# Appendix 9.1: Habitat and Protected Species Survey Report

## Banniskirk Substation and Converter Station

PREPARED FOR

SSEN Transmission

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SIGNATURE PAGE

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## Banniskirk Substation and Converter Station

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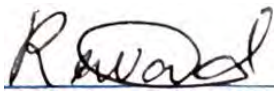

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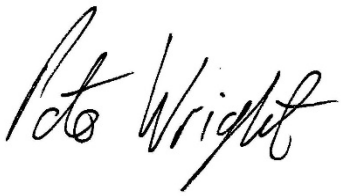

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## ACRONYMS AND ABBREVIATIONS

| Acronyms | Description |
|---|---|
| BCT | Bat Conservation Trust |
| CIEEM | The Chartered Institute of Ecology and Environmental Management |
| HVDC | High Voltage Direct Current |
| ECoW | Ecological Clerk of Work |
| ERM | Environmental Resource Management Ltd |
| GWDTE | Ground Water Dependent Terrestrial Ecosystems |
| JNCC | Joint Nature Conservation Committee |
| Kilovolt (kV) | One thousand volts of electricity |
| Km | Kilometer |
| m | Meters |
| MW | Megawatts |
| NVC | National Vegetation Classification |
| OHL | Overhead Line |
| SBL | Scottish Biodiversity List |
| SEPA | Scottish Environment Protection Agency |
| SPP | Species Protection Plans |
| SSEN | Scottish and Southern Electricity Networks |
| TN | Target Note |
| UKHab | The UK Habitat Classification |
| UKTAG | United Kingdom Technical Advisory Group |

# 1. INTRODUCTION

This report describes the methods and results of the habitat and protected species surveys undertaken to obtain baseline ecological information in connection with Banniskirk Hub, a proposed 400 kilovolt (Kv) substation and a High Voltage Direct Current (HVDC) Switching Station (hereafter referred to as 'the Proposed Development') by Scottish and Southern Electricity Networks Transmission (SSEN Transmission). The following terminology is used through this report:

- The Site: all land within the proposed red line boundary, as shown on**, Figure 1, Appendix A**;
- Ecology Survey Area (ESA): the land in which ecological surveys were undertaken based upon the Zone of Influence (ZoI) of the Proposed Development, as shown on **Figure 1, Appendix A**.
- The Proposed Development: The proposed substation and HVDC convertor station, inclusive of all necessary infrastructure, the Proposed Development layout is shown on **Figure 2, Appendix A**.

## 1.1 PROJECT BACKGROUND

The Proposed Development is a substation and HVDC, and will consist of the following:

- Creation of a platform and the construction of a new outdoor Air Insulated Switchgear (AIS), 400 kilovolt (kV) substation complete with 400 kV double busbar arrangement;
- Creation of a platform and construction of a new 525 kV DC 2 gigawatt (GW) Bi-pole HVDC converter station;
- Installation of two new Super Grid Transformers (SGT) within noise enclosures;
- Installation of two new Synchronous Compensators (SYNCOMs);
- A new substation control building and two SYNCOM buildings;
- Sustainable Drainage Systems (SuDS) for drainage;
- Security fencing around the substation and converter station
- SuDS, foul water drainage and detention basins for drainage control;
- Realignment of the Achalone Tributary around the southern and eastern edges of the Site, with naturalization measures included to improve the realigned watercourse above its current condition;
- Access points at approximate grid references ND 15580 56484 (planned to be the principal Site access), and ND 15676 56250 (planned to be a temporary site access);
- Mounding for the purposes of visual screening;
- Cut and fill earthworks as required to enable the above; and
- Temporary construction compounds and material storage areas for the duration of the construction phase.

## 1.2 SITE DESCRIPTION

The Site is located approximately 2.4 km southeast of Halkirk, Caithness, Scotland, centered on an approximate Ordnance Survey National Grid Reference (OS NGR) ND 15950 56780.

The Site largely comprises of cattle and sheep pastureland, interspersed with areas of bog, heathland, and other acid and neutral grassland habitats, which are used for rough grazing.

The Site is intersected by numerous field drains, with the Burn of Halkirk comprising of the most substantial watercourse flowing through the north.

## 1.3 PURPOSE OF REPORT

Habitat and protected species surveys were undertaken following recommendations set out in the EIA Scoping Report[1], completed by Environmental Resources Management Ltd (ERM) in 2023. The objective of the surveys was to collect detailed information regarding the occurrence and distribution of protected species within the Site and its surrounds, to provide an accurate baseline on which to base an Ecological Impact Assessment (EcIA). The purpose of this report is to detail the methods and results of the habitat and protected species surveys.

[1] ERM (2023). Spittal Substation Scoping Report

# 2. METHODOLOGY

## 2.1 DESK STUDY

### 2.1.1 DESIGNATED SITES

To provide context for the results of the report, a desk study was carried out in September 2023 and reviewed in July 2024. NatureScot's (NS) Site Link[2] website was consulted to obtain information regarding statutory designated sites, such as Sites of Special Scientific Interest (SSSI), Special Protection Areas (SPA), Ramsar Sites, Special Area of Conservation (SAC), National Nature Reserve (NNR), and Local Nature Reserves (LNR), within 5 km of the Site.

5 km is considered an appropriate Zone of Influence (ZoI) for ecological features, considering the scale of the Proposed Development and prevailing habitats within and adjoining the Site.

### 2.1.2 Habitats of Principal Importance

Ancient Woodland Inventory (AWI) (Scotland)[3] and the Carbon and Peatland 2016 map[4] were consulted to identify areas of ancient woodland and carbon-rich soils, deep peat, and priority peatland habitat within 500 m of the Site.

Habitat Map of Scotland (HabMoS)[5] was consulted to identify any priority habitats listed under Scottish Biodiversity List[6] within the Site. The Highland Council's local biodiversity action plan[7] was reviewed to identify any locally important priority habitats which were relevant to the Site.

### 2.1.3 PROTECTED AND PRIORITY SPECIES

Protected species are those that are afforded protection under legislation such as the Conservation (Natural Habitats, &c.) Regulations 1994 (as amended)[8] , the Wildlife and Countryside Act 1981 (as amended)[9] and the Protection of Badgers Act 1992[10]. Priority species are those which are of particular importance for the conservation of biodiversity in Scotland, such as those included on the Scottish Biodiversity List (SBL)[6].

[2] NatureScot. SiteLink [Online]. Available at: https://sitelink.nature.scot/map (Accessed June 2024)

[3] Scottish Government (2010). Ancient Woodland Inventory (Scotland) [Online]. Available at: https://spatialdata.gov.scot/geonetwork/srv/api/records/A091F945-F744-4C8F-95B3-A09E6EF6AE33 (Accessed June 2024)

[4] Scotland's Environment (2016). Carbon and Peatland 2016 map [Online]. Available at: https://soils.environment.gov.scot/maps/thematic-maps/carbon-and-peatland-2016-map/ (Accessed June 2024)

[5] Scotland's Environment (2023). Habitat Map of Scotland [Online]. Available at: Habitat Map of Scotland | Scotland's environment web (Accessed June 2024).

[6] NatureScot (2010). Scottish Biodiversity List [Online]. Available at: https://www.nature.scot/doc/scottish-biodiversity-list (Accessed June 2024)

[7] Highland Council (2024). Biodiversity Action Plan 2021-2026 [Online]. Available at: Highland_Nature_Biodiversity_Action_Plan_2021_____2026.pdf (Accessed June 2024)

[8] UK Government (1994). Conservation (Natural Habitats, &c.) Regulations 1994 [Online]. Available at: https://www.legislation.gov.uk/uksi/1994/2716/contents (Accessed June 2024)

[9] UK Government (1981). Wildlife and Countryside Act 1981 [Online]. Available at: https://www.legislation.gov.uk/ukpga/1981/69 (Accessed June 2024)

[10] UK Government (1992). Protection of Badgers Act 1992 [Online]. Available at: https://www.legislation.gov.uk/ukpga/1992/51/contents (Accessed June 2024)

The National Biodiversity Network (NBN)[11] Atlas was searched for records of protected and priority species within 2 km of the Site. Only data that can be used for commercial use, (open licenses CC0[12], CC-BY[13] and OGL[14]) was considered for the purposes of this report.

A 2 km search radius is considered an appropriate ZoI for ecological features, considering the scale of the Proposed Development and prevailing habitats within and adjoining the Site. Only records of protected and priority species from the last 20 years were included.

## 2.2 FIELD SURVEY

### 2.2.1 UKHAB SURVEY

A UK Hab Survey was completed on the 29th and 30th September 2023 and the 01st May 2024, which followed the latest version of the UKHab Methodology[15].

Concurrently with recording the habitat type, a habitat condition assessment (HCA) was undertaken for the habitats within the Site. Each habitat parcel was assigned a condition score (Good, fairly Good, Moderate, Fairly Poor, Poor, or N/A) based on Natural England's guidance[16].

The UKHab Survey encompassed all land detailed within the Site, as shown on **Figure 1, Appendix A**.

The aims of the surveys were to classify and map habitats and assess their potential to support protected and / or priority species. Target Notes (TN) were recorded for notable features and are detailed within **Appendix B**.

Plants and their frequency of occurrence were recorded using the subjective DAFOR scale (dominant, abundant, frequent, occasional or rare)[17]. This scale was only utilised for the UKHab Survey. The nomenclature of vascular plants followed Stace (2019)[18].

Weather conditions, and names of surveyors are detailed in **Table 1**.

### 2.2.2 NATIONAL VEGETATION CLASSIFICATION (NVC) SURVEYS

A NVC survey of plant communities with the potential to support Groundwater Dependent Terrestrial Ecosystems (GWDTE) was completed on the 29th and 30th September 2023 within the Site.

This was done based on the hydrogeological setting of each plant community identified with reference to the NVC community and associated groundwater dependency scores published in

[11] NBN Atlas Scotland (2023). Available at: https://scotland.nbnatlas.org/ (Accessed June 2024)

[12] Creative Commons No rights reserved licence

[13] Creative Commons licence with attribution

[14] Open Government Licence

[15] UKHab Limited (2023). UK Habitat Classification Version 2.0. UKHab Ltd, Stockport. [Online]. Available at: http://www.ukhab.org (Accessed June 2024)

[16] UK Government (2024). Statutory biodiversity metric tools and guides [Online]. Available at: https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides (Accessed June 2024)

[17] The DAFOR scale is used for semi-quantitative sampling, to provide a quick estimate of the relative abundance of species (generally plants) in a given area. Abundance (number of individuals) and cover (area coverage) are often used interchangeably in this type of surveying, although they may have very different meanings.

[18] Stace, C. (2019). New Flora of the British Isles. 4th edition. UK. Cambridge University Press.

current SEPA guidance[19]. The SEPA classification is modified from the United Kingdom Technical Advisory Group (UKTAG) (2004) list of NVC communities[20], which provides the full list for all communities. This system scores each NVC community by its dependency on groundwater (i.e. low, moderate or high).

Target notes of features of interest were recorded with a geographic reference and photograph taken (see **Target Notes, Appendix B,**).

Surveyor names and conditions during surveys are noted in **Table 1**.

### 2.2.3 PROTECTED SPECIES WALKOVER SURVEYS

In accordance with NS standing advice[21], ERM completed a range of surveys to establish the presence or likely absence of protected and priority species within the ESA. The Protected Species Walkover Surveys (PSS) were undertaken by ERM ecologists who are members of the Chartered Institute of Ecology and Environmental Management (CIEEM) with at least capable level of competence in undertaking surveys for protected species; as per CIEEM's Competency Framework[22].

The PSS were undertaken at the same time as the habitat surveys. Dates, times and weather conditions during the PSS and habitat surveys are shown in **Table 1**, below.

TABLE 1 : HABITAT AND PROTECTED SPECIES WALKOVER SURVEYS DETAILS

| Date | Surveyors | Approximate survey start / end time | Weather |
|---|---|---|---|
| 29/09/2023 | Aaron Martin and Heather Green | 09:00-17:00 | Rain: in afternoon, Temp: 14°C, Beaufort wind force scale (SSE)[23]: 3; Cloud cover (CC)[24]: 6/8 |
| 30/09/2023 | | 09:00-12:00 | Rain: 0%, Temp: 14°C, Beaufort wind force scale (SW): 3; Cloud Cover: 6/8 |
| 01/05/2024 | Aaron Martin and Michael Conner | 11:00-16:00 | Rain: 5%, Temp 16°C, Beaufort wind force scale (SW): 2; Cloud Cover: 4/8 |

[19] Scottish Environment Protection Agency (SEPA), 2014. Land Use Planning System Guidance Note 31: Guidance on Assessing the Impacts of Windfarm Development Proposals on Groundwater Abstractions and Groundwater Dependent Terrestrial Ecosystems. Available at: https://www.sepa.org.uk/media/144266/lups-gu31-guidance-on-assessing-the-impacts-of-development-proposals-on-groundwater-abstractions-and-groundwater-dependent-terrestrial-ecosystems.pdf.

[20] UK Technical Advisory Group on the Water Framework Directive, 2004. Guidance on the identification and risk assessment of groundwater dependent terrestrial ecosystems. Available at: https://www.wfduk.org/resources%20/risk-assessment-groundwater-dependent-terrestrial-ecosystems.

[21] NatureScot. (2022) Planning and development: standing advice and guidance documents [Online]. Available at: https://www.nature.scot/professional-advice/planning-and-development/planning-and-development-advice/planning-and-development-standing-advice-and-guidance-documents (Accessed June 2024).

[22] CIEEM. (2021) Competency Framework. Chartered Institute of Ecology and Environmental Management [Online]. Available at: https://cieem.net/wp-content/uploads/2022/01/Competency-Framework-2022-Web.pdf (Accessed June 2024).

[23] Met Office Beaufort wind force scale. Available at https://www.metoffice.gov.uk/weather/guides/coast-and-sea/beaufort-scale

[24] Royal Meteorological Society Weather Symbols and Synoptic Charts. Available at https://www.metlink.org/resource/student-charts.

#### 2.2.3.1 BATS

The assessment for bats followed guidelines produced by the Bat Conservation Trust (BCT), where relevant, reference is made to evaluation methods (e.g., of potential suitability of roosting habitats), as they can influence the type of survey / methods required. It should be noted that since the surveys were undertaken the BCT Guidelines for Professional Ecologists have been updated[25]; however, at the time of survey the third edition[26] was the current edition and so this was the edition of the guidelines used to plan and undertake surveys. If the updated guidelines had been available at the time of survey, the methodology employed would not have changed; however, the way in which Potential Roosting Features (PRFs) are classified in respect of trees would have been different.

An assessment of habitats and PRFs was completed on the 29th and 30th September 2023 in line with BCT methodology[26], as shown in **Table 2**, overleaf. The assessment of the potential for bat roosts within the ESA was made based on ground-based observations. PRF aerial inspection surveys were not within the scope of this survey.

The aim of the survey was to assess any habitats suitable for bats to roost, commute, and forage within the ESA.

[25] Collins, J. (4 ed.)(2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines.4th edition. The Bat Conservation Trust, London.

[26] Collins, J. (ed.) (2016) Bat Surveys for Professional Ecologists: Good Practice Guidelines.3rd edition. The Bat Conservation Trust, London.

## TABLE 2 BCT CATEGORIES OF ROOSTING, COMMUTING AND FORAGING HABITATS

| Potential Suitability | Roosting habit | Commuting and Foraging Habitats |
|---|---|---|
| Negligible | No obvious habitat features on site likely to be used by roosting bats; however, a small element of uncertainty remains as bats can use small and apparently unsuitable features on occasion. | No habitat features on site likely to be used by any commuting or foraging bats at any time of the year (i.e. no habitats that provide continuous lines of shade/protection for flight-lines or generate/shelter insect populations available to foraging bats). |
| Low | A structure with one or more potential roost sites that could be used by individual bats opportunistically at any time of the year. However, these potential roost sites do not provide enough space, shelter, protection, appropriate conditions and/or suitable surrounding habitat to be used on a regular basis or by larger numbers of bats (i.e. unlikely to be suitable for maternity and not a classic cool/stable hibernation site but could be used by individual hibernating bats). | Habitat that could be used by small numbers of bats as flight-paths such as a gappy hedgerow or unvegetated stream, but isolated, i.e. not very well connected to the surrounding landscape by other habitat. Suitable, but isolated habitat that could be used by small numbers of foraging bats such as a lone tree (not in a parkland situation) or a patch of scrub. |
| Moderate | A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorization described in this table is made irrespective of species conservation status, which is established after presence is confirmed). | A structure with one or more potential roost sites that could be used by bats due to their size, shelter, protection, conditions and surrounding habitat but unlikely to support a roost of high conservation status (with respect to roost type only, such as maternity and hibernation – the categorization described in this table is made irrespective of species conservation status, which is established after presence is confirmed). |

| Potential Suitability | Roosting habit | Commuting and Foraging Habitats |
|---|---|---|
| High | A structure with one or more potential roost sites that are obviously suitable for use by larger numbers of bats on a more regular basis and potentially for longer periods of time due to their size, shelter, protection, conditions and surrounding habitat. These structures have the potential to support high conservation status roosts, e.g. maternity or classic cool/stable hibernation site. | Continuous, high-quality habitat that is well connected to the wider landscape that is likely to be used regularly by bats for flight-paths such as river valleys, streams, hedgerows, lines of trees and woodland edge. High-quality habitat that is well connected to the wider landscape that is likely to be used regularly by foraging bats such as broadleaved woodland, tree-lined watercourses and grazed parkland. Site is close to and connected to known roosts. |

#### 2.2.3.2 BADGER (*MELES MELES*)

In accordance with best practice guidance[27],[28],[29] all accessible habitat within and up to 100 m of the Site was surveyed for signs of badger in September 2023 and May 2024. Surveyors walked the ESA paying particular attention to boundary features and dense areas of vegetation such as woodland and scrub, as these were areas most likely to be used by badger, and checked for evidence of badger activity including setts, snuffle holes, latrines, footprints, guard hairs and pathways.

In accordance with Scottish Badgers[28], setts encountered were classified as follows:

- Main: usually in continuous use and characterised by a large number of holes with conspicuous spoil heaps, with well-worn paths between sett entrances. Breeding typically occurs in the main sett;
- Annex: normally located within 150 m of a main sett and connected by one or more well-worn paths, characterised by several holes; although may not be in use all the time;
- Subsidiary: normally located more than 50 m of a main sett with no obvious paths connecting with another sett, characterised by several entrances; although may not be in use all the time; and
- Outlier: characterised by one or two holes with little spoil outside entrances, and no obvious path connecting with another sett. Used sporadically and may be also used intermittently by foxes or rabbit.

[27] Harris, S., Cresswell, P. and Jefferies D. (1989) Surveying Badgers. Occasional Publication No 9, The Mammal Society, London.
[28] Scottish Badgers. (2018) Surveying for Badgers: Good Practice Guidelines (Version 1).
[29] NatureScot (2020) Protected Species Advice for Developers: Badger [Online]. Available at https://www.nature.scot/species-planning-advice-badger (Accessed June 2024).

#### 2.2.3.3 RED SQUIRREL (*SCIURUS VULGARIS*)

A walkover survey of all accessible woodland, within and up to 50 m from the Site was conducted in September 2023 and May 2024 in accordance with guidance[30],[31]. Surveyors walked woodland areas and recorded evidence of red squirrel activity including dreys, feeding remains and footprints; as well as direct sightings of individuals.

#### 2.2.3.4 PINE MARTEN (*MARTES MARTES*)

In line with best practice guidelines[32],[33] all accessible habitat that was suitable for pine marten within, and up to 250 m from, the Site was visually inspected for signs of pine marten activity, such as dens, scats and footprints; as well as direct sighting of individuals. Surveys focussed on areas of woodland habitat as pine martens are mainly found in woodlands, including conifer plantations[34]. The surveys for pine marten were completed in September 2023 and May 2024.

#### 2.2.3.5 OTTER (*LUTRA LUTRA*)

In accordance with best practice guidelines[35],[36], an otter survey of all accessible watercourses within the Site, and 200m from the Site, was completed in September 2023 and May 2024. Surveys recorded the presence of otter holts and resting sites; as well as, evidence of otter activity including spraints (dung), feeding remains, footprints, paths and slides.

Structures or places used by otter for shelter or protection were classified, as follows, in accordance with Harris and Yalden (2008)[37]:

- Holt: an underground feature that can be situated in natural cavities or specifically dug by an individual. Normally in frequent use by otter, with an abundance of spraints and prints at the entrance, although non-breeding individuals may utilise a network of holts as they move through their territory. Breeding typically occurs in holts with extensive tunnel-systems and chambers where cubs are raised; and,
- Couch: an above ground feature regularly used by otter for resting, normally characterised by vegetation that has been pulled up and flattened by an individual into a nest. Specially constructed covered couches can be used for breeding.

[30] NatureScot (2022) Standing advice for planning consultations - Red Squirrels [Online]. Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels (Accessed June 2024).

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

[32] NatureScot (2020) Protected Species Advice for Developers: Pine Marten. [Online]. Available at: https://www.nature.scot/species-planning-advice-pine-marten (Accessed June 2024).

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

[34] NatureScot (2024). Pine marten [Online]. Available at: https://www.nature.scot/plants-animals-and-fungi/mammals/land-mammals/pine-marten#:~:text=Pine%20martens%20prefer%20native%20woodlands,resting%20places)%20in%20their%20territory. (Accessed June 2024)

[35] NatureScot (2020) Protected Species Advice for Developers: Otter. [Online]. Available at: https://www.nature.scot/species-planning-advice-otter (Accessed June 2024)

[36] Chanin, P. (2003) Monitoring the Otter Lutra ultra. Conserving Natura 2000 Rivers Monitoring Series No.10. English Nature, Peterborough.

[37] Harris, S., and Yalden, D.W. (2008) Mammals of the British Isles; Handbook (4th edn). The Mammal Society: Southampton.

### *2.2.3.6* WATER VOLE (*ARVICOLA AMPHIBIOUS*)

In accordance with best practice guidelines[38],[39], all accessible watercourses within the Site, and 200 m from the Site were subject to walkover to look for signs of water vole. Two surveys were undertaken, one in September 2023 and one in May 2024. The purpose of the walkover was to record habitat suitability within the ESA, and to record evidence of water vole activity including latrines (droppings), footprints, runs, burrows and feeding remains.

The Water Vole Field Signs and Assessment, Dean (2021)[40], is used as a basis to evaluate the features of a waterbody to understand if it holds the potential to house water voles. **Table 3**, over leaf (taken from the guidance[40]) shows the criteria used during the survey to assess waterbodies for the suitability for water vole.

TABLE 3 CRITERIA FOR ASSESSING THE VALUE OF HABITAT FOR WATER VOLES

| **Habitat Category** | **Dry areas for burrows or Nests** | | | **Herbaceous vegetation** | **Water** |
|---|---|---|---|---|---|
| | Bank Profile | Bank Substrate | Variation in water level | | |
| Optimal (all criteria need to be met) | Steep (approaching 1:1) on at least one side of a watercourse. Steep or shallow on static waterbodies or fen type habitat. | Earth or peat. | No noticeable variation during the summer months; banks are not overtopped regularly. | Continuous swathe of tall and luxurious riparian vegetation providing 90 – 100 % cover on the banks (tall tussocky grassland) and marginal / in channel vegetation is present (emergent species). | Permanent water. |
| Good (all criteria need to be met) | Steep (approaching 1:1) on at least one side of a watercourse. Steep or shallow on static waterbodies or fen-type habitat. | Earth or peak banks, or stony / reinforced bank with gaps allowing access to the earth behind. | No noticeable variation during the summer months; banks are not overtopped regularly. | Continuous swathe of bankside or in-channel (emergent) vegetation providing at least 60 % ground cover. May be dominated by grasses and weeds rather than luxurious riparian vegetation. The vegetation should generally be tall, except in urban or | Permanent water. Or routinely wet for at least 2 – 3 months during the summer, and where other 'good' habitat present in immediately adjacent |

[38] NatureScot (2020) Protected Species Advice for Developers: Water Vole. [Online]. Available at: https://www.nature.scot/species-planning-advice-water-vole (Accessed June 2024).

[39] Dean, M., Strachan, R., Gow, D. and Andrews, R. (2016) The Water Vole Mitigation Handbook (Mammal Society Mitigation Guidance Series). Eds Fiona Mathews and Paul Chanin. Mammal Society, London.

[40] Dean, M. (2021). Water Vole Field Signs and Habitat Assessment. Pelagic Publishing. Exeter, pp 18-19

| Habitat Category | Dry areas for burrows or Nests | | | Herbaceous vegetation | Water |
|---|---|---|---|---|---|
| | Bank Profile | Bank Substrate | Variation in water level | | |
| | | | | suburban areas, where shorter bankside vegetation may also qualify. | areas with permanent water |
| Suitable but poor | Any habitat that falls short of the criteria to qualify as 'good' but does not meet the criteria of 'negligible' value could reasonably be considered to be 'suitable but poor.' | | | | |
| Negligible (will generally need to meet the criteria for herbaceous vegetation and at least one other) | Shallow profile on both banks | Rocky or gravel, unsuitable for burrowing. | Considerable variation in water level – the bank toe can move by more than 1 m horizontally over the breeding season. | No or limited bankside and marginal vegetation (due to shading or other 'permanent factors – note that management can change and is often a 'temporary' factor) | N/A |
| | Vertical bank face with no burrowing opportunities behind it. | Reinforced banks with no gaps | n/a | | |

#### 2.2.3.7 WILDCAT (*FELIS SILVESTRIS*)

In line with best practice guidelines[41],[42], all suitable habitats within the Site, and 200 m from the Site, were subjected to a walkover to look for signs of wildcat activity in September 2023 and May 2024. Habitat suitability and evidence of wildcat activity including denning, foraging, and breeding was recorded.

#### 2.2.3.8 HERPETOFAUNA (REPTILES AND AMPHIBIANS)

A walkover of the Site was completed in September 2023 and May 2024 to ascertain the Site's suitability to support protected reptile and amphibian species, such as common lizard (*Zootoca vivipara*), slow-worm (*Anguis fragilis*), adder (*Vipera berus*) and common toad (*Bufo bufo*). The walkover was undertaken in accordance with latest guidelines[43],[44] and involved a visual inspection of wetlands, potential basking spots and refugia (such as log piles) to check for incidental sightings of amphibians and / or reptiles. Specific hibernation features, if encountered, were recorded.

#### 2.2.3.9 BIRDS

In line with guidance[45], habitats within the Site were assessed for nesting and foraging birds, and any birds seen or heard were recorded during the Habitat Surveys and PSS.

## 2.3 LIMITATIONS

Wet/boggy ground conditions and tall grassland could have masked some field signs from mammals such as badger, pine marten, wildcat and red squirrel. This was not a significant limitation, because these conditions typically provide few structures for ground dwelling species (e.g., badger), and surveyors searched adjoining areas that were accessible to identify field signs.

Access was not granted to an area of land west of the A9 for the surveys for the commencement of surveys in 2023; however, access was granted to this area in 2024, and surveys were then completed of this area in May 2024. Therefore, this is not considered a significant limitation.

Surveyors could not survey the full extent of all watercourses within the ESA for water vole and otter, due to steep sided slopes and dense vegetation. However, these areas were largely unsuitable for water vole as the channels and banks were encroached by scrub and coarse grasses, which water vole do not typically utilise. In addition, tall and dense vegetation limits the amount of visible water within the channel itself, presenting increased levels of shading that will further reduce the establishment of more suitable aquatic and riparian vegetation that water vole typically feed on (e.g. rushes), and so it is unlikely water voles would be present.

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[41] NatureScot (2020). Standing advice for planning consultations – Wildcats [Online]. Available at: https://www.nature.scot/doc/standing-advice-planning-consultations-wildcats (Accessed June 2024)

[42] NatureScot (2014). Guidance- Wildcat Survey Methods [Online]. Available at: https://www.nature.scot/doc/guidance-wildcat-survey-methods (Accessed June 2024)

[43] Froglife (2018). Reptile Survey and Mitigation Guidance for Peatland Habitats [Online]. Available at: https://www.froglife.org/wp-content/uploads/2018/04/Compressed-Advice-note-10-Reptile-Survey-and-Mitigation-Guidance-for-Peatland-Habitats.pdf (Accessed June 2024)

[44] Sewell et al (2013). Survey protocols for the British herpetofauna [Online]. Available at: https://www.arc-trust.org/Handlers/Download.ashx?IDMF=7c736bcd-9dde-4473-8115-12cf9a5d7462 (Accessed June 2024)

[45] Scottish Natural Heritage (now NatureScot) (2017) Recommended bird survey methods to inform impact assessment of onshore wind farms, Version 2, SNH, Perth

Surveyors used binoculars to visually scan between the furrows of inaccessible areas to identify any potential couches or holts or places that could be used by otter for shelter or protection. Therefore, this is not considered a significant limitation.

# 3. RESULTS

## 3.1 DESK STUDY

### 3.1.1 DESIGNATED SITES

Six statutory designated sites were recorded within 5 km of the Site. The nearest of these sites is the River Thurso SAC, which lies approximately 1.48 km northwest of the Site at its nearest point.

**Table 4**, below, details the names, status, minimum distance and direction from the site and a description for designation. The position of these designated sites relative to the Site are shown on **Figure 3, Appendix A**.

TABLE 4 DESIGNATED SITES WITHIN 5 KM OF THE SITE

| Designation | Name | Relevant Designated Features | Minimum Distance and Direction from the Site. |
|---|---|---|---|
| SAC | River Thurso | Atlantic Salmon (*Salmo salar*) | 1.48 km northwest |
| SSSI | Loch Scarmclate | Base rich loch - nationally important base rich loch which supports locally importance plants, and nationally scarce slender-leaved pondweed (*Potamogeton filiformis*). | 3.3 km northeast |
| SPA/Ramsar | Caithness Lochs | The site regularly supports wintering whooper swan (*Cygnus cygnus*), greylag goose (*Anser anser*), Greenland white-fronted goose (*Anser albifrons flavirostris*). This site is important in maintaining the northern limit of these species' wintering distribution. | 3.5 km east |

| Designation | Name | Relevant Designated Features | Minimum Distance and Direction from the Site. |
|---|---|---|---|
| SAC/SSSI | Loch Watten | Base rich loch - nutrient enriched shallow water support extensive vegetation and nationally rich rare pondweed species: slender-leaved pondweed (*Potamogeton filiformis*) and long stalked pondweed (*Potamogeton praelongus*).<br><br>Open water transition fen - fen and swamp vegetation with locally rich species. | 4.86 km east |

## 3.1.2 PROTECTED AND PRIORITY HABITATS

### 3.1.2.1 ANCIENT WOODLAND

Two areas of ancient woodland listed on the AWI (Scotland) were recorded within 500 m of the Site. These areas were defined as Long-established (of plantation origin). The nearest of these lies 35 m north of the Site. **Table 5,** below, provides further information on these areas of ancient woodland. The position of these ancient woodland relative to the Site are shown on **Figure 4, Appendix A**.

TABLE 5 ANCIENT WOODLAND WITHIN 500 M OF THE SITE

| Designation | Name | Relevant Designated Features | Approximate Location in Relation to the Site |
|---|---|---|---|
| AWI | Unnamed | Long-Established (of plantation origin) | 35 m north |
| AWI | Unnamed | Long-Established (of plantation origin) | 45 m north |

## 3.1.3 PROTECTED AND PRIORITY SPECIES

Priority species are species of principal importance for biodiversity conservation in Scotland as listed on the Scottish Biodiversity List[6]. Protected species are those afforded legal protection under Scottish, UK, and/or European legislation.

Accounts of protected and priority species provided by NBN, within the last 20 years are detailed in **Table 6.** Where multiple records are found for a species, the nearest and most recent records are provided.

TABLE 6 PROTECTED AND PRIORITY SPECIES WITHIN 2 KM OF THE SITE

| Species | Conservation Status | Proximity of Closest Record to Site | Years of Record(s) |
|---|---|---|---|
| Otter | HR, WCA, SBL | 1 km north | 2023 (1 record) |
| | | | |

Key:
HR: The Conservation (Natural Habitats, &c.) Regulations 1994[46]
WCA: Wildlife and Countryside Act 1981[47]
SBL: Scottish Biodiversity List[6]

NBN Atlas returned 1410 records of 59 bird species within 2 km of the Site. Of these, 38 species related to species of conservation concern[48], 10 species were designated Schedule 1[47], and 18 species were included in the Scottish Biodiversity List[6].

## 3.2 FIELD SURVEY

### 3.2.1 UKHAB SURVEY

UKHab habitat classifications recorded within the Survey Area, and their conservation status, are presented in **Table 7** below**, Figure 5 & Figure 6, Appendix A** and described in **Section 3.2.1.2 -3.2.1.23**. Habitats are listed by classification grouping order as set out in the UK Habitat Classification User Manual (2023), not in order of ecological value.

TABLE 7 UKHAB CLASSIFICATIONS RECORDED WITHIN THE SURVEY AREA

| Broad Habitat Type | UKHab Code | Habitat Classification | Area (ha) | Conservation Status |
|---|---|---|---|---|
| Grassland | g1a6 | Other lowland dry acid grassland | 26.32 | |
| | g3 | Neutral grassland | 1.07 | |
| | g3c | Other neutral grassland | 1.09 | |
| | g3c8 | Holcus-Juncus neutral grassland | 31.65 | |
| | g4 | Modified grassland | 57.12 | |
| Woodland and Forest | w1c6 | Beech forests on neutral to rich soils (H9130) | 0.66 | LBAP |
| | w1f7 | Other Lowland mixed deciduous woodland | 3.85 | LBAP |
| | w1g | Other woodland; broadleaved | 7.59 | LBAP |

[46] UK Government (1994). The Conservation (Natural Habitats, &c.) Regulations 1994 [Online]. Available at: https://www.legislation.gov.uk/uksi/1994/2716/contents/made (Accessed June 2024)
[47] UK Government (1981). Wildlife and Countryside Act 1981 [Online]. Available at: https://www.legislation.gov.uk/ukpga/1981/69 (Accessed June 2024)
[48] Stanbury et al (2021). The status of our bird populations: the fifth Birds of Conservation Concern in the United Kingdom, Channel Islands and Isle of Man and second IUCN Red List assessment of extinction risk for Great Britain

| Broad Habitat Type | UKHab Code | Habitat Classification | Area (ha) | Conservation Status |
|---|---|---|---|---|
| | w1h | Other woodland; mixed | 17.17 | LBAP |
| | w1h5 | Other woodland; mixed; mainly broadleaved | 9.12 | LBAP |
| | w1h6 | Other woodland; mixed; mainly conifer | 7.25 | LBAP |
| Heathland and Scrub | h1b5 | Dry heaths; upland (H4030) | 3.76 | LBAP; SBL; Annex 1 |
| | h1b6 | Wet heathland with cross-leaved heath; upland (H4010) | 15.78 | LBAP; SBL; Annex 1 |
| | h3e | Gorse scrub | 1.29 | |
| Wetland | f1a | Blanket bog | 5.18 | LBAP; SBL; Annex 1 |
| Cropland | c1 | Arable and horticulture | 7.76 | |
| | c1f | Horticulture | 0.30 | |
| Urban | u1 | Built-up areas and gardens | 6.28 | |
| | u1a | Open mosaic habitats on previously developed land | 0.07 | |
| | u1b | Developed land; sealed surface | 0.90 | |
| | u1d | Suburban/ mosaic of developed/ natural surface | 0.15 | |
| | u1e | Built linear features | 2.94 | |
| Rivers and Lake | r1a | Eutrophic standing waters | 0.10 | LBAP; SBL |

LBAP: Local Biodiversity Action Plan[7]
SBL: Scottish Biodiversity List[6]
Annex 1: EU Habitats Directive Annex 1 Priority habitats[49]

| Broad Habitat Type | UKHab Code | Habitat Classification | Length (km) | Conservation Status |
|---|---|---|---|---|
| Rivers and Lake | r1g | Other standing water | 12.29 | |
| Rivers and Lake | r2b | Other rivers and streams | 1.22 | LBAP; SBL |

#### 3.2.1.1 GRASSLAND – (G1A6) OTHER LOWLAND ACID GRASSLAND

Four areas of other lowland acid grassland habitats were recorded during baseline surveys. within the centre of the ESA. The largest area had frequent common bent grass (*Agrostis*

[49] European Commission (1992). Habitats Directive [Online]. Available at: https://eur-lex.europa.eu/legal-content/EN/TXT/PDF/?uri=CELEX:01992L0043-20130701 (Accessed June 2024)

*capillaris*), annual meadow grass (*Poa annua*), Yorkshire fog (*Holcus lanatus*), red clover (*Trifolium pratense*), crested dog's-tail (*Cynosurus cristatus*), and soft rush (*Juncus effusus*)

A smaller area had frequent heath bedstraw (*Galium saxatile*), wavy hair grass (*Deschampsia flexuosa*), cross-leaved heath (*Erica tetralix*), common heather (*Calluna vulgaris*), and deer grass (*Trichophorum cespitosum*); as well as occasional common bent grass, sheep's fescue (*Festuca ovina*), tormentil (*Potentilla erecta*), heath rush (*Juncus squarrosus*), and sheep's sorrel (*Rumex acetosella*).

The remaining two areas had frequent cocksfoot (*Dactylis glomerata*), Yorkshire fog, common bent, sheep's fescue (*Festuca ovina*), tufted hairgrass (*Deschampsia cespitosa*), *Poa spp*., soft rush, compact rush (*Juncus conglomeratus*), cross-leaved heath, common heather, bell heather (*Erica cinerea*); as well as occasional tormentil, devil's-bit scabious (*Succisa pratensis*), yarrow (*Achillea millefolium*), creeping thistle (*Cirsium arvense*), broad-leaved dock (*Rumex obtusifolius*), common nettle (*Urtica dioica*), marsh thistle (*Cirsium palustre*), and lesser stitchwort (*Stellaria graminea*).

#### 3.2.1.2 GRASSLAND – (G3) NEUTRAL GRASSLAND

An area of neutral grassland was located within the west of the ESA. This area had frequent creeping thistle, vetch (*Vicia* spp.), cocksfoot, Yorkshire fog, tufted hair grass, crested dog's-tail, and ribwort plantain (*Plantago lanceolata*).

#### 3.2.1.3 GRASSLAND – (G3C) OTHER NEUTRAL GRASSLAND

Two areas of other neutral grassland were located within the ESA, one near the center and one within the north of the ESA. Both areas had dominant Yorkshire fog; abundant broad-leaved dock and soft rush; frequent angelica (*Angelica sylvestris*) and butterbur (*Petasites hybridus*); and occasional creeping thistle, and creeping buttercup (*Ranunculus repens*).

#### 3.2.1.4 GRASSLAND – (G3C8) HOLCUS-JUNCUS NEUTRAL GRASSLAND

Four areas of *Holcus-Juncus* neutral grassland were located throughout the ESA. This habitat had frequent soft rush, Yorkshire fog, crested dog's-tail, common bent grass, meadow grass, tufted hair grass, Poa *spp*., red clover, marsh bedstraw (*Galium palustre*), creeping buttercup, and meadow buttercup (*Ranunculus acris*). These areas also had occasional chickweed (*Stellaria media*), broad-leaved dock, spear thistle (*Cirsium vulgare*), marsh thistle (*Cirsium palustre*), and ribwort plantain.

#### 3.2.1.5 GRASSLAND – (G4) MODIFIED GRASSLAND

The majority of modified grassland habitats were located within the southern area of the ESA. These areas consisted of frequent perennial ryegrass (*Lolium perenne*), meadow buttercup (*Ranunculus acris*), common daisy (*Bellis perennis*), white clover (*Trifolium repens*), and red clover. In addition, these areas had occasional water mint (*Mentha aquatica*), meadowsweet (*Filipendula ulmaria*), creeping thistle, and broad-leaved dock.

The smaller area within the north of the ESA had frequent cocksfoot, broad-leaved dock, butterbur, and common hogweed (*Heracleum sphondylium*).

#### 3.2.1.6 WOODLAND AND FOREST – (W1F7) OTHER LOWLAND MIXED DECIDUOUS WOODLAND

There was an area of other lowland mixed deciduous woodland located within the east of the ESA. The habitat had frequent rowan (*Sorbus aucuparia*), willow *spp.* (*Salix spp.*), sycamore

(*Acer pseudoplatanus*), and silver birch (*Betula pendula*). At the time of survey there was no ground layer.

#### 3.2.1.7 WOODLAND AND FOREST – (W1G) OTHER BROADLEAVED WOODLAND

Most of the other broadleaved woodland habitat was located within the north of the ESA. The ground was wet underfoot, and the woodland displayed signs of being coppiced. These areas had abundant silver birch, beech (*Fagus sylvatica*), alder (*Alnus glutinosa*), sycamore, hawthorn (*Crataegus monogyna*), and hazel (*Corylus avellana*). The ground flora had frequent had fern (*Blechnum spicant*), and soft rush.

#### 3.2.1.8 WOODLAND AND FOREST – (W1H) OTHER WOODLAND; MIXED

Other mixed woodland habitat was located within the northeast, northwest, and southeast of the ESA. The area within the northeast had dominant Sitka spruce (*Picea sitchensis*); frequent sycamore; and rare willow. The woodland within the northwest of the ESA had abundant Sitka spruce and Norway spruce; and frequent rowan and sycamore.

The area within the southeast had dominant Norway spruce (*Picea abies*) with frequent sycamore.

#### 3.2.1.9 WOODLAND AND FOREST – (W1H5) OTHER WOODLAND; MIXED; MAINLY BROADLEAVED

Two areas of mainly broadleaved mixed woodland were respectively located within the south and the north of the ESA. The area within the south had frequent sycamore, spruce, whitebeam (*Sorbus aria*), rowan and willow. The area within the north had frequent birch, beech, alder, and sycamore.

#### 3.2.1.10 WOODLAND AND FOREST – (W1H6) OTHER WOODLAND; MIXED; MAINLY CONIFER

Two areas of mixed, mainly conifer woodland were respectively located within the north and the south of the ESA. The area within the north had frequent Douglas fir, Scots pine, and European larch (*Larix decidua*). The ground flora consisted of frequent fern spp., and invasive non-native rhododendron (*Rhododendron arboreum*). The area within the south had abundant Sitka spruce, sycamore, willow spp., rowan, and birch.

#### 3.2.1.11 HEATHLAND AND SHRUB – (H1B5) DRY HEATHS; UPLAND (H4030)

One area of dry heathland was located within the centre of the ESA, adjacent to the wet upland heathland. This area had abundant common heather and occasional wavy hair grass and *Pohlia nutans*.

#### 3.2.1.12 HEATHLAND AND SHRUB – (H1B6) WET HEATHLAND WITH CROSS-LEAVED HEATH, UPLAND (H4010)

A large area of wet upland heathland was located within the centre of the ESA. It had frequent cross-leaved heath, common heather, and bell heather; and occasional bog asphodel (*Narthecium ossifragum*), cocksfoot, tormentil, soft rush, devil's-bit scabious, yarrow, common bent, creeping thistle, dock, common nettle, and sheep's fescue.

#### 3.2.1.13 HEATHLAND AND SHRUB – (H3E) GORSE SCRUB

Gorse scrub was located within the west of the ESA adjacent to an area of upland heathland. This was dominated by common gorse (*Ulex europaeus*).

#### 3.2.1.14 WETLAND – (F1A) BLANKET BOG

An area of blanket bog was recorded within the centre of the ESA. This area had abundant *Sphagnum palustre, Sphagnum fallax, Sphagnum capillifolium, and Sphagnum cuspidatum,* and deer grass; frequent cross- leaved heath and common heather (*Calluna vulgaris*); occasional quaking oat grass (*Briza media*), compact rush (*Juncus conglomeratus*), tormentil (*Potentilla erecta*); and rare bell heather (*Erica cinerea*), bog asphodel, and hare's-tail cottongrass (*Eriophorum vaginatum).*

#### 3.2.1.15 CROPLAND – (C1) ARABLE AND HORTICULTURAL

An area of arable pastureland was recorded within the east of the ESA, which was utilised as ley.

#### 3.2.1.16 CROPLAND – (C1F) HORTICULTURAL

An unmanaged garden of vegetation plot and flower beds was located within the north of the ESA. This area was largely overgrown with brambles.

#### 3.2.1.17 URBAN – (U1) BUILT-UP AREAS AND GARDENS

Two residential properties with cultivated grounds were recorded within north of the ESA.

#### 3.2.1.18 URBAN – (U1A) OPEN MOSAIC HABITATS ON PREVIOUSLY DEVELOPED LAND

Disturbed area of soil with spoil where vegetation has grown back, south-west of the ESA.

#### 3.2.1.19 URBAN – (U1B) DEVELOPED LAND; SEALED SURFACE

There were two areas of developed land with a sealed surface within the ESA. There was an operating quarry within the southeast of the Survey Area. In addition, the main road, the A9, ran within the western extent of the ESA.

#### 3.2.1.20 URBAN – (U1D) SUBURBAN/ MOSAIC OF DEVELOPED/ NATURAL SURFACE

A small area of estate buildings and associated gardens and lawn was recorded within the north of the ESA.

#### 3.2.1.21 URBAN – (U1E) BUILT LINEAR FEATURES

Two surface paths were respectively recorded within the north and centre of the ESA, consisting of a circular path made from slats, and a track to the north of the ESA connecting to the A9.

#### 3.2.1.22 RIVERS AND LAKES – (R1A) EUTROPHIC STANDING WATERS

A large waterbody was present within the southeast of the ESA. At the time of survey, it was observed as a shallow, permanent pond, which was heavily vegetated.

#### 3.2.1.23 RIVERS AND LAKES – (R2B) OTHER RIVERS AND STREAMS

Burn of Halkirk flows through the eastern extent of the ESA.

#### 3.2.1.24 INVASIVE AND NON-NATIVE SPECIES

Rhododendron was present within *w1h6 - Other woodland; mixed; mainly conifer* within the north of the ESA.

### 3.2.2 NVC SURVEY

NVC plant communities present within the ESA, which are considered to hold some potential as GWDTE, are detailed in **Table 8**, below and **Figure 7, Appendix A**. The status of GWDTE communities is in line with SNIFFER (2009)[50] guidance.

TABLE 8 SUMMARY OF NVC COMMUNITIES WITHIN ESA AND GWDTE STATUS

| Broad Habitat Type | NVC Code | Habitat Classification | Location Within Survey Area | Potential Groundwater Dependency |
|---|---|---|---|---|
| Mire | M15 | *Scirpus cespitosus* – *Erica tetralix* wet heath | Occurs within a small area in the centre of the Survey Area on acid grassland. | Moderate |
| | M16 | *Erica tetralix* - *Sphagnum compactum* wet heath | Occurs spread across the Survey Area, on acid grassland and heathland. | High |
| | M23 | *Juncus effusus/acutiflorus* – *Galium palustre* rush-pasture | Occurs within a small area in the centre of the Survey Area on dry heathland. | High |
| Grassland | MG10 | *Holcus lanatus* - *Juncus effusus* rush-pasture | Spread across southern extent of Survey Area and in a small block within the eastern extent on *Holcus-Juncus* grassland. | Moderate |
| | U6 | *Juncus squarrosus* - *Festuca ovina* grassland | Occurs within a small area in the centre of the Survey Area on acid grassland. | Moderate |

### 3.2.3 PROTECTED SPECIES WALKOVER SURVEYS

#### 3.2.3.1 BATS

**Desk Study**

The desk study returned no records of bat species, or bats roosts within 2 km of the Site over the last 20 years.

**Preliminary Roost Assessment**

PRFs were identified within several broadleaved trees and residential buildings. Details of PRFs are summarised in **Table 9**, overleaf. **Figure 8, Appendix A** shows the position of these PRFs within the site. Further details of PRFs are detailed within **Target Notes 1-11, Appendix B.**).

[50] SNIFFER (2009). WFD95: A Functional Wetland Typology for Scotland [Online]. Available at: https://www.sniffer.org.uk/Handlers/Download.ashx?IDMF=a6579282-8428-4282-bfc7-17c7e6027601 (Accessed June 2024)

## TABLE 9 POTENTIAL ROOSTING FEATURES WITHIN THE SURVEY AREA

| ID | Roost type | Roost Features | Roosting suitability |
|---|---|---|---|
| Low | | | |
| L1 | Mature ash (*Fraxinus excelsior*) | Knot hole, approximately 3-4 m high. | PRFs were small, with limited shelter and protection, and lacked wider connectivity to other suitable roosting and foraging habitats within the wider landscape. Therefore, PRFs are of low bat roosting potential. |
| L2 | Mature beech | Cavity at base of trunk. | |
| L3 | Mature ash | Hollow within trunk, approximately 3-4 m high. | |
| L4 | Mature silver birch | Cavity within trunk, approximately 3-4 m high. | |
| L5 | Mature beech | Knot hole, approximately 5-6 m high. | |
| L6 | Mature beech | Gap/hollow where branch meets trunk, approximately 3-4 m high. | |
| L7 | Mature beech | Knot hole, approximately 3-4 m high. | |
| Moderate | | | |
| M1 | Mature Scots pine | Gap under the bark 3-4 m high, cavity under bark, and a woodpecker hole approximately 5-6 m high. | PRFs had suitable shelter and protection and had close proximity to the wider landscape along linear features such as watercourse and hedgerows, there was moderate foraging potential. Therefore, PRFs of moderate bat roosting potential. |
| M2 | Mature ash | Knot hole approximately 4-5 m high and a cavity within the trunk. | |
| B1 | Post-1990s maintenance outbuilding | Gaps within the weather boarding at the barge board, and space between the wall and a gap at the soffit. | |
| High | | | |

| ID | Roost type | Roost Features | Roosting suitability |
|---|---|---|---|
| B2 | Post-1900s manor house | Loose roof tiles, gaps within the eaves, and loose lead flashing. | PRFs clearly suitable for large number of individuals and offered shelter and protection on a more regular basis. PRFs in close proximity to the wider landscape along linear features such as watercourses and hedgerows and had high quality foraging potential. Therefore, PRFs of high bat roosting potential. |

**Bat Habitat Assessment**

The Site was situated within an agricultural setting, with habitats dominated by grazing pasture, grazed by both sheep and cattle. These habitats were generally less biologically diverse and will contain only small numbers of invertebrate prey for bats and lacked any features for roosting. These habitats in isolation were considered to support only small numbers of bats, and as such would be of low suitability for foraging and roosting bats.

However, within the wider ESA the Burn of Halkirk provided suitable foraging and commuting habitats for bats and provided connection between areas of taller neutral and acid grassland, and areas of woodland. The neutral and acid grassland and woodland habitats, provide habitat that is likely to be used regularly by foraging bats, and so it seems likely that the ESA, and the Site, will be used by foraging and commuting bats

#### 3.2.3.2 BIRDS

Habitats within the ESA include neutral and acid grassland types, heathland, and mixed woodland. These habitats are suitable to support a wide range of breeding birds, including several species of conservation concern such as meadow pipit (*Anthus pratensis*) and skylark (*Alauda arvensis*).

The following species were recorded during the surveys:

- Curlew (*Numenius arquata*);
- Common wood pigeon (*Columba palumbus*);
- Wren (*Troglodytes troglodytes*);
- Common blackbird (*Turdus merula*);
- Blue tit (*Cyanistes caeruleus*);
- Buzzard (*Buteo buteo*);
- Carrion crow (*Corvus corone*); and
- Great tit (*Parus major*).

#### 3.2.3.3 BADGER

The desk study returned no records of badger within 2 km of the Site within the last 20 years.

No evidence of badger activity was recorded during the Habitat and PSS.

The habitat survey identified suitable badger habitat within the north of the ESA, where a combination of broadleaved, mixed and conifer woodland was present, in which badger could construct setts. Furthermore, there were areas of grassland recorded, which provided suitable

foraging habitat for badger. However, no evidence of badger activity was recorded; therefore, badgers are considered absent from the Site.

#### 3.2.3.4 OTTER

The data search identified one record of otter within 2 km of the ESA, within the last 20 years.

No evidence of otter activity was recorded during the Habitat and PSS.

The habitat survey identified suitable otter habitat within the north and southeast of the ESA, where the Burn of Halkirk ran alongside woodland and a large pond adjacent to reed beds was recorded, in which otter could commute and rest. However, no evidence of otter activity was recorded; therefore, otter is considered absent from the Site.

#### 3.2.3.5 PINE MARTEN

The desk study returned no records of pine marten within 2 km of the Site within the last 20 years.

No evidence of pine marten activity was recorded during the Habitat and PSS.

The habitat survey identified suitable pine marten habitat within the north of the ESA, where a combination of broadleaved, mixed and conifer woodland was present, in which pine marten could construct dens. Furthermore, there were areas of tall swathes of grassland recorded, which provided suitable foraging habitat for pine marten. However, no evidence of pine marten activity was recorded; therefore, pine marten is considered absent from the Site.

#### 3.2.3.6 RED SQUIRREL

The desk study returned no records of red squirrel within 2 km of the Site within the last 20 years.

No evidence of red squirrel activity was recorded during the Habitat and PSS.

The habitat survey identified suitable red squirrel habitat within the north of ESA, where a combination of broadleaved, mixed and conifer woodland was present, in which red squirrels could construct dreys and forage. However, no evidence of red squirrel activity was recorded; therefore, red squirrel is considered absent from the Site.

#### 3.2.3.7 WATER VOLE

The desk study returned no records of water vole within 2 km of the Site within the last 20 years.

No evidence of water vole activity was recorded during the Habitat and PSS.

The habitat survey identified suitable water vole habitat within the north and southeast of the ESA, where the Burn of Halkirk ran alongside woodland and large pond adjacent to reed beds was recorded This provided habitat in which water vole could create burrows and forage. However, no evidence of water vole activity was recorded; therefore, water vole is considered absent from the Site.

#### 3.2.3.8 WILDCAT

The desk study returned no records of wildcat within 2 km of the Site within the last 20 years.

No evidence of wildcat activity was recorded during the Habitat and PSS.

The habitat survey identified suitable wildcat habitat within the north of the ESA, where a combination of broadleaved, mixed and conifer woodland was present, in which wildcat could construct dens. Furthermore, there were areas of open grassland, pastureland, and riparian habitats, which provided suitable foraging and commuting habitat for wildcat. However, no evidence of wildcat activity was recorded; therefore, wildcats are considered absent from the Site.

#### 3.2.3.9 AMPHIBIANS AND REPTILES

The data search returned no records of amphibian species, or reptiles, within 2 km of the Site, within the last 20 years.

**Amphibians**

No field signs of amphibians were recorded during the Habitat and PSS.

The habitat survey identified suitable common frog (*Rana temporaria*) and common toad (*Bufo bufo*) habitat throughout the ESA, where field drains, the Burn of Halkirk, damp areas of acid grassland, neutral grassland, heathland, and small areas of blanket bog were present These habitats could be used by common frog and common toad as breeding and resting sites. However, no evidence of amphibian activity was recorded; therefore, amphibians are considered absent from the Site.

**Reptiles**

No field signs of reptiles were recorded during the Habitat and PSS.

The habitat survey identified suitable common lizard (*Zootoca vivipara*) and adder (*Vipera berus*) habitat throughout the ESA, such as open ground such as heathland and damp acid and neutral grassland was present, in which common lizard and adder could use for resting, shelter and foraging. However, no evidence of reptile activity was recorded; therefore, reptiles are considered absent from the Site.

# 4. SUMMARY

Broadleaved, mixed, and coniferous woodland, upland wet heathland, neutral grassland, and acid grassland were the main habitat types recorded across the ESA.

Three SBL habitats were recorded within the Survey Area:

- Blanket bog;
- Upland heathland, and;
- Ponds.

Three EU Habitats Directive Annex 1 Priority habitats was recorded within the Survey Area:

- 4010 Northern Atlantic wet heaths with *Erica tetralix;*
- 4030 European dry heaths, and;
- 7130 Blanket bogs.

Five potential GWDTEs were recorded within the Survey Area:

- M15- *Scirpus cespitosus - Erica tetralix wet heath*
- M16 - *Erica tetralix - Sphagnum compactum wet heath*
- M23 - *Juncus effusus/acutiflorus - Galium palustre rush-pasture*
- MG10 - *Holcus lanatus - Juncus effusus rush-pasture*
- U6 - *Juncus squarrosus - Festuca ovina grassland*

No evidence of protected and priority mammal, reptile or amphibian species presence was recorded at the time of the surveys, and no further surveys or assessment are recommended.

# APPENDIX A FIGURES

FIGURE 1 SITE BOUNDARY PLAN

FIGURE 2 DEVELOPMENT PLAN

FIGURE 3 DESIGNATED SITES PLAN

FIGURE 4 HABITAT OF PRINCIPAL IMPORTANCE PLAN

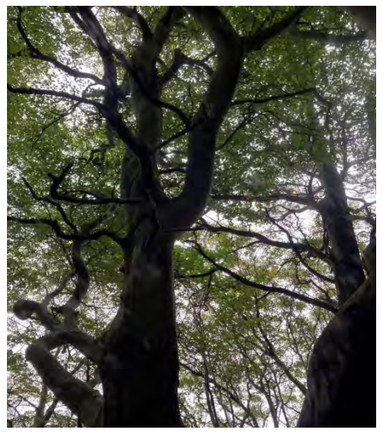
FIGURE 5 ANNEX 1 HABITATS PLAN

FIGURE 6 HABITAT RESULTS PLAN

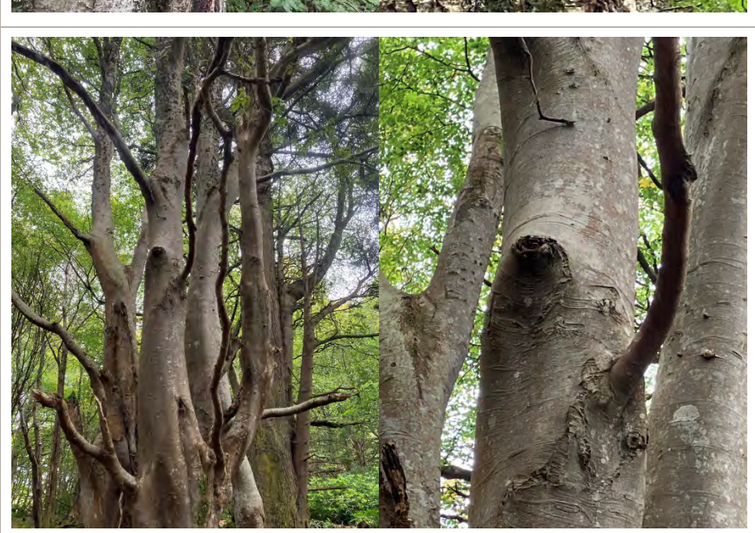
FIGURE 7 GWDTE AND NVC SURVEY RESULTS PLAN

FIGURE 8 PROTECTED SPECIES RESULTS PLAN

# APPENDIX B TARGET NOTES

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 1 | ND 15574 57685 | Mature ash tree with knot hole approximately 3-4 m high. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 2 | ND 15564 57662 | Mature beech tree with cavity at base of the trunk. |  |
| 3 | ND 15595 57608 | Mature ash tree with hollow within trunk, approximately 3-4 m high. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 4 | ND 15646 57601 | Mature silver birch with cavity within trunk, approximately 3-4 m high. |  |
| 5 | ND 15650 57628 | Mature beech with knot hole, approximately 5-6 m high. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 6 | ND 15660 57630 | Mature beech with hollow where branch meets trunk, approximately 3-4 m high. |  |
| 7 | ND 15674 57630 | Mature beech with knot hole, approximately 3-4 m high. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 8 | ND 15587 57657 | Mature Scots pine with gap under the bark 3-4 m high, cavity under bark, and a woodpecker hole approximately 5-6 m high. |  |
| 9 | ND 15600 57656 | Mature ash with knot hole approximately 4-5 m high and a cavity within the trunk. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 10 | ND 15929 57441 | Post-1990s maintenance outbuilding with gaps within the weather boarding at the barge board, and space between the wall and a gap at the soffit. |  |
| 11 | ND 16080 57471 | Post-1900s manor house with loose roof tiles, gaps within the eaves, and loose lead flashing. |   |
| 12 | ND 15601 57589 | Dried out burn/tributary. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 13 | ND 15662 57691 | Beech lined avenue/track. |  |
| 14 | ND 15808 57677 | Stagnant burn, dominated by rushes, ferns, hogweed, Yorkshire fog. |    |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 15 | ND 15874 57754 | Strip of newly planted broadleaved trees |   |
| 16 | ND 15830 57608 | Overgrown garden in manor grounds. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 17 | ND 16157 57382 | Wet neutral grassland woodland ride |  |
| 18 | ND 16053 57453 | Improved grassland, garden |  |
| 19 | ND 16056 57510 | Walled garden |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 20 | ND 15842 57399 | 1.5m wide, 2inch deep, moderate flow, rock substrate, 70 degree angle bank on both sides, 80% shaded, grassy vegetation |  |
| 21 | ND 15847 57398 | Surfaced access track, beech lined |  |

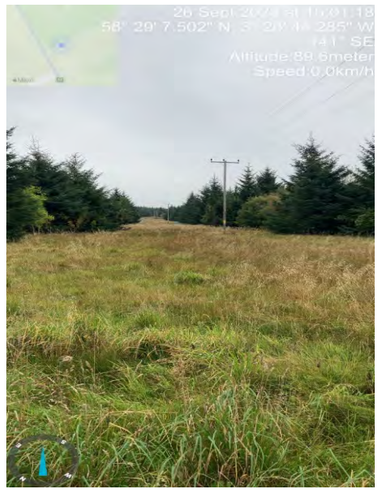
| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 22 | ND 15847 57399 | Slow wide pond inlet area. Suitable for otter resting/commuting and amphibian breeding site. |  |
| 23 | ND 15870 57382 | Narrow burn (Halkirk Burn), good riparian vegetation, good slope aspect. Suitable for otter and water vole. |   |
| 24 | ND 15979 57306 | Halkirk Burn has same condition and suitability as other sections (above). |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 25 | ND 16039 57294 | Moderately flowing narrow burn, suitable for otter and water vole. |   |
| 26 | ND 16270 57189 | Narrow moderate section, good overhand and bankside vegetation, steep slope. Sub-optimal for water vole, suitable for otter commuting/resting. |   |
| 27 | ND 16339 57228 | Ditch, moderate flow, 0.5 m deep, bankside slope steep in most sections, suitable for otter commuting, suitable/sub-optimal for water vole. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 28 | ND 16486 57003 | Straight drain, good bankside vegetation/slope. Flow too fast for water vole, suitable for commuting otter. |   |
| 29 | ND 16488 56982 | Slow flowing tributary. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 30 | ND 16522 56970 | Large pond, seems permanent, shallow, lots of vegetation, suitable for otter, water vole, and amphibians. |    |
| 31 | ND 16492 56636 | Small, narrow moderate flowing drain. Gentle slope, good bankside vegetation; however, rocky. Unsuitable for otter and water vole. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 32 | ND 16162 56423 | Dry ditch, steep slopes, riparian vegetation on slopes. |   |
| 33 | ND 15893 56241 | Channel which is densely vegetated. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 34 | ND 15852 56126 | Neutral grassland - Bent, Yorkshire fog, cocksfoot, and creeping thistle. |  |
| 35 | ND 15743 56111 | Densely vegetated channel. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 36 | ND 15861 56550 | Small, moderate flow ditch with dense vegetation in channel. |    |
| 37 | ND 15846 56632 | Small, densely vegetated channel. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 38 | ND 15937 56703 | Circular structure is a path made from slats |  |
| 39 | ND 15857 56790 | Area become more acidic, bell heather, bog asphodel, tormentil, ribwort plantain. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 40 | ND 15732 56827 | Different grassland to Holcus /Juncus grassland, ling heather, hare's tail cotton grass, vetch, tormentil, heather, devil's-bit scabious, and tufted hair grass. |  |
| 41 | ND 15722 56868 | Very slow-moving ditch, shallow slopes. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 42 | ND 15522 56814 | Narrow moderate burn, rocky, steep slope, good riparian vegetation. Suitable for commuting otter, sub-optimal water vole. |  |
| 43 | ND 15541 56863 | Old earthworks. |  |

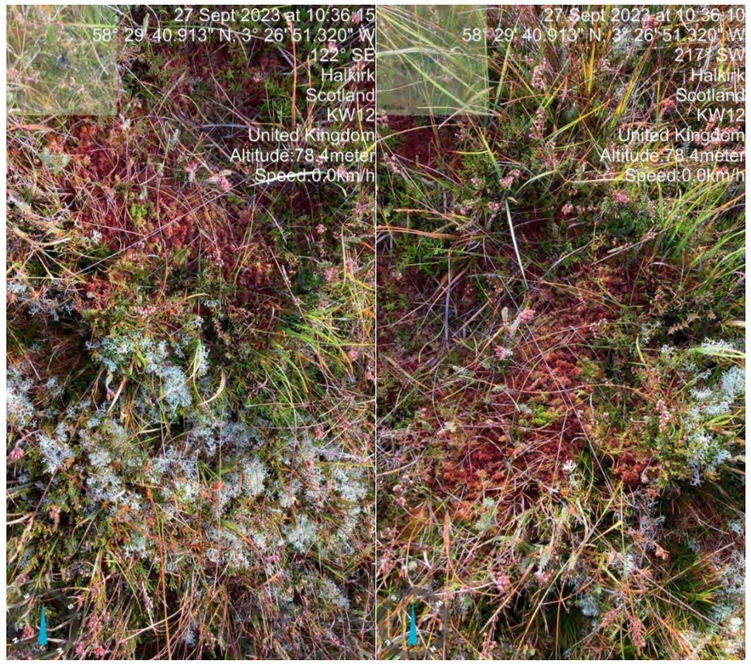
| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 44 | ND 15456 57201 | Pastureland, adjacent to west of A9. |    |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 45 | ND 15496 57416 | West of A9. |  |
| 46 | ND 15530 57492 | East of A9 looking into modified grassland and scattered gorse scrub. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 47 | ND 15550 57421 | Scattered gorse with dominant common gorse, east of A9. |  |
| 49 | ND 15473 57261 | East of A9 showing modified grassland. |  |
| 50 | ND 15781 56154 | Habitat overview of east of the A9 with modified grassland and woodland in background. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 51 | ND 15781 56155 | Habitat overview of modified grassland, west of the A9. |  |
| 52 | ND 15569 57572 | Holcus/Juncus in corner approx. 100mx20m |  |
| 53 | ND 15566 57439 | Rowan, ash and sycamore, white beam, mature, browse line evident. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 54 | ND 15627 57383 | Heathland with percentage of cover in brackets - Common heather (70) bell Heather (5) deer grass (20) field wood rush (5) poa annua (<5) sphagnum (80) Erica tetralix (5) hares tail cotton grass <5). |  <br>  |
| 55 | ND 15689 57314 | Acid grassland with percentage of cover in brackets - Compact rush (<10) scabious (<5) |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 56 | ND 15708 57298 | Percentage cover of Sphagnum capillifolium ( <5), and reindeer lichen (<5). |     |
| 57 | ND 15631 57339 | Tributary with slow flowing water, steep slope and eroded bank. Unsuitable for water vole and otter. 5 m either side of tributary there is a divide between grassland and bog. 2 m wide and 1 m deep. Juncus, scabious, tufted hair grass, and rushes. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 58 | ND 15742 57275 | Overview of centre of the ESA. |  |
| 59 | ND 15729 57260 | Bog asphodel present within heathland. |  |
| 60 | ND 15677 57249 | Suspected cattle management/feeding area. Improved grassland, 15% bare ground. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 61 | ND 16154 57110 | 0.5 m wide, 0.2 m deep. Rocky, gentle sloping, good bankside vegetation. Unsuitable for water vole, sub optimal for otter. |  |
| 62 | ND 16152 57102 | Semi improved grassland. 10% Juncus. |   |
| 63 | ND 16163 56794 | 0.4 m wide, 0.2 m deep, small, and narrow, not suitable for water vole or otter. |  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 64 | ND 16196 56699 | Bog pool, 4x15m, bog asphodel, deer grass, Sphagnum papillosum, reindeer lichen, and ling. |   |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 65 | ND 16216 56684 | Wet heath |  <br>  <br>  |

| Target Note Number | Approximate Grid Reference | Description | Photograph |
|---|---|---|---|
| 66 | ND 15354 56902 | Narrow tributary within pastureland, west of A9. Unsuitable for water vole, suitable for otter to commute and rest. |  |
| 67 | ND 15145 56940 | Tributary running parallel to horse field. Suitable for otter commuting, sub-optimal for water vole. |  |
| 68 | | Agricultural land defining the landscape west of A9. |  |

# APPENDIX C BOTANICAL SPECIES LIST

| Common name | Latin Name |
|---|---|
| Alder | *Alnus glutinosa* |
| Angelica | *Angelica sylvestris* |
| Annual meadow grass | *Poa annua* |
| Ash | *Fraxinus excelsior* |
| Beech | *Fagus sylvatica* |
| Bell heather | *Erica cinerea* |
| Blunt-leaved bog moss | *Sphagnum palustre* |
| Bog asphodel | *Narthecium ossifragum* |
| Bracken | *Pteridium aquilinum* |
| Broad-leaved dock | *Rumex obtusifolius* |
| Butterbur | *Petasites hybridus* |
| Butterwort | *Pinguicula vulgaris* |
| Cocksfoot | *Dactylis glomerata* |
| Common bent | *Agrostis capillaris* |
| Common daisy | *Bellis perennis* |
| Common gorse | *Ulex europaeus* |
| Common heather | *Calluna vulgaris* |
| Common hogweed | *Heracleum sphondylium* |
| Common nettle | *Urtica dioica* |
| Compact rush | *Juncus conglomeratus* |
| Creeping buttercup | *Ranunculus repens* |
| Creeping thistle | *Cirsium arvense* |
| crested dog's-tail | *Cynosurus cristatus* |
| Cross-leaved heath | *Erica tetralix* |

| Common name | Latin Name |
|---|---|
| Devil's-bit scabious | *Succisa pratensis* |
| Douglas fir | *Pseudotsuga menziesii* |
| European larch | *Larix decidua* |
| Feathery bog moss | *Sphagnum cuspidatum* |
| Flat-topped bog moss | *Sphagnum Fallax* |
| Hard fern | *Blechnum spicant* |
| Hare's-tail cottongrass | *Eriophorum vaginatum* |
| Hawthorn | *Crataegus monogyna* |
| Hazel | *Corylus avellana* |
| Heath bedstraw | *Galium saxatile* |
| Heath rush | *Juncus squarrosus* |
| Heath spotted orchid | *Dactylorhiza maculata* |
| Lesser stitchwort | *Stellaria graminea* |
| Marsh bedstraw | *Galium palustre* |
| Marsh thistle | *Cirsium palustre* |
| Meadow buttercup | *Ranunculus acris* |
| Meadowsweet | *Filipendula ulmaria* |
| Norway spruce (Picea abies). | *Picea abies* |
| Quaking oat grass | *Briza media* |
| Red bog moss | *Sphagnum capillifolium* |
| Red clover | *Trifolium pratense* |
| Rhododendron | *Rhododendron ponticum* |
| Ribwort plantain | *Plantago lanceolata* |
| Rowan | *Sorbus acuparia* |
| Scots pine | *Pinus sylvestris* |
| Sheep's fescue | *Festuca ovina* |

| Common name | Latin Name |
|---|---|
| Sheep's sorrel | *Rumex acetosella* |
| Silver birch | *Betula pendula* |
| Sitka spruce | *Picea sitchensis* |
| Soft rush | *Juncus effusus* |
| Spear thistle | *Cirsium vulgare* |
| Sycamore | *Acer pseudoplatanus* |
| Tormentil | *Potentilla erecta* |
| Tufted hair grass | *Deschampsia cespitosa* |
| Vetch spp. | *Vicia spp.* |
| Water mint | *Mentha aquatica* |
| Wavy hair grass | *Deschampsia flexuosa* |
| Whitebeam | *Sorbus aria* |
| White clover | *Trifolium repens* |
| Willow spp. | *Salix spp.* |
| Yarrow | *Achillea millefolium* |
| Yorkshire fog | *Holcus lanatus* |
| Nodding thread-moss | *Pohlia nutans* |

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