

Appendix 6.1

Ecology

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List of Abbreviations

Abbreviation	Description
AIL	Abnormal Indivisible Road
eDNA	Environmental DNA
ES	Environmental Statement
HGV	Heavy Goods Vehicle
GIS	Geographic Information System
HLC	Habitat Loss Calculations
NVC	National Vegetation Classification
PRF	Potential Roost Feature

A6.1 INTRODUCTION

- A6.1.1 This Technical Appendix presents the following information in support of Chapter 6: Ecology in Volume 1 of the Environmental Statement (ES) for Y Bryn Wind Farm (the proposed development):
- A list of scientific (Latin) and English names of all ecological features that are referred to in the main chapter;
 - Supplementary information regarding the survey methods employed to provide baseline information on the ecological features present within the vicinity of the proposed development; and
 - Supplementary data regarding the results of the ecological baseline surveys.

Scientific Names

- A6.1.2 Nomenclature used for vascular plants (tracheophytes), followed Stace, (2019)¹. In the case of bryophytes nomenclature from Atherton *et al.*, (2010)² was used.
- A6.1.3 Scientific and English names of all animal species referred to in Chapter 6 are given in Table A6.1. Scientific and English names of all plant and bryophyte species referred to in Chapter 6 are given in Table A6.2.

Table A6.1: Scientific and common names of animal species referred to in Chapter 6: Ecology

Taxon group	Scientific Name	Common Name
Amphibian	<i>Bufo bufo</i>	Common toad
Amphibian	<i>Rana temporaria</i>	Common frog
Amphibian	<i>Lissotriton helveticus</i>	Palmate newt
Amphibian	<i>Lissotriton vulgaris</i>	Smooth newt
Amphibian	<i>Triturus cristatus</i>	Great crested newt
Reptile	<i>Anguis fragilis</i>	Slow worm
Reptile	<i>Natrix natrix</i>	Grass snake
Reptile	<i>Vipera berus</i>	Adder
Reptile	<i>Zootoca vivipara</i>	Common lizard
Fish	<i>Salmo trutta</i>	Brown/Sea trout
Terrestrial Mammal	<i>Lepus europaeus</i>	Brown hare
Terrestrial Mammal	<i>Lutra lutra</i>	Otter
Terrestrial Mammal	<i>Martes martes</i>	Pine marten
Terrestrial Mammal	<i>Meles meles</i>	Badger
Terrestrial Mammal	<i>Muscardinus avellanarius</i>	(Hazel) dormouse
Terrestrial Mammal	<i>Mustela putorius</i>	Polecat
Terrestrial Mammal	<i>Arvicola amphibius</i>	Water vole
Terrestrial Mammal - bat	<i>Barbastella barbastellus</i>	Barbastelle bat
Terrestrial Mammal - bat	<i>Eptesicus serotinus</i>	Serotine bat

Taxon group	Scientific Name	Common Name
Terrestrial Mammal - bat	<i>Myotis bechsteinii</i>	Bechstein's bat
Terrestrial Mammal - bat	<i>Myotis brandtii</i>	Brandt's bat
Terrestrial Mammal - bat	<i>Myotis daubentonii</i>	Daubenton's bat
Terrestrial Mammal - bat	<i>Myotis mystacinus</i>	Whiskered bat
Terrestrial Mammal - bat	<i>Myotis nattereri</i>	Natterer's bat
Terrestrial Mammal - bat	<i>Myotis</i> sp.	Mouse-eared bat species
Terrestrial Mammal - bat	<i>Nyctalus</i> sp.	Noctule bat species
Terrestrial Mammal - bat	<i>Nyctalus leisleri</i>	Leisler's bat
Terrestrial Mammal - bat	<i>Nyctalus noctula</i>	Common noctule
Terrestrial Mammal - bat	<i>Pipistrellus</i> sp.	Pipistrelle bat species
Terrestrial Mammal - bat	<i>Pipistrellus nathusii</i>	Nathusius' pipistrelle
Terrestrial Mammal - bat	<i>Pipistrellus pipistrellus</i>	Common pipistrelle
Terrestrial Mammal - bat	<i>Pipistrellus pygmaeus</i>	Soprano pipistrelle
Terrestrial Mammal - bat	<i>Plecotus auritus</i>	Brown long-eared bat
Terrestrial Mammal - bat	<i>Rhinolophus ferrumequinum</i>	Greater horseshoe bat
Terrestrial Mammal - bat	<i>Rhinolophus hipposideros</i>	Lesser horseshoe bat
Invertebrate	<i>Meloe proscarabaeus</i>	Black oil beetle
Invertebrate	<i>Meloe violaceus</i>	Violet oil beetle
Invertebrate	<i>Boloria selene</i>	Small pearl-bordered fritillary
Invertebrate	<i>Coenonympha pamphilus</i>	Small heath
Invertebrate	<i>Cupido minimus</i>	Small blue
Invertebrate	<i>Erynnis tages</i>	Dingy skipper
Invertebrate	<i>Hipparchia semele</i>	Grayling
Invertebrate	<i>Lasiommata megera</i>	Wall Brown
Invertebrate	<i>Bombus humilis</i>	Brown-banded carder bee

Table A6.2: Scientific and common English names of plant and bryophyte (moss) species referred to in Chapter 6

Type	Scientific Name	Common Name
Herb	<i>Angelica sylvestris</i>	Wild angelica
Herb	<i>Calluna vulgaris</i>	Heather
Herb	<i>Centaurea nigra</i>	Common knapweed
Herb	<i>Chamaenerion angustifolium</i>	Rosebay willowherb
Herb	<i>Crocoscma x crocosmiiflora</i>	Montbretia
Herb	<i>Dactylorhiza fuchsii</i>	Common spotted-orchid
Herb	<i>Dactylorhiza</i> sp.	Marsh-orchid
Herb	<i>Erica tetralix</i>	Cross-leaved heath

¹ Stace, C., (2019) *New Flora of the British Isles, Fourth Edition*, Cambridge University Press

² Artherton, I., Bosanquet, S. & Lawley, M., (2010) *Mosses and Liverworts of Britain and Ireland: a field guide*, The British Bryological Society

Type	Scientific Name	Common Name
Herb	<i>Eupatorium cannabinum</i>	Hemp-agrinomy
Herb	<i>Euphrasia sp.</i>	Eyebright
Herb	<i>Galium palustre</i>	Common marsh-bedstraw
Herb	<i>Galium saxatile</i>	Heath bedstraw
Herb	<i>Hedera helix</i>	Ivy
Herb	<i>Hyacinthoides non-scripta</i>	Bluebell
Herb	<i>Hypochaeris radicata</i>	Cat's-ear
Herb	<i>Impatiens glandulifera</i>	Himalayan balsam
Herb	<i>Lonicera periclymenum</i>	Honeysuckle
Herb	<i>Mercurialis perennis</i>	Dog's Mercury
Herb	<i>Potentilla erecta</i>	Tormentil
Herb	<i>Potentilla reptans</i>	Creeping cinquefoil
Herb	<i>Prunella vulgaris</i>	Selfheal
Herb	<i>Ranunculus repens</i>	Creeping buttercup
Herb	<i>Rubus fruticosus</i> agg.	Bramble
Herb	<i>Urtica dioica</i>	Common nettle
Herb	<i>Vaccinium myrtillus</i>	Bilberry
Herb	<i>Viola sp.</i>	Violet
Herb	<i>Wahlenbergia hederacea</i>	Ivy-leaved bellflower
Tree/shrub	<i>Alnus glutinosa</i>	Alder
Tree/shrub	<i>Betula pubescens</i>	Downy birch
Tree/shrub	<i>Betula sp.</i>	Birch
Tree/shrub	<i>Castanea sativa</i>	Sweet chestnut
Tree/shrub	<i>Corylus avellana</i>	Hazel
Tree/shrub	<i>Crataegus monogyna</i>	Hawthorn
Tree/shrub	<i>Fagus sylvatica</i>	Beech
Tree/shrub	<i>Fraxinus excelsior</i>	Ash
Tree/shrub	<i>Malus sylvestris</i>	Crab-apple
Tree/shrub	<i>Picea sitchensis</i>	Sitka spruce
Tree/shrub	<i>Pinus contorta</i>	Lodgepole pine
Tree/shrub	<i>Pinus sylvestris</i>	Scot's pine
Tree/shrub	<i>Prunus spinosa</i>	Blackthorn
Tree/shrub	<i>Quercus petraea</i>	Sessile oak
Tree/shrub	<i>Quercus sp.</i>	Oak
Tree/shrub	<i>Rhododendron ponticum</i>	Rhododendron
Tree/shrub	<i>Salix cinerea</i>	Grey willow
Tree/shrub	<i>Salix sp.</i>	Willow
Tree/shrub	<i>Sorbus aucuparia</i>	Rowan
Tree/shrub	<i>Taxus baccata</i>	Yew

Type	Scientific Name	Common Name
Tree/shrub	<i>Ulex europaeus</i>	Gorse
Tree/shrub	<i>Ulex gallii</i>	Western gorse
Tree/shrub	<i>Ulmus glabra</i>	Wych elm
Grass	<i>Agrostis capillaris</i>	Common bent
Grass	<i>Anthoxanthum odoratum</i>	Sweet vernal-grass
Grass	<i>Arrhenatherum elatius</i>	False oat-grass
Grass	<i>Avenella flexuosa</i> (formerly <i>Deschampsia flexuosa</i>)	Wavy hair-grass
Grass	<i>Cynosurus cristatus</i>	Crested dog's-tail
Grass	<i>Dactylis glomerata</i>	Cock's-foot
Grass	<i>Deschampsia cespitosa</i>	Tufted hairgrass
Grass	<i>Festuca ovina</i>	Sheep's fescue
Grass	<i>Festuca rubra</i>	Red fescue
Grass	<i>Holcus lanatus</i>	Yorkshire fog
Grass	<i>Lolium perenne</i>	Perennial ryegrass
Grass	<i>Molinia caerulea</i>	Purple moor-grass
Grass	<i>Nardus stricta</i>	Mat-grass
Grass	<i>Phragmites australis</i>	Common reed
Grass	<i>Poa trivialis</i>	Rough meadow-grass
Sedge	<i>Carex echinata</i>	Star sedge
Sedge	<i>Carex flacca</i>	Glaucous sedge
Sedge	<i>Carex paniculata</i>	Greater Tussock-sedge
Sedge	<i>Trichophorum germanicum</i> (formerly <i>Scirpus cespitosus</i>)	Deergrass
Rush	<i>Juncus acutiflorus</i>	Sharp-flowered rush
Rush	<i>Juncus effusus</i>	Soft rush
Rush	<i>Juncus squarrosus</i>	Heath rush
Rush	<i>Juncus sp.</i>	Rush
Fern	<i>Dryopteris affinis</i>	Golden-scale male-fern
Fern	<i>Dryopteris filix-mas</i>	Male-fern
Fern	<i>Pteridium aquilinum</i>	Bracken
Moss	<i>Dicranum majus</i>	Greater fork moss
Moss	<i>Philonotus fontana</i>	Fountain apple-moss
Moss	<i>Rhytidiadelphus loreus</i>	Little shaggy-moss
Moss	<i>Rhytidiadelphus squarrosus</i>	Springy turf-moss
Moss	<i>Sphagnum denticulatum</i> (formerly <i>S. auriculatum</i>)	Cow-horn bog-moss
Moss	<i>Sphagnum fimbriatum</i>	Fringed bog-moss
Moss	<i>Sphagnum fallax</i> (formerly <i>S. recurvum</i>)	Flat-topped bog-moss
Lichen	<i>Usnea articulata</i>	String-of-sausage lichen

Type	Scientific Name	Common Name
Fungus	<i>Hericium erinaceus</i>	Bearded tooth

Survey Methods

A6.1.4 The baseline ecological surveys are described in Chapter 6. These comprised:

- Phase 1 and National Vegetation Classification (NVC) habitat surveys;
- Bat activity surveys (static detectors and walked transects);
- Preliminary bat roost assessment;
- Protected (terrestrial) mammal surveys; and
- Great crested newt surveys.

A6.1.5 All field surveys were undertaken by the following experienced ecological surveyors:

- Kate Davies (KD);
- Ciaran Rowett (CR);
- Joseph Pickard (JP);
- Heather Scott (HS);
- Mike Shewring (MS); and
- Tim Sykes (TS).

Habitat Surveys

A6.1.6 The Phase 1 survey covering the wind farm areas (all of the north and south sections) was undertaken in August and September 2020 by MS and JP. A further Phase 1 survey was completed by HS in June 2021 covering the proposed Abnormal Indivisible Loads (AIL) route.

A6.1.7 The NVC survey, covering the proposed infrastructure plus a 250 m buffer, was undertaken by HS in June 2021, with minor additions to cover previously unsurveyed areas completed in August 2021 and April 2022.

Habitat Loss Calculations Methodology

A6.1.8 Habitat loss calculations (HLC) were carried out using a bespoke tool developed in QGIS (version 3.22). This tool imports shapefiles representing the different infrastructure features constituting the proposed development, as well as a shapefile containing the Phase 1 habitat classifications across the site based on the field surveys carried out for the proposed development. Although the Phase 1 survey extended into a 250 m buffer (for example in the AIL areas), only the results from the site boundary were used in the calculations. Each infrastructure polygon was intersected with the habitat shapefile to allow calculation of the area of each habitat type that would be lost due to construction of that infrastructure feature. Any overlap in infrastructure features was dealt with in a hierarchical way to avoid inclusion of the same areas of habitat twice. Loss attributed to permanent infrastructure features, such as turbine foundations, crane pads, met masts and buildings, and finally tracks is calculated first, followed by additional loss associated with temporary structures

such as temporary construction compounds, borrow pits and earthworks. Temporary infrastructure relates to features that should be fully reinstated and therefore do not reflect permanent habitat loss. In this specific case, the tree felling plan shapefile covered all the other infrastructure so habitat loss was attributed to those features first, following the list mentioned and finally to the tree felling, where areas were not identified as part of the replanting plan.

A6.1.9 Calculations were run on both permanent and temporary infrastructure and defined as such. A combined total is presented in Chapter 6.

A6.1.10 Habitat loss was calculated separately for the following infrastructure and associated features:

- 18 permanent hard stands (including turbine footprint – 8 m radius circle);
- Two permanent meteorological masts (10 m x 10 m);
- Two permanent meteorological mast crane pads (35 m x 45 m);
- Permanent substation (75 m x 150 m);
- Permanent new tracks (6 m width);
- Existing tracks to be upgraded (permanent);
- 18 temporary hardstands (various sizes);
- Four temporary construction compounds (various sizes);
- Four temporary borrow pits (various sizes); and
- Two permanent borrow pits (various sizes);
- Temporary earthworks; and
- Permanent tree felling (minus areas to be replanted).

A6.1.11 Total habitat loss for each feature type was calculated by summing the loss associated with each individual feature.

A6.1.12 For each habitat type, the area of that habitat type lost, as a proportion of the total area of that habitat type recorded within the site boundary, was also calculated.

A6.1.13 The full HLC results can be provided upon request.

Bat Activity Surveys

Static Detectors

A6.1.14 Details of the static detector surveys are provided in Chapter 6. Weather conditions during the deployments are shown in Table A6.3. The dark shaded rows are those dates that were excluded from the analysis. The autumn deployment was analysed using both 10 nights and six nights of data. The four nights that were excluded in the six-night analysis are lightly shaded.

Table A6.3: Weather during static detector surveys 2021

Deployment	Date	Average nightly temperature (°C)	Average nightly wind speed (ms ⁻¹)
Spring	12/05/2021	6.8	0.4
Spring	13/05/2021	7.6	0.6
Spring	14/05/2021	7.5	0.7
Spring	15/05/2021	8.2	1.0
Spring	16/05/2021	7.7	0.9
Spring	17/05/2021	8.2	0.9
Spring	18/05/2021	7.1	0.8
Spring	19/05/2021	8.4	0.5
Spring	20/05/2021	8.0	3.4
Spring	21/05/2021	7.2	2.4
Spring	22/05/2021	7.0	1.1
Spring	23/05/2021	6.1	0.7
Spring	24/05/2021	7.1	2.3
Spring	25/05/2021	6.4	0.4
Spring	26/05/2021	8.1	0.2
Summer	29/06/2021	14.2	2.0
Summer	30/06/2021	15.2	3.7
Summer	01/07/2021	12.0	3.9
Summer	02/07/2021	13.3	3.8
Summer	03/07/2021	13.4	3.4
Summer	04/07/2021	11.8	6.7
Summer	05/07/2021	10.2	5.2
Summer	06/07/2021	12.8	7.4
Summer	07/07/2021	12.9	2.6

Deployment	Date	Average nightly temperature (°C)	Average nightly wind speed (ms ⁻¹)
Summer	08/07/2021	12.6	3.0
Summer	09/07/2021	11.8	2.9
Summer	10/07/2021	12.9	2.4
Summer	11/07/2021	12.0	5.6
Summer	12/07/2021	13.7	5.1
Autumn	29/09/2021	10.1	8.2
Autumn	30/09/2021	12.3	8.6
Autumn	01/10/2021	9.1	6.7
Autumn	02/10/2021	7.6	5.5
Autumn	03/10/2021	9.1	6.4
Autumn	04/10/2021	9.4	7.0
Autumn	05/10/2021	8.2	6.8
Autumn	06/10/2021	12.4	3.8
Autumn	07/10/2021	12.7	3.7
Autumn	08/10/2021	12.7	3.5
Autumn	09/10/2021	12.1	3.5
Autumn	10/10/2021	9.0	4.7
Autumn	11/10/2021	9.3	4.0
Autumn	12/10/2021	10.5	3.2

Source: Natural Power

Walked Transects

A6.1.15 The two bat transects were surveyed six times between August and October 2021 by HS and CR. Details of these survey visits are provided in Table A6.4.

Table A6.4: Bat transect surveys details and weather data 2021

Date	Surveyed area	Start	End	Sunset / Sunrise	Wind speed (Beaufort)	Precipitation	Temperature (°C) Start	End
10/08/2021	East and west transects	20:47	23:06	20:47	3	None	15	14
24/08/2021	East and west transects	03:46	06:17	06:14	1	None	14	14
06/09/2021	East transect	19:51	22:21	19:51	1	None	19	16
09/09/2021	West transect	19:48	21:53	19:48	2	None	16	16
21/09/2021	East and west transects	19:16	21:36	19:16	0	None	14	14
12/10/2021	East and west transects	18:29	20:40	18:29	1	None	13	12
25/10/2021	East and west transects	18:00	20:15	18:00	1	Light showers at first	12.5	10

Source: Natural Power

Preliminary Bat Roost Assessment

A6.1.16 Details of the primary bat roost assessment are provided in Chapter 6. The survey was undertaken by TS on the following dates: 17 April, 1, 5, 7 and 8 May 2021. Additional surveys of the AIL areas were completed on 16 and 17 June 2021 and along the potential Heavy Goods Vehicle (HGV) route on 7, 8 April 2022 (HS). Weather conditions are inconsequential for this survey type and were not recorded.

Protected Mammal Surveys

Otter/Water Vole and Badger/Pine Marten/Polecat

A6.1.17 A summary of survey effort and weather conditions for protected mammal surveys are shown in Table A6.5.

Table A6.5: Protected mammal surveys (excluding bats and dormouse) - effort and weather 2021

Date	Observer(s)	Start Time	End Time	Precipitation (last 24hrs)	Water Level
Wind Farm Areas – otter/water vole					
09/06/2021	KD/MS/JP	09:00	17:00	Dry	Medium
10/06/2021	KD/MS	08:30	16:30	Drizzle	Medium
17/06/2021	KD	08:30	12:00	Dry	Medium
18/06/2021	KD/MS	08:30	12:00	Dry	Medium
21/06/2021	KD	09:00	12:30	Dry	Medium
Wind Farm Areas – badger/pine marten/polecat					
22/07/2021	KD	13:50	16:50	Dry	Low

Date	Observer(s)	Start Time	End Time	Precipitation (last 24hrs)	Water Level
30/07/2021	KD/MS/JP	15:40	17:40	Dry	Low
19/08/2021	KD/MS/JP	08:30	11:30	Drizzle	Medium
26/08/2021	KD/MS/JP	09:00	17:00	Dry	Medium
AIL Areas – otter/water vole and badger/pine marten/polecat					
16/06/2021	CR	9:00	16:30	Dry	Medium
17/06/2021	CR	9:00	16:30	Dry	Medium
07/04/2022	HS			Some rain	Medium

Source: Natural Power

Dormouse Survey

A6.1.18 Locations of all nest tubes placed during dormouse surveys are listed in Table A6.6.

Table A6.6: Dormouse survey nest-tube locations 2021

Tube	X (Easting)	Y (Northing)
1	283002	193658
2	283000	193638
3	282974	193616
4	283013	193585
5	282981	193547
6	282993	193527
7	282990	193506
8	282987	193490
9	282978	193455
10	282982	193432
11	282965	193414
12	282980	193391
13	282979	193375
14	282963	193393
15	283646	193619
16	283654	193595
17	283674	193586
18	283676	193572
19	283699	193572
20	283658	193629
21	283594	193679
22	283506	193712
23	283544	193691
24	283569	193677
25	283587	193658

Tube	X (Easting)	Y (Northing)
26	283610	193636
27	283618	193621
28	283571	193687
29	283641	193029
30	283659	193019
31	283674	193006
32	283687	192985
33	283699	192967
34	283714	192939
35	283727	192914
36	283727	192896
37	283707	192871
38	283693	192850
39	283681	192819
40	283674	192796
41	283659	192762
42	284029	192484
43	284012	192488
44	283993	192496
45	283976	192500
46	283934	192504
47	283960	192505
48	283918	192493
49	283879	192553
50	283863	192561
51	281912	190735
52	281925	190759
53	281925	190780
54	281917	190816
55	281910	190834
56	281925	190862
57	281898	190879
58	281865	190872
59	281838	190873
60	281826	190907
61	281742	190866
62	281759	190839
63	281775	190814
64	282166	190450

Tube	X (Easting)	Y (Northing)
65	282138	190452
66	282101	190458
67	282081	190464
68	282038	190467
69	282004	190470
70	281966	190471
71	281912	190476
72	281908	190446
73	281924	190411
74	281893	190380
75	281870	190398
76	281956	189925
77	281985	189896
78	282024	189924
79	282053	189939
80	282094	189961
81	282174	189943
82	282174	189989
83	282994	190771
84	283022	190768
85	282981	190753
86	282999	190731
87	282967	190729
88	282948	190675
89	282973	190672
90	281487	188645
91	281491	188675
92	281325	188807
93	281360	188818
94	281399	188817
95	281404	188855
96	281426	188876
97	281425	188830
98	281429	188804
99	281448	188787
100	281474	188802

Source: Natural Power

A6.1.19 The dates and times of dormouse surveys are listed in Table A6.7. The tubes were placed on site on 6 and 7 May 2021.

Table A6.7: Dates and times of dormouse tube checks 2021

Date	Surveyor(s)	Start Time	End Time
25/05/2021	HS, CR	10:00	17:00
07/06/2021	HS	10:30	17:00
08/06/2021	HS	9:30	17:00
27/07/2021	HS	11:00	16:00
28/07/2021	HS	10:30	16:30
24/08/2021	HS	7:30	14:30
27/08/2021	HS	9:30	15:30
14/09/2021	HS	10:30	16:00
22/09/2021	HS	9:30	16:30
28/10/2021	HS	12:00	17:00
29/10/2021	HS	9:30	15:00

Source: Natural Power

Great Crested Newt Surveys

Environmental DNA (eDNA) Survey

A6.1.20 Details of these surveys, including the ponds sampled, are given in Chapter 6. Samples were collected by HS, who is licenced and trained in the technique. All samples were negative for great crested newt. There were no inconclusive samples. Full results can be provided upon request.

Table A6.8: Phase 1 target notes recorded during the 2020 survey (wind farm areas)

ID	Description
1	A wall parallel with the track, mainly covered with needle fall and extending the length of the coupe. There are multiple exposed edges/cracks.
2	The banks of the watercourse are dominated by Sitka spruce with some lodgepole pine and with a shrub layer of bramble. There is a small area of standing water approximately 8 m x 4 m in size.
3	Small wet/dry heath area dominated by heather with frequent bilberry.
4	Watercourse dominated by bramble scrub. There is infrequent Sitka spruce regeneration to the west, frequent Sitka spruce and willow trees to the east in an open area.
5	Himalayan balsam present.
6	Pond approximately 16 m x 5 m in size.
7	Pond approximately 2 m x 9 m in size dominated by reeds across 50% of the pond area.
8	Heather dominated dry heath within Sitka spruce coupe where there is very little Sitka spruce growing. There is also frequent bracken at the borders with occasional bramble and willow.
9	Small patch of heather dominated heath at track edge with frequent purple moor-grass, bilberry and bramble and occasional tufted hair-grass and common bent. The bryophyte layer is dominated by springy turf-moss.
10	A wall and locally frequent bramble scrub bordering Sitka spruce coupes. There is also frequent purple moor-grass and rushes with little shaggy-moss.
11	Mosaic of fragmented heather dominated dry heath and bramble scrub at track edge. There is also frequent bilberry.
12	Himalayan balsam at track edge in bramble dominated scrub.
13	Frequent Himalayan balsam along some portions of track within bramble dominated scrub with frequent bracken.
14	Stone wall.
15	Himalayan balsam scattered along track.
16	Watercourse bordered by Sitka spruce and bramble uphill and bracken and planted conifer woodland downhill.
17	Extensive Himalayan balsam along track.
18	Frequent Himalayan balsam on ride and in bramble scrub.

Physical Surveys

A6.1.21 Physical surveys were carried out by MS and KD, who are licenced and experienced surveyors. Details of the six ponds sampled can be found in Chapter 6. The main method of survey was bottle-trapping, with traps placed in suitable locations around the perimeter of each sampled pond and left overnight before being removed early the following morning. Between eight and 15 traps were set at each pond. In addition, egg searches of suitable habitat were carried out at each of the six ponds, during both the evening and morning visit. Additionally, a terrestrial refugia search was undertaken on each visit and torching (after sunset) was also undertaken at each pond. Four visits were made during spring 2022, with two visits during the recommended peak recording period of mid-March to mid-May. Each visit consisted of an evening and morning. The dates of the four visits were: 9/10 April, 14/15 May 18/19 May and 4/5 June. No evidence of great crested newt presence was found in any of the sampled ponds; thus the surveys confirmed the findings of the eDNA surveys.

Results

Habitat Surveys

A6.1.22 Target notes recorded during the Phase 1 habitat surveys are shown in Table A6.8. Target notes recorded during the NVC surveys are shown in Table A6.9. Target notes recorded during the Phase 1/NVC survey completed in the vicinity of the potential HGV route are presented in Table 6.10

ID	Description
19	Frequent Himalayan balsam at track edge.
20	Windblown trees from mature coupe covering the channel of a watercourse, with frequent Himalayan balsam south of watercourse.
21	Dry heath by road margin with heather and bell heather.
22	Dry heath patch by road margin with frequent western gorse, bell heather and heather and occasional golden-scaled male fern.
23	Montbretia present.
24	Frequent Himalayan balsam along track edges.
25	Montbretia by gate.
26	Montbretia and Himalayan balsam by road margin.
27	Himalayan balsam present.
28	The banks of the watercourse are dominated by willow with occasional alder trees.
29	More than 30% of broadleaved trees and good scrub cover along road verge with frequent oak, hazel and bramble and occasional birch and willow.
30	Broadleaved woodland and scrub at edge of Sitka spruce coupe with frequent willow, gorse and bramble and occasional sessile oak and hazel.
31	Watercourse with low flow and well vegetated sides with frequent bramble and bracken.
32	Stone wall, fragmented by forest track. Bramble is locally frequent in the immediate vicinity downslope.
33	Standing deadwood.
34	Standing deadwood.
35	Pond.
36	Standing deadwood.
37	Standing deadwood.
38	Himalayan balsam by track edge both sides.
39	Himalayan balsam present.
40	Dead standard tree.
41	Dry stone wall.
42	Standing deadwood tree, split open.
43	Pond.
44	Dry stone wall.
45	Scree.
46	Ruined building.
47	Small dry heath patch in gorse dominated scrub.
48	Heather dominated dry heath.
49	Dry heath on slope.
50	Dry stone wall.
51	Marshy grassland feature with purple moor-grass and rushes.
52	Well vegetated dry-stone wall.
53	Broadleaved trees left post-felling.
54	Sitka regeneration in strip of 3 m wide marshy grassland habitat adjacent to track.
55	Standing deadwood.
56	Concrete structure.
57	Ash with dieback.

ID	Description
58	Dry heath dominated track edge with occasional rhododendron.
59	Dry heath regenerating over quarry margins.
60	Dry heath field layer with scattered trees.
61	Broadleaf treeline.
62	Marshy grassland feature, unclear if in boundary from vantage point.
63	Patch of semi-natural broadleaved woodland dominated by birch and occasional willow with a field layer of continuous bracken.
64	Fence.
65	Sweet chestnut.
66	Dry stone wall.
67	Frequent sweet chestnut in canopy.
68	Some dry heath in field layer.
69	Pond.
70	Pond.
71	A line of semi-natural broadleaved trees on edge of coupe.
72	Pond - no safe access to assess.
73	Pond.
74	Marshy grassland by track.
75	Small wet heath feature.
76	Pond.
77	Flushed vegetation with frequent fringed bog-moss.
78	Some broadleaved trees in the canopy with frequent willow scrub.
79	Broken fence.
80	Wet/dry heath by track.
81	Patch of dry heath with heather and bilberry.
82	Dry stone wall.
83	Dry stone wall.
84	Dry heath field layer.
85	Frequent dry heath components in field layer.
86	Quarry dominated by bracken.

Source: Natural Power

Table A6.9: NVC target notes recorded during 2021 survey (proposed infrastructure plus 250 m buffer)

ID	Description
1	Transitional between unimproved neutral and marshy grassland with locally frequent soft rush, occasional purple moor-grass and wild angelica with encroaching bramble scrub.
2	Recent forestry operations destroyed track edge vegetation.
3	W24 bramble scrub along track side.
4	Dry acid dwarf shrub heath alongside of track.
5	W24 bramble scrub alongside of track.
6	H8 acid dry dwarf shrub heath on steep bank at edge of track.

ID	Description
7	Dense W25 bramble scrub.
8	MG5 neutral grassland visually dominated by common bird's-foot-trefoil with mouse-ear-hawkweed, cat's-ear and ribwort plantain on the edge of the track. Acid dry dwarf shrub heath. on steep embankment.
9	MG6 neutral grassland along edge of track with occasional cock's-foot and purple moor-grass and scattered bramble scrub.
10	U4 acid grassland along both edges of track with frequent tormentil and occasional heath bedstraw and cat's-ear and scattered bramble scrub.
11	U4 acid grassland dominated by common bird's-foot-trefoil in quarry with scattered H12 heath.
12	MG6 neutral grassland with scattered bracken and scrub.
13	MG6 neutral grassland with scattered bracken and locally frequent hemp-agrimony and rosebay willowherb.
14	MG6 neutral grassland alongside track with H12 heath on steep embankment.
15	MG6 neutral grassland alongside track.
16	A mosaic of H8 and H12 acid dry dwarf shrub heath alongside track.
17	MG6 neutral grassland and W24 bramble scrub alongside track with scattered willow trees.
18	MG6 neutral grassland with locally frequent bracken, rosebay willowherb, hemp-agrimony, male fern and bramble scrub.
19	U4-MG5 neutral grassland along both sides of track visually dominated by common bird's-foot-trefoil.
20	MG6 neutral grassland with scattered bracken and locally frequent common nettle along edge of wood where there is a footpath.
21	MG6 neutral grassland along forestry track under mature forestry.
22	Marsh-orchid.
23	Common spotted orchid
24	Greater tussock sedge.
25	Small patch of U4 acid grassland in area of valley mire
26	Small area of M6 acid flush with locally frequent sharp-flowered rush and bog-mosses.
27	Small patch of M6 acid flush with fountain apple-moss.
28	Similar vegetation to other side of track with bracken and bramble scrub. The sides of the forestry track have recently been graded/scraped.
29	U20 continuous bracken along edge of track.
30	Ditch along golfers' walking track with bog-mosses at bottom of ditch
31	Marsh-orchids
32	Here, although very shortly mown on the fairway the grass has characteristic species of adjacent marshy grassland with locally frequent purple-moor grass.
33	Fritillary butterfly seen nearby. Unimproved neutral grassland on edge of tracks and in gravel area. Species present in the sward include common bird's-foot-trefoil, violet species, mouse-ear-hawkweed, crested dog's-tail, ribwort plantain, selfheal, creeping cinquefoil, sweet vernal-grass and eyebright.
34	Small patch of M6 acid flush at head of stream.
35	M25 mire in forestry ride
36	Predominantly bracken and species poor acid grassland with some marshy grassland in forestry ride
37	Recently felled plantation with neutral grassland alongside of track. Both sides of track have recently scraped.
38	Wild strawberry.
39	M25 marshy grassland along track edge with encroaching bracken and bramble.
40	Mosaic of unimproved neutral and marshy grassland with encroaching bramble scrub. Track edge recently been scraped.
41	W25 scrub along track adjacent to young conifer woodland.
42	M25 marshy grassland with encroaching bramble scrub along track edge
43	Species poor MG6 neutral grassland being encroached by W24 bramble scrub
44	Species poor MG6 neutral grassland being encroached by W24 bramble scrub.

ID	Description
45	MG5 neutral grassland in old rock cutting with eyebright, common bird's-foot-trefoil, cat's-ear, crested dog's-tail, Yorkshire fog, lesser trefoil, daisy, heath bedstraw and tormentil.
46	U20 continuous bracken and W25 bramble scrub along track edge.
47	H12 acid dry dwarf shrub heath and U4 acid grassland along steep sides of track edge with encroaching bramble scrub.
48	M23 marshy grassland along stream otherwise a mosaic of W24 scrub and MG6 neutral grassland.
49	Damp grassland with frequent glaucous sedge, greater bird's-foot-trefoil with red fescue, rough meadow-grass, creeping buttercup and locally frequent purple moor-grass.
50	Damp MG9, M25 and MG6 grassland with W24 bramble scrub on both sides of forestry track.
51	Rank M23 marshy grassland in forestry ride.
52	Mosaic of H12 dry heath and M15 wet heath with W24 bramble scrub along forestry track edge.
53	MG6 grassland and W24 bramble scrub along edge of forestry track.
54	M6 acid flush with soft-rush and locally frequent bog-mosses.
55	Side of forestry track recently regraded/scraped, and vegetation largely destroyed.
56	Small patch of species rich U4 acid grassland.
57	Predominantly U20 bracken or W25 scrub along forestry track with some U4 acid grassland.
58	Vegetation alongside of track is predominantly M25 grassland with U20 bracken.
59	Patch of M6 acid flush.
60	Patch of U4 acid grassland around trigpoint.
61	Both sides of forestry track have recently been graded/scraped up to and including forestry ride.
62	U20 continuous bracken along edge of forestry track with MG6 grassland immediately adjacent to the track.
63	Patch of M6 acid flush.
64	U20 with scattered willow along edge of track.
65	Brown hare seen running across track.
66	Brown hare seen twice in this vicinity on two separate occasions
67	Defunct dry-stone wall
68	Dry-stone wall
69	Defunct dry-stone wall
70	Defunct dry-stone wall
71	Defunct dry-stone wall
72	Pond.
73	Wind turbine
74	Dry-stone wall, 80% in good condition
75	Wind turbine
76	Dry-stone wall still stock proof
77	Defunct dry-stone wall
78	Defunct dry-stone wall
79	Defunct dry-stone wall
80	Rock cliff along track with U4 acid grassland.
81	Defunct hedgerow.
82	Defunct dry-stone wall.
83	Defunct dry-stone wall.

ID	Description
84	Defunct dry-stone wall.
85	Himalayan balsam.
86	Earth and stone bank.
87	Relict dry-stone wall covered in dense bracken.
88	Japanese knotweed.
89	Rhododendron.
90	Rhododendron.
91	Rhododendron.
92	Rhododendron.
93	Himalayan balsam

Source: Natural Power

Table A6.10: NVC target notes recorded during 2022 survey (proposed infrastructure plus 250 m buffer), covering areas not previously surveyed

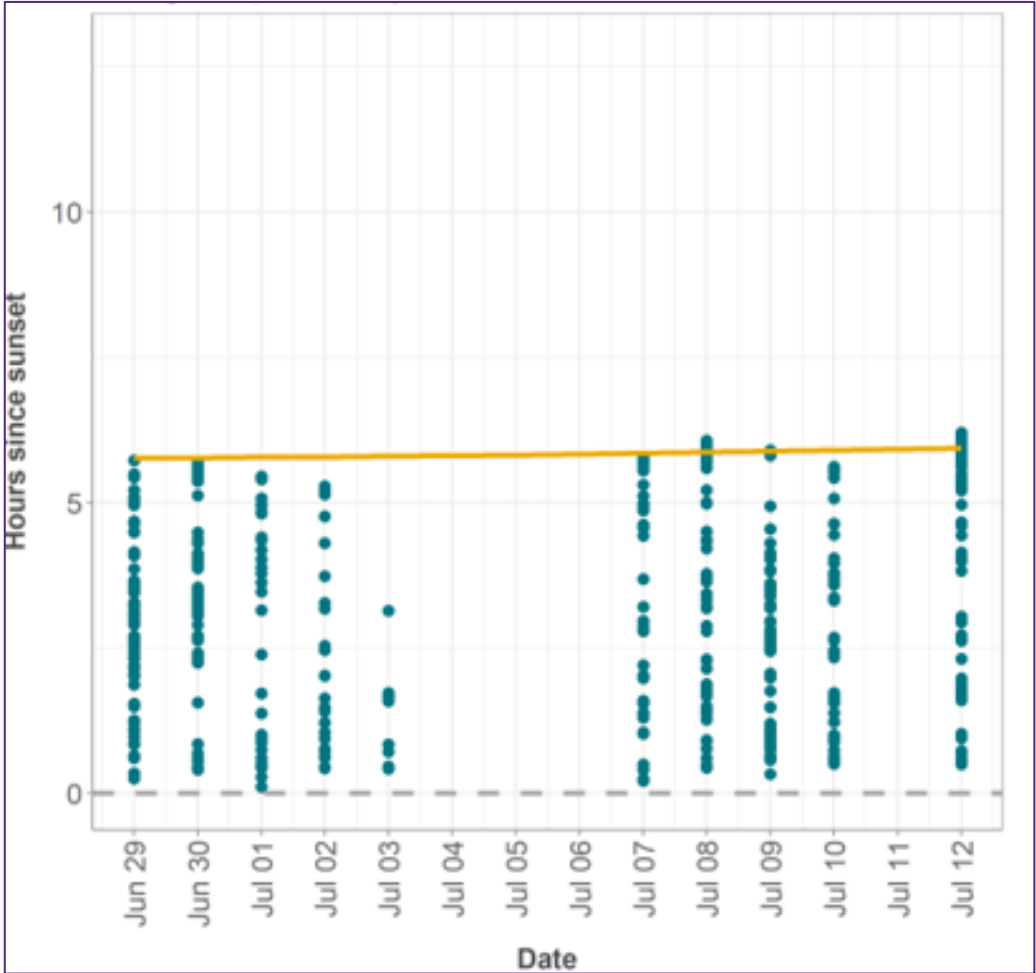
ID	Description
1	Shallow ditches each side of minor road.
2	Defunct hedge with dense gorse scrub on earth bank.
3	Defunct hedge on earth and stone bank.
4	Defunct hedge on earth bank.
5	Earth bank.
6	Earth bank with scattered bracken and one mature ash tree.
7	Earth bank, defunct hedge and one ash tree.
8	Earth bank with defunct hedge, scattered bracken and several ash trees.
9	Earth and stone bank.
10	Earth and stone bank with two mature oak trees on forestry side of fence.
11	Unmanaged hedgerow.
12	Line of mature trees, predominantly oak.
13	Defunct hedge on earth bank.
14	Defunct hedge on earth and stone bank.

Source: Natural Power

Bat Activity Surveys: Static Detectors

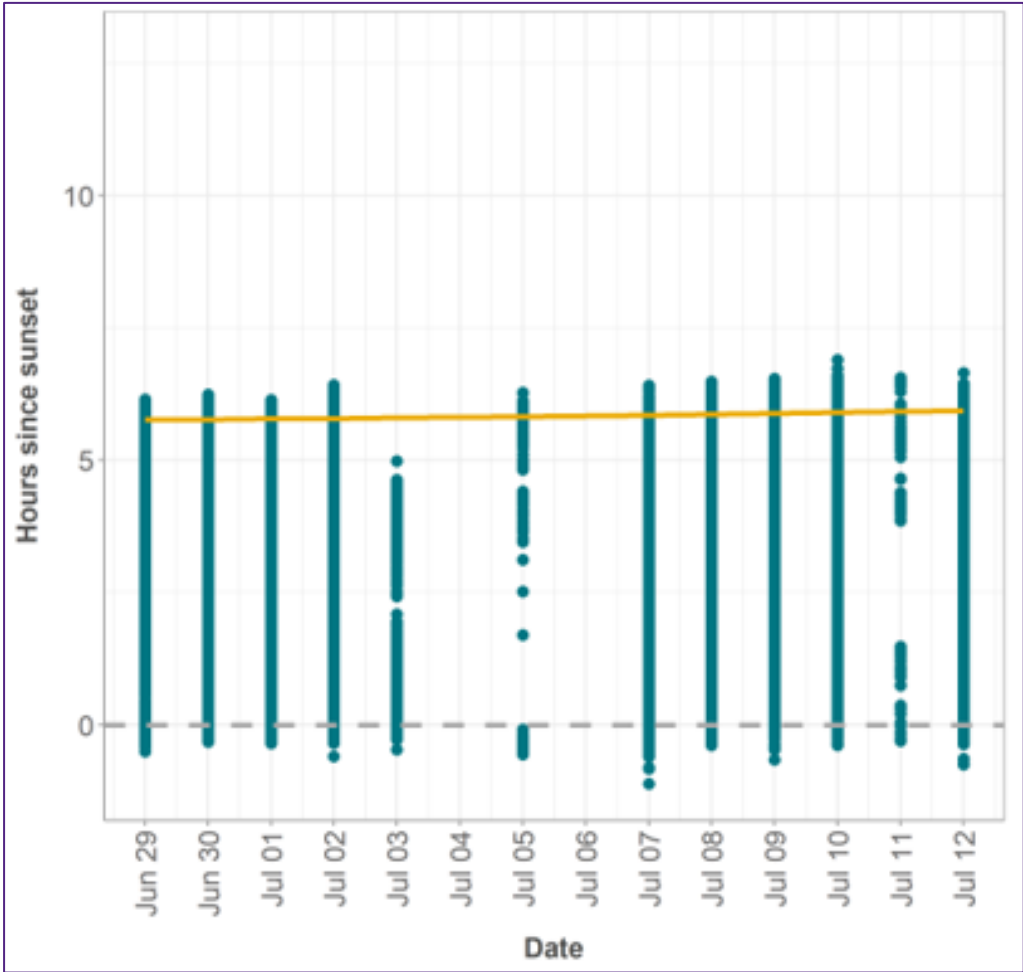
A6.1.23 The following graphs, Graphs A6.1 to Graph A6.4, show the emergence plots produced for the summer deployment for *Myotis* sp., common pipistrelle, soprano pipistrelle and lesser horseshoe. Graph A6.5 shows the emergence plot for common pipistrelle by detector (summer deployment). The dashed grey line indicates sunset, and the yellow line indicates sunrise. Emergence plots for noctule appear in Chapter 6. All emergence plots, along with other bat analysis results can be provided upon request.

Source: Natural Power



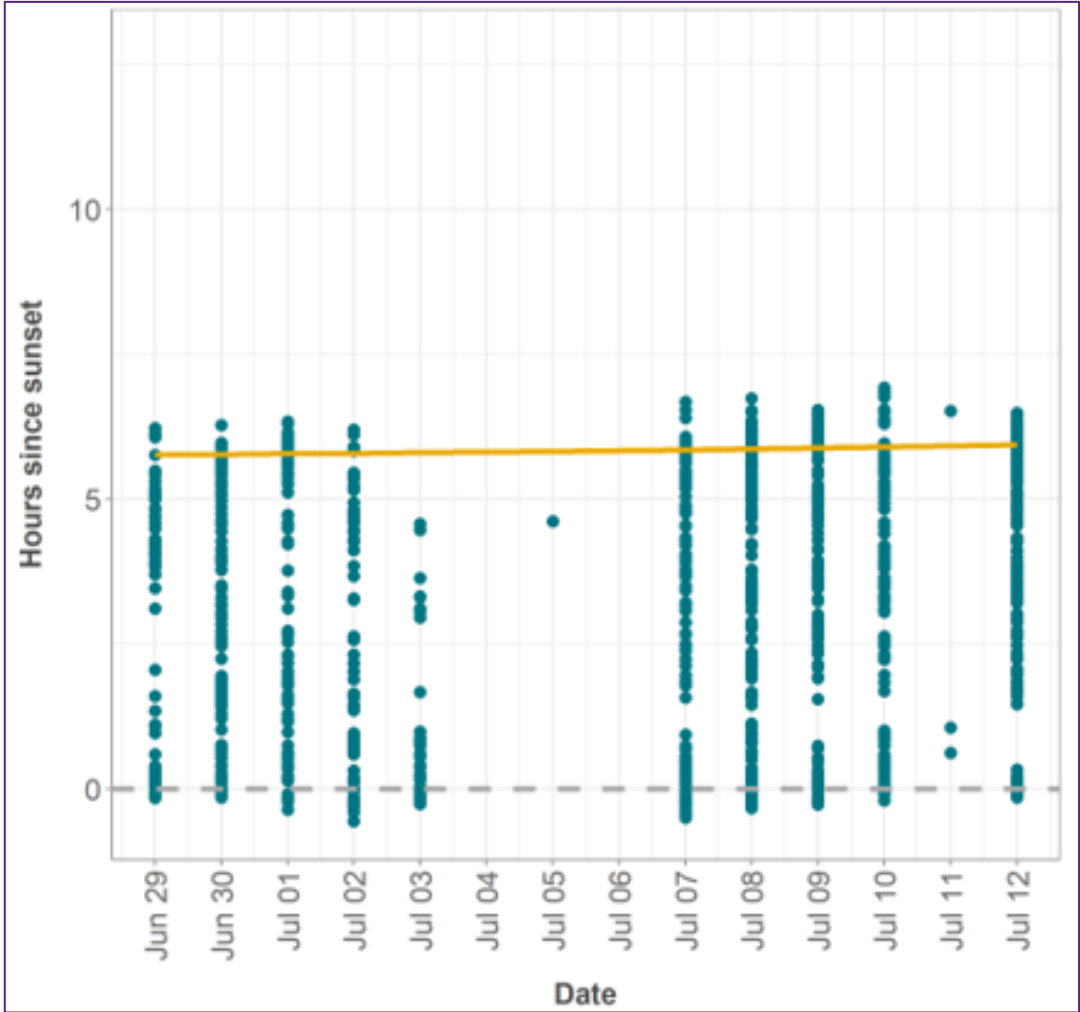
Graph A6.1: Emergence plot for *Myotis* sp. during summer 2021 deployment

Source: Natural Power



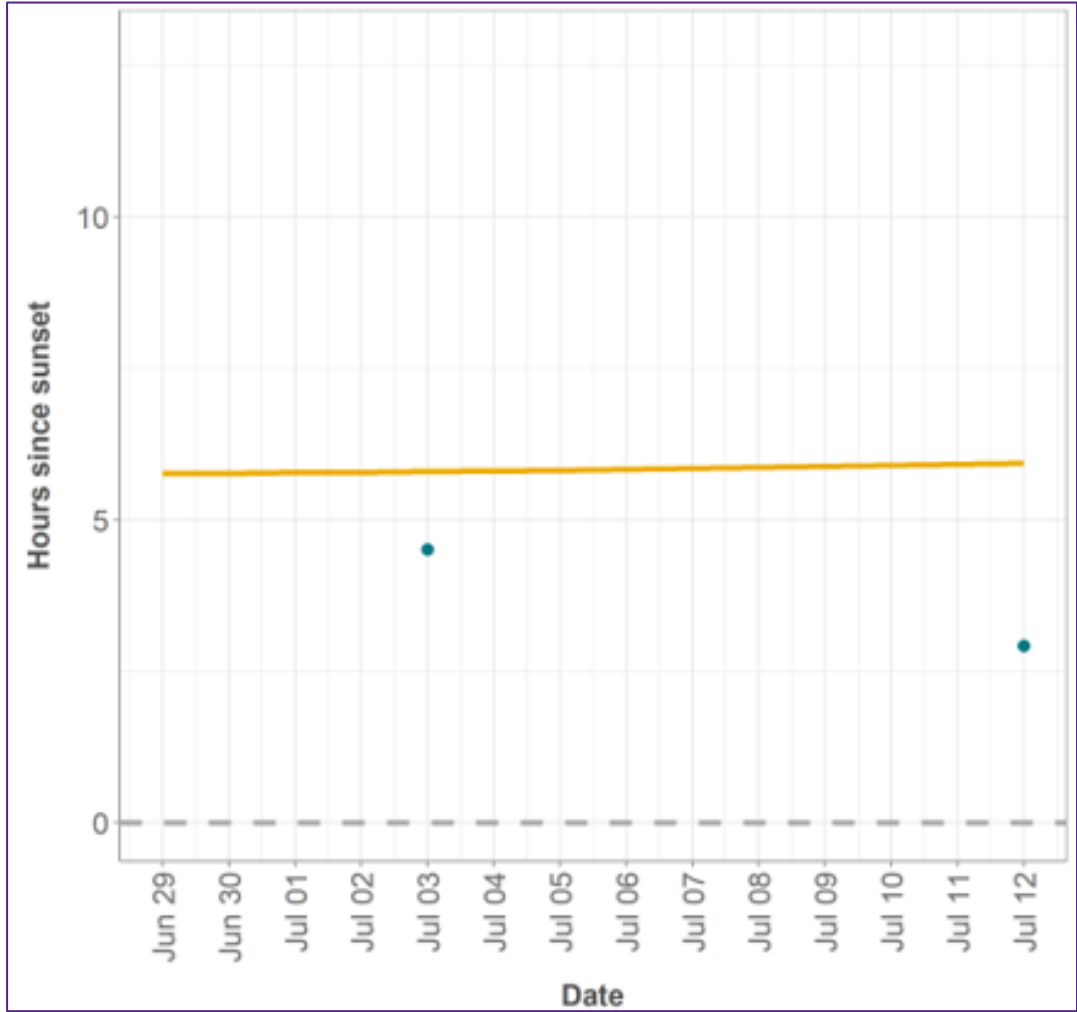
Graph A6.2: Emergence plot for common pipistrelle during summer 2021 deployment

Source: Natural Power



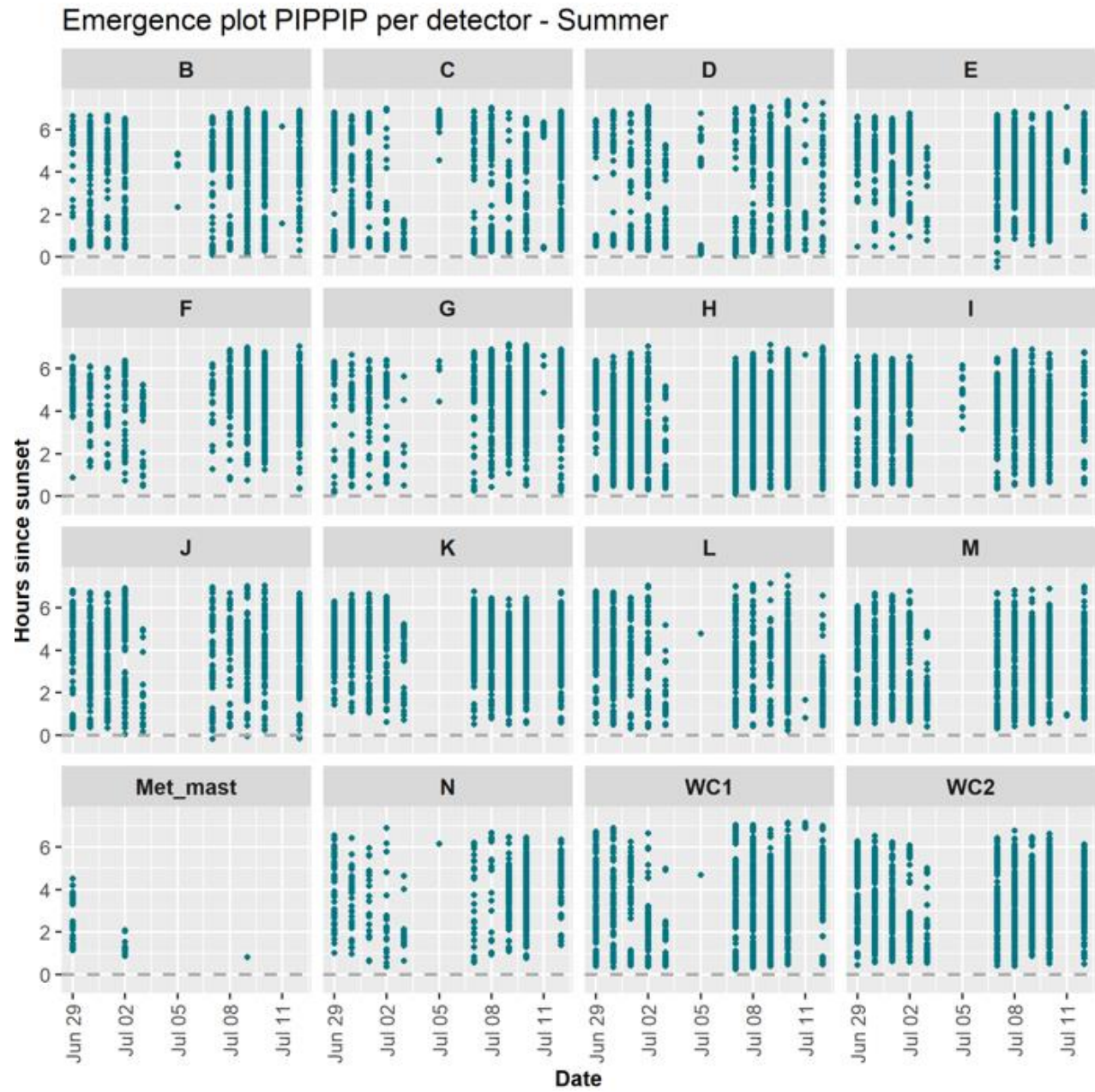
Graph A6.3: Emergence plot for soprano pipistrelle during summer 2021 deployment.

Source: Natural Power



Graph A6.4: Emergence plot for lesser horseshoe during summer 2021 deployment.

Source: Natural Power



Graph A6.5: Emergence plot for common pipistrelle at each detector during summer 2021 deployment.

Bat Activity Surveys: Walked Transects

A6.1.24 Results of the walked transect surveys for bat activity are presented in Table A6.11.

Table A6.11: Bat transect survey results from August to October 2021 inclusive

Date	Time	Species	Transect	X (Easting)	Y (Northing)
10/08/2021	21:39:15	Brown long-eared bat	West	281477	187310
10/08/2021	21:44:34	<i>Pipistrellus</i> sp.	West	281230	187338

Date	Time	Species	Transect	X (Easting)	Y (Northing)
10/08/2021	21:44:52	<i>Pipistrellus</i> sp.	West	281231	187339
10/08/2021	21:48:42	Soprano pipistrelle	West	281228	187347
10/08/2021	22:02:07	Common pipistrelle	West	281255	187564
10/08/2021	22:08:21	Soprano pipistrelle	West	281349	187619
10/08/2021	22:19:50	Common pipistrelle	West	281232	187352
10/08/2021	22:24:46	Soprano pipistrelle	West	281232	187352
10/08/2021	22:25:01	Soprano pipistrelle	West	281232	187352
10/08/2021	22:29:20	<i>Myotis</i> sp.	West	281232	187352
10/08/2021	22:43:58	Soprano pipistrelle	West	281232	187352
10/08/2021	22:45:53	Soprano pipistrelle	West	281232	187352
10/08/2021	22:46:37	Soprano pipistrelle	West	281232	187352
10/08/2021	22:51:21	Soprano pipistrelle	West	281232	187352
10/08/2021	22:53:32	Noctule	West	281232	187352
10/08/2021	22:54:38	Common pipistrelle	West	281232	187352
10/08/2021	22:55:48	Common pipistrelle	West	281232	187352
10/08/2021	22:59:23	Soprano pipistrelle	West	281232	187352
10/08/2021	23:02:11	Common pipistrelle	West	281232	187352
10/08/2021	23:02:34	Common pipistrelle	West	281232	187352
10/08/2021	23:03:08	Common pipistrelle	West	281232	187352
10/08/2021	23:03:20	Common pipistrelle	West	281232	187352
10/08/2021	23:05:57	Common pipistrelle	West	281232	187352
10/08/2021	23:06:11	Common pipistrelle	West	281232	187352
10/08/2021	23:07:10	Common pipistrelle	West	281232	187352
10/08/2021	23:13:52	Common pipistrelle	West	281232	187352
10/08/2021	23:14:20	Common pipistrelle	West	281232	187352
10/08/2021	23:14:33	Common pipistrelle	West	281232	187352
10/08/2021	23:14:48	Common pipistrelle	West	281232	187352
10/08/2021	23:15:08	Common pipistrelle	West	281232	187352
10/08/2021	23:15:19	<i>Pipistrellus</i> sp. social call*	West	281232	187352
24/08/2021	03:30:25	<i>Pipistrellus</i> sp. social call*	East	281419	188510
24/08/2021	03:30:52	<i>Pipistrellus</i> sp. social call*	East	281423	188533
24/08/2021	03:31:20	<i>Pipistrellus</i> sp. social call*	East	281397	188543
24/08/2021	03:35:43	Soprano pipistrelle	East	281227	188587
24/08/2021	03:38:58	Common pipistrelle	East	281334	188538
24/08/2021	03:58:52	<i>Pipistrellus</i> sp. social call*	East	281026	187862
24/08/2021	03:59:51	Common pipistrelle	East	281018	187868
24/08/2021	04:00:21	Common pipistrelle	East	281015	187867
24/08/2021	04:00:35	Common pipistrelle	East	281017	187865

Date	Time	Species	Transect	X (Easting)	Y (Northing)
24/08/2021	04:00:48	Common pipistrelle	East	281016	187865
24/08/2021	04:10:04	Common pipistrelle	West	281252	187889
24/08/2021	04:12:35	Common pipistrelle	East	281178	187762
24/08/2021	04:27:58	<i>Pipistrellus</i> sp. social call*	East	281238	187528
24/08/2021	04:38:24	Bat social call*	East	281464	187770
24/08/2021	04:46:09	<i>Nyctalus</i> sp.	East	281238	187525
24/08/2021	04:55:26	Common pipistrelle	East	281380	187762
24/08/2021	05:10:43	Bat social call*	East	281259	187737
24/08/2021	05:12:18	Common pipistrelle	East	281175	187702
24/08/2021	05:16:20	Common pipistrelle	East	281001	187595
24/08/2021	05:16:53	Soprano pipistrelle	East	281001	187595
24/08/2021	05:17:33	Soprano pipistrelle	East	281001	187595
24/08/2021	05:19:51	Common pipistrelle	East	281001	187595
24/08/2021	05:20:20	Common pipistrelle	West	281001	187595
24/08/2021	05:27:38	Soprano pipistrelle	West	281001	187595
06/09/2021	20:01:03	Noctule	West	281242	187328
06/09/2021	22:03:56	Common pipistrelle	West	281242	187328
06/09/2021	22:04:24	Common pipistrelle	West	281242	187328
06/09/2021	21:04:37	Common pipistrelle	West	281242	187328
06/09/2021	22:04:46	Common pipistrelle	West	281242	187328
06/09/2021	22:04:59	Common pipistrelle	West	281242	187328
06/09/2021	20:04:59	Noctule	West	281242	187328
06/09/2021	22:05:17	Common pipistrelle	West	281242	187328
06/09/2021	22:05:33	Common pipistrelle	West	281242	187328
06/09/2021	22:05:33	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	20:05:44	Noctule	West	281242	187328
06/09/2021	22:05:48	Common pipistrelle	West	281242	187328
06/09/2021	20:06:00	Noctule	West	281242	187328
06/09/2021	22:06:03	Common pipistrelle	West	281242	187328
06/09/2021	22:06:03	Soprano pipistrelle	West	281242	187328
06/09/2021	20:06:20	Noctule	West	281242	187328
06/09/2021	22:06:30	Common pipistrelle	West	281242	187328
06/09/2021	21:06:54	Common pipistrelle	West	281242	187328
06/09/2021	22:06:59	Common pipistrelle	West	281242	187328
06/09/2021	20:07:36	Noctule	West	281242	187328
06/09/2021	22:07:57	Common pipistrelle	West	281242	187328
06/09/2021	20:08:01	Noctule	West	281242	187328
06/09/2021	22:11:11	Common pipistrelle	West	281242	187328

Date	Time	Species	Transect	X (Easting)	Y (Northing)
06/09/2021	21:13:13	Noctule	West	281242	187328
06/09/2021	22:14:16	Common pipistrelle	West	281242	187328
06/09/2021	21:14:23	Common pipistrelle	West	281242	187328
06/09/2021	22:14:47	Common pipistrelle	West	281242	187328
06/09/2021	22:14:47	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	22:15:02	Common pipistrelle	West	281242	187328
06/09/2021	22:15:22	Common pipistrelle	West	281242	187328
06/09/2021	22:15:22	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	22:15:38	Common pipistrelle	West	281242	187328
06/09/2021	22:15:55	Common pipistrelle	West	281242	187328
06/09/2021	21:17:10	<i>Pipistrellus</i> sp.	West	281242	187328
06/09/2021	21:17:10	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	21:18:11	Common pipistrelle	West	281242	187328
06/09/2021	21:18:27	Common pipistrelle	West	281242	187328
06/09/2021	21:19:18	Common pipistrelle	West	281242	187328
06/09/2021	21:19:38	<i>Myotis</i> sp.	West	281242	187328
06/09/2021	21:20:22	Common pipistrelle	West	281242	187328
06/09/2021	21:20:50	Common pipistrelle	West	281242	187328
06/09/2021	22:21:12	Common pipistrelle	West	281242	187328
06/09/2021	21:21:13	Common pipistrelle	West	281242	187328
06/09/2021	22:21:38	Common pipistrelle	West	281242	187328
06/09/2021	22:22:48	Common pipistrelle	West	281242	187328
06/09/2021	22:23:30	Common pipistrelle	West	281242	187328
06/09/2021	20:23:52	Common pipistrelle	West	281242	187328
06/09/2021	22:23:56	Common pipistrelle	West	281242	187328
06/09/2021	22:24:21	Common pipistrelle	West	281242	187328
06/09/2021	22:24:21	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	22:24:38	Common pipistrelle	West	281242	187328
06/09/2021	22:24:38	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	21:25:38	<i>Pipistrellus</i> sp.	West	281242	187328
06/09/2021	21:25:38	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	21:25:53	<i>Pipistrellus</i> sp.	West	281242	187328
06/09/2021	21:25:53	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	20:26:02	Common pipistrelle	West	281242	187328
06/09/2021	21:31:46	Soprano pipistrelle	West	281242	187328
06/09/2021	21:34:32	Common pipistrelle	West	281242	187328
06/09/2021	21:36:01	<i>Myotis</i> sp.	West	281242	187328
06/09/2021	19:36:35	Noctule	West	281242	187328

Date	Time	Species	Transect	X (Easting)	Y (Northing)
06/09/2021	21:39:35	Common pipistrelle	West	281242	187328
06/09/2021	21:40:44	<i>Myotis</i> sp.	West	281242	187328
06/09/2021	20:40:52	Common pipistrelle	West	281242	187328
06/09/2021	21:41:10	Common pipistrelle	West	281242	187328
06/09/2021	19:44:07	Noctule	West	281242	187328
06/09/2021	21:44:15	Common pipistrelle	West	281242	187328
06/09/2021	19:44:23	Noctule	West	281242	187328
06/09/2021	19:44:42	Noctule	West	281242	187328
06/09/2021	20:44:59	Common pipistrelle	West	281242	187328
06/09/2021	20:44:59	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	21:45:01	Common pipistrelle	West	281242	187328
06/09/2021	21:45:43	Common pipistrelle	West	281242	187328
06/09/2021	21:46:01	Common pipistrelle	West	281242	187328
06/09/2021	20:46:24	Common pipistrelle	West	281242	187328
06/09/2021	21:47:51	Common pipistrelle	West	281242	187328
06/09/2021	20:48:14	<i>Pipistrellus</i> sp.	West	281242	187328
06/09/2021	21:49:14	Common pipistrelle	West	281242	187328
06/09/2021	21:49:32	Common pipistrelle	West	281242	187328
06/09/2021	20:50:01	Common pipistrelle	West	281242	187328
06/09/2021	21:50:51	Common pipistrelle	West	281242	187328
06/09/2021	21:50:51	<i>Pipistrellus</i> sp. social call*	West	281242	187328
06/09/2021	21:51:06	Common pipistrelle	West	281242	187328
06/09/2021	21:51:22	Soprano pipistrelle	West	281242	187328
06/09/2021	21:51:47	Common pipistrelle	West	281242	187328
06/09/2021	21:52:24	Common pipistrelle	West	281242	187328
06/09/2021	21:52:40	Common pipistrelle	West	281242	187328
06/09/2021	20:54:58	Common pipistrelle	West	281242	187328
09/09/2021	20:01:16	Noctule	West	281232	187333
09/09/2021	21:11:49	Brown long-eared bat	West	281232	187333
09/09/2021	21:23:59	Noctule	West	281232	187333
09/09/2021	20:39:06	<i>Pipistrellus</i> sp.	West	281232	187333
09/09/2021	20:40:41	Common pipistrelle	West	281232	187333
09/09/2021	20:41:25	Common pipistrelle	West	281232	187333
09/09/2021	20:44:22	Common pipistrelle	West	281232	187333
09/09/2021	21:45:59	Common pipistrelle	West	281232	187333
09/09/2021	21:45:59	<i>Pipistrellus</i> sp. social call*	West	281232	187333
09/09/2021	19:47:53	<i>Nyctalus</i> sp.	West	281232	187333
21/09/2021	19:13:33	Noctule	West	282527	187706

Date	Time	Species	Transect	X (Easting)	Y (Northing)
21/09/2021	19:13:36	Noctule	East	282527	187706
21/09/2021	19:14:13	Noctule	East	282482	187689
21/09/2021	19:14:28	Noctule	East	282482	187689
21/09/2021	19:14:35	Noctule	West	282482	187689
21/09/2021	19:14:55	Noctule	East	282482	187689
21/09/2021	19:15:10	Noctule	West	282445	187671
21/09/2021	19:15:10	Noctule	East	282445	187671
21/09/2021	19:17:22	Noctule	East	282442	187698
21/09/2021	19:17:30	Noctule	West	282442	187698
21/09/2021	19:17:38	Noctule	East	282442	187698
21/09/2021	19:17:45	Noctule	West	282442	187698
21/09/2021	19:17:51	Noctule	West	282442	187698
21/09/2021	19:19:02	Noctule	West	282495	187753
21/09/2021	19:19:41	Noctule	East	282495	187753
21/09/2021	19:19:47	Noctule	West	282495	187753
21/09/2021	19:19:53	Noctule	West	282495	187753
21/09/2021	19:19:56	Noctule	East	282495	187753
21/09/2021	19:20:51	Noctule	East	282527	187783
21/09/2021	19:21:19	Noctule	East	282555	187813
21/09/2021	19:21:34	Noctule	East	282555	187813
21/09/2021	19:21:49	Noctule	East	282555	187813
21/09/2021	19:22:15	Noctule	East	282573	187856
21/09/2021	19:22:45	Noctule	East	282573	187856
21/09/2021	19:23:40	Noctule	East	282583	187903
21/09/2021	19:30:05	Noctule	East	282499	187872
21/09/2021	19:30:20	Noctule	East	282499	187872
21/09/2021	19:31:04	Noctule	East	282455	187842
21/09/2021	19:31:20	Noctule	East	282455	187842
21/09/2021	19:31:35	Noctule	East	282455	187842
21/09/2021	19:32:02	Noctule	East	282404	187828
21/09/2021	19:32:23	Noctule	East	282404	187828
21/09/2021	19:32:43	Noctule	East	282404	187828
21/09/2021	19:33:07	Noctule	East	282353	187817
21/09/2021	19:33:39	Noctule	East	282353	187817
21/09/2021	19:34:08	Soprano pipistrelle	East	282298	187811
21/09/2021	19:34:33	Noctule	East	282298	187811
21/09/2021	19:43:31	Common pipistrelle	West	281939	187741
21/09/2021	19:47:53	Soprano pipistrelle	West	281957	187737

Date	Time	Species	Transect	X (Easting)	Y (Northing)
21/09/2021	19:47:53	Common pipistrelle	West	281957	187737
21/09/2021	19:48:10	Common pipistrelle	West	281955	187736
21/09/2021	19:48:10	<i>Pipistrellus</i> sp. social call*	West	281955	187736
21/09/2021	19:48:21	Soprano pipistrelle	East	281955	187736
21/09/2021	19:48:23	Soprano pipistrelle	West	281955	187736
21/09/2021	19:48:23	Common pipistrelle	West	281955	187736
21/09/2021	19:48:23	<i>Pipistrellus</i> sp. social call*	West	281955	187736
21/09/2021	19:48:32	Soprano pipistrelle	West	281955	187736
21/09/2021	19:48:32	Common pipistrelle	West	281955	187736
21/09/2021	19:48:37	Soprano pipistrelle	East	281955	187736
21/09/2021	19:48:42	Soprano pipistrelle	West	281955	187736
21/09/2021	19:50:09	Soprano pipistrelle	East	281935	187731
21/09/2021	19:52:01	Soprano pipistrelle	East	281932	187705
21/09/2021	19:53:25	Common pipistrelle	West	281932	187683
21/09/2021	19:54:04	Soprano pipistrelle	East	281932	187666
21/09/2021	19:54:42	Soprano pipistrelle	East	281932	187666
21/09/2021	19:55:15	Soprano pipistrelle	East	281924	187663
21/09/2021	19:56:19	Soprano pipistrelle	East	281921	187639
21/09/2021	19:56:52	Common pipistrelle	East	281921	187639
21/09/2021	19:57:56	Soprano pipistrelle	East	281897	187624
21/09/2021	19:58:51	Soprano pipistrelle	East	281862	187612
21/09/2021	20:00:15	Common pipistrelle	East	281804	187603
21/09/2021	20:00:48	Common pipistrelle	East	281804	187603
21/09/2021	20:01:19	Common pipistrelle	East	281761	187601
21/09/2021	20:01:51	Soprano pipistrelle	East	281761	187601
21/09/2021	20:01:51	Common pipistrelle	East	281761	187601
21/09/2021	20:01:51	<i>Pipistrellus</i> sp. social call*	East	281761	187601
21/09/2021	20:02:24	Common pipistrelle	East	281727	187593
21/09/2021	20:03:43	Common pipistrelle	East	281686	187586
21/09/2021	20:04:29	Common pipistrelle	East	281659	187572
21/09/2021	20:08:23	Common pipistrelle	East	281523	187521
21/09/2021	20:15:13	Common pipistrelle	West	281389	187457
21/09/2021	20:15:13	<i>Pipistrellus</i> sp. social call*	West	281389	187457
21/09/2021	20:16:11	Common pipistrelle	West	281353	187428
21/09/2021	20:16:25	Common pipistrelle	West	281353	187428
21/09/2021	20:16:35	Common pipistrelle	West	281353	187428
21/09/2021	20:16:35	<i>Pipistrellus</i> sp. social call*	West	281353	187428
21/09/2021	20:17:11	Common pipistrelle	West	281363	187399

Date	Time	Species	Transect	X (Easting)	Y (Northing)
21/09/2021	20:17:11	<i>Pipistrellus</i> sp. social call*	West	281363	187399
21/09/2021	20:28:53	Common pipistrelle	West	281467	187329
21/09/2021	20:28:53	<i>Pipistrellus</i> sp. social call*	West	281467	187329
21/09/2021	20:48:05	Soprano pipistrelle	West	281220	187329
21/09/2021	20:48:05	<i>Pipistrellus</i> sp. social call*	West	281220	187329
21/09/2021	20:48:44	Soprano pipistrelle	West	281220	187329
21/09/2021	20:48:44	<i>Pipistrellus</i> sp. social call*	West	281220	187329
21/09/2021	20:49:34	Soprano pipistrelle	West	281220	187329
21/09/2021	20:53:43	Soprano pipistrelle	West	281220	187329
21/09/2021	20:56:07	Common pipistrelle	West	281220	187329
21/09/2021	20:56:21	Soprano pipistrelle	West	281220	187329
21/09/2021	20:56:21	<i>Pipistrellus</i> sp. social call*	West	281220	187329
21/09/2021	20:56:33	Soprano pipistrelle	West	281220	187329
21/09/2021	20:56:33	<i>Pipistrellus</i> sp. social call*	West	281220	187329
21/09/2021	20:56:55	Soprano pipistrelle	West	281220	187329
21/09/2021	20:56:55	<i>Pipistrellus</i> sp. social call*	West	281220	187329
21/09/2021	21:10:52	Common pipistrelle	East	281220	187329
21/09/2021	21:15:30	Soprano pipistrelle	West	281220	187329
21/09/2021	21:30:48	Soprano pipistrelle	West	281220	187329
21/09/2021	21:31:58	Soprano pipistrelle	East	281220	187329
21/09/2021	21:33:02	Soprano pipistrelle	West	281220	187329
21/09/2021	21:33:15	Soprano pipistrelle	West	281220	187329
21/09/2021	21:33:15	<i>Pipistrellus</i> sp. social call*	West	281220	187329
21/09/2021	21:33:32	Possible brown long-eared bat*	West	281220	187329
21/09/2021	21:33:52	<i>Pipistrellus</i> sp.	East	281220	187329
21/09/2021	21:35:03	Soprano pipistrelle	West	281220	187329
21/09/2021	21:36:10	Soprano pipistrelle	East	281220	187329
21/09/2021	21:36:20	Soprano pipistrelle	West	281220	187329
21/09/2021	21:37:37	Soprano pipistrelle	West	281220	187329
12/10/2021	18:37:10	Soprano pipistrelle	East	282546	187805
12/10/2021	18:37:25	Soprano pipistrelle	East	282546	187805
12/10/2021	18:37:40	Soprano pipistrelle	East	282546	187805
12/10/2021	18:51:39	Soprano pipistrelle	West	282446	187559
12/10/2021	19:01:25	<i>Myotis</i> sp.	West	281968	187459
12/10/2021	19:05:09	Common pipistrelle	West	281780	187395
12/10/2021	19:46:27	Soprano pipistrelle	East	281228	187346
12/10/2021	19:46:27	<i>Pipistrellus</i> sp. social call*	East	281228	187346
12/10/2021	19:46:42	Soprano pipistrelle	East	281228	187346

Date	Time	Species	Transect	X (Easting)	Y (Northing)
12/10/2021	19:47:11	Soprano pipistrelle	East	281228	187346
12/10/2021	19:47:24	Soprano pipistrelle	East	281228	187346
12/10/2021	19:47:24	<i>Pipistrellus</i> sp. social call*	East	281228	187346
12/10/2021	19:53:20	<i>Pipistrellus</i> sp. social call*	West	281228	187346
12/10/2021	19:54:01	<i>Pipistrellus</i> sp. social call*	West	281228	187346
12/10/2021	20:00:38	Common pipistrelle	West	281228	187346
12/10/2021	20:01:06	Common pipistrelle	West	281228	187346
12/10/2021	20:01:43	Common pipistrelle	West	281228	187346
12/10/2021	20:04:18	Soprano pipistrelle	East	281228	187346
25/10/2021	18:19:29	Soprano pipistrelle	West	282535	187941
25/10/2021	18:21:17	Possible noctule*	East	282509	187884
25/10/2021	19:06:36	Soprano pipistrelle	East	281246	187341
25/10/2021	19:07:13	<i>Pipistrellus</i> sp.	East	281246	187341
25/10/2021	19:08:11	Soprano pipistrelle	East	281246	187341

Preliminary Bat Roost Assessment

Table A6.12: Potential Roost Features (PRFs) from the daytime inspection of trees and other structures with the potential to support bat roosts

Grid Reference (Easting, Northing)		Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Photos
1	282894 193177	Good	Conifer	Mature - dead	Hole; Wound; Rot; Lifting bark; Snapped branch	Various	Various	

Date	Time	Species	Transect	X (Easting)	Y (Northing)
25/10/2021	19:08:30	Soprano pipistrelle	East	281246	187341
25/10/2021	19:08:50	Soprano pipistrelle	East	281246	187341
25/10/2021	19:09:09	Soprano pipistrelle	East	281246	187341
25/10/2021	19:09:38	Soprano pipistrelle	East	281246	187341
25/10/2021	19:11:44	Soprano pipistrelle	East	281246	187341
25/10/2021	19:12:16	Soprano pipistrelle	East	281246	187341
25/10/2021	19:12:29	Soprano pipistrelle	East	281246	187341
25/10/2021	19:12:29	Noctule	East	281246	187341
25/10/2021	19:12:49	Soprano pipistrelle	East	281246	187341
25/10/2021	19:13:34	Soprano pipistrelle	East	281246	187341

NB. Records marked with an asterisk (*) were not used in the bat analysis – social calls and species not positively identified

Source: Natural Power

Grid Reference (Easting, Northing)		Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Photos
2	281611 191005	Good	Conifer	Mature - dead	Hole; Wound; Rot; Lifting bark; Snapped branch; Internal crack	Various	Various	
3	282942 190682	Good	Oak	Mature - alive	Hole; Cut; Wound; Lifting bark; Snapped branch	Various	Various	
4	283091 190079	Good	Conifer	Over-mature	Hole; Wound; Rot; Lifting bark; Snapped branch	Various	Various	

Grid Reference (Easting, Northing)		Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Photos
5	282368 189068	Good	Conifer	Mature - dead	Lifting bark	0m to 10m	Various	
6	282575 189266	Good	Conifer	Mature - dead	Hole; Rot; Lifting bark. Woodpecker holes.	0m to 8m	Various	
7	282818 189531	Good	Conifer	Mature - dead	Hole; Wound; Rot; Lifting bark	2m to 5m	Various	
8	283049 188777	Good	Conifer	Mature - dead	Hole; Rot. Woodpecker holes.	Various		
9	281408 188517	Good	Beech	Ancient - alive	Hole; Wound; Rot; Lifting bark; Snapped branch	Various		
10	282862 193251	Low	Conifer	14 dead trees				
11	283783 192062	Low			Breezblock structure with roof			
12	283261 191056	Low	Group of trees	Dead				
13	281824 190764	Moderate	Beech	Mature woodland				

	Grid Reference (Easting, Northing)	Roost Potential	Tree Species	Life Stage	PRF		Height	Orientation	Photos
1 4	282079 189663	Moderate	Native	Mature woodland	Situated in a ravine				NA
1 5	283841 191146	Moderate	Ash, sycamore	Row of mature trees	Ivy; Cracks		Various	Various	

Source: Natural Power

Protected Mammal Surveys: Otter/Water Vole and Badger/Pine Marten/Polecat

A6.1.25 A summary of all protected mammal signs recorded during baseline surveys (within 750 m of wind farm infrastructure plus AIL area and 250 m buffer) are shown in Table A6.13. The locations of the badger setts are not provided here but are given in a separate Appendix 6.2: Ecology Confidential Appendix.

Table A6.13: Protected mammal survey results

Date	Easting, Northing	Species	Confidence of record	Nature of record	Comments
17/06/2021	283384 191038	Badger	Definite	Latrine	
17/06/2021	283504 190954	Badger	Probable	Snuffle hole	
19/07/2021	283031 188636	Badger	Definite	Badger seen	Badger seen crossing track during ornithology survey.
22/07/2021	280719 189966	Polecat	Definite	Polecat seen	Polecat seen during ornithology survey.
23/08/2021	See Appendix 6.2	Badger	Definite	Badger sett	Minimum of three holes, with one hole with recent soil digging near entrance. Incidental record during bat transect survey.
26/08/2021	See Appendix 6.2	Badger	Definite	Badger sett	Minimum eight holes. At least two holes appeared to be in regular use with latrines and fresh digging.
26/08/2021	283210 190142	Badger	Probable	Wasp nest predated	
08/04/2022	283879 191110	Otter	Probable	Slide	Running into small watercourse.

Source: Natural Power

Dormouse Survey

Dormouse Habitat Assessment

A6.1.26 A dormouse habitat assessment was undertaken to help determine placement of dormouse nest-tubes. As there are no hedgerows, potential habitat for dormouse is limited to productive forestry, patches of semi-natural or planted broadleaved or mixed woodland and dense/scattered scrub with

scattered trees. Although it is acknowledged that this method of assessment is not accepted in Wales, the information presented below is included for completeness.

A6.1.27 Using the Phase 1 habitat survey completed in 2020, areas within 150 m of infrastructure were targeted. Each area was assessed according to the following scoring system derived from The Dormouse Conservation Handbook³:

³ Bright P, Morris P & Mitchell-Jones T (2006) *The dormouse conservation handbook* Second edition. English Nature

- Below 300 m altitude (+1 point), above 300 m (-1);
 - Canopy layer (>5 m in height) has >4 desirable species⁴ (+1), <3 desirable species (-1);
 - Shrub layer⁴ (<5 m in height) >4 desirable species (+1), <3 desirable species (-1);
 - Presence of hazel and/or honeysuckle, + 1 point for each;
 - Scrub layer well developed (+1 point, poorly developed -1);
 - Presence of log/brash Pile: +1 point;
 - Two or more standard trees +1 point;
 - Evidence of Fruiting - R (1 point), O - 2, F - 3, A - 4, D 5⁵;
- Presence of Natural Nesting Sites (e.g. standing dead wood, crevices, birds’ nests, squirrel drays) R/O (1 point), F/A/D (2 points);
 - Seasonally waterlogged yes (-1 point);
 - Ground flora species rich (+ 1 point), species poor (- 1 point);
 - Woodland size in hectares: >50 ha (1 point) 2-20 ha (0 point) < 2 ha (-1); and
 - On / adjacent to ancient woodland yes (1 point), No (-1)
- A6.1.28 A summary of the dormouse habitat assessment is shown in Table A6.14. All surveyed habitat was regarded as being ‘poor’ or ‘very poor’ for dormice, based on the assessment criteria.

Table A6.14: Summary of dormouse habitat assessment

Dormouse Nest-tubes nos.	Closest infrastructure	Habitat Description	Habitat Score	Habitat Assessment ⁶
1 - 14	T02 and track	A clearing along the edge of mature coniferous woodland which ranges in altitude from 280 - 320 m. It consists of an area of young plantation coniferous woodland. There are rare ash trees with occasional to locally frequent bramble scrub and occasional willow trees/scrub on a moderate north facing slope. In the field layer there is a patchwork of heathland (bilberry, heather, western gorse), purple moor-grass damp grassland and rosebay willowherb. There are also small areas of acid flush vegetation with soft-rush and bog-mosses.	4	Very poor
15 - 28	T03	This area of mixed woodland is alongside the edge of mature plantation coniferous woodland at about 325 m in altitude. There is a stream flowing along its east boundary. There are occasional Sitka spruce and ash trees with abundant bramble and occasional willow in the shrub layer. In the field layer there is occasional patches of heathland (bilberry and heather) and rank grassland.	4	Very poor
29 - 41	T06 and tracks	At about 320 m in altitude the habitat consists of a mosaic of bramble scrub, bracken, scattered mixed woodland, rank marshy and damp neutral grassland and heathland adjacent to a coniferous woodland.	4	Very poor
42 - 50	Track	At just under 300 m in altitude the habitat consists of an area of frequent young willow trees and frequent bramble scrub with rare young ash, oak, Sitka spruce and Scot's pine trees. In the scant field layer under the frequent bramble there is a patchwork of heathland (bilberry, heather, western gorse), purple moor-grass, damp neutral grassland and rosebay willowherb.	7	Poor
51-75	T07, T09 and tracks	At about 230 - 250 m altitude the habitat consists of an area of mixed woodland with frequent beech and Scot's pine trees in the canopy and locally frequent willow trees. There is a poorly developed shrub layer with locally frequent bramble and willow. In the field layer there are scattered patches of bracken but overall, very little is growing under the mature canopy.	3	Very poor
76 - 82	T10	Along the edge of mature coniferous woodland uphill from an Ancient Woodland Site at an altitude of about 250 m. There are poorly developed shrub and field layers present under the dense shade of the coniferous woodland. However, adjacent to the coniferous woodland along the verge of a track and within a small forestry clearing, there is dry acid grassland and marshy grassland with scattered bramble shrub.	3	Very poor
83 - 89	Track	An area of mixed woodland at just under 300 m in altitude, adjacent to a stream flowing down a gully on an east facing slope. There is frequent willow, occasional oak and Sitka spruce with rare alder, rowan and birch trees in the canopy. The trees are predominantly young being less than 10 years old. In the shrub layer there is frequent bramble with locally frequent gorse. In the field layer there is continuous bracken and locally frequent bilberry.	6	Poor
90 - 100	T18, substation, and tracks	At just under 300 m in altitude the area is predominantly a large clearing in the plantation conifer woodland with transitional marshy grassland and wet heathland habitat dominated by purple moor-grass. The habitat has become overgrown with frequent bramble scrub and large patches of bracken. There are young, scattered trees such as occasional to locally frequent willow and rare ash, rowan and Sitka spruce with a line of trees along the stream towards the eastern end of area. The trees are predominantly young estimated to be less than ten years old.	5	Very poor

Source: Natural Power

⁴ Alder, Birch, Sweet Chestnut, Hazel, Hawthorn, Ash, Ivy, Crab-apple, Blackthorn, Oak, Bramble, Willow, Yew, Wych Elm

⁵ D – dominant, A – abundant, F – frequent, O – occasional, R - rare

⁶ 13 points and over - very good potential habitat for Dormouse, 9 points and over - potential habitat for Dormouse, 8 points and below poor habitat for Dormouse, 5 points and below very poor habitat for Dormouse.

Desk study

A6.1.29 The SEWBRc data returned records of protected or notable species within the search area. This was the site boundary plus 2 km for all ecological features except bats, for which a 5 km buffer was used. Table A6.15 summarises the 40 species of moth in the returned data. These are Section 7 listed species (Sec7), but none appear on the LBAP lists. Due to the large number of records returned only those recorded since 2015 are included (Ornithological features are listed in Chapter 7: Ornithology Assessment). It should be noted that, as with all data supplied by a biological records centre, the records in the database will be influenced by observer effort (e.g. in the distribution of records and in the species recorded).

Table A.15: Moth species recorded within the site boundary + 2 km 2015-2021

Species	No. records	Most recent	Protection/conservation status
Anomalous	10	2021	Sec7
Autumnal Rustic	13	2021	Sec7
Blood-vein	10	2021	Sec7
Brindled Beauty	20	2021	Sec7
Broom Moth	13	2021	Sec7
Buff Ermine	26	2021	Sec7
Centre-barred Sallow	1	2021	Sec7
Cinnabar	17	2021	Sec7
Dark Brocade	1	2016	Sec7
Dark-barred Twin-spot Carpet	14	2021	Sec7
Dot Moth	22	2021	Sec7
Dusky Brocade	12	2021	Sec7
Dusky Dart	2	2016	Sec7
Dusky Thorn	5	2021	Sec7
Ear Moth	1	2015	Sec7
Feathered Gothic	2	2018	Sec7

Species	No. records	Most recent	Protection/conservation status
Flounced Chestnut	2	2021	Sec7
Forester	3	2020	Sec7
Galium Carpet	1	2020	Sec7
Garden Tiger	15	2021	Sec7
Ghost Moth	6	2016	Sec7
Green-brindled Crescent	1	2021	Sec7
Hedge Rustic	12	2020	Sec7
Knot Grass	21	2021	Sec7
Lackey	4	2016	Sec7
Latticed Heath	6	2021	Sec7
Minor Shoulder-knot	1	2019	Sec7
Mottled Rustic	6	2019	Sec7
Neglected Rustic	9	2021	Sec7
Oak Hook-tip	2	2016	Sec7
Oblique Carpet	1	2021	Sec7
Powdered Quaker	4	2021	Sec7
Rosy Minor	3	2020	Sec7
Rosy Rustic	4	2021	Sec7
Rustic	6	2021	Sec7
Sallow	14	2021	Sec7
Shoulder-striped Wainscot	21	2021	Sec7
Small Phoenix	31	2021	Sec7
Small Square-spot	9	2018	Sec7
White Ermine	24	2021	Sec7

Source: SEWBRc