Bowdun Offshore Wind Farm

Technical Appendix 7.1: UKHab and Protected Species Survey (2024)

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THISTLE WIND PARTNERS

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Bowdun Offshore Wind Farm

Technical Appendix 7.1: UKHab and Protected Species Survey (2024)

0742303

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ACRONYMS AND ABBREVIATIONS

Acronym	Description
AOD	Above ordnance datum
BCT	Bat Conservation Trust
BSA	Badger Survey Area
BtSA	Bat Survey Area
CA	Confidential Annex
CIEEM	Chartered Institute of Ecology and Environmental Management
DBW	Daytime Bat Walkover
EcIA	Ecological Impact Assessment
EIA	Environmental Impact Assessment
ERM	Environmental Resources Management Limited
ESA	Ecology Survey Area
FAR	Further Assessment Required
FLS	Forestry and Land Scotland
HCA	Habitat Condition Assessment
HSA	Habitat Survey Area
INNS	Invasive Non-Native Species (of plant)
JNCC	Joint Nature Conservation Committee
Km	Kilometer – One thousand meters
kV	Kilovolt
LBAP	Local Biodiversity Action Plan
m	Meters
MLWS	Mean Low High Water Springs
NG	National Grid
NS	NatureScot
OS NGR	Ordnance Survey National Grid Reference
OSA	Otter Survey Area
OWF	Offshore Wind Farm
PPP	Planning Permission in Principle
PRF	Potential Roost Feature
PMSA	Pine Marten Survey Area
RSSA	Red squirrel Survey Area

SBL	Scottish Biodiversity List
TWP	Thistle Wind Partners
UKHab	UK Habitat Classification
WSA	Wildcat Survey Area
WVSA	Water Vole Survey Area

1. INTRODUCTION

Environmental Resources Management Limited (ERM) was commissioned by Thistle Wind Partners (TWP) to undertake initial ecology surveys to obtain baseline onshore ecological information in connection with the proposed onshore connection works associated with Bowdun Offshore Wind Farm (OWF) (hereafter referred to as the Proposed Development).

The following terminology is used through this report:

- Proposed Development: term used to define the Onshore Infrastructure associated with the Project landward of Mean Low High Water Springs (MLWS) for which Planning Permission in Principle (PPP) is being sought. Further details of the parameters are set out in **EIA Report Volume 1, Chapter 3 (Project Description)**;
- Ecology Study Area (2024): land areas that the Proposed Development would be sited within; and
- Ecology Survey Area (ESA): land areas where ecology surveys were undertaken, incorporating the Ecology Study Area (2024) and species-specific zones of influence described in **Section 2**; as shown on **Figure 1 (Appendix A)**.

1.1 PROPOSED DEVELOPMENT

The Proposed Development consists of the following key components:

- Landfall - The area in which the offshore export cables make landfall and is also the transitional area between the Offshore Transmission Assets and the Onshore Transmission Assets, located near Benholm;
- Onshore Export Cable Corridor - The area landward of MLWS to the Substation within which the Onshore Export Cables will be installed and forms part of the PPP Application Boundary;
- Any temporary ancillary onshore infrastructure required for the construction phase of the Cable Corridor and Substation (such as construction compounds and access);
- Substation - The onshore Substation to be constructed as a component of the Proposed Development. The Substation would transform voltage from low to high by means of electrical transformers to ensure the electrical energy provided from the offshore generation assets is at a voltage suitable for connection to the National Grid (NG); and
- 400 kV cable corridor - The 400 kV Cable Corridor will house the cabling required for the onward transmission from the Substation to the proposed SSEN-T Hurlie substation.

1.2 ECOLOGY STUDY AREA (2024)

The Ecology Study Area (2024) is situated approximately 5 km to the west of Stonehaven, Aberdeenshire; comprising an approximate 500 m corridor running for approximately 17 km between the Fetteresso Forest and Gourdon. The Ecology Study Area (2024) is approximately 1,201.8 hectares (ha) and centred on approximate Ordnance Survey National Grid Reference (OS NGR) NO 79858 76633 (Plantation of Hillhead).

Topography within the Ecology Study Area (2024) ranges from 0 m above ordnance datum (AOD) at Gourdon in the south, to approximately 250 m AOD at Fetteresso Forest in the north. The Ecology Study Area (2024) covers a broad range of habitat types which includes

woodlands, grassland, scrub, wetland and cropland. The Ecology Study Area (2024) crosses the Bervie Water and a number of smaller watercourses including the Forthie Water, Drumlithie Burn, Carron Water, Burn of Annamuick and Burn of Elfhill.

Prevailing land-use within the Ecology Study Area (2024) is characterised by agricultural activities including arable farming and cattle/sheep grazing; as well as commercial forestry, most notably in Fetteresso Forest. The Ecology Study Area (2024) passes in close proximity to the hamlet of Arbuthnott and the village of Drumlithie; with private residential properties and farms scattered across the Ecology Study Area (2024). The Ecology Study Area (2024) crosses a section of the A92 road at Gourdon, B967 road at Arbuthnott and the A90 trunk road near Drumlithie; as well other local rural roads and tracks.

1.3 PURPOSE OF THE REPORT

Habitat and protected species surveys were undertaken following recommendations set out in the EIA Scoping Report[1], completed by ERM in 2024. The objective of this document is to report on the findings of these surveys. Further details relating to baseline information is presented in **Technical Appendix 7.2: UKHab, NVC for GWDTE and Protected Species (2025)**[2] and **Technical Appendix 7.3: Protected Species (Confidential Annex)**[3].

[1] TWP. (2024) Bowdun Offshore Wind Farm: Onshore Scoping Report. Prepared by RPS for and on behalf of Thistle Wind Partners (Doc Ref. TWP-BOW-RPS-OSC-RPT-00002 /FINAL).

[2] ERM. (2025) Bowdun Offshore Wind Farm - Onshore Ecology: Technical Appendix 7.2 UKHab, NVC for GWDTE and Protected Species Survey (2025). Commissioned report to Thistle Wind Partners from Environmental Resources Management Limited (Issued November 2025).

[3] ERM. (2025) Bowdun Offshore Wind Farm - Onshore Ecology: Technical Appendix 7.3 Protected Species Survey (Confidential Annex). Commissioned report to Thistle Wind Partners from Environmental Resources Management Limited (Issued November 2025).

2. METHODOLOGY

In accordance with NatureScot (NS) and the Chartered Institute of Ecology and Environmental Management (CIEEM) standing advice[4,5] habitat and protected species surveys were undertaken by ERM.

2.1 UKHAB SURVEY

A habitat survey was undertaken within the Ecology Study Area (2024) (the Habitat Survey Area, or HSA), with vegetation and habitats classified in accordance with the latest version of UKHab[6]. Habitat condition was also captured to inform any Biodiversity Net Gain (BNG) metric assessment; in accordance with Natural England's guidance[7].

Plants and their frequency of occurrence were recorded using the subjective DAFOR[8] scale (Dominant, Abundant, Frequent, Occasional or Rare). Different levels of plant species cover within an area was then used to determine UKHab classification alongside other geographical or land management factors. The nomenclature of vascular plants occurring within the defined survey area follows Stace (2019)[9].

Incidental sightings of any invasive non-native species (INNS) of plant encountered during the survey were noted to inform the need for furthers surveys, management and/or eradication.

2.2 PROTECTED SPECIES

In accordance with NS standing advice and good practice guidelines, ERM completed a range of surveys to determine the presence or likely absence of protected species within the ESA. Incidental signs of any priority species[10,11] encountered within the ESA were also noted to inform the need for further surveys.

Sensitive information relating to species considered vulnerable to persecution or over-exploitation are reported in a separate Confidential Annex (CA)[12]; taking cognisance of NS guidance[13]. Therefore, sensitive information relating to badger and significant bat roosts are not presented in this report.

[4] NatureScot. (2024) Planning and development: standing advice and guidance documents [Online]. Available at: <https://www.nature.scot> (last accessed May 2025).
[5] CIEEM. (2021). Good Practice Guidance for Habitats and Species. Chartered Institute of Ecology and Environmental Management. Available at: <https://cieem.net/resource/good-practice-guidance-for-habitats-and-species/> (last accessed May 2025).
[6] UKHab Ltd (2023) UK Habitat Classification 2.0. UKHab Ltd, Stockport. Available at: <https://www.ukhab.org> (last accessed May 2025).
[7] UK Government (2024). Statutory biodiversity metric tools and guides [Online]. Available at: <https://www.gov.uk/government/publications/statutory-biodiversity-metric-tools-and-guides> (last accessed May 2025)
[8] The DAFOR scale is used for semi-quantitative sampling, to provide a quick estimate of the relative abundance of species (generally plants) in each area. Abundance (number of individuals) and cover (area coverage) are often used interchangeably in this type of surveying, although in fact they may have very different meanings.
[9] Stace, C. (2019). New Flora of the British Isles (4th edition). University Press, Cambridge.
[10] NatureScot (2020). Scottish Biodiversity List [Online]. Available at: <https://www.nature.scot/doc/scottish-biodiversity-list> (last accessed May 2025)
[11] North East Scotland Local Biodiversity Partnership (2025). North East Scotland Local Biodiversity Partnership [Online]. Available at: <https://www.nesbiodiversity.org.uk> (last accessed May 2025)
[12] ERM. (2025) Bowdun Offshore Windfarm: Onshore Ecology Habitats and Protected Species Survey Confidential Annex. Commissioned report to Thistle Wind Partners from Environmental Resources Management Limited (v1-0, Issued June 2025).
[13] NS. (2025) Sensitive Species List of Scotland [online]. NatureScot. Available at: <https://www.nature.scot/doc/sensitive-species-scotland-list> (last accessed May 2025).

2.2.1 BATS

In accordance with Bat Conservation Trust (BCT) guidelines[14], a Daytime Bat Walkover (DBW) was carried out to identify the presence of potential bat habitats within and up to 50 m from the Ecology Study Area (2024) (Bat Survey Area, or BtSA). The DBW consisted of a ground-level non-intrusive visual assessment of accessible areas within the BtSA to determine the presence of roosting, foraging, commuting and swarming habitats; and to inform the need for further bat surveys.

The DBW classified the suitability of accessible habitats and structures (including buildings and bridges) as None, Negligible, Low, Moderate or High; as described in **Table** 2.1. Accessible trees were classified as None, Further Assessment (FAR) or Potential Roost Feature (PRF); as described in

Table 2.2.

No Preliminary Bat Roost Assessment (PBRA), internal building inspections or aerial inspections were carried out.

TABLE 2.1 GUIDANCE FOR ASSESSING THE SUITABILITY OF BAT HABITATS

Suitability	Roosting habitats (Structures)	Flight-paths and Foraging Habitats
None	No habitat features on site likely to be used by any roosting bats at any time of the year (i.e. a complete absence of crevices/suitable shelter at all ground/underground levels).	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).
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 obvious habitat features on site likely to be used as flight-paths or by foraging bats; however, a small element of uncertainty remains in order to account for non-standard bat behaviour.
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	Continuous habitat connected to the wider landscape that could be used by bats for flight-paths such as lines of trees and scrub or linked back gardens. Habitat that is connected to the wider landscape that could be used by bats

[14] Collins, J. (ED.) (2023) Bat Surveys for Professional Ecologists, Good Practice Guidelines (4th Editions), The Bat Conservation Trust, London

Suitability	Roosting habitats (Structures)	Flight-paths and Foraging Habitats
	hibernation - the categorisation described in this table is made irrespective of species conservation status, which is established after presence is confirmed).	for foraging such as trees, scrub, grassland or water.
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.

TABLE 2.2 GUIDANCE FOR ASSESSING BAT ROOST SUITABILITY OF TREES

Suitability	Description
NONE	Either no PRFs in the tree or highly unlikely to be any.
FAR	Further assessment required to establish if PRFs are present in tree.
PRF	A tree with at least one PRF present.

2.2.2 BADGER

Accessible areas of habitat deemed suitable to support badger within and up to 100 m of the Ecology Study Area (2024) (Badger Survey Area, or BSA) were surveyed for evidence of badger activity as per current NS standing advice[15]. Badger field signs include structures or places for shelter or protection (e.g. setts), as well as latrines, pathways, footprints, guard hairs, scratch marks, and signs of foraging ("snuffle holes")[16].

In accordance with Harris *et al*. (1989)[17], setts encountered were classified into one of the four categories below:

- 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

[15] NatureScot. (2024). Standing advice for planning consultations - Badgers. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-badgers> (last accessed May 2025).
[16] Scottish Badgers (2018). Surveying for Badgers: Good Practice Guidelines (Version 1). Available at: <https://www.scottishbadgers.org.uk/> (last accessed May 2025).
[17] Harris S, Cresswell P and Jefferies D (1989) Surveying Badgers. Mammal Society, Southampton.

- 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.

Each sett entrance was classified according to its degree of usage and activity status as classified by Scottish Badgers[16]:

- Well Used (WU) are clear of debris and vegetation, sides worn smooth but not necessarily excavated recently;
- Partially used (PU) are not in regular use and have debris e.g. twigs and leaves in the entrance. They could be used after only a minimal amount of clearance; and
- Disused (D) not in use for some time, are partially blocked and could not be used without considerable effort. If the hole has been disused for some time all that may be visible is the overgrown spoil heap and a depression in the ground where the hole used to be. Rabbits and foxes may take over part of a sett and keep disused entrances open.

2.2.3 OTTER

Accessible areas of habitat deemed suitable to support otters within, and up to 200 m from the Ecology Study Area (2024) (Otter Survey Area, or OSA), were surveyed for evidence of otter activity in accordance with good practice guidelines[18]. 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[19].

Structures or places used by otter for shelter or protection were classified, in accordance with Harris and Yalden (2008)[20]:

- Den/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.

2.2.4 PINE MARTEN

Accessible areas of habitat deemed suitable to support pine marten within, and up to 250 m from, the Ecology Study Area (2024) (Pine Marten Survey Area, or PMSA) were surveyed for evidence of pine marten activity in accordance with good practice guidelines[21]. Pine marten field signs include structures or places for shelter or protection (e.g. dens), as well as feeding signs and scat[22].

[18] NatureScot. (2024). Standing advice for planning consultations - Otters. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-otters> (last accessed May 2025).
[19] Chanin and Smith (2003). Monitoring the otter Lutra lutra. Conserving Natura 2000 Rivers Monitoring Series No 10. Peterborough, English Nature.
[20] Harris, S., and Yalden, D.W. (2008) Mammals of the British Isles Handbook (4th edn). Mammal Society, Southampton.
[21] NatureScot. (2024). Standing advice for planning consultations – Pine Martens. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-pine-martens> (last accessed May 2025).
[22] The Vincent Wildlife Trust (2020). A Guide to Identifying Evidence of Pine Martens. Available at: <https://www.vwt.org.uk/wp-content/uploads/2020/07/Evidence-of-Pine-MartensJune2020Webversion.pdf> (last accessed May 2025).

Analysis of scat samples recovered during the survey was undertaken by Warwick University[23].

2.2.5 RED SQUIRREL

A walkover survey of all accessible woodland, within and up to 50 m from the Ecology Study Area (2024) (Red Squirrel Survey Area, or RSSA) was conducted in accordance with good practice guidance[24,25]. Surveyors walked woodland areas and recorded evidence of red squirrel activity including dreys, feeding remains and footprints; as well as direct sightings of individuals.

2.2.6 WATER VOLE

Accessible areas of habitat deemed suitable to support water vole within and up to 200 m from the Ecology Study Area (2024) (Water Vole Survey Area, or WVSA) were surveyed for evidence of water vole activity in accordance with good practice guidelines[26]. Water vole field signs include structures or places for shelter or protection (e.g. burrows, nests), as well as latrines, runs and feeding remains[27],[28].

The Water Vole Field Signs and Assessment, Dean (2021)[29], is used as a basis to evaluate features of a waterbody to determine whether it is suitable for water vole; as summarised in **Table** 2.3.

TABLE 2.3 CRITERIA FOR ASSESSING THE VALUE OF HABITAT FOR WATER VOLE

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.	Earth or peak banks, or stony / reinforced bank with gaps	No noticeable variation during the summer months; banks are not	Continuous swathe of bankside or in-channel (emergent) vegetation providing at least 60 % ground cover.	Permanent water. Or routinely wet for at least 2 – 3 months during the

[23] EcoWarwicker Ecological Forensics (2025). Mustelid DNA Species Test [Online]. Available at: <https://www.ecowarwickerforensics.com/mustelid-species-test> (last accessed May 2025).
[24] NatureScot. (2022) Standing advice for planning consultations - Red Squirrels [Online]. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-red-squirrels> (last accessed May 2025).
[25] 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. Mammal Society, Southampton.
[26] NatureScot. (2024). Standing advice for planning consultations – Water Voles. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-water-voles> (last accessed May 2025).
[27] Strachan, R. Moorhouse, T. and Gelling, M. (2011). Water Vole Conservation Handbook. Third Edition. Wildlife Conservation Research Unit (WildCRU), Oxon.
[28] 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.
[29] Dean, M. (2021). Water Vole Field Signs and Habitat Assessment. Pelagic Publishing, Exeter.

Habitat Category	Dry areas for burrows or Nests			Herbaceous vegetation	Water
	Bank Profile	Bank Substrate	Variation in water level		
	Steep or shallow on static waterbodies or fen-type habitat.	allowing access to the earth behind.	overtopped regularly.	May be dominated by grasses and weeds rather than luxurious riparian vegetation. The vegetation should generally be tall, except in urban or suburban areas, where shorter bankside vegetation may also qualify.	summer, and where other 'good' habitat present in immediately adjacent 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. Vertical bank face with no burrowing opportunities behind it.	Rocky or gravel, unsuitable for burrowing. Reinforced banks with no gaps.	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

2.2.7 WILDCAT

In line with good practice guidelines[30,31], all suitable habitats within and up to 200 m from the Ecology Study Area (2024) (Wildcat Survey Area, or WSA) were subjected to a walkover to record habitat suitability and evidence of wildcat activity (such as denning, foraging and breeding).

2.2.8 OTHER SPECIES

Based on a review of NBN Atlas Scotland, there are no records of great crested newt in Aberdeenshre. NatureScot indicate that great crested newts are typically found in central and southern parts of Scotland, with isolated populations recorded around Inverness and other parts of the Highlands. The Ecology Study Area (2024) is outwith the typical range for the species, and no specific great crested newt survey was undertaken as the species is considered to be absent from potential wetland and terrestrial habitats in the locality.

Although no specific surveys were carried out for other priority species such as those within Local Biodiversity Action Plan (LBAP)[32], Scottish Biodiversity List (SBL[33]), and/or invasive non-native species (INNS); any incidental field signs or sightings were recorded.

[30] NatureScot (2020). Standing advice for planning consultations – Wildcats [Online]. Available at: <https://www.nature.scot/doc/standing-advice-planning-consultations-wildcats> (last accessed May 2025).
[31] NatureScot (2014). Guidance- Wildcat Survey Methods [Online]. Available at: <https://www.nature.scot/doc/guidance-wildcat-survey-methods> (last accessed May 2025).
[32] North East Scotland Local Biodiversity Partnership (2025). North East Scotland Local Biodiversity Partnership [Online]. Available at: <https://www.nesbiodiversity.org.uk> (last accessed May 2025).
[33] NatureScot (2020). Scottish Biodiversity List [Online]. Available at: <https://www.nature.scot/doc/scottish-biodiversity-list> (last accessed May 2025).

2.3 SURVEY PERSONNEL AND TIMINGS

The habitat and protected species surveys were undertaken by the following lead surveyors who are members of CIEEM with at least capable level of competence in undertaking and leading surveys for habitat and protected species[34]:

- Callum Gilhooley ACIEEM – ERM Principal Consultant Ecologist with 11+ years' experience;
- Robert Potter ACIEEM – ERM Senior Consultant Ecologist with 13+ years' experience;
- Aaron Martin qualifying CIEEM – ERM Consultant Ecologist with 3+ years' experience;
- Aaron Nugent ACIEEM – ERM Consultant Ecologist with 3+ years' experience; and
- Theo Loizou MCIEEM – ERM sub-contractor and botanical specialist with 27+ years' experience.

Lead surveyors were periodically assisted by the following individuals: Isabella Cornwell – ERM Consultant Ecologist and qualifying CIEEM member with 1 year experience, Catriona Holland, ERM Environmental Consultant with 1 year experience and Andy Dowse, ERM sub-contractor with 20+ years experience. Timings of site visits and associated personnel is presented in **Table** 2.4.

TABLE 2.4 SURVEY PERSONNEL AND TIMINGS

Date	Personnel	Start and End Time (24hrs)	Weather			
			Temp. (°C)	Wind Speed (Beaufort Scale) [35]	Rain (mm)	Cloud Cover (oktas) [36]
19/08/2024	CG, AN, RP, & TL.	15:00 - 18:00	16	2	1.5	4
20/08/2024	CG, AN, RP, & TL.	09:00 - 18:00	16	3	2	2
21/08/2024	CG, AN, RP, & TL.	09:00 - 17:30	14	3	1.7	2
22/08/2024	CG, AN, RP, & TL.	09:00 - 18:00	18	3	0.6	4
23/08/2024	CG, AN, RP, & TL.	09:00 - 15:00	17	2	10.9	5
26/08/2024	CG, AM, AN, and TL.	14:00 - 17:30	15	3	0.2	2
27/08/2024	CG, AM, AN, and TL.	09:00 - 17:30	16	4	6.6	4

[34] CIEEM. (2024) Competency Framework. Chartered Institute of Ecology and Environmental Management [Online]. Available at: <https://cieem.net/wp-content/uploads/2019/02/Competency-Framework-2024-V7-Web.pdf> (last accessed May 2025).
[35] Met Office Beaufort wind force scale. Available at: <https://www.metoffice.gov.uk/weather/guides/coast-and-sea/beaufort-scale> (last accessed May 2025).
[36] The total amount of the sky covered by cloud is expressed in oktas (eighths). Royal Meteorological Society Weather Symbols and Synoptic Charts. Available at: <https://www.metlink.org/resource/student-charts> (last accessed May 2025).

Date	Personnel	Start and End Time (24hrs)	Weather			
			Temp. (°C)	Wind Speed (Beaufort Scale) [35]	Rain (mm)	Cloud Cover (oktas) [36]
28/08/2024	CG, AM, AN, and TL.	09:30 - 18:00	15	6	11.7	6
29/08/2024	CG, AM, AN, and TL.	09:00 - 18:30	16	6	0	6
30/08/2024	CG, AM, AN, and TL.	09:00 - 15:00	18	3	0	2
09/09/2024	AN & IC.	15:00 – 18:00	13	3	1.5	5
10/09/2024	AN & IC.	08:00 – 18:00	11	5 (gusts of 9)	0.5	4
11/09/2024	AN & IC.	08:00 – 18:00	12	4	0	4
12/09/2024	AN & IC.	08:00 – 18:00	11	3	0.2	4
13/09/2024	AN & IC.	09:00 – 13:00	13	2	0	1
07/10/2024	AN & CH.	13:00 – 18:00	12	2	9.5	6
08/10/2024	AN & CH.	09:00 – 18:00	12	3	1.0	5
09/10/2024	AN & CH.	08:30 – 18:00	11	3	1.1	4
10/10/2024	AN & CH.	08:30 – 18:00	7	4	0.8	6
11/10/2024	AN & CH.	08:30 – 18:00	7	4	2.6	5
06/11/2024	AM & AD.	14:00 – 16:15	15	3	0	1
07/11/2024	AM & AD.	09:00 – 16:15	11	4	0	6
08/11/2024	AM & AD.	09:00 – 15:00	10	4	0	6

2.4 SURVEY 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 wetter habitats typically provide few denning structures for ground dwelling species (e.g. badger), and surveyors searched adjoining areas that were accessible to identify field signs.

Areas of woodland that appeared weak standing and with evident fallen trees were surveyed tentatively or at distance on days of weather where wind levels were high enough to pose threat of treefall. This was not considered a significant limitation as such scenarios happened rarely across the survey area and survey period, and surveyors searched adjoining areas that were accessible to identify field signs. Moreover, these trees were typically not large or mature enough to host significant PRFs for bats or denning features for red squirrel or pine marten.

It was not possible to inspect all areas of woodland and scrub due to the presence of dense vegetation that prevented safe access. Where this was encountered, surveyors visually assessed adjoining areas to search for relevant field signs that might indicate that dense vegetation is regularly utilised by a protected or priority species (e.g. mammal paths, footprints, etc). Therefore, whilst evidence within inaccessible areas may have been missed, this is not considered to be a significant limitation.

The full extent of all watercourses could not be surveyed due to overgrown and dense vegetation or deep, fast flowing water. 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. Furthermore, tall, 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 the species prefer slow flowing water; therefore, it is unlikely that water vole would be present. With respect to otter, 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, meaning that suitable resting areas and signs of otter could be recorded. Therefore, this is not considered a significant limitation.

Whilst surveyors could not access small parts of the ESA within Fetteresso Forest, due to forestry activities and moving plant, inaccessible areas were visually assessed from adjoining land where it was safe to do so. Although some evidence of protected species may have been missed in these areas, habitats were of limited suitability due to disruption from prevailing land management; and evidence of these areas being regularly utilised would be recorded from adjoining area.

A small proportion of land within the HSA was not accessible due to landowner permission not being provided, which typically consisted of farms and private residential properties. Fields that could not be physically accessed were limited to farmland near Upper Bualk Farm, Hill of Tannachie and Glenbervie. Other areas that could not be accessed included scrub and boundary features near Gobbs Farm and the Burn of Elfhill. These areas of no access are shown on **Figures 2.1-2.11 (Appendix A)**.

3. SURVEY FINDINGS

3.1 UKHAB SURVEY

Cropland was the most prevalent broad habitat encountered, accounting for over 50.0 % of the HSA. These areas were characterised by extensive field systems containing monocultures of wheat, barley, oats and winter stubble; as well as rye-grass and clover leys and non-cereal crops (cabbage, chard, pea, potato, *etc*.).

Grassland areas were common and widespread, accounting for approximately 29.5 % of the HSA. These areas were characterised by modified grasslands and neutral grasslands, which were typically species-poor and dominated by palatable species that rely on the addition of nutrients and fertilisers.

Woodland and forests accounted for approximately 15.9 % of the HSA. Of this, coniferous woodland amounted to approximately 11.6 % of the HSA, the majority of which was situated within Fetteresso Forest. In these areas, coniferous woodlands were characterised by dense plantations of Sitka spruce (*Picea sitchensis*) or Norway spruce (*Picea abies*), with more open woodland areas containing larch and Scot's pine.

Each UKHab classification that was recorded within the HSA is described in **sections 3.1.1 to 3.1.8**; and shown on **Figures 2.1-2.11 (Appendix A)**. Target Notes providing additional details of habitats and species are presented in **0**; and a complete species list of flora recorded across the HSA is detailed in **Appendix C**.

The EU Habitats Directive Annex I habitat H91E0 Alluvial forests with *Alnus glutinosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanae, Salicion albae*) was recorded within the HSA. This is situated within the area of 'w1d5 Alder woodland on floodplains' that runs alongside the Bervie Water and the Hareden Burn.

Other priority habitats that have been recorded within the HSA include:

- Coastal vegetated shingle;
- Ponds;
- Rivers;
- Hedgerows;
- Purple moor grass and rush pastures;
- Upland mixed ashwoods; and
- Wet woodland.

The extent of the above protected or priority habitats are shown on **Figures 3.1-3.11 (Appendix A)**.

TABLE 3.1 UKHAB HABITAT CLASSIFICATIONS WITHIN BOWDUN HABITAT SURVEY AREA

Ecosystem	Code	Habitat	Area (ha)	Proportion (%) of HAS	Length within HSA (km)	Conservation Status
Grassland	1. g1b6	Other upland acid grassland	11.3	0.9	-	LBAP

Ecosystem	Code	Habitat	Area (ha)	Proportion (%) of HAS	Length within HSA (km)	Conservation Status
	2. g1c	Bracken	0.8	0.1	-	
	4. g3c	Other neutral grassland	52.4	4.3		LBAP
	5. g3c5	*Arrhenatherum* neutral grassland	17.3	1.4		LBAP
	6. g3c6	*Lolium-Cynosurus* neutral grassland	1.3	0.1		LBAP
	7. g3c7	*Deschampsia* neutral grassland	3.9	0.3		LBAP
	8. g3c8	*Holcus-Juncus* neutral grassland	1.7	0.1		LBAP
	9. g4	Modified grassland	265.0	21.7		
Woodland and forest	10. w1b	Upland mixed ashwoods	12.0	1.0	-	LBAP, SBL
	11. w1d	Wet woodlands	1.8	0.1	-	LBAP, SBL
	12. w1d5	Alder woodland on floodplains	6.7	0.5	-	LBAP, SBL, Annex I
	13. w1f7	Other lowland mixed deciduous woodland	1.3	0.1	-	LBAP, SBL
	14. w1g	Other broadleaved woodland	17.4	1.4	1.1	LBAP
	15. w1h	Other woodland; mixed	2.4	0.2	-	-
	16. w1h5	Other woodland; mixed; mainly broadleaved	3.5	0.3	-	-
	17. w1h6	Other woodland; mixed; mainly conifer	7.1	0.6	-	-
	18. w2c	Other coniferous woodland	139.4	11.4	-	-
Heathland and shrub	19. h2a5	Species-rich native hedgerow	-	-	0.5	LBAP, SBL
	20. h2a6	Other native hedgerow	-	-	2.5	LBAP, SBL

Ecosystem	Code	Habitat	Area (ha)	Proportion (%) of HAS	Length within HSA (km)	Conservation Status
	21. h2b	Non-native and ornamental hedgerow	.		0.2	-
	22. h3	Dense scrub	0.1	0.01		LBAP
	23. h3e	Gorse scrub	11.0	0.9		LBAP
	24. h3h	Mixed scrub	1.5	0.1		LBAP
	25. h3j	Willow scrub	0.01	<0.01	-	LBAP
Wetland	26. f2b	Purple moor-grass and rush pastures	0.2	0.02	-	LBAP, SBL
	27. f2f	Other wetlands	0.6	0.05	0.3	LBAP
Cropland	28. c1	Arable and horticulture	5.5	0.5	-	-
	29. c1b5	Rye-grass and clover ley	42.2	3.4	-	-
	30. c1b6	Legume-rich ley	0.5	0.04	-	-
	31. c1b7	Herb-rich ley	1.1	0.1	-	-
	32. c1c5	Winter stubble	112.2	9.2	-	-
	33. c1c7	Other cereal crops	396.3	32.4	-	-
	34. c1d8	Other non-cereal crops	62.8	5.1	-	-
Urban	35. u1	Built-up areas and gardens	11.7	1.0	-	-
	36. u1b	Developed land; sealed surface	0.01	<0.01	0.4	-
	37. u1b5	Buildings	6.9	0.6	-	-
	38. u1b6	Other developed land	<0.01	<0.01	-	-

Ecosystem	Code	Habitat	Area (ha)	Proportion (%) of HAS	Length within HSA (km)	Conservation Status
	39. u1c	Artificial unvegetated, unsealed surface	-	-	0.3	-
	40. u1e	Built linear features	-	-	9.7	-
Sparsely vegetated land	41. s3b	Coastal vegetated shingle	0.9	0.1	-	LBAP, SBL
Rivers and lakes	42. r1g	Other standing water	0.7	0.1	4.9	LBAP, SBL
	43. r2a	Rivers (priority habitat)	1.9	0.2	2.9	LBAP, SBL
	44. r2b	Other rivers and streams	0.5	0.04	28.4	LBAP, SBL
Other	No access		21.7	1.8		

3.1.1 GRASSLAND

Modified grassland was the most dominant habitat type, and was recorded frequently across the centre and south of the Survey Area. A range of LBAP neutral grasslands, were recorded throughout the Survey Area. The most extensive of these was other neutral grassland. *Arrhenatherum*, *Deschampsia*, and *Holcus-Juncus* neutral grassland occurred in smaller areas throughout the Survey Area. Other upland acid grassland, an LBAP habitat, was located within the northern extent of the Survey Area within felled areas of Fetteresso Forest. Bracken occurred in small, isolated stands across three locations.

3.1.1.1 G1B6 – OTHER UPLAND ACID GRASSLAND

There were two areas of 'g1b6 – Other upland acid grassland' in the north of the HSA at Fetteresso Forest. These areas were not typical or textbook upland acid grassland habitats and had grown over previously felled coniferous plantation blocks. Wavy hairgrass (*Avenella flexuosa*) was abundant to dominant whilst common heather (*Calluna vulgaris*) and Yorkshire fog (*Holcus lanatus*) was occasional to frequent. Other species included occasional young Sitka spruce saplings, gorse (*Ulex europaeus*), heath rush (*Juncus squarrosus*), soft rush (*Juncus effusus*), tufted hairgrass (*Deschampsia cespitosa*), meadowgrass (*Poa*) spp. and rare greater woodrush (*Luzula sylvatica*), bell heather (*Erica cinerea*), rosebay willowherb, male fern (*Dryopteris filix-mas*), Scot's pine (*Pinus sylvestris*) saplings, common holly (*Ilex aquifolium*) and bramble (*Rubus fruticosus agg.*).

3.1.1.2 G1C – BRACKEN

Dense stands of dominant, continuous bracken (*Pteridium aquilinum*) were rare in the HSA as the species typically occurred in scattered form throughout other habitats such as 'g3c – Other neutral grassland' and 'h3 – dense scrub'. These dense stands of continuous bracken only occurred in three areas of the HSA, with two of them located just south of Kirkton. One of these areas of bracken was located within a larger woodland area of 'w1d5 – Alder woodland on floodplains (H91E0)' and only bracken was visible within the stand, whilst the other ran through a 'g4 – Modified grassland' field but stemmed from another area of broadleaved woodland and although bracken was dominant here, gorse was scattered and rare. The other area of this habitat was located in the north of the HSA and adjacent to Carron water and was adjacent to a dense stand of gorse scrub and so also had rare, scattered gorse within it.

3.1.1.3 G3C – OTHER NEUTRAL GRASSLAND

This category comprises various neutral grassland types that were encountered within the HSA. It can be further divided into several sub-types that are named at the next level (Level 5) of the UKHab hierarchy, and these are described in more detail below. But some examples are best retained at this more generic level because they are not a good fit for any of the sub-types. These include a stand dominated by Yorkshire-fog that had colonised a felled plantation, and stands dominated by mixtures of tall, weedy forbs such as common nettle (*Urtica dioica*), creeping thistle (*Cirsium arvense*) and rosebay willowherb (*Chamaenerion angustifolium*). Moreover, habitat 'g1d – Other lowland acid grassland' described below was not deemed large enough to be mapped but was found within an area of largely 'g3c – Other neutral grassland' and thus is described within this section also.

3.1.1.4 G3C5 – *ARRHENATHERUM* NEUTRAL GRASSLAND

This dry grassland type was the most common and abundant on the HSA, found in agricultural landscapes in rank, uncultivated areas where it occurred in mosaics with damper grassland types and scrub, or in strips along the edges of arable fields in association with boundary features such as hedgerows and drainage ditches. False oat-grass (*Arrhenatherum elatius*) was typically abundant in these swards, along with frequent cocks-foot (*Dactylis glomerata*) and Yorkshire-fog. In most stands forbs present included frequent hogweed (*Heracleum sphondylium*), common nettle and creeping thistle, and there was an array of other species found in some examples but not others, including frequent to occasional white clover (*Trifolium repens*), meadow vetchling (*Lathyrus pratensis*), meadow buttercup (*Ranunculus acris*), creeping buttercup (*Ranunculus repens*), curled dock (*Rumex crispus*), broad-leaved dock (*Rumex obtusifolius*), couch (*Elymus repens*), cow parsley (*Anthriscus sylvestris*), common ragwort (*Jacobaea vulgaris*), common knapweed (*Centaurea nigra*) and oxeye daisy (*Leucanthemum vulgare*).

3.1.1.5 G3C6 – *LOLIUM-CYNOSURUS* NEUTRAL GRASSLAND

This was a rare habitat on the HSA, though it is generally common as a form of improved agricultural pasture and is of low value. One area in the south of the HSA near Banff Croft was species-poor, consisting of little other than abundant crested dog's-tail (*Cynosurus cristatus*), and frequent perennial rye-grass (*Lolium perenne*) and white clover. The only other area of this habitat occurred to the north of the HSA near Annamuick. Here, perennial ryegrass appeared abundant and crested dog's-tail occasional to frequent, but other species were present such as

frequent Yorkshire fog and soft rush, occasional sweet vernal-grass, hawkbit (*Leontodon*) spp., creeping buttercup, creeping thistle and rare cocks-foot, meadowgrass spp. and common chickweed (*Stellaria media*).

3.1.1.6 G3C7 – *DESCHAMPSIA* NEUTRAL GRASSLAND

This is a slightly damp form of grassland that is generally found in places where drainage is impeded and/or former grazing land has been abandoned, allowing the spread of tussocky grasses. In the HSA, this habitat occurred in mosaics with drier grasslands (such as 'g3c5 *Arrhenatherum* neutral grassland' described above) and patches of scrub. Tufted hair-grass was abundant in these stands, accompanied by frequent Yorkshire-fog and false oat-grass, and occasional soft-rush. Forbs were scarce as they are generally unable to compete with the tall, tussock-forming grasses, and were therefore limited to robust weedy species such as creeping thistle and common nettle.

3.1.1.7 G3C8 – *HOLCUS-JUNCUS* NEUTRAL GRASSLAND

Like the 'g3c7 *Deschampsia* neutral grassland' habitat above, this is also a habitat associated with poor drainage or naturally waterlogged conditions such as depressions and drainage ditches. It can cover extensive areas where there is a lack of grazing but can also occur as scattered patches within grazed fields, marking out areas that livestock avoid. For this reason, it was rarely the primary habitat in any given location within the HSA but rather tended to occur as a secondary habitat within parcels of neutral or modified grassland. Therefore, it was more common and widespread than the mapping indicates. The most abundant species overall in these stands was soft rush, and this could be completely dominant in some locations. But sometimes it was equalled or even exceeded by Yorkshire-fog. In addition, there was frequently a little tufted hair-grass or cocks-foot. Forbs were represented by frequent to abundant creeping buttercup, and frequent or occasional white clover, curled dock, common sorrel (*Rumex acetosa*), creeping thistle, marsh thistle (*Cirsium palustre*) and marsh violet (*Viola palustris*).

g4 – Modified grassland

Modified grassland was very common and widespread within the HSA, characterised as it is by productive agricultural fields grazed by livestock. These pastures are intentionally species-poor, dominated by palatable species that rely on the addition of nutrients in the form of fertilisers. Perennial rye-grass was abundant to completely dominant in these swards, and this was almost always accompanied by abundant white clover. In one or two locations the rye-grass was replaced by Timothy (*Phleum pratense*). In many examples there was little other than these, but some stands contained a sprinkling of other species, especially near field edges less subjected to fertiliser inputs and more affected by livestock trampling. These included frequent to occasional cocks-foot, Yorkshire-fog, false oat-grass, soft-brome (*Bromus hordeaceus*) and annual meadow-grass (*Poa annua*). Other occasional forbs were dandelion (*Taraxacum* agg.), common mouse-ear (*Cerastium fontanum*), creeping buttercup, red clover (*Trifolium pratense*), creeping thistle, spear thistle (*Cirsium vulgare*), common chickweed, broad-leaved dock, autumn hawkbit (*Scorzoneroides autumnalis*), ribwort plantain (*Plantago lanceolata*) and greater plantain (*Plantago major*).

3.1.2 WOODLAND AND FOREST

Coniferous plantation woodland was most extensive in the northern extent of the Survey Area, forming large, uniform blocks. Other lowland mixed deciduous woodland was also concentrated in the northern extent in more fragmented patches. Other broadleaved woodland occurred throughout the Survey Area, including isolated blocks and field-margin planting.

More ecologically valuable types were more limited in distribution. Upland mixed ashwood was restricted to two areas — one in the far south and another in the north. Wet woodland occurred in four small areas in the south and one in the north of the Survey Area, often associated with riparian features and low-lying ground.

3.1.2.1 W1B UPLAND MIXED ASHWOODS

There were two locations for this habitat within the HSA; a c.10 ha stand at Benholm in the far south and a c.1 ha area adjacent to Bervie Water further north. In common between these disparate examples was their location on steep ground adjacent to watercourses. Although primarily a habitat of the uplands, the species composition here justifies categorisation as this type. This is a species-rich form of woodland found on basic soils. There was variation in the exact species makeup between stands so not all the species in the following list were found in both locations, but in general the canopy comprised abundant ash, frequent downy birch and wych elm (*Ulmus glabra*), and frequent to occasional sycamore. In the smaller stand ash was only occasional and wych elm absent, and here there was a shrub layer consisting of abundant hazel and occasional grey willow and eared willow (*Salix aurita*), with a dense tangle of blackthorn (*Prunus spinosa*) in places. In the larger example the understorey was a sparse layer of occasional hawthorn and elder. The field layer was a variable mixture of forbs, grasses and ferns. Forbs included frequent to occasional dog's mercury (*Mercurialis perennis*), herb-Robert (*Geranium robertianum*), wood avens (*Geum urbanum*), red campion (*Silene dioica*), meadowsweet (*Filipendula ulmaria*), hedge woundwort (*Stachys sylvatica*), greater stitchwort (*Stellaria holostea*), opposite-leaved golden saxifrage (*Chrysosplenium oppositifolium*) and common nettle. Grass species included frequent to occasional tufted hair-grass and creeping soft-grass, whilst the luxuriant fern cover comprised frequent bracken, male fern and golden-scaled male-fern (*Dryopteris affinis*), alongside occasional broad buckler-fern (*Dryopteris dilatate*) and lady-fern (*Athyrium felix-femina*). The ground layer was conspicuous here, with mosses including abundant *Atrichum undulatum*, and frequent *Thuidium tamariscinum* and *Plagiomnium undulatum.*

3.1.2.2 W1D WET WOODLANDS / W1D5 ALDER WOODLAND ON FLOODPLAINS

There were five small <0.8 ha areas of 'w1d Wet woodlands' habitat within the HSA. Three of these are in the south, in line with Inverbervie. These areas all contained abundant grey willow, and then varied between them slightly in their composition with other broadleaved trees including ash, English oak, birch spp., goat willow (*Salix caprea*), elm and rowan, and one area contained occasional Scot's pine. Ground flora of these areas generally consisted of frequent – abundant Yorkshire fog and soft rush, alongside occasional – frequent tufted hairgrass and tall forbs such as common nettle, common hemp-nettle (*Galeopsis tetrahit*), marsh thistle and wild angelica (*Angelica sylvestris*). Other species included frequent – abundant creeping buttercup and then a mix of bramble, gorse, wood avens, greater woodrush and floating sweet-grass (*Glyceria fluitans*) between them. Two of these areas were strictly semi-natural but one of them was a mix of planted birch and oak, with semi-natural willows.

The fourth area of 'w1d Wet woodlands' occurred towards the north of the HSA and adjacent the Carron Water. This area included abundant osier with occasional birch spp. and rare – occasional alder. The ground flora in this area consisted of abundant creeping buttercup, frequent – abundant meadowsweet, frequent common nettle and occasional broadleaved dock, cocks-foot and Yorkshire fog.

There was one larger area of 'w1d5 Alder woodland on floodplains', approximately 6.9 ha in size, in the south of the HSA. The north of this area of habitat runs alongside the Bervie Water and has a tributary from this watercourse, the Hareden Burn, running through it. The habitat consists largely of a semi-natural mixed woodland which has been partly modified by deliberately planted trees. Although grey willow is abundant, true wet woodland is not well developed. The wood occurs over gentle to moderately steep slopes and is not strictly in a floodplain. Alongside grey willow, ash and alder are abundant also. Downy birch, English oak, gorse, blackthorn, sycamore, wild cherry, male fern and raspberry all occur occasionally throughout with locally frequent-abundant patches. Wych elm, rowan, lady fern (*Athyrium filix-femina*) and beech all occur occasionally and goat willow and gooseberry (*Ribes uva-crispa*) rarely. As for the understory and lower plant species, great woodrush was abundant throughout. Reed canary grass (*Phalaris arundinacea*), bracken, broad-leaved dock, creeping buttercup, tufted hairgrass, cow parsley, common nettle, red campion, wild angelica, Yorkshire fog, germander speedwell (*Veronica chamaedrys*), marsh woundwort (*Stachys palustris*), cocks-foot, false oat-grass and creeping soft grass all occur occasionally throughout with locally frequent-abundant patches. Marsh thistle, coltsfoot (*Tussilago farfara*), water forget-me-not (*Myosotis scorpioides*), soft rush and floating sweet-grass occurred occasionally and lesser spearwort (*Ranunculus flammula*) and heath speedwell (*Veronica officinalis*) were rare. This habitat qualifies as an EU Habitats Directive Annex I Priority Habitat under 'H91E0 Alluvial forests with *Alnus glutionosa* and *Fraxinus excelsior* (*Alno-padion, Alnion incanae, Salicion albae*)'.

3.1.2.3 W1F7 - OTHER LOWLAND MIXED DECIDUOUS WOODLAND

There were two areas of 'w1f7 – Other Lowland mixed deciduous woodland' in the HSA. The larger area of approximately 1 ha was located in the northern half of the HSA, just south of and bordering the Forthie Water. This area consisted of frequent goat willow, oak, ash and alder and occasional to locally frequent sycamore and beech. The ground flora contained frequent tufted hairgrass, broadleaved dock, spear thistle creeping buttercup and common bent, as well as occasional meadowsweet and ground elder.

The other area of this habitat occurred in the far south of the HSA, just north of Mains of Benholm was a lot smaller at 0.2 ha in size. This area comprised of frequent ash, hazel, aspen (*Populus tremula*) and wych elm as well as occasional black pine (*Pinus nigra*), rowan and oak. The ground flora consisted of abundant hedge woundwort and common nettle, frequent ground elder and hogweed, and occasional red campion. Both areas of 'w1f7 – Other Lowland mixed deciduous woodland' were planted but the smaller area had mature trees and abundant fallen deadwood.

3.1.2.4 W1G - OTHER BROADLEAVED WOODLAND

After 'w2c Other coniferous woodland', 'w1g Other broadleaved woodland' was the most common woodland habitat classification within the HSA. These are areas of broadleaved woodland that did not fit into higher classification for UKHab broadleaved woodland definitions,

and they took form in a variety of states, from semi-natural woodlands with mature trees, to planted woodlands with young trees. The presence and frequency of broadleaved tree and shrub species were variable. Species within these habitats comprised of a mix of native and non-native species including alder, ash, beech, bird cherry, blackthorn, bramble, cotoneaster spp., downy birch, elder, elm, goat willow, grey willow, hawthorn, hazel, Himalayan balsam, holly, honeysuckle (*Lonicera periclymenum*), horse chestnut, ivy, oak, osier, rowan, sessile oak (*Quercus petraea*), silver birch, small-leaved lime, snowberry (*Symphoricarpos*) spp., sycamore, white willow, whitebeam, wild cherry and wych elm.

Generally, the understories and ground flora of this habitat classification within the HSA typically included patches of neutral grasses with tall forbs. Scattered bracken, scattered scrub and scattered rushes could also make up large areas of the understory. There are some areas of this habitat that included ground flora species that were not frequently recorded throughout the HSA. One area (0.6 ha) in the south of the HSA near Middle Knox contained male fern, common dog violet (*Viola riviniana*), black oak fern (*Gymnocarpium dryopteris*), black spleenwort (*Asplenium adiantum-nigrum*) and germander speedwell. Another area (0.2 ha) further north near Dendoldrum hill contained herb-robert, broad-leaved willowherb (*Epilobium montanum*), cowslip (*Primula veris*), *Kindbergia praelonga*, lady fern and scaly male fern (*Dryopteris affinis*). Further north, there is another area (0.1 ha) just south of Kirkton that also contained herb-robert alongside rough meadow-grass (*Poa trivialis*), and further north from this area, near Little Wairds, there is a larger area (3.2 ha) that contained typically wetter species such as sharp-flowered rush (*Juncus acutiflorus*), devil's bit-scabious (*Succisa pratensis*), marsh violet, sneezewort (*Achillea ptarmica*), tormentil, compact rush (*Juncus conglomeratus*) and marsh willowherb (*Epilobium palustre*). Further north there is a small area (0.1 ha) on the northern edge of the A90 at Pade O'France which contained hairy willowherb (*Epilobium hirsutum*) and again, further north from this area, there was a larger area at Blererno that contained non-native species monkeypuzzle (*Araucaria araucana*) and crocosmia spp.

3.1.2.5 W1H OTHER WOODLAND; MIXED / W1H5 OTHER WOODLAND; MIXED; MAINLY BROADLEAVED / W1H6 OTHER WOODLAND; MIXED; MAINLY CONIFER

Areas of 'w1h6 Other woodland; mixed; mainly conifer', 'w1h5 Other woodland; mixed; mainly broadleaved' and 'w1h Other woodland; mixed' were habitats including coniferous woodland but with varying percentages of broadleaved trees or broadleaved woodland habitat within their makeup. These habitats were scattered in small areas throughout the HSA. These habitats were typically plantations, whether standing alone or running alongside houses within gardens. When habitats were mainly coniferous, Sitka or Norway spruce tended to be abundant – dominant, however larch and on one occasion a mix of Scot's pine and Douglas fir (*Pseudotsuga menziesii*) with sitka spruce made up that coniferous majority areas of woodland. Areas that were mainly broadleaved tended to include a wider mix of broadleaved species as opposed to one or two species making up the broadleaved percentage of the habitat. These areas included a mix of sycamore, rowan, ash (*Fraxinus excelsior*), beech, oak (*Quercus*) spp., birch (*Betula*) spp., apple (*Malus pumila*), wild cherry, hawthorn (*Crataegus monogyna*), field maple (*Acer campestre*), currant (*Ribes*) spp., hazel (*Corylus avellana*), cotoneaster (*Cotoneaster*) spp., elm (*Ulmus procera*), whitebeam (*Sorbus aria*), grey alder (*Alnus incana*), grey willow (*Salix cinerea*), common laburnum (*Laburnum anagyroides*) and lower plants like gorse and climbers such as ivy (*Hedera helix*) and beach rose (*Rosa rugosa*)

alongside rare-occasional conifers including Sitka spruce, larch, Scot's pine and Lawson cypress (*Chamaecyparis lawsoniana*). Additional tree species to those mixed woodland habitats with a more even split of coniferous and broadleaved trees included common holly, bird cherry (*Prunus padus*), small-leaved lime (*Tilia cordata*), Leyland cypress (*Cupressus x leylandii*), common rhododendron (*Rhododendron ponticum*), downy birch (*Betula pubescens*), elder (*Sambucus nigra*), fuchsia (*Fuchsia*) spp., privet (*Ligustrum*) spp., poplar (*Populus*) spp. and osier (*Salix viminalis*). Since these mixed woodland habitats tended to be newer and more managed planted areas, ground flora was generally not as diverse as that of the more open coniferous plantation habitats of w2c. Generally ground flora was similar to or represented a mix of 'g3c5 *Arrhenatherum* neutral grassland' and 'g3c7 *Deshampsia* neutral grassland' (see **sections 3.1.1.4** and **3.1.1.6**) with false oat grass and tufted hairgrass occurring alongside other common neutral grasses like cocks-foot, creeping soft grass (*Holcus mollis*) as well as areas of tall forbs or scrub including rosebay willowherb, common ragwort, common nettle, soft rush, gorse and raspberry (*Rubus idaeus*). Ground elder (*Aegopodium podagraria*), chervil (*Anthriscus*) spp., wood avens (*Geum urbanum*), common daisy (Bellis perennis), common dandelion (*Taraxacum officinale*) and *Thuidium tamariscinum* occurred occasionally throughout these habitats and in one instance stands of the invasive Himalayan balsam (*Impatiens glandulifera*).

3.1.2.6 W2C OTHER CONIFEROUS WOODLANDS

The most common woodland habitat was 'w2c Other coniferous woodland' of which the majority was situated within Fetteresso Forest in the north of the survey area. Although classified technically under the same named habitat, areas of 'w2c Other coniferous woodland' varied in their species assemblage with mature |Sitka spruce or Norway spruce dominating in some areas to form dense plantation blocks with a lack of ground flora in most instances, in comparison to more open woodlands with larch (*Larix decidua*) and Scot's pine mixed plantation areas, as well as areas of younger spruce plantation, with ground flora consisting of a varied mix of predominantly grasses, dwarf shrub and mosses. Grassland understory in these more open woodlands varied slightly in different areas between being more populus in acidic species such as wavy hairgrass and common bent or more neutral species such as tufted hairgrass (*Deschampsia cespitosa*), Yorkshire fog and meadowgrass (*Poa*) spp. Understories typically also included a mix of frequent – abundant common heather, *Hylocomium splendens*, *Plageothesium undulatum*, *Polytrichum commune* as well as occasional – frequent wood sorrel (*Oxalis acetosella*) and soft rush throughout, with the latter species being more abundant in wetter areas where watercourses passed through the woodland. In these wetter areas soft rush occured alongside species such as tormentil, cross-leaved heath (*Erica tetralix*), heath bedstraw, creeping buttercup, jointed rush (*Juncus articulates*), common sorrel, stitchwort (*Stellaria*) spp. as well as *Sphagnum squarrosum*, *Sphagnum capillifolium* and *Sphagnum palustre*. In drier areas within these woodlands bilberry and bell heather occur rarely – occasionally throughout. Other species that occured rarely throughout this habitat included tree species such as birch (*Betula*) spp., alder (*Alnus glutinosa*), rowan (*Sorbus aucuparia*), English oak (*Quercus robur*), sycamore (*Acer pseudoplatanus*), wild cherry (*Prunus avium*) and beech (*Fagus sylvatica*), scrub species such as gorse and bramble, as well as other ferns, tall forbs, grasses, woodrushes and sedges such as bracken, hard fern (*Blechnum spicant*), buckler fern spp., wood fern spp., rosebay willowherb, common nettle, foxglove (*Digitalis purpurea*), broad-leaved dock, cleavers (*Galium aparine*), greater woodrush (*Luzula sylvatica*), common chickweed, heath rush, common sedge (*Carex nigra*) and fescue (*Festuca*) spp.

3.1.3 HEATHLAND AND SHRUB

Gorse scrub and mixed scrub were the most widespread types, occurring throughout the Survey Area. A notable patch of willow scrub occurred in the central part of the Survey Area, typically associated with areas of impeded drainage and/or wetter soils.

3.1.3.1 H2A5 – SPECIES-RICH NATIVE HEDGEROW / H2A6 – OTHER NATIVE HEDGEROW / H2B - NON-NATIVE AND ORNAMENTAL HEDGEROW

Approximately 455 m of 'h2a5 Species rich native hedgerow' occurred at the borders of many of the agricultural fields to the north of Annamuick. These hedges primarily comprised of a mix of hawthorn, hazel, blackthorn and dog rose (*Rosa canina*) but also occasionally included ash. Each hedgerow also included a mix of rare – frequent tall forbs including knapweed, hogweed, creeping thistle, common ragwort and lower plants such as selfheal (*Prunella vulgaris*), harebell (*Campanula rotundifolia*) and willowherb (*Epilobium*) spp.

As per the UKHab definition, many of the 'h2a6 – Other native hedgerow' habitats consisted of a similar species make-up to that of the 'h2a5 Species rich native hedgerow' but typically consistented of less than four native scrub species per 30 m. This habitat was also found bordering agricultural fields to the north of Annamuick, but also just north of Glenbervie and in the very south of the HSA.

Also, in the very south of the HSA, two sections of 'h2b – Non-native and ornamental hedgerow' occurred on the outside of residential buildings at Mains of Benholm and Middle Knox, respectively. Laurel (*Laurus nobilis*) was present in both hedgerows but the one near the Mains of Benholm contained ivy and sycamore, whilst the other at Mains of Benholm had copper beech (*Fagus sylvatica f. purpurea*) and hazel throughout. Another non-native and ornamental hedgerow was located just north of Glenbervie running between a road and an arable field. This hedge was abundant in Lawson's cypress and had occasional sycamore, white beam (*Sorbus*) spp. and cherry (*Prunus*) spp. with rare bramble, rowan and laurel.

3.1.3.2 H3 – DENSE SCRUB / H3E – GORSE SCRUB / H3H – MIXED SCRUB / H3J – WILLOW SCRUB

Six sections of 'h3 – dense scrub' were scattered in the southern half of the HSA, primarily running through or alongside agricultural fields. These habitats had continuous scrub cover at over 75% but were not dominated by a single species. Gorse was abundant throughout each section and then tall forbs were typically occasional to locally frequent and each section contained a different composition of species such as knapweed, wild angelica, hogweed, broadleaved dock, rosebay willowherb, common nettle, henbit deadnettle (*Lamium amplexicaule*) and creeping thistle. Tall neutral grasses such as false oat-grass, cocks-foot and Yorkshire fog were also scattered throughout. Two of the areas contained scattered trees such as sycamore, raspberry and/or ash, and another section contained occasional to locally frequent invasive species, Himalayan balsam. Near Kirkton an area contained scattered bracken and a wetter area of this habitat occurred near Little Wards, with gorse still abundant but species such as soft rush and marsh thistle were also frequent to abundant in form.

Where gorse was more dominant, habitat classicisation 'h3e – gorse scrub' occurred. As these habitats were typically so dense, less species were visible and/or present within them, however on occasion tall forbs, bracken and other tree/scrub species such as rowan, wild cherry, hawthorn, elder, grey willow, broom (*Cytisus scoparius*) or bramble sprouted through. This habitat occurred on occasion throughout primarily the northern half of the HSA and

typically bordered, ran through or was directly within agricultural fields, with the largest section (5 ha) occurring either side of the Burn of Elfhill.

Habitats of 'h3h – mixed scrub' primarily consisted of abundant gorse alongside other scrub species varying in frequency from occasional to abundant, such as broom, bramble, sycamore, ash, blackthorn, hawthorn and/or raspberry. These differed to areas of 'h3 – dense scrub' and 'h3e – gorse scrub' habitats due to these other species of scrub occurring at greater frequencies alongside gorse. One section of this habitat consisted of dominant broom. This habitat was relatively uncommon but occurred on occasion throughout the HSA in small areas (largest 0.4 ha), primarily at the edge of agricultural fields and occasionally woodlands.

One small area (0.005 ha) of 'h3j – willow scrub' was present near the centre of the HSA, near Little Wards. This area contained abundant willow (*Salix*) spp., alongside frequent gorse and soft rush, tufted hairgrass, cocks-foot and Yorkshire fog formed the majority of the ground flora.

3.1.4 WETLANDS

The most notable wetland habitat was purple moor grass and rush pastures, with two areas recorded — one in the southern extent and another in the north of the Survey Area. Smaller patches of other wetlands were present near the Forthie Water in the north of the Survey Area. These were typically narrow, linear features or poorly drained ground.

3.1.4.1 F2B - PURPLE MOOR-GRASS AND RUSH PASTURES

There were two areas of 'f2b – Purple moor-grass and rush pastures' in the HSA. One smaller (0.02 ha) transitional area adjacent to one of the tributaries running from the Burn of Benholm in the south of the HSA, and another larger area (0.2 ha) further north which lies adjacent to the Bervie Water. The smaller area contained abundant mint (*Mentha*) spp., and then frequent to locally abundant soft rush, marsh thistle, tufted hairgrass, wild angelica, marsh woundwort and marsh willowherb, whilst the larger area contained frequent to locally abundant soft rush and reed canary-grass, frequent wild angelica, Yorkshire fog and creeping bent (*Agrostis stolonifera*) and occasional to locally frequent marsh horsetail (*Equisetum palustre*), water forget-me-not, brooklime (*Veronica beccabunga*), water mint (*Mentha aquatica*), and creeping buttercup.

3.1.4.2 F2F – OTHER WETLANDS

There were eight areas of 'f2f Other wetlands' within the HSA, all of which were generally small in size (<0.07 ha) but there was one slightly larger area of 0.4 ha running adjacent to the Forthie Water in the northern half of the HSA. The other areas were typically scattered about the southern half of the survey area, usually adjacent to other waterbodies or watercourses. These habitats varied in species composition between them but all contained either frequent to dominant reed canary-grass, branched bur-reed (*Sparganium erectum*), bulrush (*Typha latifolia*) or reed mannagrass (*Glyceria maxima*). These habitats also varied between them in their composition and abundance of typically wetter plant species that are less frequent across the HSA and the more common tall ruderal plant species. For example, two of the areas contained frequent-abundant bottle sedge (*Carex rostrata*), occasional watercress (*Nasturtium officinale*) and occasional to locally frequent common duckweed (*Lemna minor*). One of the two areas contained occasional spike-rush (*Eleocharis palustris*), whilst the other hosted frequent marsh willowherb, locally frequent creeping buttercup and sharp-flowered rush, and

occasional marsh horsetail and ragged robin (*Silene flos-cuculi*). The other areas of this habitat classification tended to include a mix of these wetter plant species alongside the more common tall ruderal plant species. In these areas, in addition to those already mentioned, other wetter species such as water mint and marsh marigold (*Caltha palustris*) occurred alongside more transitional species such as monkeyflower (*Mimulus guttatus*), creeping thistle, wild angelica, meadowsweet, soft rush, common nettle, curled dock, spear thistle, knapweed, hogweed, tufted hairgrass, *Gunnera* spp., as well as eared willow on one occasion and the invasive Himalayan balsam on two occasions.

3.1.5 CROPLAND

3.1.5.1 C1 – ARABLE AND HORTICULTURE

There was one moderately sized cropland area (5.5 ha) in the south of the HSA at Craig Garbill that could not be classified into more detailed habitat classification as no crop was present at the time of the survey and the entire field was left fallow.

3.1.5.2 C1B5 – RYE-GRASS AND CLOVER LEY / C1B6 – LEGUME-RICH LEY / C1B7 – HERB-RICH LEY

Ten fields of 'c1b5 – Rye-grass and clover ley' were scattered across the southern half of the HSA. These were fields that were typically dominated by perennial ryegrass and some fields included occasional to abundant white clover or were evidently cattle grazed or cut for hay/silage.

There was one small area (0.5 ha) of 'c1b6 – Legume-rich ley' just north of Peattie in the south of the HSA that bordered an area of 'c1d8 – Other non-cereal crops'. This area contained abundant scentless mayweed (*Tripleurospermum inodorum*), shephards purse (*Capsella bursa-pastoris*) and Italian ryegrass (*Lolium multiflorum*) and frequent pineappleweed (*Matricaria discoidea*) and fumitorie (*Fumaria*) spp.. In the south of the area also and just north of Peattie Burn there is one area larger area (1.1 ha) classed as 'c1b7 – Herb-rich ley' which contained various weedy species including frequent scentless mayweed.

3.1.5.3 C1C5 – WINTER STUBBLE / C1B7 – OTHER CEREAL CROPS

The two habitats, 'c1c5 – Winter stubble' and 'c1b6 – Other cereal crops', covered large areas across the entire HSA, with the latter being the most abundant habitat recorded during the survey. These habitats typically comprised fields dominated by arable crops such as wheat (*Triticum aestivum*), barley (*Hordeum vulgare*) or oat (*Avena sativa*) that were either in full stand, had been ploughed or left in the ground over winter after harvesting. Despite being monocultures and typically dominated by the one species of arable crop, these fields sporadically included common tall forbs such as common nettle throughout or around the crop boundary and less common weedy species such as annual meadow grass, scentless mayweed, pineappleweed, dove's-foot Crane's-bill (*Geranium molle*), common field speedwell (*Veronica persica*), field forget-me-not (*Myosotis arvensis*), knotgrass (*Polygonum aviculare*), common hemp-nettle, charlock (*Sinapis arvensis*), henbit deadnettle, common chickweed, milkweed (*Euphorbia peplus*), redshank (*Persicaria maculosa*) and field pansy (*Viola arvensis*).

3.1.5.4 C1D8 – OTHER NON-CEREAL CROPS

Arable fields of 'c1d8 – Other non-cereal crops' were scattered throughout the length of the HSA but not as common as fields of cereal crops. These fields were dominated by either

cabbage (*Brassica*) spp., chard (*Chenopodiaceae*) spp., pea (Pisum) spp. or potato (*Solanum tuberosum*). Similarly to fields containing cereal crops, these fields were either in full stand or had been ploughed, and on occasion contained weedy species such as common hemp-nettle, redshank and common chickweed.

3.1.6 URBAN

3.1.6.1 U1 – BUILT-UP AREAS AND GARDENS

Constructed, industrial and other artificial habitats are spread throughout the entire HSA. Typically, areas of houses and farm buildings and their surrounding gardens have been mapped as 'u1 - Built-up areas and gardens' but where these buildings stand alone with no garden or only have evidence drive-ways or concrete surrounding they have been mapped as 'u1b5 – Buildings' or 'u1b5 – Buildings' alongside 'u1b – Developed land; sealed surface'. Although many buildings appeared modern and well-sealed, particularly those that were residential, old derelict buildings and many of those associated with farm-works appeared present with cavities and holes in their structure. Areas of clear urban environment that are not clearly sealed with weedy species appearing e.g. road verges, have been mapped as 'u1c Artificial unvegetated; unsealed surface'. 'u1e – Built linear features' appeared regularly throughout the HSA with roads crossing over and through the route regularly as well as the occasional train track.

3.1.7 SPARSELY VEGETATED LAND

3.1.7.1 S3B – COASTAL VEGETATED SHINGLE

An area of 's3b – Coastal vegetated shingle' was present at the very south of the HSA near Haughs Bay. Amongst the shingle this habitat included locally frequent wood vetch (*Vicia sylvatica*), and occasional to locally frequent spear-leaved orache (*Atriplex prostrata*), cleavers, curled dock, false oatgrass, herb-robert, ribwort plantain and sea mayweed (*Tripleurospermum maritimum*). Occasional bird's-foot-trefoil (*Lotus corniculatus*) and rare frosted orache (*Atriplex laciniata*) was also present.

3.1.8 RIVERS AND LAKES

3.1.8.1 R2A – RIVERS (PRIORITY HABITAT) / R2B – OTHER RIVERS AND STREAMS / R1G – OTHER STANDING WATER

Three 'r2a – Rivers (priority habitat)' habitats were determined present within the HSA. These were Bervie Water, Forthie Water and Carron Water and each river ran quickly west to east across the HSA. Bervie Water occurred in the southern half of the HSA whilst Forthie and Carron water appeared in the northern half. These were slow to moderately flowing rivers that appeared to be in good condition and hold high ecological status. Although bankside composition varied between being predominantly soil or rock based throughout the length of each watercourse, vegetation tended to be abundant and various habitat types aligned each watercourse such as woodland, scrub, neutral grassland, or the 'f2f – Other wetlands' habitats which stemmed from these rivers, which in combination with the watercourse provide ecological opportunities.

Habitats classified as 'r2b – Other rivers and streams' and many of the 'r1g – Other standing water' habitats represent what were predominantly agricultural field drains or ditches. These

habitats were present throughout the entire HSA but differed on their abundance and flow of water, which in most cases will likely continuously fluctuate through different times of the year. In most cases these drains / ditches held little ecological value and tended to include the same flora species as that of the adjacent neutral grassland, tall forb or scrub field margin. In some cases however, less frequent species (across the HSA) in wetter and dryer drains / ditches occurred such as trailing St John's-wort (*Hypericum humifusum*), wavy bittercress (*Cardamine flexuosa*), water forget-me-not, willow spp., hairy willowherb, bush vetch (*Vicia sepium*), brooklime, water speedwell (*Veronica anagallis-aquatica*), marsh woundwart, water mint, meadow vetchling, common chickweed, monkeyflower, zigzag clover (*Trifolium medium*) and watercress.

In addition to these watercourses or ditches, small ponds also classified under 'r1g – Other standing water' were recorded across the HSA. These ponds typically appeared artificially created for drainage or have formed from tributaries adjacent to watercourses. These ponds varied in their composition of vascular plants, and some had very few or could be dominated at least on the surface by algae. Plant species that were evident within, on or surrounding the waterbodies with clear vegetation included alternate water-milfoil (*Myriophyllum alterniflorum*), broad-leaved pondweed (*Potamogeton natans*), common duckweed, bottle sedge, branched bur-reed, spikerush, water forget-me-not, water mint, marsh marigold, water horsetail, water lily (*Nymphaeaceae*) spp., stringy stonecrop (*Sedum sarmentosum*), bulbous buttercup (*Ranunculus bulbosus*), iris spp., rosebay willowherb, marsh thistle, soft rush and jointed rush.

3.1.9 INVASIVE AND NON-NATIVE SPECIES OF PLANT

Common rhododendron was recorded in small stands (<20 m^2) in two areas within the HSA. As described in **Target Note IS1 (Appendix B)**, one stand was recorded within the south in upland mixed ashwoods, to the south of Benholm Castle. A separate stand was recorded within residential plantation woodland at Broombank, in the north of the HSA; as described in **Target Note IS21 (Appendix B)**.

Giant butterbur was recorded in abundance along the banks of a tributary of Burn of Benholm within the south of the HSA; as described in **Target Notes IS2** and **IS7 (Appendix B)**. It was also present within broadleaved woodland running along the northern bank of Bervie Water, in the south of the HSA; as noted in **Target Note IS22 (Appendix B)**.

Large stands of Himalayan balsam occurred along bankside areas to the Bervie Water; as noted in **Target Notes IS8** and **IS10 (Appendix B)**. The species was also encountered in areas adjoining the Forthie Water close to the A90 trunk road; as described in **Target Notes IS14** and **IS17 (Appendix B)**.

Stands of Japanese knotweed were recorded along bankside areas of the Bervie Water near Kirkton; as noted in **Target Note IS9** and **Target Notes IS11 to IS13 (Appendix B)**. Japanese knotweed and giant hogweed were both recorded next to private access track to the north of the A90 trunk road at Candy; as described in **Target Notes IS18 to IS20 (Appendix B)**).

3.2 PROTECTED SPECIES

3.2.1 BATS

3.2.1.1 POTENTIAL ROOSTING HABITAT

A total of 14 individual trees, groups of trees or woodland areas were classified as PRFs; as shown on **Figures 2.1-2.11 (Appendix A)** and described in **Target Notes BT1-65 (Appendix B)**. In addition, 30 individual trees, groups of trees or woodland areas were classified as FAR on the basis that PRFs may be present.

Furthermore, three buildings or structures were classified as being of High suitability for roosting bats; as shown on **Figures 2.1-2.11 (Appendix A)** and described in **Target Notes BT43, BT46 and BT64 (Appendix B)**. In addition, seven buildings or structures were classified as being of Moderate suitability; and six buildings or structures were classified as being of Low suitability.

Details of one suspected maternity roost identified within the BtSA is described in **Technical Appendix 7.3: Protected Species Survey (Confidential Annex)**.

3.2.1.2 POTENTIAL FLIGHT-LINE AND FORAGING HABITATS

The BtSA was situated within typical lowland habitats, some habitats dominated by grazing pasture, grazed by both sheep and cattle. Fetteresso Forest, a coniferous plantation, within the north of the BtSA , was dominated by Sitka and Norway spruce, which 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 there were areas of mature larch and Scot’s pine woodland which were connected to woodlands in the wider area. These habitats would be of moderate suitability as they are more biologically diverse, contain greater numbers of invertebrate prey for bats, and have greater potential features for roosting.

There was suitable foraging and commuting habitats throughout the BtSA , such as mature ash woodland, other broadleaved woodland, and other coniferous woodland, which provided connection between areas of taller neutral grassland, scrub, and taller hedgerows.

The BtSA contained Carron Water, Forthie Water, and Bervie Water, all tree-lined rivers, that were of higher value for foraging and commuting bats and provides connectivity to the wider landscape. In addition, there were ditches and burns throughout the BtSA, which were also of higher value for foraging and commuting bats, especially within a farmed landscape.

3.2.2 BADGER

Suitable badger sett building and foraging habitats have been recorded within the BSA, which are described further in the **Confidential Annex**.

3.2.3 OTTER

Whilst no individuals were seen, suitable habitat and evidence of otter activity was recorded across the OSA.

The section of the Bervie Water that occurs within the OSA contains suitable otter habitats. The watercourse was characterised by a channel width of between 5-10 m with moderate water flow over gravels. The pool and riffle system has resulted in point bar deposits and shallow water on the inside of bends; with deeper water (typically at least 1 m deep) on the

outside of bends. Two spraints were recorded in the western extent of the OSA near Arbuthnott; as described in **Target Notes PS12-13 (Appendix B)**. Bankside areas are largely tree-lined with dense vegetation cover; however, no otter holts were recorded. It is possible that otter holts and couches in bankside areas could be obscured by dense vegetation; however, there was no evidence of otter regularly utilising habitats adjoining inaccessible banksides.

The section of the Carron Water that occurs within the OSA contains suitable otter habitats. The watercourse was characterised by a narrow channel with moderate water flow over gravels. Water depth was typically shallow, often less than 0.1 m across the channel width. Bankside areas consisted of open grassland vegetation over slopes with variable gradients, with occasional scattered trees and scrub. One spraint was recorded in the western extent of the OSA near Buckie's Mill (**Target Note PS29, Appendix B**); and in the eastern extent of the OSA towards the railway line (**Target Note PS30, Appendix B**). No otter holts or couches were recorded along this section of the Carron Water.

The section of the Burn of Annamuick that occurs within the OSA contains suitable otter habitats. The watercourse was characterised by a narrow channel with moderate water flow over gravels. Water depth was typically shallow, often less than 0.1 m across the channel width. Bankside areas consisted of open grassland vegetation over slopes with variable gradients, with occasional scattered trees and scrub. One spraint was recorded in the western extent of the OSA near Nether Quithel (**Target Note PS53, Appendix B**).

A tributary to the Burn of Benholm occurs within the southern extent of the OSA, between Benholm and Mains of Benholm, which contains suitable otter habitats. The section near Cattie's Well contains a narrow channel with slow moving water through cobbles and boulders, where an old spraint was recorded (**Target Note PS55, Appendix B**). A further spraint was recorded nearby at the bridge crossing at Benholm (**Target Note PS7, Appendix B**). Despite a steep woodland gorse and waterfalls through the Den of Benholm, spraints were recorded further upstream at the bridge crossing at Mains of Benholm. This indicates that the watercourse may be an important pathway connecting the Burn of Benholm to ponds and other wetland habitats in the locality, evidenced by potential footprints to the east of Mains of Benholm (**Target Note PS1** and **PS4, Appendix B**).

Other wetlands connected to the OSA may provide additional otter habitat. Whilst no evidence of otter activity was confirmed in these areas, there is potential for otter to forage and/or commute along suitable habitats:

- Burn of Elfhill (tributary to the Carron Water)
- Forthie Water (tributary to the Bervie Water)
- Haughs Bay (mouth of the Ben of Benholm)
- Peattie Burn (tributary to the Bervie Water)

The following watercourses were considered to be unsuitable due to a lack of suitable features and no confirmed evidence of otter activity:

- Burn of Day (tributary to the Cowie Water);
- Burn of Bauks (tributary to the Carron Water);
- Drumlithie Burn (tributary to the Forthie Water); and
- agricultural field drains.

Additional information regarding otter field signs are presented in **0**; and shown on **Figures 2.1-2.11 (Appendix A)**.

3.2.4 PINE MARTEN

Evidence of pine marten was confirmed at two locations in Fetteresso Forest through environmental DNA analysis of scats (**Target Notes PS39** and **PS40, Appendix B**). No other evidence of pine marten activity was confirmed elsewhere in the PMSA.

Woodlands within the PMSA are considered to be of limited suitability as pine marten denning habitat. Areas of commercial forestry at Fetteresso Forest are typically characterised by extensive monocultures of Sitka spruce and/or Norway spruce with no understorey. As a result, the limited structural and species diversity of these commercial forestry areas are typically devoid of any elevated features of a suitable size and nature that pine marten could establish natal dens within.

Other features in Fetteresso Forest than could be utilised by pine marten for shelter or protection were limited to gaps under fallen trees within the northern extent of the PMSA; however, no other supporting evidence to indicate any use by pine marten was recorded. Features located on (or very close to) the ground were considered to be unsuitable for establishing natal dens due to increased risk of predation and exposure to the elements; and likely to be utilised only periodically by non-breeding pine marten.

Small pockets of potential foraging habitat are locally present in areas of open ground that occur along forest edges, rides and glades at Fetteresso Forest. It is considered that pine marten are likely to forage within the PMSA where these habitats occur, with denning sites located in suitable habitats outside of, and adjoining, the PMSA.

The suitability of potential denning and foraging habitats in the south of the PMSA is considered to be extremely limited, with small and largely fragmented woodlands situated an increasingly arable landscape.

Pine marten field signs are presented in more detail in **0**; and shown on **Figures 2.1-2.11 (Appendix A)**.

3.2.5 RED SQUIRREL

A single red squirrel was encountered within Fetteresso Forest crossing a forestry track into an adjoining forestry (**Target Note PSPS35, Appendix B**). Three squirrel dreys were recorded within the RSSA including two in conifer woodland at Forthie Water (**Target Notes PS23-24, Appendix B**) and one squirrel drey within broadleaved woodland at Bervie Water (**Target Note PS15, Appendix B**). In addition, a potential squirrel drey was observed from distance within a group of larch trees at the Burn of Annamuick (**Target Note PS54, Appendix B**).

Whilst grey squirrel are known to occur in Aberdeen, it is understood this population is geographically and genetically isolated from other mainland populations. Elsewhere, grey squirrel have been recorded as far north as Johnshaven in areas connected to woodlands adjoining the Burn of Benholm. On the basis that no grey squirrel were observed during the survey, and that no grey squirrel have been reported in the wider Fetteresso Forest, it is assumed that dreys within he RSSA are likely to have been established by red squirrel.

Woodlands within the northern extent of the RSSA, notably in Fetteresso Forest, provide suitable drey habitat. These extensive plantations are characterised by monocultures of Sitka

spruce or Norway spruce and, to a lesser extent stands of larch and Scot's pine. These areas are connected to other extensive forestry areas and capable of providing year-round supply of fruit and seed-bearing trees and shrubs. Broadleaved trees are typically absent from Fetteresso Forest, most likely in response to minimising habitat for grey squirrel.

Woodland areas elsewhere within the RSSA, notably south of the A90 trunk road, are considered to be of more limited suitability for red squirrel to establish dreys within. These woodlands areas area typically small and isolated from other suitable woodland habitats. The exception to this includes more extensive areas of broadleaved woodland that adjoin the Bervie Water and the Burn of Benholm.

Red squirrel field signs are presented in more detail in **0;** and shown on **Figures 2.1-2.11 (Appendix A)**.

3.2.6 WATER VOLE

Whilst no individuals were seen, suitable habitat and evidence of water vole activity was recorded across the Water Vole Survey Area (WVSA).

The section of the Forthie Water that occurs within the WVSA is classified as being of 'Optimal' habitat suitability (**Target Notes WV23-25** and **WV38, Appendix B**). The watercourse was characterised by a narrow channel with limited water flow, and a depth of 1 m across the channel width. Bankside areas largely consisted of grasses, rushes and broad-leaved herbaceous forbs over steep banksides. A feeding station was noted in the eastern extent of the WVSA (**Target Note PS20, Appendix B**); and two burrows within the western extent where feeding remains could be seen around burrow entrances (**Target Note S27, Appendix B**).

The section of the Carron Water that occurs within the WVSA is classified as being of 'Suitable but poor' habitat suitability (**Target Notes WV34** and **WV37, Appendix B**). The watercourse was characterised by a narrow channel with moderate water flow over gravels. Water depth was typically less than 0.1 m across the channel width. Bankside areas largely consisted of grassland vegetation over slopes of variable gradients, with occasional scattered trees and scrub. Where more vertical bankside areas were encountered, heavy clay soils and stones were often embedded within the bank substrate. A potential burrow was noted in the western extent (**Target Note PS28, Appendix B**). Whilst the presence of emergent vegetation was limited; water vole feeding remains were noted in the eastern extent (**Target Note PS32, Appendix B**).

The following watercourses were classified as being of Negligible habitat suitability due to a lack of suitable features, disturbance to bankside/aquatic habitats from cattle and no confirmed evidence of water vole activity:

- Bervie Water;
- Burn of Annamuick (tributary to the Carron Water);
- Burn of Bauks (tributary to the Carron Water);
- Burn of Benholm;
- Burn of Day (tributary to the Cowie Water);
- Burn of Elfhill (tributary to the Carron Water); and
- Hareden Burn (tributary to the Bervie Water).

Small watercourses and field drains connected to suitable water vole habitats may provide additional water vole habitat. Whilst no evidence of water vole activity was confirmed in these areas, there is potential for breeding populations to utilise adjoining habitats.

Water vole field signs and potential habitat features are presented in more detail in **0;** and shown on **Figures 2.1-2.11 (Appendix A)**.

3.2.7 WILDCAT

No evidence of wildcat activity was identified within the WSA.

Woodlands within the WSA are considered to be of limited suitability as wildcat denning habitat. Areas of commercial forestry at Fetteresso Forest are characterised by extensive monocultures of Sitka spruce and/or Norway spruce; and the limited structural and species diversity of these commercial forestry areas are typically devoid of any features of a suitable size and nature that wildcat could establish breeding dens within. The lack of any significant understorey within forestry areas further limit the availability of denning habitat; and limits the amount of dense cover that wildcat typically utilise to move between suitable habitats.

Fetteresso Forest provides limited prey habitat due to the limited structural and species diversity of woodland areas. Grassland habitats in the northern extent of the WSA are subject to regular animal grazing; and other grassland habitats along watercourses and field margins are unlikely to support significant populations of small mammals and rabbits required to sustain breeding wildcat.

Woodland areas elsewhere within the WSA, notably south of the A90 trunk road, are considered to be of limited suitability for wildcat to establish dens within; as they are small in scale and isolated from suitable prey habitats.

3.2.8 OTHER SPECIES

3.2.8.1 AMPHIBIANS

One common toad (*Bufo bufo*) was encountered on the banks of the Forthie Water.

It is likely that widespread species of amphibian, including common toad, may breed within permanent ponds and ephemeral wetland features that occur across the ESA. In addition, areas of unmanaged grassland, boundary features and woodlands may provide suitable hibernation features, particularly where these habitats are accessible and occur in close proximity to breeding sites.

Common toad is a species of principle importance for biodiversity conservation in Scotland, within the meaning of the Nature Conservation (Scotland) Act 2004 (as amended in Scotland).

3.2.8.2 REPTILES

No evidence of widespread species of reptile was encountered.

Suitable habitat for common lizard (*Lacerta vivipara*) and slow-worm (*Anguis fragilis*) is considered to be present within the ESA. This primarily includes areas of field margins, unmanaged grassland and other boundary features that support mosaics of short vegetation and/or bare ground (for basking) that adjoin areas of unmanaged grassland and scrub (for cover and foraging). Such habitats are not considered to be extensive within the ESA, due to the prevailing extents of arable and commercial forestry.

Suitable habitats for adder (*Vipera berus*) are limited to areas that could support important populations of prey, notably small mammals, in proximity to hibernation sites. Prey habitats are not extensive within the ESA but are locally present along boundary features such as banksides to watercourse, margins to hedgerows and forest edges.

Adder, common lizard and slow-worm are protected by the Wildlife and Countryside Act 1981 (as amended in Scotland); and species of principle importance for biodiversity conservation in Scotland, within the meaning of the Nature Conservation (Scotland) Act 2004 (as amended in Scotland).

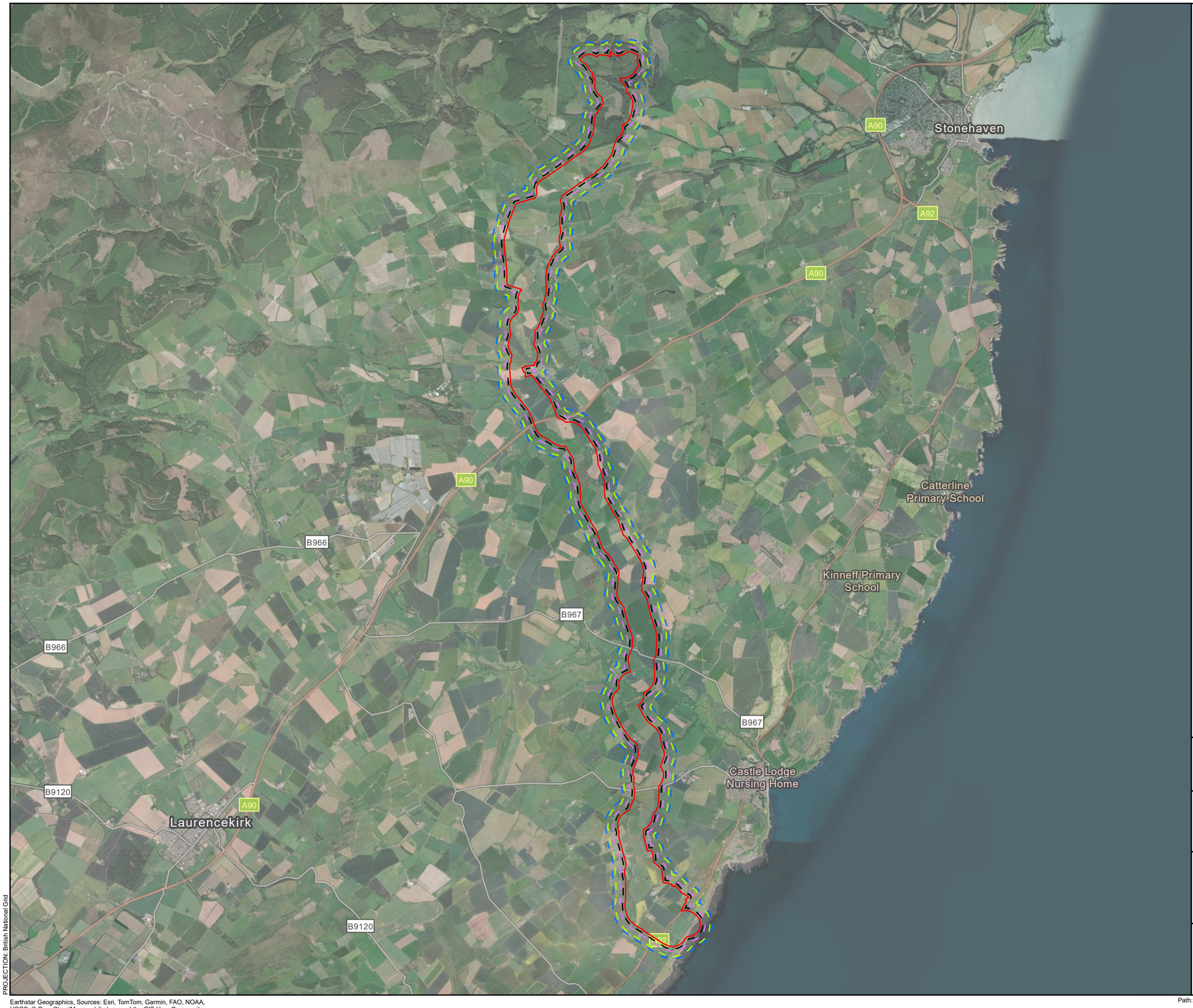
3.2.8.3 BROWN HARE

Brown hare (*Lepus europaeus*) was encountered on five separate occasions within the ESA, all of which were noted in agricultural land to the south of the A90 trunk road. This consisted of individual animals being flushed from cover near Middle Knox, Three Wells, Candle Hillock and Upper Craighill.

It is likely that brown hare will be present within arable fields and adjoining boundary features, particularly to the south of the A90 trunk road where arable fields are more extensive.

Brown hare is a species of principle importance for biodiversity conservation in Scotland, within the meaning of the Nature Conservation (Scotland) Act 2004 (as amended in Scotland).

Appendix A Figures



Ecology Study Area (2024)

Pine Marten Survey Area (250 m)

Otter, Water Vole and Scottish Wildcat Survey Area (200 m)

Badger Survey Area (100 m)

All Species Survey Area (50 m)

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Figure 1
Bowdun Offshore Windfarm - Onshore Ecology
Ecology Survey Area (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx

UK Habitat

- s3b - coastal vegetated shingle
- f2b - Purple moor-grass and rush pastures
- u1b6 - other developed land
- w1f7 - Other Lowland mixed deciduous woodland
- w1b - upland mixed ashwoods
- r2b - Other rivers and streams
- w1d - wet woodland
- w1h5 - Other woodland; mixed; mainly broadleaved
- w1h - other woodland, mixed
- f2f - Other wetlands
- g3c7 - Deschampsia neutral grassland
- h3h - Mixed scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- u1b5 - buildings
- c1c5 - Winter Stubble
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- f2f - Other wetlands
- h2a6 - Other native hedgerow
- h2b - Non-native and ornamental hedgerow
- h3 - Dense scrub
- h3h - Mixed scrub
- r1g - Other standing water
- r2b - Other rivers and streams
- u1b - Developed land; sealed surface
- u1e - Built linear features
- w1g - Other broadleaved woodland
- No Access

BT28-Tree, BT29-Tree, BT27-Tree, BT25-Tree, PS2, PS1, PS4, BT8-Tree, BT26-Tree, BT23-Building, PS5, PS3, BT9-Tree, BT21-Tree, PS7, BT22-Tree, BT15-Tree, BT14-Tree, PS6, BT18-Building, BT10-Tree, BT11-Tree, BT12-Tree, BT7-Tree, BT19-Tree, BT4-Tree, BT1-Building, BT3-Building, BT16-Tree, BT20-Tree, BT6-Tree, BT2-Tree, BT17-Tree, PS54, BT13-Tree, BT5-Tree

A92

Benholm

Burn of Benholm

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

- FAR
- Low
- Moderate
- PRF

Protected Species

- Otter
- Pine Marten
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)

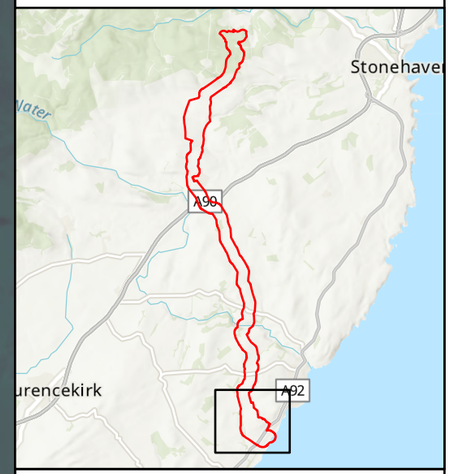

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Figure 2.1
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- c1 - Arable and horticulture
- u1b - developed land, sealed surface
- c1b6 - Legume-rich ley
- c1b7- Herb-rich ley
- r2b - Other rivers and streams
- w1d - wet woodland
- w1h5 - Other woodland; mixed; mainly broadleaved
- f2f - Other wetlands
- h3h - Mixed scrub
- h3e - Gorse scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- c1b5 - Rye-grass and clover ley
- u1b5 - buildings
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a6 - Other native hedgerow
- h3 - Dense scrub
- r1g - Other standing water
- r2b - Other rivers and streams
- u1b - Developed land; sealed surface
- u1c - Artificial unvegetated, unsealed surface
- u1e - Built linear features

Hareden Burn

Peattie Burn

BT38-Building
BT37-Building
BT36-Tree
BT32-Building
BT34-Building
BT33-Building
BT35-Tree
BT31-Tree
BT24-Tree
BT30-Tree
BT28-Tree
BT29-Tree

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

- FAR
- Low
- Moderate
- Negligible
- PRF

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)

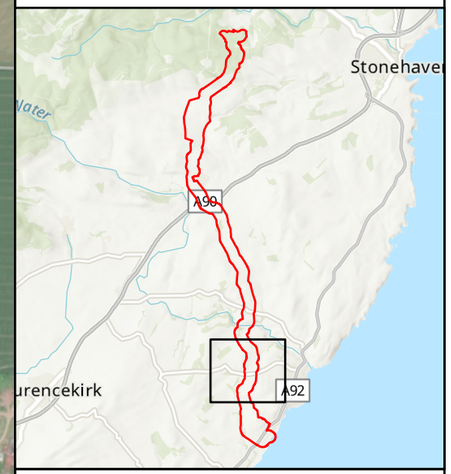

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Figure 2.2
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

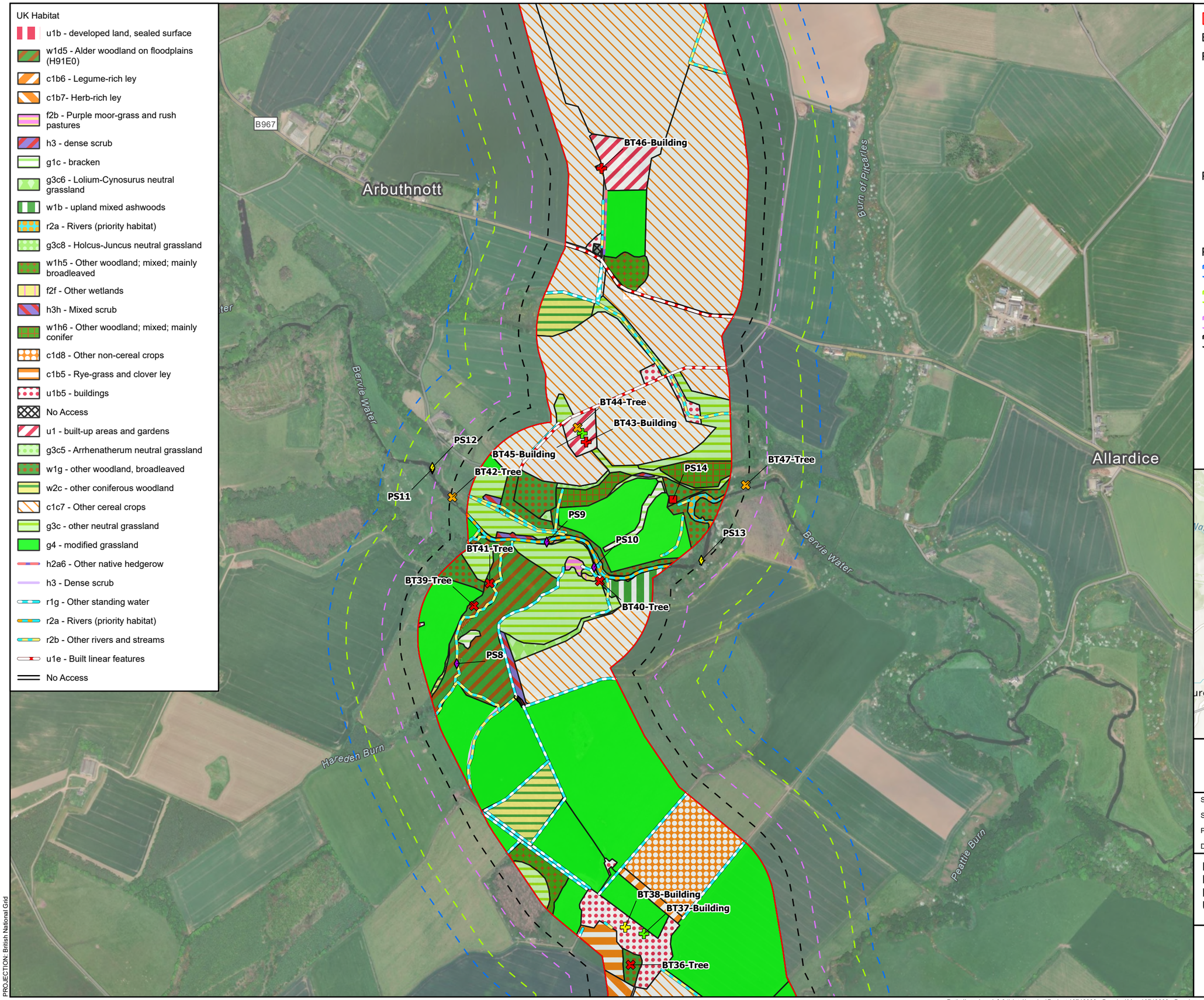
THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- u1b - developed land, sealed surface
- w1d5 - Alder woodland on floodplains (H91E0)
- c1b6 - Legume-rich ley
- c1b7- Herb-rich ley
- f2b - Purple moor-grass and rush pastures
- h3 - dense scrub
- g1c - bracken
- g3c6 - Lolium-Cynosurus neutral grassland
- w1b - upland mixed ashwoods
- r2a - Rivers (priority habitat)
- g3c8 - Holcus-Juncus neutral grassland
- w1h5 - Other woodland; mixed; mainly broadleaved
- f2f - Other wetlands
- h3h - Mixed scrub
- w1h6 - Other woodland; mixed; mainly conifer
- c1d8 - Other non-cereal crops
- c1b5 - Rye-grass and clover ley
- u1b5 - buildings
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a6 - Other native hedgerow
- h3 - Dense scrub
- r1g - Other standing water
- r2a - Rivers (priority habitat)
- r2b - Other rivers and streams
- u1e - Built linear features
- No Access



- Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

- FAR
- High
- Low
- Negligible
- PRF

Protected Species

- Otter
- Red Squirrel
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)

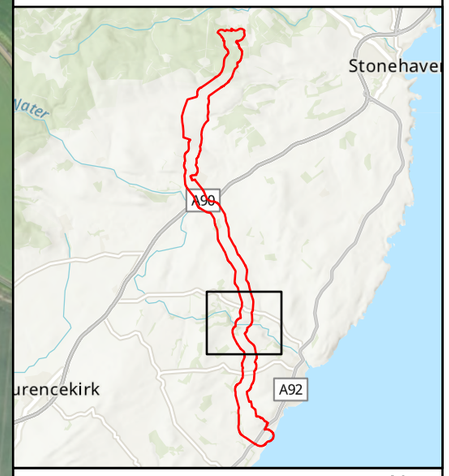


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Figure 2.3
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

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THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- u1b - developed land, sealed surface
- h3j - Willow scrub
- h3 - dense scrub
- g3c8 - Holcus-Juncus neutral grassland
- w1h - other woodland, mixed
- f2f - Other wetlands
- h3h - Mixed scrub
- w1h6 - Other woodland; mixed; mainly conifer
- h3e - Gorse scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- c1b5 - Rye-grass and clover ley
- u1b5 - buildings
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h3 - Dense scrub
- r1g - Other standing water
- r2b - Other rivers and streams

PS17
PS16
PS15
BT50-Building
BT49-Tree
BT48-Building
Bridgend Burn
Burn of

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

- Low
- Moderate
- NONE

Protected Species

- Pine Marten

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)

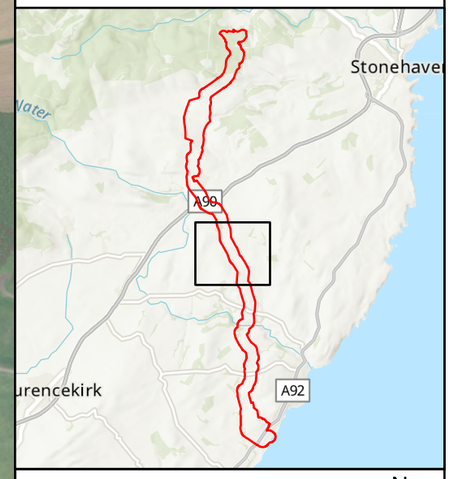

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Figure 2.4
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

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THISTLE WIND PARTNERS

PROJECTION: British National Grid

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UK Habitat

- u1b - developed land, sealed surface
- h3j - Willow scrub
- h3 - dense scrub
- w1f7 - Other Lowland mixed deciduous woodland
- r2a - Rivers (priority habitat)
- g3c8 - Holcus-Juncus neutral grassland
- w1h - other woodland, mixed
- f2f - Other wetlands
- g3c7 - Deschampsia neutral grassland
- w1h6 - Other woodland; mixed; mainly conifer
- h3e - Gorse scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- c1b5 - Rye-grass and clover ley
- u1b5 - buildings
- c1c5 - Winter Stubble
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h3 - Dense scrub
- r1g - Other standing water
- r2a - Rivers (priority habitat)
- r2b - Other rivers and streams
- u1e - Built linear features
- w1g - Other broadleaved woodland

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

- FAR
- Low
- NONE
- Negligible
- PRF

Protected Species

- Pine Marten
- Red Squirrel
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)

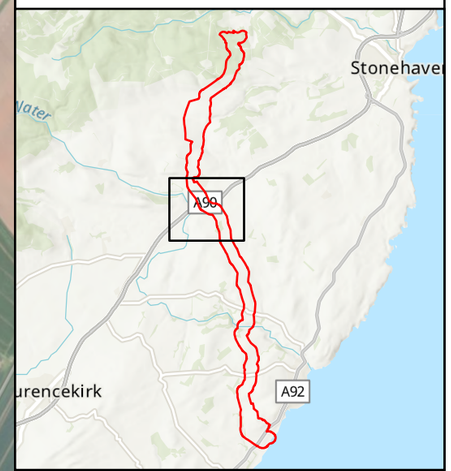

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Figure 2.5
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- h2b - other hedgerows
- w1f7 - Other Lowland mixed deciduous woodland
- r2a - Rivers (priority habitat)
- g3c8 - Holcus-Juncus neutral grassland
- w1d - wet woodland
- w1h5 - Other woodland; mixed; mainly broadleaved
- w1h - other woodland, mixed
- f2f - Other wetlands
- g3c7 - Deschampsia neutral grassland
- h3h - Mixed scrub
- w1h6 - Other woodland; mixed; mainly conifer
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- u1b5 - buildings
- c1c5 - Winter Stubble
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a6 - Other native hedgerow
- h3e - Gorse scrub
- r2a - Rivers (priority habitat)
- r2b - Other rivers and streams
- u1e - Built linear features
- w1g - Other broadleaved woodland
- No Access

BT62-Tree
BT63-Tree
BT58-Tree
BT57-Tree
BT64-Building
BT56-Tree
BT55-Tree
BT54-Building
BT53-Building
PS24
PS22
BT51-Tree
PS23
PS20
PS19
PS18
Glenbervie School
Drumlithie
Glenbervie Road
Glenbervie Old Graveyard
A90

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

- FAR
- High
- Low
- Negligible
- PRF

Protected Species

- Pine Marten
- Red Squirrel
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)

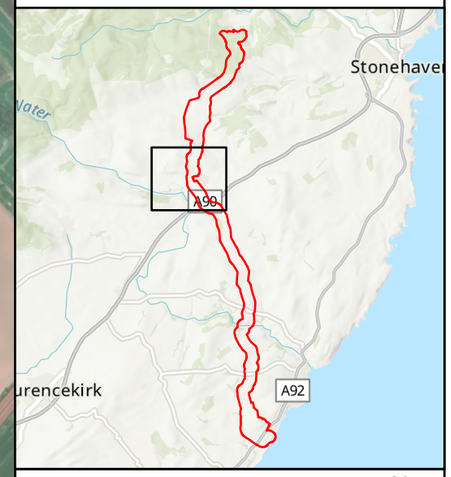

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Figure 2.6
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- h2b - other hedgerows
- g1c - bracken
- r2a - Rivers (priority habitat)
- g3c8 - Holcus-Juncus neutral grassland
- w1d - wet woodland
- w1h5 - Other woodland; mixed; mainly broadleaved
- w1h - other woodland, mixed
- g3c7 - Deschampsia neutral grassland
- h3h - Mixed scrub
- w1h6 - Other woodland; mixed; mainly conifer
- h3e - Gorse scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- u1b5 - buildings
- c1c5 - Winter Stubble
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a6 - Other native hedgerow
- h3e - Gorse scrub
- r2a - Rivers (priority habitat)
- r2b - Other rivers and streams
- u1e - Built linear features
- w1g - Other broadleaved woodland
- No Access

PS30
Carron Water
PS29
PS27
PS28
BT61-Building
BT59-Tree
BT62-Tree
BT63-Tree
BT58-Tree
BT57-Tree
BT64-Building
BT56-Tree
Glenbervie School
Glenbervie Road
Glenbervie Road

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

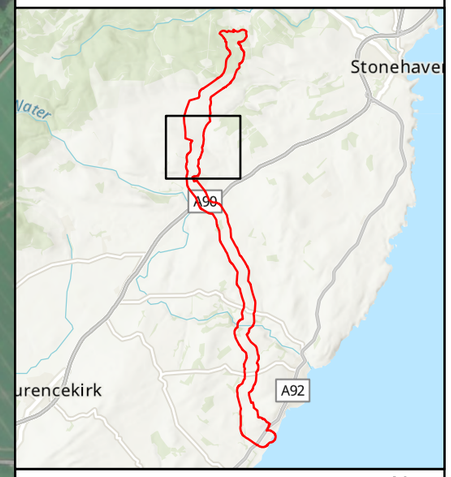
- FAR
- High
- Moderate
- PRF

Protected Species

- Otter
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)



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SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 2.7
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- g1c - bracken
- g3c6 - Lolium-Cynosurus neutral grassland
- r2a - Rivers (priority habitat)
- g3c8 - Holcus-Juncus neutral grassland
- w1d - wet woodland
- w1h5 - Other woodland; mixed; mainly broadleaved
- w1h - other woodland, mixed
- g3c7 - Deschampsia neutral grassland
- h3h - Mixed scrub
- w1h6 - Other woodland; mixed; mainly conifer
- h3e - Gorse scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- u1b5 - buildings
- c1c5 - Winter Stubble
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w1g - other woodland, broadleaved
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a6 - Other native hedgerow
- h3e - Gorse scrub
- r2a - Rivers (priority habitat)
- r2b - Other rivers and streams
- u1e - Built linear features
- w1g - Other broadleaved woodland
- No Access

PS53
PS52
BT60-Building
PS25
PS26
PS30
PS29
PS27
PS28
BT61-Building
BT59-Tree
BT62-Tree
Killer Burn
Carron Water

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

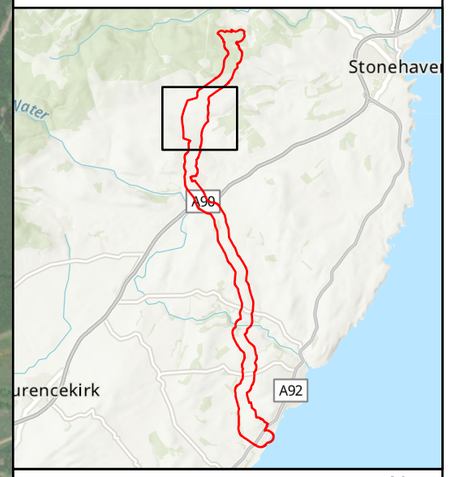
- FAR
- Low
- Moderate
- PRF

Protected Species

- Otter
- Pine Marten
- Red Squirrel
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)



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SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 2.8
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- g1b6 - other upland acid grassland
- g1c - bracken
- g3c6 - Lolium-Cynosurus neutral grassland
- r2a - Rivers (priority habitat)
- g3c8 - Holcus-Juncus neutral grassland
- r2b - Other rivers and streams
- w1d - wet woodland
- w1h5 - Other woodland; mixed; mainly broadleaved
- h3e - Gorse scrub
- r1g - Other standing water
- c1d8 - Other non-cereal crops
- u1b5 - buildings
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a5 - Species-rich native hedgerow
- h2a6 - Other native hedgerow
- h3e - Gorse scrub
- r2a - Rivers (priority habitat)
- r2b - Other rivers and streams
- u1e - Built linear features
- No Access

PS38
PS40
PS51
PS50
Burn of Annanwick
PS53
PS52
BT60-Building
PS25
PS26
Killer Burn
PS30
Carron Water
PS29
PS27

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

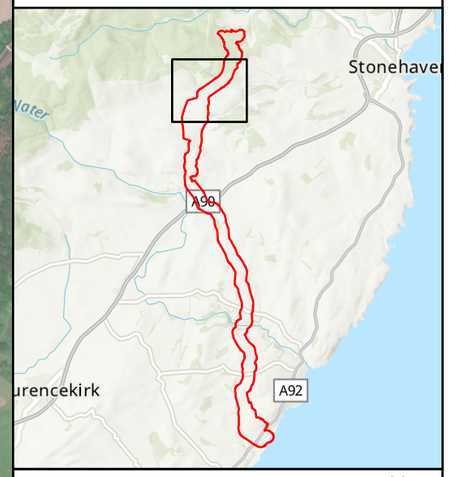
- Low

Protected Species

- Otter
- Pine Marten
- Red Squirrel
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)



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SCALE: See Scale Bar	VERSION: A07
SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 2.9
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

UK Habitat

- g1b6 - other upland acid grassland
- g3c6 - Lolium-Cynosurus neutral grassland
- g3c8 - Holcus-Juncus neutral grassland
- r2b - Other rivers and streams
- w1h5 - Other woodland; mixed; mainly broadleaved
- h3e - Gorse scrub
- c1d8 - Other non-cereal crops
- u1b5 - buildings
- No Access
- u1 - built-up areas and gardens
- g3c5 - Arrhenatherum neutral grassland
- w2c - other coniferous woodland
- c1c7 - Other cereal crops
- g3c - other neutral grassland
- g4 - modified grassland
- h2a5 - Species-rich native hedgerow
- h2a6 - Other native hedgerow
- r2b - Other rivers and streams
- u1e - Built linear features
- w1g - Other broadleaved woodland
- No Access

PS44
PS36
PS47
PS48
BT65-Tree
PS37
PS39
PS49
PS38
PS40
PS51
PS50
PS53
PS52
BT60-Building
PS25

Ecology Study Area (2024)

Bat Roost Assessment

Roost suitability

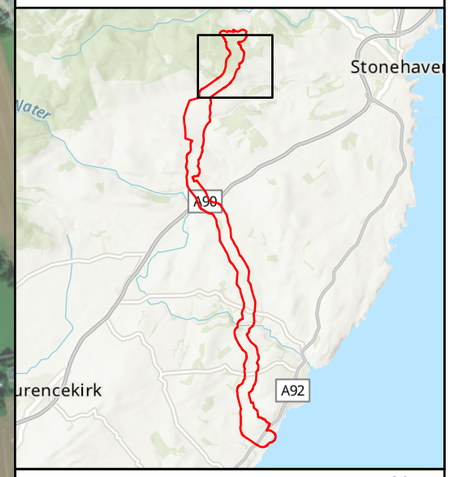
- FAR
- Low

Protected Species

- Otter
- Pine Marten
- Red Squirrel
- Water Vole

Protected Species Study Areas (2024)

- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)



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Metres

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SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 2.10
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

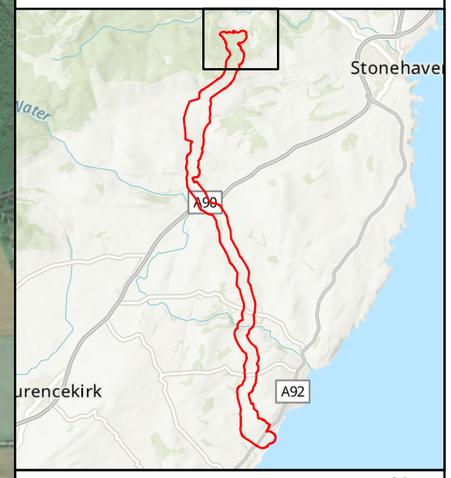
UK Habitat
- g1b6 - other upland acid grassland
- No Access
- g3c5 - Arrhenatherum neutral grassland
- w2c - other coniferous woodland
- g3c - other neutral grassland
- r2b - Other rivers and streams
- u1e - Built linear features
- w1g - Other broadleaved woodland
- No Access

Cowie Water
Burn of Day
Burn of Day
PS31
PS32
PS33
PS34
PS45
PS46
PS41
PS35
PS43
PS44
PS42
PS36
PS47
PS48
BT65-Tree
PS37
PS49
PS38
PS39
PS40

Ecology Study Area (2024)
Bat Roost Assessment
Roost suitability
- FAR

Protected Species
- Pine Marten
- Red Squirrel

Protected Species Study Areas (2024)
- Pine Marten Survey Area (250 m)
- Otter, Water Vole and Scottish Wildcat Survey Area (200 m)
- Badger Survey Area (100 m)
- All Species Survey Area (50 m)



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Metres

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SCALE: See Scale Bar	VERSION: A07
SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 2.11
Bowdun Offshore Windfarm - Onshore Ecology
UKHab and Protected Species Survey (2024)

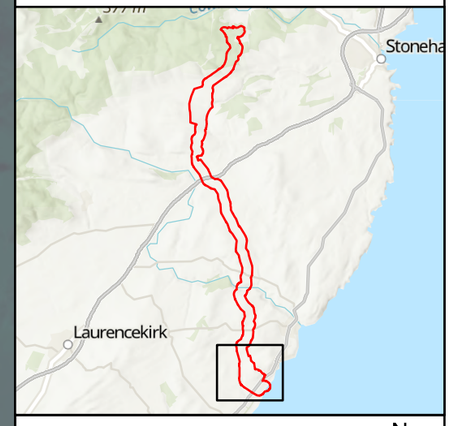
ERM
THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 2 - UKHab and Protected Species Survey (2024) - A01

SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)

A92
A92
A92
Benholm
Burn of Benholm
Burn of Benholm



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PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.1
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

ERM
THISTLE WIND PARTNERS

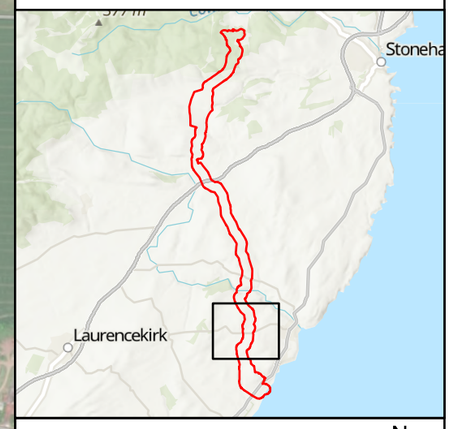
PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

Hareden Burn

Peattie Burn

SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



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Metres

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SCALE: See Scale Bar	VERSION: A04
SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.2
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

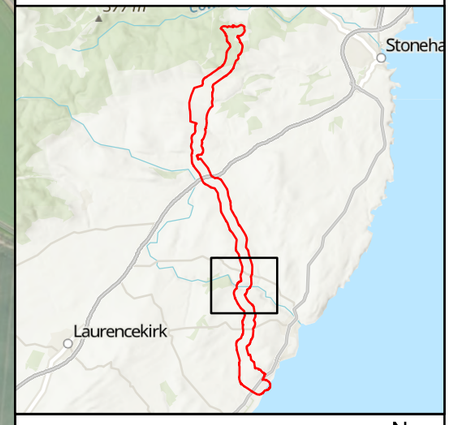
ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

Annex I Habitats (Areas)
SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



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Metres

N

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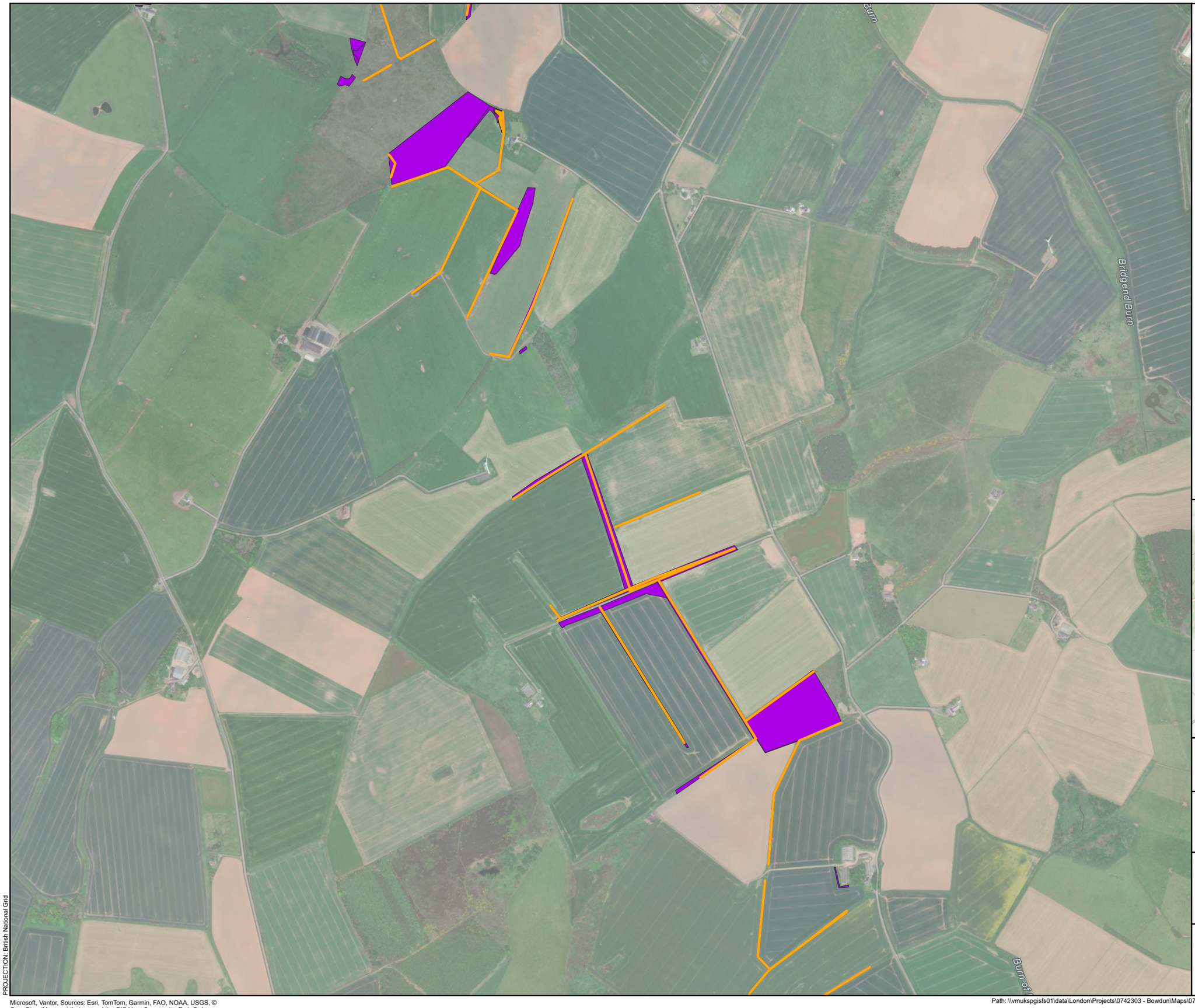
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.3
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

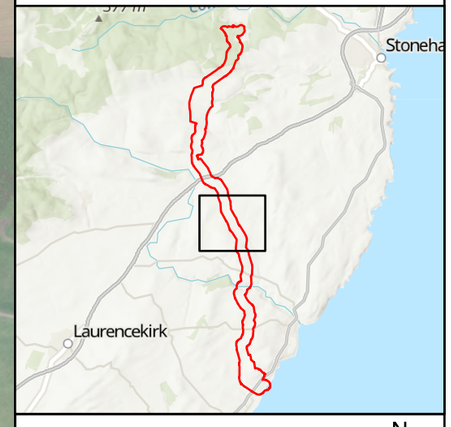
ERM
THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01



SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



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Metres

N

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PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.4
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

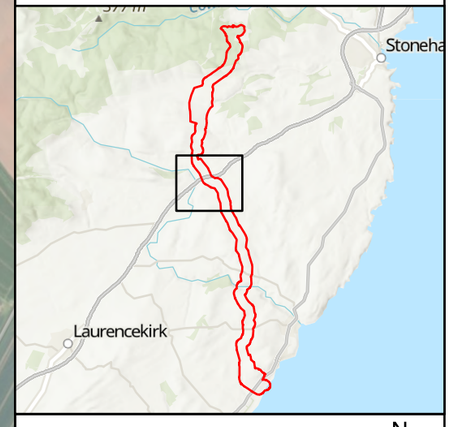
ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



0 100 200 300 400
Metres

N

SCALE: See Scale Bar	VERSION: A04
SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.5
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

ERM

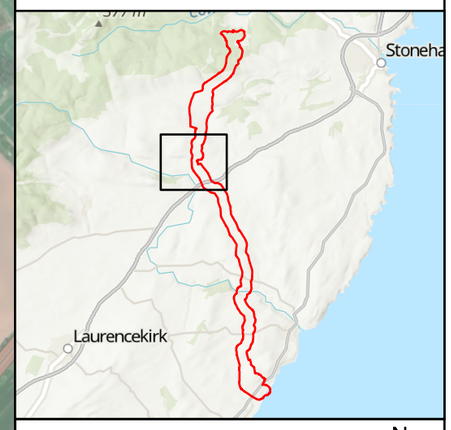
THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)

Glenbervie Road
Glenbervie School
Drumlithie
Glenbervie Road
Glenbervie Road
Glenbervie
Glenbervie Old Graveyard
Rolland Road
A90
A90
Forthie Wa



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Metres

N

SCALE: See Scale Bar	VERSION: A04
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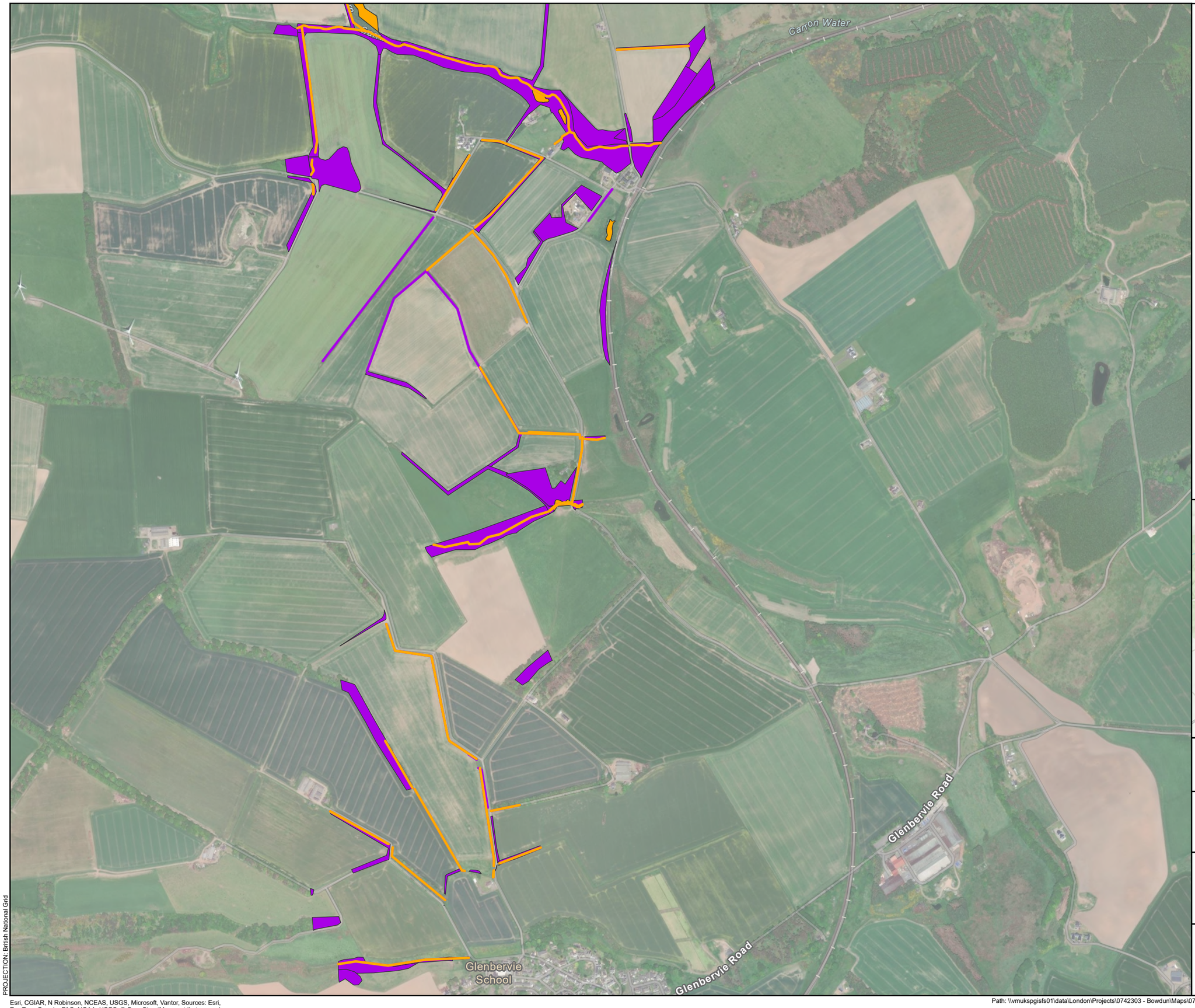
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.6
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

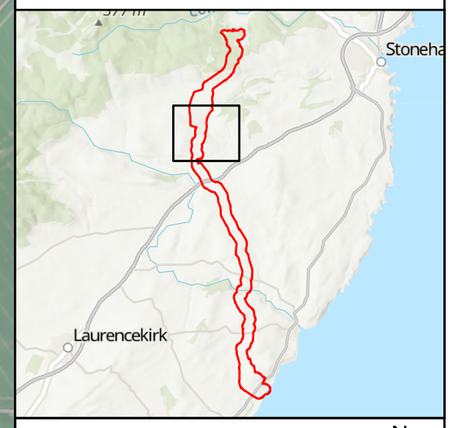
ERM
THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01



SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



0 100 200 300 400
Metres

N

SCALE: See Scale Bar	VERSION: A04
SIZE: A3	DRAWN: JS
PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.7
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

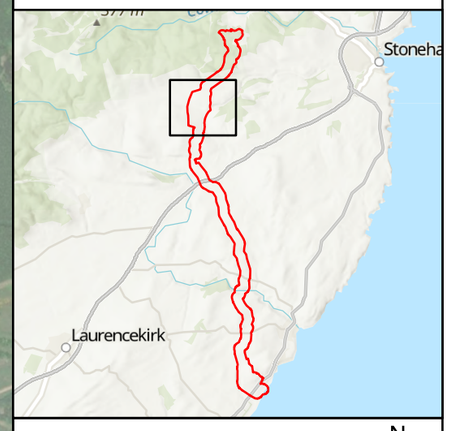
ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



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PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

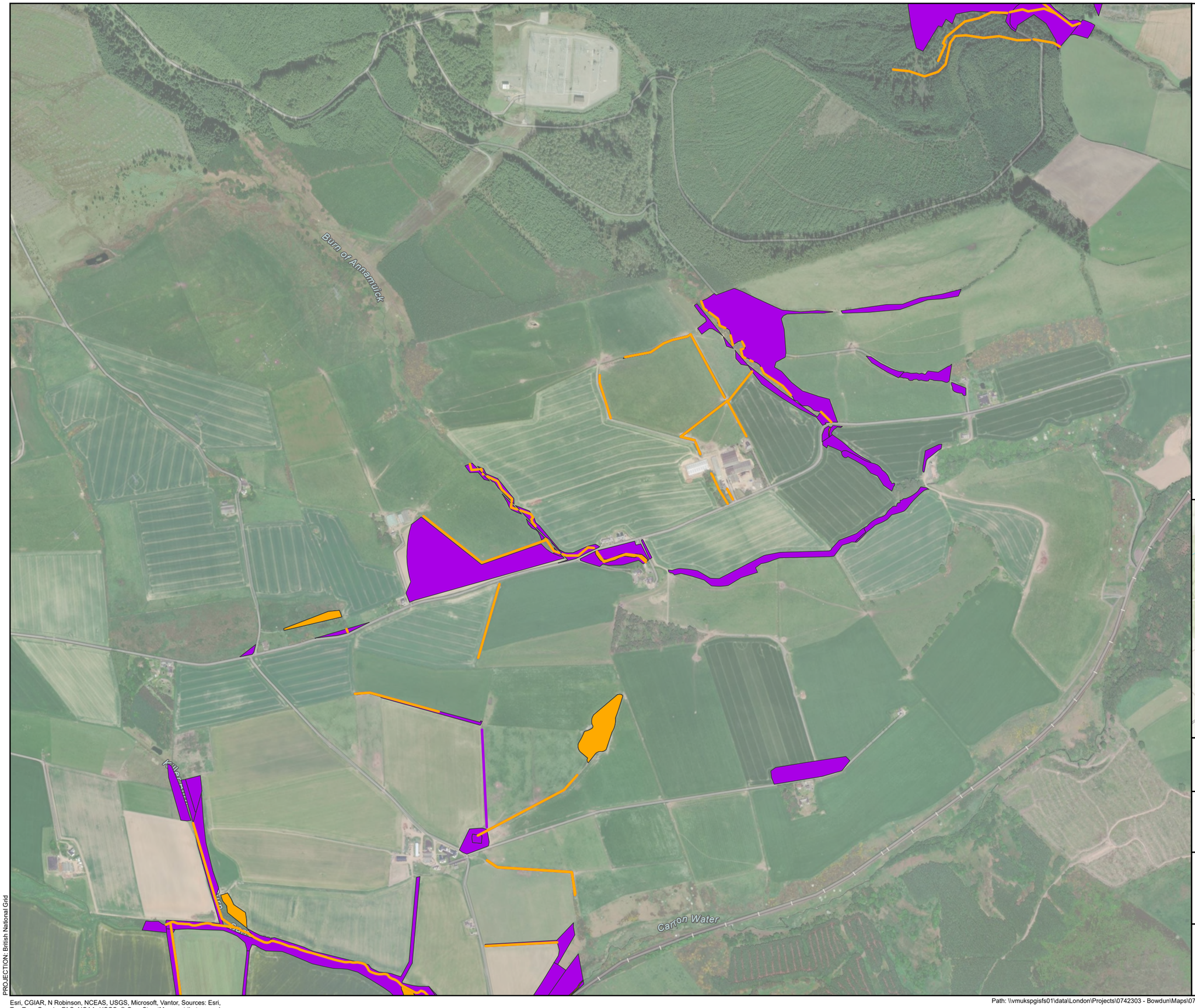
Figure 3.8
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

ERM

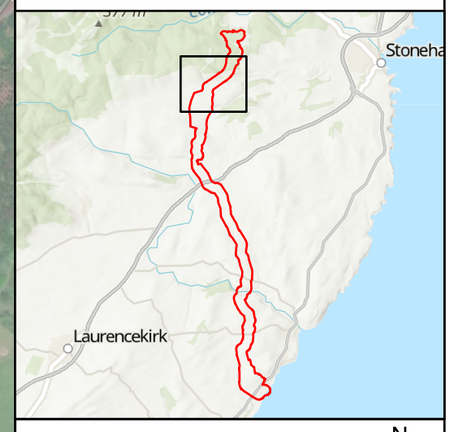
THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01



SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



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Metres

N

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PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.9
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

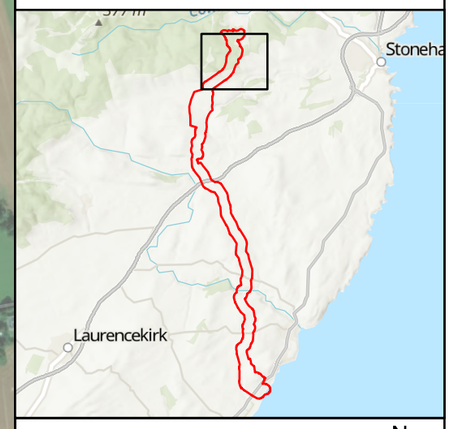
ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

SLB Habitats (Areas)
SBL Habitats (Linear)
LBAP Habitats (Areas)
LBAP Habitats (Linear)



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Metres

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PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.10
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

ERM
THISTLE WIND PARTNERS

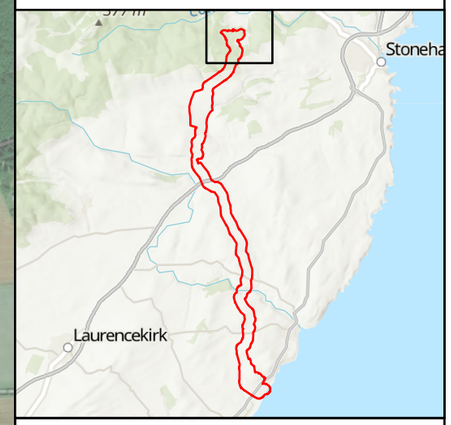
PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

SBL Habitats (Linear)

LBAP Habitats (Areas)

LBAP Habitats (Linear)



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Metres

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PROJECT: 0742303	CHECKED: AN
DATE: 11/12/2025	APPROVED: AB

Figure 3.11
Bowdun Offshore Windfarm - Onshore Ecology
Protected or Priority Habitats

ERM

THISTLE WIND PARTNERS

PROJECTION: British National Grid

Path: \\vmukspgisfs01\data\London\Projects\0742303 - Bowdun\Maps\0742303 - Bowdun.aprx\0742303 - Bowdun - Figure 3 - Protected or Priority Habitats - A01

Appendix B Target Notes

TN Ref	Type	OS NGR	Description of evidence/feature
HA1	Habitats	NO8168569371	Wood vetch along shingle beach. Locally scarce species in Aberdeenshire.
HA2	Habitats	NO8173369842	Potential flush flagged but likely enriched by run off and not GWDTE. Appears abundant with watercress.
HA3	Habitats	NO8164870158	Marsh spotted-orchid (*Dactylorhiza maculata*).
HA4	Habitats	NO8058369668	Mature sycamore tree.
HA5	Habitats	NO8050769826	Non-native cuckoo-pint (*Arum maculatum*).
HA6	Habitats	NO8050569834	Mature ash tree.
HA7	Habitats	NO8027170092	Mature sycamore tree.
HA8	Habitats	NO8026170078	Mature sycamore tree.

HA9	Habitats	NO8024170003	Mature beech tree.
HA10	Habitats	NO8025969961	Mature wych elm.
HA11	Habitats	NO8031769916	Mature ash tree.
HA12	Habitats	NO8040970546	Mature copper beech.
HA13	Habitats	NO8030770868	Mature beech.
HA14	Habitats	NO8029070856	Mature beech.
HA15	Habitats	NO8027770857	Mature Scot’s pine.
HA16	Habitats	NO8033171507	Mature Scot’s pine.
HA17	Habitats	NO8033071501	Mature rowan tree.

HA18	Habitats	NO8005971752	Pond dried up – terrestrialised with rushes and horsetail.
HA19	Habitats	NO8032872181	Quarry pond.
HA20	Habitats	NO8054473769	Pond dominated by common duckweed.
HA21	Habitats	NO8000573769	Pool and gravel bed on watercourse. Algae, pondweed, meadowsweet, forget-me-not spp., marsh marigold, soft rush and common bentgrass.
HA22	Habitats	NO7995276503	Marsh grassland dominated by soft rush.
HA23	Habitats	NO7914183584	An area of wet, marshy ground that is dominated by rushes.
HA24	Habitats	NO8021886084	Lousewort spp. on track fringe.
HA25	Habitats	NO8039386445	Dry forest ditch.
HA26	Habitats	NO8029186291	An area of flushed/marshy grassland characterised by Yorkshire fog, water purslane (*Lythrum portula*), creeping buttercup, common sorrel, common bent, soft rush, tufted hairgrass.

BT1	Bats	NO8165069989	Residential buildings which could contain PRFs. They appear well sealed and in regular use. One shed-like building round the back with more potential for access points but still appears well sealed from distance. Overall, PRFs considered to be of Moderate suitability for roosting bats.
BT2	Bats	NO8091969857	Further Assessment Required (FAR). Mature sycamore with potential PRFs.
BT3	Bats	NO8144069926	Dwelling house that could contain PRFs. Overall, PRFs considered to be of Low suitability for roosting bats.
BT4	Bats	NO8075270014	Potential Roost Feature (PRF) noted. A willow species with PRFs.
BT5	Bats	NO8054069427	Further Assessment Required (FAR). Mature sycamore with potential PRFs.
BT6	Bats	NO8050469838	Potential Roost Feature (PRF) noted. Mature beech tree with PRFs.
BT7	Bats	NO8038270051	Potential Roost Feature (PRF) noted. Standing deadwood beech tree with PRFs.
BT8	Bats	NO8052370722	Further Assessment Required (FAR). Mature sycamores with potential PRFs.
BT9	Bats	NO8050570616	Further Assessment Required (FAR). A group of sycamore trees visually assessed from adjoining land with potential PRFs.

BT10	Bats	NO8047370351	Potential Roost Feature (PRF) noted. Standing deadwood broadleaved tree with PRFs.
BT11	Bats	NO8045770319	Further Assessment Required (FAR). Immature, semi-mature and mature broadleaved trees along woodland edge with potential PRFs.
BT12	Bats	NO8044170275	Potential Roost Feature (PRF) noted. Dead broadleaved tree with PRFs.
BT13	Bats	NO8058369668	Potential Roost Feature (PRF) noted. Standing deadwood broadleaved tree with PRFs.
BT14	Bats	NO8084370430	Further Assessment Required (FAR). Mature sycamore with potential PRFs.
BT15	Bats	NO8081870447	Potential Roost Feature (PRF) noted. Group of mature broadleaved trees with PRFs.
BT16	Bats	NO8031769916	Further Assessment Required (FAR). Mature ash with potential PRFs.
BT17	Bats	NO8034369876	Further Assessment Required (FAR). Mature sycamore with potential PRFs.
BT18	Bats	NO8045170419	Brick bridge with potential for PRFs. Appeared well sealed. Overall, PRFs considered to be of Low suitability for roosting bats.

BT19	Bats	NO8050869997	Further Assessment Required (FAR). Mature ash with potential PRFs.
BT20	Bats	NO8050269988	Further Assessment Required (FAR). Mature ash with potential PRFs.
BT21	Bats	NO8042070517	Further Assessment Required (FAR). Mature wych elm with potential PRFs.
BT22	Bats	NO8046170553	Further Assessment Required (FAR). Mature broadleaved trees with potential PRFs.
BT23	Bats	NO8046970624	Old building with PRF potential. Potentially too exposed but under slates and within the roof are access points into the building. Overall, PRFs considered to be of Moderate suitability for roosting bats.
BT24	Bats	NO8083271895	Further Assessment Required (FAR). Mature Scot’s pine with potential PRFs.
BT25	Bats	NO8030770868	Further Assessment Required (FAR). Mature beech with potential PRFs.
BT26	Bats	NO8029070856	Potential Roost Feature(s) noted. Mature beech with PRFs.
BT27	Bats	NO8027770857	Further Assessment Required (FAR). Mature Scot’s pine with potential PRFs.

BT28	Bats	NO8033171507	Further Assessment Required (FAR). Mature Scot's pine with potential PRFs.
BT29	Bats	NO8034771490	Potential Roost Feature(s) noted. Mature beech with PRFs.
BT30	Bats	NO8098172030	Further Assessment Required (FAR). Mature goat willow with potential PRFs.
BT31	Bats	NO8097072034	Further Assessment Required (FAR). Fallen broadleaved tree with potential PRFs.
BT32	Bats	NO8101272259	Cluster of private residential properties and outbuildings. Traditional stone build with well-sealed slate roofs. Overall, PRFs considered to be of Moderate roosting suitability.
BT33	Bats	NO8099372166	Derelict outbuilding with gaps in brickwork and roof slates. External door is missing and roof void visible. Not entered due to unidentified and potentially hazardous materials on the ground. Overall, PRFs considered to be of Moderate suitability for roosting bats.
BT34	Bats	NO8098272117	Small outbuilding that appears to be stone build with flat roof. Potential gaps around doorway. Not accessible as surrounded by security fencing. Overall, PRFs considered to be of Moderate suitability for roosting bats.
BT35	Bats	NO8101172091	Further Assessment Required (FAR). Mature broadleaved tree with potential PRFs.
BT36	Bats	NO8067173157	Further Assessment Required (FAR). Group of mature broadleaved trees with potential PRFs.

BT37	Bats	NO8070873244	Open farm sheds for cattle. Overall, PRFs considered to be of Negligible suitability for roosting bats due to exposure to the elements.
BT38	Bats	NO8065673262	Complex of farm buildings ranging in size and construction type including traditional stonebuild residential dwellings and outbuildings with corrugated sheet or slate roofs; as well as modern pre-fabricated agricultural stores. Overall, PRFs considered to be of Low suitability for roosting bats.
BT39	Bats	NO8023474158	Further Assessment Required (FAR). Individual trees with potential PRFs within a broadleaved woodland.
BT40	Bats	NO8058574227	Further Assessment Required (FAR). Mature ash with potential PRFs.
BT41	Bats	NO8027874221	Further Assessment Required (FAR). Standing deadwood mature tree with potential PRFs.
BT42	Bats	NO8017474461	Potential Roost Feature(s) noted. Mature trees with PRFs within woodland strip adjacent to Bervie Water.
BT43	Bats	NO8054774615	Agricultural store at Kirkton with gaps around window panes, loose tiles and loose rendering. Collapsed roof potentially limits suitability of internal features; however, these could not be safely assessed. Overall, PRFs considered to be of High suitability for roosting bats.
BT44	Bats	NO8052374655	Potential Roost Feature(s) noted. Mature beech with PRFs.
BT45	Bats	NO8053674639	Three large storage buildings and an extension comprising breeze block walls, timber frame and corrugated cladding. There is potential for PRFs. Overall, PRFs considered to be of Negligible for roosting bats due to exposure to the elements.

BT46	Bats	NO8059075378	Complex of buildings at Pitcarles, including a potential derelict former dwelling house. Overall, PRFs considered to be of High suitability for roosting bats.
BT47	Bats	NO8099274495	Potential Roost Feature(s) noted. Bankside trees along section of the Bervie Water with PRFs.
BT48	Bats	NO8070776535	Complex of largely derelict farm buildings. Overall, PRFs considered to be of Moderate suitability for roosting bats.
BT49	Bats	NO7991277822	No Potential Toost Feature(s) due to exposure to elements. Shelterbelt planting comprising conifer trees.
BT50	Bats	NO7975578577	Modern residential dwelling house and outbuildings. Overall, PRFs considered to be of Low suitability for roosting bats.
BT51	Bats	NO7885279644	Further Assessment Required (FAR). Groups of Scot's pine with potential PRFs within shelterbelt planting.
BT52	Bats	NO7914979432	No Potential Roost Feature(s). Small woodland with trees that are not of a site/nature to support PRFs.
BT53	Bats	NO7837180097	Railway overbridge with small gaps in the brickwork on the underside of the arch. Overall, PRFs considered to be of Negligible suitability for roosting bats.
BT54	Bats	NO7823180332	Complex of farm buildings ranging in size and construction type including traditional stone-built residential dwellings and outbuildings with corrugated sheet or slate roofs; as well as modern pre-fabricated agricultural stores. Overall, PRFs considered to be of Low suitability for roosting bats.

BT55	Bats	NO7808280732	Potential Roost Feature(s) noted. Mature sycamore with PRFs.
BT56	Bats	NO7817581205	Further Assessment Required (FAR). Narrow belt of broadleaved woodland trees with potential PRFs.
BT57	Bats	NO7810481537	Further Assessment Required (FAR). Narrow belt of broadleaved woodland trees and standing deadwood with potential PRFs.
BT58	Bats	NO7848781745	Further Assessment Required (FAR). Group of mature Scot’s pine and oak trees with potential PRFs.
BT59	Bats	NO7790583206	Further Assessment Required (FAR). Group of mature trees, derelict agricultural stores and outbuildings with potential PRFs.
BT60	Bats	NO7904584628	Low-lying bridge crossing the Burn of Annamuick. Overall, PRFs considered to be of Low suitability for roosting bats.
BT61	Bats	NO7876983257	Traditional stone-built bridge over the Carron Water. Overall, PRFs considered to be of Moderate suitability for roosting bats.
BT62	Bats	NO7850182219	Potential Roost Feature(s) noted. Mature cherry tree with PRFs.
BT63	Bats	NO7803182058	Further Assessment Required (FAR). Narrow belt of trees with mature Scot’s pine with potential PRFs.

BT64	Bats	NO7792181427	Complex of buildings at Pitcarles, including a potential derelict former dwelling house. Overall, PRFs considered to be of High suitability for roosting bats.
BT65	Bats	NO8013686224	Further Assessment Required (FAR). Standing deadwood with potential PRFs.
IS1	Invasive species	NO8045770333	Rhododendron - one shrub covering approximately 20 m^2.
IS2	Invasive species	NO8042969950	Giant butterbur (Petasites japonicus) along bank.
IS3	Invasive species	NO8047569915	Giant butterbur along bank.
IS4	Invasive Species	NO8050069629	Giant butterbur along bank.
IS5	Invasive Species	NO8051469679	Giant butterbur along bank.
IS6	Invasive Species	NO8051469702	Giant butterbur along bank.
IS7	Invasive Species	NO8051669646	Giant butterbur along bank.

IS8	Invasive species	NO8058474238	Himalayan balsam.
IS9	Invasive species	NO8059774239	Japanese knotweed.
IS10	Invasive species	NO8067674247	Himalayan balsam.
IS11	Invasive species	NO8084274344	Japanese knotweed.
IS12	Invasive species	NO8083174379	Japanese knotweed.
IS13	Invasive species	NO8105074521	Japanese knotweed.
IS14	Invasive species	NO7855079614	Himalayan balsam - present along the riverbank and along the more open edges of the woodland, between conifer plantation and broadleaved fringe.
IS15	Invasive species	NO7842779494	Himalayan balsam.
IS16	Invasive species	NO7849679551	Himalayan balsam.

IS17	Invasive species	NO7861779627	Himalayan balsam - dense stands either side of the bank.
IS18	Invasive species	NO7878579934	Giant hogweed (Heracleum mantegazzianum).
IS19	Invasive species	NO7885579942	Big patch of Japanese knotweed adjacent to Swedish whitebeam.
IS20	Invasive species	NO7884179913	A couple of stands of Japanese knotweed here.
IS21	Invasive species	NO7824080266	Rhododendron - planted rhododendron outside house.
IS22	Invasive species	NO8064374251	Giant butterbur in broadleaved woodland running along banks of Bervie Water.
PS1	Protected species: Otter	NO8092970879	Otter – potential print in ditch.
PS2	Protected species: Water Vole	NO8091370872	Potential feeding signs / feeding station. Old vegetation but some appear cut at a 45-degree angle.
PS3	Protected species: Water Vole	NO8065970762	Burrows on bankside of ditch but presumed old rabbit burrows. No underside burrows visible and no water vole feeding or latrines observed.

PS4	Protected species: Otter	NO8067470766	Otter – potential print.
PS5	Protected species: Pine Marten	NO8050070633	No evidence recorded and potentially too close to active arable field but pile of logs and rocks present suitable denning material for wildcat / pine marten.
PS6	Protected species: Otter	NO8045770423	Otter spraint just outside bridge. No other evidence such as prints etc. Suitable for watercourse for commuting though.
PS7	Protected species: Otter	NO8045770423	Dead / predated frog in water – potentially by otter.
PS8	Protected species: Water Vole	NO8018673997	Parts of Hareden Burn that have greater wood-rush which covers the undersides of banks which go inward from under water. No evidence of water vole nearby but can't search these undersides as they go from under water.
PS9	Protected species: Water Vole	NO8043774336	Bervie Water - potential for water vole burrows within reed canary grass but no clear evidence and vegetation too dense.
PS10	Protected species: Water Vole	NO8056974266	Bervie Water – water in this location flowing too fast to be suitable for water vole. Banks are generally not steep and unsuitable for water vole also.
PS11	Protected species: Otter	NO8011874540	Relatively fresh spraint.
PS12	Protected species: Otter	NO8011874544	Older spraint.

PS13	Protected species: Otter	NO8086874285	The bankside appears to be subject to regular erosion and slippage. A small hole has appeared within the steep face but no paths present suggesting it is regularly utlised by any species. If the feature persists, there is potential for otter to utilise in the future. A short distance to the left, a small area of bankside is being undercut with overhanging grassy vegetation that could be utilised by otter as a couch.
PS14	Protected species: Red Squirrel	NO8078974455	Potential red squirrel drey. Interwoven twigs in fork of tree approximately 2/3 way up the trunk. Football size / shape. No feeding remains around the tree base.
PS15	Protected species: Pine Marten	NO7935078382	Habitat suitability; low suitability. Dense conifer plantation, limited foraging opportunity. Surrounding edge habitat and field margins may provide network for commuting to higher value habitat.
PS16	Protected species: Pine Marten	NO7928378612	Habitat suitability; low suitability. Young conifer plantation with some young broadleaved trees. Limited suitability but may provide foraging opportunities and connection to wider landscape if present.
PS17	Protected species: Pine Marten	NO7917878780	Habitat suitability – mature, thinned conifer plantation with young broadleaved fringe adjacent to pond.
PS18	Protected species: Water Vole	NO7932379507	Feeding station.
PS19	Protected species: Water Vole	NO7928479491	Potential water vole runs from banks down towards Forthie Water.
PS20	Protected species: Water Vole	NO7927579491	Potential for burrows to be obscured by tall vegetation.
PS21	Protected species: Water Vole	NO7905379461	Potential burrows on bankside with some feeding signs around entrances.

PS22	Protected species: Red Squirrel	NO7880779664	Potential drey, could just be fallen twigs but in suitable location on tree.
PS23	Protected species: Red Squirrel	NO7891279599	Potential drey – football shaped at base of trunk and suitable size and material.
PS24	Protected species: Pine Marten	NO7821279842	Habitat suitability – sub-optimal. Broadleaved woodland strip near buildings, A90 dual carriageway, and railway. Possible commuting potential.
PS25	Protected species: Water Vole	NO7898384627	Likely field vole latrines due to size but rain appears to have smeared other scat which could be water vole latrine. Flagged as precaution.
PS26	Protected species: Pine Marten	NO7911584414	Potential pine marten den. No evidence of pine marten in surrounding woodland but gap appears in fallen trunk base which could potentially run into the hollow tree providing suitable den habitat.
PS27	Protected species: Water Vole	NO7850383416	Potential water vole burrow and feeding signs. No latrines but rain may have cleared.
PS28	Protected species: Otter	NO7860083323	Relatively fresh otter spraint.
PS29	Protected species: Otter	NO7904183462	Otter spraint.
PS30	Protected species: Water Vole	NO7909483523	Water vole feeding remains / station.

PS31	Protected species: Pine Marten	NO8063187640	Probable pine marten scat. Too old to send for DNA analysis.
PS32	Protected species: Pine Marten	NO8057487574	Probable pine marten scat – collected and set for DNA analysis but unsuccessful.
PS33	Protected species: Pine Marten	NO8063487461	Probable pine marten scat – too washed away from berry remainders to be sent for DNA analysis.
PS34	Protected species: Red Squirrel	NO8065587419	Sighting – observed running across track and up tree.
PS35	Protected species: Pine Marten	NO7946987344	2x probable pine marten scats – faeces washed by rain and can't sample for DNA analysis.
PS36	Protected species: Pine Marten	NO8009686701	Probable pine marten scat – too washed away from berry remainders to be sent for DNA analysis.
PS37	Protected species: Pine Marten	NO7961086191	Probable pine marten scat – too washed away from berry remainders to be sent for DNA analysis.
PS38	Protected species: Pine Marten	NO8001586109	Probable pine marten scat – too washed away from berry remainders to be sent for DNA analysis.
PS39	Protected species: Pine Marten	NO8028586202	Confirmed pine marten scat – from eDNA analysis on 09/11 - Fetteresso south 1.

PS40	Protected species: Pine Marten	NO8029685983	Confirmed pine marten scat – from eDNA analysis on 09/11 - Fetteresso south 2.
PS41	Protected species: Pine Marten	NO8045587335	Shallow shelter dug out, with material outside entrance. Entrance approximately 30 cm high, 25 cm wide and only goes back about 40 cm. Flagged as potential PM shelter / resting point due to confirmed presence.
PS42	Protected species: Pine Marten	NO8041487264	Probable pine marten scat.
PS43	Protected species: Pine Marten	NO8024187326	Probable pine marten scratch marks from climbing over fallen trunk.
PS44	Protected species: Pine Marten	NO8023587186	Potential den - excavation running underneath a boulder that appears too small for badger. There was two entrances and the gap underneath boulder only 15 cm high.
PS45	Protected species: Pine Marten	NO8005087437	Probable pine marten scat.
PS46	Protected species: Pine Marten	NO8061687402	Probable pine marten scat.
PS47	Protected species: Pine Marten	NO8032786353	Probable pine marten scat.
PS48	Protected species: Pine Marten	NO7986086308	Probable pine marten scat.

PS49	Protected species: Pine Marten	NO7981686224	Probable pine marten scat.
PS50	Protected species: Pine Marten	NO7964885493	Probable pine marten scat.
PS51	Protected species: Pine Marten	NO7936385534	Probable pine marten scat.
PS52	Protected species: Otter	NO7891684661	Otter spraint.
PS53	Protected species: Red Squirrel	NO7890184671	Potential drey on conifer. Can't get too close to verify as no access to land parcel.
PS54	Protected species: Otter	NO8051469665	Otter spraint on large boulder on minor river bend under sycamore.
WV1	Water vole suitability	NO8029070490	Suitability: good. Unnamed ditch / width: 0.6 m / depth: 0.05 m / substrate type: stoney with cobbles / flow: very slow / bank side comp: ferns, miss, steep sided with rounded shoulders.
WV2	Water vole suitability	NO8045870440	Suitability: suitable but poor. Burn of Benholm generally appears unsuitable with a narrow stream and stoney / firm banksides but there are parts of it that appear wider with softer banksides with deeper water that, although no signs were observed, offer more suitable water vole habitat. Not consistent enough to offer habitat to a large population.

WV3	Water vole suitability	NO8045770533	Suitability; suitable but poor. Burn of Benholm – appears more suitable here with softer banksides, more open and slow flow but no evidence. Water at points around 30 cm deep.
WV4	Water vole suitability	NO8044870572	Suitability; suitable but poor. Small pond stemming from Burn of Benholm is stagnant but offers dense, suitable vegetation and host water approximately 1 m deep.
WV5	Water vole suitability	NO8091770874	Suitability; suitable but poor. Unnamed ditch / width: 0.1 m / depth: 0.1 m / substrate type: soil and rock / flow: very slow / bank side comp: vegetated, steep, ruderal and tall grass. Notes: lack of water and generally unsuitable for water vole but potential feeding signs further along the ditch.
WV6	Water vole suitability	NO8079070825	Suitability; suitable but poor. Pond stemming from unnamed ditch / width: 7 m / depth: 3 m / substrate type: soil / flow: none / bank side comp: shallow bank side with a mix of vegetation - aquatic and terrestrial. Notes: abundant vegetation for feeding and cover on shallow banksides. Not ideal but potential.
WV7	Water vole suitability	NO8084972552	Suitability; good. Unnamed burn / width: 0.8 m / depth: 0.2 m / substrate type: bedrock, silt, stones / flow: slow / bank side comp: vegetated, steep, ruderal and tall grass, bracken. Vegetation abundant but not optimal for water vole due to lack of rushes.
WV8	Water vole suitability	NO8019373968	Suitability; suitable in parts. Hareden Burn / width: 1.5 m / depth: 0.5 m / substrate type: soil, stones / flow: moderate / bank side comp: generally shallow and rocky but some more suitable, densely vegetated areas of rushes e.g. great wood rush along banksides.

			Potential in parts for water vole with more suitable banksides occurring at parts but not consistently. Where it widens in depth survey could not be complete due to waterfalls and H&S risk.
WV9	Water vole suitability	NO8059374238	Suitability; unsuitable. Bervie Water / width: 5 m / depth: 1.5 m / substrate type: soil, rock / flow: moderate / bank side comp: reed canary grass, Japanese knotweed and marsh thistle. There are sheltered, less fast parts of this section with emergent reed canary grass and steep overhanging slopes which may be suitable for water vole.
WV10	Water vole suitability	NO8003173795	Suitability; good. Hareden Burn / width: 0.6 m / depth: 0.2 m / substrate type: gravel / flow: slow / bank side comp: broken banks, modified grassland to south (right bank), rank grasses and thistle to north. Mostly heavily vegetated, open to cow grazing in field, no signs observed.
WV11	Water vole suitability	NO8000074019	Suitability; good. Unnamed ditch / width: 0.3 m / depth: 0.1 m / substrate type: soil / silt: slow / bank side comp: steep, cut banks, vegetated. Vegetated, minimal rushes, no signs observed. Ditch/canalised burn.
WV12	Water vole suitability	NO8016374303	Suitability; good. Unnamed ditch / width: 0.3 m / depth: 0.2 m / substrate type: soil / silt: slow / bank side comp: steep sided, vegetated and overgrown in places, natural channel (or has naturalised if originally cut). Vegetated, minimal rushes, no signs observed. Ditch/canalised burn.
WV13	Water vole suitability	NO8013674510	Suitability; suitable but poor. Bervie Water / width: 10 m / depth: 0.5 m / substrate type: soil / silt: slow / bank side comp: appear soft with abundant vegetation.

			This section appears suitable for water vole - plenty of slow flowing water, vegetation and light. However, Bervie Water is unsuitable overall for water vole.
WV14	Water vole suitability	NO8075874305	Suitability; suitable but poor. Unnamed ditch / width: 4 m / depth: 1 m / substrate type: soil / flow: very slow / bank side comp: shallow but soft. Not ideal for water vole but suitable. More vegetation at banks would be better. In active gamebird field too so may be disturbed.
WV15	Water vole suitability	NO8082674425	Suitability; unsuitable. Bervie Water / width: 5m / depth: 0.75 m / substrate type: soil and cobbles / flow: moderate / bank side comp: shallow but abundant vegetation. Good vegetation for water vole but water flow potentially too fast at parts. Bankside not always steep or spilt and some banks are shaded in parts.
WV16	Water vole suitability	NO8100274494	Suitability; unsuitable. Bervie Water / width: 10 m / depth: 1.5 m / substrate type: soil / flow: bank side composition: slow.
WV17	Water vole suitability	NO7995177256	Suitability; good. Unnamed ditch / width: 0.3 m / depth: 0.2 m / substrate type: soil / flow: moderate / bank side composition: grasses, forbs. Steep overhanging banks suitable for water vole with sub-optimal vegetation. However, it may be susceptible to agriculture disturbance.
WV18	Water vole suitability	NO7972678613	Suitability; suitable but poor.

			Unnamed drain / width: 1.5 m / depth: 0.05 m / substrate type: clay / flow: slow / bank side composition: grasses, forbs. It is more suitable at this located of the ditch / drain than further south for water vole but bankside vegetation could be more abundant and the channel with deeper water.
WV19	Water vole suitability	NO7946579211	Suitability; good. Unnamed ditch / width: 0.3 m / depth: 0.1 m / substrate type: soil / flow: very slow / bank side composition: very steep banksides of height 1.4 m approximately, grassed bank tops with rushes. Water vole burrow potential but low water level and limited food plants.
WV20	Water vole suitability	NO7961279149	Suitability; good. Unnamed ditch / width: 0.3 m / depth: 0.1 m / substrate type: soil / flow: very slow / bank side composition: very steep banksides of height 1.4 m approximately, grassed bank tops with rushes. Water vole burrow potential but low water level and limited food plants.
WV21	Water vole suitability	NO7952279282	Suitability; good. Unnamed ditch / width: 0.3 m / depth: 0.1 m / substrate type: soil / flow: very slow / bank side composition: very steep banksides of height 1.4 m approximately, grassed bank tops with rushes. Water vole burrow potential but low water level and limited food plants.
WV22	Water vole suitability	NO7936779483	Suitability; good. Unnamed ditch / width: 0.4 m / depth: 0.1 m / substrate type: soil / flow: slow / bank side composition: steep slope with grasses, forbs and rushes. Water vole burrow potential but low water level and limited food plants.
WV23	Water vole suitability	NO7944479570	Suitability; optimal.

			Forthie Water / width: 3 m / depth: 1.2 m / substrate type: soil/rock / flow: slow / bank side composition: grasses, reeds and herbs. Water vole could burrow near reeds and have aquatic vegetation to forage. Good balance of emergent and submerged vegetation.
WV24	Water vole suitability	NO7932379507	Suitability; optimal. Forthie Water / width: 3 m / depth: 0.75 m / substrate type: soil / flow: slow / bank side composition: grasses, reeds and herbs. Plenty of vegetation and suitable bank side habitat for water vole. Water vole could burrow near reeds and have aquatic vegetation to forage. Good balance of emergent and submerged vegetation.
WV25	Water vole suitability	NO7877079660	Suitability; optimal. Forthie Water / width: 3 m / depth: 0.75 m / substrate type: soil / flow: slow / bank side composition: grasses, reeds and herbs. Habitat suitability of similar quality extends to the west.
WV26	Water vole suitability	NO7901479281	Suitability; good. Unnamed ditch / width: 0.6 m / depth: 0.5 m / substrate type: stone, cobble and silt / flow: slow / bank side composition: steep face up to 1.5 m in height at a 40-degree angle, rushes, meadowsweet and grasses present. Cattle poached. Overgrown in upper sections, lower more open and may be suitable for water vole.
WV27	Water vole suitability	NO7894479176	Suitability; good. Unnamed ditch / width: 0.6 m / depth: 0.5 m / substrate type: stone, cobble and silt / flow: slow / bank side composition: steep face up to 1.5 m in height at a 40-degree angle, rushes, meadowsweet and grasses present. Cattle poached. Overgrown in upper sections, lower more open and may be suitable for water vole.

WV28	Water vole suitability	NO7846379529	Suitability; optimal. Forthie Water / width: 3 m / depth: 0.75 m / substrate type: soil / flow: slow / bank side composition: grasses, reeds and herbs. Forthie Water continues to be optimal further west but limitation to survey is that the long vegetation means makes it difficult to spot signs and flag potential burrows. Survey recommended for spring.
WV29	Water vole suitability	NO7860979636	Suitability; good. Forthie Water / width: 3 m / depth: 0.75 m / substrate type: soil / flow: slow / bank side composition: less densely vegetated with suitable vegetation and shaded by woodland. Less suitable for water vole in this location due to trees either side causing shading and the bank sides having less vegetation in parts or dense stands of unsuitable Himalayan balsam. Still suitable though but not optimal.
WV30	Water vole suitability	NO7778480594	Suitability; good. Unnamed ditch / width: 0 m / depth: 0.0 m / substrate type: soil / flow: none / bank side composition: 40 degrees, 1.4 m tall, rank grasses and ruderals. Channel choked by terrestrial vegetation.
WV31	Water vole suitability	NO7885884733	Suitability; suitable but poor. Burn of Annamuick / width: 0.75 m / depth: 0.15 m / substrate type: soil / flow: moderate / bank side composition: neutral grassland either side with tall forbs. There is potential for water vole - enough water and vegetation for cover and foraging but cows seem to have access and trampling could occur. No signs recorded.
WV32	Water vole suitability	NO7899584617	Suitability; suitable but poor. Burn of Annamuick / width: 0.75 m / depth: 0.15 m / substrate type: soil / flow: moderate / bank side composition: neutral grassland either side with tall forbs.

			Like the point recorded further north (33), the burn here is suitable but not optimal. Bankside are too shallow but there is good water flow and suitable vegetation for foraging, such as soft rush.
WV33	Water vole suitability	NO7943684574	Suitability; suitable but poor. Burn of Annamuick / width: 0.75 m / depth: 0.15 m / substrate type: soil / flow: moderate / bank side composition: neutral grassland either side with tall forbs. Further south of Burn of Annamuick - enough water and vegetation for water vole but flow potentially too fast. Trampling seems to have occurred also.
WV34	Water vole suitability	NO7783983589	Suitability; suitable but poor. Carron Water / width: 1.5 m / depth: 0.1 m / substrate type: clay/rock / flow: moderate / bank side composition: Neutral grassland with scattered trees. The bank sides are shallow for most part but occasionally very steep and compact. No signs observed. Shallow bank side and rocky substrate makes it not ideal for water vole but suitable water flow and bankside vegetation.
WV35	Water vole suitability	NO7858283383	Suitability; suitable but poor. Carron Water / width: 1.5 m / depth: 0.15 m / substrate type: clay/rock / flow: moderate / bank side composition: Neutral grassland with scattered trees. The bank sides are shallow for most part but occasionally very steep and compact. No signs observed. Shallow bank side and rocky substrate makes it not ideal for water vole but suitable water flow and bankside vegetation.
WV36	Water vole suitability	NO7880983262	Suitability; suitable but poor. Carron Water, further east / width: 1.5 m / depth: 0.15 m / substrate type: clay/rock / flow: moderate / bank side composition: Neutral grassland with scattered trees. The bank sides are shallow for most part but occasionally very steep and compact.

			Shallow bank side and rocky substrate makes it not ideal for water vole but suitable water flow and bankside vegetation.
WV37	Water vole suitability	NO7911983525	Suitability; good. Carron Water, further east / width: 1.2 m / depth: 0.2 m / substrate type: soil / flow: moderate / bank side composition: neutral grassland but with more reed grass and rushes than to the west of the water course. Slower flow and deeper at this part of Carron water making it more suitable for water vole. There are also parts of the bank where the water makes damper and suitable foraging areas.
WV38	Water vole suitability	NO7887882184	Suitability; suitable but poor. Unnamed drain which has expanded out creating Juncus marsh / width: 20 m / depth: 0.01 m / substrate type: soil / flow: none / bank side composition: no definite water channel present that was detected by OS, seems to be this marshy Juncus habitat. Occasionally a ditch appears with some collected water on other side of fence for which we don't have land access. Not textbook suitable for water vole but marshy wet Juncus is potentially suitable for water vole and with many field vole latrines and burrows present.
WV39	Water vole suitability	NO7886382234	Suitability; suitable but poor. Unnamed pond / width: 15 m / depth: 2 m / substrate type: soil / flow: none / bank side composition: tall neutral grasses and ruderals as well as reed grass present on shallow bank sides. No land access to assess in depth so flagged as suitable as precaution.
WV40	Water vole suitability	NO7979586812	Suitability; suitable but poor. Unnamed drain / width: 0.3 m / depth: 0.3 m / substrate type: peat / flow: very slow / bank side composition: shallow and mossy with neutral grasses, rushes and Sitka plantation either side. Not textbook water vole habitat but rushy areas adjacent to channel may be suitable when water collects in them.

WV41	Water vole suitability	NO7923785459	Suitability; good. Unnamed drain / width: unclear / depth: 0.3 m / substrate type: soil / flow: fast / bank side composition: ferns, grasses and rushes. Water flow is potentially too fast for water vole but good bankside vegetation and overhanging slopes. Where's there's slower areas habitat is potentially suitable.
WV42	Water vole suitability	NO7896684621	Suitability; suitable but poor. Unnamed / width: 0.4 m / depth: 0.3 m / substrate type: soil / flow: moderate / bank side composition: grasses, rushes and ruderals. Good steep sloping overhanging banks with good foraging vegetation.
WV43	Water vole suitability	NO7881084773	Suitability; suitable but poor. Unnamed / width: 0.75 m / depth: 0.15 m / substrate type: soil / flow: moderate / bank side composition: neutral grassland either side with tall forbs. Not got access to go further up watercourse from this point. There is potential for water vole - enough water and vegetation but cows seem to have access and trampling could occur. No signs recorded.
WV44	Water vole suitability	NO7880084785	Suitability; suitable but poor. Unnamed / width: 0.4 m / depth: 0.3 m / substrate type: soil / flow: moderate / bank side composition: grasses, rushes and ruderals. Good steep sloping overhanging banks with good foraging vegetation.
WV45	Water vole suitability	NO7868784893	Suitability; suitable but poor. Unnamed / width: 0.4 m / depth: 0.3 m / substrate type: soil / flow: moderate / bank side composition: grasses, rushes and ruderals. Good steep sloping overhanging banks with good foraging vegetation.

WV46	Water vole suitability	NO7884682503	Suitability; good. Unnamed pond / width: 15 m / depth: 2 m / substrate type: soil / flow: none / bank side composition: grasses, rushes and ruderals. Dirty water, nice island bit in the middle for water vole burrows. Good foraging vegetation. Lots of duck activity though.
WV47	Water vole suitability	NO7875482616	Suitability; suitable but poor. Unnamed ditch / width: 0.5 m / depth: 1 m / substrate type: soil / flow: very slow / bank side composition: grasses, rushes. Good emergent vegetation for water vole, potentially too dense for them but good overhanging slopes.
WV48	Water vole suitability	NO7874282501	Suitability; good. Wet margins to pond, quite quickly deepens. Water clear and pond approximately 8 m x 70 m. Bank side includes grasses and rushes.

Appendix C Botanical Species List

Common name	Scientific name
Vascular plants	
Alder	*Alnus glutinosa*
Alternate water-milfoil	*Myriophyllum alterniflorum*
Annual meadow-grass	*Poa annua*
Apple	*Malus pumila*
Ash	*Fraxinus excelsior*
Aspen	*Populus tremula*
Autumn hawkbit	*Scorzoneroides autumnalis*
Barley	*Hordeum vulgare*
Beach rose	*Rosa rugosa*
Beech	*Fagus sylvatica*
Bell heather	*Erica cinerea*
Birch spp.	*Betula spp.*
Bird cherry	*Prunus padus*
Bird’s-foot-trefoil	*Lotus corniculatus*
Black oak fern	*Gymnocarpium dryopteris*
Black pine	*Pinus nigra*
Black spleenwort	*Asplenium adiantum-nigrum*
Blackthorn	*Prunus spinosa*

Bottle sedge	*Carex rostrata*
Bracken	*Pteridium aquilinum*
Bramble	*Rubus fruticosus*
Branched bur-reed	*Sparganium erectum*
broad buckler-fern	*Dryopteris dilatate*
Broad-leaved dock	*Rumex obtusifolius*
Broad-leaved pondweed	*Potamogeton natans*
Broad-leaved willowherb	*Epilobium montanum*
Brooklime	*Veronica beccabunga*
Broom	*Cytisus scoparius*
Bulrush	*Typha latifolia*
Charlock	*Sinapis arvensis*
Chervil spp.	*Anthriscus spp.*
Cleavers	*Galium aparine*
Cocks-foot	*Dactylis glomerata*
Coltsfoot	*Tussilago farfara*
Common bent	*Agrostis capillaris*
Common chickweed	*Stellaria media*
Common daisy	*Bellis perennis*
Common dandelion	*Taraxacum officinale*

Common dog violet	*Viola riviniana*
Common duckweed	*Lemna minor*
Common field speedwell	*Veronica persica*
Common heather	*Calluna vulgaris*
Common holly	*Ilex aquifolium*
Common knapweed	*Centaurea nigra*
Common laburnum	*Laburnum anagyroides*
Common mouse-ear	*Cerastium fontanum*
Common nettle	*Urtica dioica*
Common ragwort	*Jacobaea vulgaris*
Common rhododendron	*Rhododendron ponticum*
Common sedge	*Carex nigra*
Common sorrel	*Rumex acetosa*
Common sorrel	*Rumex acetosa*
Compact rush	*Juncus conglomeratus*
Copper beech	*Fagus sylvatica f. purpurea*
Cotoneaster spp.	*Cotoneaster spp.*
Couch	*Elymus repens*
Cow parsley	*Anthriscus sylvestris*
Creeping bent	*Agrostis stolonifera*

Creeping buttercup	*Ranunculus repens*
Creeping soft grass	*Holcus mollis*
Crested dog’s-tail	*Cynosurus cristatus*
Crocosmia spp.	*Crocosmia spp.*
Cross-leaved heath	*Erica tetralix*
Cuckoo-pint	*Arum maculatum*
Curled dock	*Rumex crispus*
Currant spp.	*Ribes spp.*
Dog rose	*Rosa canina*
Dog’s mercury	*Mercurialis perennis*
Douglas fir	*Pseudotsuga menziesii*
Dove’s-foot Crane’s-bill	*Geranium molle*
Downy birch	*Betula pubescens*
Eared willow	*Salix aurita*
Elder	*Sambucus nigra*
Elm	*Ulmus procera*
English oak	*Quercus robur*
European larch	*Larix decidua*
False oat-grass	*Arrhenatherum elatius*
Fescue spp.	*Festuca spp.*

Field forget-me-not	*Myotis arvensis*
Field maple	*Acer campestre*
Field pansy	*Viola arvensis*
Floating sweet-grass	*Glyceria fluitans*
Foxglove	*Digitalis purpurea*
Frosted orache	*Atriplex laciniata*
Fuchsia spp.	*Fuchsia spp.*
Fumitorie spp.	*Fumaria spp.*
Giant butterbur	*Petasites japonicus*
Giant hogweed	*Heracleum mantegazzianum*
Goat willow	*Salix caprea*
Golden-scaled male-fern	*Dryopteris affinis*
Gooseberry	*Ribes uva-crispa*
Gorse	*Ulex europaeus*
Greater plantain	*Plantago major*
Greater stitchwort	*Stellaria holostea*
Greater woodrush	*Luzula sylvatica*
Grey alder	*Alnus incana*
Grey willow	*Salix cinerea*
Ground elder	*Aegopodium podagraria*

Hairy willowherb	*Epilobium hirsutum*
Hard fern	*Blechnum spicant*
Harebell	*Campanula rotundifolia*
Hawkbit spp.	*Leontodon spp.*
Hawthorn	*Crataegus monogyna*
Hazel	*Corylus avellana*
Heath bedstraw	*Galium saxatile*
Heath rush	*Juncus squarrosus*
Hedge woundwort	*Stachys sylvatica*
Henbit deadnettle	*Lamium amplexicaule*
Herb-robert	*Geranium robertianum*
Himalayan balsam	*Impatiens glandulifera*
Himalayan honeysuckle	*Leycesteria formosa*
Hogweed	*Heracleum sphondylium*
Honeysuckle	*Lonicera periclymenum*
Iris spp.	*Iris spp.*
Italian ryegrass	*Lolium multiflorum*
Ivy	*Hedera helix*
Jointed rush	*Juncus articulates*
Knotgrass	*Polygonum aviculare*

Lady fern	*Athyrium filix-femina*
Laurel	*Laurus nobilis*
Lawson cypress	*Chamaecyparis lawsoniana*
Leyland cypress	*Cupressus x leylandii*
Lousewort spp.	*Pedicularis* spp.
Male-fern	*Dryopteris filix-mas*
Marsh horsetail	*Equisetum palustre*
Marsh marigold	*Caltha palustris*
Marsh spotted-orchid	*Dactylorhiza maculata*
Marsh thistle	*Cirsium palustre*
Marsh violet	*Viola palustris*
Marsh willowherb	*Epilobium palustre*
Marsh woundwart	*Stachys palustris*
Mat-grass	*Nardus stricta*
Meadow buttercup	*Ranunculus acris*
Meadow vetchling	*Lathyrus pratensis*
Meadowgrass spp.	*Poa spp.*
Meadowsweet	*Filipendula ulmaria*
Milkweed	*Euphorbia peplus*
Monkeyflower	*Mimulus guttatus*

Monkeypuzzle	*Araucaria araucana*
Oak spp.	*Quercus spp.*
Oat	*Avena sativa*
Osier	*Salix viminalis*
Oxeye daisy	*Leucanthemum vulgare*
Pineappleweed	*Matricaria discoidea*
Poplar spp.	*Populus spp.*
Privet spp.	*Ligustrum spp.*
Ragged robin	*Silene flos-cuculi*
Raspberry	*Rubus idaeus*
Red campion	*Silene dioica*
Red clover	*Trifolium pratense*
Red fescue	*Festuca rubera*
Redshank	*Persicaria maculosa*
Reed canary grass	*Phalaris arundinacea*
Reed mannagrass	*Glyceria maxima*
Ribwort plantain	*Plantago lanceolata*
Rosebay willowherb	*Chamaenerion angustifolium*
Rough meadow-grass	*Poa trivialis*
Rowan	*Sorbus aucuparia*

Scaly male fern	*Dryopteris affinis*
Scentless mayweed	*Tripleurospermum inodorum*
Scot’s pine	*Pinus sylvestris*
Sea mayweed	*Tripleurospermum maritimum*
Selfheal	*Prunella vulgaris*
Sessile oak	*Quercus petraea*
Sharp-flowered rush	*Juncus acutiflorus*
Shephards purse	*Capsella bursa-pastoris*
Sitka spruce	*Picea sitchensis*
Small-leaved lime	*Tilia cordata*
Sneezewort	*Achillea ptarmica*
Snowberry spp.	*Symphoricarpos spp.*
Soft rush	*Juncus effuses*
Soft-brome	*Bromus hordeaceus*
Spear thistle	*Cirsium vulgare*
Spear-leaved orache	*Atriplex prostrata*
Spike-rush	*Eleocharis palustris*
Stitchwort spp.	*Stellaria spp.*
Stringy stonecrop	*Sedum sarmentosum*
Sweet vernal-grass	*Anthoxanthum odoratum*

Sycamore	*Acer pseudoplatanus*
Timothy	*Phleum pratense*
Tormentil	*Potentilla erecta*
Trailing St John’s-wort	*Hypericum humifusum*
Tufted hairgrass	*Deschampsia cespitosa*
Water forget-me-not	*Myosotis scorpioides*
Water lily spp.	*Nymphaeaceae spp.*
Water mint	*Mentha aquatica*
Water purslane	*Lythrum portula*
Water speedwell	*Veronica anagallis-aquatica*
Watercress	*Nasturtium officinale*
Wavy bittercress	*Cardamine flexuosa*
Wavy hairgrass	*Avenella flexuosa*
Wheat	*Triticum aestivum*
White clover	*Heracleum sphondylium*
Whitebeam	*Sorbus aria*
Wild cherry	*Prunus avium*
Willowherb spp.	*Epilobium spp.*
Wood avens	*Geum urbanum*
Wood sorrel	*Oxalis acetosella*

Wood vetch	*Vicia sylvatica*
Wych elm	*Ulmus glabra*
Yorkshire fog	*Holcus lanatus*
Zigzag clover	*Trifolium medium*
Lower plants	
Acute-leaved bog-moss	*Sphagnum capillifolium*
Blunt-leaved bog-moss	*Sphagnum palustre*
Common feather-moss	*Kindbergia praelonga*
Common haircap	*Polytrichum commune*
Common smoothcap	*Atrichum undulatum*
Common tamarisk-moss	*Thuidium tamariscinum*
Glittering wood-moss	*Hylocomium splendens*
Hart’s-tongue thyme-moss	*Plagiomnium undulatum*
Spikey bog-moss	*Sphagnum squarrosum*
Waved silk-moss	*Plageothesium undulatum*

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