – Hydrological Damage to Blanket Bog

- 9.6.21 Blanket bog can be subject to adverse drying effects caused by the hydrological effects of infrastructure, blocking or diverting water flow in the peat.
- 9.6.22 Note that the blanket bog affected by infrastructure is largely the drier M19 NVC type, which is able to exist on significantly sloping ground and does so at this site. The abundance and variety of bog-moss is lower in M19, including at the Development Site, and although the presence of scattered bog-moss and hare's-tail cottongrass indicate M19 blanket bog, it closely approaches heath in its driest forms, with likely shallower peat. Since it is naturally drier, M19 is less prone to the adverse effect of drying than the wetter M17 and M18 NVC types. Blanket bog that is both sloping and uphill of infrastructure will be hydrologically affected over a much shorter distance.
- 9.6.23 Turbine T01 is located in a gently sloping wetter area of vegetation that was classified largely as acid flush with a minor blanket bog component corresponding most closely to M17. However, the great majority of M17 blanket bog on the north west moorland is located north of the Allt Achadh a'Choirce, where the ground is fairly flat, and hence often wetter. All infrastructure is located south of the Allt Achadh a'Choirce, thus wetter blanket bog will be almost entirely unaffected.
- 9.6.24 Embedded design elements include access tracks that adhere to wind farm best practice construction methods. Floating tracks constructed according to best practice will be employed where necessary following more detailed ground investigation which would be carried out post-consent. Cut/fill techniques will be required where access tracks cross appreciably sloping ground, however the bog is drier on sloping ground and therefore less prone to

hydrological effects. Most of the affected intact bog on the north west moorland is of this drier type (NVC type M19), with minimal amounts of wetter bog affected. Similarly, affected bog in forest clearings and rides is also this drier type or is degraded by drainage to resemble wet heath.

- 9.6.25 For these reasons, hydrological effects on adjacent blanket bog are not expected to be significant. As such, there is predicted to be an adverse Negligible change to a feature of National importance, constituting at most a Permanent Minor Adverse effect, which is **Not Significant** under the terms of the EIA Regulations.

Construction – Pollution of Blanket Bog

- 9.6.26 The theoretical source of airborne pollution would be construction traffic. However, traffic pollution effects on habitats are generally not regarded as significant more than 200m from the source, or where traffic flow is less than 1000 vehicles or 200 heavy vehicles per day (Highways England, 2019). The rate of vehicular traffic during construction will be much less than these quantities. Therefore, airborne pollution is not relevant.
- 9.6.27 Waterborne pollution could theoretically damage blanket bog through transfer of pollutants in surface run-off. However, the proposed access tracks (existing to be upgraded, or to be constructed) incorporate standard pollution controls such as interception ditches and settling pools, and the CEMP will incorporate standard measures to control pollution in accordance with SEPA guidance on pollution prevention and wind farm construction good practice. Standard surface water treatment and other standard pollution controls incorporated into a CEMP are considered embedded mitigation. Therefore, it is improbable that polluted surface run-off would cause significant damage to blanket bog. Consequently, there is predicted to be no effect on blanket bog as a result of construction pollution, which is **Not significant** under the terms of the EIA Regulations.

Operation – Pollution of Blanket Bog

- 9.6.28 Pollution during operation is improbable owing to the infrequency of maintenance vehicles at the wind farm during operation, and pollution controls that are standard and can be expected to be implemented such as the carrying of spill kits in vehicles to contain fuel, oil or chemical spills, as well as interception ditches along the sides of constructed tracks. There is therefore expected to be a no effect by this means, which is **Not Significant** under the terms of the EIA Regulations.

Decommissioning

- 9.6.29 Decommissioning will result in removal of infrastructure from areas of open peatland, areas that are both existing and that will be present at construction and thereafter as a result of implementation of the updated Carradale LMP. In the medium term this will result in a minor increase in the extent of blanket bog vegetation. This would be a Minor beneficial change to

a feature of High importance, constituting a Moderate beneficial effect which is **Significant** under the EIA Regulations.

Potential Effects on Heath

Construction – Direct Loss of Heath

- 9.6.30 The area of lost heath is estimated in the worst case to be 4.6ha, compared to approximately 45.6ha in the Development Site. This is wet heath of a standard and species-poor nature, corresponding to NVC type M15b. Although wet heath is an Annex I habitat and priority Scottish habitat, and is potentially moderately groundwater-dependent, it must be noted that this type of wet heath is extremely common in western Scotland, is scattered across the Development Site, and is of no note. Moreover, most of the loss concerns wet heath alongside the existing forestry track, where it is not entirely natural and is species-poor. More notable flushed wet heath occurs extremely rarely in the Development Site, but far from proposed infrastructure and will be entirely unaffected. The affected area of heath also includes a very small amount of dry heath (in the worst case estimated at 0.2ha), also not species-rich and also of a ubiquitous type (NVC type H12a). The loss is consequently considered a Low magnitude change to a feature of Low Importance, constituting a Negligible effect which is **Not Significant** under the EIA Regulations.

Construction – Hydrological Damage to Heath

- 9.6.31 The affected heath is almost all wet heath along the existing forest track, comprising narrow strips of species-poor and not entirely natural vegetation. Hydrological damage cannot extend far because the wet heath here is restricted to narrow strips. Therefore, the impact will be Negligible, constituting a Negligible effect which is **Not Significant** under the EIA Regulations.

Construction / Operation – Pollution of Heath

- 9.6.32 As described above for broadleaved woodland and blanket bog, air pollution is not relevant because there will be insufficient air-polluting activity. Waterborne pollution will be controlled during construction by embedded CEMP and standard measures such as interception ditches and settling ponds, and during operation maintenance activity will be minimal with negligible risk of causing waterborne pollution. Consequently, there is expected to be no effect through pollution on heath, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.33 Decommissioning will result in removal of infrastructure from areas of heath. However, since the degree of effect at construction is Negligible, owing largely to the very small area of heath affected, the Minor beneficial change at decommissioning from removal of infrastructure from heath would also constitute a Negligible effect which is **Not Significant** under the EIA Regulations.

Potential Effects on Basic Flush

Construction – Hydrological Damage to Basic Flush

- 9.6.34 A single but large basic flush was identified in the north-west open moorland area, considered to be Regionally notable owing to the infrequency of large basic flushes in the wider landscape. Such flushes are potential GWDTE. No infrastructure impinges upon this feature, therefore there will be no direct loss. The closest approach of deep excavations (turbine base) is approximately 60m south-east of this flush, and therefore within the 200m consideration distance for deep excavations. However, the flush is fed by water from the north, and this turbine is on the opposite side of the Allt Achadh a'Choirce valley from the basic flush and uphill of the stream. Consequently, there can be no adverse hydrological effect on this flush. Other identified basic flush (in the south-eastern open moorland, and including flushed species-rich forms of wet heath and mat-grass grassland) are small and far more distant from infrastructure (over 600m or more separation distance), with no possibility of effect. Consequently, there is no change and **no effect** on basic flush, which is **Not Significant** under the EIA Regulations.

Construction – Hydrological Damage to Basic Flush

- 9.6.35 As noted in the previous paragraph, all basic flush is either on the opposite side of the Allt Achadh a'Choirce valley from infrastructure, or over 600m away with no hydrological connectivity. Consequently, there will be no hydrological damage to and **no effect** on basic flush, which is **Not Significant** under the EIA Regulations.

Construction / Operation – Pollution of Basic Flush

- 9.6.36 As described above for broadleaved woodland and blanket bog, air pollution is not relevant because there will be insufficient air-polluting activity. Waterborne pollution could not reach basic flush habitat because it is either on the opposite side of the Allt Achadh a'Choirce valley from infrastructure, or over 600m away with no hydrological connectivity. Consequently, there is expected to be **no effect** through pollution on basic flush habitat, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.37 There will be no effect on basic flush at decommissioning, for the same reasons set out above for lack of effect during construction and operation.

Potential Effects on Other Habitats

Construction – Direct Loss of Other Habitats

- 9.6.38 Other habitats, as explained in Table 9-7, including the watercourses, are not of special note and are of Local importance (or less) only.

9.6.39 Losses to other terrestrial habitats in the main Development Site arise from:

- construction of T01 and a small part of borrow pit BP06 in an area dominated by acid flush habitat (with a subsidiary blanket bog component), acid flush is potential GWDTE but is also very common in upland Scotland and not notable,
- minor losses alongside the existing forestry access track, where common upland habitats and degraded blanket bog exist in narrow strips between the existing track and what is expected to be a mix of retained and clear-felled forestry under the updated Carradale LMP (FLS, *unpublished*) at the time of construction,
- construction of turbines T11, T13 and T14, borrow pit BP05 and parts of the access tracks to them, in former forestry that is expected to have been partly clear-felled and partly retained under the updated Carradale Forest LMP at the time of construction, and is intended for peatland restoration. The vegetation present at this time that would be lost, given the short time period between clear-felling (either by FLS or the Applicant) and construction, is expected to be very poor (see Future Baseline above),
- construction of turbines T02, T04, T05, T06 and T08, three borrow pits, the construction compound / battery storage facility, the substation and parts of associated access tracks in areas that will be retained Sitka plantation at the time of construction and will therefore be key-holed with associated minor and inconsequential loss of Sitka plantation,
- construction of turbines T07 and T10 and parts of the associated access tracks in what will be open ground at the time of construction having been recently cleared under the updated Carradale LMP to be retained as open land, and
- minor alterations to the access track from the A83.

9.6.40 The habitats lost through the above will comprise:

- loss of acid flush habitat, amounting in the worst-case estimate to approximately 2.1ha. Most of this loss is on the north-west moorland, largely due to the lay-down area of T01 and a small part of borrow pit BP06. This type of acid flush, which is potential GWDTE, is dominated by sharp-flowered rush with bryophytes such as *Polytrichum commune* and common bog-moss species, is not species-rich and is very common in the wetter parts of Scotland. For comparison, there are approximately 9ha of such habitat in the north-west moorland, and approximately 26ha in the red line boundary,
- loss of Sitka spruce plantation or what will be recently clear-felled Sitka plantation at the time of construction, amounting to approximately 58.6ha,
- negligibly small amounts of non-notable bracken and marshy grassland, amounting in the worst case to 0.06ha,
- approximately 1.9ha of existing track and a small amount of existing quarry, both of which are sparsely vegetated and of no ecological value, and
- very minor losses of broadleaved woodland, pasture and potentially conifer plantation along the access track from the A83; such losses will be minimal because the access track is intended to be widened as far as possible on the north side away from the woodland.

- 9.6.41 These losses are considered a Low magnitude change. Although the affected acid flush is potential GWDTE, the affected form is acid and not species-rich, and is very common in the region and western Scotland as a whole.
- 9.6.42 A significant watercourse will be crossed once only, on the Clachaig Water at the existing bridge vicinity (see Chapter 3 of this EIAR: Project Description). Five other watercourse crossings are towards the heads of minor tributaries only. The degree of stream habitat loss at these locations will be negligibly small compared to the extents of the Clachaig Water, Allt Achadh a'Choirce and the tributaries of these watercourses.
- 9.6.43 There will consequently be an adverse Negligible magnitude of change on other habitats, including watercourses, constituting a Negligible effect, which is **Not Significant** under the terms of the EIA Regulations.

Construction – Hydrological / Pollution Damage to Other Habitats

- 9.6.44 As discussed in the previous section, other habitats in the vicinity of infrastructure are of lower ecological value.
- 9.6.45 Hydrological effects on other habitats that are potential GWDTE will be minimal because such habitats in the vicinity of infrastructure are small, localised and not notable.
- 9.6.46 Waterborne construction pollutants, including silt, would be highly unlikely to spread far from the works because the infrastructure will be constructed in accordance with standard wind farm construction best practice, including interception ditches, silt traps and settlement ponds, and these controls will be embedded in a CEMP.
- 9.6.47 Airborne pollution, whose source would primarily be vehicular traffic, would not be significant in terms of nitrogen deposition, because construction traffic flow will be less than the limits (1000 vehicles or 200 heavy vehicles per day) advised in standard DMRB air quality guidance. Dust emissions, whose primary source would again be vehicular activity, are not likely to be significant and are expected to be adequately controlled through measures embedded in the CEMP (see Chapter 3 of this EIAR: Project Description).
- 9.6.48 For these reasons, there is expected to be an adverse but Negligible hydrological / pollution effect on other habitats, constituting an effect of Negligible significance which is **Not Significant** under the terms of the EIA Regulations.

Decommissioning

- 9.6.49 Decommissioning will result in removal of infrastructure from other habitats. However, since the degree of effect at construction and operation is Negligible, the Low magnitude beneficial change at decommissioning from removal of infrastructure would also constitute a Negligible effect which is **Not Significant** under the EIA Regulations

Potential Effects on Protected Species – Bats

Construction – Loss of Bat Roost Sites

- 9.6.50 There are no known roost sites within the main Development Site. Sitka spruce plantation offers little roost opportunity for bats, and there are no mature broadleaved trees in the main Development Site except very distantly from infrastructure. A small number of small roofless ruined sheilings scattered within the plantation offer negligible roost potential; however, no such sheilings will be affected by the works. Moreover, the baseline bat survey data above strongly suggest that the small numbers of bats that appear to use the Development Site are commuting there rather than originating inside it. Therefore, there is expected to be negligible effect on bat roosts in the main Development Site.
- 9.6.51 There will be limited removal of broadleaved trees to upgrade the existing access track from the A83. Given the bats recorded in the main Development Site, desk study data, and the geographical location of the Development Site within the UK in the context of the known distributions of bat species, it is highly unlikely that any rare or notable bat species would utilise the woodland along the access track from the A83. The number of broadleaved trees that would be removed is also small. In the event that bat roost(s) in these trees were lost, this would likely affect common bat species only, and the effect on their overall conservation status on the Kintyre peninsular would likely be negligible.
- 9.6.52 Notwithstanding legal obligations regarding bat roosts that can be addressed through appropriately-timed pre-construction surveys, there is consequently likely to be (at most) an adverse but Negligible change on the conservation status of bats (locally or at larger scales) through roost loss, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the terms of the EIA Regulations.

Construction – Changes to Bat Foraging / Commuting Habitat

- 9.6.53 At the time of construction, following completion of the initial phase of the updated Carradale LMP, there will be significantly less Sitka spruce plantation and substantial areas of open clear-felled land in large part intended for peatland restoration. The recorded bat species in general prefer to forage and commute along linear features such as woodland edges and watercourses.
- 9.6.54 The Proposed Development will not have any effect on watercourses from the perspective of bat commuting and foraging. Infrastructure through the clear-felled areas will slightly reduce the extent of clear-felled habitat, which however this is expected to be poorly vegetated at the time of construction and would be of lower value to bats as foraging habitat. Assuming successful peatland restoration, much of the clear-felled areas would develop into blanket bog also of lower value to bats. Infrastructure on existing open moorland is primarily blanket bog and similarly of lower value to bats, in particular given the absence of evidence of bat species that preferentially forage in large open areas (such as *Nyctalus* spp.). Infrastructure in Sitka spruce plantation at the time of construction will effectively result in a very slight increase in

woodland edge habitat that would however be of likely negligible overall benefit to bats given the abundance of forest breaks. Areas intended for native woodland planting under the updated Carradale LMP, which would be beneficial for bats, will not be impacted by the Proposed Development. For these reasons, there is expected overall to be Negligible change to bat foraging / commuting habitats as a result of the Proposed Development and no effect by this means on the conservation status of bats (locally or at larger scales), constituting an effect of Negligible Significance which is **Not Significant** under the terms of the EIA Regulations.

Operation – Bat Mortality

- 9.6.55 There is a recorded Moderate level of bat activity in the Development Site, dominated by common pipistrelle and soprano pipistrelle. These are common species but regarded as having high collision risk, whilst the other less-commonly recorded species (brown long-eared bat and *Myotis* sp.) are regarded as having low collision risk (SNH *et al*, 2019). Taking into account the relative abundance of these species and their collision risk, the population vulnerability of these species is stated to be Medium for the pipistrelles, and Low for the other species (SNH *et al*, 2019).
- 9.6.56 Following further guidance in SNH *et al* (2019), and considering in particular the habitat requirements of pipistrelles whose populations, as noted above, are the most vulnerable of the recorded species, the main Development Site is currently considered to have a habitat risk between Low and Moderate. This is because the Moderate habitat risk criterion of connectivity by linear features (streams and woodland edges) will exist at the Development Site at the time of construction, but the other criteria fail in that the habitat is not extensively used by foraging bats and there is negligible roost potential. Under the updated Carradale LMP, there would be an increase in open peatland and reduction in woodland. The more extensive open ground would reduce overall suitability for the bat species recorded (no species favouring extensive open ground were recorded, even in the open north-west moorland), but the increase in native woodland through tree planting would likely provide an increase in foraging habitat (and also potentially roosting habitat in the very long term). Overall, habitat risk at the time of construction and during operation would likely remain Moderate at most. For project size, the Proposed Development meets one of the criteria for Moderate size (number of turbines 10 to 40) but for turbine size the criterion points to Large project size (since the proposed turbines are taller than 100m). Combining habitat risk (Moderate) and project risk (using High, for a conservative assessment) results in a High site risk value of '4'. Finally, combining the site risk value with the Moderate population vulnerability for pipistrelles, the overall risk assessment for bat collision is Medium (SNH *et al*, 2019).
- 9.6.57 Turbines T01 and T03 are located on the north west moorland. Given the lack of evidence of species that preferentially forage over wide open areas, and general low level of bat activity in this area, bat collision mortality is likely to be rare at these turbines. Seven of the turbines (T02, T04, T05, T06, T08, T11 and T13) are located in Sitka spruce plantation that is expected

to be still in place at the time of construction and will require key-hole felling for construction, for which a 100m radius key-holing procedure will be implemented. The other turbines are located in areas that will have already been cleared under the updated Carradale Forest LMP, which also utilises a 100m radius clearance area for turbines within plantation that would not otherwise have been felled at the of construction (see Figure 17.4 and Figure 17.6; EIA Volume 2b). SNH *et al* (2019) notes that key-holing can encourage bats towards turbines (following the newly-created woodland edges), and if the cleared area around the key-holed turbines is insufficient this could result in on-going bat collision mortality, particularly in this case, given the recorded species, of pipistrelles. However, the embedded mitigation of a 100m radius for key-holing turbines in forestry maintains at least 50m separation of turbine blades from trees, and is therefore in accordance with NatureScot guidance (SNH *et al*, 2019). Consequently, there is expected to be Negligible effect through bat collision, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.58 Decommissioning will result in removal of turbines, and therefore removal of all bat collision risk. However, given that collision mitigation is proposed involving appropriate separation of turbines from trees such that bat collision risk is expected to be Negligible (see Section 9.7), the removal of turbines at decommissioning would also be expected to have Negligible effect on bats which is **Not Significant** under the EIA Regulations. No other effect on bats from decommissioning is expected.

Potential Effects on Protected Species – Otter

Construction – Loss or Disturbance of Otter Refuges

- 9.6.59 There were no confirmed otter refuges (such as holts or couches) found in the main Development Site, either during the 2020 surveys or the surveys informing the 2016 EIA. The 2020 survey found three potential holt features along the Clachaig Water. The closest is 75m downstream of the existing bridge crossing of the Clachaig Water, which will be reused or upgraded for the Proposed Development. This potential feature is a sheltered area under the riverbank with a small blind tunnel, that is not well-hidden and vulnerable to predation, and would be insufficient for breeding purposes. It is well beyond likely disturbance. A cavern under a boulder 100m downstream of the Clachaig Water crossing is also unsuitable for breeding purposes for the same reasons, and is also downstream of a substantial artificial weir-like structure that effectively screens it from the Clachaig Water crossing. The only other identified feature with potential for use as a holt is 1.2km upstream of the Clachaig Water crossing and 340m from the nearest infrastructure, far beyond any possible disturbance. Given the lack of confirmed otter refuges, and the lack of possible effect on identified features with potential for future use by otter, there is expected to be no loss or damage to otter refuges in the main Development Site.

- 9.6.60 The 2016 EIA identified two otter holts near the A83. The western-most holt is beyond the opposite side of the A83 and approximately 150m from the closest works, and disturbance will likely be minimal or none given the intervening main road and separation distance. The other is by the Killean Burn approximately 50m from the closest possible approach of access track improvement works. The latter holt is sheltered from possible access track improvement works by its location within woodland low in the steep valley of the Killean Burn.
- 9.6.61 There is therefore expected to be no loss or damage to otter refuges, and disturbance is expected to be slight, insignificant and of no consequence to the conservation status of otter (locally or at larger scales). Consequently, and notwithstanding legal obligations regarding otter refuges and requirement for pre-commencement survey to verify absence of new otter refuges, there is expected to be an adverse but Negligible effect on otter refuges, constituting an effect of Negligible significance, which is **Not Significant** under the terms of the EIA Regulations.

Construction – Loss of Otter Habitat

- 9.6.62 Habitat of most value to otters in the Development Site comprises the watercourses and closely adjacent habitat. There will be negligible loss to watercourses and closely adjacent habitat because the Proposed Development does not impinge upon them except very locally at one crossing of the Clachaig Water where there is an existing bridge, and at five other crossings towards the heads of minor tributaries only. There are no standing waters or swamps that would also constitute good habitat suitability for otter. Habitat loss resulting from the Proposed Development primarily involves Sitka spruce plantation, former Sitka spruce plantation expected to be recently clear-felled under the updated Carradale LMP at the time of construction, smaller amount of blanket bog and very small amounts of wet heath/acid flush, none of which constitute optimal otter habitat. In particular the dominant Sitka spruce and clear-felled areas which are of negligible value to otter. The Proposed Development will not prevent otter from using the existing watercourses and adjacent habitat.
- 9.6.63 For these reasons, there is expected to be an adverse but Negligible effect on otter habitat of no consequence to the conservation status of otters (locally or at larger scales), constituting an effect of Negligible Adverse significance, which is **Not Significant** under the terms of the EIA Regulations.

Construction – Otter Vehicle Collision Mortality

- 9.6.64 Except under exceptional circumstances, construction working hours mean that works will take place mostly in daylight and rarely at night, and therefore mostly outside periods when otters are most active. Vehicular traffic during construction will also be bound by standard construction site safety protocol to travel at low speeds. The probability of otter casualties as a result of vehicle collision during construction is therefore extremely low. Consequently, there is expected to be Negligible effect by this means, constituting an effect of Negligible significance, which is **Not Significant** under the terms of the EIA Regulations.

Operation – Otter Vehicle Collision Mortality

- 9.6.65 Maintenance of the Proposed Development once constructed will require a minimal amount of vehicular traffic, travelling at low speeds. The probability of otter casualties as a result of vehicle collision during operation is therefore extremely low. Consequently, there is expected to be Negligible effect by this means, constituting an effect of Negligible significance, which is **Not Significant** under the terms of the EIA Regulations.

Decommissioning

- 9.6.66 Decommissioning has the potential to cause disturbance or mortality of otter similarly to construction and operation, but for the same reasons set out above for construction and operation these effects are likely to be Negligible and **Not Significant**.

Potential Effects on Protected Species – Pine Marten

Construction – Loss or Disturbance of Pine Marten Refuges

- 9.6.67 There are no known pine marten dens in the Development Site, and the dominant Sitka spruce plantation in the main Proposed Development has very low den suitability – the trees do not offer large cavities, there are no known rock features near infrastructure in the plantation, and areas that will have been clear-felled under the updated Carradale LMP at the time of construction will be highly disturbed. The one pine marten den found during the 2020 surveys is located amongst boulders on slopes at the edge of the south-eastern moorland, over 700m from the nearest infrastructure, far beyond possible adverse effects. However, since this den included an excavated cavity in heather-covered peat, in addition to runs and cavities amongst and under large boulders, and given records of likely pine marten droppings elsewhere in the Development Site, it is remotely possible that a pine marten den could be established in the future in similar drier sloping peat on the north-west open moorland.
- 9.6.68 There is therefore a very low risk of a new pine marten den on the north-western moorland being damaged or disturbed during construction in that area. The loss of such a den would however not be likely to significantly affect the conservation status of pine marten. This is because pine martens use multiple dens similarly to other mustelids, and the insecurity of such a location and vulnerability to predation (e.g. by fox, evidence of which was common during the 2020 surveys) imparts low suitability as a breeding site. Consequently, and notwithstanding legal obligations regarding pine marten which can be addressed through pre-commencement surveys, there is likely to be a Negligible effect on pine marten from den loss or disturbance, constituting an effect of Negligible Adverse significance which is **Not Significant** under the EIA Regulations.

Construction – Changes to Pine Marten Habitat

- 9.6.69 At the time of construction, the updated Carradale LMP will have been partially implemented including removal of substantial areas of forestry for peatland restoration. The Proposed

Development will involve negligible further loss of woodland, and also negligible loss of open habitats suitable for foraging by pine marten. Therefore, there will be Negligible effect on pine marten from habitat changes as a result of the Proposed Development, constituting an effect of Negligible Adverse significance which is **Not Significant** under the EIA Regulations.

Construction – Pine Marten Vehicle Collision Mortality

- 9.6.70 Except under exceptional circumstances, construction working hours mean that works will take place mostly in daylight and rarely at night. Construction work will therefore mostly occur outside periods when pine martens are most active. Vehicular traffic during construction will also be bound by standard construction site safety protocol to travel at low speeds. The probability of pine marten casualties as a result of vehicle collision during construction is therefore extremely low. Consequently, there is expected to be Negligible effect by this means, constituting an effect of Negligible significance, which is **Not Significant** under the EIA Regulations.

Operation – Pine Marten Vehicle Collision Mortality

- 9.6.71 Maintenance of the Proposed Development once constructed will require a minimal amount of vehicular traffic passing along the access tracks, travelling at low speeds. The probability of pine marten casualties as a result of vehicle collision during operation is therefore extremely low. Consequently, there is expected to be Negligible effect by this means, constituting an effect of Negligible significance, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.72 Decommissioning has potential to cause disturbance or mortality of pine marten similarly to construction and operation, but for the same reasons set out above for construction and operation these effects are likely to be Negligible and **Not Significant**.

Potential Effects on Protected Species – Wild Cat

- 9.6.73 The assessment of effects on wildcat is very similar to that of pine marten, except that there are no known wild cat dens in the Development Site, no evidence of wild cat was found during surveys, and desk study information suggests that although wild cat may occur, the region is not a key area for wild cat.
- 9.6.74 Therefore, although the same potential effects given above for pine marten also apply to wild cat, the likelihood of den damage or disturbance is much lower. Therefore, all potential effects on wild cat, both at construction and operation, are considered to be of Negligible significance, and **Not Significant** under the EIA Regulations.

Potential Effects on Protected Species – Red Squirrel

Construction – Loss or Disturbance of Red Squirrel Dreys

- 9.6.75 As noted in the baseline, Sitka spruce plantation supports low densities of red squirrel compared to other more favoured woodland types, and no observations of red squirrel were made during the surveys, therefore density is predicted to be low. At the time of construction only a minority of the infrastructure will require key-hole felling because the majority of plantation in the vicinity of infrastructure will have been felled by FLS under the updated Carradale LMP. Key-hole felling for the minority of infrastructure that requires it will be of far less impact than the expected wide-spread clear-felling under the updated Carradale LMP. Periodic clear-felling is also part of the baseline environment since this is commercial forestry. Felling that may be required of broadleaved trees along the lower access track from the A83, which may be used at times by red squirrel, is expected to be slight and a negligibly small amount of the retained broadleaved woodland. Whilst disturbance of dreys in retained forestry could theoretically occur as a result of construction activity, the forestry prone to such disturbance will be small given a maximum disturbance distance for breeding dreys of 50m, and that much of the forestry near infrastructure will have been felled by FLS. Consequently, and notwithstanding legal obligations regarding red squirrel dreys which can be addressed through pre-commencement survey, any drey loss or disturbance is likely to have Negligible effect on the conservation status of red squirrel. This constitutes an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Construction – Loss of Red Squirrel Habitat

- 9.6.76 As discussed above in regard to loss or disturbance of dreys, the degree of woodland loss as a result of the Proposed Development will be slight, because the majority of plantation near infrastructure will already have been felled by FLS, and the small amount of key-holing required and the slight amount of felling required along the access track from the A83 will affect a minimal amount of the woodland resource existing at the time of construction. Consequently, there will be a Negligible effect on red squirrel habitat, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Construction – Red Squirrel Vehicle Collision Mortality

- 9.6.77 Movement of construction vehicles along tracks will be infrequent and slow-moving, posing negligible risk to red squirrels and of less effect than existing forestry vehicle movements. There will therefore be a Negligible effect, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Operation – Red Squirrel Vehicle Collision Mortality

- 9.6.78 Movement of maintenance vehicles along tracks will be infrequent and slow-moving, posing negligible risk to red squirrels and of less effect than existing forestry vehicle movements.

There will therefore be a Negligible effect, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.79 Decommissioning has potential to cause disturbance or mortality of red squirrel similarly to construction and operation, but for the same reasons set out above for construction and operation these effects are likely to be Negligible and **Not Significant**.

Potential Effects on Reptiles

Construction – Reptile Mortality

- 9.6.80 The baseline information indicates that all three native Scottish reptiles (common lizard, slow worm and adder) are present in the Development Site. None of these species is specially-protected, but are afforded protection from intentional or reckless injury and killing. Of those habitats in the vicinity of infrastructure, these reptiles are liable to be present at the time of construction in the open north-western moorland and any forest breaks that are wide enough to receive sunlight for basking and contain sufficient dense ground vegetation for cover. They are not likely to be common in the areas clear-felled under the updated Carradale LMP, because these are not likely to be well-vegetated and will therefore likely offer suboptimal cover and foraging resources.
- 9.6.81 The extent of more suitable reptile habitat impacted by construction is small in comparison to the area not affected: the unaffected proportion of the whole north-western moorland section is expected to be approximately 97%, and very few forest breaks will be significantly affected owing to the situation of most infrastructure (outside the north-western moorland) in solid plantation (or areas that will be clear-felled by the time of construction) or along the existing access track. Additionally, the very large extent of open moorland (over 300ha) in the south-eastern part of the Development Site will be entirely unaffected. Consequently, there is a possible adverse but Negligible effect by reptile mortality during construction, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Construction – Changes to Reptile Habitat

- 9.6.82 As discussed for reptile mortality above, the amount of favourable reptile habitat lost to infrastructure is negligible compared to the very large available resource in the Development Site. The constructed access tracks will be suitable for reptile basking, similarly to the existing access track which was seen to be used by common lizard for this purpose during baseline surveys, and is probably also used by the other reptile species. This may provide a very slight but ultimately negligible benefit. Consequently, there is expected to be a Negligible effect on reptile habitat, constituting an effect of Negligible significance, which is **Not Significant** under the EIA Regulations.

Operation – Reptile Mortality

- 9.6.83 Maintenance of the Proposed Development will require passage of maintenance vehicles along access tracks. These will be infrequent and travelling at low speed. Therefore, although common reptiles may use the access tracks for basking in cooler conditions, reptile mortality by this means would be rare. Moreover, use of the access tracks by forestry vehicles would at times be far more significant, although also only rarely likely to result in reptile mortality, and the very large unaffected extent of reptile habitat within the Development Site means that most reptiles would not be near access tracks. Consequently, there would be Negligible effect through reptile mortality during operation, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.84 Decommissioning has potential to cause mortality of common reptiles similarly to construction and operation, but for the same reasons set out above for construction and operation these effects are likely to be Negligible and **Not Significant**.

Potential Effects on Fish

Construction – Pollution Effects on Fish

- 9.6.85 The baseline information indicates that notable fish species are absent from the main Development Site. Therefore, no effects on notable fish species are likely. Common fish species that are present, including small populations of brown trout, would be vulnerable to pollution including siltation (which can smother spawning gravel, for example). The Proposed Development requires crossing of watercourses at six locations (see Chapter 3 of this EIA: Project Description, Table 3-5). However, only one crossing involves a significant watercourse, on the Clachaig Water at the existing bridge vicinity. The other crossings are toward the heads of small tributaries of the Clachaig Water, some very small. However, works at these crossings, or poorly managed works elsewhere with insufficient silt management, have the potential to cause siltation of the streams. Adverse effects from these on fish would likely be negligible given the small and non-notable fish populations and the effects of existing forestry. However, surface water will be managed by embedded controls in the CEMP, which will include standard measures to control pollution in accordance with wind farm construction best practice, including silt traps, settlement ponds, interception ditches and general pollution prevention measures as required by SEPA. Consequently, there is expected to be a Negligible effect on fish during construction, constituting an effect of Negligible Adverse significance, which is **Not Significant** under the EIA Regulations.

Construction – Barriers to Fish Movement

- 9.6.86 The crossing of Clachaig Water will utilise the existing bridge location and five crossings elsewhere towards the heads of minor tributaries. The bridge work will not impact the stream bed and will therefore not affect fish passage. The very small tributaries crossed elsewhere,

which are crossed near the upper ends of their extents, would support negligibly small fish populations. Consequently, there will be a Negligible effect on fish movement, constituting an effect of Negligible significance, which is **Not Significant** under the EIA Regulations.

Operation – Pollution Effects on Fish

- 9.6.87 As noted above, the Proposed Development requires only one crossing of Clachaig Water at an existing bridge location and five crossings towards the heads of minor tributaries elsewhere. The Proposed Development will ensure, as normal and required by SEPA, that surface run-off from access tracks at risk of polluting watercourses is intercepted and subject to settlement / filtration. As such, there is expected to be a Negligible effect on fish through operational pollution, constituting an effect of Negligible significance, which is **Not Significant** under the EIA Regulations.

Decommissioning

- 9.6.88 Decommissioning has potential to cause pollution effects on fish similarly to construction and operation, but for the same reasons set out above for construction and operation these effects are likely to be Negligible and **Not Significant**.

9.7 Mitigation and Monitoring

Habitat Management Plan

- 9.7.1 A Habitat Management Plan (HMP) will be produced. The primary components will be the provision of compensatory blanket bog restoration, borrow pit restoration, and the provision of compensatory tree planting for limited broadleaved woodland loss associated with the lower part of the access track from the A83, and habitat protection measures.

Compensatory Blanket Bog Restoration

- 9.7.2 Unmitigated loss of blanket bog is predicted to be significant given the degree of importance assigned to blanket bog. It has therefore been agreed that compensatory peatland restoration will be carried out, in line with the updated Carradale LMP. The proposed area where this restoration work will take place is the substantial restoration area shown in Figure 17.5 (EIA Volume 2b). This area, although currently largely Sitka spruce plantation, is scheduled to be clear-felled by FLS between 2022 and 2030 in the updated Carradale LMP (FLS, *unpublished*). Although some infrastructure will be present in parts of this restoration area, it is expected that approximately 56.2 ha of peatland would be restored to reasonable condition in the longer term, once trees have been removed by FLS and mitigation such as water retention measures have been implemented. The restoration work would commence following construction of the Proposed Development and the felling of the required area by FLS. Note that in the absence of the Proposed Development, the peatland restoration would likely still be carried out by FLS, whereas if the Proposed Development is consented, then the Applicant

will finance the restoration. It has been agreed that the restoration work will follow FLS standards for peatland restoration of cleared forestry, and the details will be established through liaison with FLS. The peatland restoration will only commence after the existing plantation woodland is felled and removed by FLS.

- 9.7.3 The initial success of the peatland restoration measures will be monitored and remedial action taken if necessary (e.g. in the event of failure of water retention measures). The Applicant will work with FLS to maintain the restored peatland area.

Borrow Pit Restoration

- 9.7.4 Five of the six proposed borrow pits are located in existing forestry. These borrow pit locations are identified in the updated Carradale LMP (FLS, *unpublished*) and are intended under the LMP to be open ground.
- 9.7.5 Restoration of five of the six of the borrow pits (one is likely to continue to be used by FLS as is currently the case) will be to open habitat, including borrow pit BP06 at the edge of the north-western moorland. The restoration will be advised by the Ecological Clerk of Works and with liaison with FLS where appropriate.

Compensatory Broadleaved Tree Planting

- 9.7.6 The minimal loss of broadleaved trees has been assessed as not significant under the EIA Regulations. However, it remains locally significant, and following best practice and local and national planning policy the loss will be compensated. The small amount of existing broadleaved tree loss will occur in the lower section of the access track from the A83, but will likely be very limited since expansion of the track will take place as far as possible on the northern side of the access track. It will be compensated by nearby tree planting, with a preference for implementation next to the access track of native broadleaved species of local provenance that are appropriate to the locality. Where semi-natural broadleaved woodland is lost, then in line with best practice and acknowledging that planted trees cannot replace semi-natural woodland, the area of planting will be three times the area lost. Where non-semi-natural broadleaved woodland is lost, the replacement area will be at least the same. Appropriate species to simulate the canopy and shrub layers of a natural low altitude woodland type in this region, such as NVC types W11 or W17, comprise downy birch *Betula pubescens*, hazel, sessile oak *Quercus petraea* and, in small proportion, rowan *Sorbus aucuparia* and holly *Ilex aquifolium*.
- 9.7.7 The success of the above tree planting will be monitored for three years, and remedial action taken in the unlikely event that establishment fails.

Habitat Protection Measures

- 9.7.8 Habitat protection measures will comprise embedded measures set out in the CEMP regarding pollution prevention, and tasks performed by the Ecological or Environmental Clerk

of Works such as monitoring of pollution control measures, the above compensatory habitat measures, and advising on infrastructure micro-siting and habitat reinstatement.

Protected Species Survey Update

- 9.7.9 Although effects on protected species are all predicted to be not significant under the EIA Regulations, the refuges of these species, and the animals themselves, are nevertheless subject to legal protection regardless of the importance of individual refuges or populations. Additionally, construction will not take place until 2023/24, by which time protected species may well have established new refuges. Currently, NatureScot consider survey data for a number of protected species to be out-of-date after 12 months.
- 9.7.10 To comply with protected species legislation, policy and best practice, protected species surveys will be carried out no more than 12 months before commencement of works. For clarity, the works are taken to include the limited tree felling carried out specifically for the Proposed Development, but not felling carried out by FLS under the updated Carradale LMP. Ideally, they will not be carried out less than two months before works commence, in order to avoid project delays in the event that derogation licensing and associated mitigation is required (should protected species refuges be found that will be subject to damage, disturbance or obstruction by the works).
- 9.7.11 The surveys will cover protected species known to occur in the vicinity of proposed works, or for which there is a reasonable possibility of such species moving into this vicinity. This will comprise surveys for otter, pine marten / wildcat, red squirrel dreys and badger, as well as a bat roost suitability survey of broadleaved trees to be felled or lopped along the lower access track from the A83. These surveys will follow standard guidance and will take place within the survey buffers typically required by NatureScot.

General Protected Species Protection Measures

- 9.7.12 The following standard measures for avoiding harm to protected species will be implemented, with input as necessary from the Ecological Clerk of Works:
- The limited required tree felling for the Proposed Development will as far as possible be carried out outside the breeding bird season (taken to be March to August, inclusive), and (except where it is clear that red squirrel dreys are absent) outside of the red squirrel breeding season (February to September, inclusive). Where this is not possible, the ECoW will make checks for nesting birds and red squirrel dreys,
 - Where protected species refuges such as red squirrel dreys, pine marten dens or otter holts are found to be present, the ECoW will advise on the minimum distance that tree felling or works may approach and will obtain derogation licence(s) prior to works proceeding that are liable to cause damage, disturbance or obstruction of such protected species refuges,

- Excavations will be provided with a means of escape for animals that may fall in overnight, such as a ramp or battered slope,
- Except where required to remain open for passage of water, pipes that animals could enter will be capped overnight, and
- Artificial lighting will be avoided as far as possible, and where required will be directional to minimise lightspill onto surrounding terrestrial habitats and watercourses.

Appointment of Ecological Clerk of Works

9.7.13 An Ecological Clerk of Works (ECoW) will be appointed to provide ecological supervision and advice for and during construction as necessary. The tasks of the ECoW will include:

- Pre-commencement checks including the protected survey update proposed above,
- Advising on exact infrastructure placement within the micro-siting tolerances,
- Monitoring of and advising on storage of overburden to minimise habitat damage,
- Monitoring of any peat / turves that may be stored for later reinstatement,
- Advising on habitat reinstatement, such as at temporary quarries (borrow pits), including where possible biodiversity priorities,
- Monitoring of pollution control measures and advising on placement of ditches, settlement ponds, etc. to minimise habitat damage,
- Monitoring of protected species, and liaising appropriately to resolve any issues that arise, if necessary, including obtaining further derogation licence(s) and developing associated proportionate mitigation, and
- Monitoring of compensatory habitat measures (blanket bog restoration and tree planting).

9.8 Residual Effects

9.8.1 The only unmitigated effect predicted to be significant involved loss of blanket bog.

9.8.2 Given the above compensatory peatland restoration set out in the HMP, and the substantial area that this covers, there is expected to be a net enhancement resulting in a residual beneficial Moderate effect on blanket bog. This constitutes a residual effect of Moderate Beneficial significance which is **Significant** under the EIA Regulations.

9.8.3 Bat collision mortality is mitigated by the embedded key-holing procedure (see Section 9.5) whereby the cleared area without trees around all turbines in forestry will be 100m in radius for the life of the wind farm. This ensures that there will be more than 50m between rotor blade tips and the nearest woodland, accounting for maximum rotor diameter, minimum rotor hub height and tree height of up to 35m. Bat collision mortality therefore remains Negligible and **Not Significant** under the EIA Regulations.

- 9.8.4 All other residual effects remain the same as the predicted unmitigated effects, i.e. they are **Not Significant**. The above mitigation / compensation measures not related to blanket bog or bats will be implemented as a matter of best practice and in order to achieve compliance with nature conservation legislation and local and national policy.
- 9.8.5 Table 9-8 below presents a summary of ecological effects, mitigation and significance.

Table 9-8 Summary of Effects

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
	Direct loss – worst case 0.5ha loss along access track to A83 during track alterations.	Permanent Minor Adverse	Replanting in proportion to the actual loss.	Negligible	Not Significant
Broadleaved woodland	Airborne or waterborne pollution during construction. Airborne insignificant owing to insufficient vehicular or other polluting activity. Waterborne minimised by embedded standard pollution controls.	None	None	None	Not Significant
	Hydrological effects during construction, largely avoided by woodland type, location and minimal infrastructure effects.	None	None	None	Not Significant
	Operational pollution during maintenance, likely minimal through embedded standard pollution controls and minimal nature of the maintenance activity.	None	None	None	Not Significant
Blanket bog	Direct loss – worst case estimate 7.8 ha (of which 6.3 ha is in north-west moorland), out of 112 ha in the latter area and 380 ha overall in the red line boundary.	Permanent Moderate Adverse	Habitat Management Plan with implementation of part of the peatland restoration under updated Carradale LMP, with at least 56.2 ha likely to be restored.	Permanent Moderate Beneficial	Significant (Beneficial)

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
	Hydrological damage by infrastructure on blanket bog, likely minimal owing to embedded mitigation of floating tracks in flatter areas and dominance of drier bog type in affected areas.	Permanent Minor Adverse (at most)	Habitat Management Plan with implementation of part of the peatland restoration under updated Carradale LMP, with at least 56.2 ha likely to be restored.	Permanent Moderate Beneficial	Significant (Beneficial)
	Airborne or waterborne pollution during construction. Airborne insignificant owing to insufficient vehicular or other air-polluting activity. Waterborne minimised by embedded standard pollution controls.	None	None	None	Not Significant
	Operational pollution during maintenance, avoided through embedded standard pollution controls and minimal nature of the maintenance activity.	None	None	None	Not Significant
	Decommissioning – removal of infrastructure from blanket bog, with minor increase in blanket bog extent.	Moderate Beneficial	None	Moderate Beneficial	Significant (Beneficial)
Heath	Direct loss – worst case estimate 4.6ha, almost all wet heath rather than dry heath. The type of wet heath concerned is mostly along the forest track, and is abundant in western Scotland, frequent in the Development Site, and of no note.	Negligible	None	Negligible	Not Significant
	Hydrological damage to heath during construction, negligible owing to effected wet heath largely in narrow strips along forestry track.	Negligible	None	Negligible	Not Significant

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
	Pollution during construction (controlled by standard embedded measures) or during operation (controlled by same measures).	None	None	None	Not Significant
	Decommissioning – very minor removal of infrastructure from heath and reinstatement.	Negligible	None	Negligible	Not Significant
Basic flush	Direct loss – none. Basic flush is outside infrastructure footprint.	None	None	None	Not Significant
	Hydrological damage – none. There is no hydrological connectivity between basic flush habitat and infrastructure.	None	None	None	Not Significant
	Pollution during construction/operation – none. Basic flush is not hydrologically connected to infrastructure and airborne pollution will not be significant.	None	None	None	Not Significant
	Decommissioning – no effects possible for same reasons given above.	None	None	None	Not Significant
	Other habitats	Direct loss. Sitka plantation (or what will be recently clear-felled at the time of construction) of negligible ecological value, worst case loss of 58.6 ha. Common type of non-notable species-poor acid flush loss 2.1ha at worst with 26 ha in the red line boundary. Other habitat losses negligibly small.	Negligible	None	Negligible

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
	Decommissioning – removal of infrastructure and habitat reinstatement, affecting small areas of habitats of low importance.	Negligible	None	Negligible	Not Significant
	Loss of roosts – no roosts known in wind farm site, possibility of roosts in limited trees to be removed along access track to A83, but likely to be few and to affect common species only.	Negligible	Pre-commencement survey for roost suitability. If roosts along lower access track are lost, compensatory bat boxes of appropriate type(s).	None	Not Significant
Bats	Changes to foraging/commuting habitat – very little as a result of initial phase of updated Carradale LMP having been implemented at the time of construction. Very slight increase in woodland edge where keyholing required.	Negligible	None	Negligible	Not Significant
	Bat mortality through operational collision. Addressed through embedded mitigation measure of 100m radius for key-hole clearance in forestry for life of wind farm, which ensures minimum 50m separation of blade tips from woodland / trees.	Negligible	Embedded mitigation measure of 100m key-holing radius (see left) for life of wind farm.	Negligible	Not Significant
	Decommissioning – removal of all collision risk. Magnitude of impact low since the 100m minimum separation of rotors from trees would have been in place with consequent negligible bat collision risk.	Negligible	None	Negligible	Not Significant

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
Otter	Loss/disturbance of refuges, of which none currently known near proposed infrastructure.	Negligible	Pre-commencement survey, licensing if necessary	Negligible	Not Significant
	Loss of otter habitat, amounting to negligibly small loss of optimal waterside vegetation, with no substantial swamps/standing waters etc. and no watercourse loss.	Negligible	None	Negligible	Not Significant
	Otter vehicle collision during construction/operation – very unlikely owing to low traffic speeds and mostly daylight works.	Negligible	None	Negligible	Not Significant
	Decommissioning – disturbance/mortality as during construction/operation and similarly improbable.	Negligible	None	Negligible	Not Significant
Pine marten	Loss/disturbance of pine marten refuges, of which none currently known near proposed infrastructure and unlikely to be established nearby given shortage of suitable nearby features.	Negligible	Pre-commencement survey, licensing if necessary.	Negligible	Not Significant
	Pine marten vehicle collision during construction/operation – very unlikely owing to low traffic speeds and mostly daylight works.	Negligible	None	Negligible	Not Significant
	Decommissioning – disturbance/mortality as during construction/operation and similarly improbable.	Negligible	None	Negligible	Not Significant

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
Wild cat	Effects similar but more improbable than for pine marten. No field evidence of wild cat found, and although wild cat could nevertheless occur at the Development Site it is not known as a key area for this species.	Negligible	Pre-commencement survey, licensing if necessary.	Negligible	Not Significant
Red squirrel	Loss/disturbance of dreys, likely to be insignificant owing to reduced woodland cover at time of construction and lower density of this species in Sitka plantation.	Negligible	Pre-commencement survey, licensing if necessary.	Negligible	Not Significant
	Red squirrel vehicle collision during construction/operation – very unlikely owing to low traffic speeds and limited adjacent woodland.	Negligible	None	Negligible	Not Significant
	Decommissioning – disturbance/mortality as during construction/operation and similarly improbable.	Negligible	None	Negligible	Not Significant
Common reptiles	Mortality of reptiles during construction – limited impact owing to proposed infrastructure being situated largely in plantation/clear-fell or along existing access track, and 97% of north-west moorland and all of south-east moorland unaffected.	Negligible	None	Negligible	Not Significant
	Changes to reptile habitat – negligible loss of suitable habitat with 97% of north-west moorland and all of south-east moorland unaffected.	Negligible	None	Negligible	Not Significant
	Reptile mortality during operation – very limited impact owing to low traffic speeds, and again most moorland habitat unaffected.	Negligible	None	Negligible	Not Significant

Receptor	Description of Effect	Effect	Additional Mitigation	Residual Effects	Significance
	Decommissioning – mortality as for construction and similarly negligible.	Negligible	None	Negligible	Not Significant
	Pollution effects during construction – improbable owing to limited works near water, standard embedded pollution controls in CEMP as required by SEPA, and capable of affecting small non-notable fish populations only.	Negligible	None	Negligible	Not Significant
Fish	Barriers to fish movement – none expected on Clachaig Water, which will be crossed once by bridge. Five other crossings are towards the heads of minor tributaries only with likely negligibly small fish populations, and there are no known notable fish species.	Negligible	None	Negligible	Not Significant
	Pollution effects during operation – improbable, limited infrastructure near water, SEPA requirement for surface run-off to be treated, and capable of affecting small non-notable fish populations only.	Negligible	None	Negligible	Not Significant
	Decommissioning – pollution risks similar to construction and controlled by embedded pollution controls.	Negligible	None	Negligible	Not Significant

9.9 Cumulative Effects

9.9.1 Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2018). Chapter 2 of this EIA: Approach to EIA sets out an agreed list of wind farms for consideration for cumulative assessment. These are shown in Table 9-9 and extend to 22.1km from the Proposed Development.

Table 9-9 Wind Farms for Cumulative Assessment

Name	Status	No. of Turbines	Approximate Distance (km)
Airigh	Consented	14	22.1
Auchadaduie	Operational	3	5.1
Beinn an Tuirc	Operational	46	4.7
Beinn an Tuirc Extension	Operational	19	6.6
Beinn an Tuirc Phase III	Under Construction	16	8.6
Blary Hill	Under Construction	14	3.9
Cour	Operational	10	7.3
Deucheran Hill	Operational	9	2.6
Eascairt	Consented	13	15.5
Freasdail	Operational	11	18.0
Gigha	Operational	3	8.8
High Constellation	Consented	10	8.7
Leim Farm (Gigha)	Operational	1	9.0
Narachan	Planning - Not determined	17	3.8
Sheirdrim	Planning - Not determined	19	15.8
Tangy I & II	Operational	22	12.7
Tangy IV*	Consented	16	11.7

If constructed, Tangy IV would replace the existing Tangy I & II schemes. Therefore, Tangy I & II are considered part of the baseline and only Tangy IV is proposed in Chapter 2 of this EIA: Approach to EIA for cumulative assessment.

9.9.2 No ecological information was found for Deucharan Hill Wind Farm. This small wind farm became operational 20 years ago. It is the closest of the above-listed wind farms to the Development Site, at 2.6km to the north-east. However, there is limited ecological connectivity, since it is located in a different watershed to the Proposed Development with an

intervening area of high open ground. It is located mainly amongst commercial forestry, with smaller amounts of open ground, and is not close to significant watercourses. Although the separation distance is within the distance that bat populations might range, the likelihood of bats commuting between these sites is considered relatively low given an intervening area of high open ground, and the very low level of bat activity found on the open northwest moorland at the Proposed Development. Consequently, given also a) the limited open ground at Deucheran Hill and therefore limited possible effects on blanket bog (if present) and other open habitats, b) the negligible effects of the Proposed Development on features other than bog and bats without mitigation, and c) the predicted lack of adverse effects of the Proposed Development with blanket bog and bat mitigation, there is unlikely to be any significant ecological (non-avian) cumulative effect with Deucheran Hill Wind Farm.

- 9.9.3 The proposed Narachan Wind Farm is the second-closest of the above-listed wind farms to the Proposed Development at 3.8km. It is located beyond Deucheran Hill Wind Farm amongst forestry with smaller amounts of open ground included bog. The EIAR for this wind farm states that there were no significant ecological (non-avian) effects other than for bats, which would be mitigated by maintaining appropriate buffer zones between turbines and habitat of value to bats. It is less likely with 3.8km separation, and intervening high ground, that bats would commute between Narachan Wind Farm and the Proposed Development. However, in view of the predicted negligible effect on bats (with similar mitigation in place) of the Proposed Development, there are not likely to be significant cumulative effects on bats between these sites, nor on other ecological features given the stated lack of other impacts for Narachan Wind Farm.
- 9.9.4 The Blary Wind Farm site, which is under construction, is 3.9km south of the Development, with negligible ecological connectivity to the Proposed Development as a result of intervening open moorland and plantation, and no watercourses flowing between the sites. It was predominantly conifer plantation, with smaller areas of wet modified bog and marshy grassland. Common, low-risk bat species were identified as well as otter, common lizard, brown trout and Atlantic salmon. Given also the limited residual effects predicted for Blary Wind Farm, cumulative ecological effects are considered unlikely to be significant.
- 9.9.5 The operational Auchadaduie Wind Farm site mainly comprised commercial conifer plantation with small areas of grassland, watercourses and broad-leaved woodland. The site is 5.1km distant from the Proposed Development with no clear ecological connectivity. Common and widespread bat species and otter were recorded. No other important ecological features were recorded and the potential for them was considered limited. Cumulative ecological effects are also considered unlikely due to the limited number and distribution of ecological features within the Auchadaduie site.
- 9.9.6 Ecological information on the operational Beinn an Tuirc wind farm was not found – this site, which was completed 20 years ago, is 4.7km from the Proposed Development and comprises significantly more turbines (46 turbines) than any of the other above-listed wind farms. There is no ecological connectivity with this wind farm, with the substantial valley of the Barr Water between the Proposed Development and Beinn an Tuirc Wind Farm, and extensive open

ground. Information on Beinn an Tuirc Extension was also not found – this was more recently completed in 2013, and is a little more distant from the Proposed Development. The Beinn an Tuirc Phase III Wind Farm site, which is under construction, is 8.6km from the Proposed Development, with no ecological connectivity. It mainly comprised conifer plantation woodland, with higher areas of blanket bog and dry heath. No otter, pine martin, red squirrel, badger or amphibians were recorded. Occasional sightings of adder and common lizard were recorded. Evidence of water vole was restricted to a single burrow. Consultees were satisfied with the proposed mitigation and habitat management plan. The development was predicted to result in a net increase in blanket bog habitat. There is potential therefore for a cumulative beneficial effect on blanket bog, given that both this site and the Proposed Development result in significant increases in this habitat. There is unlikely to be any other significant cumulative effect.

- 9.9.7 The operational Cour Wind Farm site, which is 7.3km from the Proposed Development with no ecological connectivity, mainly comprised open moorland habitats including heath and blanket bog (modified and intact). Surveys recorded otter, adder, common lizard and low levels of activity from common bat species. NatureScot (then SNH) did not object on ecological grounds with appropriate mitigation in place. Given also the separation distance and lack of connectivity, significant cumulative impacts are considered highly unlikely.
- 9.9.8 The increasing separation distance of the other wind farms listed in Table 9-9, approaching and exceeding 10km, renders adverse cumulative ecological impacts increasingly unlikely, particularly given the likely absence of such cumulative effects for the closest wind farms discussed above, and the negligible effects of the Proposed Development with mitigation in place for blanket bog and bats. Consequently, there is considered to be no likelihood of any significant adverse cumulative ecological (non-avian) effect with other wind farms. This applies to both Scenario 1 and Scenario 2 (as set out in Chapter 2 of this EIA: Approach to EIA). There is a potential beneficial cumulative beneficial effect locally on blanket bog, owing to the expected increase in blanket bog habitat from habitat restoration at Beinn an Tuirc Phase III Wind Farm and from implementation by the Proposed Development of a significant part of the updated Carradale LMP blanket bog restoration.

9.10 Summary of Assessment

- 9.10.1 Identified important ecological features within the Development Site include blanket bog, basic flush, heath, broadleaved woodland (beside the A83 access track only), common bat species, otter, pine marten, red squirrel and fish. However, the protected species evidence indicates a low level of presence within the Development Site, with the exception of a Moderate activity level for common bat species (mainly common and soprano pipistrelles) comparable with the surrounding region (as determined by Ecobat analysis of static detector data).
- 9.10.2 Bat collision risk is mitigated by the embedded design measure of 100m radius for key-holing turbines in forestry, for the life of the wind farm, which ensures at least 50m separation of blade tips from trees (as per SNH *et al*, 2019).

- 9.10.3 Important habitats are highly localised with limited impact from the Proposed Development, with the exception of blanket bog. Ecological effects before mitigation are predicted to be negligible except for direct loss of blanket bog which is assessed as Moderate adverse and Significant.
- 9.10.4 Mitigation for the Proposed Development that addresses the adverse effect on blanket bog is the implementation and financing of the restoration of 56.2 ha forestry to blanket bog in line with the updated Carradale LMP and FLS restoration standards. With this mitigation in place, the residual effect for blanket bog is expected to be Moderate beneficial and Significant.
- 9.10.5 All other residual effects are Negligible or None and Not Significant.

9.11 References

- AECOM (2016). Clachaig Glen Environmental Statement.
- Argyll and Bute Council (2015). Local Development Plan – Written Statement. [Online]. Available: <https://www.argyll-bute.gov.uk/ldp>. [Accessed 14/12/20].
- Argyll and Bute Council (2015). Local Development Plan – Written Statement. [Online]. Available: <https://www.argyll-bute.gov.uk/ldp>. [Accessed 14/12/20].
- Argyll and Bute Council (2017). Biodiversity Technical Note. [Online]. Available: https://www.argyll-bute.gov.uk/sites/default/files/biodiversity_technical_note_feb_2017_4.pdf. [Accessed 14/12/20].
- Argyll and Bute Council (2019). Proposed Local Development Plan 2 – Written Statement. Available: <https://www.argyll-bute.gov.uk/sites/default/files/Unknown/finalldp2writtenstatementdepositv2.pdf>. [Accessed 14/12/20].
- Averis, A., Averis, B., Birks, J., Horsfield, D., Thompson, D. and Yeo, M. (2004) An Illustrated Guide to British Upland Vegetation, JNCC, Peterborough.
- Bat Conservation Trust (2016). Core Sustainance Zones: Determining Zone Size. Bat Conservation Trust, London.
- Chanin, P. (2003). Monitoring the Otter *Lutra lutra*, Conserving Natura 2000 Rivers Monitoring Series No. 10, English Nature, Peterburgh.
- Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trehwella, W.J., Wells, D. and Wray, S. (eds.) (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.
- Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016). The Water Vole Mitigation Handbook, Mammal Society Mitigation Guidance Series. The Mammal Society, London.
- Fox, R., Warren, M.S. and Brereton, T.M. (2010). A new Red List of British Butterflies, Species Status 12, 1-32. Joint Nature Conservation Committee, Peterborough.

- FLS (*unpublished*) Updated Carradale Land Management Plan (title yet to be determined).
- Hall, J.E., Kirby, K.J. and Whitbread, A.M (2004). National Vegetation Classification: Field guide to woodland. JNCC, Peterborough.
- Harris S, Cresswell P and Jefferies D (1989). Surveying Badgers – An occasional publication of the Mammal Society, No. 9. Mammal Society, London
- Harris, S. and Yalden, D.W. (2008). Mammals of the British Isles (4th Edition). The Mammal Society, Southampton.
- Highways England (2019). DMRB Sustainability and Environment Appraisal: LA105 Air Quality. Highways England.
- Liles, G. (2003). Otter Breeding Sites. Conservation and Management. Conserving Natura 2000 Rivers Conservation Techniques Series No. 5, English Nature, Peterborough.
- Rodwell, J.S. (ed.) (1991a). British Plant Communities Volume 1 Woodlands and Scrub. Cambridge University Press, Cambridge.
- Rodwell, J.S. (ed.) (1991b). British Plant Communities Volume 2 Mires and Heaths. Cambridge University Press, Cambridge.
- Rodwell, J.S. (ed.) (1992). British Plant Communities Volume 3 Grassland and Montane Communities. Cambridge University Press, Cambridge.
- Rodwell, J.S. (ed.) (1995). British Plant Communities Volume 4 Aquatic Communities, Swamps and Tall-herb Fens. Cambridge University Press, Cambridge.
- Rodwell, J.S., Dring, J.C., Averis, A.B.G., Proctor, M.C.F., Malloch, A.J.C., Schaminée, J.N.J. and Dargie, T.C.D. (2000). Review of coverage of National Vegetation Classification, JNCC Report No. 302. Joint Nature Conservation Committee, Peterborough.
- Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines. Version 1.
- Scottish Natural Heritage, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, University of Exeter and Bat Conservation Trust (2019). Bats and onshore wind turbines: survey, assessment and mitigation.
- Spracklen, B.D., Lane, J.V., Spracklen, D.V., Williams, N. and Kunin, W.E. (2013). Regeneration of native broadleaved species on clearfelled conifer plantations in upland Britain. Forest Ecology and Management 310: pp 204-212.
- Strachan, R. (2007). National survey of otter *Lutra lutra* distribution in Scotland 2003-04. Scottish Natural Heritage Commissioned Report No. 211.
- Strachan, R., Moorhouse, T. and Gelling, M. (2011). Water Vole Conservation Handbook. 3rd Edition. Wildlife Conservation Research Unit, University of Oxford.

RWE

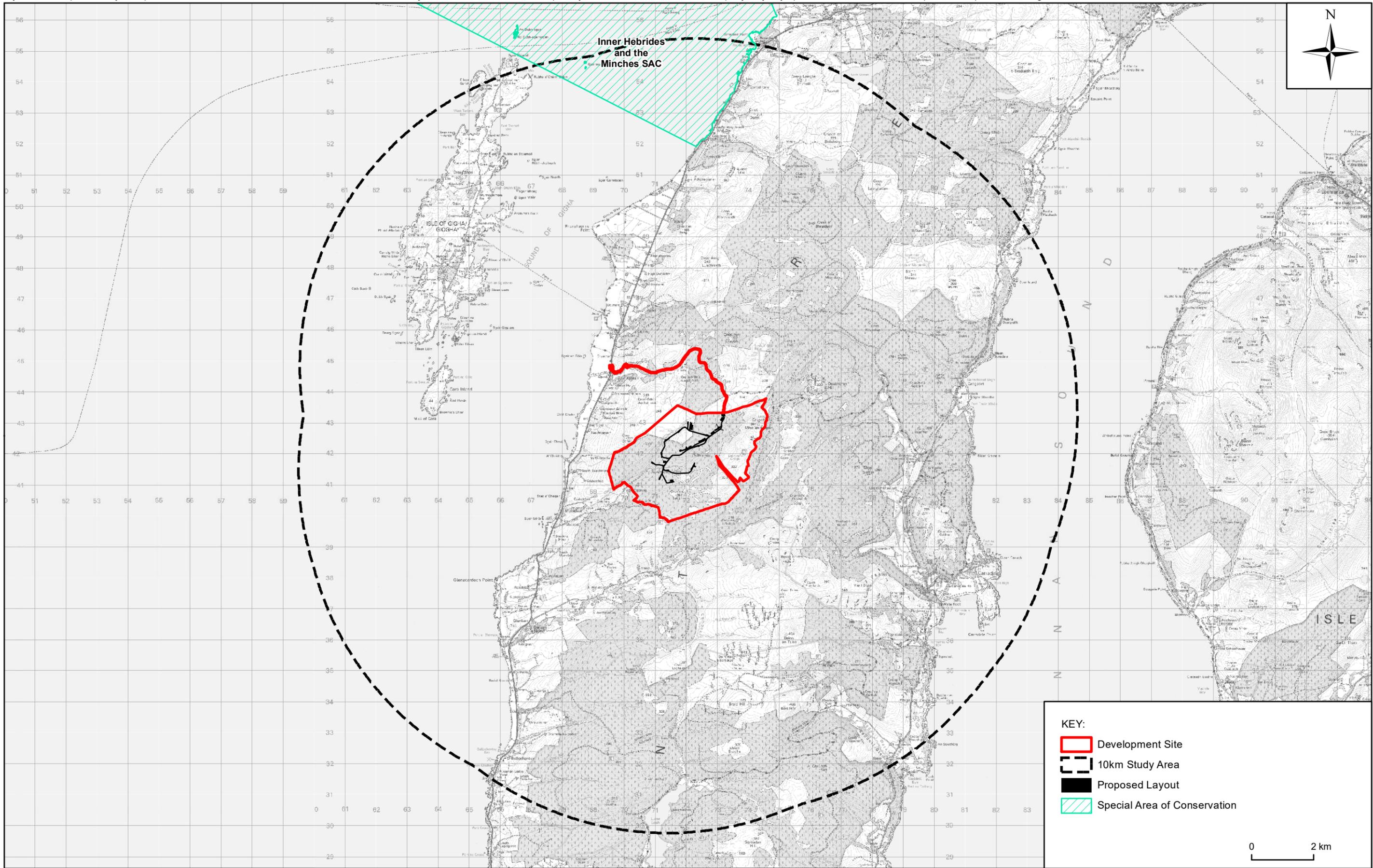
Clachaig Glen Wind Farm

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EIAR Figures

Figures: 9.1; 9.2



KEY:

- Development Site
- 10km Study Area
- Proposed Layout
- Special Area of Conservation

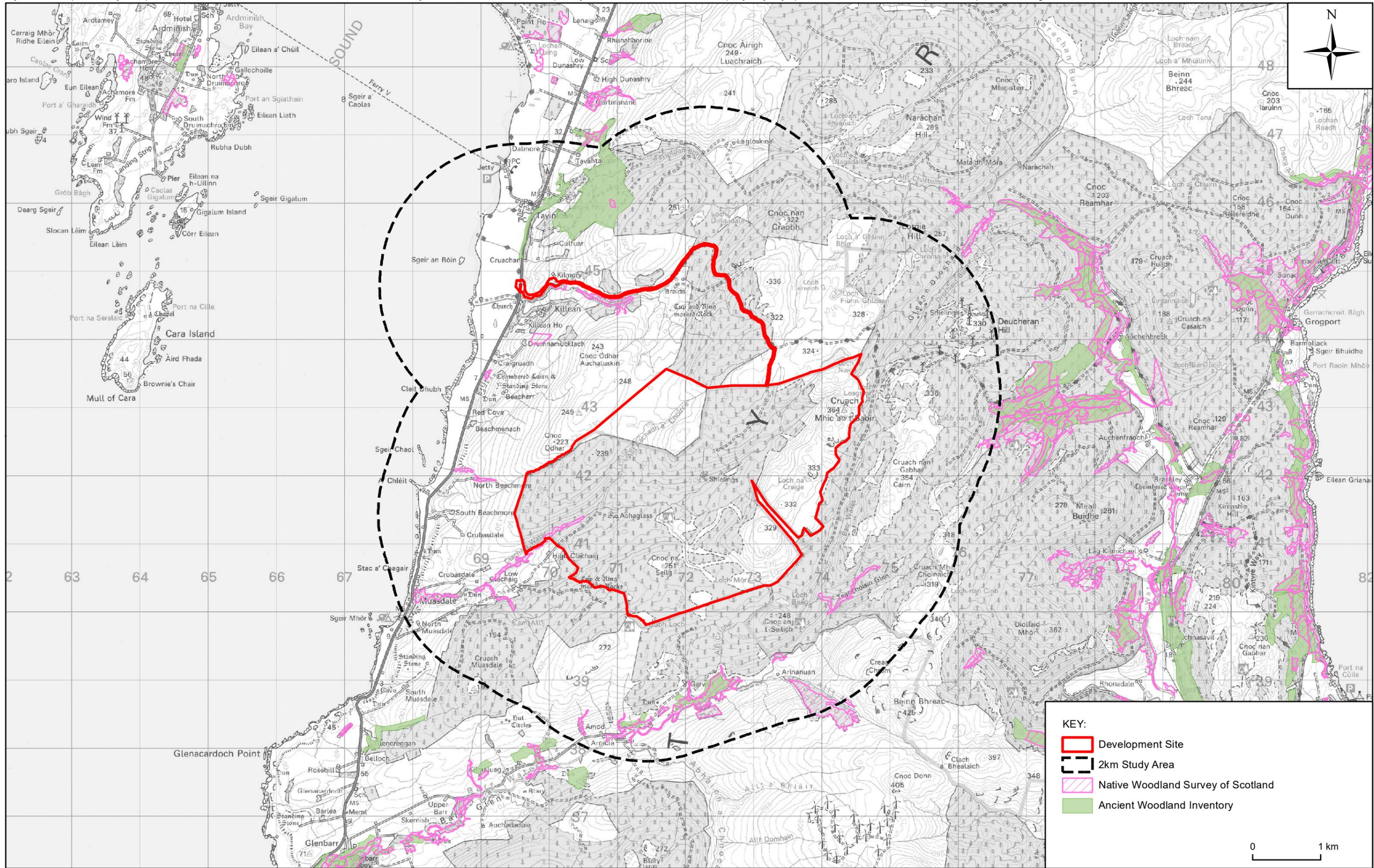
0 2 km

Client:	RWE
Project:	CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

Title:	FIGURE 9.1 NON-ORNITHOLOGICAL EUROPEAN DESIGNATED SITES
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AECOM	
One Trinity Gardens Quayside Newcastle, NE1 2HF	
Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com	

Drawn:	LC	Checked:	AR
Verified:	ND	Approved:	SW
Date:	JANUARY 2022	Scale at A3:	1:110,000
Drawing Number:	CG_220105_EIA9.1_v2		A3



KEY:

- Development Site
- 2km Study Area
- Native Woodland Survey of Scotland
- Ancient Woodland Inventory

0 1 km

Client: **RWE**

Project: **CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT**

Title: **FIGURE 9.2 OTHER NON-ORNITHOLOGICAL DESIGNATED SITES**

AECOM
 One Trinity Gardens
 Quayside
 Newcastle, NE1 2HF
 Tel +44 (0) 191 224 6500
 Fax +44 (0) 191 224 6599
 www.aecom.com

Drawn: LC	Checked: AR
Verified: ND	Approved: SW
Date: JANUARY 2022	Scale at A3: 1:50,000
Drawing Number: CG_220105_EIA9.2_v2	A3

RWE

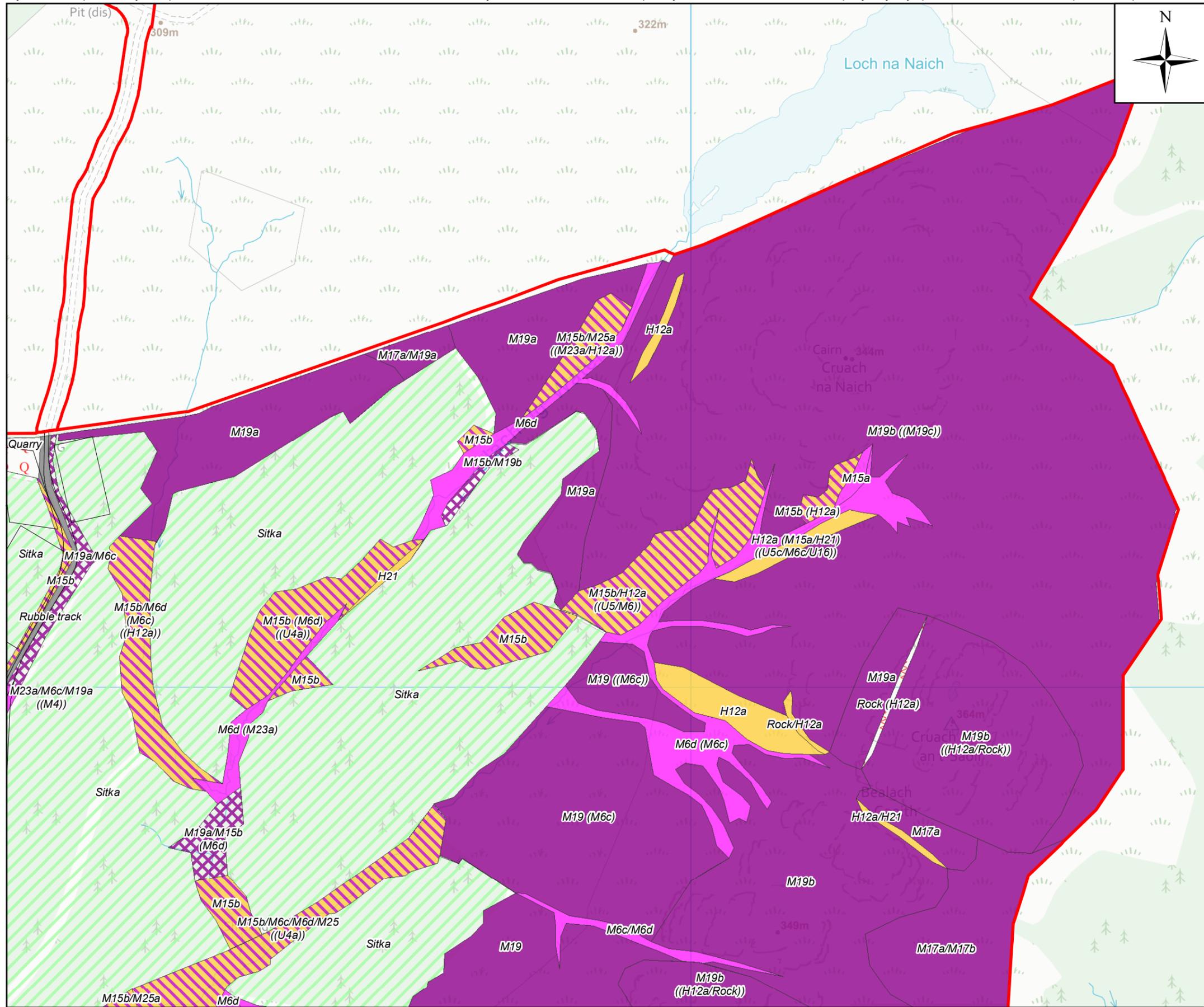
Clachaig Glen Wind Farm

Environmental Impact Assessment Report

Volume 2b

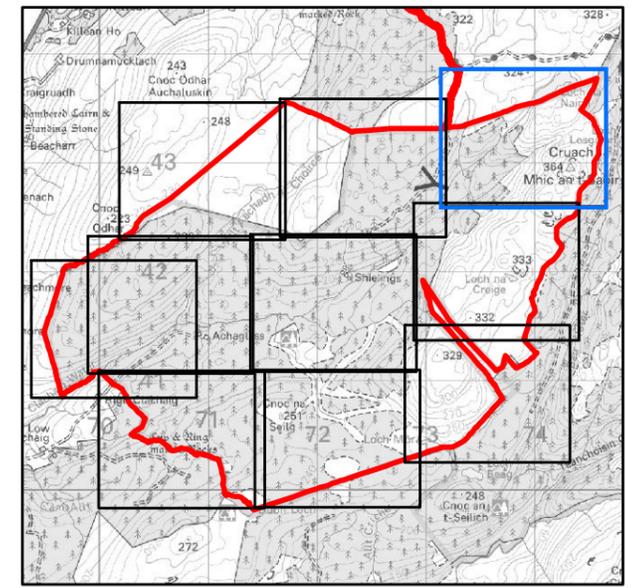
EIAR Figures

Figure: 9.3



- KEY:**
- Development Site
 - Proposed Infrastructure Layout Outline
- Phase 1 Habitats**
- A1.2.2 - Broadleaved woodland - plantation
 - D1.1 - Dry dwarf shrub heath - acid
 - D2 - Wet dwarf shrub heath
 - E1.6.1 - Blanket sphagnum bog
 - E1.7 - Wet modified bog
 - E2.1 - Flush and spring - acid/neutral flush
 - I1.1.1 - Inland cliff - acid/neutral
 - I2.1 - Quarry
 - Existing track

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



0 200 Meters

Client:	RWE
Project:	CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

Title:	FIGURE 9.3 HABITATS SHEET 1 OF 10
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AECOM	
One Trinity Gardens Quayside Newcastle, NE1 2HF	Tel +44 (0) 191 224 6500 Fax +44 (0) 191 224 6599 www.aecom.com

Drawn:	LC	Checked:	AR
Verified:	ND	Approved:	SW
Date:	JANUARY 2022	Scale at A3:	1:5,000
Drawing Number:	CG_220105_EIA9.3_v4		A3



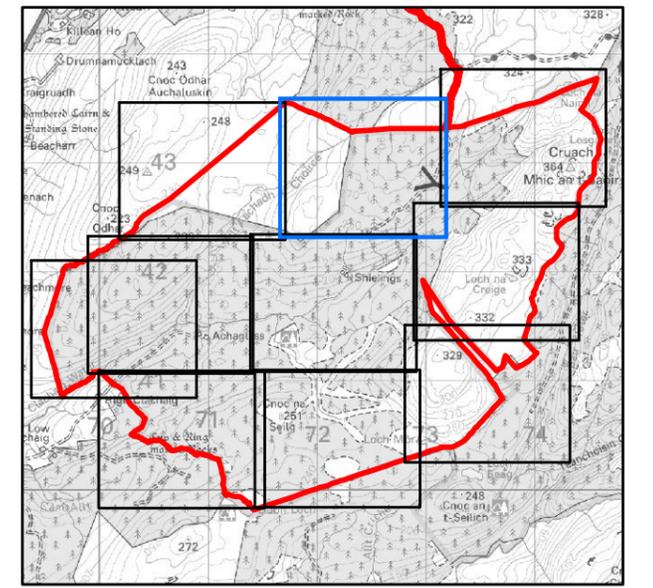
KEY:

- Development Site
- Proposed Turbine Location
- Proposed Infrastructure Layout Outline

Phase 1 Habitats

- A1.2.2 - Broadleaved woodland - plantation
- B5 - Marsh/marshy grassland
- C1.1 - Poor semi-improved grassland
- D1.1 - Dry dwarf shrub heath - acid
- D2 - Wet dwarf shrub heath
- E1.6.1 - Blanket sphagnum bog
- E1.6.1/D1.1 - Blanket sphagnum bog / Dry dwarf shrub heath - acid
- E1.7 - Wet modified bog
- E2.1 - Flush and spring - acid/neutral flush
- E2.2 - Flush and spring - basic flush
- I2.1 - Quarry
- Existing track

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

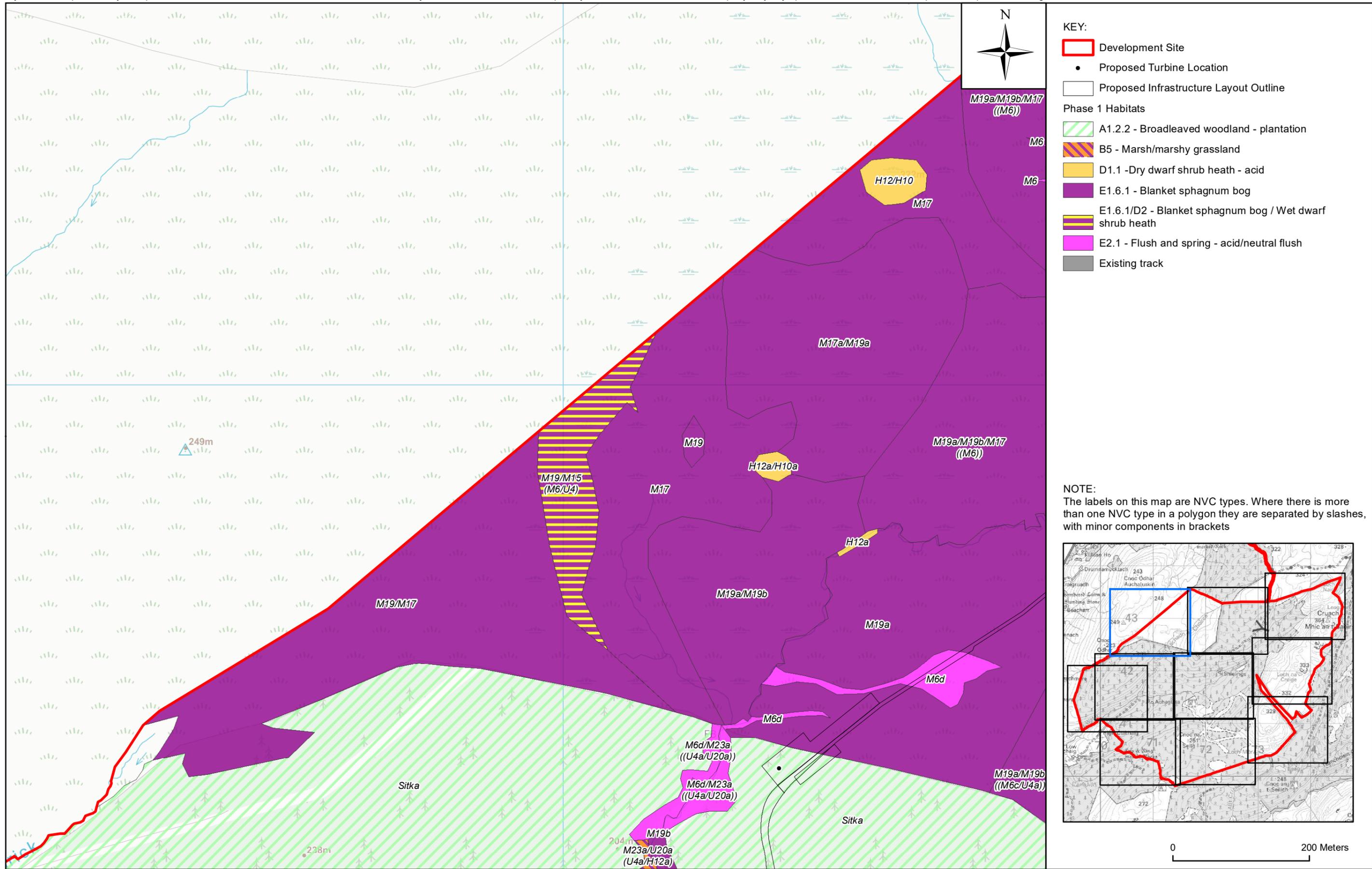
Title: **FIGURE 9.3 HABITATS SHEET 2 OF 10**

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Verified: ND	Approved: SW
Date: JANUARY 2022	Scale at A3: 1:5,000
Drawing Number: CG_220105_EIA9.3_v4	A3



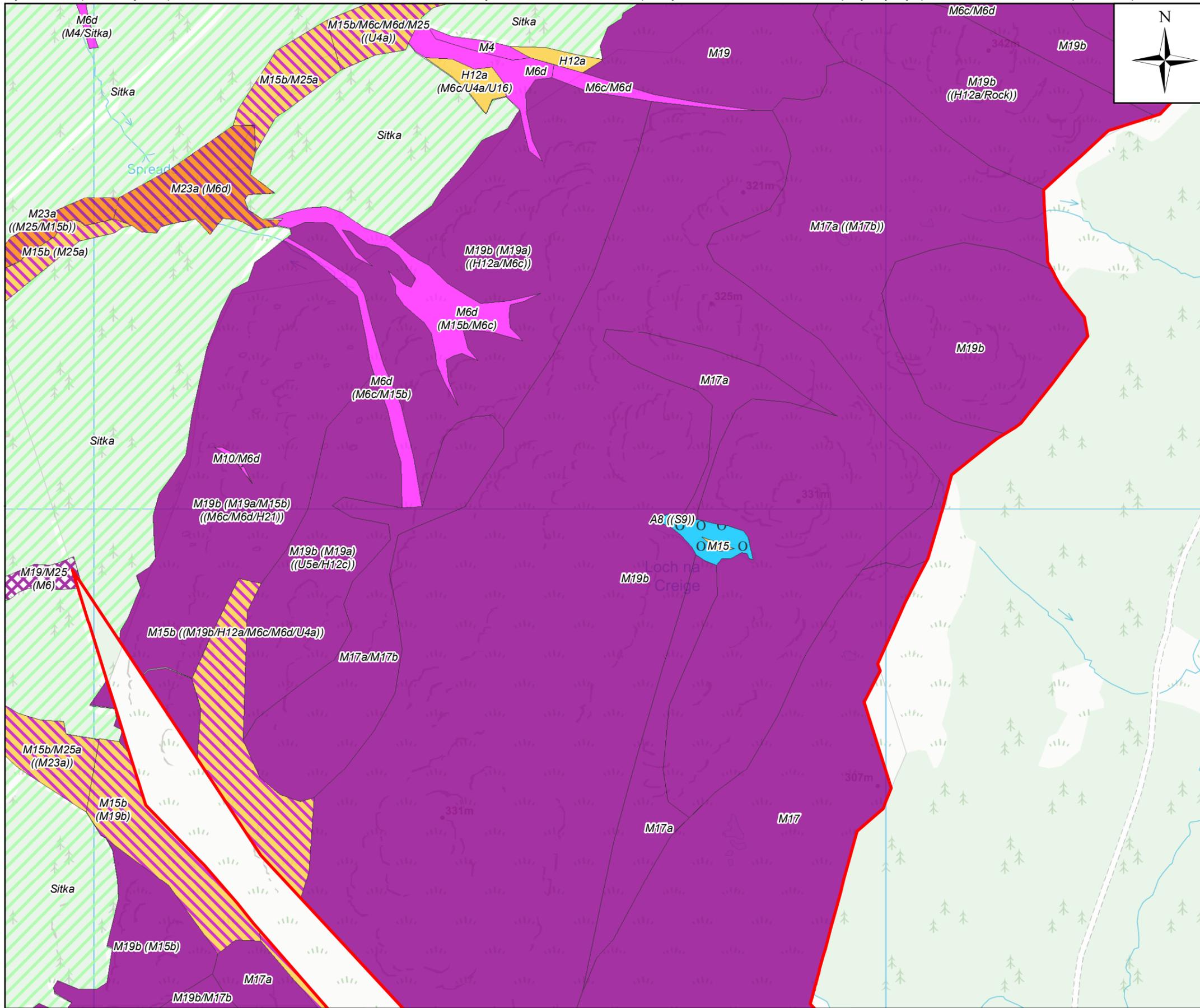
Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

Title: **FIGURE 9.3 HABITATS SHEET 3 OF 10**

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Verified: ND	Approved: SW
Date: JANUARY 2022	Scale at A3: 1:5,000
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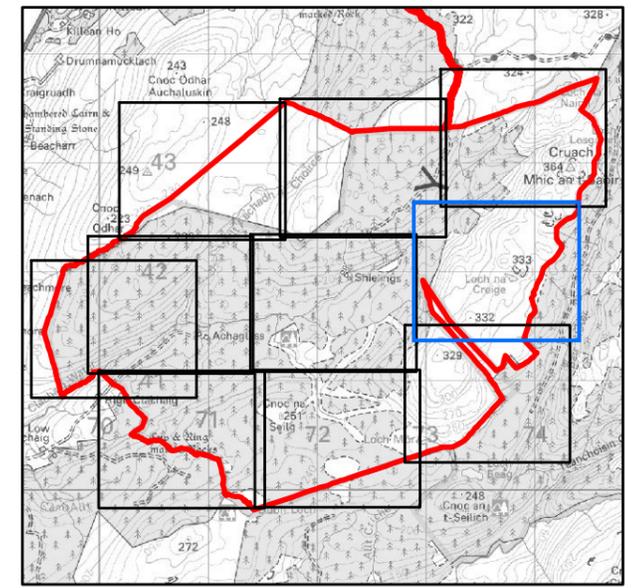
KEY:

- Development Site
- Proposed Infrastructure Layout Outline

Phase 1 Habitats

- A1.2.2 - Broadleaved woodland - plantation
- B5 - Marsh/marshy grassland
- D1.1 - Dry dwarf shrub heath - acid
- D2 - Wet dwarf shrub heath
- E1.6.1 - Blanket sphagnum bog
- E1.7 - Wet modified bog
- E2.1 - Flush and spring - acid/neutral flush
- E2.2 - Flush and spring - basic flush
- G1.3 - Standing water - oligotrophic
- Existing track

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



0 200 Meters

Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

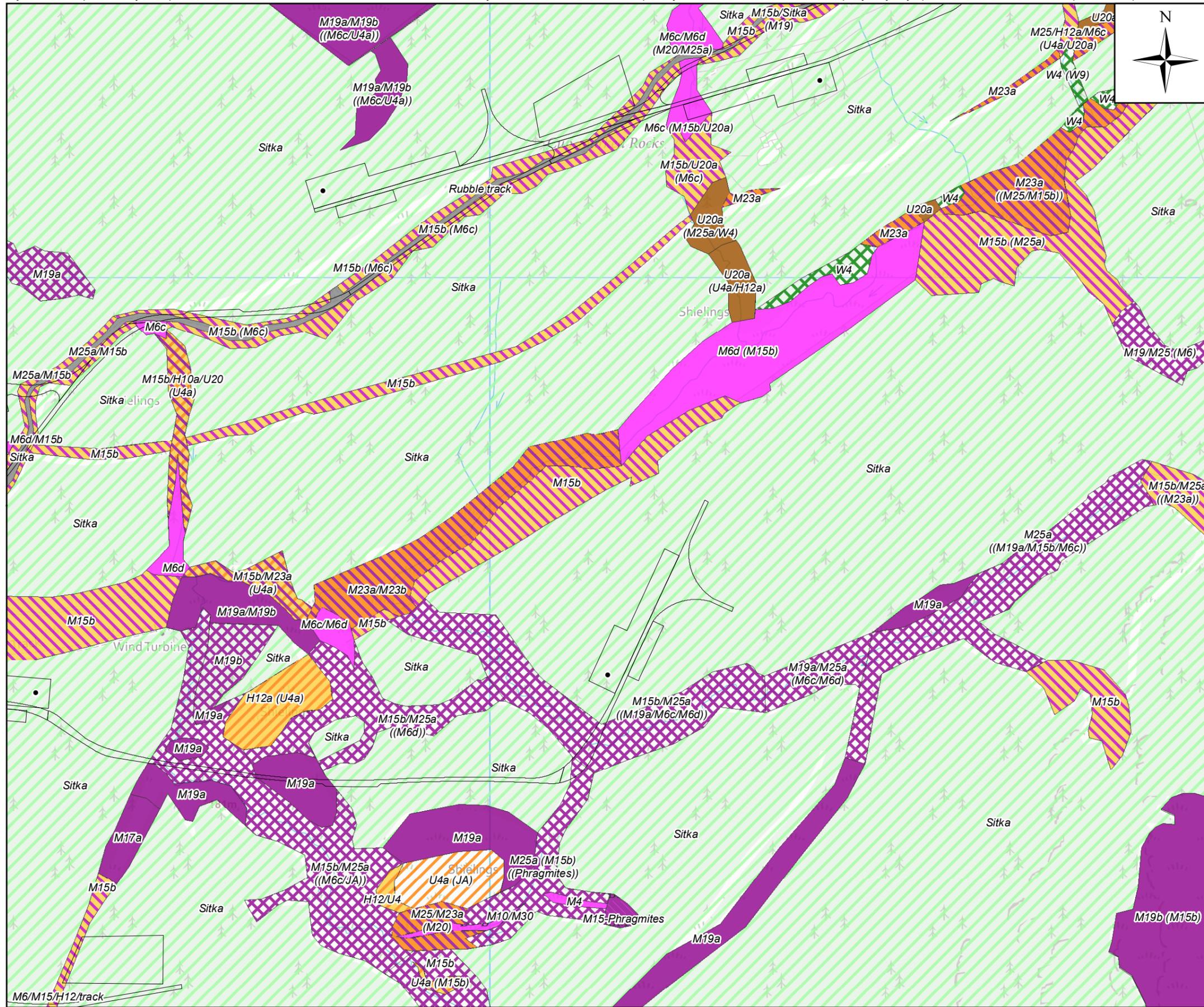
Title: **FIGURE 9.3 HABITATS SHEET 4 OF 10**

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Date: JANUARY 2022	Scale at A3: 1:5,000
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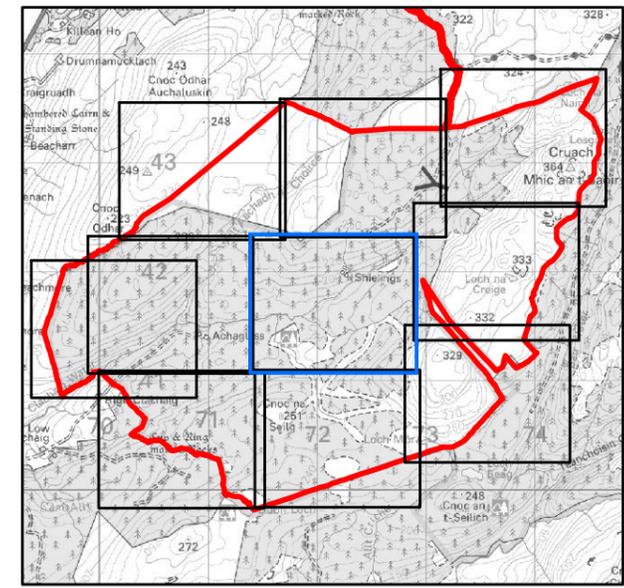
KEY:

- Development Site
- Proposed Turbine Location
- Proposed Infrastructure Layout Outline

Phase 1 Habitats

- A1.2.2 - Broadleaved woodland - plantation
- A2.1 - Scrub - dense/continuous
- B1.1 - Acid grassland - unimproved
- B5 - Marsh/marshy grassland
- C1.1 - Poor semi-improved grassland
- D2 - Wet dwarf shrub heath
- D5 - Dry heath/acid grassland
- D6 - Wet heath/acid grassland
- E1.6.1 - Blanket sphagnum bog
- E1.6.1/D2 - Blanket sphagnum bog / Wet dwarf shrub heath
- E1.7 - Wet modified bog
- E2.1 - Flush and spring - acid/neutral flush
- E2.2 - Flush and spring - basic flush
- E3.2 - Fen - basin mire
- Existing track

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



0 200 Meters

Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

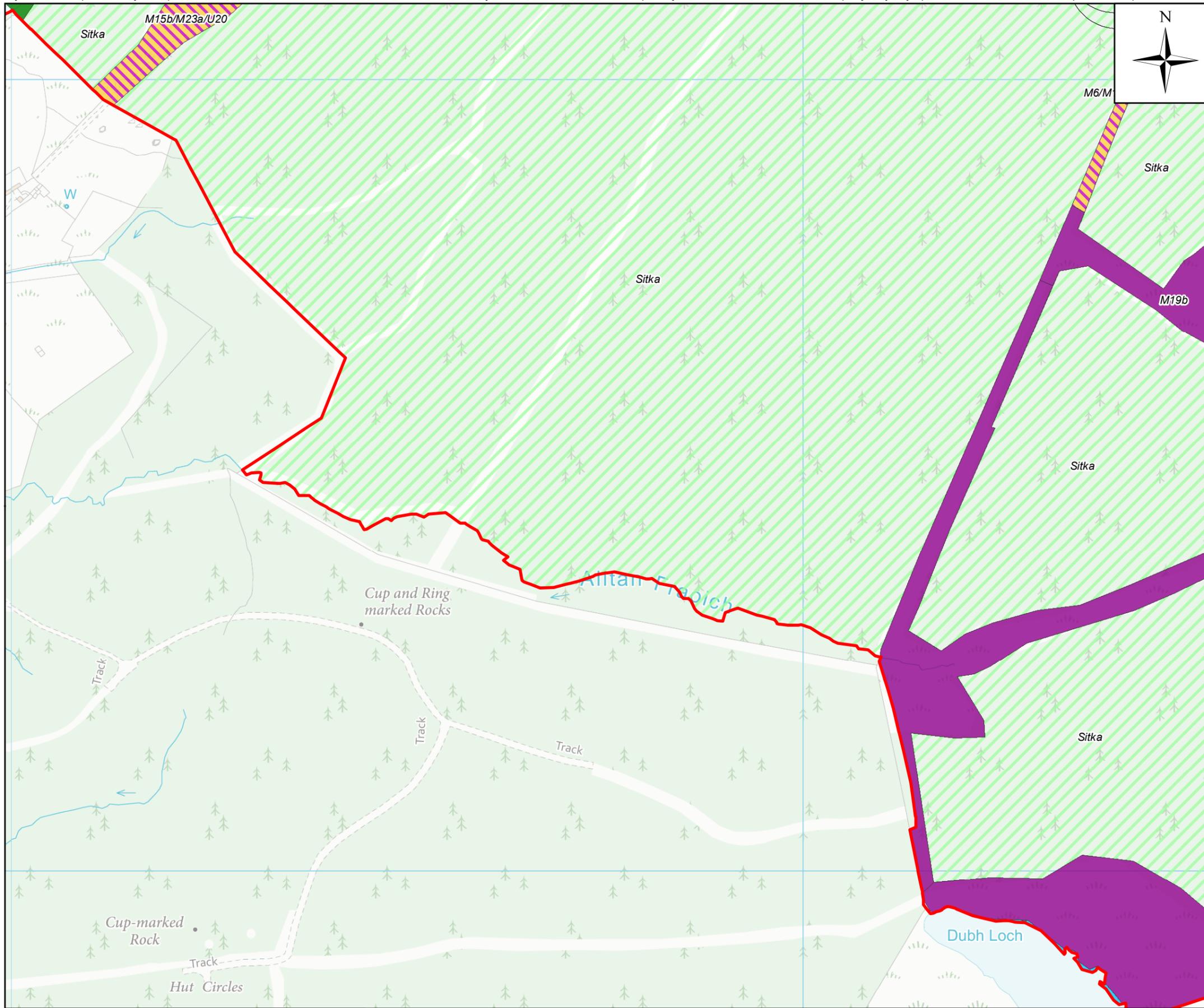
Title: **FIGURE 9.3 HABITATS SHEET 5 OF 10**

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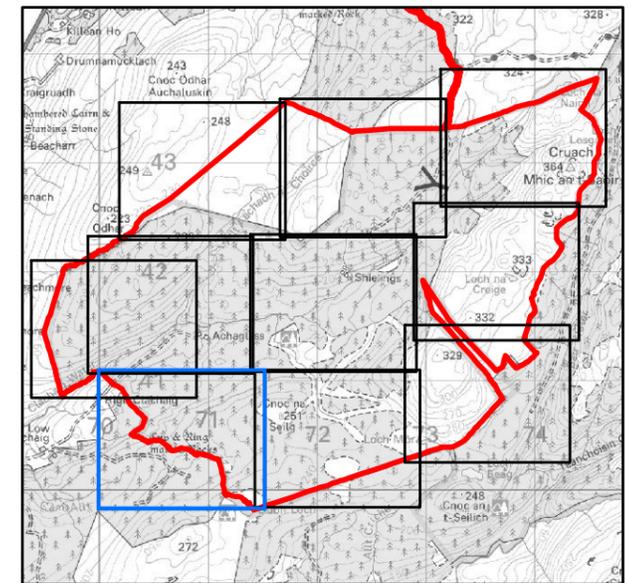
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Verified: ND	Approved: SW
Date: JANUARY 2022	Scale at A3: 1:5,000
Drawing Number: CG_220105_EIA9.3_v4	A3



- KEY:**
- Development Site
 - Proposed Infrastructure Layout Outline
- Phase 1 Habitats**
- A1.1.1 - Broadleaved woodland - semi-natural
 - A1.2.2 - Broadleaved woodland - plantation
 - B1.1 - Acid grassland - unimproved
 - D2 - Wet dwarf shrub heath
 - E1.6.1 - Blanket sphagnum bog
 - G1.3 - Standing water - oligotrophic

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



0 200 Meters

Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

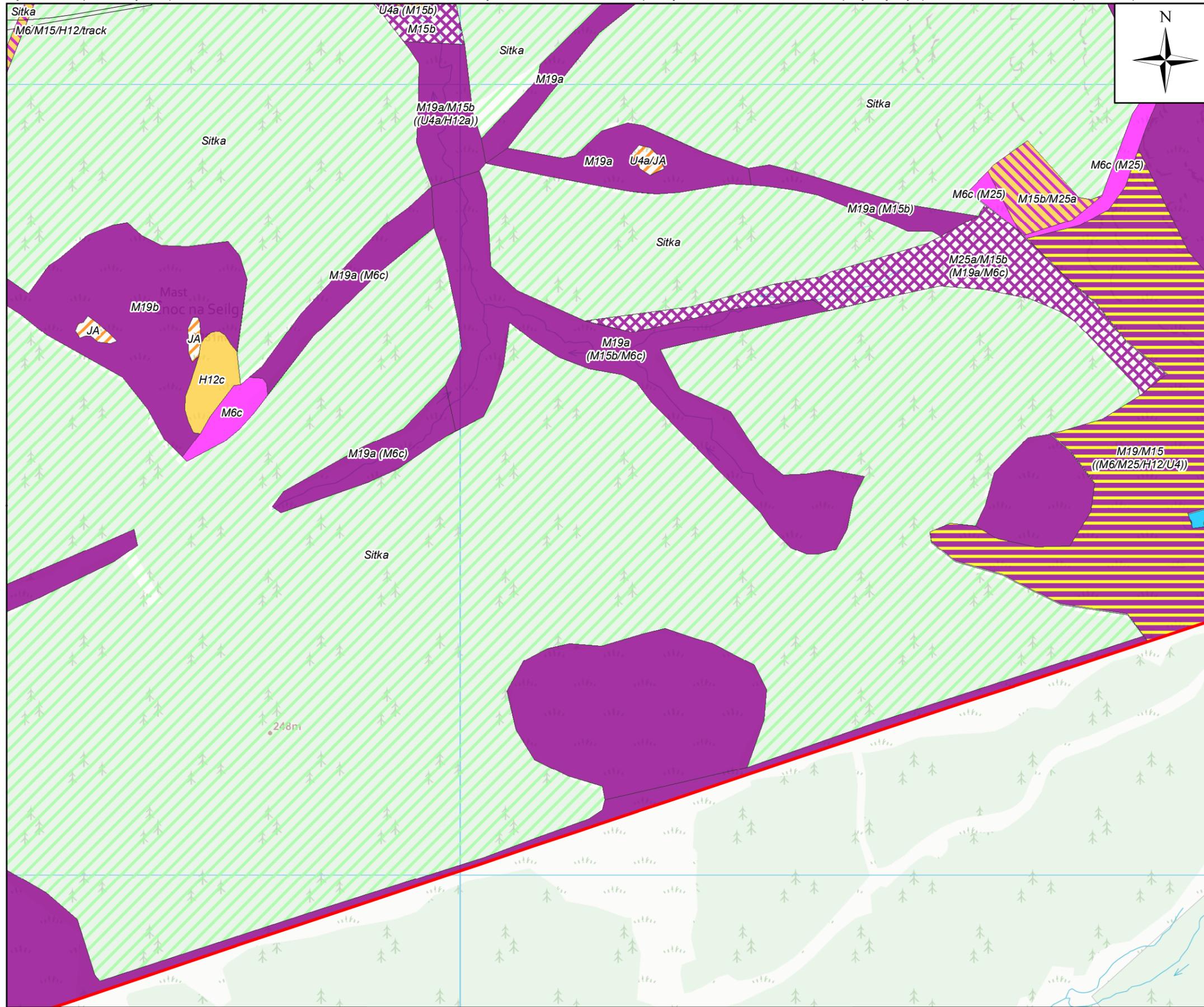
Title: **FIGURE 9.3 HABITATS SHEET 8 OF 10**

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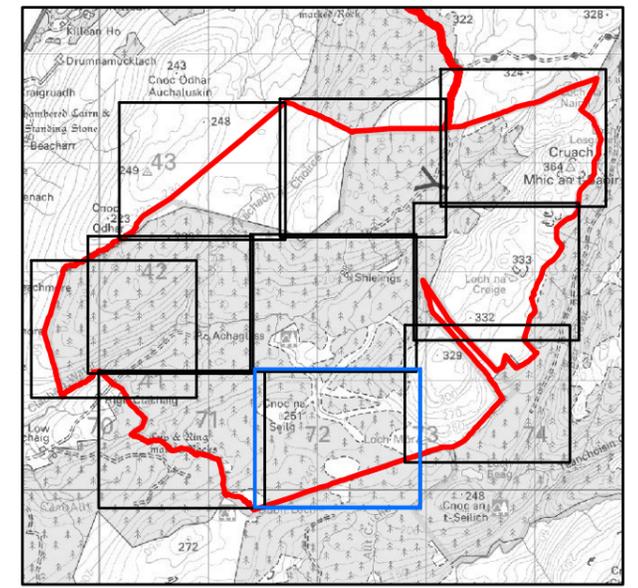
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Fax +44 (0) 191 224 6599
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Verified: ND	Approved: SW
Date: JANUARY 2022	Scale at A3: 1:5,000
Drawing Number: CG_220105_EIA9.3_v4	A3



- KEY:**
- Development Site
 - Proposed Infrastructure Layout Outline
- Phase 1 Habitats**
- A1.2.2 - Broadleaved woodland - plantation
 - B1.1 - Acid grassland - unimproved
 - D1.1 - Dry dwarf shrub heath - acid
 - D2 - Wet dwarf shrub heath
 - D6 - Wet heath/acid grassland
 - E1.6.1 - Blanket sphagnum bog
 - E1.6.1/D2 - Blanket sphagnum bog / Wet dwarf shrub heath
 - E1.7 - Wet modified bog
 - E2.1 - Flush and spring - acid/neutral flush
 - G1.3 - Standing water - oligotrophic

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



0 200 Meters

Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

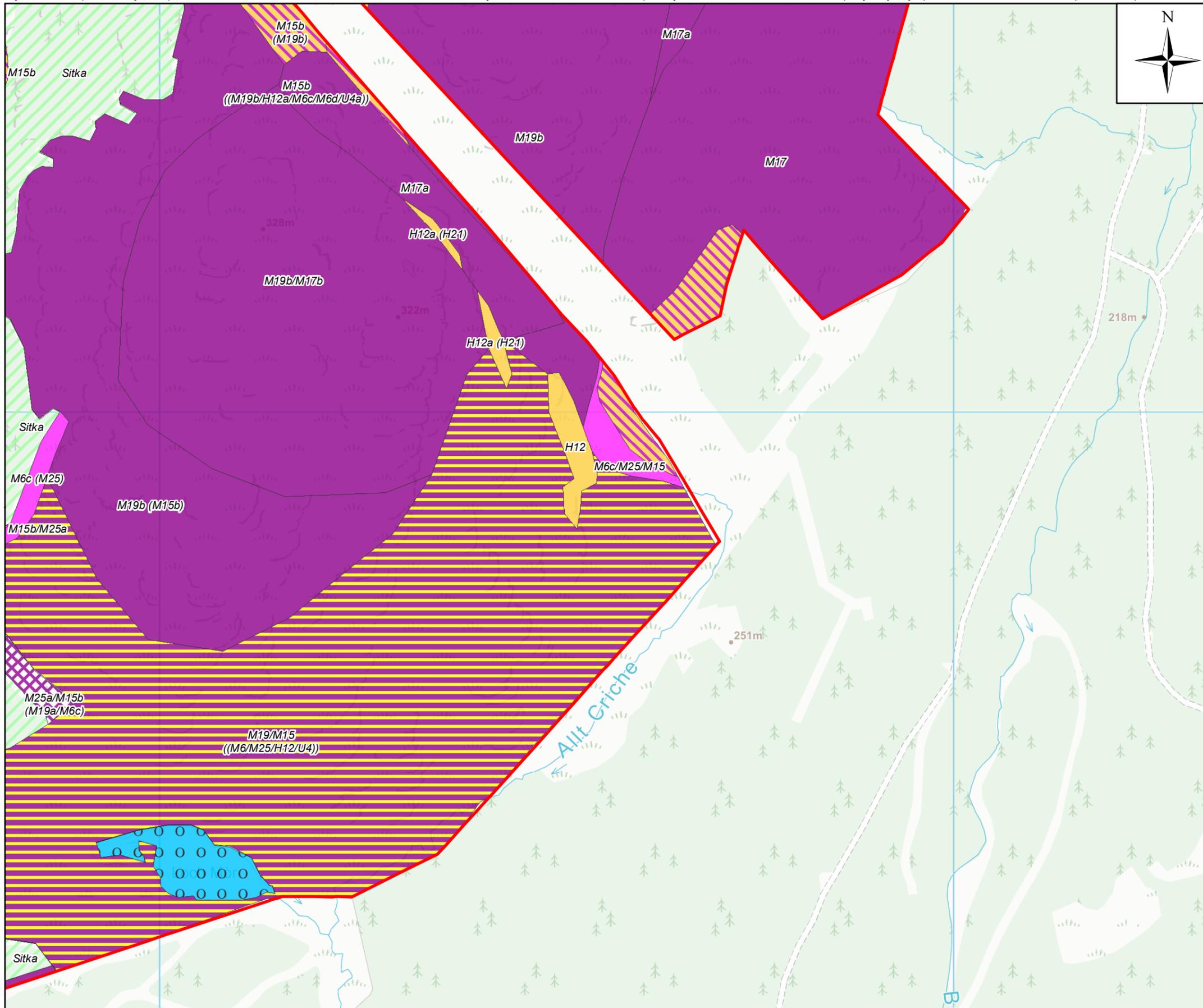
Title: **FIGURE 9.3 HABITATS SHEET 9 OF 10**

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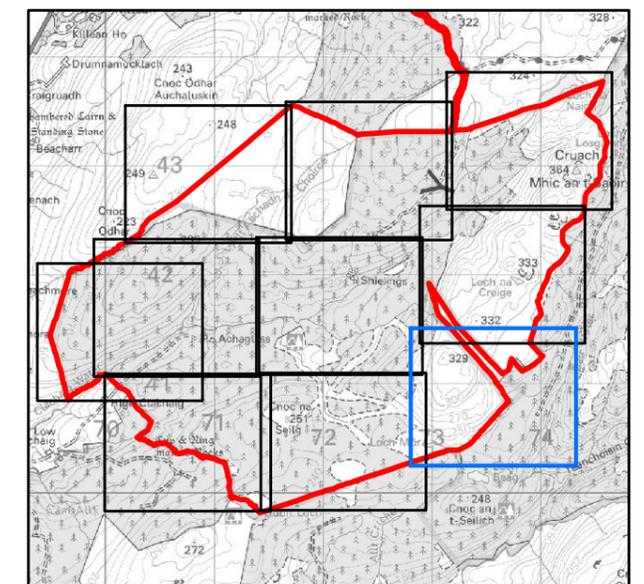
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Verified: ND	Approved: SW
Date: JANUARY 2022	Scale at A3: 1:5,000
Drawing Number: CG_220105_EIA9.3_v4	A3



- KEY:**
- Development Site
 - Phase 1 Habitats**
 - A1.2.2 - Broadleaved woodland - plantation
 - D1.1 - Dry dwarf shrub heath - acid
 - D2 - Wet dwarf shrub heath
 - E1.6.1 - Blanket sphagnum bog
 - E1.6.1/D2 - Blanket sphagnum bog / Wet dwarf shrub heath
 - E1.7 - Wet modified bog
 - E2.1 - Flush and spring - acid/neutral flush
 - G1.3 - Standing water - oligotrophic

NOTE:
The labels on this map are NVC types. Where there is more than one NVC type in a polygon they are separated by slashes, with minor components in brackets



Client: **RWE**

Project: CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT

Title: **FIGURE 9.3 HABITATS SHEET 10 OF 10**

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Date: JANUARY 2022	Scale at A3: 1:5,000
Drawing Number: CG_220105_EIA9.3_v4	A3

RWE

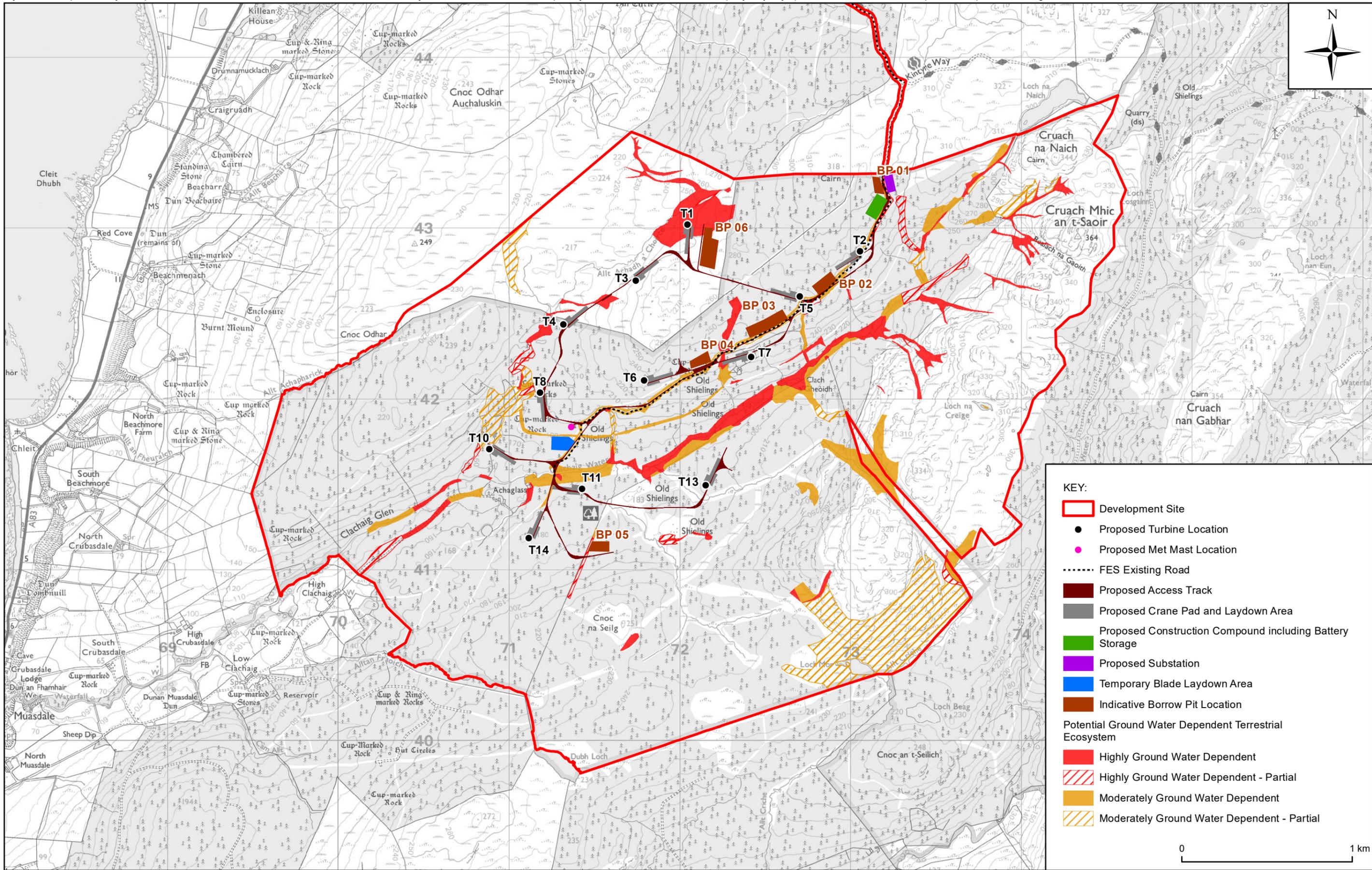
Clachaig Glen Wind Farm

Environmental Impact Assessment Report

Volume 2b

EIAR Figures

Figures: 9.4; 9.5; 9.6



KEY:

- Development Site
- Proposed Turbine Location
- Proposed Met Mast Location
- FES Existing Road
- Proposed Access Track
- Proposed Crane Pad and Laydown Area
- Proposed Construction Compound including Battery Storage
- Proposed Substation
- Temporary Blade Laydown Area
- Indicative Borrow Pit Location

Potential Ground Water Dependent Terrestrial Ecosystem

- Highly Ground Water Dependent
- Highly Ground Water Dependent - Partial
- Moderately Ground Water Dependent
- Moderately Ground Water Dependent - Partial

0 1 km

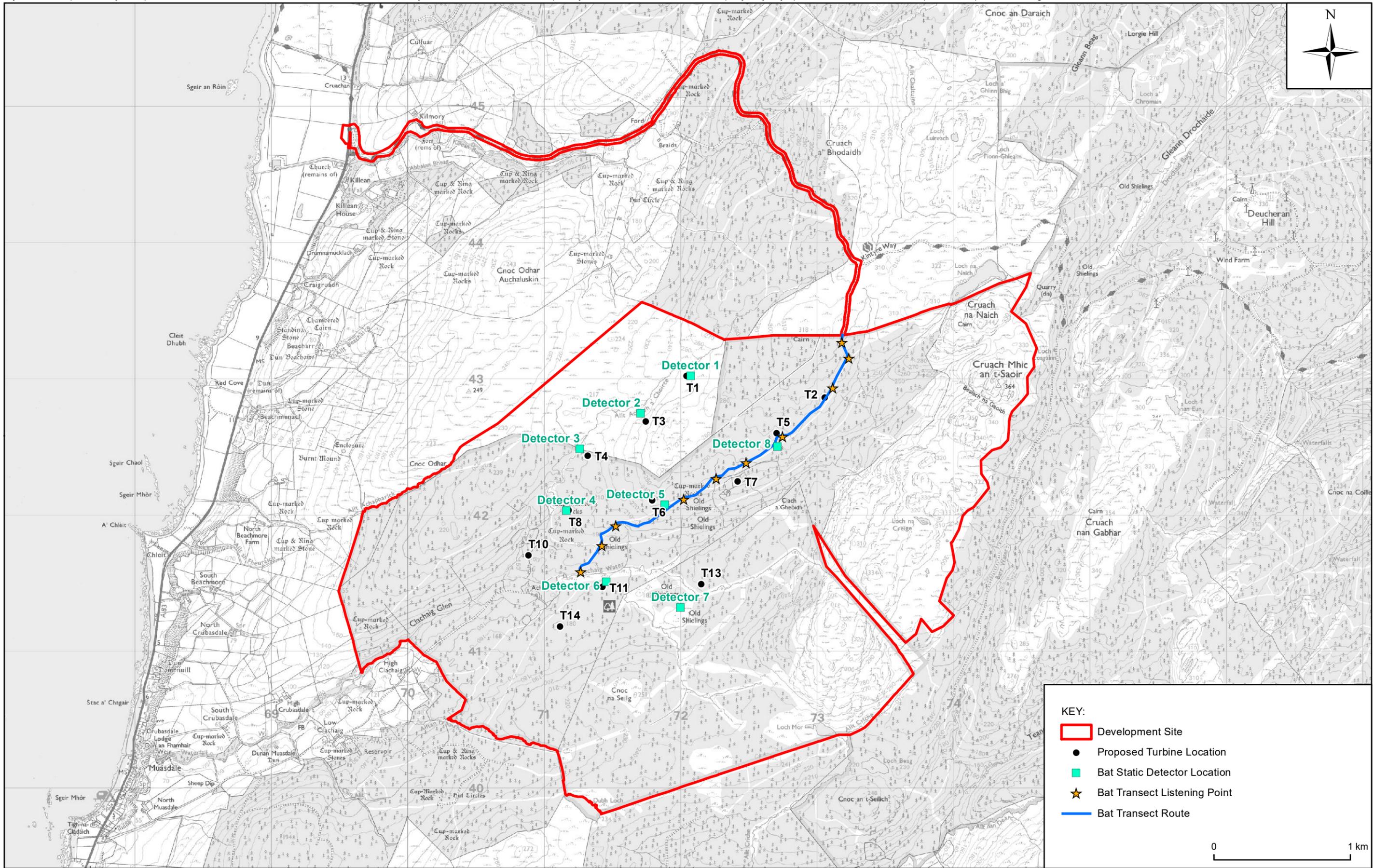
Client: **RWE**

Project: **CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT**

Title: **FIGURE 9.4 POTENTIAL GROUND WATER DEPENDENT TERRESTRIAL ECOSYSTEMS (GWDTE)**

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Date: JANUARY 2022	Scale at A3: 1:20,000
Drawing Number: CG_220106_EIA9.4_v3	A3



KEY:

- Development Site
- Proposed Turbine Location
- Bat Static Detector Location
- Bat Transect Listening Point
- Bat Transect Route

0 1 km

Client: **RWE**

Project: **CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT**

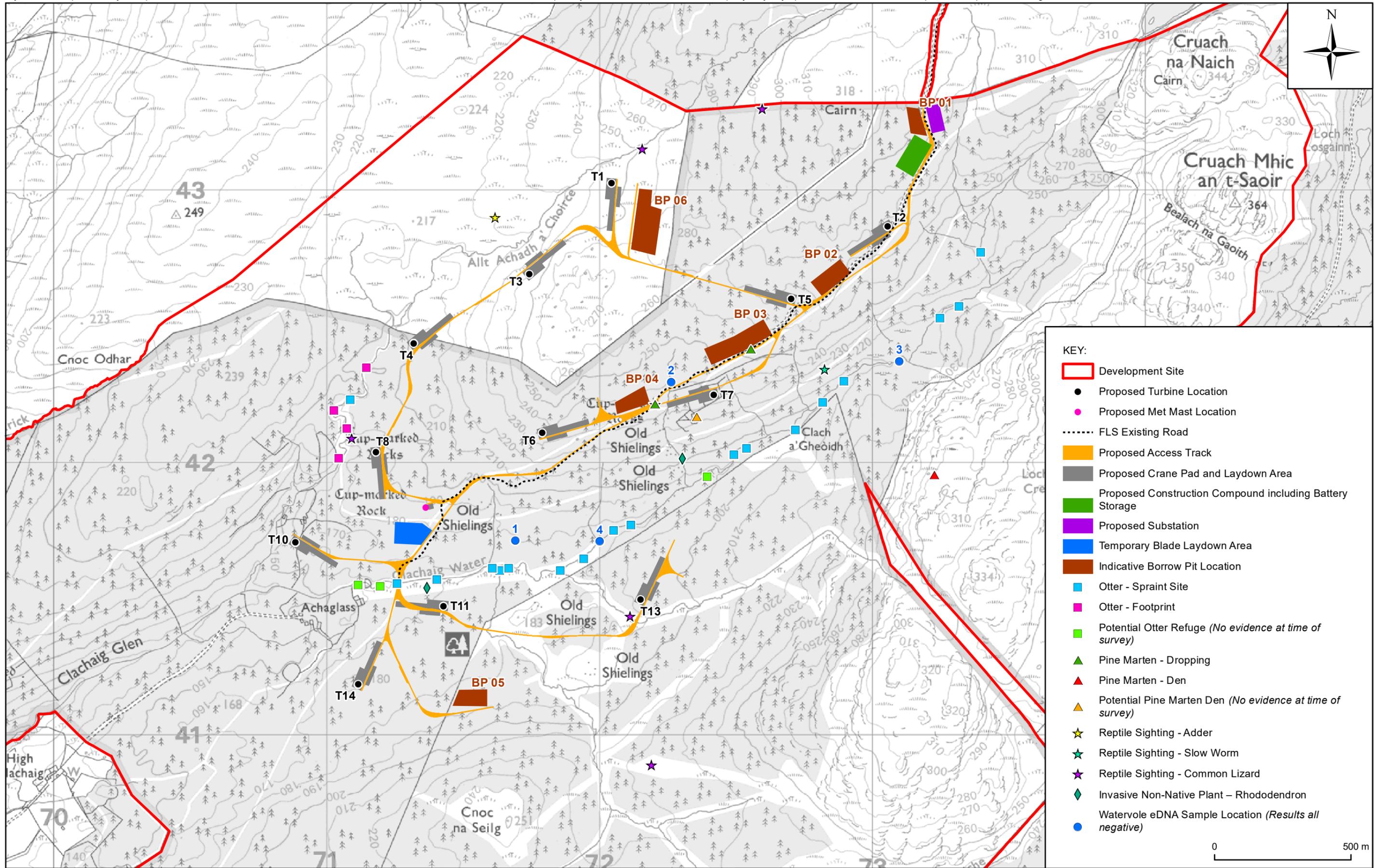
Title: **FIGURE 9.5 BAT TRANSECT AND STATIC DETECTOR LOCATION**

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Date: JANUARY 2022	Scale at A3: 1:25,000
Drawing Number: CG_220106_EIA9.5_v3	A3



Client: **RWE**

Project: **CLACHAIG GLEN WIND FARM ENVIRONMENTAL IMPACT ASSESSMENT**

Title: **FIGURE 9.6 OTHER PROTECTED AND NOTABLE SPECIES**

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Date: JANUARY 2022	Scale at A3: 1:12,500
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