Offshore Wind Power Limited

# West of Orkney Windfarm Onshore EIA Report

## Volume 1, Chapter 10 – Terrestrial Non-Avian Ecology

WO1-WOW-CON-EV-RP-0090: Approved by S.Kerr
Document Control 25/10/2023

**ASSIGNMENT** L100632-S06
**DOCUMENT** L-100632-S06-A-REPT-010

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West of Orkney Windfarm

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| REV | DATE | DESCRIPTION | ISSUED | CHECKED | APPROVED | CLIENT |
|---|---|---|---|---|---|---|
| A01 | 16/10/2023 | Issued for Use | Caledonian Conservation | LS | LS | OWPL |
| R01 | 19/04/2023 | Issued for Review | Caledonian Conservation | LS | LS | OWPL |

# CONTENTS

# 10 TERRESTRIAL NON-AVIAN ECOLOGY

Chapter summary

This chapter of the Onshore Environmental Impact Assessment (EIA) Report assesses the potential effects from the onshore Project on terrestrial non-avian ecology including direct, indirect, whole project assessment, cumulative, inter-related effects, inter-relationships and transboundary effects.

Caledonian Conservation Ltd undertook a range of notable and protected species surveys and habitat assessments including a National Vegetation Classification (NVC) and a Scottish Primrose survey across the onshore Project area. A 250 m survey buffer was used for the protected species surveys (excluding bats), and a 30 m buffer was used to identify any potential bat roost sites. Practical Land Management undertook a deer survey in the onshore Project area with a 500 m survey buffer included. This survey comprised day-time vantage points; including a site walk-over to identify evidence of deer activity, and night-time survey using thermal imaging cameras.

The baseline surveys identified a number of notable and protected terrestrial non-avian ecology receptors. These included key habitats and botany including Annex I habitats such as coastal grassland and mire communities, Ground Water Dependent Terrestrial Ecosystems (GWDTEs), and Scottish primrose, which were ubiquitous within 50 m of the shoreline. The presence of protected species including otter, water vole, pine marten, and common lizard was confirmed. Whilst no evidence of badger activity was identified during the survey visits, suitable habitat was identified, and badger are known to be present within the wider area. No evidence of red squirrel was identified during the survey visits and the habitats present within the onshore Project area were largely considered to be unsuitable for this species. Similarly, no suitable ponds for great crested newt were identified. Roe deer and red deer were identified and there is suitable habitat present, including good quality pasture mixed with small woodlands, for these species.

The following impacts were identified as requiring assessment:

- Construction:
  - Direct habitat loss due to land-take;
  - Indirect impacts upon habitats due to land-take;
  - Disturbance and damage/injury to habitats or protected species;
  - Indirect effects on habitats or protected species (e.g., due to pollution or sedimentation and herbivory by deer displaced or disturbed); and
  - Reduction in deer welfare.
- Operation and maintenance:
  - Disturbance due to maintenance works which are expected to be infrequent and small scale;
  - Indirect effects on habitats and species (e.g., pollution of watercourses as a result of accidental release and herbivory by deer displaced or disturbed); and
  - Reduction in deer welfare.

The assessment has taken account of embedded mitigation measures for the assessment of potential effects. Potential impacts are assessed to be low or negligible with the appropriate application of the embedded mitigation, and the impacts during decommissioning are expected to be equivalent to those encountered during construction. Mitigation includes measures to protect notable and protected habitats and species for the duration of the works, recommendations for the avoidance of protected habitats and adherence to best practice and regulatory guidance. These measures will be implemented through a Species and Habitat Protection Plan (SHPP) and monitored via a Habitats Management Plan (HMP) and Ecological Clerk of Works (ECoW).

- No significant impacts to any terrestrial non-avian ecology receptors are predicted, either for the onshore Project or cumulatively with other plans or developments.
- In addition, the Project is committed where possible to enhancing the environment, and it is proposing a biodiversity enhancement project in relation to the great yellow bumblebee. The Project proposes to create more wildflower meadows with key flower species for the great yellow bumblebees. The outline Biodiversity Enhancement Plan (BEP) is submitted alongside the PPP application.

## 10.1 Introduction

This chapter of the Onshore Environmental Impact Assessment (EIA) Report presents the terrestrial non-avian ecology receptors of relevance to the onshore Project through consultation, desk-based research and field surveys. The potential impacts from the construction, operation and maintenance and decommissioning of the onshore Project on these receptors has been assessed. Where required, mitigation is proposed, and the residual impacts and their significance are assessed. Potential cumulative and transboundary impacts are also considered. The structure and assessment methods of this chapter differs from others so as to conform with the Chartered Institute of Ecology and Environmental Management (CIEEM) Ecological Impact Assessment (EcIA) guidance (CIEEM, 2018). However, wherever possible, terminology has been adapted to remain as close to other topic-specific chapters without deviating from best practice assessment methodology.

The assessment and survey work detailed in this chapter includes protected species surveys, National Vegetation Classification (NVC) (Joint Nature Conservation Committee (Elkington *et al.*, 2001) survey, Scottish Primrose survey and bat roost potential survey which has been undertaken by Caledonian Conservation Ltd providing independent and objective reporting based upon sound data collection and analysis in accordance with best practice guidelines and standards of CIEEM. Practical Land Management Ltd undertook a deer survey to inform the assessment, as detailed in this chapter.

Table 10-1 below provides a list of all the supporting studies which relate to and should be read in conjunction with the terrestrial non-avian ecology impact assessment. All supporting studies are appended to this Onshore EIA Report and issued on the accompanying Universal Serial Bus (USB).

*Table 10-1 Supporting studies*

| DETAILS OF STUDY | LOCATIONS OF SUPPORTING STUDY |
|---|---|
| **Climate and Carbon Assessment** | Onshore EIA Report, Supporting Study (SS) 1: Climate and carbon assessment. |
| **Terrestrial Non-Avian Ecology Technical Supporting Study** | Onshore EIA Report, SS6: Terrestrial non-avian ecology technical survey report. |
| **Deer Survey Supporting Study** | Onshore EIA Report, SS7: Deer survey report. |

The impact assessment presented herein draws upon information presented within other impact assessments within this Onshore EIA Report. Equally, the terrestrial non-avian ecology impact assessment also informs other impact assessments. This interaction between the impacts assessed within different topic-specific chapters on a receptor is defined as an 'inter-relationship'. The topic-specific chapters and impacts related to the assessment of potential effects on terrestrial non-avian ecology are provided in Table 10-2.

Impacts relating to freshwater ecology and terrestrial ornithology are discussed in chapter 9: Freshwater ecology and chapter 11: Terrestrial ornithology, respectively, and are not considered within this chapter.

*Table 10-2 Terrestrial non-avian ecology inter-relationships*

| CHAPTER | IMPACT | DESCRIPTION |
|---|---|---|
| **Water and sediment quality (chapter 9, Offshore EIA Report)** | Indirect mortality. | A reduction in water quality resulting in an indirect impact upon otter populations due to a reduction in the availability and quality of fish prey species. |
| **Geology and hydrology (chapter 8, Onshore EIA Report)** | Changes to flow patterns and drainage. | Any changes that influence flow availability to local catchments have the potential to influence fish passage past obstacles for habitat access and local survival during extreme temperatures (chapter 9: Freshwater ecology). This will affect otter populations due to impacts on the availability and quality of fish prey species. |
| **Terrestrial ornithology (chapter 11, Onshore EIA Report)** | Potential loss or modification of foraging, breeding or overwintering habitats within the onshore Project area. | The likely impact of habitat loss within the onshore Project area upon breeding or wintering birds. |
| **Land use and other users, including forestry (chapter 12, Onshore EIA Report)** | Direct impacts. | The likely impact of habitat loss on woodland within the onshore Project area. |
| **Air quality (chapter 14, Onshore EIA Report)** | Indirect impacts. | Construction related increases in pollution and dust resulting in a reduction in water quality and tree health. |
| **Noise and vibration (chapter 15, Onshore EIA Report)** | Indirect impacts. | Increasing levels of noise and vibration can impact protected and notable species, causing disturbance to foraging, commuting and resting animals; in particular species such as bats, badger and pine marten. |
| **Access, traffic and transport (chapter 16, Onshore EIA Report)** | Direct and indirect mortality of protected species, and direct and indirect habitat loss. | Risk of injury or mortality to protected and notable species from vehicular traffic during construction, maintenance and decommissioning activities.<br>Direct land-take and indirect impact upon neighbouring habitats during the construction of temporary and permanent access tracks through |

| CHAPTER | IMPACT | DESCRIPTION |
|---|---|---|
| | | disruption to groundwater flow through sensitive habitats or accidental release.<br><br>Indirect mortality or disturbance to terrestrial non-avian ecology due to the severance of foraging habitat and commuting routes due to the construction of temporary and permanent access tracks. |

The following specialists have contributed to the assessment:

- Caledonian Conservation Ltd: survey design, scoping agreement and implementation, reporting and Onshore EIA Report chapter write up; and
- Practical Land Management Ltd: survey design and implementation of the deer survey, reporting and provision of information to support the assessment of deer in this chapter.

Effects on all designated sites are considered in this chapter in the context of EcIA (CIEEM, 2018).

In addition, effects on Special Protected Areas (SACs) and Ramsar[1] sites have been considered under the Habitats Regulation Appraisal (HRA) process which has been undertaken alongside this Onshore EIA Report.

## 10.2 Legislation, policy and guidance

Over and above the legislation presented in chapter 3: Planning policy and legislative context, the following legislation, policy and guidance are relevant to the assessment of impacts from the onshore Project on terrestrial non-avian ecology:

- Legislation:
  - European Union (EU) Regulation (1141/2014) on invasive alien (non-native) species: imposes restrictions on a list of species known as 'species of Union concern', published in Commission Implementing Regulation 2016/1141. These are species whose potential adverse effects across the European Union are such that concerted action across Europe is required. The list is drawn up by the European Commission and managed with Member States using risk assessments and scientific evidence[2]. Invasive Non-native Species (INNS) (EU Exit) (Scotland) (Amendment etc.) Regulations 2020 ensures this legislation continues to function after the UK's departure from the EU.

*[1] Ramsar sites are classified under the Convention on Wetlands of International Importance, to which the UK Government is a signatory. Protection is implemented through co-designation of Ramsar sites as protected sites defined under domestic legislation. Most Ramsar sites are included in the Natura 2000 site network, with protection afforded as SPAs or SACs. Natura 2000 sites are European protected sites designated under the domestic legislation implementing the Habitats and Birds Directives. All Ramsar sites are also designated as SSSIs (national protected sites). See section 11.2 for more detail on relevant legislation.*

*[2] The EU Directives have been included as a reference, but it is noted that following the UK withdrawal from the EU these Directives are not legally binding, although the EU Withdrawal Act (2018) maintains the requirements of the EU Directives into domestic law as retained EU Law.*

- European Council Directive 92/43/EEC on the Conservation of Natural Habitats and Wild Flora and Fauna (the Habitats Directive)[1]: aims to promote the maintenance of biodiversity, and as such identifies species and habitats for which core areas must be designated as Special Areas of Conservation (SACs). Transposed into United Kingdom (UK) law by the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland);
- European Council Directive 2000/60/EC (the Water Framework Directive) (WFD)[1]: identifies and protects Groundwater-Dependent Terrestrial Ecosystems (GWDTE) as receptors sensitive to development pressures and which are therefore considered an indicator of the status of groundwater bodies. Transposed into Scottish law by the Water Environment and Water Services (Scotland) Act 2003;
- Wildlife and Countryside Act (WCA) 1981 (as amended in Scotland): provides protection to species and habitats including all wild birds, enhanced protection for species listed on Schedule 5, and protection for habitats and plants of national importance through the designation of Sites of Special Scientific Interest (SSSI);
- Protection of Badgers Act (PBA) 1992 (as amended by the Wildlife and Natural Environment (Scotland) Act 2011): provides full legal protection to badgers and their setts, including (but not limited to); wilfully injuring or killing a badger; disturbing a badger while in a sett; and intentionally or recklessly damaging or destroying any part of a sett, or obstructing access;
- The Deer (Scotland) Act 1996: Part I of the Act establishes the Deer Commission for Scotland and Part II of the Act concerns the conservation, control and management of deer;
- Wildlife and Natural Environment (WANE) (as amended in Scotland) Act 2011: amends other pieces of legislation including the WCA and PBA and creates a mechanism for establishing a code of practice with regards to non-native, invasive species. Note, in Scotland there is not a defined list of invasive non-native species – instead the meaning of non-native range is defined, and it is an offence to cause these to be present outwith their native range;
- Nature Conservation (Scotland) Act (NCSA) 2004 (as amended): places a duty on all public authorities to consider biodiversity in their work, requires Scottish Ministers to produce a biodiversity strategy and list of species and habitats of principal importance for biodiversity conservation in Scotland, and strengthens legislation protecting SSSIs; and
- Electricity Works (Environmental Impact Assessment (Scotland) Regulations 2017: in respect of the Project, implement Directive 2001/92/EU in relation to the construction and operation of onshore infrastructure associated with offshore generating stations and their impact on the environment.

- Policy:
  - The International Union for Conservation of Nature (IUCN) Red Data Book Species: provides taxonomic, conservation status and distribution information on taxa that have been globally evaluated using the IUCN Red List Categories and Criteria;
  - National Planning Framework 4 (NPF4) (Scottish Government, 2023): emphasises the importance of protecting biodiversity, reversing biodiversity loss, delivering positive effects from development, and strengthening nature networks. As part of this, development proposals are expected to contribute towards the enhancement of biodiversity, including restoration of degraded habitats, as well as restoring connections between nature networks. Specific policies related to this chapter include: Policy 2 Climate mitigation and adaption, Policy 3 Biodiversity, Policy 4 Natural places, Policy 5 Soils, Policy 6 Forestry, woodland and trees, and Policy 29 Rural development;
  - Scottish Biodiversity List (SBL) (NatureScot, 2020a): is a list of habitats, animals and plants that Scottish Ministers consider to be of principal importance for biodiversity conservation in Scotland. It was developed to meet the requirements of section 2 (4) of the NCSA 2004 for the conservation of biodiversity, and supersedes the UK Biodiversity Action Plan (UKBAP). Public bodies must consider SBL species when reporting on their 'Biodiversity Duty' (as defined and required by the NCSA 2004 and WANE (Scotland) Act 2011);
  - Government Circular 06/2005: Biodiversity and Geological Conservation: Statutory Obligations and their Impact within the Planning System (Office of the Deputy Prime Minister (ODPM));
  - Highland Nature Biodiversity Action Plan (BAP) 2021 – 2026: local BAP which defines nature conservation priorities, actions and targets for the Highland region;

- Highland-Wide Local Development Plan (HwLDP) (The Highland Council (THC), 2012): sets out a strategy to support the growth of all communities across THC region. It seeks to enable sustainable Highland communities, safeguard the environment, support a competitive, sustainable and adaptable Highland. Specific policies related to this chapter include:
  - Policy 51: Trees and Development - promotes developments which provide significant protection to existing hedges, trees and woodlands areas;
  - Policy 52: Principle of Development in Woodland;
  - Policy 58: Protected Species - states that where protected species are present the council will require surveys to be carried out to establish presence and if necessary, mitigation will need to be implemented to avoid or minimise impacts on species;
  - Policy 59: Other Important Species - states that species listed under the Habitats Directive, UK and Local Biodiversity Action Plans (LBAPs) and the SBL will need to be considered in terms of adverse effects from proposals;
  - Policy 60: Other Important Habitats and Article 10 Features - states that the council will seek safeguarding of integrity features of the landscape which are of major importance because of their linear or continuous structures or combination as habitat 'stepping stones' for the movement of wild fauna and flora. This policy also seeks to protect those habitats which are protected under legislation or conservation plans;
- The Caithness and Sutherland Local Development Plan (CaSPlan) (THC, 2018): Chapter 2, Strategy and Policies, considers planning policies relevant to the safeguarding of areas of high-quality nature conservation value, and the protection and enhancement of green networks and green spaces;
- Scottish Biodiversity Strategy 2022 to 2045. Tackling the Nature Emergency in Scotland (Scottish Government, 2022): updated biodiversity strategy, notably aiming to halt and reverse biodiversity loss in Scotland. This strategy remains a draft to ensure that the final version reflects any agreement made at Conference of the Parties (COP)15. A final version will be published alongside the delivery pan, which will build on the key actions presented in the document above;
- Scottish biodiversity strategy post-2020: Statement of intent, 2020: sets the direction for a new biodiversity strategy which will respond to the increased urgency for action to tackle the twin challenges of biodiversity loss and climate change;
- Scotland's Biodiversity: It's in Your Hands: strategy for the conservation and enhancement of biodiversity in Scotland (Scottish Executive, 2004);
- 2020 Challenge for Scotland's Biodiversity: strategy for the conservation and enhancement of biodiversity in Scotland (Scottish Government, 2013);
- Scottish Government Planning Advice Note 1/2013: Environmental Impact Assessment;
- Scottish Planning Circular 1/2017 guidance on the Town and Country Planning (EIA) (Scotland) Regulations 2017): gives guidance on the 2017 Regulations which transpose the EIA Directive into the Scottish planning system;
- Scotland's Forestry Strategy 2019 to 2029: presents a 50-year vision and 10-year framework to action, expand, protect and enhance Scotland's forests and woodlands (Scottish Government, 2019);
- Caithness BAP, February 2003: presents an introduction to the habitats and species present in Caithness, listing the main issues and identifying opportunities for future developments that could help conserve and enhance the biodiversity of Caithness in the next five to ten years;
- The UKBAP – most recently updated in 2007: superseded by the 'UK post-2010 Biodiversity Framework' and devolved under the NCSA, the UKBAP lists of priority species and habitats are still of value to policy makers;
- Scotland's Wild Deer: a National Approach (Scottish Government, 2008); and
- Scotland's Wild Deer: a National Approach Including 2015-2020 Priorities (Scottish Government, 2014); and
- Good practice During Windfarm Construction (Scottish Renewables *et al.*, 2019).

- Guidance:
  - A Handbook on Environmental Impact Assessment, Version 5 (Historic Environment Scotland (HES) and Scottish Natural Heritage (SNH), 2018): guidance to be followed when undertaking EIA published by SNH (now NatureScot) and HES;
  - Amphibian and Reptile Groups of the UK (ARG UK) Advice Note 10: Reptile Survey and Mitigation Guidance for Peatland Habitats (Cathrine, 2018);
  - Assessing the Cumulative Impact of Onshore Wind Energy Developments (NatureScot, 2021);
  - Best Practice Guidance on the management of wild deer in Scotland (Best Practice Guides, 2023);
  - Best Practice Deer Management (The Deer Initiative, 2011);
  - Collins, J. (ed.) (2016) Bat Surveys for the Professional Ecologists: Good Practice Guidelines (3rd edn);
  - Dean *et al.* (2016) The Water Vole Mitigation Handbook;
  - Froglife (2015) Surveying for Reptiles: tips, techniques and skills to help you survey for reptiles;
  - Gent, A. and Gibson, S. (1998) Herpetofauna Workers Manual;
  - Guidance on the Electricity Works (Environmental Impact Assessment) (Scotland) Regulations 2000;
  - Guidance on Electricity Works (Environmental Impact Assessment) (Scotland) Amendment Regulations 2008;
  - Guidelines for Ecological Impact Assessment in the UK and Ireland. Terrestrial, Freshwater, Coastal and Marine (CIEEM, 2018);
  - NatureScot (2019a) Species Planning Advice – otter;
  - NatureScot (2019b) Species Planning Advice – pine marten;
  - NatureScot (2019c) Species Planning Advice – red squirrel;
  - NatureScot (2019d) Species Planning Advice – water vole;
  - Land Use Planning System Scottish Environment Protection Agency (SEPA) Guidance Note 4: Planning Guidance on Windfarm Developments (SEPA, 2012);
  - Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems (SEPA, 2014);
  - SEPA (2018). Pollution Prevention Guidelines (PPG): Dealing with spills. Guidance document PPG 22 produced by SEPA, Northern Ireland Environment Agency (NIEA) and the Environment Agency (EA);
  - SEPA (2021). Supporting Guidance (WAT-SG-75). Sector-Specific Guidance: Water Run-Off from Construction sites. Version 2;
  - SEPA (2022). The Water Environment (Controlled Activities) Scotland Regulations 2011 (as amended): A Practical Guide. Version 9.2;
  - THC Supplementary Guidance. Highland's Statutory Protected Species (THC, 2013); and
  - WFD95: A Functional Wetland Typology for Scotland – Project Report (Scotland and Northern Ireland Forum for Environmental Research (SNIFFER), 2009).

## 10.3 Scoping and consultation

Stakeholder consultation has been ongoing throughout the EIA and has played an important part in ensuring the scope of the baseline characterisation and impact assessment are appropriate with respect to the onshore Project and the requirements of the regulators and their advisors.

The Scoping Report was submitted to Scottish Ministers (via Marine Scotland - Licensing Operations Team (MS-LOT[3])) and THC on 1st March 2022, who then circulated the report to relevant consultees[4]. A Scoping Opinion was received from THC on 9th May 2022. Relevant comments from the Scoping Opinion specific to terrestrial non-avian ecology are provided in Table 10-4 below, which provides a response on how these comments have been addressed within the Onshore EIA Report. The Scoping Opinion supersedes any pre-application advice provided by THC which was received on the 10th February 2021.

Further consultation has been undertaken throughout the pre-application stage. Table 10-3 summarises the consultation activities carried out relevant to terrestrial non-avian ecology.

*Table 10-3 Consultation activities for terrestrial non-avian ecology*

| CONSULTEE AND TYPE OF CONSULTATION | DATE | SUMMARY |
|---|---|---|
| **NatureScot – meeting** | 28th April 2022 | An online meeting to discuss the onshore Project Design Envelope (PDE) and to obtain agreement from consultees on survey methodologies, key sensitivities (to date), mitigations (to date), approach to assessment and a framework for proportionate approach to cumulative effects. The survey methods proposed were agreed at the meeting. |
| **NatureScot – meeting** | 2nd November 2022 | An online meeting to present an update on the onshore Project and PDE and to obtain agreement from consultees on the following: survey methodologies; key sensitivities (to date); mitigations (to date); approach to assessment; and a framework for proportionate approach to cumulative effects.<br><br>A positive response from the NatureScot representative was received. Agreement of survey methods, key sensitivities, assessment methods and approach to mitigation was reaffirmed. |

[3] *MS-LOT have since been renamed Marine Directorate - Licensing Operations Team (MD-LOT).*

[4] *The Scoping Report was also submitted to Orkney Islands Council (OIC), as the scoping exercise included consideration of power export to the Flotta Hydrogen Hub, however, this scope is not covered in this Onshore EIA Report and will be subject to a separate planning application to OIC.*

*Table 10-4 Comments from the Scoping Opinion relevant to terrestrial non-avian ecology*

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| THC | The EIAR needs to address the nature of the hydrology and hydrogeology of the site, and of the potential impacts on GWDTEs, water courses, water supplies including private supplies, water quality, water quantity and on aquatic flora and fauna. Impacts on watercourses, lochs, groundwater, other water features and sensitive receptors, such as water supplies, need to be assessed. Measures to prevent erosion, sedimentation or discolouration will be required, along with monitoring proposals and contingency plans. Assessment will need to recognise periods of high rainfall which will impact on any calculations of run-off, high flow in watercourses and hydrogeological matters. You are strongly advised at an early stage to consult SEPA as the regulatory body responsible for the implementation of the Controlled Activities (Scotland) Regulations 2005 (CAR), to identify if a CAR license is necessary and the extent of the information required by SEPA to assess any license application. | GWDTEs have been identified as part of onshore ecology surveys (through NVC) and information is presented in Section 10.6.<br><br>For further detailed assessment on the hydrology and hydrogeology receptors identified by THC please see chapter 8: Geology and hydrology. However, any specific mitigation in relation to terrestrial non-avian ecology receptors are included in this chapter, see Section 10.6.<br><br>In addition, freshwater ecology surveys have been undertaken and are assessed in chapter 9: Freshwater ecology. |
| THC | The EIA Report should provide a baseline survey of the bird and animals (mammals, reptiles, amphibians, etc) interest on site. It needs to be categorically established which species are present on the site, and where, before a future application is submitted. Further the EIA Report should provide an account of the habitats present on the proposed development site. It should identify rare and threatened habitats, and those protected by European or UK legislation, or identified in national or local BAP. Habitat enhancement and mitigation measures should be detailed, particularly in respect to blanket bog, in the contexts of both biodiversity conservation. Details of any habitat enhancement programme (such as native- tree planting, stock exclusion, etc) for the proposed site should be provided. It is expected that the EIA Report will address whether or not the development could assist or impede delivery of elements of relevant BAPs. | A baseline survey has been undertaken for animals (mammals, reptiles and amphibians) and habitats and a description of these results, are provided in section 10.6. Full details of the baseline surveys are provided in SS6: Terrestrial non-avian ecology technical survey report.<br><br>A baseline survey for birds has also been undertaken and this is detailed and assessed in chapter 11: Terrestrial ornithology.<br><br>Habitat enhancement measures for the Project are provided in the outline Biodiversity Enhancement Plan (BEP) which accompanies this Planning Permission in Principle (PPP) application. Mitigation measures for blanket bog are provided in the assessment as detailed in section 10.6. |

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| THC | The presence of protected species such as Schedule 1 Birds or European Protected Species (EPS) must be included and considered as part of the planning application process, not as an issue which can be considered at a later stage. Any consent given without due consideration to these species may breach European Directives with the possibility of consequential delays or the project being halted by the European Commission (EC). Please refer to the comments of NatureScot and The Royal Society for the Protection of Birds (RSPB) in this respect. | As part of this Onshore EIA Report, European Protected Species (EPS) have been included and considered within this chapter. Schedule 1 birds are included and considered within chapter 11: Terrestrial ornithology.<br><br>A description of results from the baseline surveys is provided in section 10.6. Full details of the baseline surveys are provided in SS6: Terrestrial non-avian ecology technical survey report.<br><br>Reference to standing advice on protected species is given in section 10.6, where appropriate.<br><br>Response to NatureScot and Royal Society for the Protection of Birds (RSPB) comments are detailed below. |
| THC | The EIA Report should address the likely impacts on the nature conservation interests of all the designated sites in the vicinity of the proposed development. It should provide proposals for any mitigation that is required to avoid these impacts or to reduce them to a level where they are not significant.<br><br>NatureScot have provided advice in respect of the designated site boundaries for SACs and Special Protected Areas (SPAs) and on protected species and habitats within those sites. The potential impact of the development proposals on other designated areas such as SSSI's should be carefully and thoroughly considered and, where possible, appropriate mitigation measures outlined in the EIA Report. | Effects on all designated sites are considered in this chapter in the context of EcIA (CIEEM, 2018).<br><br>A HRA screening report was produced, which assisted in the identification of which sites and qualifying features will require an Appropriate Assessment (AA).<br><br>As per the Habitat Regulations, a Report to Inform Appropriate Assessment (RIAA) (comprising part of the Habitat Regulations Assessment (HRA) process) has been carried out to determine whether or not the development would have an adverse effect on the integrity of any designated sites in the area. The results of the assessment are detailed in the Onshore RIAA, which accompanies this PPP application.<br><br>The potential impact of the onshore Project on other designated areas, including SSSI sites, is discussed in section 10.6.4.2. Advice from NatureScot in respect of designated site boundaries for SACs and SPAs has been followed. |

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| THC | If wild deer are present or will use the site an assessment of the potential impact on deer will be required. This should address deer welfare, habitats and other interests. | A deer survey and assessment has been undertaken with full details provided in SS7: Deer survey report. An assessment of the potential effects of the onshore Project on deer welfare and indirect effects on vulnerable habitats as a result of deer impacts is included in section 10.6.6.10. |
| THC | Further advice may be provided by NatureScot on ecology and ornithology in relation to the surveys required and the adequacy of the work already undertaken. However, noting that NatureScot are broadly content with the scope of the assessment. | Further consultation has been undertaken with NatureScot including requesting advice on survey methodology and surveys required and receiving confirmation of their agreement with the survey methodology approach. |
| THC | The EIA Report should include an assessment of the effects on GWDTE. | NVC communities corresponding with GWDTEs are described and assessed in section 10.4.4.2.<br><br>In this chapter, reference has been made to the relevant guidance and specific mitigation measures to protect watercourses and GWDTEs. For further information and assessment on GWDTE, see chapter 8: Geology and hydrology. |
| THC | It should be noted that it is for the competent authority to consider whether an Appropriate Assessment (AA) under the Habitat Regulations is required. Your EIA Report should provide sufficient information for the competent authority to come to a view on such matters. Further in relation to ornithology the Regional Golden Eagle Conservation Management Plan and the associated studies and research should form part of the baseline for the EIAR. The development will be required to contribute toward the implementation of the Regional Golden Eagle Conservation Management Plan. | As per the Habitat Regulations, a RIAA (comprising part of the HRA process) has been carried out to determine whether or not the development would have an adverse effect on the integrity of any designated sites in the area. The results of the assessment are detailed in the Onshore RIAA, which accompanies this PPP application.<br><br>Following discussion with THC it was confirmed that the contribution towards the Regional Golden Eagle Conservation Management Plan is no longer required as this in place in south Inverness and is not applicable in onshore Project area. For further ornithology details please refer to chapter 11: Terrestrial ornithology. |

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| SEPA | GWDTE are protected under the WFD and therefore the layout and design of the development must avoid impact on such areas. The following information must be included in the submission:<br><br>a) A map demonstrating that all GWDTE are outwith a 100 m radius of all excavations shallower than 1 m and outwith 250 m of all excavations deeper than 1m and proposed groundwater abstractions. If micro-siting is to be considered as a mitigation measure the distance of survey needs to be extended by the proposed maximum extent of micro-siting. The survey needs to extend beyond the site boundary where the distances require it.<br><br>b) If the minimum buffers above cannot be achieved, a detailed site-specific qualitative and/or quantitative risk assessment will be required. We are likely to seek conditions securing appropriate mitigation for all GWDTE affected. | The potential impact of the construction, operations and maintenance and decommissioning stages of the onshore Project upon GWDTEs has been assessed (see section 10.6 and chapter 8: Geology and hydrology). Maps identifying GWDTEs within the onshore Project area have been included, however, detailed design has not yet been undertaken to identify excavation locations.<br><br>Where the recommended minimum buffers cannot be achieved, general recommendations have been made as well as recommendations for site-specific assessments of all GWDTEs likely to be impacted once the onshore export cable corridor and onshore infrastructure locations have been finalised, post-consent. |
| SEPA | Please refer to Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems for further advice and the minimum information we require to be submitted. | Reference has been made to the relevant guidance (SEPA Guidance Note 31) and specific mitigation measures to protect watercourses and GWDTEs are described in section 10.5.4.<br><br>For further details refer to chapter 8: Geology and hydrology. |
| SEPA | Do you agree that all receptors and impacts have been identified?<br><br>Yes. We recommend consideration of the use of Horizontal Directional Drilling (HDD) for not only coastal habitats/the cable landing but also as a possible mitigation measure through sensitive habitats, watercourses etc. Avoidance should be the first principle should GWDTE be present with floating tracks or HDD considered as mitigation measures only if avoidance is not possible. | Horizontal Directional Drilling (HDD) will be used at major river crossings (i.e. River Thurso) and specific embedded mitigation measures will be implemented for GWDTE, as detailed in section 10.5.4. |
| RSPB | When deciding on the final landfall location, underground cable route, and infrastructure locations, all designated sites should be avoided, all areas of cliff coastal habitats, peatland and wetland should be avoided and all areas with high densities of farmland waders should be avoided. | Detailed recommendations regarding appropriate mitigation measures for terrestrial ornithology receptors, including farmland waders, is provided in chapter 11: Terrestrial ornithology. |

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| | | The onshore Project area has been designed to avoid all designated sites (with the exception of the River Thurso SAC). Additionally, the mitigation measures embedded within the onshore Project design to minimise impact upon high sensitivity areas including designated sites, coastal areas and GWDTEs are provided in section 10.5.4. |
| RSPB | We agree with the scope of surveys proposed in section 3.3 Terrestrial Non-Avian Ecology. We note that habitats are proposed to be reinstated after the works as part of the mitigation measures. Not all habitats however can be easily reinstated. Therefore, the long-term or permanent loss of bird nesting, foraging, and/or roosting habitat along the onshore export cable corridor cannot be ruled out. Horizontal Directional Drilling (HDD) should be used if sensitive habitats cannot be avoided. | HDD will be used where possible, along with other methods such as the avoidance of GWDTEs and the use of clay stoppers to prevent works from affecting groundwater flows which may permanently damage sensitive habitats.<br><br>Chapter 11: Terrestrial ornithology, carried out a detailed assessment of the potential impacts from the works to understand the likely result in the long-term or permanent loss of bird nesting, foraging, and/or roosting habitat along the onshore export cable corridor. |
| RSPB | With regards to cumulative impacts, the onshore windfarm listed in Table 3-33 Onshore Windfarms within the Study Area should be included in the assessment. In addition, the grid connection for the Limekiln windfarm and the onshore infrastructure for the Pentland Floating Offshore Windfarm and Orkney High Voltage Direct Current (HVDC) Connection Project overlap the search area for the proposed development and should be included. Cumulative impacts on habitat loss, peat, Invasive non-native species (INNS), bird disturbance and bird displacement should be considered. | An assessment of cumulative impacts related to construction, operation and maintenance and decommissioning effects has been undertaken and is detailed in section 10.7.<br><br>The specific projects grid connections highlighted (Limekiln windfarm, Pentland Floating Offshore Windfarm and Orkney High Voltage Direct Current (HVDC) Connection Project) no longer overlap with the onshore Project area and therefore have been removed from consideration within the assessment.<br><br>For an assessment of cumulative impacts upon bird disturbance and displacement please see chapter 11: Terrestrial ornithology. |

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| RSPB | With the expected adoption of NPF4 in summer 2022, we encourage developers to think about how they will deliver positive effects for or biodiversity net gain. In Caithness, we would recommend the following:<br>• Land management for breeding farmland waders.<br>• Peatland restoration.<br>• Greenland white-fronted goose research programme: Since Greenland white-fronted geese are in decline, and only a limited amount of information is known about the movements and habits in Caithness, we would encourage the consideration of measures such as the funding of monitoring and research to identify key habitat used by Greenland white-fronted geese in the county, which could then inform land management practice and help guide future development to try to maximise their wintering survival. | We welcome the inclusion of this approach in NPF4 and will actively consider and apply relevant biodiversity net gain projects for the Project. This will be undertaken in consultation with relevant stakeholders, including the RSPB. An outline BEP is provided alongside this PPP application.<br>For further details on breeding farmland waders and Greenland-white fronted goose please refer to chapter 11: Terrestrial ornithology. |
| RSPB | Finally, we consider it likely the project risks having a significant effect on European Sites either on its own or in combination with other proposals. An appropriate assessment will therefore be required. | As per the Habitat Regulations, a RIAA (comprising part of the HRA process) has been carried out to determine whether or not the development would have an adverse effect on the integrity of any designated sites in the area. The results of the assessment are detailed in the Onshore RIAA, which accompanies this PPP application. |
| NatureScot | NatureScot have advised that they consider that peatland impacts in their interests should be considered under the non-avian terrestrial ecology section of the EIAR. A site-specific peat and NVC habitat survey will be required to confirm the quality and distribution of peatland across the development site plus an appropriate. The extent of priority peatland habitat loss and damage, both direct and indirect must be included in the EIAR. You should utilise the advice in the following guidance from NatureScot:<br>• Advising on carbon-rich soils, deep peat and priority peatland habitat in development management | The peatland habitats have been considered, with their quality captured in the NVC Survey. No peat assessment, beyond the relevant ecological features (i.e., habitats and species), has been undertaken for terrestrial non-avian ecology. However, a peat and peatland assessment has been undertaken and presented in chapter 8: Geology and hydrology.<br>GWDTEs have been identified during the NVC surveys and have been assessed in an ecological context. These have also been considered in chapter 8: Geology and hydrology.<br>Peat landslide hazard and risk assessment and peat depth assessment is not within the scope of the ecology surveys. However, these have been |

| CONSULTEE | COMMENT | RESPONSE |
|---|---|---|
| | https://www.nature.scot/advising-carbon-rich-soilsdeep-peat-and-priority-peatland-habitat-development-management<br>• Guidance on Development on Peatland<br>https://www.nature.scot/professionaladvice/planning-and-development/planning-and-development-advice/planningand-development-standing-advice-and-guidance-documents<br>• Peat landslide hazard and Risk assessment<br>https://www.nature.scot/professionaladvice/planning-and-development/planning-and-development-advice/planningand-development-standing-advice-and-guidance-documents<br>• Good Practice during Windfarm Construction<br>https://www.nature.scot/guidancegood-practice-during-wind-farm-construction<br>NatureScot have highlighted errors in table 3-3 in relation to the River Thurso SSSI, Caithness and Sutherland SAC, Achanarras Quarry SSSI and Broubster Leans SSSI. These must be corrected to ensure that the assessment is appropriately targeted. Please see the NatureScot response attached as an appendix to this response for details. | discussed in relation to geology and hydrology (see chapter 8: Geology and hydrology). |
| NatureScot | The assessment should distinguish between peat - the material - and peatland, which refers to the ecosystems and vegetation that form peat. The peatland classification (Class1, Class 2 etc.) relates to the condition of the vegetation and the system's ability to form peat or to be restored to active peat forming condition. At present both peat and peatland are referred to in the Geology and Hydrology section, but peatland impacts might be better considered under Non-Avian Terrestrial Ecology. Should any peatland be identified along the cable route we recommend that, as well as NVC survey, an assessment is made of its condition. | NVC communities and assessment of conditions are described in section 10.4.4.2.<br>For detailed assessment of peat and peatland please refer to chapter 8: Geology and hydrology. |
| NatureScot | In Table 3-18 (page 51), Agrostis-Festuca grassland is dominated by bents (*Agrostis spp.*) and fescues (*Festuca spp.*) not mat grass (*Nardus stricta*). | This mistake has now been amended. Correct NVC classifications have been used in this chapter. |

## 10.4 Baseline characterisation

This section provides a summary of the terrestrial non-avian ecology survey results. An assessment of the current baseline for terrestrial non-avian ecology within the onshore study area is provided in section 10.6 (Assessment of potential effects). The methods used to carry out the terrestrial non-avian ecology desk study, protected species surveys (excluding bats), NVC survey, bat roost potential survey and deer survey are also summarised. The key sensitive receptors have been identified (within this Onshore EIA Report, the term 'key sensitive receptors' is equivalent to the CIEEM term 'Important Ecological Feature'). Further details of the surveys and survey methodology are presented in SS6: Terrestrial non-avian ecology technical survey report.

A number of ecological receptors, which should be included and considered as part of the PPP application process, were identified at scoping. These included protected and notable species (mammals, reptiles, amphibians etc.), designated sites, notable and protected habitats; including GWDTEs, and protected and notable plant species.

A high-level Desk Based Assessment (DBA) was undertaken to prioritise habitats for detailed NVC survey, ground-truthing of the DBA during a walkover survey and detailed protected species surveys. In addition, a DBA identified the requirement for a detailed deer survey which was subsequently undertaken with results presented in SS7: Deer survey report.

### 10.4.1 Study area

The terrestrial non-avian ecology onshore study area (hereafter referred to as the onshore study area) is defined as the onshore Project area (see Figure 10-1) and an additional 'buffer area' encompassing the Zone of Influence (ZoI) over which ecological receptors may be affected. The guidelines for an EcIA require that the surveyed site includes all areas where significant effects could occur throughout the life of the onshore Project. The ZoI of the proposed activities upon different habitats and species varies greatly. For each ecological feature, published guidance and professional judgement were used to determine a suitable buffer around the proposed onshore Project area.

A buffer of 250 metre (m) is considered to be an appropriate distance to take into account potential effects upon habitats; including GWDTEs, and a range of protected or notable species. For bats, whilst the Core Sustenance Zones (CSZ) for species such as common pipistrelle and soprano pipistrelle (the species of bat most likely to be present on site) are between two and three kilometres respectively (Collins, 2016). No net loss of bat foraging habitat is anticipated as a result of the proposed works. Therefore, due to the scale and nature of the works, a 30 m buffer to identify any potential bat roost sites was considered sufficient, with no disturbance impacts anticipated beyond this buffer.

For the protected species surveys (excluding bats), a 250 m buffer was implemented. The 250 m buffer was considered appropriate to account for potential disturbance to species such as water vole (*Arvicola amphibius*), where territories can extend to a length of 200 m (Strachan *et al.*, 2011). For more mobile species such as otter (*Lutra lutra*) and badger (*Meles meles*), which can occupy home ranges or territories of up to 32 kilometres (km) for otter (NatureScot, 2020b) and 150 hectares (ha) for badger, the potential for impact upon the most sensitive of ecological features; breeding holts or setts, is considered. As development exclusion zones required for these are generally up to 100 m for badger and 200 m for otter, a 250 m buffer was therefore considered appropriate.

The study areas and applicable buffers are summarised below in Table 10-5.

*Table 10-5 Terrestrial non-avian ecology study areas*

| STUDY | BUFFER FROM ONSHORE SITE |
|---|---|
| **Desk study** | 20 km (statutory international designated sites)<br>5 km (statutory national designated sites and pine marten and bats)<br>2 km (all other species groups) |
| **Extended Phase 1 Habitat Survey** | 250 m |
| **Scottish Primrose Survey** | 250 m buffer from onshore site and 500 m inland buffer |
| **Protected Species Surveys** | 250 m |
| **NVC Survey** | 250 m |
| **Bat Roost Potential Survey** | 30 m |
| **Deer Survey** | 500 m |

The onshore Project area encompasses the proposed landfall points, the onshore export cable corridor and the location of the proposed onshore substation search area, this is shown on Figure 10-1.

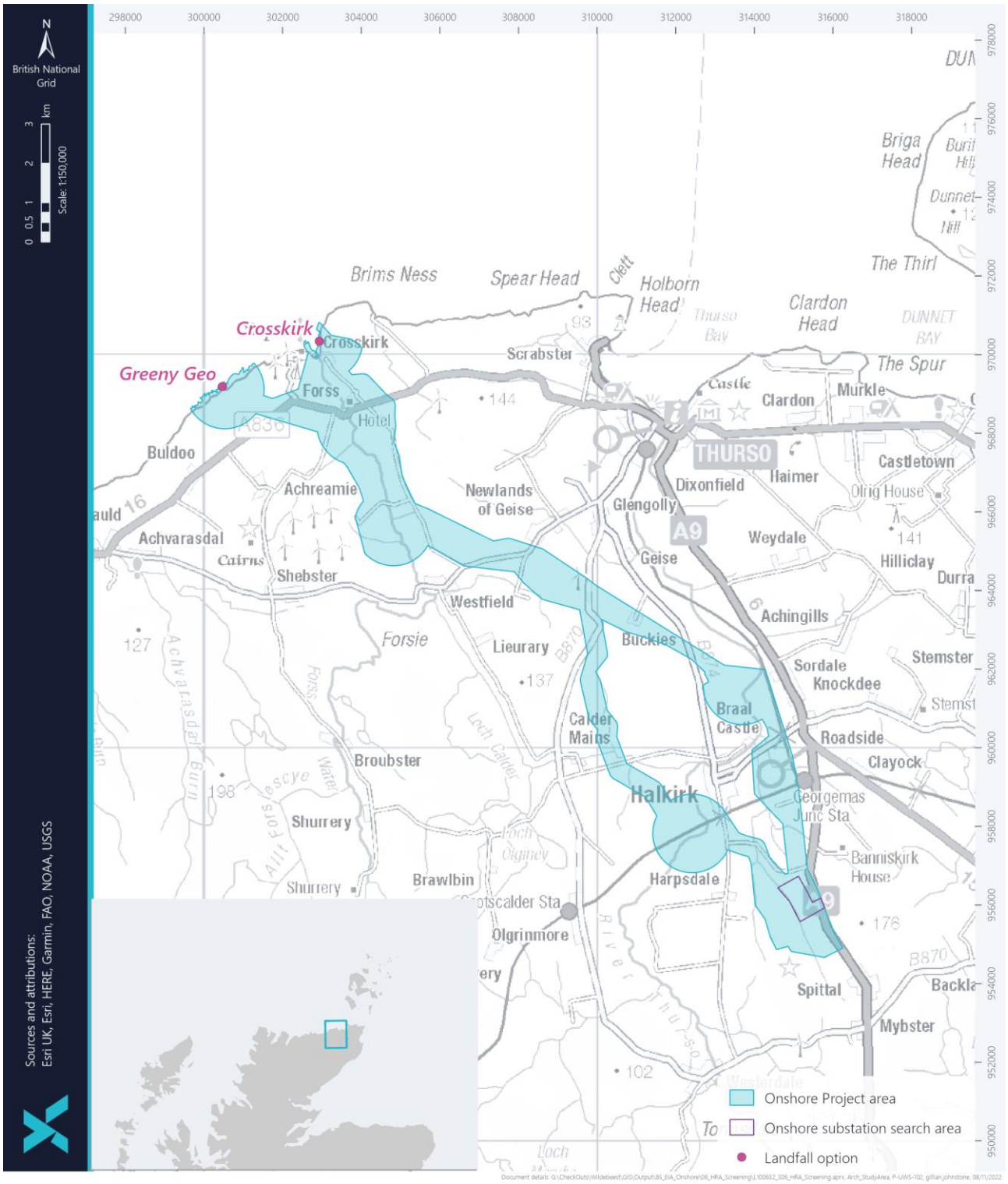


*Figure 10-1 Onshore Project area*

## 10.4.2 Data sources

A detailed desk study of the existing literature and data relating to terrestrial non-avian ecology was undertaken. As part of this desk study, requests for ecological data recorded within 2 km of the onshore Project area were made to organisations on 22nd March 2022 and 25th May 2022. Details of the data providers are listed in Table 10-6 below. In addition, relevant available digital datasets and published reports were also reviewed. The National Biodiversity Network (NBN) Atlas database was searched for non-avian biological records on 6th April 2022. Only records with licences allowing commercial use were included (Creative Commons License with attribution (CC-BY), Creative Commons No rights reserved licence (CCO), Open Government Licence (OGL)). The NBN Atlas also provides Creative Comms with attribution Non-Commercial (CC-BY-NC) data. CC_BY_NC data can only be used for non-commercial purposes and can therefore not be referenced by this chapter.

Whilst the use of NBN Atlas data is considered standard and appropriate in desk studies, it is (as for all desk study data) important to note that the absence of records does not indicate that a particular species is absent from the onshore study area, particularly considering the restrictions on the commercial use of certain datasets. By contacting a range of organisations that hold specific data on protected species in the area, this is not considered a notable constraint.

For all data sources, records from the past 10 years were included in the results. Older data was excluded as it is less likely to provide an accurate reflection of the current baseline. In addition, as the ZoI varies for different ecological features, a different buffer was applied for some species or groups based on best practice guidelines and professional judgement.

The desk study information was used to give an overview of the existing ecological environment within the onshore Project area and surroundings, provide information on sensitive habitats and non-avian species and provide information on statutory sites designated for their ecological interest. This information was used to put habitats and non-avian populations known from the onshore Project area into context in terms of their ecological importance.

The existing data sets and literature with relevant coverage to the onshore Project, which have been used to inform the baseline characterisation for terrestrial non-avian ecology are outlined in Table 10-6.

*Table 10-6 Summary of key data sets and reports*

| TITLE | SOURCE | YEAR* | AUTHOR |
|---|---|---|---|
| **Mapping and aerial imagery** | Ordnance Survey Maps<br>https://shop.ordnancesurvey.co.uk/maps/ | 2022 | Ordnance Survey (OS) |
| **Protected species and habitats** | SiteLink<br>https://sitelink.nature.scot/home | 2022a | NatureScot |

| TITLE | SOURCE | YEAR* | AUTHOR |
|---|---|---|---|
| **Protected species and habitats** | SBL<br>https://www.nature.scot/scotlands-biodiversity/scottish-biodiversity-strategy-and-cop15/scottish-biodiversity-list | 2020a | NatureScot |
| | NBN Atlas<br>https://nbnatlas.org | 2021 | NBN |
| | Report on the Species and Habitat Review<br>https://data.jncc.gov.uk/data/bdd8ad64-c247-4b69-ab33-19c2e0d63736/UKBAP-Species-HabitatsReview-2007.pdf | 2007 | JNCC |
| | CaSPlan<br>https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/283/caithness_and_sutherland_local_development_plan | 2018 | THC |
| | Caithness amphibian data | 2022 | Amphibian and Reptile Conservation Trust (ARC) |
| | Badger records | 2022 | Scottish Badgers |
| | Protected and notable botanical species records | 2022 | Botanical Society of Britain and Ireland (BSBI) |
| | Records of species of national or international conservation interest | 2022 | Highland Biological Recording Group (HBRG) |
| | Caithness butterfly records | 2022 | Butterfly Conservation |
| | Great yellow bumblebee records | 2022 | Bumblebee Conservation Trust (BBCT) |
| | Mammal records | 2022 | The Mammal Society |
| | Bat survey data | Not currently supplying data | Inverness Bat Group |

| TITLE | SOURCE | YEAR* | AUTHOR |
|---|---|---|---|
| Protected species and habitats | Protected and notable species records | 2012 (no longer active) | Caithness Biodiversity Group |
| Deer | Deer distribution survey | 2023a | The British Deer Society |
| | Forest and Land Scotland (FLS) culls for Sibster forest | 2019-2022 | FLS Ranger Manager |

** Where datasets were not dated, the year of access has been used.*

## 10.4.3 Project site-specific surveys

Surveys were undertaken within the terrestrial non-avian ecology onshore study area to identify potential impacts upon sensitive receptors during each stage of the onshore Project; i.e., construction, operation and maintenance and decommissioning.

A summary of the relevant guidance, survey methodology and field signs for each species is presented in Table 10-7. Further details of the methods are provided in the SS6: Terrestrial non-avian ecology technical survey report and SS7: Deer survey report. All surveys, with the exception of the bat roost potential survey and deer survey, were based on the onshore study area (onshore Project area plus 250 m buffer), and therefore covered a slightly larger area than required for robust consideration of effects within the onshore Project area. The bat roost potential assessment was conducted within 30 m of the onshore Project area which, as discussed in section 10.4.1, was considered an appropriate buffer area for the identification of potential roost sites which may be impacted as part of the proposed works. The deer survey was conducted within 500 m of the onshore Project area and was considered an appropriate buffer area for the assessment of deer presence and impacts upon deer welfare.

### 10.4.3.1 Methodology

#### 10.4.3.1.1 National Vegetation Classification survey

NVC surveys were completed between 5th July and 31st August 2022 and between 26th and 28th September 2022. The NVC surveys targeted potentially sensitive habitats identified by the desk-based Phase 1 and during ground-truthing assessments. The purpose of the NVC survey was to identify any sensitive habitats, including those listed under Annex I of the Habitats Directive.

As part of the NVC survey, wetland habitats were evaluated in accordance with the Wetland Typology developed by SNIFFER (2009) in terms of their potential to be GWDTEs. Any potential GWDTEs were identified in accordance with standard guidance (SEPA, 2017; UK Technical Advisory Group (UKTAG), 2009). Plant identifications follow Stace (2019) for vascular plants, and Hill *et al.* (2008) for bryophytes.

#### 10.4.3.1.2 Scottish primrose survey

Scottish primrose (*Primula scotica*) surveys were undertaken in areas where the presence of this species was most likely to occur; typically, within areas of damp, ungrazed grassland with a short sward, usually with sloping ground and near the coast.

The survey visits in 2022 coincided with the two Scottish primroses flowering periods, which occur in May and July / August 2022. Although most rosettes do not flower, conducting the surveys during the main flowering periods provides better confidence that the plant is present as the leaves are not clearly visible.

Existing known locations were revisited (Morris, 2009), in addition to other potential habitats (e.g. coastal grassland and heathland, including areas near the sea cliffs), to detect further unrecorded populations. Physical counts of the plants were made up to 200, with populations larger than 200 individual plants being estimated based on density and extent following methods described by Morris (2009) and Rich *et al.* (2005).

#### 10.4.3.1.3 Protected species survey

Protected species surveys included searches for signs of protected species such as mammal dens, feeding signs and footprints. Surveyors also recorded habitats suitable for protected species including woodland areas, waterbodies, potential bat roost sites and reptile refuges. Reference was made to relevant field guides, and standard survey methodology was followed.

*Table 10-7 Summary of relevant field guides, survey guidance, signs searched for and survey buffer areas for terrestrial non-avian ecology*

| SURVEY | SURVEY BUFFER | RELEVANT GUIDANCE/SURVEY METHOD FOLLOWED | SURVEY METHODOLOGY / FIELD SIGNS |
|---|---|---|---|
| **Badger** | 250 m | • Roper (2010);<br>• Bang & Dahlstrøm (2006); and<br>• SNH, 2002a. | • Setts;<br>• Footprints;<br>• Latrines/dung pits (used as territorial markers);<br>• Hairs – highly distinctive, and often become snagged on fences;<br>• Feeding signs – snuffle holes (small scrapes where badgers have searched for earthworms; insects or tubers); and<br>• Paths. |
| **Deer** | 500 m | • The Deer initiative (2011). | • A day-time vantage point survey;<br>• A site walk-over to identify evidence of deer activity; and identification of habitats suitable for deer; and<br>• A night-time survey using thermal imaging cameras to aid in the detection of deer. |
| **Otter** | 250 m | • SNH (2008);<br>• Bang & Dahlstrøm (2006); and | • Holts – below ground resting places;<br>• Couches – above ground resting places;<br>• Footprints; |

| SURVEY | SURVEY BUFFER | RELEVANT GUIDANCE/SURVEY METHOD FOLLOWED | SURVEY METHODOLOGY / FIELD SIGNS |
|---|---|---|---|
| | | • Chanin (2003). | • Spraints – faeces used as territorial markers; with a characteristic sweet odour;<br>• Prey remains; and<br>• Paths and slides. |
| **Pine marten** | 250 m | • Bang & Dahlstrøm (2006); and<br>• Cresswell *et al.* (2012). | • Scat – recognisable by their size, shape, and content, and also distinguishable from fox (*Vulpes vulpes*) droppings by their smell, if not desiccated;<br>• Dens – usually in hollows in trees, but also subterranean dens amongst tree roots, should no suitable tree dens be present; and<br>• Footprints – may be found on softer ground and can be differentiated from fox and other mustelids by size and shape. |
| **Red squirrel** | 250 m | • Gurnell *et al.* (2009). | • Visual observations of animals;<br>• Squirrel dreys – a sheltering nest of interwoven twigs (ball shaped/size) found on both broadleaf and conifer trees;<br>• Footprints; and<br>• Feeding signs (such as conifer cones gnawed in a manner characteristic to squirrels). |
| **Reptiles** | 50 m | • Cathrine (2018). | The presence of any reptiles was noted and habitats present within the study area were assessed as to their suitability to support reptiles following best practice guidance. Potential reptile habitat includes dense scrub, heathland, peatland, or tussocky grassland with a south-facing aspect. Potential refugia include rocks, rubble, and wood piles. Any reptiles observed were noted. |
| **Water vole** | 250 m | • Dean (2021);<br>• Dean *et al.* (2016); and<br>• Strachan *et al.* (2011). | • Burrows;<br>• Droppings/latrines; and<br>• Footprints; and feeding signs – gnawed vegetation, and grazed 'lawns' which are often associated with burrows. |

### 10.4.4 Existing baseline

This section describes the results of the onshore Project site-specific surveys and provides information on relevant designated sites of ecological interest.

In Section 10.6 these results, augmented by a review of literature and available data source, have been used to describe the current baseline environment for terrestrial non-avian ecology.

### 10.4.4.1 Review of available data

#### 10.4.4.1.1 Designated sites

A search was made for statutory sites designated for ecological interest. Only designated sites with terrestrial non-avian ecology features are considered in this chapter. The NatureScot Sitelink register (NatureScot, 2022a) was accessed to obtain information on the designated sites.

Six sites of international importance were located within 20 km of the onshore Project area (SAC and Ramsar sites), and 10 sites of national importance were noted within 5 km of the onshore Project area (SSSI and National Nature Reserves (NNR)) (see below Figure 10-2). These are summarised in Table 10-8 and are listed in order of proximity to the onshore Project area. The closest of these, Ushat Head SSSI, abuts the onshore Project area boundary.

*Table 10-8 Summary of designated sites with terrestrial non-avian ecological features within 20 km (international) and 5 km (national) of the onshore Project area*

| SITE NAME | DESIGNATION | DISTANCE AND DIRECTION FROM ONSHORE PROJECT AREA | QUALIFYING TERRESTRIAL ECOLOGY FEATURE |
|---|---|---|---|
| Ushat Head | SSSI | Abuts onshore Project area | Maritime heath of botanical importance found only in Caithness, Sutherland and Orkney. Also supports colonies of Scottish primrose which only grows in Caithness, Sutherland and Orkney and the rare small-fruited sedge (*Carex viridula*).<br>Ushat Head SSSI abuts the eastern boundary of the onshore Project area. |
| Loch Lieurary | SSSI | 0.1 km south | One of the largest examples of basin fen habitat in Caithness. |
| Westfield Bridge | SSSI | 0.6 km south-east | Nationally important fen meadow and calcareous grassland vegetation. Species-rich, calcareous grassland is a rare habitat in Caithness. |
| River Thurso | SSSI | 1.1 km south-west | Nationally important example of floodplain fen habitat. Also supports several nationally rare or scarce plants: holy grass (*Hierochloe odorata*), estuarine sedge (*Carex recta*), shady horsetail (*Equisetum pratense*), pyramidal bugle (*Ajuga pyramidalis*), and juniper (*Juniperus communis*). |
| Newlands of Geise Mire | SSSI | 2.4 km north-east | Nationally important example of valley fen habitat including a complete transition from drier fen to floating moss carpet which is rare in Caithness. |

| SITE NAME | DESIGNATION | DISTANCE AND DIRECTION FROM ONSHORE PROJECT AREA | QUALIFYING TERRESTRIAL ECOLOGY FEATURE |
|---|---|---|---|
| **Broubster Leans** | SAC and SSSI | 2.8 km west | Internationally important very wet mire habitat with unstable quaking surface. |
| **Loch Scarmclate** | SSSI | 3.1 km east | Nationally important example of a base-rich loch which is the only shallow, nutrient rich, marl loch in Caithness. Supports Nationally Scarce slender-leaved pondweed (*Potamogeton filiformis*). |
| **Holborn Head** | SSSI | 3.4 km north-east | Nationally important example of maritime heath and maritime grassland habitat. Also supports colonies of Scottish primrose. |
| **Sandside Bay** | SSSI | 4.6 km north-west | An area of maritime cliff vegetation that is an excellent example of cliff-top habitats in northern Scotland, with a complex mixture of species-rich maritime grassland and heath communities. This site also supports a nationally important population of Scottish primrose. |
| **Red Point Coast** | SSSI | 4.6 km north-west | An area of maritime cliff vegetation that is an excellent example of cliff-top habitats in northern Scotland, with a complex mixture of species-rich maritime grassland and heath communities. This site also supports a nationally important population of Scottish primrose. |
| **Loch Watten** | SAC and SSSI | 5.3 km east | Natural eutrophic lake dominated by pondweed vegetation (an Annex I habitat) and one of the least affected by nutrient enrichment in Scotland. Also designated for its wintering (non-breeding) Greenland white-fronted goose (*Anser albifrons flavostris*), greylag goose (*Anser anser*) and whooper swan (*Cygnus cygnus*) populations. |
| **Caithness and Sutherland Peatlands** | SAC and Special Protection Area (SPA) | 5.4 km south-east | SAC - Internationally important habitats listed under Annex I of the Habitats Directive:<br>• Depressions on peat substrates;<br>• Blanket bog;<br>• Wet heathland with cross-leaved heath;<br>• Very wet mires often inundated by an unstable 'quaking' surface;<br>• Acid peat-stained lakes and ponds; and<br>• Clear-water lakes with aquatic vegetation and poor to moderate nutrient levels.<br>Internationally rare species listed under Annex II of the Habitats Directive:<br>• Otter; and<br>• Marsh saxifrage (*Saxifraga hirculus*). |

| SITE NAME | DESIGNATION | DISTANCE AND DIRECTION FROM ONSHORE PROJECT AREA | QUALIFYING TERRESTRIAL ECOLOGY FEATURE |
|---|---|---|---|
| Caithness and Sutherland Peatlands | Ramsar | 5.4 km south-east | Largest and most intact area of blanket bog in Scotland designated for the following habitats and species:<br>• Blanket bog (including vegetation and surface pattern types not found elsewhere);<br>• Mire;<br>• Oligotrophic lochs, dystrophic lochs, lochans and pools;<br>• Fen;<br>• Wet heath;<br>• Mosaics of grassland and river within blanket bog and mire;<br>• *Sphagnum lindbergii* and *S. majus* (Nationally scarce mosses);<br>• Bog orchid (*Hammarbya paludosa*) (Nationally scarce higher plant);<br>• *Oreodytes alpinus* (Nationally rare water beetle)<br>• Otter; and<br>• Freshwater pearl mussel (*Margaritifera margaritifera*). |
| Loch of Wester | SAC and SSSI | 16.1 km south-east | SAC: Naturally nutrient-rich loch which is dominated by pondweed vegetation (an Annex I habitat).<br>SSSI: Mesotrophic loch supporting several notable and uncommon species of aquatic plant. |
| Strathy Point | SAC | 16.3 km west | Internationally important vegetated sea cliff habitat (an Annex I habitat). Also supports Scottish primrose. |

#### 10.4.4.1.2 Protected species

The desk study data search provided information on protected and notable terrestrial non-avian species within 2 km of the onshore Project area (see Table 10-5). Full details of the desk study results are provided in SS6: Terrestrial non-avian ecology technical survey report and any relevant information is referred to within the existing baseline assessment for each terrestrial non-avian ecology receptor. This information has been used to put terrestrial, non-avian, protected or notable species into context in terms of their ecological importance.

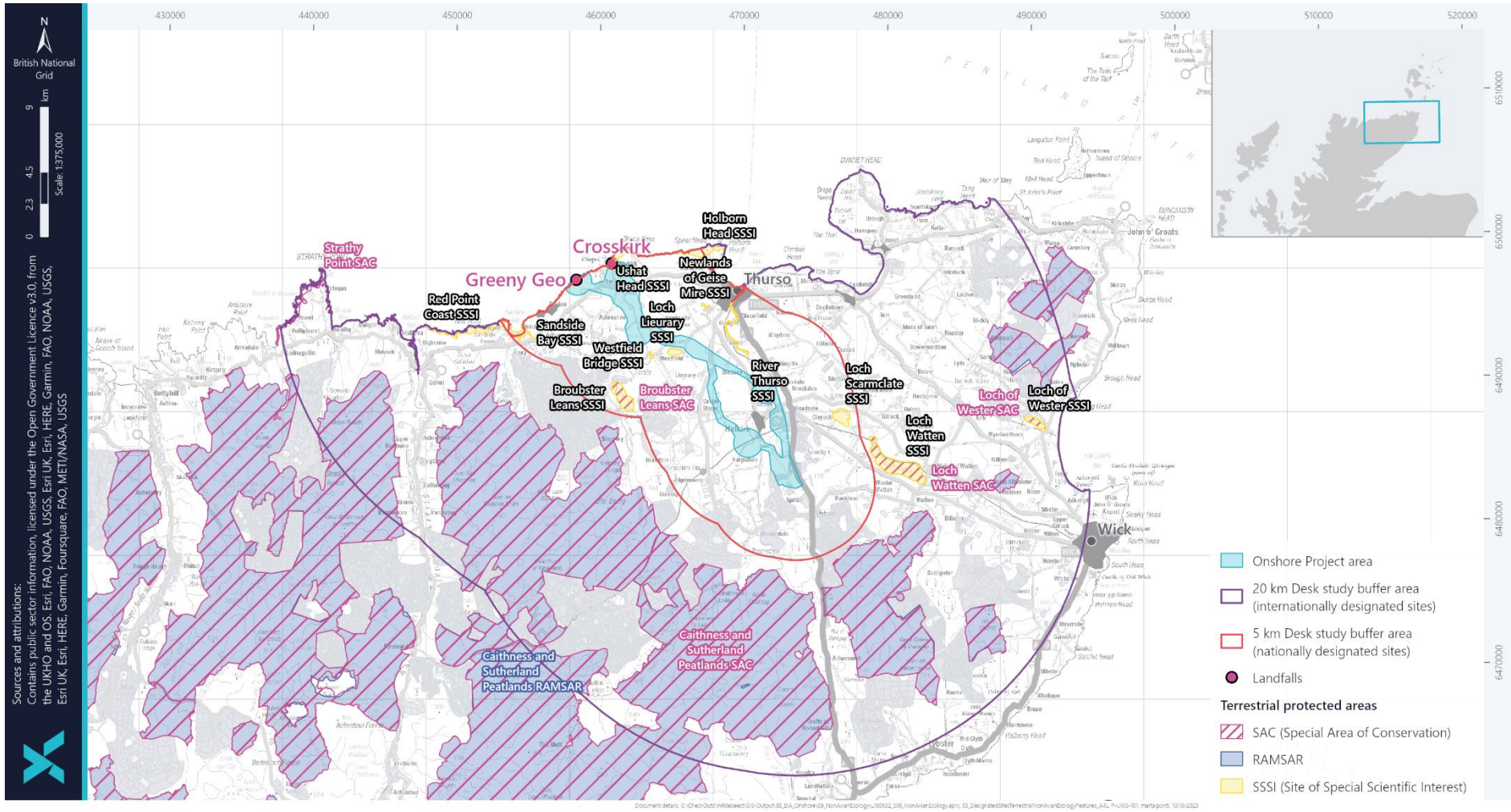


*Figure 10-2 Designated sites in the vicinity of the onshore Project area*

### 10.4.4.2 Project-specific surveys

#### 10.4.4.2.1 National Vegetation Classification

Thirty-five different plant communities, and a further 19 sub-communities were recorded during the NVC survey. Fourteen of the habitats (23 including sub-communities) correspond with Annex I habitats (see Table 10-9). Twenty-seven communities (42 including sub-communities) were identified as SBL priority habitats. Seven were identified as highly groundwater-dependent and a further nine were moderately groundwater-dependent NVC communities. Sixteen different mosaic habitats, consisting of a mix of two or more distinct classifications, were identified (see Table 10-9).

The detailed findings of the NVC survey are detailed in SS6: Terrestrial non-avian ecology technical survey report. The NVC communities are shown in Figure 10-3 and Figure 10-4, the ground water dependent NVC communities are shown in Figure 10-5 and Figure 10-6, the Annex I and SBL priority habitats are shown in Figure 10-7 and Figure 10-8 and a summary of the priority habitats recorded (GWDTE, Annex I and UKBAP / SBL) during the NVC are provided in Table 10-9.

#### 10.4.4.2.2 Annex I Habitats

Fourteen distinct Annex I habitats (with additional sub-communities) were recorded across the site (see Table 10-8). Three of these were heath communities, one wet mire community, two of a maritime cliff community, four woodland communities, one blanket bog community, one purple moorgrass (*Molinia caerulea*) meadow community, one calcium rich fen community, and one of species-rich Nardus grassland. Four of these were also recorded as part of eight different habitat mosaics.

*Table 10-9 Summary of NVC communities corresponding with Annex I habitats identified within 250 m of the onshore Project area*

| NVC CODE | NVC NAME | DESCRIPTION | CONSERVATION STATUS | EXTENT (HA) WITHIN STUDY AREA (TO BUFFER) | EXTENT (HA) WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) | PERCENTAGE OF HABITAT TYPE WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) |
|---|---|---|---|---|---|---|
| H7 | *Calluna vulgaris-Scilla verna heath* | H7 *Calluna vulgaris-Scilla verna* heath overlaps with the Annex I classifications H4030 Dry heaths, and H1230 vegetated sea cliffs. Within the onshore study area H4030 Dry heaths is a better match for the vegetation seen. The majority of the H7 heath was present along the coastal strip; east of the Forss Water, but also occurred as small patches on the west side of the coastal strip, and on the ridge above Oust farm. All examples seen were degrading into MG10a grassland. | SBL priority habitat - Lowland heathland. | 12.18 | 8.19 | 0.25 |
| M10 | *Carex dioica-Pinguicula vulgaris mire* | The sole example seen was a species-rich wet flush around the burn running from the reservoir above Oust farm. It is notable as one of the few clearly calcareous habitats seen in the study area. | SBL priority habitat - Lowland fens.<br>GWDTE (high). | 0.04 | 0.00 | 0.00 |
| M15 | *Scirpus cespitosus-Erica tetralix wet heath* | Widespread within the study area, especially on the wetter ground around Halkirk. Showed signs of significant drying out due to the dry weather conditions in the summer of 2022. | SBL priority habitat - Lowland heathland.<br>GWDTE (moderate). | 101.54 | 46.00 | 1.43 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **M15c** | *Scirpus cespitosus-Erica tetralix wet heath - Cladonia spp. sub-community* | Found within the Moss of Geise and to the south around Skinnet farm. Showed signs of significant drying out due to the dry weather conditions in the summer of 2022. | SBL priority habitat - Lowland heathland.<br>GWDTE (moderate). | 101.54 | 46.00 | 1.43 |
| **M16** | *Ericetum tetralicis wet heath* | At Bloody moss, in Halkirk. Showed signs of significant drying out due to the dry weather conditions in the summer of 2022. | SBL priority habitat - Lowland heathland.<br>GWDTE (high). | 61.80 | 39.20 | 1.22 |
| **M16a** | *Ericetum tetralicis wet heath - typical sub-community* | Slopes adjacent to Achanarras quarry. Showed signs of significant drying out due to the dry weather conditions in the summer of 2022. | SBL priority habitat - Lowland heathland.<br>GWDTE (high). | | | |
| **M22** | *Juncus subnodulosus – Cirsium palustre fen-meadow* | One very small area identified, approximately 1.3 km south of Forss. It is a botanically diverse classification in which rushes predominate. No degradation of the habitat noted. | SBL priority habitat – purple moorgrass and rush pasture.<br>GWDTE (high). | 0.66 | 0.66 | 0.02 |
| **M24** | *Molinia caerulea-Cirsium dissectum fen-meadow* | A single example on the lower slopes of the Forss valley, between Bridge of Forss and Lythmore Strath. | SBL priority habitat - Purple moorgrass and rush pasture. | Only present as part of M24/M25/M27 mosaics | Only present as part of M24/M25/M27 mosaics | 0.00 |
| **M25** | *Molinia caerulea-Potentilla erecta mire* | Widespread in study area, as degraded mires. | SBL priority habitat - Purple moorgrass and rush pasture.<br>GWDTE (moderate). | 219.16 | 105.16 | 3.27 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **M25a** | *Molinia caerulea-Potentilla erecta mire – Erica tetralix sub-community* | A single example occurs on the ridge above Oust farm in the Forss valley. | SBL priority habitat - Purple moorgrass and rush pasture GWDTE (moderate). | | | |
| **M25b** | *Molinia caerulea-Potentilla erecta mire - Anthoxanthum odoratum sub-community* | Common and widespread throughout the study area, including Oust, Crosskirk, and Moss of Geise. | SBL priority habitat - Purple moorgrass and rush pasture GWDTE (moderate). | | | |
| **M25c** | *Molinia caerulea-Potentilla erecta mire - Angelica sylvestris sub-community* | A single example found on the slopes of Spittal hill. | SBL priority habitat - Purple moorgrass and rush pasture.<br>GWDTE (moderate). | 219.16 | 105.16 | 3.27 |
| **MC9** | *Festuca rubra-Holcus lanatus maritime grassland* | Wet coastal grassland. All examples were found along the coastal strip, primarily to the west of the Forss valley. | SBL priority habitat - Lowland fens. | 17.95 | 16.08 | 0.50 |
| **MC9a** | *Festuca rubra-Holcus lanatus maritime grassland - Plantago maritima sub-community* | A single example of wet cliff edge grassland seen at the western end of the coastal strip within the study area. | SBL priority habitat - Lowland fens. | | | |
| **MC9e** | *Festuca rubra-Holcus lanatus maritime grassland - Anthoxanthum odoratum sub-community* | A small fragment present at the western end of the coastal strip. | SBL priority habitat - Lowland fens. | | | |

| | | | | | | |
|---|---|---|---|---|---|---|
| MC10 | *Festuca rubra-Plantago spp. maritime grassland* | Present along the coastal strip west of the Forss valley as degraded coastal heaths. This degrades to MG10a grassland further away from the shore. | SBL priority habitat - Maritime cliff and slopes. | 22.49 | 12.43 | 0.39 |
| S27 | *Carex rostrata-Potentilla palustris tall-herb fen* | The only large examples seen were the pond/fen NE of Crosskirk, and the wetter parts of Loch Lieurary SSSI. This habitat was identified by its unstable 'quaking' surface. The example was partially dried due to hot weather but was still floristically diverse. | SBL priority habitat - Lowland fens.<br>GWDTE (moderate). | 2.83 | 0.42 | 0.01 |
| S27a | *Carex rostrata-Potentilla palustris tall-herb fen - Carex rostrata-Equisetum fluviatile sub-community* | Small ponds at Ushat head, Lybster smallholdings, and north of East Calder at Burnside farm. | SBL priority habitat - Lowland fens.<br>GWDTE (moderate). | | | |
| U4 | *Festuca ovina-Agrostis capillaris-Galium saxatile grassland* | Small, scattered patches throughout study area, including as part of mosaics. | SBL priority habitat - Lowland dry acid grassland. | 10.27 | 2.20 | 0.07 |
| W4 | *Betula pendula-Molinia caerulea woodland* | Achalone and Houstry. Small woodlands. | SBL priority habitat - Wet woodland.<br>GWDTE (high). | 0.19 | 0.00 | 0.00 |
| W6 | *Alnus glutinosa-Urtica dioica woodland* | Managed woodland adjacent to Forss hotel, with mature trees. | SBL priority habitat - Wet woodland.<br>GWDTE (moderate). | 10.63 | 10.63 | 0.33 |

| | | | | | | |
|---|---|---|---|---|---|---|
| **W8e** | *Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland - Geranium robertianum sub-community* | Sycamore-dominated woodland with mature trees at Braal castle. | SBL priority habitat - Lowland mixed deciduous woodland. | 2.78 | 0.00 | 0.00 |
| **W8g** | *Fraxinus excelsior-Acer campestre-Mercurialis perennis woodland - Teucrium scorodonia sub-community* | Aimster woodland edge vegetation. | SBL priority habitat - Lowland mixed deciduous woodland. | | | |
| **W21** | *Crataegus monogyna-Hedera helix scrub* | Scrub/Hedge at Achanarras. | None. | 0.38 | 0.00 | 0.00 |

*Table 10-10 Habitat mosaic classifications*

| NVC CODE | DESCRIPTION | SBL PRIORITY HABITAT | GWDTE STATUS | EXTENT (HA) WITHIN STUDY AREA (TO BUFFER) | EXTENT (HA) WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) | PERCENTAGE OF HABITAT TYPE WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) |
|---|---|---|---|---|---|---|
| M15/M16/M23/M25 | M15/M16/M23/M25 mosaic | Lowland heathland / Purple moorgrass and rush pasture. | Moderate / High / High / Moderate | 131.27 | 124.85 | 3.88 |
| M15/M16/M25 | M15/M16/M25 mosaic | Lowland heathland / Purple moorgrass and rush pasture. | Moderate / High / Moderate | 25.44 | 6.21 | 0.19 |
| M15/M25 | M15/M25 mosaic | Lowland heathland / Purple moorgrass and rush pasture. | Moderate | 23.83 | 19.96 | 0.62 |
| M16/M25 | M16/M25 mosaic | Lowland heathland / Purple moorgrass and rush pasture. | High / Moderate | 29.96 | 15.91 | 0.49 |
| M23/M25 | M23/M25 mosaic | Purple moorgrass and rush pasture. | Moderate / High | 124.05 | 87.38 | 2.72 |

| NVC CODE | DESCRIPTION | SBL PRIORITY HABITAT | GWDTE STATUS | EXTENT (HA) WITHIN STUDY AREA (TO BUFFER) | EXTENT (HA) WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) | PERCENTAGE OF HABITAT TYPE WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) |
|---|---|---|---|---|---|---|
| M23/M25/MG10a | M23/M25/MG10a mosaic | Purple moorgrass and rush pasture / Coastal and floodplain grazing marsh. | High / Moderate / Moderate | 34.52 | 31.74 | 0.28 |
| M23/MG10a | M23/MG10a mosaic | Purple moorgrass and rush pasture / Coastal and floodplain grazing marsh. | High / Moderate | 9.13 | 9.13 | 1.11 |
| M24/M25/M27 | M24/M25/M27 mosaic | Purple moorgrass and rush pasture / Lowland fens. | High / Moderate / Moderate | 35.61 | 35.61 | 0.99 |
| M25/MG10a | M25/MG10a mosaic | Purple moorgrass and rush pasture / Coastal and floodplain grazing marsh. | High / Moderate | 26.33 | 9.13 | 0.61 |
| M27/MG9 | M27/MG9 mosaic | Lowland fens / Coastal and floodplain grazing marsh. | Moderate | 75.07 | 56.39 | 1.75 |

| NVC CODE | DESCRIPTION | SBL PRIORITY HABITAT | GWDTE STATUS | EXTENT (HA) WITHIN STUDY AREA (TO BUFFER) | EXTENT (HA) WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) | PERCENTAGE OF HABITAT TYPE WITHIN ONSHORE PROJECT AREA (EXCLUDING BUFFER) |
|---|---|---|---|---|---|---|
| M28/MG9 | M28/MG9 mosaic | Lowland fens / Coastal and floodplain grazing marsh. | Moderate | 5.05 | 5.05 | 0.16 |
| MG6/MG7/ Gorse | MG6/MG7/Gorse mosaic | None. | None | 9.66 | 8.31 | 0.26 |
| MG10a/MG9 | MG10a/MG9 mosaic | Coastal and floodplain grazing marsh. | Moderate | 46.56 | 31.53 | 0.98 |
| U4/M25 | U4/M25 mosaic | Purple moorgrass and rush pasture / Lowland dry acid grassland. | Moderate / None | 133.05 | 68.89 | 2.14 |
| U4/MG9 | U4/MG9 mosaic | Coastal and floodplain grazing marsh / Lowland dry acid grassland. | Moderate / None | 12.11 | 0.00 | 0.00 |
| U5/M15 | U5/M15 mosaic | Lowland dry acid grassland / Lowland heathland. | None/ Moderate | 31.92 | 20.71 | 0.64 |

#### 10.4.4.2.3 Scottish primrose

During the field survey, Scottish primrose was found to be ubiquitous within 50 m of the shore in lightly grazed areas (see Figure 10-9). Full survey results are provided in SS6: Terrestrial non-avian ecology technical survey report and a baseline assessment of Scottish primrose within the onshore study area is provided in section 10.6.5.2.

#### 10.4.4.2.4 Northern knotgrass

Northern knotgrass was found at the side of a track on the ridge above Oust farm. It was also casually observed outside the study area at Dounreay, and on a road verge at Westfield. Full survey results are provided in SS6: Terrestrial non-avian ecology technical survey report and a baseline assessment of Northern knotgrass within the onshore study area is provided in section 10.6.6.4.

#### 10.4.4.2.5 Eyebright

No rare Euphrasia spp. were recorded during the survey, but it is possible that one or more of the rare species occur within the study area. Full survey results are provided in SS6: Terrestrial non-avian ecology technical survey report and a baseline assessment of *Euphrasia marshallii*, an SBL priority species listed as requiring conservation action within the onshore study area, is provided in section 10.6.6.5.

#### 10.4.4.2.6 Field gentian

Through discussion with a local resident, it is understood that in the onshore study area field gentian (*Gentianella campestris*) was present on the road verge of the access road to Forss Business and Technology Park, at ND022691. As the site had been recently mown to almost ground level, no field gentian plants were observed during the survey. However, the vegetation present appeared to indicate suitable habitat for this species. Full survey results are provided in SS6: Terrestrial non-avian ecology technical survey report and a baseline assessment of field gentian within the onshore study area is provided in section 10.6.6.6.

#### 10.4.4.2.7 Badger

No evidence of badger activity was identified within the onshore study area. However, due to the presence of suitable foraging habitat, and the known presence of badger within the wider area, it is considered likely that badger do occasionally pass through the onshore Project area. Full survey results are provided in SS6: Terrestrial non-avian ecology technical survey report and a baseline assessment of badger within the onshore study area is provided in section 10.6.6.2.

#### 10.4.4.2.8 Bats

Figure 10-10 and Figure 10-11 show the locations and Bat Conservation Trust (BCT) categories of buildings, built structures, trees, woodland areas and rock faces within the northern and southern portions of the onshore study area respectively. Full details of the bat roost potential survey are provided in the SS6: Terrestrial non-avian ecology technical survey report. To summarise, the survey visits identified 84 buildings or building complexes of Moderate / High to High bat roost potential, 143 of Low / Moderate to Moderate bat roost potential, and 98 of Negligible / Low

to Low bat roost potential. Two stone-built bridges and one culvert were identified as being of Low to Moderate suitability for roosting bats, and two bridges were considered to be of Negligible suitability.

A small, disused quarry was observed to the north-east of Forss. Whilst no close inspection was undertaken, the deep crevices observed within the rock faces were considered to be of moderate suitability for roosting bats; with species including common pipistrelle and brown long-eared bat known to exploit such features within these artificial landforms (Bat Rock Habitat Key, 2021). The rock faces along the coastline to the northern extent of the onshore study area also support deep crevices. However, as these features would be regularly exposed to salty sea spray, waves, wind and rain, with no sea caves present which are known to be utilised by roosting bats (Bat Rock Habitat Key, 2021) and could provide shelter from the elements, they are considered to be of Negligible to Low suitability for roosting bats.

Suitable foraging and commuting habitat within the onshore study area includes small pockets of woodland, woodland edges and riparian habitats. Linear features, such as watercourses and woodland edges, are known to be used by commuting bats, whilst tree-lined watercourses and woodland edges are often also used by bats as shelter from the elements, to optimise foraging success. However, as the vast majority of the onshore study area is comprised of wide expanses of farmland, the pockets of woodland and riparian habitat are relatively isolated.

There are relatively few scattered trees present within the onshore study area, and those that are present are generally young to semi-mature, supporting few or no features suitable for roosting bats. Nevertheless, a number of scattered trees with bat roost potential were identified. These included mature elm trees (*Ulmus procera* and *Ulmus glabra*) with rot holes and split limbs, sycamore (*Acer pseudoplatanus*) trees with rot holes and dead Sitka spruce (*Picea sitchensis*) with areas of lifted bark.

A baseline assessment of bats within the onshore study area is provided in section 10.6.5.3.

#### 10.4.4.2.9 Great crested newt

In Scotland, it is estimated that the number of great crested newt 'occupied ponds' is 1,542, with an estimated 1,156 'breeding ponds' (i.e. ponds within which great crested newts have been observed to breed) (Wilkinson *et al.*, 2011). Within northern Scotland, approximately 40 breeding ponds are located around Inverness, and it is known that great crested newts have been introduced to one site in Caithness (McInerny, 2018); outwith the onshore study area to the north-east. Although the great crested newt's range extends throughout the UK, it is only found in discrete, low-altitude areas in Scotland, with records becoming scarcer with increasing altitude. Larger populations are found within rural south and Inverness, with Scotland being at the periphery of the species most north-western global range.

No statutory designated sites which include great crested newt as a qualifying feature were identified within 5 km of the onshore Project area.

A total of 37 ponds within the onshore study area, were subject to Habitat Sustainability Index (HSI) assessments. The ponds surveyed returned results of 'poor' or 'below average' in terms of their suitability for great crested newts. Therefore, no further surveys were undertaken. Figure 10-12 shows the locations and suitability of the ponds within the study area. Full details of the HSI assessment, including details of the HSI calculations for each of the numbered ponds in the figure below, are provided in Table A4.1, SS6: Terrestrial non-avian ecology technical survey report. Due

to the lack of suitable waterbodies within the onshore study area for great crested newts, this species has been scoped out for further assessment (see Table 10-13).

#### 10.4.4.2.10 Otter

The field surveys identified evidence of otter activity along named watercourses and drains throughout the onshore study area, with higher levels of activity recorded along the River Thurso and Forss Water. Evidence of otter activity included spraint sites, paths, slides and couches, with two holts located within the onshore Project area along Forss Water.

The highest quality habitat for otter was assessed to be along the River Thurso and Forss Water. Habitats of moderate suitability included tributaries of the River Thurso and Forss Water, whilst habitats of a lower suitability included field drains. Although it is expected that otter more frequently utilise the higher suitability habitats, it is expected otter could utilise any riparian areas within the onshore Project area, as indicated by the baseline survey results. Figure 10-13 and Figure 10-14 show the location and nature of the evidence of otter activity identified within the onshore study area. A baseline assessment of otter within the onshore study area, including an assessment of the suitability of the habitats present, is provided in section 10.6.5.4. Full details of the otter survey results are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.4.4.2.11 Pine marten

No den sites were noted for pine marten. However, to the south of the onshore study area (west of the onshore substation), the landowner provided anecdotal evidence that pine marten had been nesting in the farm building at Achanarras Farm (within the onshore study area) and at a farm building at Spittal Mains (outside the study area - south of the onshore substation).

Pine marten scat was recorded in relatively low numbers across the onshore study area and a pine marten was sighted approximately 2 km outwith the onshore Project area; near the eastern banks of Loch Calder. Further anecdotal evidence of pine marten presence was recorded, with sightings to the south of the onshore Project area and within the grounds of a residential property to the east of the Burn of Baillie (outside the onshore Project area).

Figure 10-15 shows the location and nature of the evidence of pine marten activity identified within the onshore study area. A baseline assessment of pine marten within the onshore study area, including an assessment of the suitability of the habitats present, is provided in section 10.6.5.5 and full details of the pine marten survey results are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.4.4.2.12 Red squirrel

Red squirrel are found in both broadleaved and conifer woodlands, but those that provide a variety of different seeds provide a more stable food resource. It is estimated that seventy-five percent of the UK's red squirrel's population is located in Scotland, with population numbers varying between 148 to 239 thousand (Mathews *et al.*, 2018). However, this species' most northern range is recorded as being near the red squirrel stronghold site at Morangie Forest, in Tain, over 80 km south-east of the onshore Project area. Whilst red squirrel were historically recorded further north; in 1999 and before, current distribution data indicates that they are no longer present in Caithness (Scott, 2011). This has been supported by field study data where no evidence of red squirrel activity was identified within the onshore

study area. As red squirrel are reliant on the availability of a range of suitable foraging resources throughout the year, the lack of evidence of squirrel activity is likely due to the fact that the pockets of woodland across the onshore Project area and within the onshore study area are relatively sparse, small, isolated and are generally comprised of young to semi-mature trees.

#### 10.4.4.2.13 Reptiles

The field surveys identified evidence of reptiles in the form of five common lizard (*Zootoca vivipara*) sightings, four of which are located outwith the onshore study area. One record of a common lizard was found south of Achanarras, two common lizards were found approximately 3 km south-west of Halkirk, and one common lizard was recorded north-east of Westfield. The single record of common lizard within the onshore study area was approximately 1.4 km south of Halkirk, in wet, neutral grassland.

Figure 10-16 and Figure 10-17 shows the location of reptiles found within the Project study area, as well as highlighting areas of suitable reptile habitat, including potential hibernacula. A baseline assessment of reptiles within the onshore study area, including an assessment of the habitats present, is provided in section 10.6.1.4 and full details of the reptile survey results are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.4.4.2.14 Water vole

Field surveys recorded areas of suitable habitat along watercourses, wet ditches and waterbodies throughout the onshore study area and conclusive evidence of water vole activity; in the form of burrows, feeding signs and latrine sites, were identified during the survey visits. The majority of the evidence of water vole activity was located along Forss Water; to the north of the site, Calder Burn; approximately 2 km west of Halkirk, and along a tributary of River Thurso; approximately 2.4 km south-west of Halkirk. The water vole signs along Forss Water comprised of feeding signs and a three-entrance burrow. During the survey, a small mammal was heard (but not seen) entering the water near this burrow network. The sound was consistent with the characteristic 'plop' associated with a water vole disappearing below the water's surface. The water vole signs observed along Calder Burn were located just outwith the onshore study area, to the west of Halkirk. Here, fresh droppings were noted within three of the four latrines, there were four individual burrow entrances and feeding signs were observed. The vegetation was dense along the Calder Burn, limiting detailed inspection of the banks. Due to the level of activity recorded, it is considered likely that the vegetation is obscuring additional burrow entrances and further evidence of water vole activity.

Figure 10-18 and Figure 10-19 shows the location and nature of the evidence of water vole activity identified within the onshore study area. A baseline assessment of water vole within the onshore study area, including an assessment of the habitats present, is provided in section 10.6.5.6 and full details of the water vole survey results are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.4.4.2.15 Deer

The field surveys identified evidence of deer, both roe deer *(Capreolus capreolus)* and red deer (*Cervus elaphus)*, within the onshore study area. Roe deer were the main species present and were sighted across different locations in the onshore study area, and one red deer was sighted around Sibster and Halkirk. The terrain and nature of the ground is conducive to roe deer, with good quality pasture mixed with small areas of woodland and areas of gorse and willow scrub. This habitat provides the necessary areas for feeding and shelter and allows roe deer to thrive. The

low scrub of the habitat is not as favourable for red deer, which are a herding animal and are less tolerant of disturbance.

Only one red deer was spotted at Sibster forest. However, there was evidence of young trees having been browsed multiple times, indicating that there was presence of a number of deer in the area. The cull figures from FLS for land at Sibster indicate that 50 roe deer were culled over a period of four years (2019 – 2022 inclusive), indicating a significant deer population in this area. For example, 21 roe deer were culled in 2021 and 16 roe deer were culled in 2022, an increase from 2019 and 2020 where nine and four roe deer were culled respectively.

Figure 10-20 provides evidence of the deer activity in the onshore study area during the field survey work.

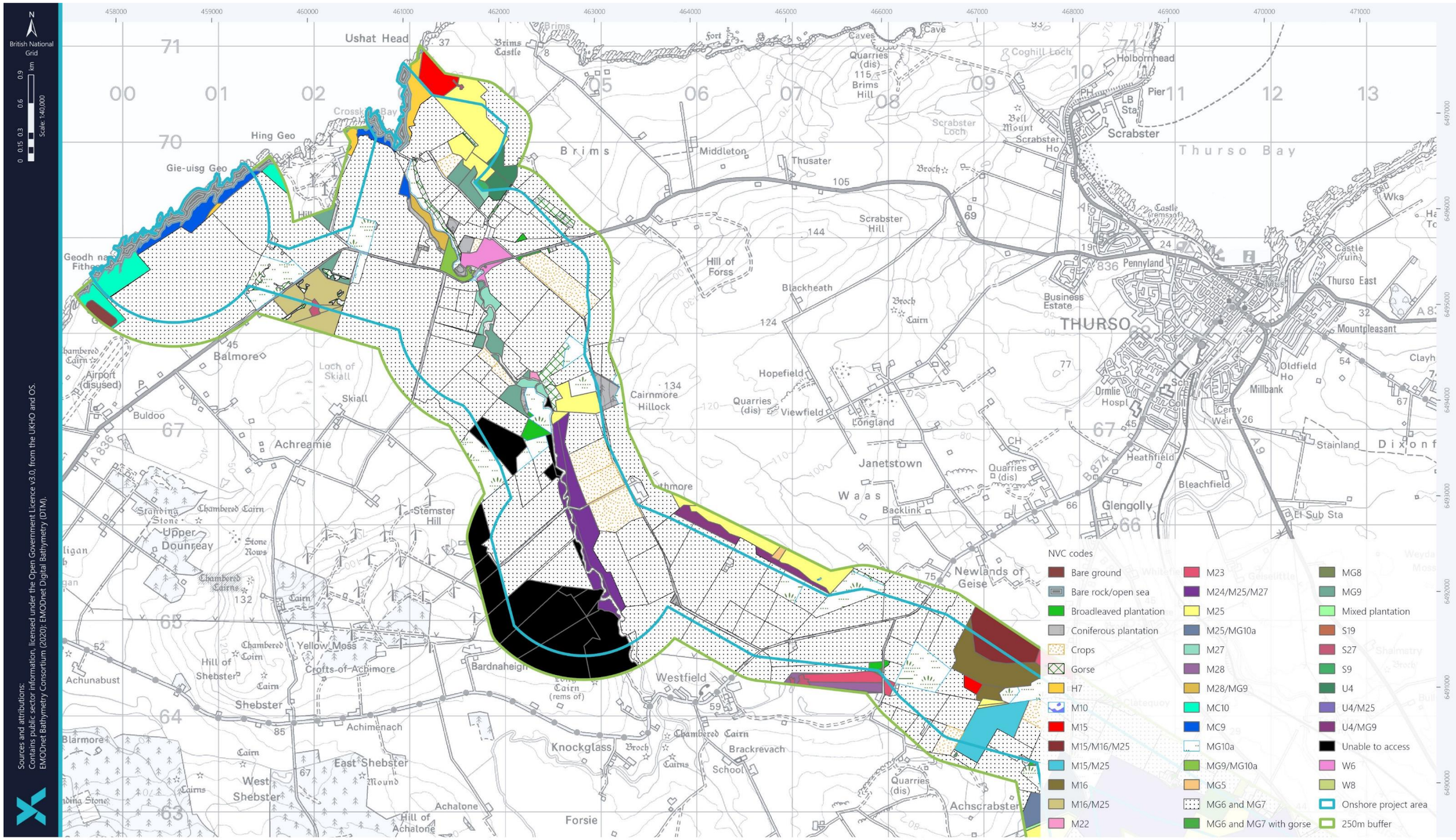


*Figure 10-3 NVC habitats recorded within the northern section of the onshore study area*

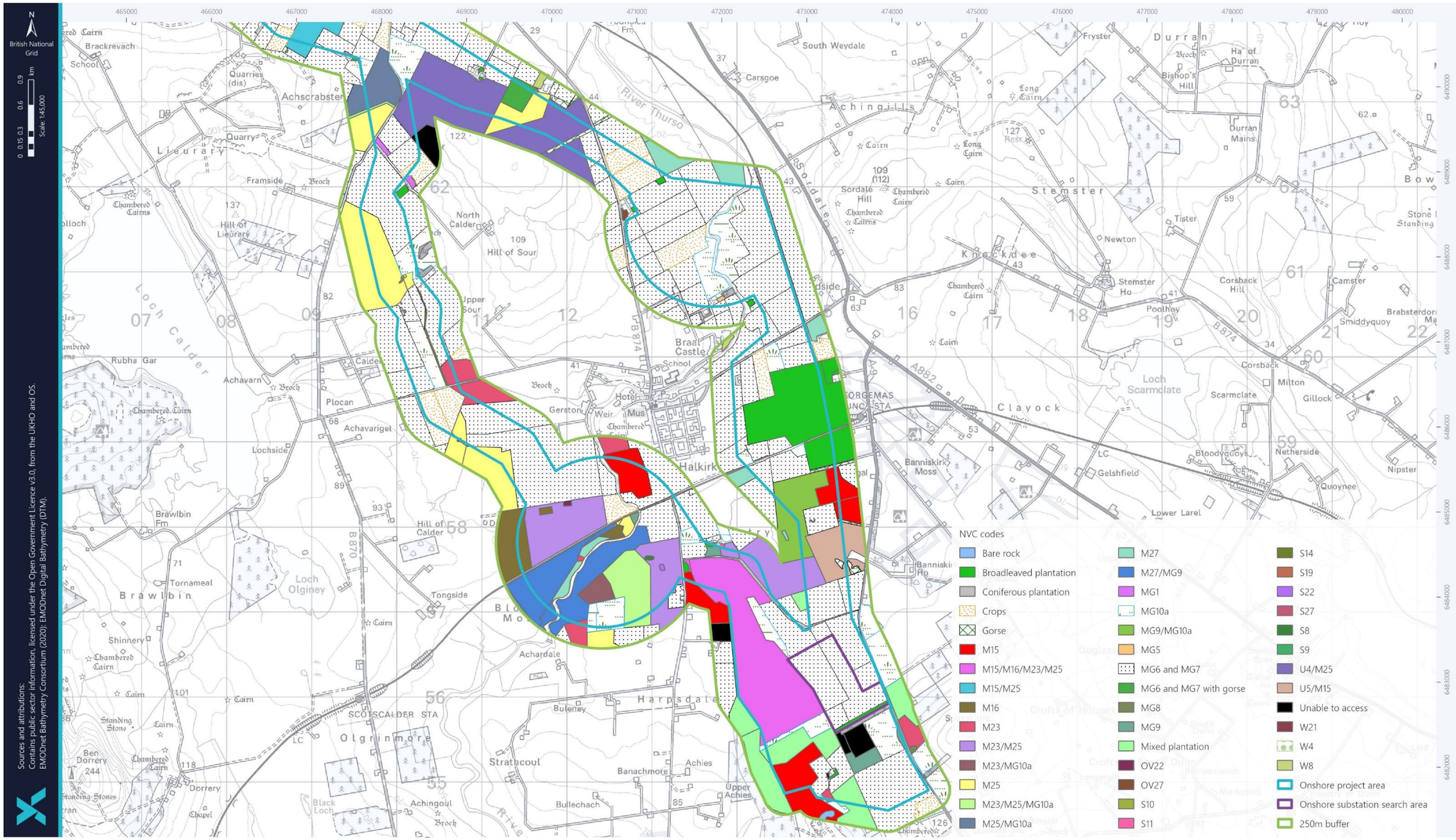


*Figure 10-4 NVC habitats recorded within the southern section of the onshore study area*

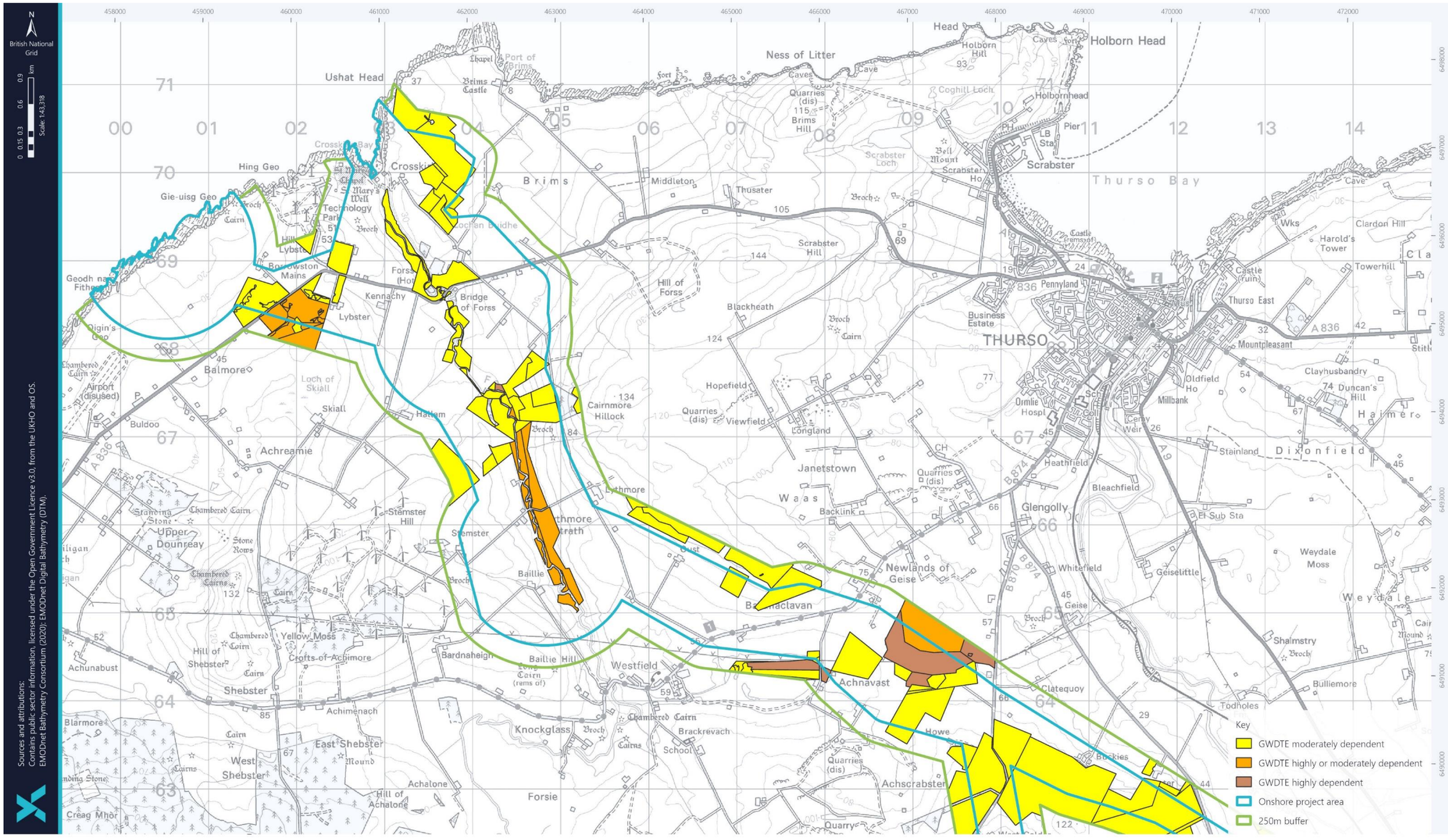


*Figure 10-5 GWDTEs recorded within the northern section of the onshore study area*

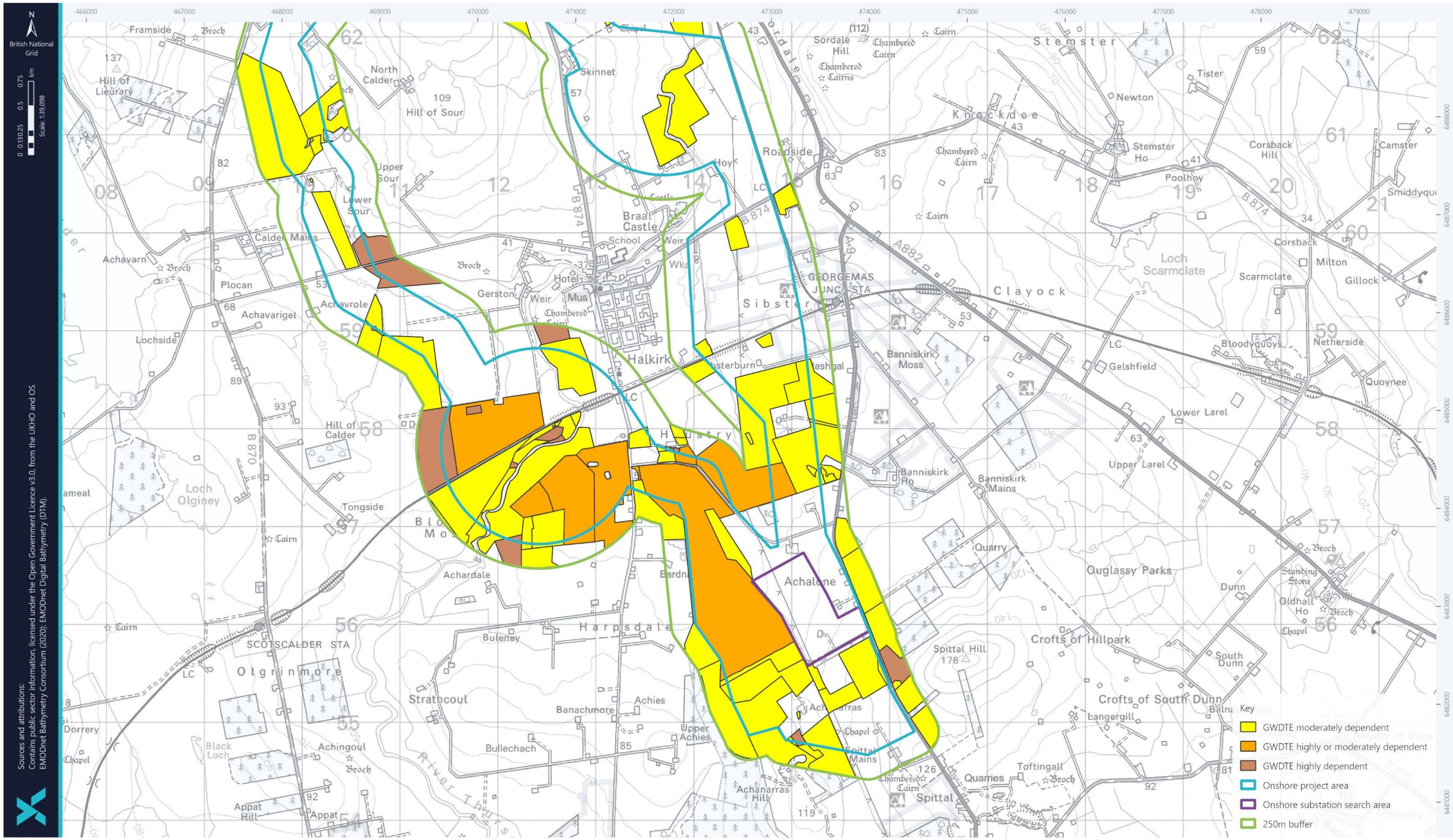


*Figure 10-6 GWDTEs recorded within the southern section of the onshore study area*

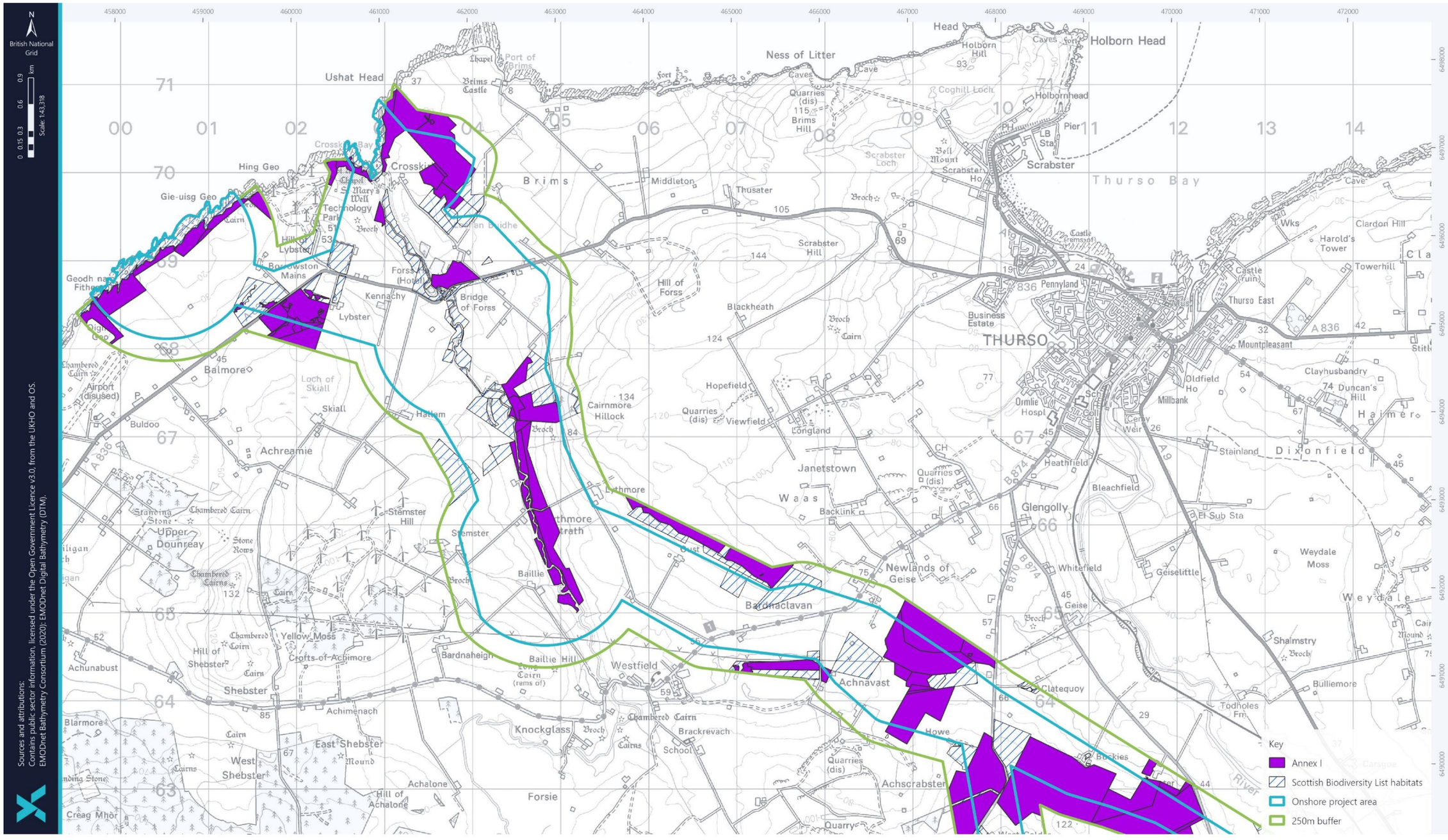


*Figure 10-7 Annex I and SBL habitats recorded within the northern section of the onshore study area*

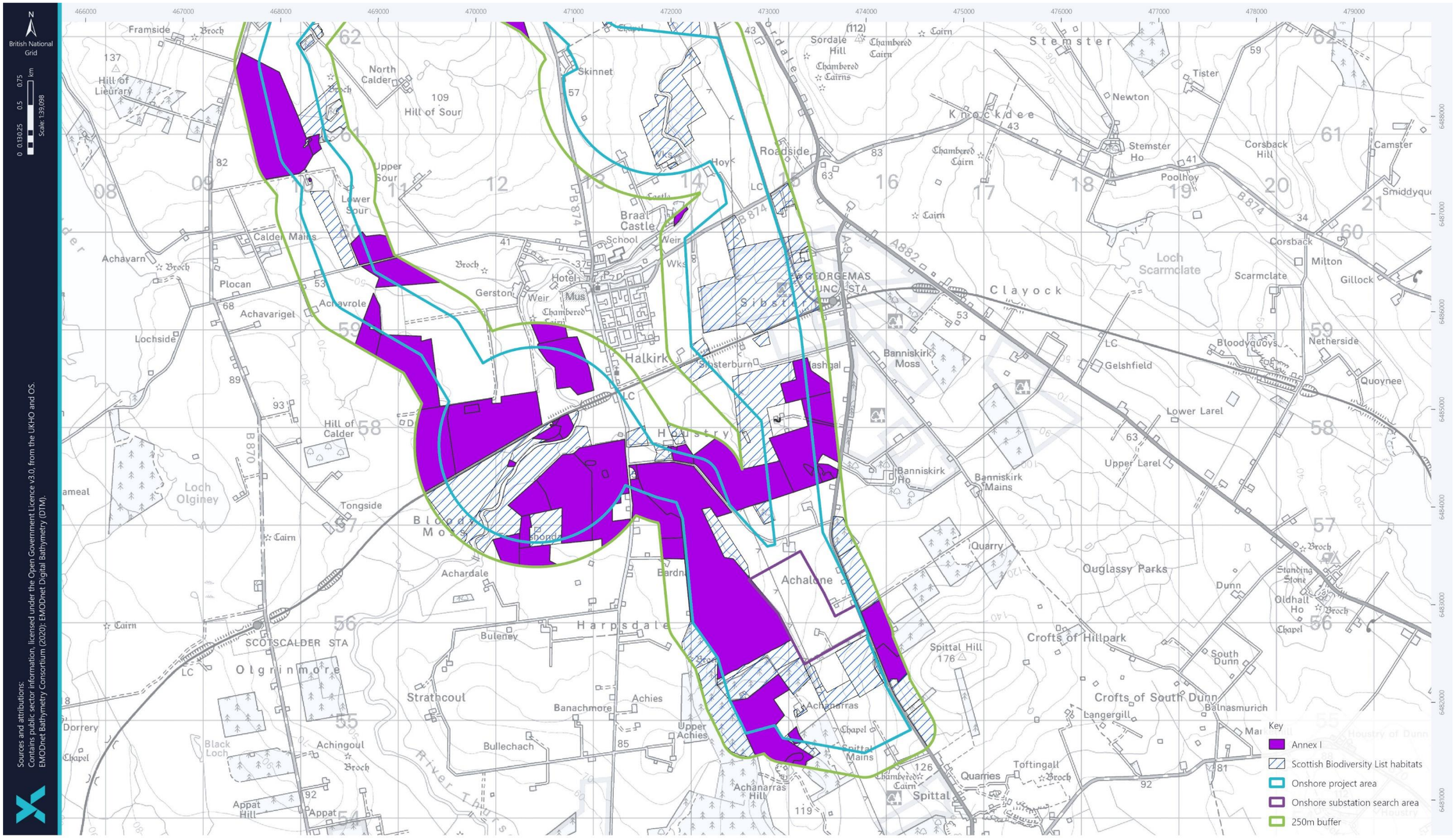


*Figure 10-8 Annex I and SBL habitats recorded within the southern section of the onshore study area*

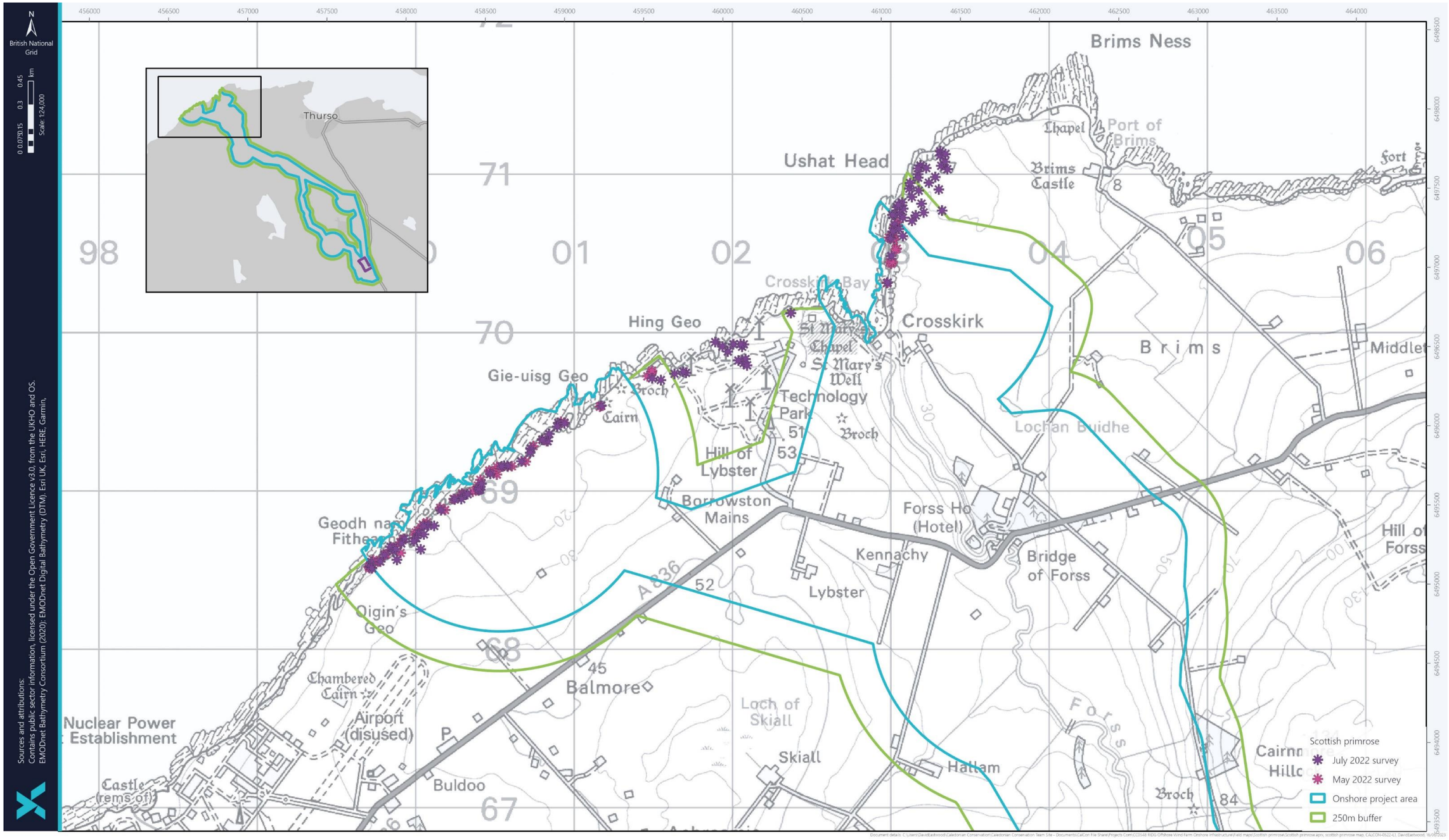


*Figure 10-9 Scottish primrose survey results*

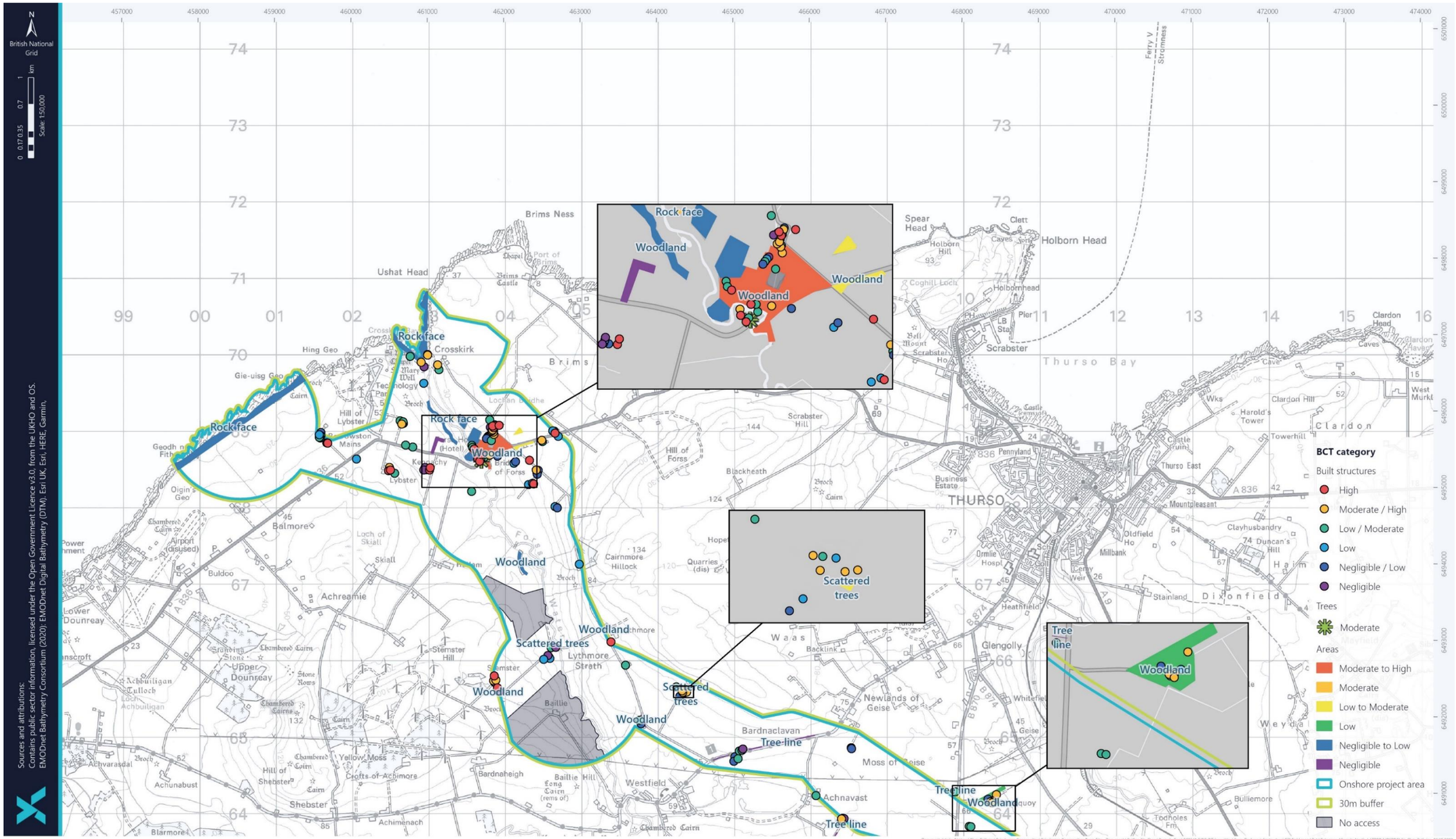


*Figure 10-10 The BCT categories of buildings, built structures, trees and woodland areas within the northern section of the onshore study area*

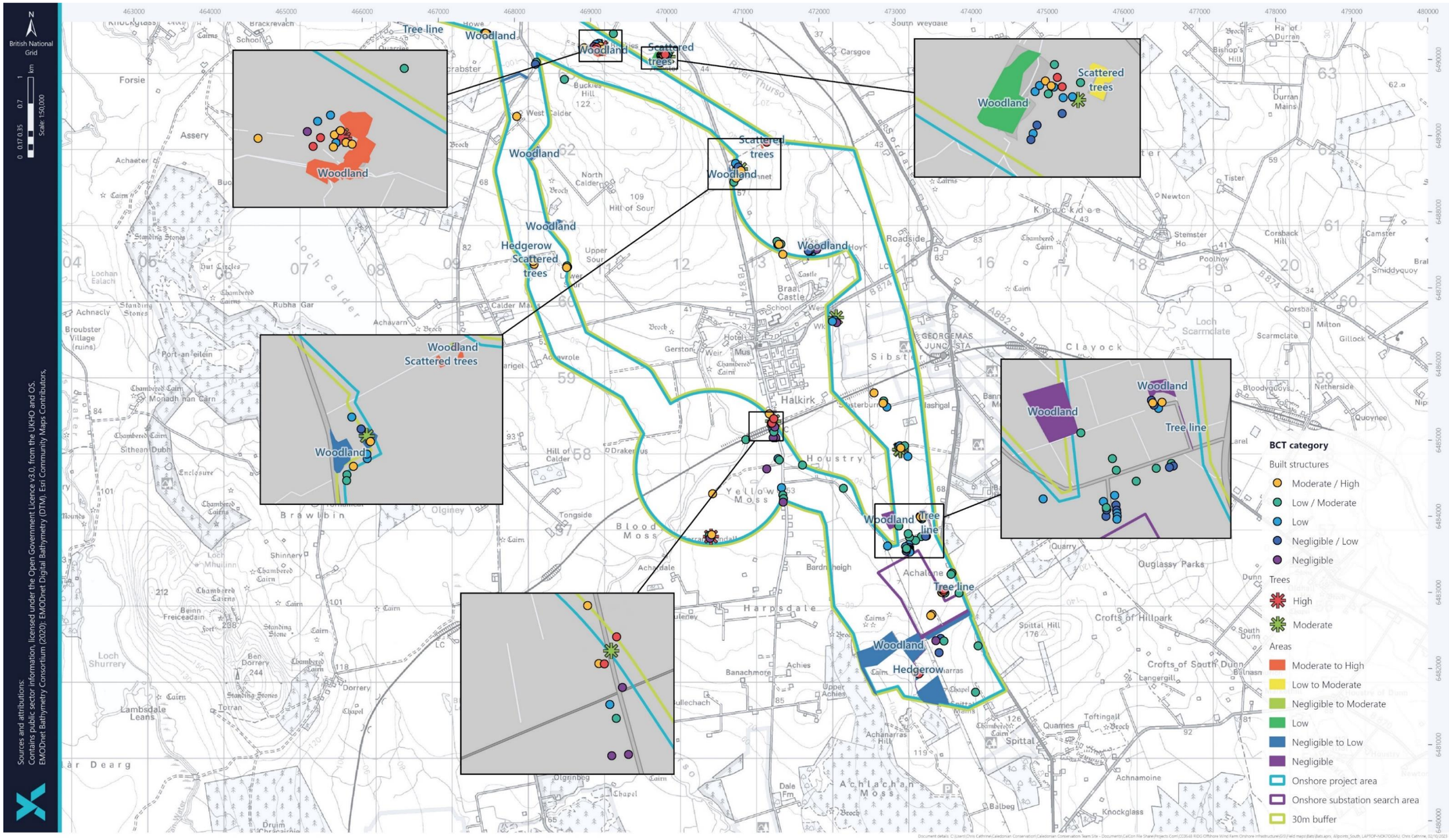


*Figure 10-11 The BCT categories of buildings, built structures, trees and woodland areas within the southern section of the onshore study area*

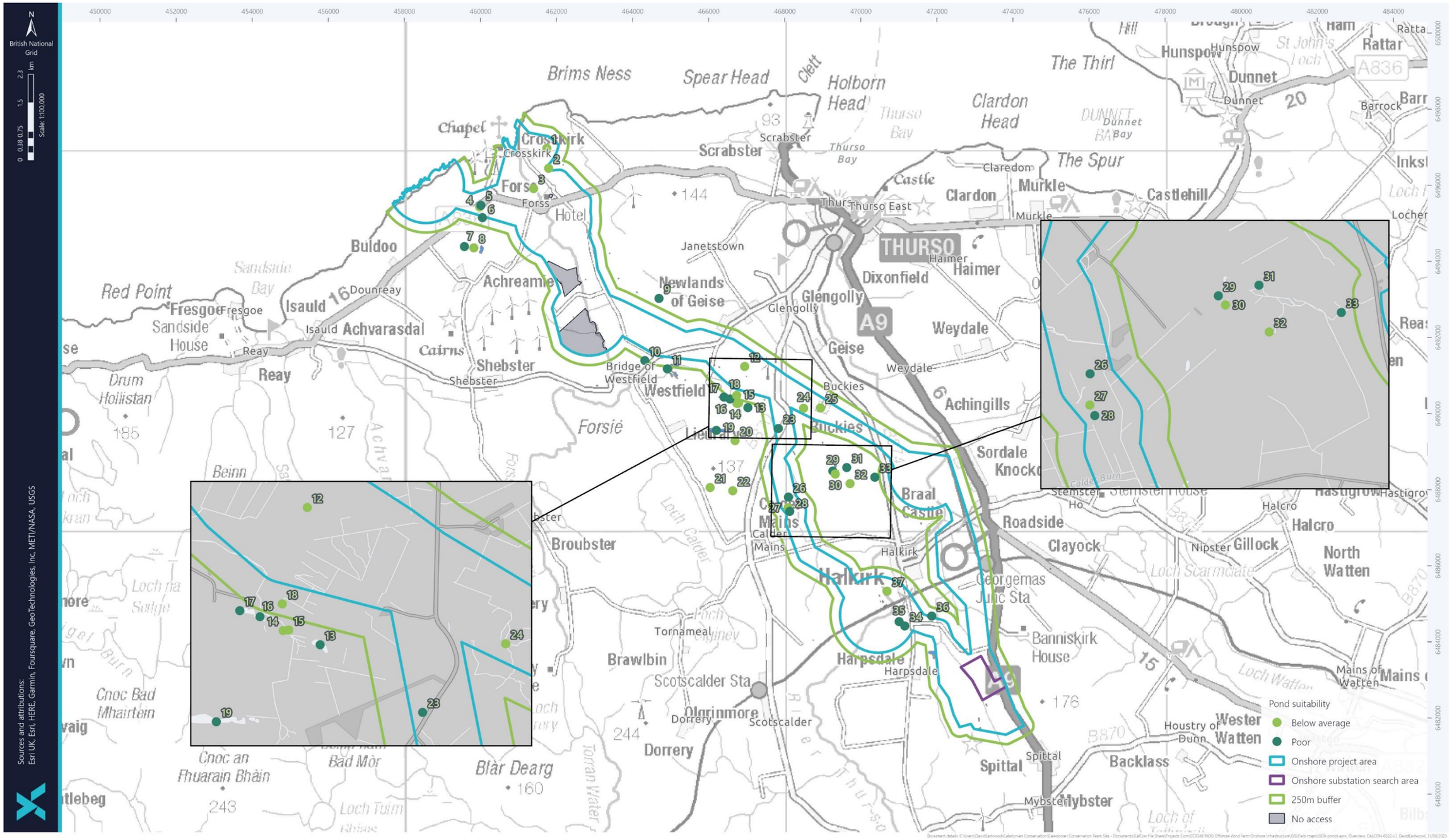


*Figure 10-12 The location and HSI scores of the ponds within the onshore study area*

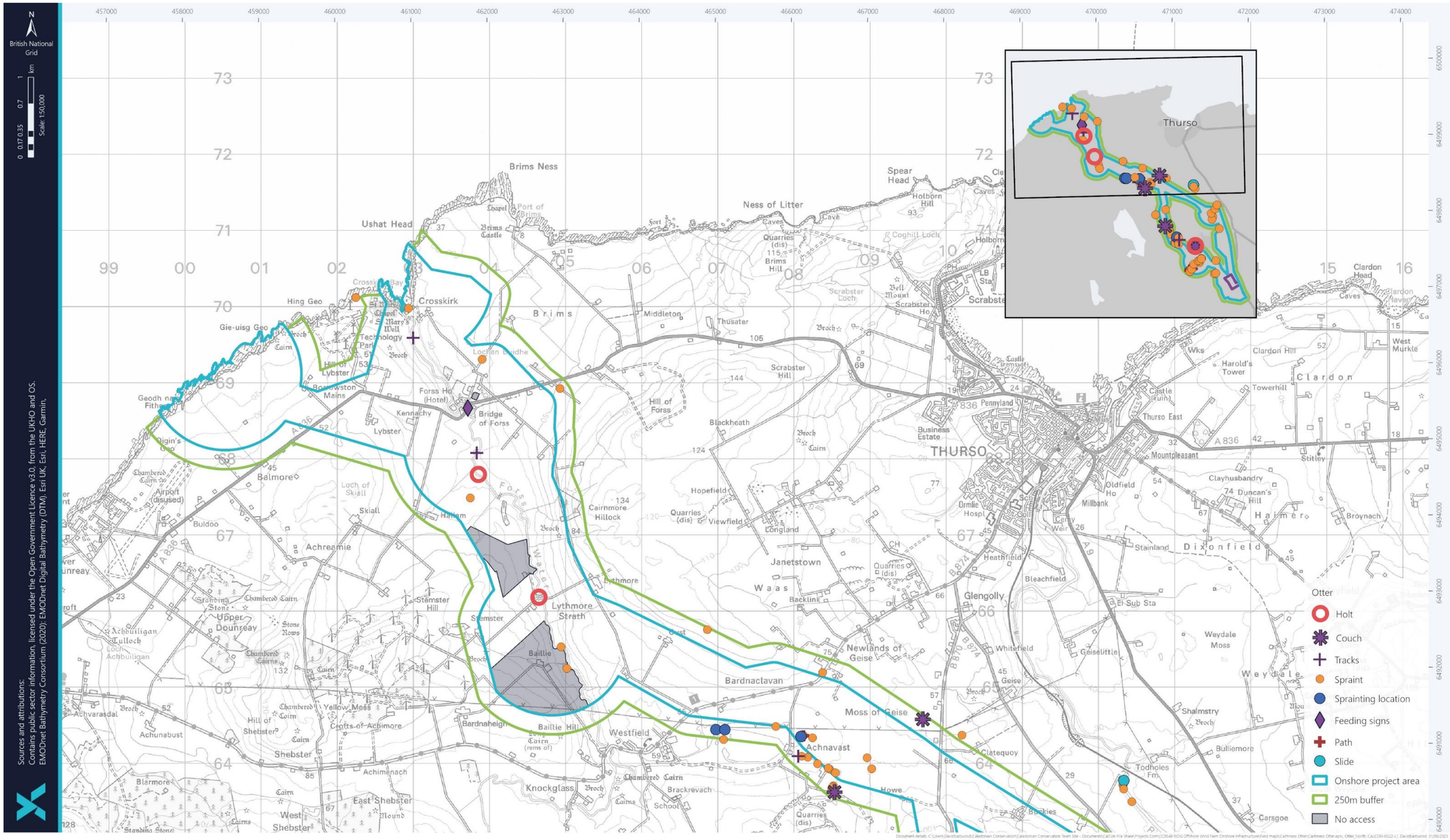


*Figure 10-13 Evidence of otter activity within the northern section of the onshore study area*

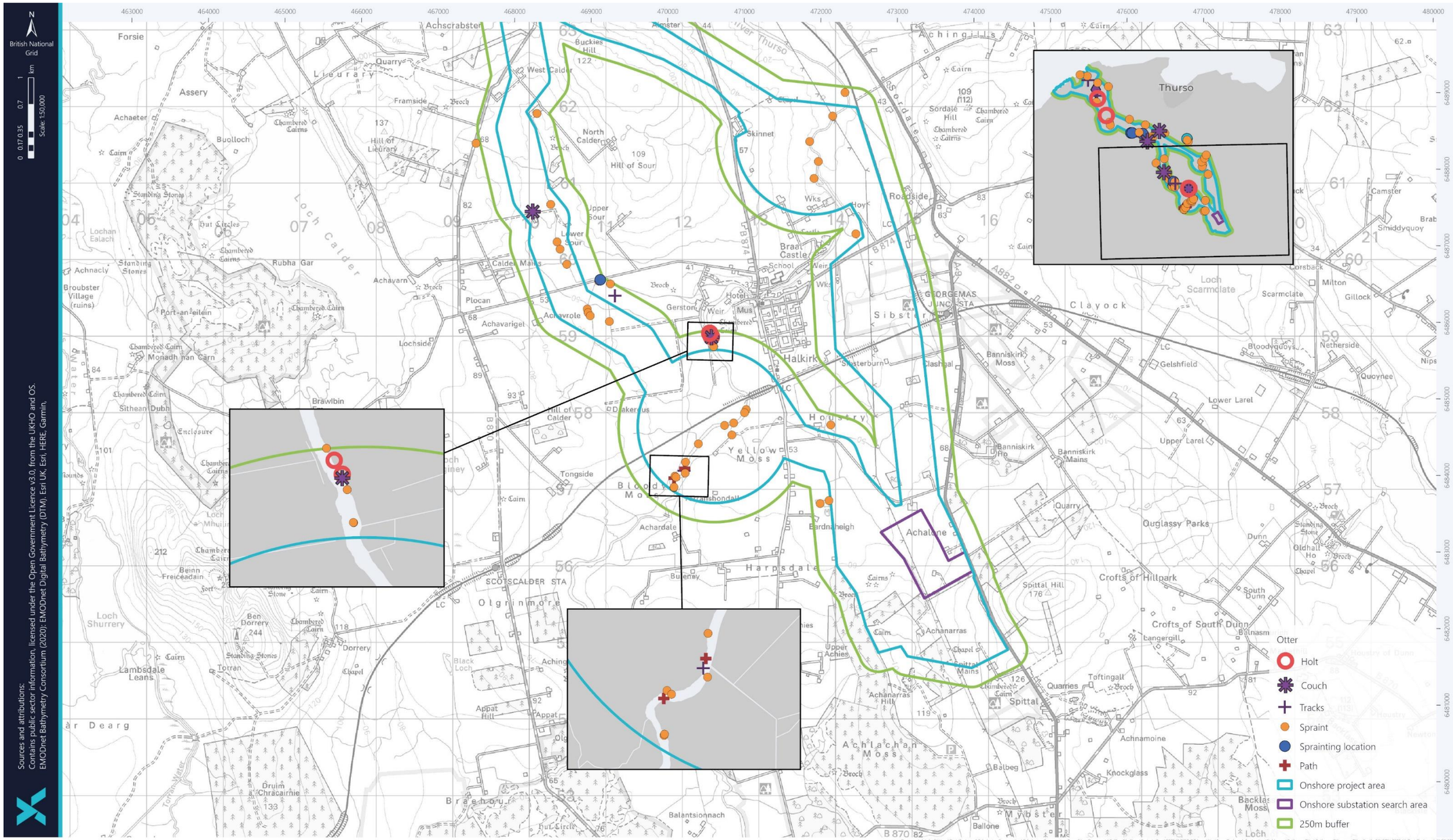


*Figure 10-14 Evidence of otter activity within the southern section of the onshore study area*

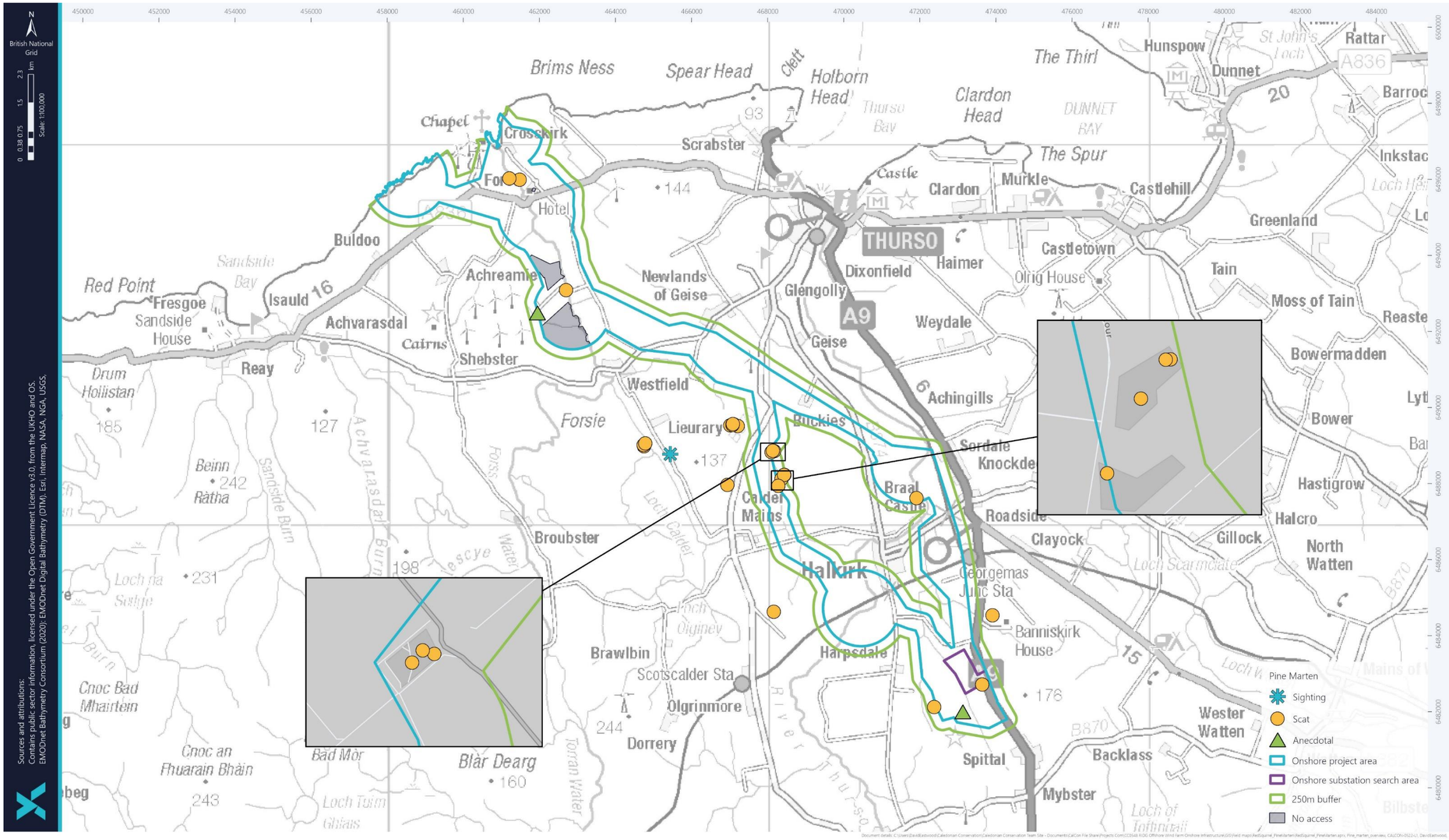


*Figure 10-15 Evidence of pine marten activity identified during the survey visits*

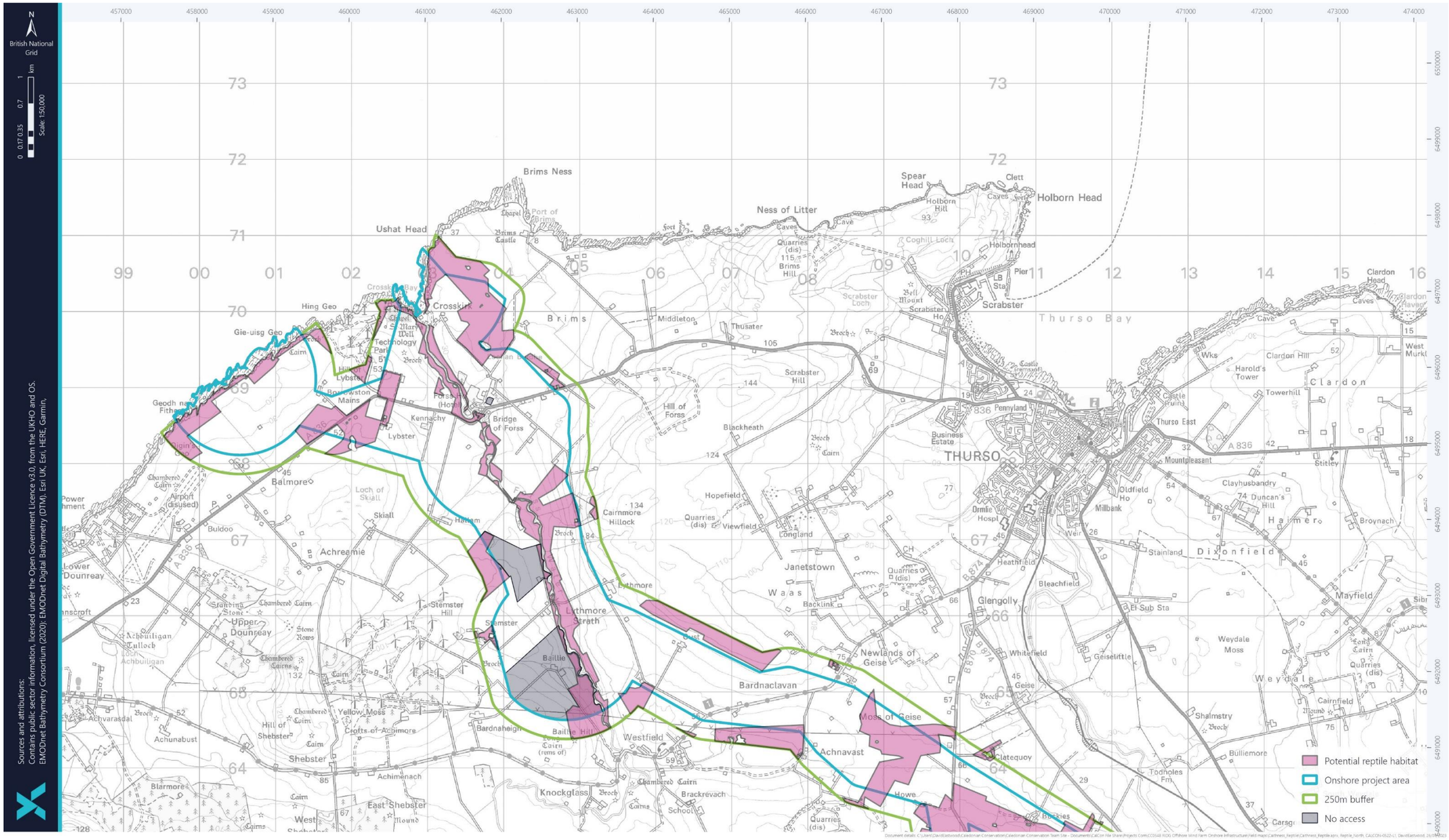


*Figure 10-16 Reptile survey results within the northern portion of the onshore study area*

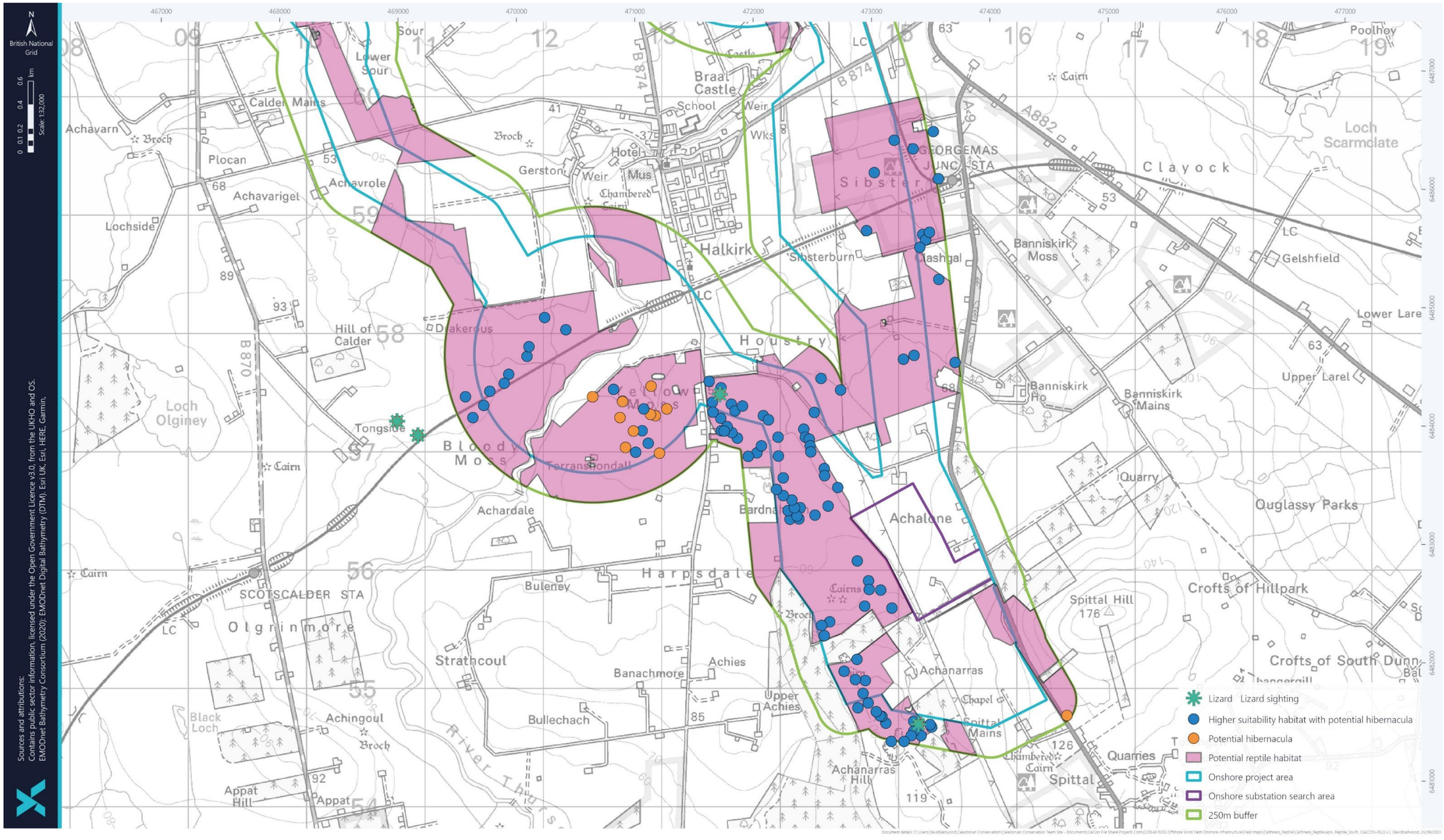


*Figure 10-17 Reptile survey results within the southern portion of the onshore study area*

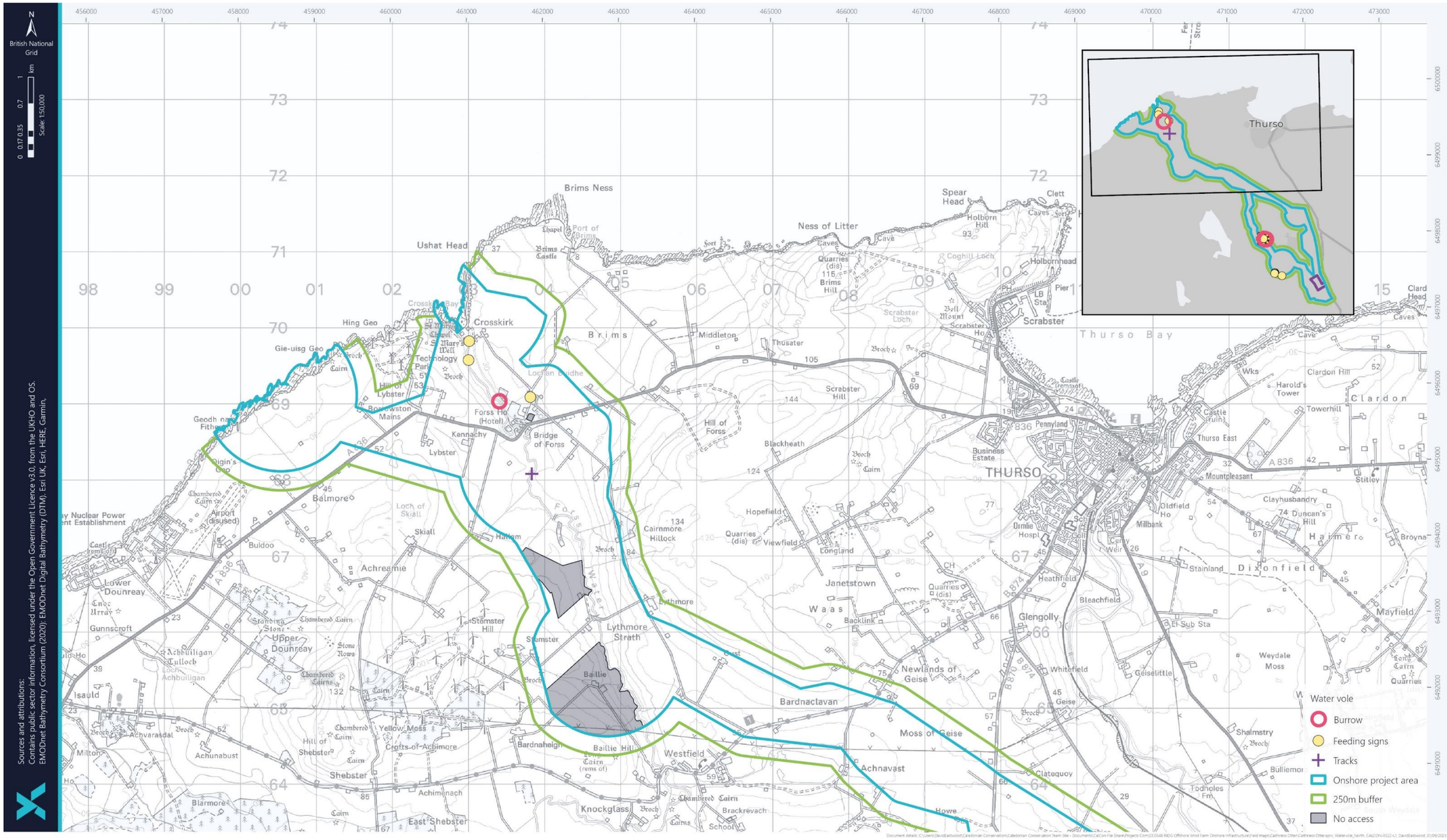


*Figure 10-18 Evidence of water vole activity within the northern section of the onshore study area*

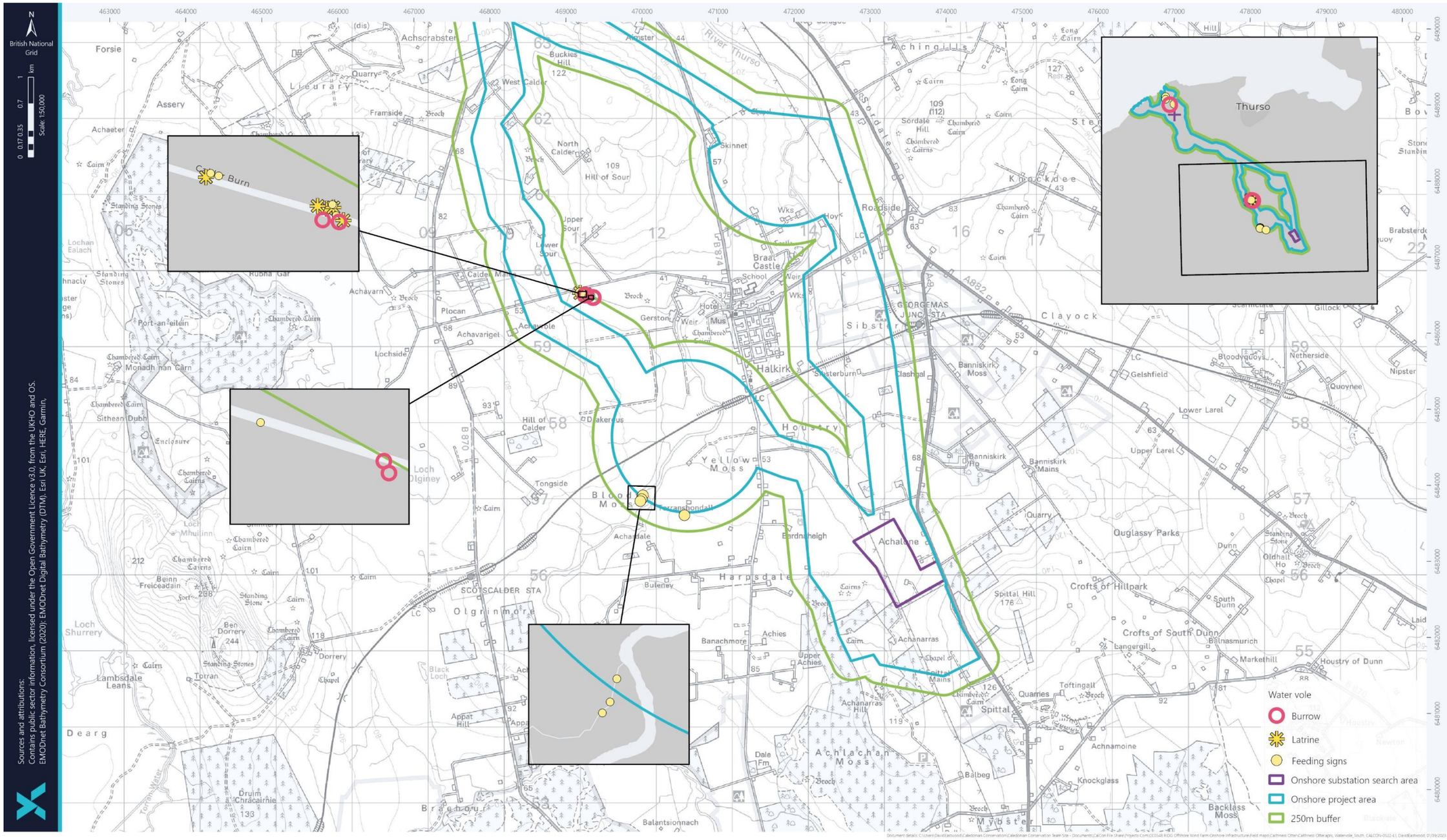


*Figure 10-19 Evidence of water vole activity within the southern section of the onshore study area*

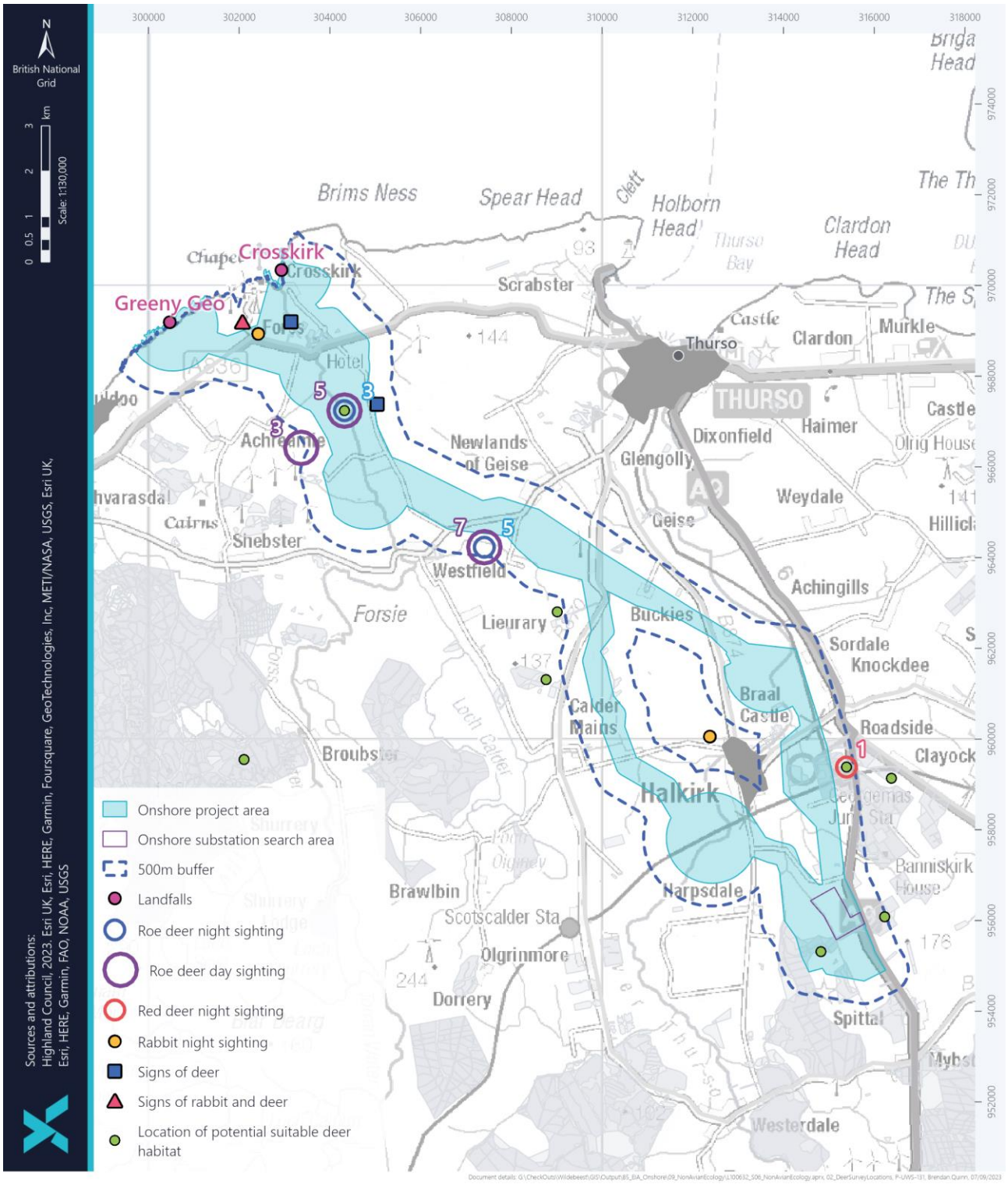


*Figure 10-20 Evidence of deer activity within the onshore study area*

### 10.4.5 Future baseline

It should be noted that for the purposes of this assessment, in line with CIEEM (2018) guidelines, the baseline is considered to be the habitats and species likely to be present at the time the onshore Project proceeds. It is important to note that the future baseline is a projection, with a range of possible future conditions, and it is subject to uncertainty associated with the available projections. Across the lifetime of the Project, it is considered highly likely that the future baseline will be broadly comparable to the existing baseline described above.

In the absence of the onshore Project, no significant land use changes are anticipated within the next four years up to the point when the onshore Project is constructed and becomes operational. Whilst a number of proposed, consented and operational developments were identified during scoping that could have a direct impact upon the onshore Project area, no significant impact upon the majority of the habitats and species present were anticipated (see section 10.7, assessment of cumulative effects). Therefore, it is likely that the future baseline will be similar to the existing baseline. This is discussed in more detail below and reference to further details provided within this Onshore EIA Report are provided where relevant.

#### 10.4.5.1 Habitats

Man-made or improved habitats, such as improved grassland (MG6 and MG7) and arable fields, were by far the most abundant habitats recorded during the NVC survey, with improved grassland accounting for approximately 1,700 ha of land; almost three-quarters of the total onshore study area. Changes in farming practices are likely to have the greatest impact upon these habitats. It is anticipated that some fields are likely to increase in species diversity within the next four years up to the point where the onshore Project becomes operational due to farmers scaling back their businesses and following schemes such as the Agriculture, Biodiversity and Climate Change Network; a joint Scottish Government and industry initiative aimed at encouraging farmers to take action to improve biodiversity on site, whilst other fields may decrease in species diversity as farming practices intensify or as pastoral land is converted to arable.

For more notable or protected habitats identified within the onshore study area, land use changes are likely to result in the greatest impact. Developments, in particular large housing developments and changes in road network infrastructure, can result in habitat loss and degradation, changes to groundwater flows, accidental release and fragmentation. Due to the UK housing shortage, the CaSPlan (THC, 2018) highlights the need to meet future demand for new housing and state that their supply target over the next 20 years is for the construction of 530 houses in Caithness. However, due to THC commitment to safeguard key ecological features from development; maintaining and enhancing green networks and green spaces (THC, 2018), and the Scottish Government strategy to improve connectivity and habitat availability; with pledges to deliver the changes needed to protect and restore terrestrial biodiversity in Scotland (Scottish Government, 2022), such impacts may be minimised. For further details on the future baseline for land use and agriculture see chapter 12: Land use and other users, including forestry.

No significant changes in the road network or large housing developments have been consented within the onshore Project area and no other major infrastructure developments were highlighted by the cumulative impact assessment. Therefore, in the absence of the onshore Project, no significant land use changes are anticipated within the coming years up to the point where the onshore Project becomes operational. For further details on the future baseline associated with traffic and roads see chapter 16: Access, traffic and transport.

There is currently a drive in Scotland for increasing and more varied woodland cover, with targets for future woodland expansion to cover 21% of Scotland's land area by 2032 (Scottish Government, 2017), aims to increase the amount of native woodland in good condition (Scottish Government, 2015) and commitments to ensure that forests and woodlands are sustainably managed and that harvested sites are replanted appropriately (Scottish Government, 2015).

It is understood that a small area of coniferous plantation woodland along the north-eastern aspect of Spittal substation was felled in 2023, after the non-avian ecology survey visits. This narrow shelter-belt was comprised of young to semi-mature Sitka spruce with occasional young sycamore and larch. Windblown trees and dead trees were also present. Due to the small size of the shelter belt, and the age and species composition of the trees present, the felling of these trees does not have a notable impact upon the assessment of current or future baseline of woodland within the onshore Project area, particularly considering the proposals for woodland planting around the onshore substation (see chapter 17: Landscape and visual). For the remaining areas of plantation woodland, no active land management plans were found for within the onshore Project area. The majority of the areas of coniferous plantation woodland in the area are young, with many apparently privately owned. As the existing pockets of woodland increase in maturity, and as the government strategy is to increase the area of woodland cover, the overall area of suitable woodland habitat is therefore expected to remain, if not increase, in quality.

The closest planned Forestry and Land operations to the onshore Project area is the Braehour Forest, a plantation woodland area located approximately 5 km west of the southern extent of the onshore Project boundary. The proposals for this site include the felling of approximately 682 ha of plantation woodland (predominantly lodgepole pine and Sitka spruce) between 2018 and 2023. As only approximately 125 ha of restocking are proposed, a net reduction in plantation woodland is anticipated. However, the proposals for the site include the creation of a riparian and successional woodland network and the restoration of afforested deep peat adjacent to designated peatland sites, it is anticipated that the foraging resource in the area will increase, as will the availability and connectivity of commuting routes. For further details on the future baseline for forestry see chapter 12: Land use and other users, including forestry.

Climate change impacts upon notable and protected habitats are difficult to determine, with relatively little research available. Where data is available, there is a high degree of uncertainty and the implications are not clear. However, increasing temperatures, drier summers, an increase in rainfall in winter and an increase in extreme weather events are likely to affect the habitats present within the onshore Project area in a variety of ways. Whilst habitats such as wetlands and wet woodlands may benefit from increasing levels of rainfall in winter, they are likely to be adversely affected during periods of drought in summer. For other habitats, such as unimproved or semi-improved grassland areas, drier summer conditions and flooding events may adversely affect the plant species present, with species lacking the ability to tolerate periods of drought or submersion within standing water.

Increasing temperatures are likely to have an effect on a range of plant species. In addition to the threat of desiccation and a decrease in productivity, elevated temperatures may result in a mismatch between pollinators and plants as a consequence of an earlier flowering period (Robbirt *et al.*, 2014), and may increase the activity of plant pathogens and pests. Native plant species can be further impacted through the spread of Invasive Non-Native Species (INNS) species, with an increase in the geographic distribution of non-native plants predicted as a result of climate change (IUCN, 2021).

The ability of habitats to continue to function in spite of the pressures associated with climate change will be dependent on the capacity of the species present to adapt and evolve to these changing conditions, or potentially to expand into more suitable neighbouring habitats; if present. However, in the short to medium term, whilst some change to the habitats present may be anticipated, with evidence of habitats affected by dry weather conditions identified during the NVC surveys, it is considered likely that the future baseline will not be significantly affected by changing climatic conditions in the next four years. For further details on the future baseline associated with climate change, see SS1: Climate and carbon assessment.

### 10.4.5.2 Badger, otter, pine marten and water vole

In the absence of the onshore Project, the populations of protected mammals; such as badger, otter, pine marten and water vole are likely to be influenced in the short to medium-term by changes in land use resulting in habitat loss, degradation and fragmentation. In the longer term, climate change could significantly affect these species.

Land use changes are often a key factor affecting the likely future baseline of protected species. Developments, in particular large housing developments and changes in road network infrastructure, result in the displacement of these species through habitat loss or fragmentation, and an increase in mortality due to an increase in road casualties and a reduction in the carrying capacity of the remaining habitat areas. As discussed in section 10.4.5.1, to meet future housing demands, CaSPlan target is to construct 530 new houses in Caithness over the next 20 years. As badger, otter and water vole are affected by urbanisation, it is possible that these developments will have an adverse impact upon the populations of these protected species. However, due to THC's commitment to safeguard key ecological features from development, and to maintain and enhance green networks and green spaces (THC, 2018), such impacts may be minimised. At present, no significant changes in the road network within the onshore Project area are anticipated. For further details on the future baseline associated with traffic and roads see chapter 16: Access, traffic and transport.

For badger, the threat of persecution; including interference of setts by farmers or gamekeepers, snaring, poisoning or shooting, may also affect future baseline. However, due to the likely low population of badger in the onshore Project area, with no setts identified during the survey visit, the effect of persecution upon badger populations in the area is considered to be negligible.

The key threats to water vole populations are considered to be changes in land management; in particular wetland drainage, arable cultivation and watercourse canalisation and predation by American mink. Conversely, habitats improvements by the WFD and captive breeding projects are having a positive impact on the population size and distribution of water vole.

As discussed in section 10.4.5.1, due to various Scottish Government targets it is anticipated that the woodland resource within the onshore Project area will increase in its extent, quality and connectivity. As there is currently limited woodland cover in Caithness, any increase is likely to have a positive impact on the species present, in particular for arboreal species such as pine marten. Such increases in woodland cover are also likely to positively impact badger populations through an increase in foraging, commuting and set-building habitat.

There is relatively little research available on the likely effects of climate change on protected and notable species. Where data is available, there is a high degree of uncertainty and the implications are not clear. For some mammals; such as badger, otter and water vole, mild winters may result in an increase in survival and fecundity. Conversely,

increases in summer temperatures coupled with a decrease in summer rainfall may affect food abundance, with some animals forced to relocate and low adult survival during the driest years. Whilst certain species may be able to adapt to these changes, with badger, otter, pine marten and water vole exhibiting an ability to exploit different climatic regimes due to their wide ranges across Europe and further afield, local adaptations do exist. For badger, pine marten and water vole, the apparently low populations within the onshore study area, and the likely low genetic diversity of these species in Caithness, may limit the ability of the species to adapt to future climatic conditions. The increasing variability of weather conditions is also likely to have an impact upon population sizes, with increases in rainfall and the ensuing floods resulting in the mortality of young during the breeding season, in particular for species such as otter and water vole.

For otter, the implications of climatic change upon freshwater habitats and sea temperatures is also likely to be key. Whilst an increase in the body mass of otter has potentially been linked to energy savings due to elevated sea temperatures in winter (Yom-Tov, 2006), the long-term implications of climate change upon the aquatic environment; in particular the impact upon invertebrate populations, has implications for fish populations and therefore otter survival. SS1: Climate and carbon assessment provides further details on climate change.

#### 10.4.5.3 Bats

As discussed in section 10.4.5.1, due to the lack of active land management plans for pockets of plantation woodland within the onshore Project area, THC's commitment to safeguard key ecological features from development and to maintain and enhance green networks and green spaces (THC, 2018), and the current drive in Scotland for increasing and more varied woodland cover (Scottish Government, 2017), it is anticipated that the areas of habitat suitable for foraging and commuting bats within the onshore Project area will remain, if not increase, in quality and extent.

The implications of climate change upon bat populations in the UK are not clear. However, it is thought that bats may be particularly sensitive to the effects of climate change due to their high surface-to-volume ratios and their low reproductive rates (Festa *et al.*, 2022). Whilst increasing temperatures will result in certain species of bat expanding their range in a northerly direction, as has been observed for Nathusius' pipistrelle (*Pipistrellus nathusii*) (Lundy *et al.*, 2010), other species may be affected differently, with a recent study predicting declines in the northern ranges of Leisler's bat *Nyctalus leisleri* and common pipistrelle (*Pipistrellus pipistrellus*) in Ireland (Roche, 2020). Increases in spring and winter temperatures may also lead to bats emerging from hibernation earlier in the year, potentially resulting in an increase in bat mortality as a result of exposure to subsequent cold periods (Jones *et al.*, 2009) or due to insufficient invertebrate prey. These increases in temperature can also affect the breeding success of female bats, with warmer springs and winters resulting in young being born earlier in the year, causing in a discrepancy between the timing of birth and the availability of food (Andrews *et al.*, 2016). The increasing variability of weather conditions is also likely to have an impact upon the survival rate of pups, with increases in rainfall and wind-speeds known to depress foraging activity, potentially leading to the desertion of the young (BCT, 2007). SS1: Climate and carbon assessment provides further details on climate change.

In the short to medium term, due to the comparative lack of woodland areas, tree lines, hedgerows and other suitable foraging and commuting habitats, the impacts upon local bat populations will be primarily influenced by local building developments, in particular the direct loss of actual or potential bat roost sites through the conversion of barns, farmhouses and attic spaces, and urbanisation with the potential for housing developments to result in habitat fragmentation with increased levels of light and noise pollution. Another key potential impact is the renovation and re-insulation of residential dwellings. During the bat roost potential survey of the buildings within the onshore study

area, it was evident that many of the residential dwellings present had been subject to renovation works including the external rendering of the walls and the installation of new Unplasticised Polyvinyl Chloride (uPVC) fascias and soffits. It is likely that many of these works have disturbed, modified or destroyed potential or actual roosting locations within the buildings. Any future renovation works are likely to have a similar impact.

In the longer term, climate change could have a significant impact upon the populations present in Caithness, with some species likely to benefit as a result of increasing ranges to the north, and while others are likely to decline.

### 10.4.5.4 Reptiles

In the absence of the onshore Project, the populations of common lizard, adder (*Vipera berus*) and slow worm (*Anguis fragilis*) in Caithness are likely to be impacted in the short to medium term by the availability and connectivity of suitable habitat. Changes in land use, including the regularly evolving management of the agricultural land which dominates the onshore study area, can negatively impact a local reptile population; particularly those within small and isolated habitat patches. Where populations are isolated from other areas of suitable habitat, habitat destruction or modification can result in local extinction events due to the reptiles restricted ability to disperse. However, as discussed in section 10.4.5.1 and 10.4.5.2, THC has made a commitment to safeguard key ecological features from development and to maintain and enhance green networks and green spaces (THC, 2018). This, in combination with the current drive in Scotland for increasing and more varied woodland cover (Scottish Government, 2017), should ensure that the areas of suitable habitat for reptiles, increase in their quality, connectivity and extent.

As for the terrestrial mammals discussed in this EIA chapter, the implications of climate change upon reptile populations in the UK are not clear. However, as reptile physiology relies on external temperatures to function, it is likely that these species will be particularly sensitive to the effects of climate change. While it may be predicted that the populations of common lizard, adder and slow worm within Caithness are likely to benefit as a result of increasing species ranges to the north, the connectivity of areas of suitable habitat and the ability of local populations to adapt to climate change will likely be a limiting factor. Other variables include the potential for increased mortality of reptiles in winter due to an increase in the occurrence of extreme weather events; such as flooding, a decrease in snow cover, and the increased likelihood of late frosts. Whilst milder winters may result in greater reproductive success due to earlier spring emergence bringing reproduction forward, and potentially enabling a greater number of broods per year; as observed in slow worm (Le Galliard *et al.*, 2012) and common lizard (Bestion *et al.*, 2015), milder winters may also result in an increase in mortality due to a lack of snow cover and a reduction in the duration of hibernation. As UK reptile species cannot tolerate exposure to extremely cold weather conditions, they enter a state of hibernation when temperatures decrease. If the temperature drop is not sufficient to induce hibernation, but the reptile's level of activity is too low to support effective hunting or foraging, they are unlikely to survive. Furthermore, changes in the duration of hibernation may cause a discrepancy between the emergence of reptiles and the availability of their prey species, also resulting in starvation. SS1: Climate and carbon assessment provides further details on climate change.

### 10.4.5.5 Deer

In the absence of the onshore Project, the population of deer in Caithness is likely to be impacted by short-to-medium changes in food, shelter and levels of disturbance. In the longer term, climate change could also significantly affect these species. Anecdotal evidence indicates that the distribution of both roe and red deer has increased in Caithness over the last 50 years. This ingress is expected to partly be a product of circumstances, such as the loss of

gamekeeping jobs and changes in farming practices. Land use changes are often a key factor affecting the likely future baseline of these species. As discussed in section 10.4.5.2, large developments may cause disturbance and displacement of these species, including an increase in mortality due to an increase in road casualties. However, due to the THC's commitment to safeguard these ecological features, such impacts may be minimised.

As discussed in section 10.4.5.2, due to various Scottish Government targets, it is anticipated that the woodland resource within the onshore Project area will increase in its extent, quality and connectivity. As there is currently limited woodland cover in Caithness, any increase is likely to have a positive impact on the species present, in particular for red deer. For further details on woodland and forestry see chapter 12: Land use and other users, including forestry.

## 10.4.6 Summary and key issues

A summary of key sensitive receptors, as identified from the baseline characterisation study, is presented in Table 10-11 below. These will form the focus of the impact assessment.

Woodland areas are comparatively rare within the proposed onshore Project area and are therefore considered to be a key element on site. The woodland areas on site have the potential to support a range of species such as badger, bats, deer and pine marten. These woodland areas are currently relatively small and are generally young to semi-mature, with the most mature pockets located in Forss and along the River Thurso; to the east of Halkirk. It is understood that these more mature woodland areas were planted approximately 80 years ago.

*Table 10-11 Summary and key issues for terrestrial non-avian ecology*

| | ONSHORE PROJECT AREA |
|---|---|
| SUMMARY AND KEY ISSUES | The key sensitive receptors and key issues are:<br>• Habitats and botany:<br>- Annex I habitats – direct and indirect impacts;<br>- GWDTEs – direct and indirect impacts;<br>- Scottish primrose – loss of plants and impact upon habitat; and<br>- Woodland areas – direct and indirect impacts.<br>• Protected species:<br>- Bats – impact upon roost sites;<br>- Otter – impacts on shelters, injury or mortality, disturbance during foraging;<br>- Pine marten – impacts on shelters, injury or mortality, disturbance during foraging;<br>- Reptiles- impacts on hibernation sites, injury or mortality; and<br>- Deer – impacts on deer welfare and herbivory by deer displaced or disturbed. |

## 10.4.7 Data limitations and uncertainties

For the majority of the terrestrial non-avian ecology receptors, no significant data gaps or uncertainties have been identified. However, significant limitations with regard to the assessment of the bat roost potential of the onshore study area have been identified and are highlighted below. Two data providers also identified during the data search did not provide any data on bats. These were the Caithness Biodiversity Group; which is no longer active, and the

Inverness Bat Group; which is no longer supplying bat sighting data. However, records received from other data providers included many of the same taxonomic groups, so this is not considered to be a significant limitation.

The buildings and built structures accessed for bat roost potential were subject to an external assessment only. No detailed internal surveys, endoscope inspections or nocturnal surveys were undertaken. Surveys of scattered trees were limited to a ground-based assessment, with no detailed inspection of potential roost features undertaken, and woodland areas were classified as a group, with no assessment of individual trees undertaken. Whilst this approach allows the broad identification of built structures and natural features with suitability for roosting bats, it is highly unlikely that bat roosts (where present) would be identified using this approach. More detailed inspection (including internal surveys of buildings, aerial inspections of trees and nocturnal surveys as required) would be required to fully ascertain their bat roost suitability and status with regard to roosting bats. These limitations are considered to have resulted in a significant data gap for determining bat roost potential of the site. To mitigate this, robust measures to prevent the disturbance, modification or destruction of bat roosts have been adopted as part of the onshore Project development process (see section 10.5.4). The robust measures discussed in section 10.5.4 will prevent this from becoming a notable constraint.

Many of the data providers (for all habitats and species) which did provide data either held very few or no relevant records for the onshore study area and timeframe in question. It is likely that the onshore study area is under-recorded and, therefore, the records received are not an accurate representation of the presence or absence of species of conservation concern with the onshore study area. However, as detailed Project specific surveys have been undertaken which provide a robust baseline (with the exception of bats), this is not considered to be a significant limitation.

No dedicated invertebrate surveys were undertaken. However, habitats with suitability for protected or notable invertebrate species have been noted and the potential for the onshore Project area to support species including great yellow bumblebee (*Bombus distinguendus*), moss carder bee (*Bombus pascuorum*), large heath butterfly (*Coenonympha tullia*), small blue butterfly (*Cupido minimus*) and small pearl-bordered fritillary (*Boloria selene*) are discussed in this chapter.

Surveys were carried out in safely accessible areas, where relevant permissions from landowners had been secured. Whilst access was granted to the majority of the onshore study area, surveys were restricted in certain areas; namely small pockets of land between Forss and Westfield, towards the northern extent of the proposed route (areas within which access was prohibited are shown in Figures 10-2 to 10-12). There were also a number of fields and farm buildings within the onshore study area that could not be safely accessed due to the presence of cattle. Wherever possible, inaccessible areas were subject to visual assessment from adjoining fields and various vantage points using high-powered binoculars. From these remote surveys, it was evident that the majority of the habitat types within the inaccessible areas were comprised of improved grassland areas and pockets of coniferous plantation woodland, and therefore not of ecological importance or GWDTEs. However, as would be expected following detailed assessment of similar riparian habitats, narrow strips of Annex I and GWDTE habitats were observed remotely within inaccessible areas of the Forss Water valley.

Parts of the Loch Lieurary SSSI site could not be accessed because of high water levels which made it impossible to cross water-filled ditches safely. During the surveys in September 2022, the Moss of Geise could also not be safely accessed on health and safety grounds because of high water levels. Both sites on these occasions were assessed from a distance using high-powered binoculars.

Owing to the large area of land to be surveyed, small habitat patches were not surveyed unless they were deemed to have significant botanical interest that would contribute to the overall understanding of the onshore study area, such as ponds or vegetated ditches. Typically, areas that were not assessed included road verges and field margins, and areas around gates, where vegetation is sparse. These limitations are not likely to present a significant data gap since the habitats within inaccessible areas were similar to those in other parts of the onshore study area and/or of low conservation value.

With respect to deer, there is a paucity of data available to inform the assessment of deer presence. However, based on the Project specific surveys undertaken and expert judgement, it is expected that the area has a population of roe deer that is consistent with the land use and available shelter. Anecdotally the population of roe deer has grown over the past 50 years. How that population might change in the future is not clear, nor is it clear whether the population of red deer, which is occasional rather than consistent and resident, might change.

## 10.5 Impact assessment methodology

### 10.5.1 Impacts requiring assessment

The impacts identified as requiring consideration for terrestrial non-avian ecology are listed in Table 10-12. Information on the nature of impact (i.e., direct or indirect) is also described. It should be noted that impacts are not necessarily relevant to all Project stages.

*Table 10-12 Impacts requiring assessment for terrestrial non-avian ecology*

| POTENTIAL IMPACT | NATURE OF IMPACT |
|---|---|
| **Construction and decommissioning*** | |
| Habitat loss due to land-take | Direct / Indirect |
| Mortality, disturbance and damage/injury of important terrestrial non-avian ecology receptors | Direct |
| Effects on habitats or protected species (e.g., pollution or sedimentation, noise and lighting) | Indirect |
| Reduction in deer welfare | Direct |
| **Operation and maintenance** | |
| Disturbance and damage/injury to habitats or protected species | Direct |

| POTENTIAL IMPACT | NATURE OF IMPACT |
|---|---|
| Effects on habitats or protected species (e.g. due to pollution or accidental release, noise and lighting) | Indirect |

**** In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during the decommissioning of the onshore Project considered analogous with, or likely less than, those of the construction stage as detailed in section 10.6.***

## 10.5.2 Impacts scoped out of the assessment

The impacts scoped out of the assessment during EIA scoping, and the justification for this, are listed in Table 10-13.

*Table 10-13 Impacts scoped out for terrestrial non-avian ecology*

| IMPACT SCOPED OUT | JUSTIFICATION |
|---|---|
| **Construction, operation and maintenance and decommissioning** | |
| Direct and indirect mortality of great crested newt | No suitable ponds identified within the onshore Project area or the extended 250 m buffer. |
| Direct and indirect mortality of red squirrel | Due to the lack of evidence of red squirrel activity on site, the isolation of pockets of suitable woodland from other areas of suitable habitat in the wider area and the lack of current data indicating the presence of red squirrel in Caithness. |
| Habitats and species of negligible importance | These are generally common and widespread ecological features. |
| The impact of invasive non-native species (INNS) upon biodiversity | Whilst the impact of INNS upon biodiversity is known, and there are constraints regarding the legal responsibility to prevent their transfer under the WCA as amended by the WANE Act they have been scoped out from ecological evaluation as they are not considered to have a relevant conservation status. However, best practice measures will be implemented during the construction of the onshore Project to ensure that these INNS are not spread during works. Such measures will include pre-work checks carried out by the Ecological Clerk of Works (ECoW), with appropriate processes employed to ensure that any INNS, if present, are dealt with appropriately. |

## 10.5.3 Assessment methodology

The approach adopted for the assessment of ecological impacts on terrestrial non-avian ecology is in line with published guidance for EcIA produced by CIEEM (CIEEM, 2018). These guidelines set out the process for assessment through the following stages:

- Determination of the importance of ecological features through desk study and surveys;
- Identification and characterisation of potential effects to determine level of impact;
- Assessment of likely significant impacts;
- Identification of requirement for measures to avoid and mitigate (reduce) these impacts; and assessment of the significance of any residual impacts after mitigation;
- Identification of any monitoring requirements; and
- Assessment of the significance of any residual impacts after mitigation.

The worst case scenario estimates habitat loss in the event that the onshore construction works take place within the most sensitive habitats.

#### 10.5.3.1 Determining importance

According to the CIEEM guidance (2018), determining which ecological features are important and should be subject to detailed assessment is one of the key challenges in the EcIA process. Ecological features can be important for a variety of reasons, and may relate, for example to:

- Quality or extent of designated sites or habitats;
- Habitat / species rarity;
- The extent to which they are threatened throughout their range; or
- Their rate of decline.

The level of importance of ecological features identified within the onshore Project area has been determined using the criteria defined in Table 10-14. To remain consistent with the broader assessment methods used in this EIA, the definitions are equivalent to those described in chapter 7: EIA methodology. In line with CIEEM guidance, these criteria have been determined with regard to statutory requirements and policy objectives for biodiversity. Note that in this assessment 'receptor' is used to refer to Important Ecological Features as defined in CIEEM guidance (CIEEM, 2018), so as to ensure consistency with the broader EIA assessment methodology as defined in chapter 7: EIA methodology.

In addition, where relevant and where available, use is made of contextual information about distribution of habitats and species, and species abundance, including trends based on historical records.

As available quantitative data on a particular habitat or species may be limited, particularly below the international and national level, the evaluation of importance may also involve an element of professional judgement.

Evaluations are based upon a combination of information gathered via the desk study and field survey results, along with professional experience and judgement. Social and economic factors are also considered when assessing ecological features if appropriate.

In addition to the importance of a habitat or species *per se*, the assessment presented here also considers the value of the onshore Project area and surroundings for each ecological feature in terms of the extent of habitat present, the number of individuals present or the nature and level of use. For example, if an otter holt used for breeding was identified within a proposed development site, the species would likely be assigned a medium or higher importance level. However, if a small number of infrequent otter signs were found, without any couch or holt present, otters may be assessed as being of low importance.

*Table 10-14 Sensitivity criteria*

| SENSITIVITY OF RECEPTOR | DEFINITION |
|---|---|
| **High** | Internationally important habitats or species that are part of an internationally important population. For example:<br>• An internationally designated site, candidate site, or an area meeting the criteria for an international designation (e.g. an SAC);<br>• Large areas of priority habitat listed under Annex I of the Habitats Directive, and smaller areas of such a habitat that are essential to maintain the viability of that ecological resource; or<br>• A regularly occurring, nationally significant population of any internationally important species, listed under Annex II or Annex IV of the Habitats Directive.<br><br>Nationally important habitats, or species that are part of a nationally important population. For example:<br>• A nationally designated site, or area meeting criteria for national level designations (e.g. a SSSI);<br>• Significant extents of a priority habitat identified in the SBL, or smaller areas which are essential to maintain the viability of that ecological resource; or<br>• A regularly occurring, regionally significant population of any nationally important SBL priority species, or species listed under Schedule 1 or Schedule 5 of the WCA, Annex II or Annex IV of the Habitats Directive. |
| **Medium** | Regionally important habitats or species that are part of a regionally important population. For example:<br>• Viable areas of key semi-natural SBL priority habitat;<br>• A regularly occurring, locally significant population of any nationally important SBL priority species, or species listed under Schedule 1 or Schedule 5 of the WCA, Annex II or Annex IV of the Habitats Directive; or<br>• Sites which exceed the local authority-level designations but fall short of SSSI selection guidelines, including areas of semi-natural woodland exceeding 0.25 ha. |
| **Low** | Habitats or species that are part of a locally important population. For example:<br>• Areas of semi-natural ancient woodland smaller than 0.25 ha;<br>• Sites of Importance for Nature Conservation or equivalent sites selected on local authority criteria.<br>• Local Nature Reserves;<br>• Other species of conservation concern, including species under the Local Biodiversity Action Plan, in this case the Highland Biodiversity Action Plan (HBAP); or<br>• Areas of habitat or species considered to appreciably enrich the ecological resource within the local context (e.g. species-rich flushes or hedgerows). |
| **Negligible** | Common and widespread habitat, or species of little or no intrinsic nature conservation value. For example:<br>• All other species and habitats that are widespread and common and which are not present in locally, regionally, or nationally important numbers, or habitats which are considered to be of poor ecological value (e.g. commercial forestry). |

### 10.5.3.2 Identification and characterisation of potential effects

In line with CIEEM guidance (2018), reference is made to the following characteristics when describing potential ecological effects:

- Nature of impact*: whether an impact is positive/beneficial to habitats (e.g. by improving habitat structure) or to species (e.g. by increasing species diversity or extending habitat) or negative/detrimental to habitats (e.g. by direct habitat destruction) or to species (e.g. by loss of or displacement from suitable habitat);*
- Extent: *the spatial or geographical area over which the effect may occur;*
- Magnitude*: the size, amount, intensity and volume. This should be quantified if possible and expressed in absolute or relative terms (e.g. the amount of protected habitat lost or percentage decline in a species population);*
- Duration*: the length of time the activity occurs over. This should be defined in relation to ecological characteristics (e.g. a species lifecycle) as well as human timeframes. It should also be noted that the duration of an activity may differ from the duration of the resulting effect (e.g. if short-term construction activities cause disturbance to badger (Meles meles) during their breeding period, there will be long-term implications from failure to reproduce that season);*
- Reversibility*: an irreversible effect is one from which recovery is not possible within a reasonable timescale or there is no reasonable chance of action being taken to reverse it. A reversible effect is one from which spontaneous recovery is possible or which may be counteracted by mitigation;*
- Frequency*: the number of times an activity occurs. This may influence the resulting effect; and*
- Timing*: the time of year during which the activity occurs. This may result in an effect on an ecological feature if it coincides with critical life-stages or seasons (e.g. the badger breeding season).*

The timescales of potential effects on ecological features are considered. Incorporated into this evaluation is the reversibility of the effect, which is based on the duration of the impact, or the time required for the feature to return to baseline pre-construction conditions (Regini, 2000). Knowledge of how rapidly the population or performance of a species is likely to recover following loss or disturbance (e.g. by individuals being recruited from other populations elsewhere) is used to assess reversibility, where such information is available.

The following definitions have been applied with regard to timescales:

- Immediate*: within approximately 12 months;*
- Short-term*: within approximately one to five years;*
- Medium-term*: within approximately six to 15 years; and*
- Long-term*: more than 15 years.*

### 10.5.3.3 Geographic context

Impacts on terrestrial non-avian ecology are assessed in local and, if necessary, regional context as appropriate. For the purposes of the assessment, a local population refers to the population within Caithness. If a potentially significant impact on a local population or habitat extent is identified, the assessment is extended to consider potential impacts on the wider regional population or habitat extent. However, if no significant effect on the local population or habitat extent is identified, consideration of the wider geographical area is not considered necessary since this will result in potential effects that are of the same or lower level for those wider populations or habitat extents.

NatureScot has defined Natural Heritage Zones (NHZs) within Scotland (SNH, 2002b), which they consider to be appropriate biogeographical spatial units against which regional effects of proposed developments can be assessed. NHZ classifications represent areas with a high level of biogeographic coherence and are unrelated to administrative boundaries. The onshore Project area lies within NHZ 2: Orkney and North Caithness. Where an assessment of a

regional ecological feature is necessary, effects are assessed within this NHZ as far as possible. However, there are limited data on habitats and populations of species available at the NHZ level.

### 10.5.3.4 Determining magnitude of effects

For the purposes of this assessment, the potential effects are assigned to different magnitude levels to assist the assessment process, so as to remain consistent with the broader EIA assessment methodology described in chapter 7: EIA methodology. The magnitude level of an effect is defined using the criteria in Table 10-15. Note that these effects relate to negative effects; where positive effects are predicted, these are not assigned different levels.

*Table 10-15 Magnitude criteria*

| MAGNITUDE CRITERIA | DEFINITION |
|---|---|
| **High** | Total or almost complete loss of an ecological feature (habitat or population), likely to result in a permanent effect on its long-term ecological integrity and affect its conservation status.<br>Large-scale, permanent changes to an ecological feature, and likely to change its ecological integrity and affect its conservation status. |
| **Medium** | Moderate-scale, long-term changes to an ecological feature, or larger-scale temporary changes, but its long-term ecological integrity is unlikely to be affected and any changes in conservation status are reversible. |
| **Low** | Small-scale, temporary effects on an ecological feature that do not affect ecological integrity or conservation status. |
| **Negligible** | Little or no detectable effect on an ecological feature. |

### 10.5.3.5 Significance of impact

For terrestrial non-avian ecology, potential effects are identified and significance of impact is assessed for each stage of the Project lifecycle. Significance is attributed relative to the background conditions.

The latest CIEEM guidance on EcIA (CIEEM, 2018) avoids and discourages use of the matrix approach to determining significance and describes only two categories: "significant" or "not-significant".

According to the CIEEM guidance, for the purpose of EcIA, a "significant effect" is an effect that either supports or undermines biodiversity conservation objectives for important ecological features and biodiversity in general. Effects can be considered significant at a wide range of scales from international to local.

The guidance further states that "in broad terms, significant effects encompass impacts on structure and function of defined sites, habitats, or ecosystems and the conservation status of habitats and species (including extent, abundance and distribution)".

In line with this guidance, rather than using a matrix to determine significance, the approach used in this chapter is to consider the importance and sensitivity of the habitats and populations and the characteristics and severity of the effect. Professional judgement is applied as to whether the ecological integrity of a habitat or population will be affected.

The term "ecological integrity" refers to the maintenance of the conservation status of a habitat or population of a species at a specific location or geographical scale. This is used here in accordance with the definition adopted by the ODPM Circular 06/2005 on Biodiversity and Geological Conservation (Ministry of Housing, Communities and Local Government, 2005), whereby designated site integrity refers to "the coherence of its ecological structure and function, across its whole area, that enables it to sustain the habitat, complex of habitats and/or the levels of populations of the species for which it was classified".

Effects are more likely to be significant where they affect a habitat or species of higher levels of importance, threaten the integrity of a habitat or population, or where the severity of the effect is high. Effects not considered to be significant would be those that do not threaten the integrity of an ecological feature or where the habitat or population affected is considered to be of low importance.

In this assessment, an effect that threatens the integrity of a habitat or species population is considered to be significant. Effects that do not threaten the integrity of a habitat or population are considered to be not significant.

Where appropriate, mitigation measures are identified to avoid and reduce potentially significant effects. It is also good practice to propose mitigation measures to reduce negative effects that are not significant.

The significance of residual effects on habitats and populations following implementation of mitigation is then determined along with any monitoring requirements.

### 10.5.4 Embedded mitigation

As described in chapter 7: EIA methodology, certain measures have been adopted as part of the Project development process in order to reduce the potential for impacts to the environment, as presented in Table 10-16. These have been accounted for in the assessment presented below. The requirement for additional mitigation measures (secondary mitigation) will be dependent on the significance of the effects on terrestrial non-avian ecology receptors.

In line with CIEEM guidance (2018) the principal mitigation measure adopted to minimise the impact of the onshore Project on terrestrial non-avian ecology features has been the use of an iterative design process, which has involved consideration of key ecological issues and constraints throughout the design process. As a result, most of the mitigation measures are embedded within the overall design, allowing the opportunity to site onshore infrastructure away from sensitive ecological features such as Ushat Head SSSI and Annex I habitats, where possible.

In accordance with the onshore PPP application, the embedded mitigations listed below have been attributed to particular Development Zones within the onshore Project area, these are detailed in Table 10-16 and the Development Zones shown in Figure 10-21.

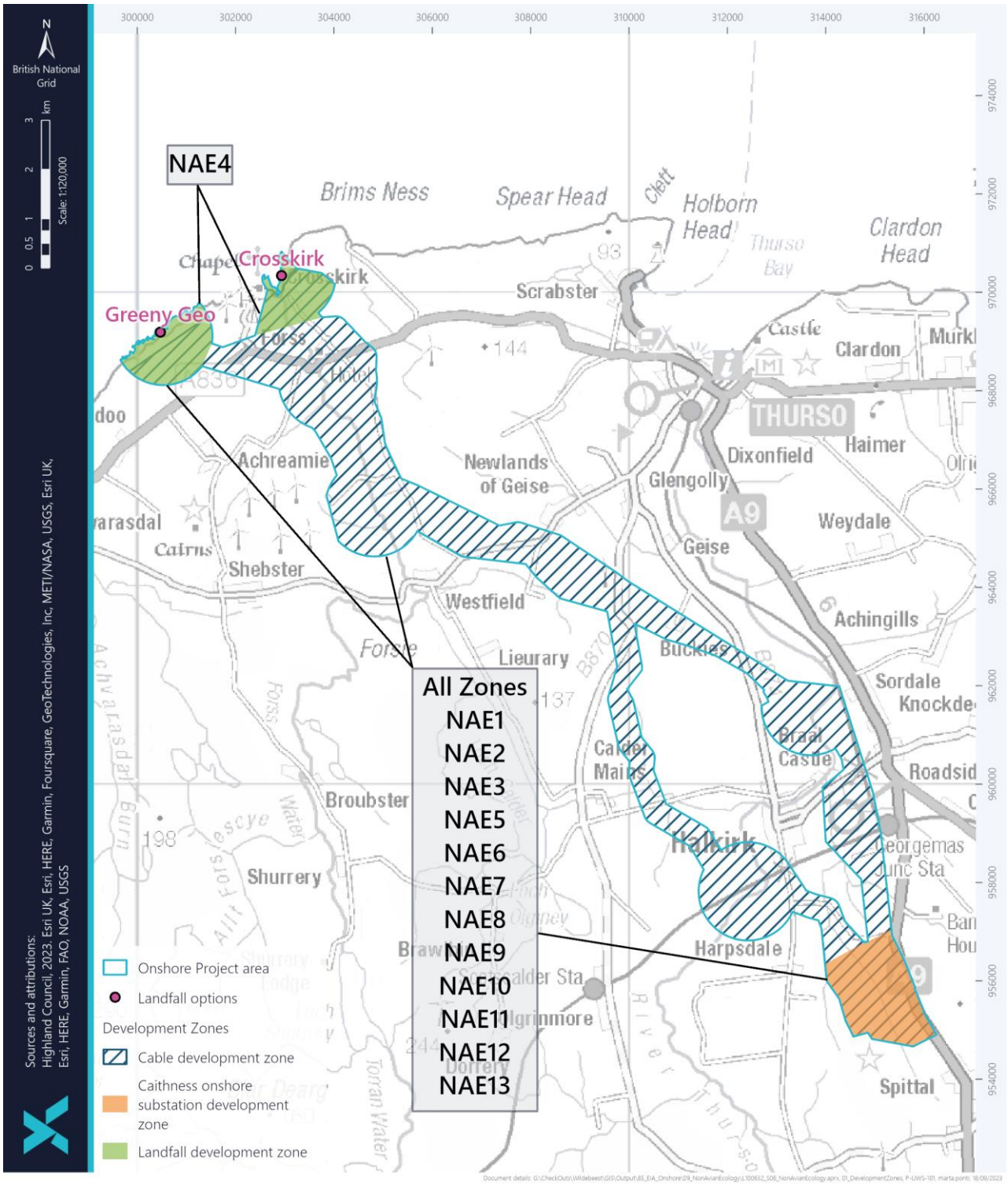


*Figure 10-21 Development Zones and mitigations for the onshore PPP application*

*Table 10-16 Embedded mitigation measures relevant to terrestrial non-avian ecology*

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| NAE1 | Onshore Project area avoidance of sensitive areas | Primary | The boundary of the onshore Project has been developed to avoid sensitive areas (peatland, GWDTEs, designated areas) wherever possible. Where impacts cannot be avoided, these will be minimised.<br><br>Consideration of non-avian ecology sensitivities as part of the constraints mapping exercise to inform final cable route and associated construction infrastructure.<br><br>If sensitive areas are unavoidable, targeted specific NVC surveys as agreed with NatureScot post-consent will be carried out within a 250 m buffer ahead of construction works to allow for the micrositing of the route to avoid particularly sensitive habitats and notable or protected plant species in the Project area. | Established within the design principles. | All zones |
| NAE2 | Minimisation of watercourse crossings | Primary | Minimisation of watercourse crossing where possible (i.e., reduce the number of crossings and the impact of each crossing through the implementation of appropriate techniques such as HDD). | Established within the design principles (secured through CMSs) and secured through conditions attached to the PPP. | All zones |

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| NAE3 | GWDTE buffers | Primary | Where possible, the following buffers between GWDTEs and excavations will be implemented:<br>• 250 m for the onshore export cable corridor and any other excavations greater than 1 m in depth; and<br>• 100 m for excavations less than 1 m in depth.<br>If the onshore export cable corridor is located within 250 m of any GWDTEs, clay stoppers will be included in the onshore export cable corridor trench to prevent them from acting as preferential pathways for drainage. | As per Outline Management Plan (OMP) 1: Outline Construction Environment Management Plan (CEMP), these measures will be established within the Pollution Prevention and Control Plan and the final CEMP.<br>Drainage and Flood Risk Plan which will be appended to the final CEMP. Outline provided within SS3: Flood risk and drainage assessment. | All zones |
| NAE4 | Minimising impact on cliff coastal habitats | Primary | Minimising impact on cliff coastal habitats associated with designated sites or communities of conservation importance by the use of HDD.<br>No de-vegetation or ground-breaking works are to occur within 50 m of the cliff edge. This will ensure that sensitive coastal habitats and species are not adversely affected by the construction, operation or decommissioning works for the onshore Project. | Established through design principles (secured through CMSs) and established within the Species and Habitats Protection Plan (SHPP).<br>The SHPP will be secured through a condition attached to the PPP. | Landfall zone |

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| NAE5 | Creation and implementation of SHPP in relation to locally occurring terrestrial mammals/ ecology and protected species | Primary | The SHPP will ensure all trenches and excavations will be fenced or covered over at night to prevent any animals from falling in and becoming trapped. If this is not possible, an adequate means of escape must be provided (i.e. a gently graded side wall or provision of gently sloped wooden plank or equivalent).<br><br>Pre-construction surveys for protected mammal and reptile species will be undertaken to identify any species making use of the onshore Project area ahead of works. Should any protected species be identified, specific mitigation would be developed in consultation with NatureScot. For example, in the event that the onshore Project cannot be sited to avoid potential effects on an otter shelter, works would only be carried out under a NatureScot otter Derogation Licence, with appropriate mitigation and compensation measures implemented to ensure that otter are maintained at a favourable conservation status within the onshore Project area.<br><br>Pre-construction surveys will identify features with the potential to be used by reptiles as hibernation sites. Wherever possible works will avoid impacts on these features by micrositing. Where this is not possible, potential hibernation features will be dismantled under the supervision of a suitably qualified and experienced ECoW(s), outwith the hibernation season (September to March inclusive) (Cathrine, 2018).<br><br>For protection of bats and bat roosts, no works are to take place within 30 m of any buildings. If works cannot be avoided within the recommended buffer area, and significant direct or indirect impact is still anticipated, detailed bat roost potential survey and bat activity surveys are to be undertaken prior to commencement of works. In the event that a bat roost is identified within the 30 m buffer, it may be necessary to secure a bat Derogation Licence prior to works commencing. | These measures will be established within the SHPP. The SHPP will be secured through a condition attached to the PPP. | All zones |

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| NAE6 | Return location to pre-construction state (all locations) | Primary | Return location to pre-construction state (all locations).<br><br>Once an area is no longer required for construction, it will be re-instated, where possible, to ensure it can return to its original use for the remainder of the construction period and operational period. The only exception to this will be permanent infrastructure including the substation and tracks, where habitat loss will be permanent.<br><br>Where habitat is to be reinstated, turfs will be removed to a suitable storage point where they will be maintained during works. Topsoil and subsoil, where applicable, will also be stored separately, and excavations backfilled with these materials to maintain the original stratification as well as is practical. Turfs will then be replaced as close to their original location as possible. Due to the temporary and short-term nature of most construction activities, this method will allow the reinstatement of habitat immediately after works are completed in a given area. | Established through design principles (secured through CMSs). These measures will also be established within the Habitat Management Plan (HMP) and the SHPP. These plans will be secured through conditions attached to the PPP.<br><br>Landowner agreements. | All zones |
| NAE7 | Return location to pre-construction state (high sensitivity habitats) | Primary | Return location to pre-construction state (high sensitivity habitats).<br><br>For high sensitivity habitats (e.g., Annex I habitats, GWDTEs and SBL habitats), particular care should be taken when removing, storing and reinstating the turfs. In addition to ensuring that the turfs are replaced as close to their original location as possible, and as quickly as possible following works in a given area, the turf should be reinstated in their original orientations. Additionally, targeted specific NVC surveys as agreed with NatureScot post-consent will be carried out within a 250 m buffer ahead of construction works to allow for the micrositing of the route to avoid particularly sensitive habitats and notable or protected plant species in the Project area. | Established through design principles (secured through CMSs). These measures will also be established within the HMP and the SHPP. These plans will be secured through conditions attached to the PPP.<br><br>Landowner agreements. | All zones |

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| NAE8 | ECoW(s) | Primary | Ensure appropriately qualified ECoW presence at sensitive locations and/or sensitive periods.<br><br>The CEMP will include details of a watching brief which will ensure that the correct procedure can be followed if a protected mammal or reptile is found during devegetation or groundbreaking works. When the ECoW is not present on site, works must stop within 30 m of the protected species; as soon as it is safe to do so. Advice must then be sought from the ECoW and an approach agreed upon with NatureScot (if appropriate) prior to works recommencing. | The requirement for ECoW(s) will be secured through a condition attached to the PPP.<br><br>The SHPP will also include the requirements for ECoW(s). The SHPP will be secured through a condition attached to the PPP.<br><br>Where appropriate Derogation Licences will be obtained from NatureScot. | All zones |
| NAE9 | CEMP | Tertiary | The CEMP will outline how the onshore Project will ensure the suitable implementation and control of the mitigation measures. An outline CEMP (OMP1: Outline CEMP) is provided alongside the application for PPP. | As per OMP1: Outline CEMP, the final CEMP will be provided at post-consent.<br><br>The final CEMP will be secured through a condition attached to the PPP. | All zones |
| NAE10 | Control of diffuse pollution and point source pollution | Tertiary | Pollution prevention and control measures will be implemented in accordance with the latest legislation and guidance from SEPA. This includes utilisation of best practice sediment management techniques and employment of best practice pollution prevention techniques.<br><br>The final CEMP will include a Pollution Prevention and Control Plan in accordance with SEPA's Pollution Prevention Guidelines. A Dust and Air | As per OMP1: Outline CEMP, these measures will be established within the Pollution Prevention and Control Plan and DAQMP which will be appended to the final CEMP. | All zones |

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| | | | Quality Management Plan (DAQMP) will also be produced within the final CEMP. | The CEMP will be secured through a condition attached to the PPP.<br><br>These measures will also be secured through conditions of CAR authorisations, if required. | |
| NAE11 | Engagement with Neighbouring Developments | Tertiary | Engagement with Neighbouring Developments to allow the monitoring / understanding of the likely cumulative environmental impacts of the works and to take steps to mitigate the impact of these. This includes collaboration on any Biodiversity Net Gain projects. | External communication with the community, landowners and asset owners will be undertaken by the Community Liaison Officer (CLO).<br><br>The requirement for a CLO will be secured through a condition attached to the PPP.<br><br>An Outline BEP has been provided alongside the application for PPP. The final BEP will be secured through a condition attached to the PPP. | All zones |

| ID | MITIGATION MEASURE | FORM (PRIMARY OR TERTIARY) | DESCRIPTION | HOW MITIGATION WILL BE SECURED | DEVELOPMENT ZONE APPLICABLE |
|---|---|---|---|---|---|
| NAE12 | Deer management plan | Tertiary | The Deer Management Plan will be prepared post-consent and include details of the proposed mitigation and management measures to reduce and manage any impacts on deer and any damage to vulnerable habitats. Specific measures will be consulted on with relevant consultees, but measures may include:<br>• Removal of identified deer habitat only taking place in autumn and winter (September – February) to avoid disturbance to dependent young;<br>• Where woodland removal is unavoidable, planting should be fully protected with deer fencing and rabbit netting;<br>• Watching brief; and<br>• Use of ECoW(s) to ensure implementation. | These measures will be established within the Deer Management Plan.<br>The Deer Management Plan will be secured through a condition attached to the PPP. | All zones |
| NAE13 | Decommissioning, Restoration and Aftercare Plan | Tertiary | A Decommissioning, Restoration and Aftercare Plan will be prepared for the onshore Project and agreed with THC prior to decommissioning works being undertaken. The plan will include any measures required to protect ecological features during decommissioning which are likely to be similar to those proposed within the CEMP. | Established within the design principles (secured through CMSs) and the Decommissioning, Restoration and Aftercare Plan which will be secured through a condition attached to the PPP. | All zones |

### 10.5.5 Worst case scenario

As detailed in chapter 7: EIA methodology, this assessment considers the worst case scenario for the onshore Project parameters which are predicted to result in the greatest environmental impact, known as the 'worst case scenario'. The worst case scenario represents, for any given receptor and potential impact, the design option (or combination of options) that would result in the greatest potential for change.

Given that the worst case scenario is based on the design option (or combination of options) that represents the greatest potential for change, the development of any alternative options within the design parameters will give rise to no worse effects than those assessed in this impact assessment. Table 10-17 presents the worst case scenario for potential impacts on terrestrial non-avian ecology during construction, operation and maintenance, and decommissioning.

Two potential onshore export cable corridor routes are being considered for the Project and the onshore substation search area presented is larger than the proposed final footprint of the substation. As the onshore export cables and onshore substation are currently not defined within the onshore Project area, it is not possible to undertake a quantitative assessment of the likely impact of the Project upon individual terrestrial non-avian ecology receptors.

*Table 10-17 Worst case scenario specific to terrestrial non-avian ecology receptor impact assessment*

| POTENTIAL IMPACT | WORST CASE SCENARIO | JUSTIFICATION |
|---|---|---|
| **Construction and decommissioning** | | |
| **Direct habitat loss due to land-take**<br><br>**Mortality, disturbance and damage / injury of important terrestrial non-avian ecology receptors** | Landfall<br>• Preparation of the working area at the landfall site to accommodate a maximum of six (five plus one contingency) boreholes, HDD drilling equipment, utilities and welfare facilities with an estimated area of 7,500 $m^2$; and<br>• Storage of excavated materials from the boreholes estimated to be 1,630 $m^3$ per HDD bore prior to disposal off-site.<br><br>Onshore export cable corridor<br>• Construction and reinstatement of temporary laydown areas (estimated to be every 2 km along the route) and access roads for cable installation works;<br>• Ditches and small watercourses that are crossed by the onshore Project haul roads will have appropriately sized pipework installed to maintain water conveyance capacity. Such pipework will be removed when the haul roads are removed;<br>• Excavation of trenches and storage of excavated materials estimated to be 162,525 m3 per trench (five trenches) for the working corridor estimated to be up to 33 km long and 100 m wide; and<br>• Although not fully defined, it is conservatively assumed that the installation of the onshore export cables will progress in sections across multiple work fronts. The process will follow trenching, installation of ducts and reinstatement and will be conducted in sections (i.e. from one Cable Joint Bay (CJB) to the next) and repeated.<br><br>Onshore substation<br>• Preparation of temporary work compound for substation 62,500 $m^2$ (including compound and welfare facilities); and | Direct habitat loss during the preparation of working areas, excavation activities and the storage of materials are considered to result in the greatest impact upon protected and notable species within the onshore study area.<br><br>Construction activities could result in disturbance or mortality to protected species.<br><br>Construction noise and lighting may disturb commuting, foraging or resting badger, bats, otter, pine marten and water vole |

| POTENTIAL IMPACT | WORST CASE SCENARIO | JUSTIFICATION |
|---|---|---|
| | • Substation permanent area (including landscaping and Sustainable Drainage Systems (SuDS) allowance) of approximately 23.9 hectares (ha), with maximum excavated material 1,207,000m$^3$.<br><br>Access tracks<br><br>Approximately 5 km in length of permanent access tracks. 24% (1.2 km) are existing tracks, 44% (2.21 km) are existing tracks that require improvements and 33% (1.67 km) will be newly installed tracks.<br><br>• Temporary access tracks (not including haul roads) up to 3,300 m in length at the landfall, the entry and exit points of the HDD points and the onshore substation. Lengths are indicative only; and<br>• Where possible, local infrastructure including road networks, farmer tracks and utility access roads will be utilised to minimise the construction of new infrastructure. Temporary bridges/spanning structure will be considered for appropriate locations for haul roads. | |
| **Indirect effects on habitats or protected species, (e.g. due to pollution or sedimentation, noise and lighting)** | Landfall<br><br>• Preparation of the working area at the landfall site to accommodate a maximum of six (five plus one contingency) boreholes, HDD drilling equipment, utilities and welfare facilities with an estimated area of 7,500 m$^2$;<br>• Storage of excavated materials from the boreholes estimated to be 1,630 m$^3$ per HDD bore prior to disposal off-site;<br>• Materials used during drilling of bores, e.g., drilling muds and grout; and<br>• Fuel used in plant machinery.<br><br>Onshore export cable corridor<br><br>• Construction and reinstatement of temporary laydown areas (estimated to be every 2 km along the route) and access roads for trench/HDD works;<br>• Ditches and small watercourses that are crossed by the onshore Project haul roads will have appropriately sized pipework installed to maintain water conveyance capacity. Such pipework will be removed when the haul roads are removed; and | These activities are considered to represent the worst case scenario with regard to potential indirect impact upon key habitats and species as a result of accidental release including the contamination of groundwater due to surface water runoff, sediment pollution, the effects of construction dust, noise and light pollution. |

| POTENTIAL IMPACT | WORST CASE SCENARIO | JUSTIFICATION |
|---|---|---|
| | • Excavation of trenches / HDD and storage of excavated materials estimated to be 162,525 $m^3$ per trench (five trenches) for the working corridor estimated to be 33 km long and 100 m wide.<br><br>Onshore substation<br><br>• Potential for on-site batching of concrete;<br>• Sustainable Urban Drainage Systems (SuDS) will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and Shunt Reactor bunds will discharge to the surface water drainage system through a bund water control unit; and<br>• Installation of septic tank system and subsequent discharges. | |
| **Reduction in deer welfare** | • Potential loss of shelter and food resource during land take (as detailed above);<br>• Up to 9.58 ha of forestry / woodland may be cleared; and<br>• Disturbance and restriction of movement during construction works due to an increase in sound, vibration and lighting. | In addition to the destruction of habitats, potentially resulting in the loss of shelter and food resource, ground preparation works could directly result in the direct disturbance of deer. |
| **Operation and maintenance** | | |
| **Habitat loss** | Onshore substation<br><br>• Post construction, the temporary works will be removed and the ground re-instated. The only permanent structures will be the onshore substation (maximum of 12 buildings anticipated), associated hardstanding and permanent access tracks; and<br>• Maximum footprint of onshore substation: approximately 23.9 ha with associated hard standing. | Maximum footprint of substation which is the only 'above ground' element of the onshore Project that will result in long term loss of habitats. |
| **Disturbance and injury or mortality due to maintenance works which** | The onshore substation will be unmanned. Therefore, there will be a limited amount of traffic (predominantly light-vehicle traffic) to and from the substation for general operation and maintenance purposes. | Possible injury or mortality to ecological receptors through the movement of maintenance vehicles through the site and some temporary disturbance to foraging and |

| POTENTIAL IMPACT | WORST CASE SCENARIO | JUSTIFICATION |
|---|---|---|
| **are expected to be infrequent and small scale** | • Bi-weekly visual inspection and replace fault items under warranty; and<br>• Additional plant maintenance quarterly.<br><br>Onshore cables; routine maintenance:<br><br>• Bi-annual visual inspection of joint bays / Transition Joint Bay (TJB) / earth link boxes.<br><br>Non-routine maintenance activities:<br><br>• As required following events causing deterioration or damage to areas surrounding cables; and<br>• Reactive maintenance to faults /failure rates of key plant items. | commuting animals during routine maintenance works and as a result of the operation of the substation.<br><br>During more significant maintenance works (if required) there is some potential for habitat loss, disruption of groundwater flows and more significant accidental release. There is also the potential for a greater level of disturbance and injury or mortality to terrestrial mammals and reptiles during ground-breaking works (if required) and deep excavations and uncapped piping. |
| **Indirect effects on habitats or protected species, (e.g. due to pollution or accidental release, noise and lighting** | • SuDS system will be required for surface water drainage. Transformer and shunt reactor areas are at higher risk of oil contamination. Runoff from the transformer bunds and Shunt Reactor bunds will discharge to the surface water drainage system through a bund water control unit.<br><br>Operational noise:<br><br>• High Voltage Alternating Current (HVAC) – 100 dB; and<br>• Installation of septic tank system and subsequent discharges. | Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for disruption of groundwater flows and more significant accidental release.<br><br>Operational noise and lighting may disturb commuting, foraging or resting badger, bats, otter, pine marten and water vole. |

## 10.6 Assessment of potential effects

### 10.6.1 Evaluation of sensitivity

A summary of the evaluation of the sensitivity of habitats and species recorded within the onshore study area during the 2022 baseline surveys is provided in Table 10-18.

*Table 10-18 Evaluation of the sensitivity of habitats and terrestrial species recorded within the onshore study area during the 2022 baseline surveys*

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| High | Designated sites of international importance:<br>• Broubster Leans SAC;<br>• Loch Watten SAC;<br>• Caithness and Sutherland Peatlands SAC / Ramsar;<br>• Loch of Wester SAC; and<br>• Strathy Point SAC. | These SACs and Ramsar are internationally designated sites, supporting habitats and protected species which are considered to be part of an internationally important population. |
| | Designated sites of national importance:<br>• River Thurso SSSI;<br>• Ushat Head SSSI;<br>• Loch Lieurary SSSI;<br>• Westfield Bridge SSSI;<br>• Newlands of Geise Mire SSSI;<br>• Loch Scarmclate SSSI;<br>• Holborn Head SSSI;<br>• Sandside Bay SSSI;<br>• Red Point Coast SSSI; and<br>• Broubster Leans SSSI. | These SSSIs are nationally designated sites supporting habitats considered to be part of a nationally important population. |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | Heath (H7, M15 and M16) | These communities correspond with nationally important habitats protected under Annex I of the Habitats Directive (H4030 Dry heaths, H4010 Wet heathland with cross-leaved heath and H4010 Wet heathland with cross-leaved heath respectively). All three also correspond to the Lowland Heathland SBL priority habitat. M15, whilst common and widespread in Scotland, it is considered internationally important because Scotland contains most of the worldwide distribution of this habitat.<br><br>M16 and M15 are also considered to be highly and moderately groundwater-dependent respectively. |
| | Mire (M22 and M23) | These communities correspond to the SBL priority habitats; Purple moorgrass and rush pasture, and Coastal and floodplain grazing marsh respectively.<br><br>These habitat types are considered to be highly groundwater-dependent. |
| | Mire (M24, M25 and S27) | These communities correspond with nationally important habitats protected under Annex I of the Habitats Directive (H6410 Purple moorgrass meadows, H7130 Blanket bog, and H7120 degraded raised bog and H7140 Very wet mires respectively). All three are SBL priority habitats, with M24 and M25 corresponding to Purple moorgrass and rush pasture and S27 corresponding to Lowland fens.<br><br>M24 is considered to be highly groundwater-dependent, whilst M25 and S27 are considered to be moderately groundwater-dependent. |
| | Fen (M10, M27 and MG8) | All three fen habitats correspond to the Lowland fens SBL priority habitat. M10 is also an Annex I habitat.<br><br>M10 is considered to be highly groundwater-dependent, whilst M27 and MG8 are moderately groundwater-dependent. |
| | Coastal grassland (MC9 and MC10) | Both of these communities correspond with nationally important habitats protected under Annex I of the Habitats Directive (H1230 Vegetated sea cliffs). MC9, the wetter of these two classifications, also matches the SBL priority habitat 'Lowland fens', whilst MC10 matches the SBL priority habitat 'Maritime cliff and slopes'. |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | Grassland (U4 and U5) | U4 corresponds to the Annex I habitat; H6230 Species rich grassland with mat-grass, in upland areas. It is also an SBL priority habitat, Lowland dry acid grassland. Although typically classified as an upland habitat, in Caithness it occurs lower down due to the prevailing climatic conditions. In the onshore study area it is generally species poor, though contributes to overall habitat diversity.<br><br>U5 corresponds to the Annex I habitat H6230; Species rich grassland with mat-grass. It is only recorded once within the onshore study area, as part of a habitat mosaic near Houstry. |
| | Swamp (S11 and S27) | These communities form part of the SBL priority habitat 'Lowland fens'. S11 is highly groundwater-dependent and S27 is moderately groundwater-dependent. While these habitat only cover small areas on site, they are considered to be essential to maintain the viability of the ecological resource. |
| **Medium** | Grasslands (MG5 and MG9) | MG5 and MG9 correspond with the SBL priority habitats Lowland meadows and Coastal and floodplain grazing marsh respectively. MG9 is also considered to be moderately groundwater-dependent. |
| | Swamp (S8, S9, S10, S14, S19 and S22) | These habitats fall under the SBL priority habitat classification 'Lowland fens'. |
| | Woodland (W4 and W6) | Both of these woodland habitats have characteristics consistent with the Annex I habitats; H91CO (Caledonian forest) and H91EO (Alder woodland on floodplains) respectively. However, within the onshore study area, these classifications are not considered appropriate due to the small size and fragmented/ disturbed nature of the woodland areas.<br><br>Both W4 and W6 fall under the SBL priority habitat 'Wet Woodlands'. And both are groundwater-dependent, with W4 considered to be highly groundwater-dependent and W6 moderately groundwater-dependent.<br><br>Due to the scarcity of woodland within the study area, these habitats are considered to enrich the local area. |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | Woodland (W8 and W21) | Both of these woodland habitats have characteristics consistent with the Annex I habitats; H9180 (Mixed woodland on base-rich soils associated with rocky slopes) and H5130 (Juniper on heaths or calcareous grassland) respectively. However, within the onshore study area, these classifications are considered to be a poor match for the only examples seen, with extensive levels of human disturbance observed within the W8 habitat, and no juniper identified within the W21 habitat.<br><br>W8 is an SBL priority habitat 'Lowland mixed deciduous woodland'.<br><br>Due to the scarcity of woodland within the study area, these habitats are considered to enrich the local area. |
| | Scottish Primrose | An SBL and HBAP priority species.<br><br>Scottish primrose is a key feature of Ushat Head SSSI; abutting the eastern boundary of the northern extent of the onshore Project area, Holburn Head; approximately 3.4 km north-east and Red Point Coast SSSI; approximately 4.6 km north-west of the onshore Project area. The population at Red Point Coast SSSI is thought to hold over 1% of the world population of Scottish primrose. During the survey visits, Scottish primrose was found to be ubiquitous within 50 m of the coastline, within the onshore Project area. |
| | Bats | All bat species are EPS, and the animals and their roost sites are fully protected under the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended in Scotland). Nine of the ten bat species that occur in Scotland are SBL priority species. Whilst bats are found throughout Scotland, numbers generally decrease with latitude (SNH, 2015), and only four species commonly occur in Caithness; common pipistrelle, soprano pipistrelle, brown long-eared bat and Daubenton's bat.<br><br>Due to the location of the onshore Project area, the bats present are likely to be approaching their northern extent. As the status of the site with regard to foraging and roosting bats is unknown, a precautionary approach is adopted whereby it is assumed that the onshore study area, supports a locally significant population of bats. |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | Otter | Otter is an EPS and the animals and their shelters are fully protected under the Conservation (Natural Habitats &c.) Regulations 1994 (as amended in Scotland). It is also an SBL priority species and a designated feature of the Caithness and Sutherland Peatlands SAC located adjacent to the southern extent of the onshore Project area. Whilst otter is classed as Near Threatened on the IUCN Red List of Threatened Species, Scotland is considered a European stronghold for otter and the species is now widespread across the country (SNH, 2015), including across the Highlands (Scott, 2011). However, there is evidence that the Caithness and Sutherland Peatlands SAC population is declining (Findlay *et al.*, 2015). Nevertheless, as frequent evidence of otter activity was identified throughout the onshore study area, otter are considered to be of local significance on site. |
| | Pine marten | Pine marten is classified as Least Concern on the IUCN Red List of Threatened Species. In England and Wales, its population trend is classed as decreasing and it is classified as Critically Endangered; the highest risk category for wild species. However, in Scotland where more than 98% of the British population occurs, the geographical range has increased over the last 10 years (Croose *et al.*, 2013) and the population is classed as stable.<br><br>Pine marten and their dens receive full protection under Schedule 5 of the WCA 1981 (as amended). Pine marten is also listed as a conservation priority species on the UKBAP and SBL. Desk study and consultation data revealed two records of pine marten. Records within the study area were limited, likely reflecting the large territories of pine marten and their relatively reclusive nocturnal nature.<br><br>Evidence of pine marten activity was found within the onshore study area. While the lack of natural denning sites and woodland areas within the onshore Project area may limit numbers, it is considered that those present are part of a locally significant population. |
| | Water Vole | In Scotland, water vole receive partial legal protection under Schedule 5 of the WCA 1981 (as amended). This makes it an offence to deliberately or recklessly damage, destroy or obstruct access to any structure or place that water voles use for shelter or protection, or disturb a water vole while it is using a place of shelter or protection. In Scotland, this legal protection is currently restricted to the water vole's places of shelter or protection, i.e. their burrows, but does not currently extend to the animals themselves. Full protection to cover the animals is proposed.<br><br>Water vole is listed as a conservation priority species on the UKBAP and SBL. Within the SBL, it is noted as being in need of conservation action. Water vole are classified as Least Concern on the IUCN Red List of Threatened Species |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | | and, while its overall population trend is classified as stable at the global level, the population has experienced a dramatic decline in the UK over the last century.<br><br>Evidence of water vole activity was found within the onshore study area and the population is thought to be locally significant. |
| **Low** | Grassland (MG1, MG6 and MG7) | MG1 is a widespread and abundant grassland habitat associated with disturbed and waste ground. It can be floristically diverse due to the absence of grazing.<br><br>MG6 and MG7 are both SBL priority habitats as part of coastal and floodplain grazing marsh. However, both of these are species poor and the examples present within the onshore study area are agriculturally improved and of little conservation interest. |
| | Rush pasture MG10 | MG10 is moderately groundwater-dependent. It is an impoverished vegetation type and rarely contains any uncommon species. |
| | Open habitat community OV22 and OV27 | OV22 and OV27 are of low conservation interest. |
| | Badger | Badger and their setts are protected under the PBA 1992; as amended by the WANE (Scotland) Act 2011, which protects the species against cruelty and from the incidental effects of lawful activities which could cause harm. The species is relatively common in Scotland. Whilst badgers can be found in a wide variety of habitats, they are particularly common in the lower-lying more fertile parts of the country. Although there are no accurate figures for the Scottish population, it has been estimated at around 25,000 (Harris *et al.*, 1995). Whilst the overall population is probably stable, with badger classed as Least Concern on the IUCN Red List of Threatened Species (Kranz, 2016), there are parts of Scotland where badgers appear to be on the increase (SNH, 2002a).<br><br>Within the onshore study area, no evidence of badger activity was identified. Therefore, whilst badger are known to be present in the wider area and it is likely that they do pass through the site, it is considered unlikely that they form part of a locally significant population. |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | Reptiles | All reptile species are legally protected under Schedule 9 of the WCA 1981 (as amended) which protects them against intentional or reckless killing and injury, as well as protection from sale. The three most regularly occurring Scottish terrestrial reptile species; common lizard, slow worm and adder, are listed as UKBAP conservation priority species and are on the SBL. The range of all three species is known to extend up to northern Scotland, including Caithness.<br><br>All three regularly occurring reptile species are classed as Least Concern on the IUCN Red List of Threatened Species. However, declines have been recorded for all three species since 2000 (Humphreys *et al.*, 2011).<br><br>Common lizard were found within the onshore study area. However, as areas of suitable habitat on site were limited, with the majority of the site comprised of low-suitability heavily-managed grassland areas, it is considered unlikely that reptiles are regularly occurring or form part of a locally significant population. |
| | Northern Knotgrass | Northern knotgrass is a Nationally Scarce arable weed. |
| | Eyebright (*Euphrasia marshallii*) | *Euphrasia marshallii* is a SBL priority species, listed as requiring conservation action. It is understood that this species is said to be threatened by industrial development. |
| | Field gentian | Field gentian is a Nationally Scarce plant. |
| | Invertebrate communities of conservation importance | Maritime soft cliff and bare and sparsely vegetated ground adjacent to flower rich grassland has the potential to support rare invertebrate species, especially where they occur in sheltered places with diverse flowering plants nearby.<br><br>This habitat occurs along the northern extent of the study area where sedimentary mudstone is exposed as a result of ongoing erosion, maintaining bare or sparsely vegetated patches.<br><br>Bare and sparsely vegetated ground is of value to invertebrates (e.g. for basking and burrowing) (Buglife, 2012) and can support invertebrate communities of conservation importance, particularly when it occurs in close proximity to other habitats that meet additional requirements of invertebrate species, such as flower-rich grassland. |

| SENSITIVITY | RECEPTOR | JUSTIFICATION |
|---|---|---|
| | Great yellow bumblebee | Great yellow bumblebee is a Nationally Scarce species, listed as a priority on the SBL and included on the HBAP. The north coast of Scotland is a stronghold for the species in the UK. This species likely uses the vetch and clover-rich grassland along the coast to forage, as well as tussocky grassland across for nesting. |
| | Large heath butterfly | The large heath butterfly is an SBL species listed as vulnerable and in need of conservation action. It is considered likely that any areas of moorland or blanket bog of over one ha are likely to support populations of this species. |
| | Moss carder bee | This species is considered scarce in Britain having suffered significant declines but is more frequent in north-west Highlands. Long corolla flowered species including members of the pea family such as kidney vetch (*Anthyllis vulneraria*) and bird's-foot trefoil (*Lotus corniculatus*) are important foraging resources for this species. |
| | Small blue butterfly | Small blue butterfly is a SBL species.<br><br>The small blue butterfly's sole food plant, kidney vetch, occurs within the Project area within the coastal grassland and maritime cliff vegetation along the northern extent. Three populations are known on the Caithness coast, with the nearest being west of Thurso. However, this species is difficult to detect and may be under recorded within the onshore study area. |
| | Small pearl-bordered fritillary | The small pearl-bordered fritillary is an SBL species listed as not threatened. Populations of this butterfly are known from Achlachan Moss to the south of the Project study area. |
| | Deer | Deer in Scotland are not a protected species and are relatively widespread. |
| **Negligible** | Bare ground, bare rock, broadleaved plantation, coniferous plantation, crops, gorse and mixed plantation. | Widespread and abundant habitats with little biodiversity value and of low conservation concern. |

## 10.6.2 Habitats and species not taken forward to the assessment phase

Habitats and species of negligible importance are not considered further in this assessment as these are generally common and widespread ecological features. As discussed in section 10.4.4, red squirrel and great crested newt are also not taken forward to the assessment phase.

## 10.6.3 Habitats and species taken forward to the assessment phase

In this section, results from the desk study and all relevant field surveys have been reviewed to describe the current baseline environment for terrestrial non-avian ecology, providing an overview of the existing ecological environment within the onshore Project area and wider landscape. Following assessment of the current baseline, the likely impact of each stage of the Project upon the terrestrial non-avian ecology features is assessed.

Although no significant impacts on ecological features of low value are likely, these features are nevertheless considered because they are of local conservation importance and additional mitigation measures could be recommended for such features as a good practice measure. Furthermore, due to various limitations (see section 10.4.7), precautionary measures are considered prudent.

To avoid repetition, where potential effects on ecological features of the same level of importance are likely to be similar due to similarities in ecology and/or distribution, they are assessed as a group rather than separately for each feature.

## 10.6.4 Potential effects on receptors of high sensitivity

### 10.6.4.1 Designated Sites of International Importance

#### 10.6.4.1.1 Baseline

As detailed in section 10.4.4.1.1 and shown in Figure 10-2, there are five SACs and one Ramsar site with terrestrial non-avian ecology features located within 20 km of the onshore Project area: Broubster Leans SAC, Loch Watten SAC, Caithness and Sutherland Peatlands SAC, Caithness and Sutherland Peatlands Ramsar, Loch of Wester SAC and Strathy Point SAC.

#### 10.6.4.1.2 Potential construction effects

In the absence of appropriate mitigation measures, the construction element of the onshore Project has the potential to cause direct or indirect damage to internationally designated sites. However, the six sites are located over 2.5 km away from the onshore Project area. Therefore, there will be no direct impact upon these protected areas or their adjacent habitats through habitat loss due to land-take, or disturbance and damage. Furthermore, due to the distances involved, no habitat connectivity or pathway for indirect effect on the habitat features of the SACs have been identified.

Therefore, no impact is predicted for Broubster Leans SAC, Loch Watten SAC, Loch of Wester SAC, Strathy Point SAC and Caithness and Sutherland Peatland Ramsar, or on habitat features associated with Caithness and Sutherland Peatlands SAC, as there is no pathway for effect.

Whilst no impact upon the habitat features is anticipated, otter are a qualifying feature for the Caithness and Sutherland Peatlands SAC / Ramsar. As otter can occupy long riparian territories, it is possible that those associated with this SAC may forage within the onshore Project area. As the construction of the Project may result in direct effects on otter such as temporary loss or severance of foraging habitat and injury or mortality, indirect impacts upon the qualifying feature of the SAC / Ramsar may be anticipated.

The potential impact of the construction of the onshore Project upon otter, a qualifying feature for the Caithness and Sutherland Peatlands SAC / Ramsar, is fully assessed in section 10.6.5.4. With the implementation of the embedded mitigation measures and taking into account the temporary and short-term nature of the construction works, the impact of construction upon otter is considered to be of negligible magnitude and resultant effects are assessed as not significant.

#### 10.6.4.1.3 Potential operation and maintenance effects

As detailed in section 10.6.5.4.3 the overall impact of the operation and maintenance of the site upon otter; a qualifying feature for the Caithness and Sutherland Peatlands SAC / Ramsar, is considered to be of negligible magnitude. As such, effects are assessed as being not significant to Caithness and Sutherland Peatlands SAC / Ramsar indirectly via effects on otter. No impact upon the other SACs present within 20 km of the onshore Project area is anticipated as there is no pathway for effects to occur.

#### 10.6.4.1.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, effects are not significant with regard to the SACs assessed.

### 10.6.4.2 Designated Sites of National Importance (SSSIs)

#### 10.6.4.2.1 Baseline

As detailed in Section 10.4.4.1 and shown in Figure 10-2, there are 10 SSSIs located within 5 km of the onshore Project area; River Thurso, Ushat Head, Loch Lieurary, Westfield Bridge, Newlands of Geise Mire, Loch Scarmclate, Holborn Head, Sandside Bay, Red Point Coast and Broubster Leans. See Table 10-8 for a description of their qualifying terrestrial non-avian ecology features.

#### 10.6.4.2.2 Potential construction effects

In the absence of appropriate mitigation measures, the construction elements of the onshore Project have the potential to cause direct or indirect damage to nationally designated sites, in particular Ushat Head SSSI, which abuts the eastern boundary of the site at Crosskirk landfall.

For Ushat Head, a small area of maritime heath habitat associated with the SSSI may be adversely impacted depending on the onshore export cable corridor selected, methods used and mitigation imposed. Whilst this site lies just outwith the Project area, avoiding direct habitat loss (e.g. through ground clearance, trenching and tracking), indirect impacts may occur. During the construction of various components of the site; including the temporary compounds and access tracks, there is the potential for accidental release of excess silt, hydrocarbons and other pollutants, resulting in an indirect impact upon Scottish primrose and maritime heath habitats within the SSSI. Furthermore, it is known that the Scottish primrose and maritime heath habitats associated with the SSSI population are present within the onshore study area; occurring outwith the SSSI boundary. Scottish primrose is ubiquitous within 50 m of the coastline and three small areas of degraded maritime heath are present at the northern extent of the onshore Project area. However, with the embedded mitigation; including a commitment to avoid de-vegetation or ground-breaking work within 50 m of the cliff edge and various pollution control measures in place, impacts on Scottish primrose and maritime heath communities are considered unlikely.

Loch Lieurary is located 0.1 km south of the onshore study area. Loch Lieurary SSSI has been designated as a representative of basin fen habitat and is one of the largest examples of fen habitat in Caithness. The basin fen lies on the site of a former loch which has been converted to wet ground through progressive sedimentation. Much of the site was inaccessible during the project specific surveys due to high water levels during the study, but those parts assessed were classified as S27 and MG8. No direct impacts are anticipated as the SSSI does not lie within the onshore Project area. Furthermore, no additional basin fen or calcareous grassland habitats were identified within the onshore Project area, therefore no direct impacts upon the qualifying habitats of the SSSI are anticipated. However, due to the proximity of this site to the onshore Project area, it is possible that changes to the hydrology of the site and due to accidental releases during construction, and/or indirect impacts associated with deer disturbance and displacement, will have an impact upon the qualifying habitats of the SSSI.

Westfield Bridge SSSI is located 0.6 km south-east of the onshore study area. Westfield Bridge also supports nationally important fen meadow, as well as calcareous grassland vegetation; which is a rare habitat in Caithness. Due to the proximity of this site to the onshore Project area, it is possible that changes to the hydrology of the site and due to accidental releases during construction, and/or indirect impacts associated with deer disturbance and displacement will have an impact upon the qualifying habitats of the SSSI. During the NVC survey, no additional basin fen or calcareous grassland habitats were identified within the onshore Project area, therefore no direct impacts upon the qualifying habitats of the SSSI are anticipated.

The River Thurso SSSI is located 1.1. km southwest of the onshore study area. Although no direct impacts upon the floodplain fen associated with this site are anticipated, coastal and grazing floodplain marsh were identified elsewhere throughout the onshore study area. Therefore, it is possible that the floodplain fen associated with this site is present at other points on the River Thurso, including onsite, and that some habitats may be lost depending on the onshore export cable corridor selected, methods used and mitigation employed. It is also possible that changes to the hydrology of the site and due to accidental releases further upstream during construction, and/or indirect impacts

associated with deer disturbance and displacement will result in indirect impacts upon the floodplain fen within the SSSI.

The remaining SSSI sites; Newlands of Geise Mire, Loch Scarmclate, Holborn Head, Sandside Bay, Red Point Coast, Broubster Leans, Loch Watten and Loch of Wester are located over 2 km away from the onshore study area. Therefore, there will be no direct impact upon these protected areas or their adjacent habitats. Furthermore, due to the distances involved, no habitat connectivity or pathway for effect on the habitat features of the SSSIs have been identified.

As detailed above, no direct impacts upon the nationally important sites have been identified. Where indirect effects are possible, implementation of the embedded mitigation detailed in section 10.5.4 will reduce the impacts of construction activities, including substation construction and cable-laying activities. In the unlikely case that an accidental release occurs, this can be managed through the application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity or conservation status of the nationally designated sites. Furthermore, due to the short duration of the works (i.e. less than five years, as defined in Section 10.5.3.2), with habitat reinstatement proposed, any impact will be temporary and reversible. Any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, the impact is defined as being of negligible magnitude. As these receptors are of high sensitivity the resultant effects on designated sites of national importance are assessed as not significant.

#### 10.6.4.2.3 Potential operation and maintenance effects

Whilst no direct impacts upon Ushat Head, Loch Lieurary, Westfield Bridge or River Thurso SSSI are anticipated during the routine maintenance and operation of the onshore Project, indirect effects may occur due to the pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for direct or indirect effects to occur during operation and general maintenance is considered to be significantly lower than that during construction.

In the event that more significant maintenance works are required; such as non-routine maintenance of the onshore export cable corridor, habitat loss as a result of excavation to assess and repair any faults may occur. However, as the onshore Project has been designed to ensure that it does not encompass any sites of national importance, no direct impacts upon these sites are anticipated.

More significant maintenance works may result in indirect effects on statutory sites due to accidental pollution of groundwater and watercourses during the excavation of cables etc., and disruption of groundwater flow. The impact of these works will be dependent on the location, extent and nature of the works, as well as the particular ecological sensitivities of the designated sites likely to be impacted. Accordingly, the level of mitigation required, including suitable set-back zones, appropriate methods of work, the requirement for pre-works surveys will be dependent on a variety of factors and should be subject to a detailed assessment by a suitably experienced ecologist prior to works commencing. However, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during construction.

The implementation of the embedded mitigation detailed in section 10.5.4 will reduce the impacts of operation and maintenance activities. In the unlikely case that an accidental release occurs, this can be managed through the

application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity or conservation status of the internationally designated sites. No direct impacts upon these nationally designated sites are anticipated. Therefore, the impact is defined as being of **negligible magnitude.** As these receptors are of **high sensitivity** the resultant effects on designated sites of national importance are assessed as **not significant.**

#### 10.6.4.2.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, effects during decommissioning are assessed as **not significant** on these designated sites of national importance.

### 10.6.4.3 Habitats of high sensitivity

For a detailed assessment of the NVC survey results, see SS6: Terrestrial non-avian ecology technical survey report. Figures 10-3 and 10-4 show the locations of the NVC habitats recorded within the northern and southern sections of the onshore study area respectively. The areas of the NVC habitats recorded (both extent within the study area (to buffer) and within the onshore Project area (excluding buffer)) are provided in Table 10-9. For context, this table also provides the percentage of the onshore Project area made up of each NVC habitat type. Based on the results of the Project specific surveys:

- Approximately 7% (~230 ha; just over 2 $km^2$) of the total onshore Project area has NVC communities corresponding with Annex I habitats of high sensitivity (Table 10-9); and
- Less than 1% (~10 ha; less than 0.5 $km^2$) of the total onshore Project area has habitat mosaics recorded of high sensitivity (Table 10-10).

As the onshore export cable route is to be defined, direct impacts are not expected to affect the entire area.

Justification of the classification of the habitat types as '**high sensitivity**', including their groundwater dependency, as provided in Table 10-18.

#### 10.6.4.3.1 Baseline

**Heaths**

H7 *Calluna vulgaris-Scilla verna* heath overlaps with the Annex 1 classifications H4030 Dry heaths, and H1230 Vegetated sea cliffs. Within the onshore study area H4030 Dry heaths is a better match for the vegetation seen. The majority of the H7 heath was present along the coastal strip east of Forss Water, but also occurred as small patches on the west side of the coastal strip, and on the ridge above Oust farm. All examples seen were degrading into MG10a grassland. H7 heath is dominated by heather (*Calluna vulgaris*) and *Festuca spp*. grasses, with frequent

plantains (*Plantago lanceolata* and *P. maritima*), catsear (*Hypochaeris radicata*) and tormentil (*Potentilla erecta*). H7 is a fairly widespread coastal community, occurring on freely-draining acidic soils with a generally low nutrient content.

M15 *Scirpus cespitosus-Erica tetralix* wet heath is contained within H4010 Wet heathland with cross-leaved heath. This classification is common and widespread in Scotland, but internationally important because Scotland contains most of the worldwide distribution of this habitat. This classification is important for rare bryophytes. It is typically dominated by heather, deergrass (*Trichophorum cespitosum*), cross-leaved heath (*Erica tetralix*) and purple moorgrass (*Molinea caerulea*). The M15c *Cladonia spp*. sub-community was widespread within the study area, and represents slightly drier areas, where bell heather (*Erica cinerea*) and tormentil are frequent. Approximately 50% of the M15 habitats present showed evidence of significant degradation through drying, grazing or gorse colonisation.

M16 *Ericetum tetralicis* wet heath is also contained within H4010 Wet heathland with cross-leaved heath. This is generally a species poor classification in which cross-leaved heath dominates, although at Achanarras the M16a typical sub-community occurs, in which *Sphagnum* species and other bryophytes are more abundant. M16 heath is characteristic of drier climates in the south and east, and is usually dominated by combinations of *E. tetralix*, *Calluna* and *Milinia*. The M16 habitats present on site were generally considered to be in a better condition than the M15 heathland, with less degradation noted. However, degradation through drying was identified in areas.

Both wet heath types are widespread within the onshore study area but showed signs of significant drying out due to warmer summers, such as experienced in 2022.

All three heath habitats correspond to the Lowland heathland SBL priority habitat. M16 heath is highly groundwater-dependent, and M15 is moderately groundwater-dependent.

### Mire

M22 *Juncus subnodulosus-Cirsium palustre* fen-meadow corresponds to the SBL priority habitat Purple moorgrass and rush pasture, and is highly groundwater-dependent. It occurs in a small area on the northern banks of the Forss Water, approximately 1.3 km south of Forss. No degradation of this peatland habitat was noted. It is a botanically diverse classification in which rushes predominate, and jointed rush (*Juncus articulatus*) was also common. Angelica (*Angelica sylvestris*), meadowsweet (*Filipendula ulmaria*), marsh thistle (*Cirsium palustre*) and devil's bit scabious (*Succisa pratensis*) are frequent, sometimes in large stands. This community has a widespread distribution through the southern British lowlands, although its overall distribution is decreasing due to changes in land management practices (Elkington *et al.*, 2002).

M23 *Juncus effusus/acutiflorus-Galium palustre* rush pasture corresponds to the SBL priority habitat, Coastal and floodplain grazing marsh, and is highly groundwater-dependent. It is widespread throughout the onshore study area on wetter unimproved ground, including as parts of mosaics, and while botanically species poor it can be a valuable for invertebrates and birds. Two sub-communities are present within the onshore study area. The M23a *Juncus acutiflorus* sub-community occurs in the valley of the River Thurso, in which marsh bedstraw (*Galium palustre*), marsh willowherb (*Epilobium palustre*) are frequent and Yorkshire fog (*Holcus lanatus*) is the dominant grass. The M23b *Juncus effusus* sub-community is less species rich and is transitional between M23 mire and MG10 rush pasture. It is present at Spittal Mains, and at Acharadale, west of Halkirk. This community is known to be widespread throughout Caithness, although land management practices such as draining, soil improvement regimes and reseeding have

reduced its former extent (Elkington *et al.*, 2002). The M23 areas noted on site were generally in good condition, although water levels were low.

M24 *Molinia caerulea-Cirsium dissectum* fen-meadow is included within H6410 Purple moorgrass meadows and the SBL priority habitat Purple moorgrass and rush pasture. This highly groundwater-dependent habitat also corresponds with nationally important habitats protected under Annex I of the Habitat Directive. Within the onshore study area it occurs only as part of habitat mosaics within the floodplain of the Forss Water. The areas identified were considered to be in good condition with no degradation noted. It is typically associated with peaty soils at the drier edges of wet mires, where meadowsweet, angelica and marsh thistle are frequent found, and *Carex panicea* is present. Known to be widespread in the lowland south of Britain, it has been reduced in extent by agricultural reclamation or neglect (Elkington *et. al.*, 2002).

M25 *Molinia caerulea-Potentilla erecta* mire corresponds to both H7130 Blanket bog, and H7120 degraded raised bog and corresponds to the SBL priority habitat Purple moorgrass and rush pasture. This moderately groundwater-dependent habitat also corresponds with nationally important habitats protected under Annex I of the Habitat Directive. This is the commonest of the wet mire communities within the onshore study area, occurring on wet peaty soils. It is generally species poor, although relatively species-rich areas were identified. Approximately 25% of these communities showed signs of degradation through drying. A good example was present at Moss of Geise and poorer examples on the west of the onshore study area around Buckies and North Calder. Three sub-communities were identified, in which tormentil is always present. M25a *Erica tetralix* sub-community occurred on the ridge above Oust in the Forss valley, in which common cotton-grass (*Eriophorum angustifolium*) and bog asphodel (*Narthecium ossifragum*) occurs. This sub-community is the most widespread in the UK, though it only occurred once within the onshore study area. The M25b *Anthoxanthum odoratum* sub-community was the most frequently found. This Is a grass-dominated community with Yorkshire fog and fescues (*Festuca spp*.) common. Devil's bit scabious and common sorrel (*Rumex acetosa*) are also frequent. A single example of the M25c *Angelica sylvestris* sub-community, which is uncommon in Scotland, was seen on Spittal hill. It is characterised by a taller sward, with purple moorgrass, and clumps of sharp-flowered rush (*Juncus acutiflorus*). M25 is known to be particularly frequent in south-west England, Wales and southern Scotland (Elkington *et al.*, 2002).

S27 *Carex rostrata-Potentilla palustris* tall-herb fen–- H7140 Very wet mires often identified by an unstable 'quaking' surface. This moderately groundwater-dependent habitat is an SBL habitat and also corresponds with nationally important habitats protected under Annex I of the Habitat Directive. The large pond north-east of Crosskirk at ND0351070567 corresponds to this habitat. These sites are typically too wet to be grazed, and consequently tend to be herb rich, with abundant marsh cinquefoil (*Potentilla palustris*) and bogbean (*Menyanthes trifoliata*) as well as herbs such as marsh bedstraw and marsh thistle. Most of the examples seen were partially dried due to a period of warm weather, but still floristically diverse, with no signs of long-term degradation. A number of small ponds throughout the onshore study area also matched S27 classifications and included examples of the S27a *Carex rostrata-Equisetum fluviatile* sub-community, which is more species poor and has larger amounts of water horsetail (*Equisetum fluviatile*). This habitat is moderately groundwater-dependent and corresponds to the SBL priority habitat Lowland fens. It is important for wetland birds.

**Fen**

M10 *Carex dioica-pinguicula vulgaris* mire can be part of H7230 calcium rich spring water fed fens. The sole example seen was a species-rich wet flush, rich in butterwort (*Pinguiculas vulgaris*), toad rush (*Juncus bufonius*) and devil's bit

scabious around the burn running from the reservoir above Oust farm. It is notable as one of the few clearly calcareous habitats seen in the onshore study area. This highly groundwater-dependent classification is predominantly a community of north-west Britain, developed in the cool, wet climate (Elkington *et al.*, 2002).

M27 *Filpendula ulmaria-Angelica sylvestris* mire corresponds to the SBL priority habitat Lowland fens. This occurred along the floodplain of Forss Water in extensive patches in which meadowsweet dominated. The classification also occurs as a mosaic with other classifications along the riverside. It occurred as both remnant ponds, and vegetated flushes. Patches of reed canary-grass (*Phalaris arundinacea*) were frequent, with valerian (*Valeriana officinalis*) and angelica frequent. M27 is a moderately groundwater-dependent classification that is typical of the edges of rivers and lowland floodplains. At Skinnet, a single example of the grassier M27c *Juncus effusus-Holcus lanatus* sub-community was identified, which contains greater quantities of purple moorgrass and sharp-flowered rush (*Juncus acutiflorus*). The M27c sub-community has a typically western distribution within the UK. Although the M27 communities are not considered to be rare in Britain, draining and grazing have reduced their extent to small remnants in many places (Elkington *et al.*, 2002), and it is considered valuable for its rich flora of tall herbs. The M27 habitats present on site were generally considered to be in poor condition, with most sites showing significant degradation towards MG10 rush pasture. Gorse and bracken were encroaching in areas and the habitats were showing signs of drying out.

MG8 *Cynosurus cristatus-Caltha palustris* grassland also corresponds to the SBL priority habitat Lowland fens but occurred only in small patches at the edges of ponds, in the drier edges on the north side of Loch Lieurary, and in fragments at Skinnet and Achanarras. Where recorded within the onshore study area, no habitat degradation was noted. It is a moderately groundwater-dependent classification that is usually dominated by grasses, and with marsh marigold (*Caltha palustris*), meadowsweet and buttercups (*Ranunculus spp*.) frequent. In Scotland it is known to occur in enclosed farmlands at low altitudes and it is known to be widely scattered in lowland Britain.

### Coastal grassland

MC9 *Festuca rubra-Holcus lanatus* maritime grassland and MC10 *Festuca rubra-Plantago spp.* maritime grassland are part of the Annex 1 H1230 Vegetated sea cliffs classification. MC9 is the wetter of these two classifications, and matches the SBL priority habitat Lowland fens, whereas MC10 is SBL priority habitat Maritime cliff and slopes. Within the onshore study area, approximately 40% of the MC9 grasslands were noted as being degraded as a result of drying and grazing. Where MC9 occurred as a mosaic with M27 mire habitat, approximately 80% of the habitats were heavily degraded and in poor condition.

MC9 is dominated by red fescue (*Festuca rubra*), with frequent sea plantain (*Plantago maritima*) and white clover (*Trifolium repens*). One sub-community was identified, the MC9a *Plantago maritima* sub-community, in which spring squill (*Scilla verna*) and grass of Parnassus (*Parnassia palustris*) were found.

MC10 grassland is similarly dominated by red fescue and sea plantain but contains more eyebrights (*Euphrasia spp*.). *E. arctica* was the most commonly recorded, but *E. scotica* and *E. foulaensis* were also recorded. Also present were spring squill and common mouse ear (*Cerastium fontanum*). The species poor MC10a *Armeria maritima* sub-community was also identified, in which sea plantain dominates to an even greater extent. The MC10 community is widely distributed in coastal areas.

These classifications form the majority of the vegetation along the coastal strip, particularly to the west of the Forss valley, and are the primary habitats in which Scottish primrose (*Primula scotica*) occurs. The MC10 examples gradually degrade into MG10a grassland further away from the shore.

### Grassland

U4 *Festuca ovina-Agrostis capillaris-Galium saxatile* grassland corresponds to H6230 Species rich grassland with mat-grass, in upland areas. It is an SBL priority habitat, Lowland dry acid grassland. In the onshore study area it occurs either as small patches, or within habitat mosaics, and is widespread but not common. It occurs on better drained acid soils where there is significant grazing. Although typically classified as an upland habitat, in Caithness it occurs at lower altitudes due to the prevailing climatic conditions. In the onshore study area it is generally species poor, though contributes to overall habitat diversity.

U5 *Nardus stricta-Galium saxatile* grassland is part of the H6230 Species rich grassland with mat-grass, in upland areas and is a habitat commonest in upland western regions. It was only recorded once within the study area, as part of a habitat mosaic near Houstry. It is a grazed grassland with relatively few species present, but in upland regions it is an important feeding and breeding habitat for skylarks, meadow pipits, and wheatears. Where it occurs at altitude it is also the primary habitat for mountain ringlet butterfly (*Erebia epiphron*).

### Swamps

S11 *Carex versicaria* swamp forms part of the SBL priority habitat Lowland fens and is a highly groundwater-dependent habitat. Within the onshore study area it was only found at the pond at Houstry Mains. Water horsetail was dominant at this site, with frequent meadowsweet, water forget-me-not (*Myosotis scorpioides*) and lesser spearwort (*Ranunculus flammula*). The pond margins were dominated by Yorkshire fog and cocksfoot grass (*Dactylis glomeratus*), with frequent marsh bedstraw. This pocket of S11 was considered to be in good condition with no degradation noted. Within the UK, this is a habitat most frequently seen in Scotland. It is typical of deeper waters and can be important for wildfowl. The rare sedge *Carex aquaticus* has been recorded in this habitat but was not seen during the surveys.

#### 10.6.4.3.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: Habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology and herbivory by deer disturbed or displaced during the construction stage.

As summarised in Table 10-17, direct habitat loss due to land-take will occur during the preparation of the working area at the landfall site, the excavation of trenches, the construction of access tracks and the construction of the onshore substation. Habitats may also be damaged through trampling and the tracking of vehicles. At present, the precise location of the onshore infrastructure has yet to be determined. Therefore, whilst it is not possible to provide a quantitative estimate of the loss of each habitat type, a precautionary approach has been adopted whereby the potential loss of any habitats within the onshore Project area has been considered.

In addition to direct habitat loss, there is the potential for direct and indirect impacts upon high sensitivity habitats and species during the construction elements of the onshore Project through the accidental release of fuel, excess silt, concrete leachate etc. into the groundwater and watercourses. The excavation of materials, in addition to directly

disrupting groundwater flow, can also remove the protective layer of soil and subsoil, making the groundwater beneath more vulnerable to pollution from leaks or spills from vehicles or equipment (SEPA Guidance Note 31). If carried out in close proximity to GWDTEs, such activities can have adverse impacts upon these receptors. In addition, disturbance and displacement of deer (as described in section 10.6.6.10) may indirectly impact vulnerable habitats, including those that have been re-instated.

### Heath

With the implementation of the embedded mitigation, the temporary HDD compound will be located approximately 150 m from the coastal cliff edge, with a commitment to ensure no ground-breaking or vegetation clearance works within 50 m of the cliff edge. As a result, when siting the onshore export cable, it may be possible to avoid direct habitat loss due to land-take, or disturbance and damage upon H7 as this high-sensitivity habitat is predominantly located along the coastline.

In the absence of appropriate mitigation, indirect effects (e.g. pollution or sedimentation) upon H7 may be anticipated during the construction of the onshore Project. However, as this heath habitat is not considered to be groundwater-dependent, and the embedded mitigation outlined in section 10.5.4 will ensure that an appropriate Pollution Prevention Plan is in place, no pathway for indirect effects is anticipated. Any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that direct habitat loss will be localised to a small area due to avoidance of the cliff edge and the micrositing of the route, impacts upon this high sensitivity habitat during construction are expected to be of a negligible magnitude. Therefore, no significant effect is predicted.

M15 and M16 habitats are present along the onshore study area. However, many of these habitat areas lie outwith or just within the onshore Project area. Therefore, it is considered possible that direct impacts; through habitat loss due to land-take, or disturbance and damage, upon the majority of these habitats can be avoided through the siting of the onshore export cable. However, complete avoidance may not be possible and adverse impacts upon these sensitive habitats may be anticipated. Where small areas of habitat are directly affected by the construction of the onshore Project, any adverse impacts will be reduced through the implementation of a targeted specific NVC survey within a 250 m buffer ahead of works, allowing for the micrositing of the route to reduce the extent over which the effect may occur, and to avoid particularly high-sensitivity areas and notable or protected plant species where possible. Furthermore, as the habitats will be re-instated following the short-term duration of the construction works; with the embedded mitigation outlined in section 10.5.4 ensuring that the turfs of these high-sensitivity areas are stored and reinstated appropriately, any impacts will be temporary and negligible in magnitude. Therefore, no significant effect is predicted.

In the absence of appropriate mitigation, indirect effects (e.g. pollution or sedimentation) upon M15 and M16 may be anticipated during the construction of the onshore Project. These habitats are considered to be moderately and highly groundwater-dependent respectively. However, as the embedded mitigation outlined in section 10.5.4 will ensure that an appropriate Pollution Prevention Plan is in place, no pathway for indirect effects is anticipated. Any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that

direct habitat loss can be minimised through the micrositing of the route, any adverse effects upon this high sensitivity habitat during construction are expected to be of a negligible magnitude. Therefore, no significant effect is predicted.

### Mire

Within the onshore study area, M24 occurs mainly as part of habitat mosaics within the floodplain of the Forss Water. M27 also occurs along the floodplain of the Forss Water in extensive patches, and often as a mosaic with other classifications elsewhere within the onshore study area, and M22 occurs in a small area on the northern banks of the Forss Water, approximately 1.3 km south of Forss. Due to the presence of other moderate to high sensitivity habitats along Forss Water, including pockets of mature broadleaved woodland which are rare within the onshore study area, avoidance of these areas is the preferred option. This may be achievable in some locations when siting the onshore export cable, particularly as the embedded mitigation measures ensure that high-sensitivity habitats will be avoided where possible, and river crossings will be minimised. However, complete avoidance of direct habitat loss due to land-take or disturbance and damage is unlikely to be possible and adverse impacts upon these sensitive habitats may be anticipated.

M23 is widespread throughout the onshore study area on wetter unimproved ground; including as parts of mosaics. While this habitat is botanically species poor it can be a valuable for invertebrates and birds. Many of these habitats are located around the onshore Project area boundary and extend into the buffer area where no direct impacts are anticipated. Therefore, it may largely be possible to site the onshore export cable to avoid the majority of these habitat areas. However, complete avoidance of direct habitat loss due to land-take or disturbance and damage it is considered unlikely. As the onshore export cable corridor will pass through some of these habitats; particularly those present as part of a mosaic, adverse impacts upon these sensitive habitats may be anticipated.

M25 is the commonest of the wet mire communities within the onshore study area, occurring on wet peaty soils. It is generally species poor, and most examples recorded showed signs of degradation through drying. A good example was present at Moss of Geise, with poorer examples recorded to the west of the study area; around Buckies and North Calder. As this habitat type was fairly ubiquitous across the onshore study area, it is considered likely that there will be some direct habitat loss during construction due to land-take or disturbance and damage. Therefore, adverse impacts upon these sensitive habitats are anticipated. S27 habitats were recorded during the survey visits. However, these largely lie just within the onshore Project area or outwith the area; within the 250 m buffer. Therefore, it is considered possible that direct impacts upon the majority of these habitats can be avoided through the siting of the onshore export cable. However, complete avoidance of direct habitat loss due to land-take or disturbance and damage may not be possible and adverse impacts upon these sensitive habitats may be anticipated.

For all of these high-sensitivity mire habitats, where there is potential for direct habitat loss, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs of these high sensitivity areas are stored and reinstated appropriately. Any adverse impact will be further reduced through the implementation of a targeted NVC survey within a 250 m buffer ahead of works, allowing for the micrositing of the route to reduce the extent over which the effect may occur, and to avoid particularly high-sensitivity areas and notable or protected plant species, where possible. Furthermore, due to the short-term duration of the construction activities and the proposed habitat reinstatement, any direct effect will be temporary and reversible.

While the aim will be to re-instate habitats along the route following the construction of the onshore export cable, construction works could result in irreversible indirect effects upon these habitats through accidental release of fuel,

concrete leachate etc. Furthermore, as these high sensitivity mire habitats are GWDTEs, permanent impacts could occur through the disruption of groundwater flows. However, implementation of the embedded mitigation detailed in section 10.5.4 should reduce the likelihood and severity of accidental release to a negligible level and ensure the protection of groundwater sources. Therefore, whilst the magnitude of the impact of the construction works is very much dependent on the route taken, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that direct habitat loss will be minimised where possible through the micrositing of the route, any adverse effects upon these high sensitivity habitats during construction are expected to be of a **negligible magnitude**. Therefore, **no significant effect** is predicted.

**Fen**

The sole example of **M10** within the onshore study area was a species-rich wet flush around the burn running from the reservoir above Oust farm. Due to the location of this habitat on the edge of the 250 m buffer area, no direct impacts, as a result of habitat loss due to land-take, or disturbance and damage, are anticipated. It is also considered unlikely that any indirect effects could occur due to the distance of this habitat from the onshore Project area. However, as M10 is an Annex I habitat which is also considered to be highly groundwater-dependent, the embedded mitigation measures outlined in section 10.5.4 should be implemented to ensure that there are no indirect impacts upon this important habitat. Therefore, whilst the magnitude of the impact of the construction works is very much dependent on the route taken, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that direct habitat loss will be avoided where possible through the micrositing of the route, any adverse effects upon this high sensitivity habitats during construction are expected to be of a **negligible magnitude**. Therefore, **no significant effect** is predicted.

Almost two thirds of the **M27** habitat identified during the NVC survey occurs within the 250 m buffer. The remainder are largely found along the River Thurso and Forss Water. No direct impacts, as a result of habitat loss due to land-take, or disturbance and damage, are anticipated upon those habitats outwith the onshore Project area, and it is considered possible that direct impacts upon the M27 habitats within the onshore Project area can be avoided through the siting of the onshore export cable, particularly as the embedded mitigation measures ensure that high-sensitivity habitats will be avoided where possible, and river crossings will be minimised. Where avoidance of this habitat is not possible, any adverse effects will be minimised through the short-term duration of the construction activities, the reversibility of the impact through habitat reinstatement and the micrositing of the route to reduce the extent over which the effect may occur and to avoid any particularly high-sensitivity areas.

M27 is moderately groundwater-dependent. Therefore, in addition to the potential for impacts through accidental release of fuel, concrete leachate etc., indirect effects upon these habitats could also occur through the disruption of groundwater flows, resulting in a permanent impact upon these high-sensitivity habitats; in spite of the temporary nature of the construction works. However, good practice measures adopted through the embedded mitigation detailed in section 10.5.4 should reduce the impact or likelihood of indirect effects to a negligible level. Therefore, whilst the magnitude of the impact of the construction works is very much dependent on the route taken, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that direct habitat loss will be avoided where possible through the micrositing of the route, any adverse effects upon this high sensitivity habitats during construction are expected to be of a **negligible magnitude**. Therefore, **no significant effect** is predicted.

MG8 occurs only in small patches at the edges of ponds in three distinct locations, the drier edges on the north side of Loch Lieurary, and in fragments at Skinnet and Achanarras. Due to the sizes of these habitats, it may be possible to avoid direct impacts, as a result of habitat loss due to land-take, or disturbance and damage, through the micrositing of the proposed route. Indirect impacts upon this moderately groundwater-dependent habitat can be minimised through the implementation of the embedded mitigation measures outlined in section 10.5.4. Any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, whilst the magnitude of the impact of the construction works is very much dependent on the route taken, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that direct habitat loss will be avoided where possible through the micrositing of the route, any adverse effects upon these high sensitivity habitats during construction are expected to be of a negligible magnitude. Therefore, no significant effect is predicted.

### Coastal grassland

With the implementation of the embedded mitigation, the temporary HDD compound will be located approximately 150 m from the coastal cliff edge, with a commitment to ensure no ground-breaking or vegetation clearance works within 50 m of the cliff edge. As a result, when siting the onshore export cable, it may be possible to avoid direct impacts, as a result of habitat loss due to land-take, or disturbance and damage, upon MC9 and MC10; high-sensitivity habitats which are predominantly located along the coastline. In the event that avoidance of these habitats is not possible, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs of these high sensitivity areas are stored and reinstated appropriately. Any adverse impact will be further reduced through the implementation of a targeted NVC survey within a 250 m buffer ahead of works, allowing for the micrositing of the route to reduce the extent over which the effect may occur, and to avoid particularly high-sensitivity areas and notable or protected plant species, where possible.

As these coastal grassland habitats are not considered to be groundwater-dependent, and the embedded mitigation outlined in section 10.5.4 will ensure that an appropriate Pollution Prevention Plan is in place, no pathway for indirect effects is anticipated. Any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that any direct habitat loss will be small-scale due to avoidance of the cliff edge and the micrositing of the route, any adverse effects upon these high sensitivity habitats during construction are expected to be of a negligible magnitude. Therefore, no significant effect is predicted.

### Grassland

The U4 and U5 grassland habitats occur primarily within the onshore study area as parts of habitat mosaics and are well-distributed throughout the area where soils are drier and subject to grazing. Approximately half of the U4/M25 habitat mosaic (the commonest of the U4 grasslands) falls within the onshore study area. Whilst the proposed onshore export cable corridor is not known, it is likely that there will be some direct impact as a result of habitat loss due to land-take, or disturbance and damage. U4 and U5 grasslands are not groundwater-dependent in themselves, but the M15 wet heath and M25 mire habitats that they primarily form mosaics with are, and so there may also be indirect effects (e.g. pollution or sedimentation) of construction work on these mosaics; though the U4 and U5 mosaic elements are likely to be less affected. Any indirect impacts associated with deer disturbance or displacement,

including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan.

Since measures are in place to avoid high sensitivity areas where possible, to limit effects upon drainage and groundwater, and habitat reinstatement procedures are also in place, it is assessed that any impacts of construction work upon U4 and U5 grasslands are likely to be of **negligible magnitude.** Therefore, **no significant effect** is predicted.

**Swamp**

**S11** is only present within the onshore study area as a small pond at Houstry Mains; south of Halkirk and **S27** is present within the onshore study area as a small pond to the north-east of Crosskirk. Whilst these habitats are located within the 250 m buffer; both lie outwith the onshore Project area. Therefore, **no direct impacts upon these habitats are anticipated** as a result of habitat loss due to land-take, or disturbance and damage.

S11 and S27 are considered to be highly and moderately groundwater-dependent respectively. Therefore, impacts upon groundwater conditions in the vicinity may indirectly affect these habitats. Furthermore, indirect impacts associated with deer disturbance and displacement may also occur. However, taking into account the temporary and short-term nature of the construction activities, and the implementation of embedded mitigation outlined in section 10.5.4 to reduce the likelihood and severity of accidental release, to protect groundwater sources, such impacts are likely to be of a **negligible magnitude.** Therefore, **no significant effect** is predicted.

#### 10.6.4.3.3 Potential operation and maintenance effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. In the event that more significant maintenance works are required, such non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, in line with SEPA Guidance Note 31 (SEPA, 2017), should any significant maintenance works be required within 250 m of GWDTEs, then the good practice measures outlined in section 10.5.4 will be implemented prior to works being undertaken. No additional mitigation is required.

Whilst maintenance works may result in indirect effects on habitats, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release, the potential for indirect effects to occur during operation is generally significantly lower than that during construction.

As routine maintenance works during the operation are likely to be of a limited extent and taking into account the embedded mitigation listed in section 10.5.4, the impact is defined as being of **negligible magnitude.** Therefore, **no significant effect** is predicted on habitats of high sensitivity.

#### 10.6.4.3.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on habitats of high sensitivity.

## 10.6.5 Potential effects on receptors of medium sensitivity

### 10.6.5.1 Habitats of medium sensitivity

For a detailed assessment of the current baseline of these habitat types within the onshore study area, see SS6: Terrestrial non-avian ecology technical survey report. Justification of the classification of the habitat types as 'medium sensitivity', including their groundwater dependency is provided in Table 10-15 and Figures 10-3 and 10-4 show the locations of the NVC habitats recorded within the northern and southern sections of the onshore study area respectively. The areas of the NVC habitats recorded (both extent within the study area (to buffer) and within the onshore Project area (excluding buffer)) are provided in Table 10-9. For context, this table also provides the percentage of the onshore Project area made up of each NVC habitat type. Based on the results of the Project specific surveys:

- Approximately 15% (~485 ha; just under 5 $km^2$) of the onshore Project area has NVC communities corresponding with Annex I habitats of medium sensitivity Table 10-9); and
- Approximately 1% (~35 ha; less than 0.5 $km^2$) of the onshore Project area has habitat mosaics recorded of medium sensitivity (Table 10-10).

As the onshore export cable route is to be defined, direct impacts are not expected to affect the entire area.

As summarised in Table 10-17, direct habitat loss due to land-take will occur during the preparation of the working area at the landfall site, the excavation of trenches, the construction of access tracks and the construction of the onshore substation. Habitats may also be damaged through trampling and the tracking of vehicles. At present, the precise location of the onshore infrastructure has yet to be determined. Therefore, whilst it is not possible to provide a quantitative estimate of the loss of each habitat type, a precautionary approach has been adopted whereby the potential loss of any habitats within the onshore Project area has been considered.

In addition to direct habitat loss, there is the potential for indirect impacts upon medium sensitivity habitats during the construction of the onshore Project through the accidental release of fuel, excess silt, concrete leachate etc. into the groundwater and watercourses. The excavation of materials, in addition to directly disrupting groundwater flow, can also remove the protective layer of soil and subsoil, making the groundwater beneath more vulnerable to pollution from leaks or spills from vehicles or equipment (SEPA Guidance Note 31). If carried out in close proximity to GWDTEs, such activities can have adverse impacts upon these receptors. In addition, disturbance and displacement of deer may indirectly impact vulnerable habitats, including those that have been re-instated.

#### 10.6.5.1.1 Baseline

### Grassland

MG5 *Cynosurus cristatus-Centaurea nigra* grassland is a species-rich classification, usually rich in bryophytes. MG5 grassland is typical of less intensive management and more traditional farm practices, with light grazing and cutting for hay. In the onshore study area the largest extent is the Moss of Halkirk, but it also occurs in small patches above Oust (where it is rich in eyebrights, *Euphrasia* spp.) and adjacent to the pumping station near Halkirk on the River Thurso. This habitat type supports rare *Euphrasia* spp. and corresponds with an SBL priority habitat.

MG9 *Holcus lanatus-Deschampsia cespitosa* grassland makes up part of an SBL priority habitat and is a moderately groundwater-dependent terrestrial ecosystem. This classification is common and widespread within the onshore study area where soils are damp or periodically inundated, occurring in river valleys, poorly drained fields, and at the margins of wetland habitats.

### Swamp

S8 *Scirpus lacustris ssp. lacustris* swamp (present as the S8c *Equisetum fluviatile* sub-community), S9 *Carex rostrata* swamp (occurring only as the S9b *Carex rostrata* sub-community), S10 *Equisetum fluviatile* swamp, S14 *Sparganium erectum* swamp (only seen as S14c *Mentha aquatica* sub-community), S19 *Eleocharis palustris* swamp (present only as S19b *Agrostis stolonifera* sub-community) and S22 *Glyceria fluitans* water-margin vegetation all fall under the SBL priority habitat classification of Lowland fens. Within the onshore study area these classifications are represented by marginal vegetation around small ponds and larger water-filled ditches, usually within grassland or mire communities, but also occurs as small patches of riverside vegetation along the Forss Water and River Thurso. These habitats are considered to appreciably enrich the ecological resource in the local area, providing additional habitats for invertebrates, amphibians and birds. Water horsetail, branched bur-reed (*Sparganium erectum*), lesser spearwort and soft rush (Juncus effusus) were all commonly seen in these assemblages.

### Woodland

Woodlands are scarce within the onshore study area, except as commercial conifer plantations or as young planted woodlands that do not match any NVC classifications.

W4 *Betula pendula-Molinia caerulea* woodland may be part of the H91C0 Caledonian forest Annex I classification H91C0 Caledonian forest, but within the onshore study area this is not to be an appropriate classification, as W4 is only represented by small woodland fragments close to farms at Achalone and Houstry.

An area of W6 *Alnus glutinosa-Urtica dioica* woodland is present adjacent to the Forss Hotel. It is a mature woodland area dominated by sycamore, but with alder occurring frequently; particularly within wetter areas close to the Forss Water. While W6 corresponds to the Annex I habitat H91E0; Alder woodland on floodplains, the woodland present on site is considered to be a poor example of this nationally important habitat as it is used as an amenity space and experiences considerable disturbance from human activity.

Both W4 and W6 woodlands fall under the SBL priority habitat Wet woodlands. W4 is highly groundwater-dependent, and W6 is moderately groundwater-dependent.

W8 *Fraxinus excelsior-Acer campestre-Mercurialis* perennis woodland includes H9180 Mixed woodland on base-rich soils associated with rocky slopes, and is also an SBL priority habitat Lowland mixed deciduous woodland. The Annex I categorisation is a poor match for the only example seen, a riverside woodland next to Braal castle, which contains large mature Sycamore (*Acer pseudoplatanus*). This woodland shows signs of extensive human disturbance, including fires.

W21 *Crataegus monogyna-Hedera helix* scrub includes part of the Annex I classification H5130 Juniper on heaths or calcareous grassland, but this is a poor match for the only example seen, as no juniper was identified as present. The only example seen in the onshore study area was an area of hedge and scrubland at Achanarras, for which the W21 classification was the best match. This site is relatively species poor, but of conservation value owing to the general scarcity of woodland habitat within the onshore study area.

All of these woodland areas are considered to be medium sensitivity receptors.

#### 10.6.5.1.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: Habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology and herbivory by deer disturbed or displaced during the construction stage.

There is the potential for all habitats of medium sensitivity to be impacted by the construction works, with the excavation of trenches, the construction of access tracks and the construction of the onshore substation resulting in direct habitat loss. Habitats in the immediate vicinity may also be damaged through trampling and the tracking of vehicles.

During the construction elements of the onshore Project, there is the potential for indirect impacts through the accidental release of fuel, excess silt, concrete leachate etc. into the groundwater and watercourses. The excavation of materials, in addition to directly disrupting groundwater flow, can also remove the protective layer of soil and subsoil, making the groundwater beneath more vulnerable to pollution from leaks or spills from vehicles or equipment (SEPA Guidance Note 31). If carried out in close proximity to GWDTEs, such activities can have adverse impacts upon these receptors. In addition, disturbance and displacement of deer (as described in section 10.6.6.10) may indirectly impact vulnerable habitats, including those that have been re-instated.

For the woodland areas, there is also potential for works to result in indirect effects due to construction-related dust pollution causing a reduction in tree health.

The majority of the MG5 species-rich grassland falls within the onshore study area, with only a small area (0.41 ha) falling within the onshore Project area. It may therefore be possible to avoid any direct or indirect impacts upon this botanically diverse community. However, in the event that avoidance of this habitat is not possible, the extent of habitat loss will be extremely small (< 1 ha) and the embedded mitigation outlined in section 10.5.4 will ensure that turfs stored and reinstated appropriately; resulting in a temporary effect on the habitat. Measures taken to reduce the likelihood and extent of any accidental release will also minimise any indirect impacts upon this habitat and any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, the impacts are likely to be temporary and of negligible magnitude. Therefore, no significant effect is predicted.

MG9 grassland is widely distributed throughout the study area, as a stand-alone habitat and as part of mosaics. Whilst it is considered to be a medium-sensitivity receptor, it is a common and widespread habitat in the lowlands, throughout the UK. As the habitat is widely distributed throughout the onshore study area, it is likely that some direct habitat loss will occur, although the extent over which the effect will occur will be minimised through the siting of the onshore export cable. Since this habitat is moderately groundwater-dependent it may also be subject to indirect impacts during construction.

This habitat often develops slowly (Rodwell, 1992) so there is further potential for significant loss of this habitat, and habitat reinstatement may be more difficult. However, with the implementation of the embedded mitigation for the reinstatement of these habitats through the appropriate storage and reinstatement of turfs, with measures taken to avoid such sites where possible, and with appropriate measures in place to limit the effects on groundwater and drainage (see section 10.5.4), it is anticipated that any adverse effects resulting from the construction of the onshore Project will be of a short duration and reversible. Any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. It is assessed that any impact upon MG9 grasslands will be of negligible magnitude. Therefore, no significant effect is predicted.

### Swamp

The S8c, S9b, S10, S14, S19b and S22 classifications are all represented by very small sites scattered throughout the onshore study area, and the majority of the S9b site falls within the buffer zone. Whilst they are all aquatic sites, none are directly groundwater-dependent, though they may be affected by run-off or sedimentation. It is possible that one or more of these sites may be affected by the onshore export cable corridor and, owing to the small size of these elements, individual sites may be entirely lost. However, it is likely that most will be minimally affected or unaffected, particularly as the extent over which the effect will occur can be further minimised through the siting of the onshore export cable. Therefore, the extent of habitat loss is likely to be small and, with appropriate habitat reinstatement measures outlined in section 10.5.4, any adverse effects will be temporary in nature. Therefore, with measures in place to reduce impacts upon drainage and to minimise watercourse crossings, it is assessed that any impacts on these classifications will be of negligible magnitude. Therefore, no significant effect is predicted.

### Woodland

Only two very small W4 wet woodland areas were recorded within the onshore study area, both of which are close to existing farms and are therefore unlikely to be directly affected by construction works. The only example of W6 wet woodland occurs next to the Forss Hotel, as a mature woodland used as a community resource. This area is the only pocket of woodland designated under the Ancient Woodland Inventory within the onshore Project area. There is a commitment to avoid any direct or indirect effects upon this area of woodland, or any other areas of mature woodland, as detailed in chapter 12: Land use and other users, including forestry. The W8 Braal castle woodland lies between Halkirk and the River Thurso. This mature area of woodland is located within the onshore study area, but lies outwith the onshore Project area. As a result, no direct impacts upon this pocket of woodland are anticipated. W21 scrubland is represented by a small patch near Achanarras, between Spittal and Halkirk. In terms of woodland areas, the Project area avoids designated woodlands such as the ancient woodland present at Forss, with no felling in highly sensitive areas proposed.

Small areas of young, mixed plantation woodland (unclassified by the NVC survey and considered to be of negligible sensitivity) will be lost during construction. However, local rerouting will be utilised where possible to limit the direct habitat loss, see chapter 12: Land use and other users, including forestry.

In the worst case scenario, 0.28 ha of woodland will be lost during construction at the Hill of Howe; at approximate central grid reference ND 09875 62992, and 9.3 ha of FLS woodland at Sibster Forest; at approximate central grid reference ND 14950 59332. This will result in a percentage loss of 3.8 and 7.15% of each of these woodland areas respectively. The Hill of Howe woodland is a 7.22 ha strip of young planted mixed woodland with species including goat willow, sycamore and Scot's pine (*Pinus sylvestris*). Sibster Forest, an area of over 130 ha of young mixed woodland, is comprised of species including ash (*Fagus sylvatica*), rowan (*Sorbus aucuparia*), sycamore, Scot's pine, hazel and Sitka spruce. Broom (*Cytisus scoparius*), hawthorn (*Crataegus monogyna*) and dog rose (*Rosa canina*) have been planted in the understorey. Due to the age class of the trees present within both pockets of woodland, and the fact that both woodland areas include species not native to this part of Scotland, it will be possible to adequately compensate for the loss of these habitats through habitat reinstatement. The woodland areas will be replaced on a like-for like-basis, with a minimum of 9.58 ha of mixed woodland planted elsewhere.

To enhance the biodiversity of the compensation woodland areas, all planted trees should be native and of local provenance, with structural diversity created through the inclusion of native understorey shrubs and ground flora, and the retention of deadwood. Diversity in the age class of the woodland areas can also be created over time by felling groups of trees and planting others.

In addition to being able to adequately compensate for the loss of these woodland areas as both are at thicket stage, neither of these young planted woodland areas match any sensitive woodland habitats identified during NVC surveys, and are considered of negligible sensitivity. Therefore, no impact on sensitive woodland habitats (W4, W6, W8 and W21) is predicted as a result of felling during construction.

For all woodland areas, there is the potential for the construction of the onshore Project to adversely impact the health of the trees present through the release of dust and through accidental release of fuel, concrete leachate etc. Furthermore, indirect impacts upon W4 and W6, highly and moderately groundwater-dependent habitats respectively, could occur through the disruption of groundwater flows. However, good practice measures adopted through the embedded mitigation detailed in section 10.5.4 should reduce the impact or likelihood of indirect effects to a negligible level. Woodland habitats are particularly sensitive to indirect impacts from deer disturbance or displacement during the construction stage. However, any indirect impacts associated with deer disturbance or displacement, including on habitats re-instated, will be adequately managed through the implementation of a Deer Management Plan. Therefore, taking into account the temporary and short-term nature of the construction activities, the fact that direct habitat loss will be avoided where possible through the micrositing of the route, and that any young to immature woodland habitats directly impacted during the works will be reinstated (with any impacts of deer herbivory on these habitats re-instated managed through a Deer Management Plan), any adverse effects upon these medium sensitivity habitats during construction are expected to be of a negligible magnitude. Therefore, no significant effect is predicted.

#### 10.6.5.1.3 Potential operation and maintenance effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. However, in the event that more significant maintenance works are required, such non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, should any significant maintenance works be required within 250 m of GWDTEs, the good practice measures outlined in section 10.5.4 will be applied prior to works being undertaken.

Operation and maintenance works may result in indirect effects on habitats, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for indirect effects to occur during the operation and maintenance of the Project is generally significantly lower than that during construction.

As routine maintenance works during the operation are likely to be of a limited extent, and taking into account the embedded mitigation listed in section 10.5.4, the impact is defined as being of negligible magnitude. Therefore, no significant effect is predicted on habitats of high sensitivity.

In line with SEPA Guidance Note 31 (SEPA, 2017), should any significant maintenance works be required within 250 m of GWDTEs, then the good practice measures outlined in section 10.5.4 will be implemented prior to works being undertaken. No additional mitigation is required.

#### 10.6.5.1.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on habitats of medium sensitivity.

### 10.6.5.2 Scottish primrose

#### 10.6.5.2.1 Baseline

Scottish primrose is an endemic plant that occurs only in Caithness, Sutherland and Orkney (Morris, 2009). It is endemic to Scotland and is included in the SBL watching brief and HBAP, which means that its populations should be monitored to ensure that it is not declining. Scottish primrose is a key feature of Ushat Head SSSI; abutting the eastern boundary of the northern extent of the onshore Project area, Holburn Head; approximately 3.4 km north-east and Red Point Coast SSSI; approximately 4.6 km north-west of the onshore Project area. The population at Red Point Coast SSSI is thought to hold over 1% of the world population of Scottish primrose. Although there are many historic records of this species along the coastline within the onshore study area, there have been no records of this

species in the area within the past 10 years. However, coastal grassland and maritime heath suitable for supporting this species can be found within the onshore study area and some may be present within the site itself.

During the field survey, Scottish primrose was found to be ubiquitous within 50 m of the shore in lightly grazed areas (see Figure 10-9). The plant can only survive in areas of short vegetation or bare soil. Inland, the vegetation surveyed was rough grassland and much less suitable, with no Scottish primrose found.

#### 10.6.5.2.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology during the construction stage.

Scottish Primrose are known to be ubiquitous within 50 m of the cliff edge; within the onshore Project area. Therefore, in the absence of appropriate mitigation, the onshore Project may result in the irreversible loss of populations of this protected plant. Direct impacts could occur through ground-clearance works within 50 m of the cliff edge, trampling by site workers and the tracking of vehicles through the areas of coastal grassland.

There is also the potential for construction activities to indirectly impact Scottish primrose populations through accidental release; including silt, concrete leachate, fuel and dust. The coastal grasslands within which Scottish primrose are found are not considered to be GWDTEs. Therefore, no pathway for effect through groundwater sources is anticipated. However, disturbance and displacement of deer (as described in section 10.6.6.10) may indirectly impact vulnerable habitats, including those that have been re-instated.

Scottish Primrose is a SBL and HBAP priority species. It is an endemic plant that occurs only in Caithness, Sutherland and Orkney (Morris, 2009). It is included in the SBL watching brief and HBAP, which means that its populations should be monitored to ensure that it is not declining. Scottish primrose is a designated feature of Red Point Coast SSSI; a site located approximately 4.6 km north-west of the onshore Project area. The population at Red Point Coast SSSI holds over 1% of the world population of Scottish primrose.

Through the implementation of the embedded mitigation; where the temporary HDD compound will be located approximately 150 m from the coastal cliff edge, with a commitment to ensure no ground-breaking or vegetation clearance works within 50 m of the cliff edge, no direct impact upon Scottish primrose is anticipated. However, in the absence of appropriate mitigation, indirect impacts may be anticipated through accidental release; including silt, concrete leachate, fuel and dust.

At a distance of 150 m from the coastal cliff edge, and with the implementation of a Pollution Prevention Plan (see section 10.5.4), no disturbance or indirect effects are predicted. As such, the magnitude of impact of the construction works upon Scottish primrose will be of negligible magnitude and no significant effect is predicted.

#### 10.6.5.2.3 Potential operation and maintenance effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: disturbance due to maintenance works during the operation and maintenance stage.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. Therefore, no further direct habitat loss or direct impact upon Scottish primrose is anticipated. In the event that more significant maintenance works are required, such as the non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, should any significant maintenance works be required, the good practice measures outlined in section 10.5.4 will be applied prior to works being undertaken.

Maintenance works may result in indirect effects on habitats and plant species, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for indirect effects to occur during operation is generally significantly lower than that during construction.

No direct affects are anticipated due to the commitment to ensure no ground-breaking or vegetation clearance works within 50 m of the cliff edge. The implementation of the embedded mitigation detailed in section 10.5.4 will reduce the likelihood of any indirect effects upon Scottish primrose as a result of the routine operation and maintenance activities. In the unlikely case that an accidental release occurs, this can be managed through the application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity of habitats supporting notable plant species. As a result, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.5.2.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the Project is anticipated. As for cable laying, the excavation and removal of the cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect upon Scottish primrose is anticipated.

### 10.6.5.3 Bats

#### 10.6.5.3.1 Baseline

The distribution of bats in Scotland is limited at the northern extent by factors including short summer nights, lower temperatures and wind exposure; in particular in coastal areas. In the Caithness region, the distribution of bats is likely also limited by the comparative lack of woodland areas and mature trees. Bats, in particular woodland specialists such as the brown long-eared bat, are known to use pockets of woodland for foraging and will often roost in close proximity to such habitats. Bats will also use woodland edges for commuting and as shelter from the elements to optimise foraging success. The woodland resource in the area is currently limited to approximately 10.5 ha of mature broadleaved woodland around Forss, and a relatively small number of other isolated pockets of mixed and coniferous plantation elsewhere (see the NVC maps (Figure 10-3 and Figure 10-4) for the location of pockets of woodland and Figure 10-10 and Figure 10-11 below for their BCT category). Outwith the more mature pockets of woodland in Forss

and along the River Thurso; to the east of Halkirk, the woodland areas are generally comprised of young to semi-mature trees with few features suitable for use by roosting bats.

No statutory designated sites which include bats as a qualifying feature were identified within 5 km of the onshore Project area. Desk study and consultation responses revealed three records of bats within the onshore study area since 2012. These records, provided by the HBRG, comprised one record of Daubenton's bat (*Myotis daubentoniid*) and two records of common pipistrelle (*Pipistrellus pipistrellus*).

The findings of the bat survey are summarised in Section 10.4.4.4 and detailed in SS6: Terrestrial non-avian ecology technical survey report. In addition to numerous buildings and built structures with bat roost potential, the survey of the onshore study area identified rock faces (both manmade and natural) and trees with the potential to support roosting bats. Whilst large portions of the onshore study area are comprised of wide expanses of farmland, suitable commuting and foraging features such as tree lines, watercourses and pockets woodland were noted.

For all of the buildings, built structures, rock faces, trees and woodland areas on site, more detailed inspection (including internal surveys for buildings, aerial inspections of trees and nocturnal surveys as required) would be required to fully ascertain their bat roost suitability and status with regard to roosting bats.

Figure 10-10 and Figure 10-11 show the locations of the potential bat roost features within the northern and southern portions of the onshore study area respectively. Full details of the bat roost potential survey results are provided in Tables A2.1 and A3.1, see SS6: Terrestrial non-avian ecology technical survey report.

#### 10.6.5.3.2 Potential construction effects

As set out in Table 10-12, bats have been assessed against the following impacts: disturbance and damage to bats and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

There is the potential for construction activities including the construction of the temporary compounds, access tracks, excavation of HDD bores and cable trenches, and construction of a new substation, to cause disturbance to commuting, foraging and roosting bats. Loss of suitable foraging habitat and illumination of potential roost features and foraging habitats could lead to the displacement of bats from an area due to a lack of foraging resource and roost abandonment. Bats also have the potential to be affected during the construction elements of the Project through the direct modification or destruction of roost locations within trees, buildings and other structures, resulting in direct or indirect mortality, and can also be injured or killed by site plant and other vehicles.

For woodland areas, in the worst case scenario a maximum of 9.58 ha of young, mixed, plantation woodland will be lost during construction (see Section 10.6.5.1.2 for more detail). Due to the size and age of the trees present within these woodland areas, no notable bat roost features were identified, with the woodland blocks considered to be of negligible to low suitability for roosting bats. Whilst the trees may provide some foraging and commuting opportunities for bats, the proposed woodland planting (as detailed in the outline BEP, which accompanies the PPP Application) will adequately compensate for the loss of these woodland areas and will ensure that the Project has no effect on the foraging resource available to bats in the area.

Bat foraging and roost sites can be affected by lighting (BCT, 2014 and Miles *et al.*, 2018). Light falling on a bat roost exit point will delay bats from emerging, reducing the time available to them for foraging. As the main peak of

nocturnal insect abundance occurs at and soon after dusk, a delay in emergence will result in the loss of this vital feeding time. At worst, direct illumination of a bat roost location can also cause roost abandonment, in particular for more light-sensitive species such as brown long-eared bats. As a result, impact to bat roosts from lighting could be deemed a breach of the protection afforded to bats and their roosts by legislation. As bats are often faithful to their roosts over may years, such disturbance can have a significant effect on the future of the colony.

The illumination of suitable foraging habitats and commuting routes can also affect bat behaviour. Different species of bat react differently to lighting (Stone *et al.*, 2015). Whilst some species are attracted to lighting due to the presence of higher numbers of insects around illuminated areas, others avoid lighting. For species such as pipistrelle bats. which are often recorded foraging around lights, this can artificially enhance a foraging area. However, bringing bats out into the open can increase the risk of predation to bats; in particular juvenile bats. Furthermore, as artificial lights can attract insects away from darker areas, creating a 'vacuum effect', light intolerant species can be affected due to a reduction in prey species within their favoured foraging sites.

The embedded mitigation measures detailed in section 10.5.4 is required for bats to avoid any significant impact and as a good practice measure to ensure that faunal species are protected during construction. With the implementation of this embedded mitigation, any impacts upon bats are considered to be of negligible magnitude and so no significant effect is predicted.

#### 10.6.5.3.3 Potential operation and maintenance effects

As set out in Table 10-12, bats have been assessed against the following impacts: disturbance to bats and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

Human activities related to the operation and maintenance of onshore infrastructure, and the vibration, noise and lighting resulting from the operation of the onshore substation, have the potential to cause temporary and localised disturbance effects on bat species. Due to the unpredictable nature of the requirement for maintenance works, it is difficult to determine precise effects on bat species. However, as discussed below, it is expected that maintenance activities would be infrequent and small scale, resulting in impacts of a lower magnitude than those during construction.

As bats are likely to forage or commute through the onshore Project area, they may be more vulnerable to disturbance through additional light or noise pollution during operation. However, whilst external lighting will be used to illuminate the substation buildings, this will be intermittent and only used when people are on site. Similarly, the level of vibration and noise resulting from the operation of the onshore Project is likely to be of a negligible magnitude and confined to the onshore substation. Therefore, particularly considering the current levels of lighting and disturbance around the onshore substation location, disturbance impacts upon bats are likely to be negligible and effects are assessed as not significant.

The magnitude of the impact of the operation and maintenance of the onshore Project upon bats will be dependent on the scale, magnitude and location of the works. The operation of the onshore Project and any routine maintenance works may result in temporary and small-scale disturbance impacts upon foraging and commuting bats that will not affect the ecological integrity or conservation status.

During the routine maintenance of the onshore infrastructure, direct injury or mortality could occur through the movement of site vehicles. However, it is expected that maintenance activities would be infrequent and small scale, with a limited amount of traffic to and from the onshore substation predicted.

Direct harm to bats could occur in the event that significant maintenance works are required for the onshore substation buildings. If that situation arises, then works should be preceded by consultation with a licensed bat ecologist. If it is considered possible that the proposed maintenance works could result in the disturbance, modification or destruction of potential bat roost features (if present), surveys will be required to determine the status of the structure with regard to roosting bats. In the event that a bat roost is identified, and disturbance, modification or destruction of the roost cannot be avoided, then it will be necessary to secure a NatureScot bat Derogation Licence prior to works commencing. Appropriate mitigation and compensation measures (informed by the results of the surveys) will ensure that the population of bats on site are maintained at a favourable conservation status.

With the implementation of the embedded mitigation measures detailed in section 10.5.4, the impact of the onshore Project upon bat species during the operation and maintenance of the site is considered to be of **negligible magnitude.** Therefore, **no significant effect** is predicted.

#### 10.6.5.3.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, **no significant effect** is predicted on bats.

### 10.6.5.4 Otter

#### 10.6.5.4.1 Baseline

Otter can be found throughout Scotland in a wide variety of freshwater and coastal habitats, although signs can also be found some distance from waterways as they commute between foraging locations. They occupy large riparian territories, the length of which will vary depending on factors such as the sex of the otter and the quality of the habitat. Home ranges for males can be around 32 km and 20 km for females (NatureScot, 2020b). Historically, one of the main threats to otter was the pollution of rivers/watercourses, resulting in a sudden and rapid decline in the population size of otter in the 1950s. With the banning of organochlorine pesticides in the 1980s, water quality improved and the otter population and range have since expanded.

Caithness and Sutherland Peatlands SAC / Ramsar, which includes otter as a qualifying feature, is approximately 5.4 km from the onshore Project area. Desk study and consultation responses revealed two otter records from the HBRG data search within the onshore study area and one further record was received from RSPB data. The HBRG otter records related to dead otters found on roads, one on the A836 near Buldoo and one on a road near Sordale (six-figure grid reference provided only). The RSPB data was located to the west of the onshore Project area boundary, near Broubster.

The field surveys identified evidence of otter activity (including two holts, a couch, spraint sites, paths and slides) along named watercourses and drains throughout the onshore study area, with higher levels of activity recorded along the River Thurso and Forss Water. In addition to suitable foraging opportunities, these high-quality commuting and foraging habitats would provide otter with easy access from the coast to beyond the onshore Project area to the south. Habitats of moderate to low suitability for otter included smaller watercourses and filed drains.

#### 10.6.5.4.2 Potential construction effects

As set out in Table 10-12, otter has been assessed against the following impacts: disturbance and damage to otters and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

Survey data indicate that otter make use of the onshore study area, with holts, couches, latrine sties, paths, tracks and feeding signs identified during the survey visits. Therefore, in the absence of appropriate mitigation, there is the potential for works to result in direct injury or mortality to otter through the movement of plant and other site vehicles, or as a result of otter becoming trapped within excavations or uncapped piping. Construction activities could also result in the destruction of protected structures such as holts and couches.

There is also the potential for indirect effects due to construction activities causing vibration, noise and lighting disturbance to commuting, foraging and resting otter, in addition to the possible temporary severance of commuting habitat. Accidental release (including silt, concrete leachate, fuel and dust) could result in a reduction in water quality, with direct effects on the availability and quality of fish prey species.

Whilst there is the potential for construction activities to adversely impact upon otter populations within the onshore study area, the implementation of the embedded mitigation listed in section 10.5.4 will reduce this impact. These mitigation measures will reduce the risk of accidental release and, in the unlikely case that an accidental release occurs, this will be managed through the application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity or conservation status of otters on the Caithness and Sutherland Peatlands SAC / Ramsar.

The embedded mitigation measures will also reduce the likelihood of any direct or indirect impacts associated with the ground clearance works, with appropriate methods of work followed and exclusion zones implemented around any holts and shelters, where possible. Any loss or disturbance of designated sites, including holts and other shelters, will only be undertaken under a NatureScot otter Derogation Licence, with appropriate mitigation and compensation measures implemented to ensure that otter populations are maintained at a favourable conservation status, without affecting qualifying features of designated sites. Due to the temporary and short-term nature of the construction activities, the fact that watercourse crossings (including smaller tributaries) and the impact of these crossings will be minimised through appropriate methods of work where possible, and as the habitats present will be reinstated as part of the proposed works, any disturbance impacts during construction will be temporary in nature and unlikely to result in a significant effect upon otter. Furthermore, as the main area of habitat loss will be at the onshore substation (6.25 ha), which is likely to impact only or predominantly heavily grazed pasture grassland, which is suboptimal habitat for otter foraging or shelter, no long-term loss of valuable habitat for this species is predicted.

It should be noted that whilst the otter feature of Caithness and Sutherland Peatlands SAC is currently in unfavourable condition, they are widespread in the surrounding area with presence remaining stable, with close to 100% occupancy, and the Scottish population is estimated at 8,000 individuals (Green & Green, 1997; Scott, 2011; Chanin, 2013; Grogan

*et al.*, 2013; Findlay *et al.*, 2015). In the unlikely worst case event of the loss of a shelter due to disturbance during construction, this will be temporary, and reversible in the short term, without any measurable impact on the distribution or population of otters.

As a result, given the implementation of the embedded mitigation measures detailed in section 10.5.4 any impacts upon otter are considered to be of **negligible magnitude** in an unlikely worst case scenario where a single otter shelter is affected, and more likely to be negligible, and so **no significant effect** is predicted.

#### 10.6.5.4.3 Potential operation and maintenance effects

As set out in Table 10-12, otter has been assessed against the following impacts: disturbance to otters and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

Human activities related to maintenance of onshore infrastructure have the potential to cause temporary and localised disturbance effects on ecological features such as otter. There is also the potential for the ongoing operation of the substation, and the resultant increase in vibration, noise and lighting, to disturb commuting, foraging and resting otter. Some potential limited impact may be anticipated as a result of visual inspection and non-routine maintenance (as required) to onshore cables.

Due to the unpredictable nature of the requirement for maintenance works, it is difficult to determine precise effects on otter. However, it is expected that maintenance activities would be infrequent and small scale, resulting in disturbance effects of a lower magnitude than those during construction. Nevertheless, potential for the disturbance and mortality of otter during the operation of the site has been identified. There is the potential for injury or mortality to otter from vehicular traffic during maintenance activities, and accidental release during the operation and maintenance of the site could result in a reduction in water quality, with direct effects on availability and quality of fish prey species.

During more significant maintenance works; where habitat loss as a result of excavation to assess and repair any faults along the onshore export cable corridor may occur, impacts upon otter may be anticipated. The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. Works in close proximity to watercourses and any confirmed or potential holt sites are likely to result in a greater impact upon otter. However, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during construction.

As otter are likely to forage or commute through the onshore Project area, they may be more vulnerable to disturbance through additional light pollution during operation. However, it is understood that whilst external lighting will be used to illuminate the substation buildings, this will be intermittent and only used when people are on site. Passive Infrared (PIR) sensor lighting may be provided around the external perimeter of the buildings. Therefore, considering the current levels of lighting and disturbance within the onshore Project area, any disturbance impacts upon otter are likely to be negligible and effects are assessed as not significant with no additional mitigation required.

It is estimated that there will be a limited amount of traffic to and from the substation for general operation and maintenance purposes (around four vehicles per month unless there are any unexpected faults). However, as there was no evidence of otter activity in the vicinity of the proposed substation, and the highest-quality habitats for otter

in the onshore Project area, the River Thurso and Forss Water, are over 2 km northwest of proposed substation site, any effects as a result of maintenance to the onshore substation are likely to be extremely unlikely and minimal.

Non-routine maintenance to onshore cables due to events causing deterioration or damage of the areas surrounding the cables, could impact upon otter. The magnitude of impact will be dependent on the location and scale of the proposed works. In the event that the works are likely to occur within 200 m of a watercourse, then pre-works surveys should be undertaken to ensure that otter will not be affected by the proposed works.

In the absence of appropriate mitigation, there is some potential for contamination of groundwater and watercourses during the operation of the onshore Project. However, the embedded mitigation will ensure that the risks of direct harm to individuals are reduced and that accidental release which could result in indirect effects are unlikely to occur, or to occur at a low frequency and intensity. Therefore, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.5.4.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on otters.

### 10.6.5.5 Pine marten

#### 10.6.5.5.1 Baseline

Pine marten distribution includes the north of Scotland, with established populations recorded within the Caithness area. Abundant in the 18th century, pine marten numbers dramatically fell in the 19th century as a result of persecution through predator control measures from shooting estates and habitat loss and fragmentation. Deforestation reduced the number of traditional den opportunities through the removal of mature trees that would likely have larger cavities. Pine marten home ranges are variable in Scotland, geographically and by sex, with previous records showing males in Galloway having home ranges up to 33 $km^2$ and home ranges of females in Monrangie as less than 1 $km^2$ (Caryl, 2008). Pine marten, whilst considered to be woodland specialist, can have large home ranges and will exploit a range of habitats including scrub and woodland edges, riparian habitats, rough grasslands and field edges. Whilst pine marten is particularly associated with well forested landscapes, Scottish pine marten have adapted to habitats with lower woodland cover, including those found in the northwest Highlands (Balharry, 1993). In mixed habitats where the woodland cover is more fragmented, the species will occur at relatively low densities as the animals require larger home ranges to fulfil resource requirements.

No statutory designated sites which include pine marten as a qualifying feature were identified within 5 km of the onshore Project area. Desk study and consultation responses revealed two pine marten records within the 5 km study area. The closest of these, a pine marten record from The Mammal Society and Biological Records Centre, was located approximately 250 m from the onshore Project area; east of Forss. The second was returned by the British Trust for

Ornithology (BTO). This was recorded approximately 2.9 km from the onshore Project area; southwest of Loch Scarmclate.

Pine marten presence within the onshore study area has been confirmed, with scat recorded in relatively low quantities and anecdotal evidence of pine marten den sites and visual observations recorded.

Areas of suitable habitat present within the proposed onshore study area are limited to the small pockets of more mature woodland in Forss and along the River Thurso; to the east of Halkirk, as evidenced by the presence of pine marten scat. It is understood that these woodland areas were planted approximately 80 years ago and, as they are small and isolated within the surrounding landscape, with no significant denning potential, their quality for pine marten is considered to be relatively low. No direct impact upon these more mature areas of woodland is anticipated as a result of the construction of the Project. Whilst areas of young mixed plantation woodland; currently considered unsuitable for pine marten, will be lost as part of the proposed works (see Section 10.6.5.1.2 for more detail), the proposed woodland planting (as detailed in the outline BEP, which accompanies this PPP Application) will adequately compensate for the loss of these woodland areas and will ensure that the Project has no effect on the foraging or commuting habitats available to pine marten in the area.

Due to the relatively scant evidence of pine marten activity across the onshore study area, and the fragmented nature of the suitable pine marten habitats, it is likely that the density of pine marten is low across the site.

Figure 10-15 shows the location and nature of the evidence of pine marten activity identified within the onshore study area. Full details of the pine marten survey results are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.6.5.5.2 Potential construction effects

As set out in Table 10-12, pine marten has been assessed against the following impacts: disturbance and damage to pine marten and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

Suitable foraging and commuting habitat for pine marten was identified within the onshore study area, and there was evidence indicating pine marten presence within the onshore study area. Therefore, direct injury or mortality could occur through the movement of plant and other site vehicles, and the felling of trees (if occupied by pine marten), and there is the possibility that pine marten could become trapped within excavations or uncapped piping. However, as key foraging and commuting areas will be avoided where possible, and no den sites were identified within the onshore study area, the majority of the effects are likely to be restricted to low levels of temporary disturbance to commuting, foraging and resting pine marten through lighting, noise and vibration. It is also anticipated that any habitat loss will be low to negligible, with the majority of the habitats lost during construction considered unsuitable for this species.

There is also the potential for works to result in indirect effects through the pollution of woodland areas due to construction-related dust pollution causing a reduction in tree health with direct effects on availability of quality of food and habitat. The loss of woodland areas and tree lines through tree felling activity is likely to have a significant impact upon pine marten due to the relatively small size of the existing woodland area and the fact that they are isolated from other suitable woodland habitats in the wider area. The fragmentation of suitable pine marten habitat,

will further reduce the dispersal abilities of pine marten in the area, potentially leading to local extinction events and a higher degree of inbreeding. However, the majority of the habitat types affected by these works will be improved grassland, arable fields and marshy grassland, habitats which are not considered suitable for this species. Therefore, as the works will only result in the loss of a small amount of foraging habitat, impacts on the local populations of pine marten during construction are likely to be of a low level.

Given the implementation of the embedded mitigation measures detailed in section 10.5.4, any impacts upon pine marten are considered to be of **negligible magnitude**, with **no significant effect** predicted.

#### 10.6.5.5.3 Potential operation and maintenance effects

As set out in Table 10-12, pine marten has been assessed against the following impacts: disturbance to pine marten and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

Human activities related to maintenance of onshore infrastructure have the potential to cause temporary and localised disturbance effects on ecological features such as pine marten. There is also the potential for the ongoing operation of the onshore substation, and the resultant increase in vibration, noise and lighting, to disturb commuting, foraging and resting pine marten.

Due to the unpredictable nature of the requirement for maintenance works, it is difficult to determine precise effects on pine marten. However, it is expected that maintenance activities would be infrequent and small scale (around four vehicles per month unless there are any unexpected faults), resulting in disturbance effects of a lower magnitude than those during construction. Nevertheless, potential for the disturbance and mortality of pine marten during the operation of the site has been identified. Whilst a limited amount of traffic is predicted to and from the onshore substation for general operation and maintenance purposes, direct injury or mortality could occur through the movement of maintenance vehicles or plant (as required for more extensive maintenance works) through the site. Indirect disturbance to commuting, foraging and resting pine marten during the operation and maintenance of the site as a result of increased lighting, noise and vibration may be anticipated. Considering the low suitability of the access tracks that will be used for the operation and routine maintenance of the onshore Project, no significant impacts are anticipated.

During more significant maintenance works; where habitat loss as a result of excavation to assess and repair any faults along the onshore export cable corridor may occur, impacts upon pine marten may be anticipated. The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. Works in close proximity to woodland areas and suitable commuting or foraging habitats are likely to result in a greater impact upon pine marten. However, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during construction.

In the absence of appropriate mitigation, there is some potential for the operation and maintenance to negatively impact pine marten. However, the magnitude of the impact post mitigation is likely to be **negligible**, and **no significant effect** is predicted.

#### 10.6.5.5.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on pine marten.

### 10.6.5.6 Water vole

#### 10.6.5.6.1 Baseline

Water vole are found throughout Scotland. Water voles are semi-aquatic rodents favouring slow-moving watercourses with steep earth or peat banks, that have limited water level fluctuations. However, fossorial forms of the species exist, which do not require the presence of a watercourse. Water voles are regarded as one of the UK's most quickly declining species, with their current numbers expected to continue to fall (Mathews *et a*l., 2018). Habitat loss and degradation, and predation by American mink (*Mustela vison*), are considered the main causes for their decline.

No statutory designated sites which include water vole as a qualifying feature were identified within 5 km of the onshore Project area. The desk study data revealed one record of water vole, based on BTO data, potentially on site (four-figure grid reference provided only) within the western branch of the proposed onshore Project area, near the River Thurso.

Field surveys recorded areas of suitable habitat along watercourses, wet ditches and waterbodies throughout the onshore study area and conclusive evidence of water vole activity; in the form of burrows, feeding signs and latrine sites, were identified during the survey visits.

Good quality water vole habitat within the onshore study area is present where watercourses, wet ditches or drain margins are less impacted by grazing or other agricultural activities. However, locations described as 'suitable but poor' could still be utilised. If these lower suitability areas become fenced-off to exclude livestock, allowing the surrounding vegetation to grow, the habitats would become more suitable for water vole as the vegetative cover and food resource increases. Overall, due to the variation in water level and grazing pressures on the banks of River Thurso, the river is described as being 'suitable but poor' in terms of suitability for water vole. However, tributaries leading into the River Thurso were noted to be of good suitability, which was evidenced by the feeding signs recorded and the desk study data.

Figure 10-18 and Figure 10-19 shows the location and nature of the evidence of water vole activity identified within the onshore study area. Full details of the water vole survey results, including more detailed maps, are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.6.5.6.2 Potential construction effects

As set out in Table 10-12, water vole has been assessed against the following impacts: disturbance and damage to water vole and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

As survey data indicates that water vole are present in the area, there is the potential for construction activities to cause disturbance to commuting, foraging and resting water vole through lighting, noise and vibration. Direct injury or mortality could also occur through the movement of plant and other site vehicles, and there is some potential for mortality or injury due to water voles becoming trapped in deep excavations and uncapped piping.

In healthy populations, water voles are able to spread several kilometres and give rise to new colonies. However, habitat loss and degradation can lead to the isolation of colonies which are then susceptible to local extinctions. Therefore, direct or indirect impacts upon suitable habitats during construction (e.g., through trenching, the tracking of vehicles, accidental release etc.) may indirectly lead to a reduction in water vole populations within the onshore study area.

In the absence of appropriate mitigation, there is the potential for construction activities to adversely impact upon water vole populations within the onshore study area. However, as the number of watercourse crossings (including smaller tributaries) will be minimised, and the onshore export cable corridor will be microsited to avoid any ecologically sensitive areas where possible, the level of impact is likely to be low. The implementation of the embedded mitigation listed in section 10.5.4 will further reduce this impact. These mitigation measures will reduce the risk of accidental release and, in the unlikely case that an accidental release occurs, this will be managed through the application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity of the watercourses in the area. With the reinstatement of the habitats following the short-term duration of the construction works, any impacts upon the habitats available to water vole will be temporary in nature.

The embedded mitigation measures will also reduce the likelihood of any direct or indirect impacts associated with the ground clearance works, with appropriate methods of work followed and exclusion zones implemented around any burrows, where possible. Any loss or disturbance of burrows will only be undertaken under a NatureScot water vole Derogation Licence, with appropriate mitigation and compensation measures implemented to ensure that water vole are maintained at a favourable conservation status within the onshore study area. As a result, and considering the short-term duration of the works, any impacts upon water vole are considered to be of negligible magnitude. Therefore, no significant effect is predicted.

#### 10.6.5.6.3 Potential operation and maintenance effects

Human activities related to maintenance of onshore infrastructure have the potential to cause temporary and localised disturbance effects on ecological features such as water vole. Some potential limited impact may be anticipated as a result of visual inspection and non-routine maintenance (as required) to onshore cables.

Due to the unpredictable nature of the requirement for maintenance works, it is difficult to determine precise effects on water vole. However, it is expected that maintenance activities would be infrequent and small scale, resulting in disturbance effects of a lower magnitude than those during construction. Nevertheless, potential for the disturbance

and mortality of water vole during the operation of the site has been identified. There is the potential for injury or mortality to water vole from vehicular traffic during maintenance activities, and accidental release during the operation and maintenance of the site could result in a reduction in water quality which may result in loss of water vole habitat.

During more significant maintenance works; where habitat loss as a result of excavation to assess and repair any faults along the onshore export cable corridor may occur, impacts upon water vole may be anticipated. The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. Works in close proximity to watercourses and any confirmed or potential colony sites are likely to result in a greater impact upon water vole. However, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during construction.

In the absence of appropriate mitigation, there is some potential for contamination of groundwater and watercourses during the operation of the onshore Project. However, the embedded mitigation will ensure that the risks are reduced and that accidental release are unlikely to occur, or to occur at a low frequency and intensity. Furthermore, where maintenance works involve disturbance to habitats within 10 m of watercourses, a pre-works water vole survey will be completed. If water voles are present works will be micro-sited if possible. If this is not possible, works will only take place with an appropriate NatureScot Derogation Licence in place, following all requirements. The magnitude of impact of the operation and maintenance of the Project upon water vole will be dependent on the scale, magnitude and location of the works. However, in general, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during constriction.

The magnitude of impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.5.6.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on water vole.

## 10.6.6 Potential effects on receptors of low sensitivity

### 10.6.6.1 Habitats of low sensitivity

For a detailed assessment of the current baseline of these habitat types within the study area, see SS6: Terrestrial non-avian ecology technical survey report. Justification of the classification of the habitat types as 'low sensitivity', including their groundwater dependency, is provided in Table 10-15. The areas of the NVC habitats recorded (both extent within the study area (to buffer) and within the onshore Project area (excluding buffer)) are provided in Table 10-8. For context, this table also provides the percentage of the onshore Project area made up of each NVC habitat type.

#### 10.6.6.1.1 Baseline

**Grassland**

MG1 *Arrhenatherum elatius* grassland is an ungrazed grassland habitat associated with disturbed and waste ground. It can be floristically diverse due to the absence of grazing. Good examples are found along the roadside of the track to North Calder farm, but it occurs scattered throughout the study area. While MG1 can correspond with the SBL priority habitat; Maritime cliffs and slopes, the habitats present within the onshore study area are not considered to be a good match to this.

MG6 *Lolium perenne-Cynosurus cristatus* grassland and MG7 *Lolium perenne* leys and related grasslands are both SBL priority habitats as part of Coastal and floodplain grazing marsh. However, these are widespread and abundant species poor grasslands that are generally agriculturally improved and have little conservation interest.

MG10 rush-pasture is a widespread habitat in lowland Britain and was the most common NVC classification found within the onshore study area. The MG10 habitat recorded within the onshore study area was assessed as moderately groundwater-dependent. However, MG10 is an impoverished vegetation type, with no uncommon species identified during the survey visits. It is generally regarded as being of lower conservation value than other types of damp grassland, although it can provide important breeding habitat for waders and wildfowl (Averis *et al.*, 2004).

OV22 *Poa annua-Taraxacum officinale* community occurs on disturbed and lightly trampled ground, typically along paths and road verges. It was recorded at the edge of Aimster farm but is likely to have been under-recorded within the study area. OV27 *Epilobium angustifolium* community is characteristic of disturbed soils, or where burning has occurred. The vegetation is overwhelmingly dominated by the vigorous *Epilobium angustifolium*, and little other vegetation is able to survive, resulting in very low biodiversity. It was recorded on the grounds of Skinnet farm but is likely to have been under-recorded within the onshore study area as it is a habitat of marginal areas. Both of these habitats are considered to be of low conservation interest.

#### 10.6.6.1.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: Habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology and herbivory by deer disturbed or displaced during the construction stage.

As summarised in Table 10-17, direct habitat loss due to land-take will occur during the preparation of the working area at the landfall site, the excavation of trenches, the construction of access tracks and the construction of the onshore substation. Habitats may also be damaged through trampling and the tracking of vehicles. At present, the precise location of the onshore infrastructure has yet to be determined. Therefore, whilst it is not possible to provide a quantitative estimate of the loss of each habitat type, a precautionary approach has been adopted whereby the potential loss of any habitats within the onshore Project area has been considered.

In addition to direct habitat loss, there is the potential for indirect impacts upon low sensitivity habitats during the construction of the onshore Project through the accidental release of fuel, excess silt, concrete leachate etc. into the groundwater and watercourses. The excavation of materials, in addition to directly disrupting groundwater flow, can also remove the protective layer of soil and subsoil, making the groundwater beneath more vulnerable to pollution

from leaks or spills from vehicles or equipment (SEPA Guidance Note 31). If carried out in close proximity to GWDTEs, such activities can have adverse impacts upon these receptors. In addition, disturbance and displacement of deer (as described in section 10.6.6.10) may indirectly impact vulnerable habitats, including those that have been re-instated.

The disturbed and waste ground classification MG1 occurs in several small sites across the onshore study area, approximately 10% of which occurs in the buffer area, and the improved grassland classifications MG6 and MG7 are the most widespread and common habitat in the onshore study area. As a result, it is likely that some of these low conservation value habitats will be lost during construction work. However, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs are stored and reinstated appropriately and that the likelihood and severity of any accidental release is reduced to a negligible level. Therefore, taking into account the temporary and short-term nature of the construction activities, and the commitment to reinstate any habitats present as part of the embedded mitigation measures, any impact upon this classification will be of negligible magnitude. Therefore, no significant effect is predicted.

MG10 rush pasture is widespread within the onshore study area and is moderately groundwater-dependent. Approximately 30% of this habitat falls within the onshore study area and will therefore not be directly impacted by the proposed works. However, as this habitat type is ubiquitous within the onshore study area, direct habitat loss is anticipated. As MG10 is moderately groundwater-dependent, construction works could also result in impacts upon groundwater flow through this habitat, resulting in irreversible effects in spite of the temporary and short-term nature of the construction activities. However, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs are stored and reinstated appropriately and that measures are taken to protect groundwater flows, ensuring no adverse impact upon groundwater-dependent habitats. Furthermore, the embedded mitigation measures will also reduce the likelihood and severity of any accidental release. Therefore, taking into account the temporary and short-term nature of the construction activities, the protection of groundwater flows and the commitment to reinstate any habitats present as part of the embedded mitigation measures, any impact upon this classification will be of negligible magnitude. Therefore, no significant effect is predicted.

OV22 is only recorded as present within the onshore study area in two very small patches. These habitats are unlikely to be affected by the construction work and, if affected, are of low botanical conservation value. With habitat re-instatement proposed and with the low conservation value of this habitat it is anticipated that any impact will be of a negligible magnitude. Therefore, no significant effect is predicted.

Similarly, OV27, a classification of disturbed and burned ground, was only recorded at a single site and is of minimal conservation value. It is unlikely to be affected by the construction work, and it is anticipated that any impact will be of negligible magnitude. Therefore, no significant effect is predicted.

#### 10.6.6.1.3 Potential operation and maintenance effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by routine maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. In the event that more significant maintenance works are required, such non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are

likely to be of a limited extent and, should any significant maintenance works be required within 250 m of GWDTEs, the good practice measures outlined in section 10.5.4 will be applied prior to works being undertaken.

Maintenance works may result in indirect effects on habitats, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for indirect effects to occur during operation is generally significantly lower than that during construction.

As routine maintenance works during the operation are likely to be of a limited extent and taking into account the embedded mitigation listed in section 10.5.4, the impact is defined as being of negligible magnitude. Therefore, no significant effect is predicted on habitats of [high]low? sensitivity.

In line with SEPA Guidance Note 31 (SEPA, 2017), should any significant maintenance works be required within 250 m of GWDTEs, then the good practice measures outlined in section 10.5.4 will be implemented prior to works being undertaken. No additional mitigation is required.

#### 10.6.6.1.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on habitats of low sensitivity.

### 10.6.6.2 Badger

#### 10.6.6.2.1 Baseline

Badgers are widespread across the Scottish mainland and have adapted to occupy many different habitats. However, the Highland region is an area where the density of badger has been estimated to be relatively low (Rainey *et al.*, 2009), when compared to other regions in Scotland. In general, badger favour areas where sett construction (free-draining slopes with sandy soil), shelter availability (woodland, scrub, or hedgerows) and a suitable resource of earthworms create the optimum conditions. Threats to badger include death or injury from road traffic, loss of feeding resources from developments and persecution in the form of badger crime (sett digging, gassing and badger baiting).

Desk study and consultation responses revealed one record of badger within the 2 km onshore study area. This Scottish Badger record, a road traffic collision on the A9 in 2014, was located approximately 2 km south of the most southern extent of the onshore Project area (six-figure grid reference provided only).

No conclusive evidence of badger activity (in the form of setts, latrine sites, foraging areas, guard hares etc.) was recorded. Whilst pockets of suitable foraging and commuting habitat were noted on site; such as riparian corridors and woodland habitats, the majority of the onshore study area is comprised of flat arable and pastoral land, with few field boundaries comprised of tree lines or hedgerows, which would be the optimal form of habitat for commuting badger. For sheltering purposes, although arable and pastoral land can be utilised by badgers, the flat topography

within such locations would make it less suitable for this species. In addition, the lack of mature woodland, tree lines or other suitable sheltering habitats within the onshore study area means such habitats are relatively isolated and fragmented.

Badger territory sizes range from 0.3 $km^2$ in optimal habitat, to over 1.5 $km^2$ in marginal habitat (Harris and Yalden, 2008). The habitats present in the onshore study area are predominantly sub-optimal for badger. Therefore, it is considered likely that any badgers present outwith the site boundaries hold larger territories. As evidence of badger activity within larger territories can be more difficult to identify, and badger are known to be present in the wider area, it is considered possible that badgers do occasionally commute through or forage within the onshore Project area.

#### 10.6.6.2.2 Potential construction effects

In the absence of appropriate mitigation, habitat loss could result in the displacement of badger from an area and direct injury or mortality could occur through the movement of plant and other site vehicles, or as a result of badger becoming trapped within excavations or uncapped piping. There is also the potential for construction activities to cause disturbance to commuting, foraging and resting badger through lighting, noise and vibration. However, as no evidence of badger activity was identified within the onshore study area, and the pockets of suitable woodland habitat present on site are limited in their extent and isolated from other suitable woodland habitats in the wider area, it is considered unlikely that badger regularly pass through the area.

No mature woodland areas with suitability for foraging, commuting or sett-building badger have been targeted for removal, and woodland planting (as detailed in the outline BEP, which accompanies this PPP Application) will adequately compensate for the loss of the young mixed plantation woodland areas (see Section 10.6.5.1.2 for more detail). As a result, and considering the short-term duration of the works, any impacts upon badger are likely to be restricted to low levels of temporary disturbance to occasional foraging or commuting animals and will therefore be of negligible magnitude, with no significant effect predicted.

#### 10.6.6.2.3 Potential operation and maintenance effects

As set out in Table 10-12, badger have been assessed against the following impacts: disturbance to badger and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting.

Whilst no conclusive evidence of badger was identified within the onshore study area, it is considered likely that badger pass through the site on occasion. Therefore, effects are likely to be restricted to low levels of temporary disturbance to badger occasionally foraging or commuting through the site as a result of an increase in lighting, noise and vibration during the operation of the substation. Direct injury or mortality could also occur through the movement of vehicles through the site. However, a limited amount of traffic is predicted to and from the substation for general operation and maintenance purposes, and the level of external lighting, noise and vibration is likely to be minimal and largely confined to the onshore substation area. Therefore, particularly considering the current levels of lighting and disturbance around the proposed substation location, and the likely low levels of badger activity across the onshore Project area, disturbance impacts upon badger are likely to be negligible.

During more significant maintenance works, where habitat loss as a result of excavation to assess and repair any faults along the onshore export cable corridor may occur, impacts upon badger may be anticipated. Excavations,

uncapped piping and the movement of plant may cause injury or mortality to commuting or foraging badger. There is also the potential for badger setts to become established within the onshore Project area during the operation of the onshore Project. As a result, more significant maintenance works may result in the destruction or disturbance of a badger set.

The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. However, in general, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during construction. Due to the short-term duration of any maintenance works, and the reinstatement of habitats following works, any impact upon foraging or commuting badger will be of a short duration. Therefore, considering the likely low level of badger activity across the site, and the implementation of the embedded mitigation measures (as detailed in the SHPP), mortality is considered unlikely and any disturbance effects are likely to be of a negligible magnitude and are assessed as not significant.

Should any significant maintenance works be required, the need for pre-maintenance surveys to identify any more recent evidence of badger activity may be determined. A suitably experienced ecologist should be contacted for advice. In the event that a sett has become established within 50 m of the works area, then it may be necessary to apply for a NatureScot badger Derogation Licence prior to works commencing. In all cases, the embedded mitigation measures outlined in the SHPP would be applied to prevent accidental harm to protected species.

#### 10.6.6.2.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on badgers.

### 10.6.6.3 Reptiles

#### 10.6.6.3.1 Baseline

There are three established native reptile species in Scotland; adder, common lizard, and slow worm. Although grass snake (*Natrix natrix*) is also known to be present in Scotland, it appears to have a limited distribution and is unlikely to be found in the north of Scotland. One of the main threats to reptiles is habitat loss and fragmentation. As such, all three of these species are listed under the "avoid negative impacts" category on the SBL.

No statutory designated sites which include reptiles as a qualifying feature were identified within 5 km of the onshore Project area. Desk study and consultation responses revealed one adder record within the onshore study area. This HBRG record related to a female adder recorded on the track of Broubster Forest, approximately 4.8 km from the onshore Project area (six-figure grid reference provided only).

The presence of common lizard was confirmed during the survey visits, with five common lizard sightings recorded: four outwith the onshore Project area and one within.

Large swathes of the onshore study area comprise heavily grazed and/or managed fields, lacking features such as hedgerows, tree lines or wet ditches. Due to the lack of structural complexity, these habitats are considered sub-optimal for reptiles. In addition to lacking suitable areas for thermoregulation, refuge from predation, and potential hibernacula, the lack of habitat diversity will also result in a reduction in invertebrate and small mammal prey for reptiles.

Areas within the onshore study area with the highest suitability for reptiles were considered to be those with a diverse vegetation structure; with opportunities for basking, foraging and refuge, and connectivity to other areas of suitable habitat. Suitable habitats included areas of marsh and marshy grassland, embankments with areas of rough grassland and tall ruderal vegetation, scattered scrub and scattered trees, railway embankments and riparian habitat. Woodland edges were also considered to be suitable for reptiles as the interface between woodland areas and surrounding habitats can provide a variety of microclimates and vegetation structures, refuge from predation and potential overwintering opportunities beneath tree roots and within small mammal burrows. Although small pockets of high suitability habitat were recorded across the onshore study area, larger sections of suitable habitat were located along Forss Water on the banks of the watercourse, from the north at the coastline to north of Westfield. In addition, larger areas at the north and south of Halkirk were recorded, with good habitat along the proposed eastern and western routes of the onshore Project area, including the banks of River Thurso.

Whilst areas of suitable habitat were available across the onshore study area, potential refugia or hibernacula (including rubble piles, rubble mounds, rocks and drystone walls) were largely confined to the southern portion of the study area. Although few south-facing slopes were observed due to the relatively flat topography of the onshore study area, basking opportunities were present in more open areas. Areas south of Halkirk are composed of saturated neutral and/or marshy grassland. Although such conditions are suitable for common lizard and adder, they may be too wet for hibernation and, due to the semi-fossorial nature of slow worms, these wetter habitats are likely to be unsuitable for their burrows.

Figure 10-16 shows the location of reptiles found within the onshore study area, as well as highlighting areas of suitable reptile habitat; including potential hibernacula. Full details of the reptile survey results, including more detailed maps, are provided in SS6: Terrestrial non-avian ecology technical survey report.

#### 10.6.6.3.2 Potential construction effects

Potential reptile habitat, including refugia, is present within the onshore study area, and the presence of common lizard has been confirmed. As a result, there is the potential for construction activities, including the movement of plant and other site vehicles, to cause death or injury of reptiles; in particular during land clearance works. The temporary destruction of areas of suitable habitat could result in the fragmentation of suitable foraging, hunting and basking areas, as well as the severance of commuting routes, potentially leading to the displacement of reptiles. Indirect impacts upon these habitats could also occur due to accidental release and construction works will result in disturbance to commuting, foraging / hunting and resting reptiles.

Impacts may also be anticipated due to trampling or the tracking of vehicles through the site. In addition to damaging areas of suitable habitat and causing disturbance to any reptiles present. However, considering the short-term duration of any works, and the fact that the majority of the onshore Project area comprises heavily grazed and/or managed fields lacking the structural complexity favoured by reptiles, any impacts upon reptiles likely to be of negligible magnitude, with no significant effect predicted.

#### 10.6.6.3.3 Potential operation and maintenance effects

As set out in Table 10-12, reptiles have been assessed against the following impacts: disturbance to reptiles and their habitat including places of shelter, as well as indirect effects such as pollution, vibration, noise, and lighting. As discussed in section 10.6.1., reptiles are considered to be of low sensitivity.

Direct injury or mortality could occur through the movement of maintenance vehicles or plant (as required for more extensive maintenance works) through the site. A limited amount of traffic is predicted to and from the substation for general operation and maintenance purposes. Therefore, considering the low suitability of the access tracks that will be used for the operation and routine maintenance of the onshore Project, no significant impacts are anticipated.

During more significant maintenance works, where habitat loss as a result of excavation to assess and repair any faults along the onshore export cable corridor may occur, direct and indirect impacts upon any reptiles present may be anticipated.

The magnitude of such impacts will be dependent on the scale, magnitude and location of the works. However, in general, it is considered likely that the potential for indirect effects to occur during maintenance works is significantly lower than that during construction. Therefore, with the implementation of the embedded mitigation measures, mortality is considered unlikely and any disturbance effects are likely to be of a negligible magnitude and are assessed as not significant.

#### 10.6.6.3.4 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to ecological receptors. The level of effect will depend on the ecological receptors present at the time of decommissioning; although this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect is predicted on reptiles.

### 10.6.6.4 Northern knotgrass

#### 10.6.6.4.1 Baseline

Northern knotgrass (*Polygonum boreale*) is a Nationally Scarce arable weed associated with disturbed arable ground. The species is thought to be declining because of changes in agricultural practices.

Northern knotgrass was found at the side of a track on the ridge above Oust farm. It was also casually observed outside the study area at Dounreay, and on a road verge at Westfield. Butler (N.d.) describes it as an agricultural weed that is common near the coast, and states that it can easily be observed in turnip fields in coastal Caithness. It is likely that it was under-recorded during the current survey as agricultural crop fields were not examined for NVC purposes.

#### 10.6.6.4.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology during the construction stage.

Northern knotgrass is an agricultural weed that was likely under recorded on site as the NVC surveys did not encompass detailed assessments of arable fields. However, as it is known to be present on site and in the wider area, the onshore Project may result in the destruction, disturbance or damage of habitats supporting this species through the excavation of trenches, the construction of access tracks and the construction of the onshore substation. Plants may also be damaged through trampling and the tracking of vehicles, although ground disturbance resulting from the construction works may temporarily benefit the species through the increased availability of suitable habitat in the immediate to short term. Indirect adverse effects may also be anticipated as a result of sedimentation, accidental release and dust as a result of construction activities.

In the absence of appropriate mitigation, populations of Northern knotgrass may be lost as part of the proposed works. However, the habitat re-instatement and the implementation of other embedded mitigation measures described in section 10.5.4 will ensure that any such impacts are temporary and are of a negligible magnitude with no significant impact upon Northern knotgrass populations anticipated.

#### 10.6.6.4.3 Potential operation and maintenance effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. Therefore, no further direct habitat loss or direct impact upon Northern knotgrass is anticipated. In the event that more significant maintenance works are required, such as the non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, should any significant maintenance works be required, the good practice measures outlined in section 10.5.4 will be applied prior to works being undertaken.

Maintenance works may result in indirect effects on habitats and plant species, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for indirect effects to occur during operation is generally significantly lower than that during construction. As a result, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.6.4.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the Project is anticipated. As for cable laying, the excavation and removal of the cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds

and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, no significant effect upon Northern knotgrass is anticipated.

### 10.6.6.5 Eyebright

#### 10.6.6.5.1 Baseline

Butler (N.d.) records three rare species of eyebrights (*Euphrasia* spp.) and a single rare hybrid as present within Caithness, of which *Euphrasia marshallii* is recorded from within the onshore study area at ND9968. Eyebrights are a difficult group of plants to identify with certainty, and specialist knowledge is usually required to record with certainty. No rare *Euphrasia* spp. were recorded during the survey, but it is possible that one or more of the rare species occur within the onshore study area.

#### 10.6.6.5.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology during the construction stage.

*Euphrasia marshallii* is found in short turf on cliff tops, often in association with Scottish primrose and acid heath habitat. Whilst it was not recorded during the NVC surveys, three small areas of degraded maritime heath habitats were recorded towards the northern extent of the onshore Project area. Ushat Head SSSI, a protected site designated for its maritime heath habitat, also abuts the eastern aspect of the northern extent of the onshore Project area. Therefore, it is considered possible that *E. marshallii* is present within these coastal habitats due to the presence of maritime heath habitats in the area. As a result, in the absence of appropriate mitigation, the onshore Project may result in the irreversible loss of populations of this protected plant. Direct impacts could occur through ground-clearance works within 50 m of the cliff edge, trampling by site workers and the tracking of vehicles through the areas of coastal grassland.

There is also the potential for construction activities to indirectly impact *E. marshallii* populations through accidental release; including silt, concrete leachate, fuel and dust. The temporary HDD compound will be located approximately 150 m from the coastal cliff edge, with a commitment to ensure no ground-breaking or vegetation clearance works within 50 m of the cliff edge. Therefore, it may be possible to microsite the onshore export cable corridor to avoid direct impacts upon habitats capable of supporting *E. marshallii*. However, where suitable heath habitats extend further into the onshore Project area, some loss of *E.marshallii* may be anticipated.

Any adverse impact will be reduced through the implementation of a targeted NVC survey within a 250 m buffer ahead of works in habitats with which it is associated (embedded mitigation for sensitive habitats), allowing for the micrositing of the route to reduce the extent over which the effect may occur, and to avoid these notable plant species, where possible. In the event that suitable *E. marshallii* habitats are directly affected the embedded mitigation

outlined in section 10.5.4 will ensure that the turfs of these high-sensitivity coastal habitats are stored and reinstated appropriately. Therefore, any impacts will be short-term and reversible.

Any indirect adverse effects upon this SBL priority species will be reduced through the implementation of the embedded mitigation measures described in section 10.5.4, reducing the likelihood and severity of any accidental release. Therefore, the impact of the construction works upon *E. marshallii* will be of a **negligible magnitude** and **no significant effect** is predicted.

#### 10.6.6.5.3 Potential operation and maintenance effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. Therefore, no further direct habitat loss or direct impact upon *E. marshallii* is anticipated. In the event that more significant maintenance works are required, such as the non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, should any significant maintenance works be required, the good practice measures outlined in section 10.5.4 will be applied prior to works being undertaken.

Maintenance works may result in indirect effects on habitats and plant species, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for indirect effects to occur during operation is generally significantly lower than that during construction.

No direct effects are anticipated due to the commitment to ensure no ground-breaking or vegetation clearance works within 50 m of the cliff edge. The implementation of the embedded mitigation detailed in section 10.5.4 will reduce the likelihood of any indirect effects upon *E. marshallii* as a result of the routine operation and maintenance activities. In the unlikely case that an accidental release occurs, this can be managed through the application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity of habitats supporting notable plant species. As a result, the impact is defined as being of **negligible magnitude** and **no significant effect** is predicted.

#### 10.6.6.5.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the Project is anticipated. As for cable laying, the excavation and removal of the cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore, **no significant effect** upon *E. marshallii* is anticipated.

### 10.6.6.6 Field gentian

#### 10.6.6.6.1 Baseline

Field gentian (*Gentianella campestris*) is a Nationally Scarce plant that is recorded by Butler (N.d.) as occurring at the roadside at ND148300, outside the onshore study area.

This particular group of plants is an unusual all-white form. The species was not observed during the survey period, but a conversation took place with local residents who described a population of white-flowered field gentian as occurring on the road verge of the access road to Forss Business and Technology Park, at ND022691. The residents stated that the plants appeared every year but did not last long as they were mown down by the grass cutting of the road verges by site maintenance staff. The site was examined, but had been recently mown to almost ground level, and no field gentian were observed, although the vegetation present appeared to indicate suitable habitat for this species.

#### 10.6.6.6.2 Potential construction effects

As set out in Table 10-12, each habitat has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology during the construction stage.

Anecdotal evidence indicates that field gentian is present on the road verge of the access road to Forss Businesses and Technology Park; within the northern extent of the onshore Project area. Direct impacts could occur through ground-clearance, trampling by site workers and the tracking of vehicles through this area.

There is also the potential for construction activities to indirectly impact field gentian populations through accidental release; including silt, concrete leachate, fuel and dust.

Depending on the route of the onshore export cable, the construction of the onshore Project could result in the loss of this Nationally Scarce plant. Where possible, the route should be sited to avoid the road verge near the Forss Businesses and Technology Park. In the event that the avoidance of this area is not possible, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs are stored and reinstated appropriately in line with embedded mitigation, ensuring that the impact is of short duration and reversible, resulting in no loss of field gentian.

Any indirect adverse effects upon this notable plant species will be reduced through the implementation of the embedded mitigation measures described in section 10.5.4, reducing the likelihood and severity of any accidental release. This will reduce the impact of the construction works upon field gentian to that of a negligible magnitude and no significant effect is predicted.

#### 10.6.6.6.3 Potential operation and maintenance effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. Therefore, no further direct habitat loss or direct impact upon field gentian is anticipated. In the event that more significant maintenance works are required, such as the non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, should any significant maintenance works be required, the good practice measures outlined in section 10.5.4 will be applied prior to works being undertaken.

Maintenance works may result in indirect effects on habitats and plant species, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release. However, the potential for indirect effects to occur during operation is generally significantly lower than that during construction. In the unlikely case that an accidental release occurs, this can be managed through the application of appropriate emergency procedures to ensure any resulting impact is small-scale and temporary and does not affect the ecological integrity of habitats supporting notable plant species. As a result, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.6.6.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the Project is anticipated. As for cable laying, the excavation and removal of the cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, with the exception that habitat will be restored following decommissioning, the potential effects resulting from decommissioning are likely to be analogous with, or likely less than, those of the construction stage. Therefore, no significant effect upon field gentian is anticipated.

### 10.6.6.7 Invertebrate communities of conservation importance (excluding great yellow bumblebee, moss carder bee, small blue butterfly, large heath butterfly and small pearl-bordered fritillary which are described below)

#### 10.6.6.7.1 Baseline

Habitats with the potential to support invertebrate communities of conservation importance were recorded within the onshore study area.

Maritime soft cliff occurs along the coastline to the north of the onshore Project area and includes sheltered sections with south-facing aspects which may support invertebrates with burrowing and/or basking requirements. Bare and sparsely vegetated ground suitable for basking and burrowing was also recorded along the coast. The adjacent coastal grassland habitat further inland likely supplements the maritime soft cliff habitat by providing a relatively diverse foraging resource as well as providing valuable foraging habitat for pollinators in general.

#### 10.6.6.7.2 Potential construction effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology.

As detailed in the embedded mitigation measures section 10.5.4, no works will occur within 50 m of the coastline. Therefore, even in the worst case scenario (i.e. works occurring just outwith 50 m from the cliff edge), there will be no direct loss of coastal grassland or maritime cliff habitats; environments considered to be of value to invertebrate communities of conservation importance. Furthermore, due to the minimum 50 m distance of the works from the cliff edge, no inadvertent damage to these sensitive habitats (through trampling or the tracking of vehicles) or indirect effects (e.g. as a result of dust or pollution) are anticipated.

For any suitable invertebrate habitats further inland, where avoidance is not possible, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs are stored and reinstated appropriately, ensuring that the impact is of short duration and reversible, resulting in no loss of suitable habitat. Any indirect adverse effects upon suitable habitats will be further reduced through the implementation of the embedded mitigation measures described in section 10.5.4, reducing the likelihood and severity of any accidental release. This will reduce the of impact of the construction works invertebrate communities of conservation importance to that of a negligible magnitude and no significant effect is predicted.

#### 10.6.6.7.3 Potential operation and maintenance effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

As the onshore Project will be located a minimum of 50 m away from the coastal habitats, no potential direct or indirect effects are expected to occur during the operation and maintenance of the Project, even in the event that more significant maintenance works are required.

For suitable habitats further inland, no direct habitat loss is anticipated during the routine maintenance and operation of the onshore Project. Therefore, no direct or indirect impacts upon invertebrate species of conservation concern are anticipated. However, in the event that more significant maintenance works are required, such as the non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent. Furthermore, the good practice measures outlined in section 10.5.4 will ensure that the turfs are stored and reinstated appropriately and that the likelihood and severity of any accidental release are reduced. As a result, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.6.7.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the Project is anticipated. As for cable laying, the excavation and removal of the

cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, with the exception that habitat will be restored following decommissioning, the potential effects resulting from decommissioning are likely to be analogous with, or likely less than, those of the construction stage. Therefore, no significant effect upon invertebrate communities of conservation importance is anticipated.

### 10.6.6.8 Great yellow bumblebee, moss carder bee and small blue butterfly

#### 10.6.6.8.1 Baseline

Great yellow bumblebee is a SBL species listed as requiring conservation action and is Nationally Scarce, being one of the scarcest bumblebee species in Britain. Within Britain, it is now largely restricted to coastal areas of Caithness and Sutherland and the northern and western isles. The pollen of vetch species is important for this bee species.

Moss carder bee is on the SBL watching brief and is considered scarce in Britain as a result of significant declines. It can be more frequent in north-west Highlands. Flowers belonging to the pea family (e.g. kidney vetch and bird's-foot trefoil) are considered important foraging resources for this species.

Small blue butterfly is a SBL species with recommendations to avoid negative impact. This species depends on kidney vetch as its sole food plant. Three populations are known from the Caithness coast with the nearest occurring west of Thurso.

Whilst great yellow bumblebee, moss carder bee and small blue butterfly were not observed during the field surveys, ten records of moss carder bee were returned by the desk study, and habitats with the potential to support these species were recorded within the onshore study area. Kidney vetch and bird's foot trefoil are present in patches within this coastal grassland and nesting and hibernation habitats for great yellow bumblebee and moss carder bee are present within field margins and tussocky grassland.

Although separate from the EIA, the Project is proposing a biodiversity enhancement project in relation to great yellow bumblebee. This is a Nationally Scarce species listed on the Scottish Biodiversity List that is now restricted to coastal areas of Orkney, the Western Isles, Caithness and Sutherland. This formerly widespread species has declined by 80% over the last century primarily due to loss of flower-rich meadow habitats and changes in agricultural practices (Goulson, 2010; Falk & Lewington, 2015; Else & Edwards, 2018; Bumblebee Conservation Trust, 2021). The Project therefore proposes to create more wildflower meadows with key flower species for great yellow bumblebees. The outline Biodiversity Enhancement Plan is submitted alongside the PPP application and will be finalised after planning consent has been granted, in line with further consultations.

#### 10.6.6.8.2 Potential construction effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology.

As detailed in the embedded mitigation measures section 10.5.4, no works will occur within 50 m of the coastline. Therefore, even in the worst case scenario (i.e. works occurring just outwith 50 m from the cliff edge), there will be no loss of coastal grassland or maritime cliff habitats; environments considered to be of value to great yellow bumblebee, moss carder bee and small blue butterfly. Furthermore, due to the minimum 50 m distance of the works from the cliff edge, no inadvertent damage to these sensitive habitats (through trampling or the tracking of vehicles) or indirect effects (e.g. as a result of dust or pollution) are anticipated. As a result, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.6.8.3 Potential operation and maintenance effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

As the onshore Project will be located a minimum of 50 m away from the coastal habitats supporting the food plants of great yellow bumblebee, moss carder bee and small blue butterfly, no potential direct or indirect effects are expected to occur during the operation and maintenance of the Project, even in the event that more significant maintenance works are required. Whilst areas of tussocky grassland and field margins are likely to be impacted as part of the proposed works, these habitats are ubiquitous across the onshore study area. Therefore, the impact of the works upon nesting and hibernating habitats for great yellow bumblebee and moss carder bee will be negligible. As a result, the impact is defined as being of negligible magnitude and no significant effect is predicted.

#### 10.6.6.8.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the Project is anticipated. As for cable laying, the excavation and removal of the cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, with the exception that habitat will be restored following decommissioning, the potential effects resulting from decommissioning are likely to be analogous with, or likely less than, those of the construction stage. Therefore, no significant effect upon great yellow bumblebee, moss carder bee and small blue butterfly are anticipated.

### 10.6.6.9 Large heath butterfly and small pearl-bordered fritillary

#### 10.6.6.9.1 Baseline

Habitats with the potential to support large heath butterfly and small pearl-bordered fritillary were recorded within the onshore study area. For the large heath butterfly, it is considered likely that any areas of moorland or blanket bog over one ha are likely to support populations of this species, whilst populations of the small pearl-bordered fritillary are known to be present at Achlachan Moss, to the south of the onshore study area. Both species, whilst undergoing serious decline in England, remain widespread in Scotland.

Whilst large heath butterfly and small pearl-bordered fritillary were not observed during the terrestrial non-avian ecology field surveys, suitable habitats for both species were identified. The food plants of small pearl-bordered fritillary are fairly ubiquitous across the onshore study area and includes thistles and bramble. The main foodplant of the large heath butterfly is hare's-tail cotton grass (*Eriophorum vaginatum*). This was also fairly ubiquitous, found within wetter habitats across the onshore study area.

#### 10.6.6.9.2 Potential construction effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: habitat loss due to land-take, disturbance and damage, and indirect effects such as pollution or alternation to hydrology.

As areas of moorland and blanket bog are ubiquitous across the onshore study area, it is considered likely that there will be some direct habitat loss during construction due to land-take or disturbance and damage. Therefore, adverse impacts upon habitats likely to support populations of large heath butterfly are anticipated. For small pearl-bordered fritillary, whilst there will be no direct or indirect impact upon Achlachan Moss during the construction of the Project, loss of the larval food plants due to land-take is likely. However, the embedded mitigation outlined in section 10.5.4 will ensure that the turfs of high sensitivity areas are stored and reinstated appropriately, with any adverse impacts further reduced through the implementation of a targeted NVC survey within a 250 m buffer ahead of works, allowing for the micrositing of the route to reduce the extent over which the effect may occur. Therefore, due to the short-term duration of the construction activities, the proposed habitat reinstatement, and the ubiquity of the larval food plants within the onshore study area, any direct effect will be temporary, of negligible magnitude and reversible.

While the aim will be to re-instate habitats along the route following the construction of the onshore export cable, construction works could result in irreversible indirect effects upon these habitats through accidental release of fuel, concrete leachate etc. For the high sensitivity GWDTEs, permanent impacts could occur through the disruption of groundwater flows. However, implementation of the embedded mitigation detailed in section 10.5.4 should reduce the likelihood and severity of accidental release to a negligible level and ensure the protection of groundwater sources. Therefore, whilst the magnitude of the impact of the construction works is very much dependent on the route taken, taking into account the temporary and short-term nature of the construction activities, the reversibility of the habitat loss and the fact that direct habitat loss will be avoided where possible through the micrositing of the route, any adverse effects upon large heath butterfly and pearl-bordered fritillary as a result of habitat loss during construction are expected to be of a negligible magnitude, with no significant effect predicted.

#### 10.6.6.9.3 Potential operation and maintenance effects

As set out in Table 10-12, each ecological receptor has been assessed against the following impacts where relevant: disturbance due to maintenance works, and indirect effects such as pollution. Note that it is considered highly unlikely that hydrology would be altered by maintenance works on existing infrastructure.

During the routine maintenance and operation of the onshore Project, no further direct habitat loss is anticipated. In the event that more significant maintenance works are required, such non-routine maintenance of the onshore export cable corridor, excavation to assess and repair any faults may result in further habitat loss. However, such works are likely to be of a limited extent and, in line with SEPA Guidance Note 31 (SEPA, 2017), should any significant

maintenance works be required within 250 m of GWDTEs, then the good practice measures outlined in section 10.5.4 will be implemented prior to works being undertaken. No additional mitigation is required.

Whilst maintenance works may result in indirect effects on habitats, e.g., pollution of groundwater and direct pollution of watercourses as a result of accidental release, the potential for indirect effects to occur during operation is generally significantly lower than that during construction.

As routine maintenance works during the operation are likely to be of a limited extent and taking into account the embedded mitigation listed in section 10.5.4, the impact is defined as being of negligible magnitude. Therefore, no significant effects upon large heath butterfly and pearl-bordered fritillary are predicted.

#### 10.6.6.9.4 Potential decommissioning effects

The level of effect will depend on the nature of the decommissioning works and the ecological receptors present at the time of decommissioning. If the cables are to be removed during the decommissioning stage, a similar level of impact as for the construction of the onshore Project is anticipated. As for cable laying, the excavation and removal of the cables will likely require similar activities such as open-cut trenching and the construction of temporary compounds and access tracks. With regard to the ecological receptors present, whilst this cannot be reliably predicted at this stage, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, with the exception that habitat will be restored following decommissioning, the potential effects resulting from decommissioning are likely to be analogous with, or likely less than, those of the construction stage. Therefore, no significant effects upon large heath butterfly and small pearl-bordered fritillary are anticipated.

### 10.6.6.10 Deer

#### 10.6.6.10.1 Baseline

Very little data exists for numbers of deer in the area, but both red and roe deer are known to be present. The pattern of land ownership and general scarcity of deer means that there is no effective deer management planning or collaborative deer management in the area. The only cull figures available are from FLS who manage the Sibster Forest.

Data available from the British Deer Society (BDS) Deer Survey[5] (BDS, 2023a) indicate the presence of both roe deer and red deer within the area. The cull figures from Sibster Forest show that 50 animals were culled across four years, indicating a significant deer population in this specific section (75.97 ha) of the onshore Project area.

Evidence and sightings of roe deer were prevalent throughout the onshore study area during the deer surveys. The presence of a mosaic of habitats including coarse and smooth grassland, wetlands, gorse, willow scrub and woodland, both native and commercial conifers, provides ideal conditions for roe deer. Red deer was only sighted on one

[5] *https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey.*

occasion, around Sibster and Halkirk during a night-time survey. Levels of disturbance and human presence, plus the relatively small amount of woodland in this area, preclude the location being ideal for red deer.

The closest designated sites to the onshore export cable corridor is the Ushat Head SSSI, designated for maritime heath, Scottish primrose and small-fruited sedge and Loch Lieurary SSSI, designated for its basin fen. Other designated sites in the wider area, as detailed in Table 10-8, are also designated for a range of habitat types that could be indirectly affected by displacement or disturbance of deer.

#### 10.6.6.10.2 Potential construction effects

As set out in Table 10-12 the relevant impacts to deer include reductions in deer welfare, which may arise from the following:

- Loss of shelter in woodland and gorse;
- Loss of food resource;
- Restriction of movement; and
- Direct disturbance.

Suitable habitats were identified for roe deer throughout the onshore Project area during the deer surveys. Red deer habitats were less frequent and only one red deer was sighted. Habitat loss, such as the felling of trees or the removal of scrub and gorse could result in a loss of shelter that provides safety and security for rumination and for young deer. Any loss of shelter, or access to it, will have an adverse impact on deer welfare and, in the case of roe deer (which are territorial animals), cause displacement with potential conflict between the displaced animals and adjacent territories. Loss of feeding habitat, such as agricultural fields and pasture may also result in reduced welfare and would most likely affect deer in late winter and early spring when food is scarcer.

Lighting, noise, vibration and the presence or movement of plant and other site vehicles may also reduce deer welfare, either by restricting their movements or through direct disturbance. Restriction of movement may adversely affect deer that are moving between areas of rest or shelter and feeding resources. Territorial roe bucks also need to move around their territory to mark and maintain it. Roe deer are not particularly sensitive to disturbance and are found in both peri-urban and urban environments (BDS, 2023b;c), so are less likely to be adversely affected by construction activity than red deer. Although numbers are thought to be low in the onshore study area, red deer are nonetheless a herding animal that is increasing in its presence in agricultural locations like this. As red deer are less associated with urban environments (BDS, 2023bc), it is expected that they may be more likely to be displaced from areas of high disturbance, particularly the males, and will find alternative locations with lower levels of disturbance. All deer are sensitive to disturbance at the time when their young are born and for several weeks thereafter, since the young are cached in shelter while their mothers feed elsewhere. Roe deer are much more tolerant of disturbance than many species and the welfare impacts are not thought to be significant except at calving time (late April – early June).

As described above, the construction stage has the potential to reduce access to shelter and food resource. However, this will be a temporary effect over a short-term duration with the reinstatement of habitats once construction is complete, as outlined in section 10.5.4. The impacts of the construction will also likely cause some temporary restrictions of movement, disturbance and displacement of deer and thus have welfare implications. However, the levels of disturbance are anticipated to be minimal, considering the localised and temporary nature of this impact

and the implementation of a Deer Management Plan. Therefore, any reductions in deer welfare are considered to be of **negligible magnitude**. Therefore, **no significant effect** is predicted.

#### 10.6.6.10.3 Potential decommissioning effects

Works associated with decommissioning may cause disturbance to deer. The level of effect cannot be reliably predicted at this stage. However, it is likely that the habitats will be similar and will support a similar suite of species.

As decommissioning works are likely to be of a similar nature and duration as construction activities, the potential effects resulting from decommissioning are likely to be similar to those resulting from construction, with the exception that habitat will be restored. Therefore**, no significant negative effect** upon deer welfare is predicted.

## 10.6.7 Summary of potential effects

A summary of the outcomes of the assessment of potential effects from the construction, operation and maintenance and decommissioning of the onshore Project is provided in Table 10-19.

No significant effects on terrestrial non-avian ecology receptors were identified. Therefore, mitigation measures in addition to the embedded mitigation measures listed in section 10.5.4 are not considered necessary.

*Table 10-19 Summary of potential effects*

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| Construction and decommissioning* | | | | | | |
| **No pathway for effect upon the habitats of the Internationally designated sites identified. However, disturbance and mortality to otter (the qualifying feature of Caithness and Sutherland Peatlands SAC / Ramsar) may occur. This is discussed in more detail below.** | Sites of International Importance (Broubster Leans, Loch Watten, Caithness and Sutherland Peatlands, Loch of Wester and Strathy Point SACs and Caithness and Sutherland Peatlands Ramsar) | High | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct habitat loss or damage due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution, sedimentation and disruption of groundwater flows etc.** | Sites of National importance (The River Thurso, Ushat Head, Loch Lieurary, Westfield Bridge, Newlands of Geise Mire, Loch Scarmclate, Holborn Head, Sandside Bay, Red Point Coast and Broubster Leans SSSIs) | High | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct habitat loss or damage due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution, sedimentation and disruption of groundwater flows etc.** | Habitats of high sensitivity (H7, M15, M16, M22, M23, M24, M25, S27, M10, M27, MG8, MC9, MC10, U4, U5 and S11) | High | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| **Direct habitat loss or damage due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution, sedimentation and disruption of groundwater flows etc.** | Habitats of medium sensitivity (MG5, MG9, S8, S9, S10, S14, S19, S22, W4, W6, W8 and W21) | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to Scottish primrose habitat / populations due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Scottish primrose | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Potential destruction or modification of roost locations within trees, buildings and other structures, potentially resulting in direct or indirect mortality. Habitat loss resulting in displacement of species, possible injury or mortality through the movement of plant and other site vehicles and disturbance to commuting, foraging and resting bats.** | Bats | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Habitat loss or fragmentation resulting in displacement of species, possible injury or mortality through the movement of plant and other site vehicles, injury or mortality due to deep excavations and uncapped piping and disturbance to resting, commuting and** | Otter | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| foraging terrestrial mammals. Pollution of the watercourses with direct effects on the availability and quality of fish prey species. | | | | | | |
| Habitat loss resulting in the possible fragmentation of suitable foraging habitat and the severance of commuting habitat, possible injury or mortality through the movement of plant and other site vehicles and the felling of trees, and disturbance to commuting, foraging and resting terrestrial mammals. Indirect effects may also occur through construction-related dust pollution, resulting in a reduction in tree health with direct effects on the availability of quality food and habitat. | Pine marten | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Habitat loss resulting in the possible temporary severance of commuting habitat, possible injury or mortality through the movement of plant and other site vehicles, and disturbance to commuting, foraging and resting terrestrial mammals. Pollution of the watercourses with direct effects on the habitat and food resource. | Water vole | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| **Direct habitat loss or damage due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution, sedimentation and disruption of groundwater flows etc.** | Habitats of low sensitivity (MG1, MG6, MG10, OV22 and OV27) | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to Northern Knotgrass habitat / populations due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Northern knotgrass | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to Eyebright (Euphrasia marshallii) habitat / populations due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Eyebright (*Euphrasia marshallii*) | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to field gentian habitat / populations due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Field gentian | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| **Habitat loss or damage resulting in displacement of species, possible injury or mortality through the movement of plant and other site vehicles, injury or mortality due to deep excavations and uncapped piping and disturbance to commuting and foraging terrestrial mammals.** | Badger | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Land clearance works resulting in the temporary loss of suitable habitat, possible injury or mortality to any reptiles present, and disturbance to commuting, foraging and resting animals. Indirect effects may also occur through the pollution of suitable habitats with direct effects on the availability of quality food and habitat.** | Reptiles | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to habitats suitable for invertebrate communities of conservation importance due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Invertebrates of conservation importance (excluding great yellow bumblebee, moss carder bee, small blue butterfly, large heath butterfly and small pearl-bordered fritillary, which are described separately). | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to coastal grassland or maritime cliff habitats due to land-take and the tracking of vehicles and trampling by site** | Great yellow bumblebee, moss carder bee and small blue butterfly. | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| personnel. Possible indirect effects due to pollution and sedimentation etc. | | | | | | |
| Direct loss or damage to habitats supporting the main foodplants of large heath butterfly and small pearl-bordered fritillary due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc. | Large heath butterfly and small pearl-bordered fritillary. | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Reduction in deer welfare | Deer | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Operation and maintenance | | | | | | |
| No pathway for effect upon the habitats of the Internationally designated sites identified. However, disturbance and mortality to otter (the qualifying feature of Caithness and Sutherland Peatlands SAC / Ramsar) may occur. This is discussed in more detail below. | Sites of International Importance (Broubster Leans, Loch Watten, Caithness and Sutherland Peatlands, Loch of Wester and Strathy Point SACs and Caithness and Sutherland Peatlands Ramsar) | High | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| **Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for disruption of groundwater flows and more significant accidental release.** | Sites of National importance (The River Thurso, Ushat Head, Loch Lieurary, Westfield Bridge, Newlands of Geise Mire, Loch Scarmclate, Holborn Head, Sandside Bay, Red Point Coast and Broubster Leans SSSIs) | High | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for habitat loss, disruption of groundwater flows and more significant accidental release.** | Habitats of high conservation value (H7, M15, M16, M22, M23, M24, M25, S27, M10, M27, MG8, MC9, MC10, U4, U5 and S11) | High | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for habitat loss, disruption of groundwater flows and more significant accidental release.** | Habitats of medium conservation value (MG5, MG9, S8, S9, S10, S14, S19, S22, W4, W6, W8 and W21) | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for more significant accidental release.** | Scottish primrose | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| Possible injury or mortality through the movement of maintenance vehicles through the site and some temporary disturbance to foraging and commuting bats during routine maintenance works and the operation of the substation. In the event that significant maintenance works to the buildings is required, then there is the potential for the disturbance, modification or destruction of potential bat roost features. | Bats | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Possible injury or mortality through the movement of maintenance vehicles through the site and some temporary disturbance to foraging and commuting otter during routine maintenance works. During more significant maintenance works, there is the potential for a greater level of disturbance and injury or mortality due to deep excavations and uncapped piping. | Otter | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Possible injury or mortality through the movement of maintenance vehicles through the site and some temporary disturbance to foraging and commuting pine marten during routine maintenance works. During more significant maintenance works, there is the potential for a greater level of disturbance and | Pine marten | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| injury or mortality due to deep excavations and uncapped piping. | | | | | | |
| Possible injury or mortality through the movement of maintenance vehicles through the site and some temporary disturbance to foraging and commuting water vole during routine maintenance works. During more significant maintenance works, there is the potential for a greater level of disturbance and injury or mortality due to deep excavations and uncapped piping. | Water vole | Moderate | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for disruption of groundwater flows and more significant accidental release. | Habitats of low sensitivity (MG1, MG6, MG10, OV22 and OV27) | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for more significant accidental release and possible | Northern knotgrass, Eyebright (*Euphrasia marshallii*), Field gentian | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| direct loss or damage to habitats supporting these notable plant species. | | | | | | |
| Possible injury or mortality through the movement of maintenance vehicles through the site and some temporary disturbance to foraging and commuting badger during routine maintenance works. During more significant maintenance works, there is the potential for a greater level of disturbance and injury or mortality due to deep excavations and uncapped piping. | Badger | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Possible injury or mortality through the movement of maintenance vehicles through the site and some temporary disturbance to reptiles during routine maintenance works. During more significant maintenance works, there is the potential for a greater level of disturbance and injury or mortality due to ground-breaking works. | Reptiles | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| Possible indirect effects due to pollution during routine operation and maintenance. During more significant maintenance works (if required) there is some potential for more significant accidental release and possible | Invertebrates of conservation importance (excluding great yellow bumblebee, moss carder bee, large heath butterfly, small blue butterfly and small pearl-bordered | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

| POTENTIAL EFFECT | RECEPTOR | SENSITIVITY OF RECEPTOR | MAGNITUDE OF IMPACT | SIGNIFICANCE OF EFFECT | SECONDARY MITIGATION REQUIREMENTS | RESIDUAL SIGNIFICANCE OF EFFECT |
|---|---|---|---|---|---|---|
| **direct loss or damage to habitats supporting invertebrates of conservation importance.** | fritillary, which are described separately). | | | | | |
| **Direct loss or damage to coastal grassland or maritime cliff habitats due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Great yellow bumblebee, moss carder bee and small blue butterfly. | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |
| **Direct loss or damage to habitats supporting the main foodplants of large heath butterfly and small pearl-bordered fritillary due to land-take and the tracking of vehicles and trampling by site personnel. Possible indirect effects due to pollution and sedimentation etc.** | Large heath butterfly and small pearl-bordered fritillary. | Low | Negligible | Not significant | None required above embedded mitigation measures. | Not significant |

**** In the absence of detailed information regarding decommissioning works, and unless otherwise stated, the impacts during decommissioning of the onshore Project are considered analogous with, or likely less than, those of the construction stage.***

## 10.7 Assessment of cumulative effects

Cumulative effects can result from individually insignificant actions that, collectively, result in a significant effect on ecological features; even when effects may not be detected when considering the onshore Project in isolation. It is important to take such actions into account as cumulative effects can make habitats and species more vulnerable or sensitive to change, in particular for features that may already be exposed to background levels of disturbance or pressure that take them close to their critical threshold (CIEEM, 2018). Therefore, the need to consider cumulative effects is a requirement under CIEEM guidelines (CIEEM, 2018). Developments to be incorporated in such an assessment must include existing and consented developments, as well as those at the application stage.

Impacts of negligible magnitude are not considered in the cumulative impact assessment as they cannot measurably affect the outcome of an impact in combination with other developments. As all identified impacts on terrestrial ornithology receptors are negligible, a cumulative impact assessment is not considered necessary nor possible.

## 10.8 Inter-related effects

Inter-related effects are the potential effects of multiple impacts, affecting one receptor or a group of receptors. Inter-related effects include interactions between the impacts of the different stages of the onshore Project (i.e., interaction of impacts across construction, operation and maintenance and decommissioning), as well as the interaction between impacts on a receptor within an onshore Project stage. The potential inter-related effects for terrestrial non-avian ecology receptors are described below.

### 10.8.1 Inter-related effects between onshore Project stages

In line with the Scoping Opinion, this chapter assesses all impacts that are relevant to terrestrial non-avian ecology receptors during the construction, operation and maintenance, and decommissioning stages of the onshore Project. Therefore, it is considered that the assessment and conclusions presented in section 10.6 provide a complete and robust assessment of all potential impacts.

The greatest impact upon terrestrial non-avian ecology receptors is predicted to result from ground clearance during the construction stage of the onshore Project, with similar impacts anticipated during decommissioning if the onshore export cable is to be removed. However, with the embedded mitigation for terrestrial non-avian ecology receptors in place (as detailed in section 10.5.4), the individual impacts of each component of construction and decommissioning have been assessed as not significant. Therefore, as negligible impacts are anticipated during the operation and maintenance of the onshore Project, and considering the long delay (30+ years) between construction and decommissioning, no additional inter-related effects beyond those presented in section 10.6 are predicted.

### 10.8.2 Inter-related effects within an onshore Project stage

The greatest impact upon terrestrial non-avian ecology receptors is predicted to result from ground clearance during the construction stage of the onshore Project, with similar impacts anticipated during decommissioning if the onshore export cables are to be removed. However, whilst the potential exists for spatial and temporary interactions between different operations for both Project stages, resulting in a more significant impact upon a terrestrial non-avian ecology receptor than when a single operation is considered in isolation, no significant inter-related effects are predicted. This

is due to the fact that, once the embedded mitigation measures are considered, the levels of effect of each component of the construction or decommissioning works upon the ecological receptors described in this chapter are 'low' and not-significant'. Therefore, the likelihood of significant inter-related effects is considered to be negligible.

For the operation of the onshore Project, it is difficult to determine the precise effects on habitats and species due to the unpredictable nature of the requirement for maintenance works. However, it is expected that routine maintenance activities would be infrequent and small scale, resulting in disturbance effects of a significantly lower magnitude than those during construction or decommissioning, with the greatest impact likely to occur during any non-routine maintenance to the onshore export cables (if required). Due to the low level of impact anticipated during the operation of the onshore Project, no significant inter-related effects are predicted.

## 10.9 Whole Project assessment

The offshore Project is summarised in chapter 5: Project description and a summary of the effects of the offshore Project is provided in chapter 18: Offshore EIA summary. These offshore aspects of the Project have been considered in relation to the impacts assessed in section 10.6.

There is no pathway for effect on terrestrial non-avian ecology due to the offshore aspects of this Project, so there are no additional impacts to consider as a result of the interaction between these two aspects.

## 10.10 Transboundary effects

Transboundary effects arise when impacts from a development within one administrative area (CIEEM, 2018) or European Economic Area (EEA) state's territory affects the environment of another EEA state(s). During the construction, operation and maintenance and decommissioning of the onshore Project, impacts upon terrestrial non-avian receptors will be localised to the extent of the terrestrial non-avian ecology study area. Given the intervening distance to neighbouring administrative areas and EEA states, there is no potential for transboundary impacts and resultant effects to occur. Therefore, transboundary effects do not need to be considered further.

## 10.11 Summary of mitigation and monitoring

No secondary mitigation, over and above the embedded mitigation measures proposed in section 10.5.4, is either required or proposed in relation to the potential effects of the onshore Project on terrestrial non-avian ecology as no adverse significant impacts are predicted.

As discussed in Section 10.5.4, an SHPP will be created and implemented to prevent harm to protected and notable habitats and animals. The implementation of the SHPP will include pre-construction surveys for protected mammal and reptile species as well as targeted surveys for potentially sensitive habitats. These surveys will be undertaken to identify any species making use of the onshore Project area ahead of works, allowing specific mitigation and compensation measures to be developed in consultation with NatureScot. Where necessary, a NatureScot Derogation Licence will be obtained prior to works commencing.

The following monitoring measures are proposed during construction, subject to review on finalisation of the onshore Project design at post-consent:

- Targeted monitoring will be put in place to provide a check on the identified sensitive habitats identified within pre-construction surveys, and to ensure that mitigation and protection measures are in place and effective. This will be implemented via the HMP;
- Surface water monitoring will be established within the existing watercourse network. Details are provided in SS3: Flood Risk and Drainage Assessment; and
- All areas of sensitive habitat will be visited and assessed by the ECoW prior to the commencement of any construction works. Assessment will include collection of representative photographs of the areas which are most likely to be affected by the works. Regular assessment visits will be undertaken throughout the construction period and for a minimum of 12 months after reinstatement and as long as is necessary to confirm the habitat has been restored, to ensure that habitat protection is effective, and any restoration and recovery works become established.

The Project is committed to protecting the environment by ensuring best practice and embedded mitigation measures are followed at all times during construction, operation and maintenance and decommissioning. Additionally, the Project is committed to enhancing the environment, where possible. The approach includes, but is not limited to, partnering with key stakeholders, neighbouring developers and the local community to ensure that any proposed enhancements are suited to the environment that they are situated in benefit not only the primary species but the wider ecosystem. The Project is proposing a biodiversity enhancement project in relation to great yellow bumblebee. This is a Nationally Scarce species listed on the Scottish Biodiversity List that is now restricted to coastal areas of Orkney, the Western Isles, Caithness and Sutherland. This formerly widespread species has declined by 80% over the last century primarily due to loss of flower-rich meadow habitats and changes in agricultural practices (Goulson, 2010; Falk & Lewington, 2015; Else & Edwards, 2018; Bumblebee Conservation Trust, 2021). The Project therefore proposes to create more wildflower meadows with key flower species for great yellow bumblebees. The outline BEP is submitted alongside the PPP application and will be finalised after planning consent has been granted, in line with further consultations.

## 10.12 References

Andrews, P., Crump, R., Harries, D. & Andrews, M. (2016) Influence of weather on a population of *soprano pipistrelle* bats in West Wales, UK: a 20 year study estimates population viability. Endangered Species Research, 30,19-28.

Averis, A.M., Averis, A.B.G., Birks, H.J.B, Horsfield, D, Thompson, D.B.A. & Yeo, M.J.M. (2004). An illustrated guide to British upland vegetation. JNCC, Peterborough.

Balharry, D. (1993). Factors Affecting the Distribution and Population Density of Pine Martens (*Martes martes L.*) in Scotland, University of Aberdeen. Unpublished PhD thesis.

Bang, P. & Dahlstrøm, P. (2006). Animal Tracks and Signs. Oxford University Press, Oxford.

Bat Conservation Trust (2007). Bat Surveys: Good Practice Guidelines. Faber Maunsell/AECOMBCT (2014). Artificial lighting and wildlife. Bat Conservation Trust: London.

Bat Rock Habitat Key (2021). Bat Roosts in Rock: A Guide to Identification and Assessment for Climbers, Cavers and Ecology Professionals. Pelagic Publishing.

Bestion, E., Teyssier, A., Richard, M., Clobert, J. & Cote, J., (2015). Live fast, die young: experimental evidence of population extinction risk due to climate change. PLoS Biol, 13(10), p.e1002281.

Best Practice Guides (2023). Best Practice Guidance on the management of wild deer in Scotland. Available online at: http://bestpracticeguides.org.uk/ [Accessed 11/09/2023].

British Deer Society (BDS) (2023a). Deer Distribution Survey. Available online at: https://bds.org.uk/science-research/deer-surveys/deer-distribution-survey/ [Accessed 11/09/2023].

BDS (2023b). Red Deer. Available online at: https://bds.org.uk/information-advice/about-deer/deer-species/red-deer/ [Accessed 11/09/2023].

BDS (2023c). Roe Deer. Available online at: https://bds.org.uk/information-advice/about-deer/deer-species/roe-deer/ [Accessed 11/09/2023].

Buglife (2012). Scottish Invertebrate Habitat Management: Brownfields. Available online at: https://cdn.buglife.org.uk/2019/07/Brownfields_1.pdf [Accessed 11/09/2023].

Bumblebee Conservation Trust (2021). Great yellow bumblebee (*Bombus distinguendus*). Great yellow bumblebee factsheet. Available online at: https://www.bumblebeeconservation.org/wp-content/uploads/2017/11/Slater-Great-yellow-bumblebee-Factsheet-02.15.pdf [Accessed 04/10/2023].

Butler, K. (N.d.). Available online at: https://bsbi.org/wp-content/uploads/dlm_uploads/CaithnessRPR2015.pdf [Accessed 11/09/2023].

Caryl, F.M. (2008). *Pine marten diet and habitat use within a managed coniferous forest.* (Doctoral thesis.) University of Stirling.

Cathrine, C. (2018). ARG UK Advice Note 10: Reptile Survey and Mitigation Guidance for Peatland Habitats. Amphibian and Reptile Groups of the United Kingdom.

Chanin, P. (2003). Monitoring the Otter *Lutra lutra*. Conserving Natura 2000 Rivers Monitoring Series No. 10. English Nature, Peterborough.

Chanin, P. (2013). Otters. Whittet Books Ltd, Stansted.

Chartered Institute of Ecology and Environmental Management (CIEEM) (2018). Guidelines for Ecological Impact Assessment in the UK and Ireland.: Terrestrial, Freshwater, Coastal and Marine version 1.2 – Updated April 2022. Available online at: https://cieem.net/wp-content/uploads/2018/08/ECIA-Guidelines-2018-Terrestrial-Freshwater-Coastal-and-Marine-V1.2-April-22-Compressed.pdf [Accessed 4/10/22].

Collins, J. (ed.) (2016) Bat Surveys for the Professional Ecologists: Good Practice Guidelines (3rd edn). The Bat Conservation Trust, London.

Cresswell, W.J., Birks, J.D.S., Dean, M., Pacheco, M., Trewhella, W.J., Wells, D. & Wray, S. (Eds.) (2012). UK BAP Mammals: Interim Guidance for Survey Methodologies, Impact Assessment and Mitigation. The Mammal Society, Southampton.

Croose E., Birks, J.D.S. & Schofield, H.W (2013) Expansion zone survey of pine marten (*Martes martes*) distribution in Scotland. SNH Commissioned Report No. 520.

Dean, M., Strachan, R., Gow, D., Andrews, R.M., Matthews, F. & Chanin, P.R.F. (2016). The Water Vole Mitigation Handbook. Mammal Society Mitigation Guidance Series. 59pp.

Dean, M. (2021). Water Vole Field Signs and Habitat Assessment: A Practical Guide to Water Vole Surveys (Conservation Handbooks). Pelagic Publishing, Exeter.

Elkington, T., Dayton, N., Jackson, D.L. & Strachan, I.M. (2002) National Vegetation Classification field guide to mires and heaths. JNCC, Peterborough.

Else, G.R. & Edwards, M. (2018). Handbook of the Bees of the British Isles. The Ray Society, London.

Falk, S. & Lewington, R. (2015). Field Guide to the Bees of Great Britain and Ireland. British Wildlife Publishing.

Festa, F., Ancillotto, L., Santini, L., Pacifici, M., Rocha, R., Toshkova, N., Amorim, F., Benítez-López, A., Domer, A., Hamidović, D., Kramer-Schadt, S., Mathews, F., Radchuk, V., Rebelo, H., Ruczynski, I., Solem, E., Tsoar, A., Russo, D. & Razgour, O. (2022). Bat responses to climate change: a systematic review. Biological reviews of the Cambridge Philosophical Society 98, 19-33.

Findlay, M., Alexander, L. & Macleod, C. (2015). Site condition monitoring for otters (*Lutra lutra*) in 2011-12. SNH, Inverness.Froglife (2015) Surveying for Reptiles: tips, techniques and skills to help you survey for reptiles. Froglife, Peterborough. 26pp.

Froglife (2015). Surveying for Reptiles: tips, techniques and skills to help you survey for reptiles. Available online at: https://www.froglife.org/surveying-for-reptiles/ [Accessed 11/09/2023].

Gent, A. and Gibson, S. (1998) Herpetofauna Workers Manual, Joint Nature Conservation Committee, Peterborough.

Goulson, D. (2010). Bumblebees. In Maclean, N. (ed.) Silent Summer: The State of Wildlife in Britain and Ireland. Cambridge University Press, Cambridge. pp. 414-429.

Green, J. & Green, R. (1997). Otter Survey of Scotland. Vincent Wildlife Trust, London.

Grogan, A., Green, R. & Rushton, S. (2013). The Impacts of Roads on Eurasian Otters (*Lutra lutra*). IUCN Otter Specialist Group Bulletin.

Gurnell, J., Lurz, P., McDonald, R., & Pepper, H. (2009). Practical Techniques for Surveying and Monitoring Squirrels. Forestry Commission Practice Note FCPN011. Forestry Commission.

Harris, S., Morris, P., Wray, S., & Yalden, D. (1995) A review of British mammals: population estimates and conservation status of British mammals other than cetaceans. JNCC, Peterborough. 216pp.

Harris, S. & Yalden, D.W. (2008) Mammals of the British Isles: Handbook, 4th Edition. The Mammal Society, Southampton

Hill, M. O., Blackstock, T. H., Long, D. G. & Rothero, G. P. (2008). A checklist and census catalogue of British and Irish bryophytes. Updated 2008. Middlewich, British Bryological Society, 184pp.

Historic Environment Scotland (HES) and Scottish Natural Heritage (SNH) (2018). Environmental Impact Assessment Handbook. Version 5. Available online at: https://www.historicenvironment.scot/archives-and-research/publications/publication/?publicationId=6ed33b65-9df1-4a2f-acbb-a8e800a592c0 [Accessed 11/09/2023].

Humphreys, E., Toms, M., Newson, S., Baker, J., & Wormald, K. (2011). An examination of reptile and amphibian populations in gardens, the factors influencing garden use and the role of a 'Citizen Science' approach for monitoring their populations within this habitat. BTO Research Report No. 572.

International Union for the Conservation of Nature (IUCN) (2021). Invasive alien species and climate change, February 2021. Available online at: https://www.iucn.org/sites/default/files/2022-04/ias_and_climate_change_issues_brief_2021.pdf [Accessed 11/09/2023].

Joint Nature Conservation Committee (JNNC) (2001). National Vegetation Classification: Field guide to mires and heaths. JNNC, Peterborough.

JNCC (2007). Report on the Species and Habitat Review. Report by the Biodiversity Reporting and Information Group (BRIG) to the UK Standing Committee. June 2007. Available online at: https://data.jncc.gov.uk/data/bdd8ad64-c247-4b69-ab33-19c2e0d63736/UKBAP-Species-HabitatsReview-2007.pdf [Accessed 11/09/2023].

Jones, G., Jacobs, D., Kunz, T., Willig, M. & Racey, P. (2009). Carpe noctem: the importance of bats as bioindicators. Endangered Species Research, 8, 93–115.

Kranz, A., Abramov, A.V., Herrero, J. & Maran, T. (2016). *Meles meles*. The IUCN Red List of Threatened Species 2016. Available online at: https://www.iucnredlist.org/species/29673/45203002 [Accessed 11/09/2023].

Le Galliard, J.F., Massot, M., Baron, J.P. and Clobert, J., (2012). Ecological effects of climate change on European reptiles. Wildlife conservation in a changing climate, pp.179-203.

Lundy, M., Montgomery, I. & Russ, J., (2010). Climate change-linked range expansion of Nathusius' pipistrelle bat, *Pipistrellus nathusii* (Keyserling & Blasius, 1839). Journal of Biogeography, 37(12), pp.2232-2242.

Mathews F,, Kubasiewicz L,, Gurnell J,, Harrower C,, McDonald R, & Shore R. (2018). A review of the population and conservation status of British mammals. Natural England, Peterborough.

McInerny, C.J. (2018). Amphibian and Reptile Conservation in Scotland: Focus on the Great Crested Newt *Triturus cristatus* and the European Adder *Vipera berus*. Reptiles and Amphibians. Glasgow Natural History Society, Glasgow.

Miles, J. (chair), Ferguson, J., Smith, N. & Fox, H. (2018) Guidance Note 08/18: Bats and artificial lighting in the UK. Institution of Lighting Professionals: Rugby and Bat Conservation Trust: London. Available online at: https://www.theilp.org.uk/documents/guidance-note-8-bats-and-artificial-lighting/ [Accessed 11/09/2023].

Ministry of Housing, Communities and Local Government (2005). Biodiversity and geological conservation: circular 06/2005. Available online at: https://www.gov.uk/government/publications/biodiversity-and-geological-conservation-circular-06-2005 [Accessed 11/09/2023].

Morris, J. (2009). *Primula scotica* survey in Caithness and Sutherland 2007-2008. Scottish Natural Heritage Commissioned Report No. 312. SNH, Golspie.

National Biodiversity Network (NBN) Trust (2021). NBN Atlas. Available online at: https://nbnatlas.org/ [Accessed 11/09/2023].

NatureScot (2019a). Species Planning Advice – otter. Available online at: https://www.nature.scot/doc/standing-advice-planning-consultations-otters [Accessed 11/09/2023].

NatureScot (2019b). Species Planning Advice – pine marten. Available online at: https://www.nature.scot/doc/standing-advice-planning-consultations-pine-martens [Accessed 11/09/2023].

NatureScot (2019c). Species Planning Advice – red squirrel. Available online at: https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels [Accessed 11/09/2023].

NatureScot (2019d). Species Planning Advice – water vole. Available online at: https://www.nature.scot/doc/standing-advice-planning-consultations-water-voles [Accessed 11/09/2023].

NatureScot (2020a). Scottish Biodiversity List. Available online at: https://www.nature.scot/doc/scottish-biodiversity-list [Accessed 26/09/22].

NatureScot (2020b) Otter. Available online at: https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/otter [Accessed 11/09/2023].

NatureScot (2021). Assessing the cumulative impact of onshore wind energy developments. NatureScot. Guidance - Assessing the cumulative landscape and visual impact of onshore wind energy developments. NatureScot.

NatureScot (2022). SiteLink. Available online at: https://sitelink.nature.scot/home [Accessed 11/09/2023].

Ordnance Survey (OS) (2022). Ordnance Survey Maps. Available online at: https://shop.ordnancesurvey.co.uk/maps/ [Accessed 11/09/2023].

Rainey, E., Butler, A., Bierman, S. and Roberts, A.M.I. (2009). Scottish Badger Distribution Survey 2006 – 2009: estimating the distribution and density of badger main setts in Scotland. Report prepared by Scottish Badgers and Biomathematics and Statistics Scotland.

Regini, K. (2000). Guidelines for ecological evaluation and impact assessment. In Practice, Bulletin of the Institute of Ecology and Environmental Management 29, 2-7.

Rich, T., Hack, & McMeechan, F. (2005). 'Vascular Plants' in Hill, D., Fasham, M., Tucker, G., Michael Shewry, M. & Shaw, P. (Eds). Handbook of Biodiversity Methods: Survey, Evaluation and Monitoring. Cambridge University Press, Cambridge, New York, Melbourne, Madrid, Cape Town, Singapore, São Paulo. pp 303-318.

Robbirt, K. M., Roberts, D. L., Hutchings, M. J & Davy, A. j. (2014). Potential Disruption of Pollination in a Sexually Deceptive Orchid by Climatic Change. Current Biology 24, 2845-2849.

Roche, N., Langton, S.D., Aughney, T., Lynn, D. & Marnell, F. (2020). Elucidating the Consequences of a Warming Climate for Common Bat Species in North-Western Europe. *Acta Chiropterologica*, 21, 359-373.

Rodwell, J.S. (Ed.). (1992). British Plant Communities Volume 3: Grasslands and montane communities. Cambridge University Press, Cambridge.

Roper, T.J. (2010). Badger. HarperCollins Publishers, London.

Scott, R. (2011). Atlas of Highland land mammals, Highland Biological Recording Group edition, in English Atlas of Highland land mammals (2011 edition). Highland Biological Recording Group.

Scotland and Northern Ireland Forum for Environmental Research (SNIFFER) (2009). WFD95: A Functional Wetland Typology for Scotland - Project Report. ISBN: 978-1-906934-21-7.

Scottish Environmental Protection Agency (SEPA) (2012). Land Use Planning System SEPA Guidance Note 4: Planning Guidance on Windfarm Developments. Available online at: https://www.sepa.org.uk/media/136117/planning-guidance-on-on-shore-windfarms-developments.pdf [Accessed 11/09/2023].

SEPA (2014). Land Use Planning System SEPA Guidance Note 31: Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available online at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf [Accessed 11/09/2023].

SEPA (2017). Guidance on Assessing the Impacts of Development Proposals on Groundwater Abstractions and GWDTE. SEPA Guidance Note 31, Version 3. Available online at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions.pdf [Accessed 11/09/2023].

SEPA (2018). Pollution Prevention Guidelines: Dealing with spills. Guidance document PPG 22 produced by SEPA, NIEA and the EA.

SEPA (2021). Supporting Guidance (WAT-SG-75). Sector Specific Guidance: Water Run-off from Construction Sites. Version 2. Available online at: https://www.sepa.org.uk/media/340359/wat-sg-75.pdf [Accessed 11/09/2023].

SEPA (2022). The Water Environment (Controlled Activities) (Scotland) Regulations 2011 (as amended): A Practical Guide. Available online at: https://www.sepa.org.uk/media/dw5de0kh/car-a-practical-guide.pdf [Accessed 11/09/2023].

Scottish Executive (2004). Scotland's Biodiversity: It's In Your Hands. A strategy for the conservation and enhancement of biodiversity in Scotland. Scottish Executive, St Andrew's House, Edinburgh.

Scottish Government (2008). Scotland's Wild Deer: A National Approach. Available online at: https://www.webarchive.org.uk/wayback/archive/20220126143540mp_/https://www.nature.scot/sites/default/files/2017-06/C249895%20-%20Scotlands%20Wild%20Deer%20-%20A%20National%20Approach%20November%202008%20DCS.pdf [Accessed 11/09/2023].

Scottish Government (2013). 2020 Challenge for Scotland's Biodiversity. A Strategy for the conservation and enhancement of biodiversity in Scotland. Scottish Government, Edinburgh. Available online at: https://www.gov.scot/publications/2020-challenge-scotlands-biodiversity-strategy-conservation-enhancement-biodiversity-scotland/documents/ [Accessed 11/09/2023].

Scottish Government (2014). Scotland's Wild Deer: A National Approach including 2015 – 2020 Priorities. Available online at: https://www.webarchive.org.uk/wayback/archive/20220413141840mp_/https://www.nature.scot/sites/default/files/2020-01/Scotland%27s%20Wild%20Deer_%20A%20National%20Approach%202015-2020%20Priorities.pdf [Accessed 11/09/2023].

Scottish Government (2015). Scotland's Biodiversity – a Route Map to 2020. The Scottish Government. Available online at: https://www.gov.scot/publications/scotlands-biodiversity-route-map-2020/documents/ [Accessed 11/09/2023].

Scottish Government (2017). Draft climate change plan: draft third report on policies and proposals 2017-2032. January 2017. Available online at: https://www.gov.scot/publications/draft-climate-change-plan-draft-third-report-policies-proposals-2017/documents/ [Accessed 11/09/2023].

Scottish Government (2019). Scotland's Forestry Strategy: 2019 - 2029. The Scottish Government. Available online at: https://www.gov.scot/publications/scotlands-forestry-strategy-20192029/documents/ [Accessed 11/09/2023].

Scottish Government (2022). Scottish Biodiversity Strategy to 2045. Tackling the Nature Emergency in Scotland. Scottish Government, Edinburgh. Available online at: https://www.gov.scot/publications/scottish-biodiversity-strategy-2045-tackling-nature-emergency-scotland/documents/ [Accessed 11/09/2023].

Scottish Government (2023). National Planning Policy 4. Scottish Government, Edinburgh. Available online at: https://www.gov.scot/publications/national-planning-framework-4/documents/ [Accessed 11/09/2023].

Scottish Natural Heritage (SNH) (2002a). Scotland's Wildlife: Badgers and Development. SNH, Battleby.

SNH (2002b). Natural Heritage Zones: A National Assessment of Scotland's Landscapes.

SNH (2008). Scotland's Wildlife: Otters and Development.

SNH (2015). Trends of Bats in Scotland. SNH Trend Note. Available online at: https://www.webarchive.org.uk/wayback/archive/20220426140651/https://www.nature.scot/doc/trend-notes-bats-scotland [Accessed 11/09/2023].

Scottish Renewables, Scottish Natural Heritage, Scottish Environment Protection Agency & Forestry Commission Scotland (2019). Good Practice during Windfarm Construction, 4th edition. Available online at: https://www.scottishrenewables.com/assets/000/000/453/guidance_-_good_practice_during_wind_farm_construction_original.pdf?1579640559 [Accessed 11/09/2023].

Stace, C.A. (2019). New Flora of the British Isles. Fourth Edition. C&M Floristics.

Stone, E.L., Harris, S. & Jones, G. (2015) Impacts of artificial lighting on bats: a review of challenges and solutions. Mammalian Biology 80 (2015) 213-219.

Strachan, R., Moorhouse, T., Gelling, M., (2011). Water Vole Conservation Handbook,3rd edn. Wildlife Conservation Research Unit, Great Britain.

The Deer Initiative (2011). Best Practice Deer Management. Available online at: www.thedeerinitiative.co.uk [Accessed 11/09/2023].

The Highland Council (THC) (2012). Highland-Wide Local Development Plan (HwLDP). Available online at: https://www.highland.gov.uk/info/178/development_plans/199/highland-wide_local_development_plan [Accessed 11/09/2023].

THC (2013). Supplementary Guidance: Highland's Statutorily Protected Species. Available online at: https://www.highland.gov.uk/downloads/file/3026/highland_statutorily_protected_species_supplementary_guidance [Accessed 11/09/2023].

THC (2018). Caithness and Sutherland Local Development Plan (CaSPlan). Available online at: https://www.highland.gov.uk/info/178/local_and_statutory_development_plans/283/caithness_and_sutherland_local_development_plan [Accessed 11/09/2023].

UK Technical Advisory Group (UKTAG) (2009). Guidance on the identification of groundwater dependent terrestrial ecosystems: Annex I – NVC plant communities and dependency on groundwater. UKTAG.

Wilkinson, J.W., Wright, D., Arnell, A. & Driver, B. (2011). Assessing population status of the great crested newt in Great Britain. Natural England Commissioned Reports, Number 080.

Yom-Tov, Y., Heggberget, T.M., Wiig, Ø & Yom-Tov, S. (2006). Body size changes among otters, *Lutra lutra*, in Norway: the possible effects of food availability and global warming. Oecologia 150, 155–160.

## 10.13 Abbreviations

| ACRONYM | DEFINITION |
|---|---|
| ARC | Amphibian and Reptile Conservation Trust |
| ARG UK | Amphibian and Reptile Groups of the UK |
| BAP | Biodiversity Action Plan |
| BBCT | Bumblebee Conservation Trust |
| BCT | Bat Conservation Trust |
| BDS | British Deer Society |
| BEP | Biodiversity Enhancement Plan |
| BSBI | Botanical Society of Britain and Ireland |
| BTO | British Trust for Ornithology |
| CAR | Controlled Activities (Scotland) Regulations |
| CasPlan | Caithness and Sutherland Local Development Plan |
| CC-BY | Creative Commons Attribution License |
| CC-BY-NC | Creative Commons Attribution Non-Commercial license |
| CCO | Creative Commons Attribution License |
| CEMP | Construction Environmental Management Plan |
| CIEEM | Chartered Institute of Ecology and Environmental Management |
| CJB | Cable Joint Bay |
| CLO | Community Liaison Officer |

| ACRONYM | DEFINITION |
|---|---|
| CMS | Construction Method Statements |
| COP | Conference of the Parties |
| CSZ | Core Sustenance Zone |
| DAQMP | Dust and Air Quality Management Plan |
| DBA | Desk-Based Assessment |
| EA | Environment Agency |
| EcIA | Ecological Impact Assessment |
| ECoW | Environmental Clerks of Work |
| EEA | European Economic Area |
| EIA | Environmental Impact Assessment |
| EPS | European Protected Species |
| EU | European Union |
| FLS | Forest and Land Scotland |
| GWDTE | Groundwater-Dependent Terrestrial Ecosystems |
| ha | Hectares |
| HBAP | Highland Biodiversity Action Plan |
| HBRG | Highland Biological Recording Group |
| HDD | Horizontal Directional Drilling |
| HES | Historic Environment Scotland |

| ACRONYM | DEFINITION |
|---|---|
| HRA | Habitat Regulations Assessment |
| HSI | Habitat Suitability Index |
| HMP | Habitat Management Plan |
| HVAC | High Voltage Alternating Current |
| HVDC | High Voltage Direct Current |
| HwLDP | Highland-Wide Local Development Plan |
| INNS | Invasive Non-Native Species |
| IUCN | International Union for Conservation of Nature |
| JNCC | Joint Nature Conservation Committee |
| km / $km^2$ | Kilometre / Kilometre squared |
| kV | Kilovolt |
| LBAP | Local Biodiversity Action Plans |
| M / $m^2$ / $m^3$ | Metre / Metre squared / Cubic metre |
| MD-LOT | Marine Directorate - Licensing Operations Team |
| MS-LOT | Marine Scotland - Licensing Operations Team |
| NCSA | Nature Conservation Scotland Act |
| NBN | National Biodiversity Network |
| NHZ | Natural Heritage Zones |
| NIEA | Northern Ireland Environment Agency |

| ACRONYM | DEFINITION |
|---|---|
| NNR | National Nature Reserves |
| NPF4 | National Planning Framework 4 |
| NVC | National Vegetation Classification |
| ODPM | Office of the Deputy Prime Minister |
| OGL | Open Government Licence |
| OHL | Overhead Lines |
| OIC | Orkney Islands Council |
| OMP | Outline Management Plan |
| OS | Ordnance Survey |
| PBA | Protection of Badgers Act |
| PDE | Project Design Envelope |
| PIR | Passive Infrared |
| PPG | Pollution Prevention Guidelines |
| PPP | Planning Permission in Principle |
| RIAA | Report to Inform Appropriate Assessment |
| RSPB | Royal Society for the Protection of Birds |
| SAC | Special Area of Conservation |
| SBL | Scottish Biodiversity List |
| SEPA | Scottish Environment Protection Agency |

| ACRONYM | DEFINITION |
|---|---|
| SHPP | Species and Habitat Protection Plan |
| SNIFFER | Scotland and Northern Ireland Forum for Environment Research |
| SNH | Scottish Natural Heritage |
| SPA | Special Protection Area |
| SS | Supporting Study |
| SSSI | Sites of Special Scientific Interest |
| SuDS | Sustainable Drainage System |
| THC | The Highland Council |
| TJB | Transition Joint Bay |
| UK | United Kingdom |
| UKBAP | United Kingdom Biodiversity Action Plan |
| UKTAG | United Kingdom Technical Advisory Group |
| uPVC | Unplasticised Polyvinyl Chloride |
| USB | Universal Serial Bus |
| WANE | Wildlife and Natural Environment (Scotland) Act |
| WCA | Wildlife and Countryside Act |
| WFD | Water Framework Directive |
| ZOI | Zone of Influence |

## 10.14 Glossary

| TERM | DEFINITION |
|---|---|
| Accidental release | A non-intentional introduction of pollutants into the environment. |
| Burrow | A sub-terranean hole or tunnel dug by a terrestrial mammal including badger. |
| Couch | A circular or oval depression, or area of flattened vegetation, approximately one metre in diameter, formed by an otter resting up in the same place (often a grassy location). |
| Den | Shelters used by pine marten for resting and breeding, as well as providing cover from weather extremes and safety from potential predators. Den sites can include rock crevices, tree cavities, subterranean burrows, buildings and log piles. |
| Diffuse Pollution | Diffuse pollution is the release of potential pollutants from a range of activities that, individually, may have no effect on the water environment, but, at the scale of a catchment, can have a significant effect. |
| Drey | A dense ball of twigs, lined with softer materials including moss, leaves, grass and fir. Dreys are used by squirrels for resting and breeding. |
| Dystrophic loch | A waterbody with acidic water and low oxygen levels due to high levels of dissolved humus, supporting little life. |
| Fossorial | An animal adapted to digging which lives primarily, but not solely, underground. |
| Guard hair | The outer layer of hair of most mammals (in this case badger) |
| Hectares | A standard unit of measurement for habitat areas in ecological surveys. |
| Herpetofauna | Reptiles and amphibians of a particular region. |
| Hibernacula | A place in which an animal (including herpetofauna) seeks refuge over winter. |
| Holt | The den or home of an otter. Natal holts are used by a female to birth and raise her cubs. |
| Latrine | An open dung pit in which badgers deposit their droppings. |
| Lochan | A small loch. |
| Mesotrophic loch | A waterbody with a moderately rich plant nutrient environment, or those having a range of submerged plant communities. |

| TERM | DEFINITION |
|---|---|
| **Nationally Scarce** | Estimated to occur in 16-100 10 km squares since January 1 1980. Nationally Scarce replaces the Nationally Notable A (Na) (recorded in 16-30 10 km squares since 1 January 1980) and Nationally Notable B (Nb) (recorded in 31-100 10 km squares since 1 January 1980) designations. Commonly abbreviated to 'NS.' |
| **Oligotrophic loch** | A waterbody relatively poor in plant nutrients and containing abundant oxygen in deeper areas. |
| **Paths** | Routes formed by otter when travelling on land. These can be very distinct if well used. |
| **Refugia** | Areas where plants and animals find refuge from adverse conditions. |
| **Peri-urban** | An area of land immediately adjacent to a city or urban area, i.e. a space where a city meets the countryside |
| **Roost** | A bat roost is defined by the BCT (Collins, 2016) as 'the resting place of a bat'. |
| **Ramsar site** | Wetland of international importance designated under the Ramsar Convention. |
| **Riparian habitat** | Land adjacent to waterbodies, including submerged land such as streambeds. |
| **Rumination** | The process of re-chewing the cud to further break down plant matter and stimulate digestion |
| **Scat** | Faeces deposited by an animal. |
| **Setback zone** | An area within which certain development activities are prohibited or significantly restricted. |
| **Setts** | The legal definition refers to a 'structure or place' showing signs of current use by badger. In most cases, a sett will comprise a series of tunnels and chambers, accessed by sett entrances. Badgers may occasionally use other types of structure for the same purpose, including natural holes or voids in rock or spaces under buildings. |
| **Slide** | The area on a steep embankment used by an otter to access a watercourse or coastline. The area often becomes muddy and slippery. |
| **Spraint** | Otter droppings, often with visible fish bones or crab shell. |
| **Spraint site** | Often prominent locations (such as boulders, sea walls, jetties etc.) where otter will defecate, advertising their presence (by scent) to other otter. |
| **Thicket stage** | Early growth of a plantation, resembling thick scrub. |