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Appendix 7.1

Ecology Technical Appendix

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List of Abbreviations

Abbreviation	Description
BAI	Bat Activity Index
CI	Confidence Intervals
ECoW	Environmental Clerk of Works
EIAR	Environmental Impact Assessment Report
GPS	Global Positioning System
GWDTE	Ground Water Dependent Terrestrial Ecosystem
HabRegs	The Conservation of Habitat and Species Regulations 2017
HLC	Habitat Loss Calculations
JNCC	Joint Nature Conservation Committee
MCB	Mixed Conifer Broadleaf Plantation
NVC	National Vegetation Classification

Abbreviation	Description
PRF	Potential Roost Feature
PS(RO)	Priority Species (Research Only)
QGIS	Quantum Geographic Information System
RLGB.Lr (NT)	GB Red List – Lower Risk (Near Threatened)
RLGB.VU	GB Red List - Vulnerable
SAC	Special Area of Conservation
SBL	Scottish Biodiversity List
SFCC	Scottish Fisheries Coordination Centre
TWIC	The Wildlife Information Centre
UKBAP	UK Biodiversity List
WCA	The Wildlife and Countryside Act 1981

A7.1 INTRODUCTION

A7.1.1 This Technical Appendix presents the following information in support of the Chapter 7: Ecology of the Environmental Impact Assessment Report (EIAR) for Scawd Law Wind Farm (the 'Proposed Development'):

- Existing non-confidential ecology records within a 5 km radius (10 km for bats) of the Proposed Development Area, held by The Wildlife information Centre (TWIC);
- Details of habitat surveys carried out by Natural Power; and
- Details of protected mammal surveys carried out by Natural Power.

A7.2 LATIN NAMES

A7.2.1 Latin and English names of all animal species referred to in Chapter 7: Ecology are given in Table A7.1, Latin names and English names of all plant and lichen species referred to in Chapter 7 are given in Table A7.2. As many of the plants in the chapter will actually have been referred to using their Latin name these tables are providing a reference to both names.

Table A7.1: Latin and English names of animal species referred to in Chapter 7

Taxon group	Scientific Name	Common Name
Amphibian	*Bufo bufo*	Common toad
Amphibian	*Rana temporaria*	Common frog
Reptile	*Vipera berus*	Adder
Reptile	*Zootoca vivipara*	Common lizard
Fish	*Anguilliformes sp.*	Eel species
Fish	*Lampetra fluviatilis*	River lamprey
Fish	*Lampetra planeri*	Brook lamprey
Fish	*Petromyzon marinus*	Sea lamprey
Fish	*Salmo salar*	Atlantic salmon
Fish	*Salmo trutta*	Brown trout
Terrestrial Mammal	*Erinaceus europaeus*	Hedgehog
Terrestrial Mammal	*Lutra lutra*	Otter
Terrestrial Mammal	*Martes martes*	Pine marten
Terrestrial Mammal	*Meles meles*	Badger
Terrestrial Mammal	*Sciurus carolinensis*	Grey squirrel
Terrestrial Mammal	*Sciurus vulgaris*	Red squirrel
Terrestrial Mammal	*Arvicola amphibius*	Water vole
Terrestrial Mammal - bat	*Myotis sp.*	Mouse-eared bat species
Terrestrial Mammal - bat	*Nyctalus sp.*	Noctule bat species
Terrestrial Mammal - bat	*Nyctalus leisleri*	Leisler's bat
Terrestrial Mammal - bat	*Nyctalus noctula*	Common noctule
Terrestrial Mammal - bat	*Pipistrellus sp.*	Pipistrelle bat species
Terrestrial Mammal - bat	*Pipistrellus nathusii*	Nathusius' pipistrelle
Terrestrial Mammal - bat	*Pipistrellus pipistrellus*	Common pipistrelle

Taxon group	Scientific Name	Common Name
Terrestrial Mammal - bat	*Pipistrellus pygmaeus*	Soprano pipistrelle
Terrestrial Mammal - bat	*Plecotus sp.*	Long-eared bat species
Terrestrial Mammal - bat	*Plecotus auritus*	Brown long-eared bat
Insect - Butterfly	*Aricia artaxerxes*	Northern brown argus
Insect - Butterfly	*Coenonympha pamphilus*	Small heath
Insect – Moth	*Eugnorisma glareosa*	Autumnal rustic
Insect – Moth	*Dasypolia templi*	Brindled ochre
Insect – Moth	*Ceramica pisi*	Broom moth
Insect – Moth	*Agrochola litura*	Brown-spot pinion
Insect – Moth	*Spilarctia luteum*	Buff ermine
Insect – Moth	*Atethmia centrago*	Centre-barred sallow
Insect – Moth	*Mniotype adusta*	Dark brocade
Insect – Moth	*Apamea remissa*	Dusky brocade
Insect – Moth	*Tholera decimalis*	Feathered gothic
Insect – Moth	*Arctia caja*	Garden tiger
Insect – Moth	*Hepialus humuli*	Ghost moth
Insect – Moth	*Allophyes oxyacanthae*	Green-brindled crescent
Insect – Moth	*Celaena haworthii*	Haworth's minor
Insect – Moth	*Xestia agathina*	Heath rustic
Insect – Moth	*Acronicta rumicis*	Knot grass
Insect – Moth	*Brachylomia viminalis*	Minor shoulder-knot
Insect – Moth	*Xestia castanea*	Neglected rustic
Insect – Moth	*Trichiura crataegi*	Pale eggar
Insect – Moth	*Orthosia gracilis*	Powdered quaker
Insect – Moth	*Hydraecia micacea*	Rosy rustic
Insect – Moth	*Xanthia icteritia*	Sallow
Insect – Moth	*Leucania comma*	Shoulder-striped wainscot
Insect – Moth	*Ecliptopera silaceata*	Small phoenix
Insect – Moth	*Diarsia rubi*	Small square-spot
Insect – Moth	*Chesias legatella*	Streak moth
Insect – Moth	*Spilosoma lubricipeda*	White ermine

Source: Natural Power

Table A7.2: Latin and English names of plant and lichen species referred to in Chapter 7

Type	Scientific Name	Common Name
Herb	*Calluna vulgaris*	Heather
Herb	*Erica cinerea*	Bell heather
Herb	*Galium palustre*	Marsh bedstraw
Herb	*Galium saxatile*	Heath bedstraw
Herb	*Lysimachia nemorum*	Yellow pimpernel
Herb	*Mercurialis perennis*	Dog's mercury
Herb	*Montia fontana*	Blinks
Herb	*Oxalis acetosella*	Wood-sorrel
Herb	*Pinguicula vulgaris*	Common butterwort
Herb	*Potentilla erecta*	Tormentil
Herb	*Ranunculus omiophyllus*	Round-leaved crowfoot
Herb	*Rubus fruticosus*	Blackberry
Herb	*Saxifraga stellaris*	Starry saxifrage
Herb	*Thymus praecox*	Wild thyme
Herb	*Vaccinium myrtillus*	Bilberry
Tree/shrub	*Acer campestre*	Field maple
Tree/shrub	*Alnus glutinosa*	Black alder
Tree/shrub	*Betula pubescens*	Downy birch
Tree/shrub	*Corylus*	Hazel
Tree/shrub	*Crataegus monogyna*	Common hawthorn
Tree/shrub	*Fraxinus excelsior*	European ash
Tree/shrub	*Hedera helix*	Common ivy
Tree/shrub	*Quercus petraea*	Sessile oak
Tree/shrub	*Sorbus aucuparia*	Rowan
Tree/shrub	*Ulex europaeus*	Common gorse
Tree/shrub	*Ulmus glabra*	Wych elm
Grass	*Agrostis capillaris*	Common bent
Grass	*Arrhenatherum elatius*	False oat-grass
Grass	*Cynosurus cristatus*	Crested dog's-tail
Grass	*Deschampsia cespitosa*	Tufted hairgrass
Grass	*Deschampsia flexuosa*	Wavy hair-grass
Grass	*Festuca ovina*	Sheep's fescue
Grass	*Holcus lanatus*	Yorkshire fog
Grass	*Lolium perenne*	Perennial ryegrass
Grass	*Molinia caerulea*	Purple moor-grass
Grass	*Nardus stricta*	Mat-grass
Sedge	*Carex dioica*	Dioecious sedge
Sedge	*Eriophorum angustifolium*	Common cottongrass
Sedge	*Eriophorum vaginatum*	Hare's-tail cottongrass
Sedge	*Trichophorum cespitosum*	Deergrass
Rush	*Eleocharis palustris*	Common spike-rush

Type	Scientific Name	Common Name
Rush	*Juncus acutiflorus*	Sharp-flowered rush
Rush	*Juncus effusus*	Soft rush
Rush	*Juncus squarrosus*	Heath rush
Fern	*Pteridium aquilinum*	Bracken
Horsetail	*Equisetum fluviatile*	Water horsetail
Moss	*Philonotis fontana*	Fountain apple-moss

Source: Natural Power

A7.3 SURVEY METHODS

A7.3.1 Baseline surveys were carried out between June and September 2019 (inclusive) and May and October 2021 to assess the habitats present in the Proposed Development Area and to quantify use of the development and surrounding area by protected mammal species.

A7.3.2 All field surveys were undertaken by the following experienced ecological surveyors:

- Adam Anderson (AA);
- Helen Allinson (HA); and
- Jack Bell (JB).

A7.3.3 The survey methods are described below.

Phase 1 Habitat Surveys

A7.3.4 Phase 1 Habitat surveys were carried out within the updated survey area and a 300 m buffer in August 2019. Further surveys were carried out in 2021 on the Primary Proposed Access.

A7.3.5 The Phase 1 habitat survey methodology provides a standardised system for classifying and mapping semi-natural vegetation and wildlife habitats over large areas of countryside.

A7.3.6 Habitats across the survey area were identified and mapped using the standard Joint Nature Conservation Committee (JNCC) Phase 1 habitat classification[1].

A7.3.7 The survey was 'extended' to search for and record signs of legally protected or other notable species, and to assess the potential for the habitats to support such species.

National Vegetation Classification (NVC)

A7.3.8 National Vegetation Classification (NVC) surveys were carried out in conjunction with the Phase 1 Habitat Surveys across the Proposed Development Area in August 2019. Further surveys were carried out in 2021 along the Proposed Access Route

A7.3.9 The NVC is a detailed phytosociological classification, which assesses the full suite of vascular plant, bryophyte and macro-lichen species within a certain vegetation type.

A7.3.10 NVC community and sub-community types were identified in the field (based on extensive surveyor experience) and delineated and mapped using Global Positioning System (GPS) as per Chapter 10 of the NVC Users' Handbook[2]. Where areas were considered to comprise mosaics or complexes of different habitat communities, the proportion of each was estimated in percentage terms. Details of habitat types identified within the survey area are provided in Chapter 7: Ecology of the EIAR.

A7.3.11 Target Notes were recorded to provide an overview of the habitat types present and any features of ecological interest.

Habitat Loss Calculations (HLC)

A7.3.12 Habitat loss calculations were carried out using a bespoke tool developed within the R statistical scripting environment (R Core Team[3], 2021). 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 development. Each infrastructure polygon is 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 is dealt with in a hierarchical way to avoid inclusion of the same areas of habitat twice. Loss attributed to tracks (which includes the crane pad areas) was calculated first, followed by additional loss associated with buildings, turbine foundations and the borrow pit and finally the track earthworks. Another bespoke tool that replicates this process developed using the graphical modeller in QGIS version 3.10 was also run and the results of each method were checked for consistency as part of the quality assurance process.

A7.3.13 Habitat loss was calculated separately for:

- Access tracks (5 m width);
- Proposed new tracks (5 m width);
- Substation/Control Building and Battery Storage compound;
- 8 turbine foundations (18 m diameter);
- Track earthworks; and
- Permanent Met Mast.

A7.3.14 Total habitat loss was calculated by summing the loss associated with each individual feature. Additionally, for each habitat type, the proportion of the total area of that habitat type recorded during surveys within the site boundary lost was also calculated.

Bat Surveys

Roost Assessment

A7.3.15 Walkover of the site and surrounding area was undertaken on 17 and 23 July 2019 to identify and assess potential bat roosts. Notes were taken of any habitat suitable for roosting, as well as any areas likely to provide key foraging or commuting habitat.

[1] JNCC, (2010). Handbook for Phase 1 habitat survey - a technique for environmental audit, ISBN 0 86139 636 7

[2] Rodwell, J.S, (2006). NVC Users' Handbook, 68 pages, ISBN 978 1 86107 574 1

[3] R Core Team (2021). R: A language and environment for statistical computing. R Foundation for Statistical Computing, Vienna, Austria. URL https://www.R-project.org/.

A7.3.16 Survey of any trees or buildings within 200 m of the proposed turbine locations (which were current at the time of survey) was undertaken in accordance with NatureScot guidance[4] [5]. This included a preliminary assessment for any cracks, holes and crevices which would provide suitable roosting habitat. The inspection was undertaken from ground level with a powerful torch and binoculars.

Automated Static Detector Surveys

A7.3.17 Bat activity surveys were undertaken in 2019, with 13 static detectors (full spectrum Wildlife Acoustic SM4 detectors) placed within the Proposed Development Area including three controlled areas in higher valued habitat within the Proposed Development: mature coniferous and broadleaved woodland, pond and stream. Following the methodology outlined in NatureScot[4] and Hundt[6], a minimum of ten nights of survey was conducted during 2019 in each of the bat active seasons (early summer, summer and autumn).

A7.3.18 Static detectors were deployed twice during the summer and once in the autumn: June (Survey 1), July (Survey 2) and September (Survey 3), for 14 nights each deployment. The early summer survey (3-16 June) was conducted due to no spring survey and only 10 bat detectors were deployed for the survey due to detector availability.

A7.3.19 The turbine locations represented the old turbine layout (18 turbines). The final turbine layout was subsequently altered, therefore static detectors were not located in the exact positions of turbines in the new layout. A summary of the automated survey schedule is provided in Table A7.3.

A7.3.20 Detectors were programmed to commence recording from 1 hour before sunset and continue until 1 hour after sunrise, to cover the active period for all species potentially encountered on site. Detectors recorded data to a memory card which was downloaded and later analysed to identify species present. Activity levels were also established from this data, based on the number of 'bat passes' recorded. Bat passes were defined as a fifteen-second recording file containing at least one bat call.

Table A7.3: Static bat detector deployment dates and locations

Detector	X	Y	Survey	Date Out	Date In	No. Nights Deployed
Pond	337384	641572	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
MCB*	337211	641486	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
Stream	337660	640702	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
A	335165	640360	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
B	335244	640887	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
C	335422	641378	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
D	335960	641674	1	NA**	NA	NA
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
E	336291	642037	1	NA	NA	NA
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
F	336595	641178	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
G	336876	640451	1	NA	NA	NA
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
H	337274	642633	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
I	337496	642260	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14
J	337695	641845	1	03/06/2019	17/06/2019	14
			2	17/07/2019	01/08/2019	14
			3	19/08/2019	02/09/2019	14

Source: Natural Power
**MCB = Mixed conifer broadleaf plantation*
***NA = Survey 1 not conducted*

A7.3.21 Weather data was provided from a local weather station[7] nearest to the proposed development and used to inform the bat data analysis. It is recommended that data is only used where the temperature is 8°C or higher and wind speeds are 5m/s or lower. A summary of the weather data is provided in Table A7.4. Highlighted rows (in pink) denotes data removed from analysis due to the adverse weather conditions.

Table A7.4: Summary of weather conditions at the Proposed Development during bat activity surveys

	Temperature (°C)			Rainfall	Wind
Date	Max.	Min.	Average	Rain (mm)	Average wind speed (mph)
Early summer					

[4] SNH, Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd., the University of Exeter, and Bat Conservation Trust (BCT) (2019). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

[5] NatureScot (Scottish Natural Heritage), Natural England, Natural Resources Wales, RenewableUK, Scottish Power Renewables, Ecotricity Ltd, the University of Exeter and the Bat Conservation Trust (BCT) (2021). Bats and Onshore Wind Turbines: Survey, Assessment and Mitigation.

[6] Hundt (2012). Bat Surveys: Good Practice Guidelines, 2nd edition. BCT, London.

[7] Weather data collected from http://www.bordersweather.co.uk/

	Temperature (°C)			Rainfall	Wind
03/06/2019	14.6	9.2	11.6	1	7.5
04/06/2019	17.6	8.1	11.7	7.2	1.6
05/06/2019	18.6	9.1	12.4	6.2	2.2
06/06/2019	19.9	6.9	13.1	0	3
07/06/2019	18.8	3.4	11.1	3.6	1.6
08/06/2019	14	9	10.7	8.2	1.9
09/06/2019	16.8	7.3	11.7	0	2.6
10/06/2019	19.9	2.7	11.1	1	0.9
11/06/2019	14.3	4.6	9.8	0	2.2
12/06/2019	10.2	8.6	9.4	7.1	6.2
13/06/2019	9.4	6.5	7.9	24.2	3.7
14/06/2019	17	6.9	11	0	0.9
15/06/2019	18.4	7.5	12.2	1	0.3
16/06/2019	18.6	4.3	12	1	1.5
Summer					
17/07/2019	19.6	11.3	14.8	3.6	2.1
18/07/2019	19.6	9.5	14.8	0.5	2.4
19/07/2019	22.6	9.6	15.3	3.6	0.9
20/07/2019	20.9	11.3	16.3	4.6	1.3
21/07/2019	19.6	8.6	14.5	4.6	3
22/07/2019	22.4	14.2	18	1	7.6
23/07/2019	27.3	15.4	20	0	3.5
24/07/2019	23.3	14.1	19	9.3	2.5
25/07/2019	32.3	12.8	21.3	0	1.5
26/07/2019	27.3	15.9	19.2	4.1	0.4
27/07/2019	19.8	14.3	15.9	13.9	0.5
28/07/2019	22.6	15	17.9	0.5	0.6
29/07/2019	19.3	14.2	17.1	0	0.5
30/07/2019	22.2	10.1	15.9	1.5	0.7
31/07/2019	21.3	15.3	17.5	1.5	1.2
Autumn					
09/08/2019	19.6	12.8	15.4	32.2	2.8
10/08/2019	21	12.3	15.9	15	0.2
11/08/2019	14.8	8.5	12.5	21.6	0.4
12/08/2019	18.1	8.4	11.8	2	0.1
13/08/2019	17.9	5.3	11.5	0.5	0.4
14/08/2019	17.7	5.9	11.8	2.5	0.2
15/08/2019	19.4	10.9	14.4	1	1.2
16/08/2019	18.5	10.9	14.4	14.5	2.3
17/08/2019	19.4	10.9	14.2	1.5	3.9
18/08/2019	17.3	10.8	13.3	0.5	4
19/08/2019	18.8	9.9	13.7	0	2.2
20/08/2019	19	8.4	13.1	2	0.3
21/08/2019	19.6	6.6	13.1	1	3.8
22/08/2019	19.8	9.6	14.6	1	3.3
23/08/2019	22.4	13.1	16.9	0	4
24/08/2019	28.2	9.6	18	0	0.4
25/08/2019	31.3	9.6	19.4	0	0.4
26/08/2019	25.3	12.6	17.7	0	1.3
27/08/2019	26.9	9.9	16.7	0.5	0.3
28/08/2019	19	8.8	14.6	0.5	2.3
29/08/2019	18.9	7.1	13.1	0.5	3.5
30/08/2019	16.8	13.2	14.9	0.5	6.4
31/08/2019	18.1	7.9	14	0	5.3
01/09/2019	18.7	7.2	11.5	1.5	0.8

Source: Bordersweather.co.uk

Bat Analysis

A7.3.22 The analysis of the bat survey data was undertaken following the methodology outlined in guidance[4]. A bat pass was defined as a sequence of bat pulses captured on a 15 second sound file. One sound file was counted as one bat pass. Different species within the same 15 second sound file were counted as separate bat passes.

A7.3.23 An individual bat can pass a particular feature on several occasions while foraging. It is therefore important to acknowledge that a bat pass is an index of bat activity that describes the amount of use bats make of an area rather than a measure of the number of individuals in a population. The Bat Activity Index (BAI) is calculated by Natural Power as the median of bat passes per night, based on the number of calls per night of a given species and, on the number of hours between sunset and sunrise.

A7.3.24 Analysis was undertaken at species level (excepting *Myotis* sp.) using Kaleidoscope automatic identification software. *Myotis* sp. and in some cases *Pipistrellus sp*. and *Nyctalus sp*. were not identified further than genus due to the overlap in call-frequency between species. Signal parameters used to identify potential bat calls and filter out noise calls within the Kaleidoscope software were set to all recordings between 16-120 kHz, 2-500 ms, 500 ms maximum inter-syllable gap and with a minimum of 3 pulses.

A7.3.25 Manual checks of the auto-identified results were undertaken for quality assurance (10% of calls), as well as to confirm rarer species identification or species which could not be identified within the software. The assessment of the bat survey data was undertaken following standard guidance[5]

A7.3.26 Survey data has been submitted to Ecobat on-line tool as required by NatureScot[5].

Protected Mammal Surveys

A7.3.27 A summary of survey effort and weather conditions for protected mammal surveys are shown in Table A7.5.

Otter and Water Vole

A7.3.28 Otter and water vole surveys were undertaken in areas of suitable habitat within the Proposed Development Area plus a 250 m buffer in July 2019. Further surveys were undertaken along the Proposed Access Route in May 2021.

A7.3.29 Surveys were carried out by experienced surveyors in appropriate weather conditions. High water levels were recorded during three of the four survey visits. Otter field signs were searched for as described in Bang & Dahlstrøm (2001)[8] and Sargent & Morris (2003)[9], while water vole field signs were searched for as described in Strachan et al. (2011)[10].

A7.3.30 Any evidence of otter and water vole presence was recorded in the field, including the location of all signs, via the use of a handheld GPS and photographs to visually catalogue each record.

Badger and Pine Marten

A7.3.31 Badger and pine marten surveys were undertaken in areas of suitable habitat within the Proposed Development Area and a 150 m buffer in July 2019. Further surveys were undertaken along the Primary Proposed Access Route and a 150 m buffer in May 2021.

A7.3.32 Surveys were carried out by experienced surveyors. Badger field signs were searched for as described in Neal & Cheeseman (1996)[11], Bang & Dahlstrøm (2001)[8] and NatureScot (2001)[12], while pine marten field signs were searched for as described in Sargent & Morris (2003)[9].

A7.3.33 Any evidence of badger and pine marten presence was recorded in the field, including the location of all signs via the use of a handheld GPS and photographs to visually catalogue each record.

Red squirrel

A7.3.34 Red squirrel surveys were undertaken in July 2019 in forested areas that were within 100 m of the Proposed Development Area. Further surveys were undertaken along the Proposed Access Route in May 2021.

A7.3.35 Surveys were carried out by experienced surveyors in suitable weather conditions. Red squirrel field signs were searched for as described in Bang & Dahlstrøm (2001)[8] and Sargent & Morris (2003)[9]. All signs of squirrel (e.g. dreys or feeding signs) were considered to represent the potential presence of red squirrel, as both red and grey squirrel are known to be present in this area, and field signs on their own cannot be identified down to species.

A7.3.36 Any evidence of red squirrel presence was recorded in the field, including the location of all signs via the use of a handheld GPS and photographs to visually catalogue each record.

Table A7.5: Protected mammal survey effort and weather 2019 and 2021

Date		Observer	Start time	End time	Precipitation (last 24hrs)	Water Level
23/07/2019	All protective species	HA	09:00	16:00		Low
24/07/2019	All protective species	HA	09:30	16:00		High
25/07/2019	All protective species	HA	09:30	16:00		High
26/07/2019	All protective species	AA	09:00	17:00	Dry	Low
26/07/2019	All protective species	HA	09:30	16:00		High
14/05/2021	All protective species	JB	10:10	16:02	Light Showers	Medium

Source: Natural Power

Fish Habitat Surveys

A7.3.37 A basic fish habitat assessment (walkover survey) of the water courses was undertaken in July 2019 on the Walker, Gatehopeknowe and Hope Burn, which flow into the River Tweed and the Leithen Water, both of which are part of the River Tweed Special Area of Conservation (SAC) which is designated for Atlantic salmon, sea lamprey, river lamprey and brook lamprey. The survey method is used to assess the suitability of habitats on site to support fish species and is based upon the Scottish Fisheries Coordination Centre (SFCC) methodology[13]. Surveys were conducted within the Proposed Development Area.

A7.3.38 This methodology approximates in-stream habitat availability for fish as a percentage (%) within a known length of the water course (100 m lengths). A number of parameters are recorded for each section, including the percentage of each substrate type (bedrock, boulder, cobble, pebble, gravel, clay, sand and silt) and also the flow characteristics (pool, riffle, glide, slack). Although these surveys do not identify the presence of fish, they do highlight key habitat where certain species may be present based on known habitat preferences. The results can then inform the requirement for further survey, such as electrofishing to identify which fish species are present.

A7.4 RESULTS

Desk Study Results

A7.4.1 A desk-based study was carried out in January 2021 to assess the presence of protected species on the site. TWIC provided data on non-avian species for a 5 km buffer of the proposed turbine layout. Table A7.6 lists all protected or invasive species for which there were records from between 2010 and 2020.

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[11] Neal, E. & Cheeseman, C. (1996). *Badgers*. Poyser Natural History, London.

[12] Scottish Natural Heritage (2001). *Scotland's Wildlife: Badgers and Development*. SNH, Battleby.

[13] Hendry *and* Cragg-Hine (1997). *Environment Agency manual Restoration* of *Riverine Salmon Habitats* – A *Guidance Manual.* 2003 Version. Environment Agency, Bristol.

Table A7.6: Desk Study Results from TWIC

Taxon group	Species	No. Records	Last Recorded	Record from	Legally Protected Species	Biodiversity Lists	Invasive
Amphibian	Common Toad	1	2013	TWIC	WCA-Sch5	UKBAP, SBL	
Amphibian	Common Frog	4	2017	TWIC	WCA-Sch5		
Reptile	Common Lizard	3	2018	TWIC	WCA-Sch5	UKBAP, SBL	
Terrestrial Mammal	European Water Vole	1	2015	TWIC	WCA-Sch5	UKBAP SBL	
Terrestrial Mammal	West European Hedgehog	32	2020	TWIC		UKBAP, SBL	
Terrestrial Mammal	European Otter	5	2018	TWIC	WCA-Sch5	HabRegs-Sch2,	
Terrestrial Mammal	Pine Marten	17	2018	TWIC	WCA-Sch5	HabRegs4, SBL, UKBAP	
Terrestrial Mammal	European Badger	4	2018	TWIC	Protection of Badgers Act 1992		
Terrestrial Mammal	Eurasian Red Squirrel	65	2017	TWIC	WCA-Sch5	UKBAP, SBL	
Mammal - Bats	Myotis Sp.	125	2017	TWIC	WCA-Sch5	UKBAP, SBL	
Mammal - Bats	Common Pipistrelle	45	2016	TWIC	WCA-Sch5	UKBAP, SBL	
Mammal - Bats	Soprano Pipistrelle	51	2019	TWIC	WCA-Sch5	UKBAP, SBL	
Mammal - Bats	Brown Long Eared	25	2018	TWIC	WCA-Sch5	UKBAP, SBL	
Mammal - Bats	Bat Sp. no ID	7	2018	TWIC	WCA-Sch5	UKBAP, SBL	
Insect – Butterfly	Northern Brown Argus	4	2016	TWIC		RLGB.VU, SBL, UKBAP	
Insect – Butterfly	Small Heath	12	2017	TWIC		PS(RO), RLGB.Lr(NT), SBL	
Insect – Hymenopteran	Bilberry Bumblebee	3	2014	TWIC		SBL	
Insect - Moth	Knot Grass	7	2017	TWIC		PS(RO), SBL	
Insect - Moth	Brown-spot Pinion	2	2018	TWIC		SBL	
Insect - Moth	Dusky Brocade	4	2016	TWIC		SBL	
Insect - Moth	Garden Tiger	13	2018	TWIC		SBL	
Insect - Moth	Centre-barred Sallow	3	2018	TWIC		SBL	
Insect - Moth	Broom Moth	15	2017	TWIC		SBL	
Insect - Moth	Haworth's Minors	2	2014	TWIC		SBL	
Insect - Moth	Streak	2	2018	TWIC		SBL	
Insect - Moth	Sallow	3	2018	TWIC		SBL	
Insect - Moth	Brindled Ochre	2	2014	TWIC		SBL	
Insect - Moth	Small Square-spot	8	2018	TWIC		SBL	
Insect - Moth	Small Phoenix	4	2018	TWIC		SBL	
Insect - Moth	Autumnal Rustic	7	2018	TWIC		SBL	
Insect - Moth	Ghost Moth	5	2018	TWIC		SBL	
Insect - Moth	Rosy Rustic	14	2018	TWIC		SBL	
Insect - Moth	Shoulder-striped Wainscot	1	2014	TWIC		SBL	
Insect - Moth	Dark Brocade	6	2018	TWIC		SBL	
Insect - Moth	Powdered Quaker	2	2018	TWIC		SBL	
Insect - Moth	White Ermine	13	2018	TWIC		SBL	

Insect - Moth	Buff Ermine	7	2018	TWIC	SBL
Insect - Moth	Feathered Gothic	1	2018	TWIC	SBL
Insect - Moth	Pale Eggar	2	2014	TWIC	SBL
Insect - Moth	Heath Rustic	1	2013	TWIC	SBL
Insect - Moth	Neglected Rustic	1	2013	TWIC	SBL

Source: TWIC

Phase 1 and NVC Surveys

A7.4.2 Descriptions of all habitats recorded during the Phase 1 Habitat and NVC surveys in the Proposed Development Area are presented in Table A7.7. Target notes recorded in the development area during habitat surveys are shown in Table A7.8, Table A7.9 and Table A7.10.

Table A7.7: Phase 1 and NVC Habitat descriptions in the Proposed Development Area 2019

Phase 1 Habitat	Phase 1 Code	NVC Code	Description
Semi-natural broadleaved woodland	A1.1.1	W7 W9 W11	Predominantly planted trees along riparian corridors. Some areas were classified as W7 *Alnus glutinosa-Fraxinus excelsior-Lysimachia nemorum* woodland, which is listed as a priority habitat on the SBL (as wet woodland) and has high potential to be ground water dependent (GWDTE).
Plantation coniferous woodland	A1.2.2		Commercial plantation forestry was scattered over the site and was generally not diverse enough to form an NVC habitat or was formed of non-native trees.
Plantation mixed woodland	A1.3.2	W8 W9	Areas of plantation mixed woodland were classified as W8 *Fraxinus excelsior-Acer campestre-Mercurialis perennis or* W9 *Fraxinus excelsior-Sorbus aucuparia-Mercurialis perennis* woodlands.
Scrub	A.2.1	W21 W23	Patches of scrub on site mainly comprised hawthorn and gorse and patches were primarily present in the south of the site.
Acid grassland	B1	U2 U4 U5 U6	Widespread across the site. Areas classified as acid grassland were mainly in upland areas of the site, but some were in lowland agricultural areas. Areas of lowland agricultural acid grassland are listed on the SBL as a priority habitat. In upland areas there were some patches of U6 *Juncus squarrosus-Festuca ovina*, which has moderate potential to be a GWDTE.
Unimproved neutral grassland	B2.1	MG9	MG9 *Holcus lanatus-Deschampsia cespitosa* has moderate potential to be a GWDTE grassland and was present in patches to the south of the site.
Semi-improved neutral grassland	B2.2	MG1	MG1 *Arrhenatherum elatius* grassland was restricted to one patch in the southern part of the site.
Calcareous grassland	B3.1	CG10	Calcareous grassland on site was in lowland areas and classed as CG10 *Festuca ovina-Agrostis capillaris-Thymus praecox* grassland, which has moderate potential to be a GWDTE and is also included on the SBL.

Phase 1 Habitat	Phase 1 Code	NVC Code	Description
Improved grassland	B4	MG6	MG6 *Lolium perenne-Cynosurus cristatus* grassland was observed at two locations in the southern part of the site.
Marshy grassland	B5	M10 M23 M25	Areas of marshy grassland were classified as M10 *Carex dioica-Pinguicula vulgaris* mire grassland, M23 *Juncus effusus/acutiflorus – Galium palustre* rush-pasture and M25 *Molinia caerulea-Potentilla erecta* mire. M10, M23 and M25 communities have high potential to be ground water dependent. M10 alkaline fens are listed on Annex 1 of EU Habitats Directive, and upland flushes, fens and swamp are on the SBL. One sub-community of M23 (M23a) is on the SBL.
Poor semi-improved grassland	B6	MG6	MG6 *Lolium perenne-Cynosurus cristatus* grassland was observed at two locations in the southern part of the site.
Bracken	C1.1	U20	Areas of bracken (U20 *Pteridium aquilinum-Galium saxatile* NVC community) were found across the site in small and large patches. Some patches were continuous, while others were more scattered and in mosaic with heath and/or acid grassland.
Acid dry dwarf shrub heath	D1.1	H9 H10 H12 H18	Dry dwarf shrub heath covered much of the upland area of the site, as well as some small patches in the lowland area of the site. The main dry heath community encountered was H12 *Calluna vulgaris-Vaccinium myrtillus* heath, but there were also large areas of H9 *Calluna vulgaris-Deschampsia flexuosa*, H10 *Calluna vulgaris-Erica cinerea* and H18 *Vaccinium myrtillus-Deschampsia flexuosa* heaths. All types of dry dwarf shrub heath on site are on the SBL.
Wet modified bog	E1.7	M3 M19 M20	The upland area of the site almost exclusively comprised open ground that were dominated by the blanket bog community M19 *Calluna vulgaris-Eriophorum vaginatum* mire or the degraded wet modified bog community M20 *Eriophorum vaginatum* mire. In areas of wet modified bog, grazing and drainage have considerably degraded the bog community. These bog habitats are listed on Annex 1 of EU Habitats Directive and on the SBL. Blanket bog communities indicate areas of deep peat.
Swamp	F1	S10 S19	There were two areas of swamp – S10 *Equisetum fluviatile* swamp and S19 *Eleocharis palustris* swamp. These areas are not GWDTE but are partially inundated and are also on the SBL.

Source: Natural Power

Table A7.8: Phase 1 and NVC target notes in the Proposed Development Area 2019

ID	Grid Ref	Note
1	NT 38190 37943	Scree; calcareous species abundant (esp. *Thymus*)

2	NT 38176 37955	CG10 (with possible CG2 intergrade). On scree slope. Very open. Grazed hard.
3	NT 37863 38448	High GWDTE potential; Spring, highly modified.no NVC community. Extensive damage/modification due to trampling and grazing by livestock. Clear areas of agricultural enrichment.
5	NT 37538 38607	Field layer quadrat. *C.vulgaris* 85. *V.myrtillus* 5. *D.flexuosa* 10. *P.erecta* 5. GROUND LAYER; *H.splendens* 15. *Hypnum jutlandicum* 20. Sward height 25cm
7	NT 38294 37825	Areas of *Helianthemum nummularium* and *Carex flacca*
8	NT 38227 37864	*H.nummuluralium* along this slope. CG10 due to essentially upland associates.
9	NT 37389 38865	*M.caerulea* at 10% sward. Peat/soil <10cm. Classed as H9e. The *C.vulgaris* is degenerate, forming dense canopy (like H9). Other than M15 (see below), this is only community dominated by *C.vulgaris* with abundant *Molinia*.
12	NT 36970 39385	GWDTE: Spring - very poor condition. Would likely be M32 if undamaged but lack of bryophyte prevents determination. Quadrat 2x2m at source. FIELD *Chrysosplenium oppisitifolium* 30. *M.fontanum* 10. *Urtica* 5. *J.effusus* 30. *G.palustre* 3. *Repens* 5. *Cardamine*
13	NT 36995 39389	Spring continues downhill. Very narrow. few bryophyte species present. Water flowing.
14	NT 36921 39424	H10c *Calluna-Erica* heath; grass sub-community. 2m x 2m quadrat taken.
15	NT 36896 40721	Quadrat 2x2m. FIELD Quadrat for U5c FIELD LAYER. Height 20cm. *N.stricta 30. P.erecta 3. G.saxatile 20. Festuca vivipara 1. A.capillaris 5. A.odoratum 5. V.myrtillus 5. Juncus squarrosus 5.*
16	NT 36987 39679	H10-H12 intergrade. This stand is old and degenerate. Considerable areas of die-back. Bracken extensive throughout, particularly where die-back (constant - not mappable). Mature, leggy stands have less *E.cinerea* than areas where heath is regenerating.
17	NT 37003 39397	TN spring runs here. Similar vegetation as previous TN
18	NT 35709 41314	H12b note that *V.vitis-idae* becomes more frequent within heath sward as move through area.
19	NT 35713 41382	Several stands dominated by *E.angustifolium* along flailed/burned break between heather stands. This is due to disturbance to peat but NOT M3 bog pool. Peat <10cm.
20	NT 35910 41166	Transition H12 to H6
21	NT 36008 40918	Burnt-out blanket bog. Peat 45-50 (min/max). Blanket bog vegetation.
22	NT 35903 40653	Grades to burned blanket mire type community (though peat depth 35cm)
23	NT 36015 40609	Turbine and crane pad on blanket bog. Peat >50cm
24	NT 35725 40779	Head of burn: Not GWDTE. *Polytrichum/ J.effusus /J.squarrosus*. No indicator bryophytes.
26	NT 35653 40840	No GWDTE habitats along burn course. Dry, occasional *J.effusus*. No GWDTE bryophytes, indication of flushing etc

27	NT 36189 41221	GWDTE; Very marginal. Mainly MG9 along river edge. Very small patches of M23b. *Urtica* and *R.repens* abundant.
28	NT 36201 41316	GWDTE: Species affinity with M32; Opposite leaved *golden saxifrage/ Philonotis fontana*. Along burn edge. Perhaps indicative of spring upstream
29	NT 36130 41423	M32 more extensive here, See TN 28
30	NT 35976 41469	Burn walked up to this point: no indication of GWDTE (spring / flush). Much erosion around channel but no calcareous species around exposed rock.
32	NT 35978 41478	Deep peat here
33	NT 35832 41862	Still M19 but grading toward wet heath. *E.vaginatum* very thin. *E.angustifolium* abundant
34	NT 38744 37565	Although fairly patchy and disturbed, W9 ground layer persists below canopy of mixed conifer/beech. Fraxinus excelsior rare.
35	NT 38775 37616	Stand of veteran *Quercus rubor*. Note carpets of *Glechoma hederacea* (AWI) below
36	NT 38769 37663	W8-W9 understorey. M.perennis dominant. Abundant mesotrophic herbs; Fragaria vesca, Silene dioica, Geum urbanum, Stachys sylvatica.
37	NT 38678 37904	Swampy/ eutrophied condition throughout
38	NT 38562 38028	INTERGRADE - enriched acid grass / dry heath.
39	NT 38559 38485	Calcareous species becoming confined to exposed rock scree at highest areas. Short U4a grassland but with much D.flexuosa. Similar to U2a but D.flexuosa not dominant enough. Transitional U4-U2.
40	NT 38383 38785	Small patch M23b at edge of W7 wet woodland (J.effusus, G.palustre, F.ulmaria)
41	NT 38409 38390	Woodland; composition. Hazel 80%, Ash 15%, Hawthorn 5%
42	NT 37982 38896	Continuation of good close-cropped CG10. *T.polytrichus* constant , *H.nummularium* frequent
43	NT 37658 38996	Heath here has no *E.cinerea*. Calcaerous influence still evident; *H.nummularium, T.polytrichus* etc abundant. H12 has no equivalent to H10d. Calcaerous areas quite open and grassy - CG10
44	NT 37497 39313	GWDTE: M23b. Area flushed ground; species rich. *J.effusus* dominant. *L.nemorum* A. See TN at source (45). Note: sections over *Carex* rich. Only *C.flacca, C.nigra and C.echinat*a identified (all abundant) but possibly more basophilic species.
45	NT 37514 39319	Spring originates here. Quadrat 1x1m. FIELD LAYER; *Juncus articulatus 3. J.effusus 25. H.lanatus 10. Ranunculus acris 3. Cirsium palustre 3. Cruciata laevipes 1. Hypericum tetrpterum 2. C.flacca 5. C.pratensis 3. N.stricta 2. Epilobium palustre 5*
46	NT 37442 39715	Burn has associated flush community- grazed and enriched (much *U.dioica*). Should however be marked as GWDTE. Closest community M32 (although perhaps. best regarded as relict W7 woodland ground flora; still GWDTE).
47	NT 37471 40260	GWDTE: small area M23b. Follows ditch below track.

48	NT 37454 40180	Small area M23b. See also TN47. Quite species rich. F.*ulmaria* and *C.oppositofolium*. Low ground presumably kept wet from river overbank flooding (low GW influence)
49	NT 38167 38682	M23a here (GWDTE). Too small extent to map
50	NT 37858 38797	CG10a. All calcareous species abundant. Adjacent H12 heath has frequent *H.nummularium and T.polytrichus*
51	NT 37877 38797	H12 heath (patcy). Frequent calcaerous spp. No E.cinerea. Presumably grazed-out H10d with associated calcicoles
52	NT 37562 38950	M23a
53	NT 37534 39055	Adjacent spring- head. More M32. See TN54 for quadrat. NOTE FOR THIS HABITAT: Referred subsequently as 'base flushed hillside'. The quadrat shows that these are base-rich springs.
54	NT 37536 39059	M10b Spring head, part of larger base-rich flush. HIGH POTENTIAL GWDTE. M10 basic flush.
55	NT 37303 39337	M23a. Highly flushed, species rich. Like others, presumably fed by base rich spring. Dominated by *Juncus* and *M.caerulea. Briza media/ L.nemorum/G.ulinigosum*
56	NT 37297 39367	Base-flushed hillside
57	NT 37350 39305	Keep as part flushed hillside polygon
58	NT 37307 39294	Keep as part of flushed hillside polygon
59	NT 37359 40630	*C.vulgaris* here very leggy and degenerate. Poor bryophyte. Close to H9.
60	NT 36987 41015	Effectively grazed out H12. *V.myrtillus* and *D.flexuosa* dominant among U4 acid grassland (occasionally grading towards U5). Should this be considered a variant of H9b?
61	NT 36791 41181	Track crosses line of *J.effusus.* does not appear to be acid flush. No Sphagnum, only P.commune. NOT GWDTE
62	NT 36727 41343	Intergrades with U4 here but map as U5c
64	NT 36735 41454	M25 in mosaic with U5. Quadrat at this location. Poor fit for any Rodwell sub community. Best fit is species-poor community described by Averis and Averis. A version of M25a, this fits due to *C.vulgaris* but no bog associates present.
65	NT 36711 42029	U5b
66	NT 36800 42281	*C.oppositofolium* etc vegetation associated with burn (as previously described). Probably relict W7/ similarities with M32. Not considered high GWD for GWDTE potential.
67	NT 36745 42227	M23. No sub community
68	NT 36911 42166	M6X Neutral mire. Quadrat below. 1x1m. Conforms with Neutral small sedge mire MX (Averis and Averis). Variant of M23. Note also suggestion of more base-rich input (TN). HIGH POTENTIAL GWDTE.
69	NT 36908 42162	M10 type mire. See other TN neutral sedge mire. This flushed ground clearly has a neutral-to base input. HIGH POTENTIAL GWDTE

70	NT 36826 42165	From aerial image looks like this may feed into neutral mire system. Not checked due to failing light. ASSUME CONNECTIVITY with GWDTE until surveyed
71	NT 37160 42097	MX runs here too. Same species as quadrat also quaking grass abundant
72	NT 37204 42235	U4 bracken
73	NT 35684 41457	*E.angustifolium* dominant. Due to disturbance. Peat 10cm. Good cover of low dwarf shrub below. Not M3
74	NT 35957 41796	M3 *E.angustifolium* bog pool. Quadrat 1x1m. Too small extent for mapping. Peat > 70cm.
75	NT 36496 42187	M20. Very small patch among uniform U5 grassland. Peat depth 50cm
76	NT 36574 42233	M23-type
77	NT 36522 42303	M20. Peat >60cm. See code
78	NT 36540 42271	GWDTE: source. Clearly ground water emerging where peat thins out.
79	NT 36564 42261	Quadrat location for M32 spring. HIGH POTENTIAL GWDTE. Location selected because closest point to infrastructure line where spring community well represented (especially bryophytes). No sub-community identified. Quadrat size 3x1m
80	NT 36943 42518	This area monoculture U5a. Clearly drier on slop, *P.commune* infrequent. No stand-out features, no dwarf shrub. Some areas quite grassy, showing affinity to U5d, where shrubs grazed out entirely.
81	NT 36936 42708	M20 /U6 mosaic. Areas with *E.vaginatum* often poor cover and peat depth <50cm. Some areas extensive *E.vaginatum* and peat >50cm
82	NT 37375 42893	M23b. Very small area at head of small hill spate burn
83	NT 37298 42633	Fairly extensive tract of M20. Peat depth mainly over 50cm but occasionally under
84	NT 37248 42475	Turbine not on M20 or deep peat. Straddles U5 and U6. Peat <50cm
85	NT 37511 42143	Turbine location mosaic U5-U6. Peat depth <50cm
86	NT 37649 41691	At turbine location complex mosaic of M25/M20/H12. Peat depth variable. At some points >50cm
87	NT 37014 42992	M19b *E.nigrum* sub-community. Quadrat here 2x2m. FIELD LAYER height 25cm: *E.nigrum 20. C.vulgaris 30. E.vaginatum 40. E.angustifolium 5. V.myrtillus 5. Rubus chamaemorus* 15. GROUND LAYER height 20mm; *S.capillofolium 40. Cladonia 5. R.loreus 10. P.schreberi 15*.
88	NT 37002 42857	M20 this side fence
89	NT 36847 42848	See note for polygon. M19/H12 eroded blanket bog
90	NT 36813 42775	Grades to U6
91	NT 36386 42279	M2 bog pool
92	NT 36347 42072	U5

93	NT 37023 39457	On aerial image this appears to be another spring head, with irrigation line running down slope. THIS WAS NOT LOCATED. Likely hidden by dense bracken. It is likely that this spring line resembles that described a little distance to the south.
264	NT 37532 39056	Quadrat 2x2m; FIELD LAYER height 10cm (Carex); Bare 20. *Pinguicula vulgaris 5. Carex hostiana 5. C.panicea 30. C.viridula 15. C.echinata 1. Molina caerulea 5. A.odoratum 5. Succisa pratensis 3. J.aticulatus 3. P.erecta 2.*
229	NT 37454 40202	U4Je. Rush dominated acid grass community. Resembles MG10 but U4 grass species. No NVC but described by Averis and Averis. Quadrat below 2x2m
83	NT 37093 40157	Bracken abundant
98	NT 35464 41496	FIELD LAYER height 20cm; *N.stricta 10. D.flexuosa 5. A.capillaris 10. J.squarrosus 5. V.myrtillus 3. G.saxatile 5.*
99	NT 35549 41416	H12b: montane *Vaccinium vitis-idaea* sub-community. Although *V.vitis-idae* only occasional (on most exposed areas - photo below), *E.nigrum* abundant and constant.
69	NT 37503 49314	Phase 1 E2.1. Species rich M23 flush. Species and distribution indicate area irrigated by base rich springs, as described in TN53 and 54. HIGH GWDTE POTENTIAL

Source: Natural Power

Table A7.9: Phase 1 target notes in the Proposed Development Area 2021

Date	ID	Notes	Notes 2
18/05/2021	1	Steeper ground here: calcareous grassland (B3) / CG10a	As before; Pilosella A, Thymus O. Lotus corniculata O. U4a dominant over CG10
18/05/2021	2	Some stands where L.sylvatica dominant (no NVC)	Phase I would class this as C3.2: Tall herb/fen, non-ruderal
18/05/2021	3	Inactive scree/steeper slope; U4a (no change to Phase 1; unimproved acid grass)	
18/05/2021	4	No spring head at source of burn tributary	
18/05/2021	5	Fence here; grades to U4je	
18/05/2021	6	M23 associates with burn; C.cuspidata A	
18/05/2021	7	U4a; abrupt transition to M25	
18/05/2021	8	U4b	
18/05/2021	9	Bracken: scattered. Small extent	Also scattered gorse (too sparse to categorise as scrub)
18/05/2021	10	Snipe nest; C4	

19/05/2021	11	Walked line of track; poor semi-improved acid grass (MG6b). Hard grazed. C.cristatus R but lacking U4 herb associates
19/05/2021	12	On-line; steeper slope: more herb rich U4. P.erecta/G.saxatile/V.myrtillus/L.campestre much more abundant than elsewhere in field. Very close cropped
19/05/2021	13	B5 Marshy grassland (M23/U4Je)

Source: Natural Power

Table A7.10: NVC target notes in the Proposed Development Area 2021

Date	ID	Notes	Notes 2
18/05/2021	1	M23; *C.cuspidata /J.effusus/J.acutiflorus/ Cirsium palustre*	Moderate potential GWDTE; small areas within general acid grass sward (U4/U4Je)
18/05/2021	2	M6; *J.acutiflorus/Polytrichum/S.fallax/S.palustre*	Small extent; grades to species poor neutral rush
18/05/2021	3	Inundation grass community; prob MG13 - return	
18/05/2021	4	CG10a	*F.ovina/Pilosella officinarum/Polytrichum thymus/Carex caryophyllea C. Pilosella* v.abundant. Thyme F
18/05/2021	5		Rush sward associated with drainage; M23b. Surround lightly base enriched U5c
18/05/2021	6	Acid grass grades to M25b from this point	
18/05/2021	7	On highest ground; U5b dominant. Polytrichum cover very high. Nardus relatively sparse in parts but constant. *A.odoratum* often dominant grass. Much of area dominated by bryophytes with sparse grass (*Polytrichum/H.splendens/R.squarrosus*)	*Sphagnum capillofolium* C in small area, with O *E.vaginatum* but peat <50cm.
18/05/2021	8	Transitions to U5a; Nardus overwhelmingly dominant	
18/05/2021	9	Head of burn; wet rush pasture, diffuse. No clear bryophyte dominated spring head at this location (see other TNs howe)	*J.effusus* dominant *C.oppositofolium* A. *Philonotis fontana* O. *R.repens/C.palustre*
18/05/2021	10	At this location more typical M32 spring (point of emergence). However, species poor and very rank coarse vegetation	*Philonotis fontana* A. *C.oppositofolium* C.
18/05/2021	11	M32	See description previous NVC TN
18/05/2021	12	M32 spring head here. Avoid. High GWDTE potential	
18/05/2021	13	U5 grades to mosaic U5a and M25b downslope from here	
18/05/2021	14	M23b closely associated with burn; species rich despite grazing. Burn narrows in gully beyond this point	*J.effusus* A. *F.ulmaria/R.ficaria/C.oppositofolium/Stellaria alsine/C.pratense/Montia fontana. Rhizomnium punctatum* A

18/05/2021	15	Head of springs/emergence; species poor/enriched/poached	J.*effusus/R.repens/Urtica /C.cuspidata*. M23b (poor)
18/05/2021	16	Springs/emergence here similarly disturbed/enriched/grazed as described up slope. Wetter and more C.cuspidata	M23b (poor)
19/05/2021	17	More typical M23 here; highly saturated, C.*cuspidata* A, high berb cover (*R.repens/R.acris/C.pratensis/Cirsium palustre/F.ulmaria*). Shoots of *Galium palustre* seen	Carex cover still very high; *C.panicea* highly dominant. *C.nigra* F. Juncus A: heavily grazed (mainly *J.acutiflorus*). *D.cespitosa* C
19/05/2021	18	Modified spring/issue: mat of *Montia fontana* (blinks)	
19/05/2021	19	Modified M32 spring here; feeding rush pasture below (as described)	
19/05/2021	20	Diffuse seepage; *M.fontana /J.effusus*. Feeds M23 rush pasture	
19/05/2021	21	Surrounding grassland: mix of *Nardus /Molinia/D.cespitisa*. High cover *C.panicea*	
19/05/2021	22	2 additional seepage points here; give rise to M23. Surround grassland rich in *C.panacea* (U5c)	
19/05/2021	23	U5c quite extensive flanking burn - enriched by overbank inundation	
19/05/2021	24	Rush-pasture flanking burn = mainly acid grass with Juncus. Highly enriched; *Urtica/Cirsium arvense*	
19/05/2021	25	Broadens to area of M23b - very poor, agricultural enrichment/grazing.	
19/05/2021	26	Stand of MG9	
19/05/2021	27	Narrow M23b in-channel. Poor- highly enriched/disturbed	
19/05/2021	28	M23b	
19/05/2021	29	M23b	
19/05/2021	30	Small area where peat>50cm; *S.capillofolium/Aulacomnium palustre/Polytrichum*. No Eriophorum seen. Rank grass/Juncus	
19/05/2021	31	Small runnel on-line; *C.cuspidata/H.lanatus/J.effusus* (MG10). Easily culverted	
19/05/2021	32	Ditch/ burn running through (as mapped); arising from springs described above	Species-poor; mainly *A.stolonifera* inundation grass community (OV28)

Source: Natural Power

HLC

A7.4.3 Results of the HLC are shown in **Error! Reference source not found.** below.

Table A7.11:HLC results

			Area lost (ha)								
Phase 1 code	**Phase 1 category**	**Total area within site boundary (ha)**	**Alternative Access track**	**Borrow pit**	**Construction compound**	**Primary Proposed track**	**Substation**	**Track earthworks**	**Turbine foundation**	**Total**	**Percentage total area lost**
A1.1.1	Semi-natural broad-leaved woodland	7.11	0.01	0.00	0.00	0.00	0.00	0.00	0.00	0.01	1.20

Phase 1 code	Phase 1 category	Total area within site boundary (ha)	Area lost (ha)								Percentage total area lost
			Alternative Access track	Borrow pit	Construction compound	Primary Proposed track	Substation	Track earthworks	Turbine foundation	Total	
A1.2.2	Plantation coniferous woodland	20.99	0.20	0.00	0.00	0.00	0.00	0.00	0.00	0.20	0.97
A1.3.2	Plantation mixed woodland	6.38	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.02	0.77
A2.1	Dense/continuous scrub	4.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
A2.2	Scattered scrub	1.63	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B1.1	Unimproved acid grassland	252.96	0.68	0.86	0.97	3.42	1.17	4.03	0.08	11.22	152.78
B1.2	Semi-improved acid grassland	62.97	0.29	0.00	0.64	0.69	0.00	1.34	0.00	2.96	9.57
B2.1	Unimproved neutral grassland	0.43	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B2.2	Semi-improved neutral grassland	1.73	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
B3.1	Unimproved calcareous grassland	12.30	0.00	0.00	0.00	0.01	0.00	0.01	0.00	0.02	9.09
B4	Improved grassland	20.11	0.11	0.00	0.00	0.19	0.00	0.23	0.00	0.52	5.15
B5	Marsh/marshy grassland	50.30	0.03	0.00	0.82	0.41	0.00	0.58	0.00	1.84	105.76
B6	Poor semi-improved grassland	5.16	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.06	1.18
C1.1: B1.1 mosaic	Continuous bracken/Unimproved acid grassland mosaic	2.96	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.12
C1.1	Continuous bracken	45.62	0.37	0.00	0.00	0.00	0.00	0.00	0.00	0.37	5.15
C1.2	Scattered bracken	11.45	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
D1.1	Acid dry dwarf shrub heath	201.83	0.92	0.00	0.59	1.76	0.00	1.78	0.05	5.10	34.43
D5	Dry heath/acid grassland mosaic	35.11	0.28	0.00	0.00	0.00	0.00	0.00	0.00	0.28	2.34
E1.7	Wet modified bog	46.67	0.00	0.00	0.21	3.38	0.23	1.64	0.24	5.70	157.80
E1.8	Dry modified bog	2.05	0.00	0.00	0.00	0.04	0.00	0.03	0.00	0.07	3.48
E2.3	Bryophyte dominated spring	0.53	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
F1	Swamp	0.08	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G1.3	Oligotrophic standing water	0.02	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
G2	Running water	1.15	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
I1.2.1	Acid/neutral scree	0.57	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
J1.1	Arable land	4.27	0.10	0.00	0.00	0.00	0.00	0.00	0.00	0.10	2.45
J3.6	Buildings	0.06	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00
Unsurveyed	Unsurveyed	1081.72	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00	0.00

Source: Natural Power

Bat Surveys

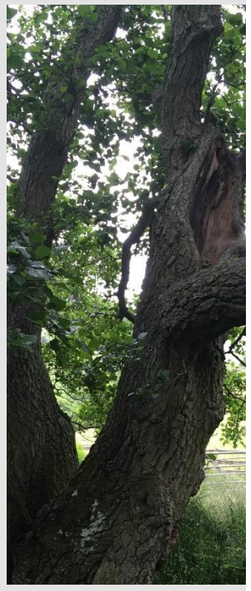
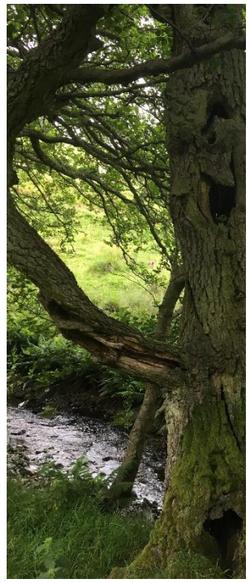
A7.4.4 Potential Roost Features (PRFs) from the daytime inspection of trees and other structures with the potential to support bat roosts are presented in Table A7.12 and Table A7.13. A summary of the bat roost assessment is presented in Table A7.14. Metrics recorded by static detectors for each species are shown in Table A7.15. Relative bat activity levels have also been assessed for each bat detector following NatureScot guidance[4]. Assessment of the median activity levels per season is in Table A7.16 and assessment of the maximum activity levels per season is in Table A7.17, confidence intervals for results presented in Table A7.16 and Table A7.17 are given in Table A7.18. Assessment of the median activity levels per bat detector location is in Table A7.19 and assessment of the maximum activity levels per bat detector location is in Table A7.20.

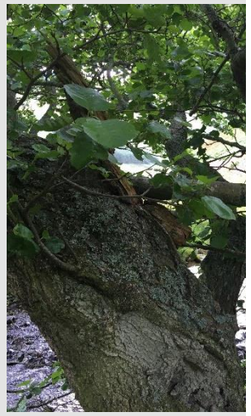
Table A7.12: PRFs recorded in trees during bat walkover surveys 2019

Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 38414 37683	Category 2‡	Oak	Mature	Lifting bark			Several mature oaks in field next to main road Max height - 12 Max circumference- 3	
NT 38414 37683	Category 2‡	Oak	Mature	Snapped branch			Several mature oaks in field next to main road Max height - 12 Max circumference- 3	
NT 38529 37699	Category 2‡	Larch	Mature	Lifting bark	2-5		Height - 12 Circumference- 2	
NT 38529 37699	Category 2‡	Birch	Mature	Internal crack	2-5		Height - 12 Circumference- 2	

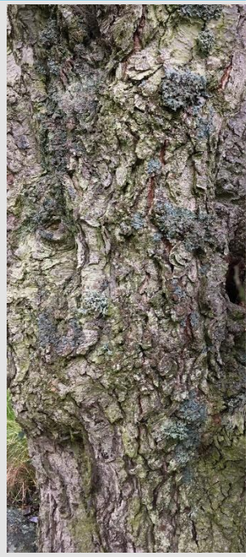
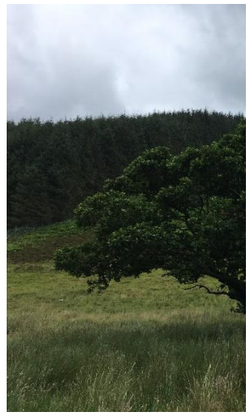
Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 38330 38553	Category 1†	Ash	Mature	Hole			3 mature ash trees on slope above track. Max height - 8 Circumference- 2	
NT 38330 38553	Category 1†	Ash	Mature	Snapped branch			3 mature ash trees on slope above track. Max height - 8 Circumference- 2	
NT 38389 38486	Category 1†	Ash	Mature	Snapped branch	2	E	Height - 12 Circumference- 3	
NT 38389 38486	Category 1†	Ash	Mature	Lifting bark			Height - 12 Circumference- 3	

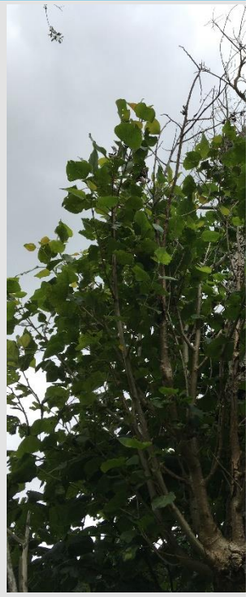
Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 38562 38403	Category 1†	Ash	Mature	Hole			Group of 3 ash trees Max height - 10 Max circumference- 3	
NT 38562 38403	Category 1†	Ash	Mature	Joined branches			Group of 3 ash trees Max height - 10 Max circumference- 3	
NT 38562 38403	Category 1†	Ash	Mature	Snapped branch			Group of 3 ash trees Max height - 10 Max circumference- 3	
NT 38368 38430	Category 1†	Ash	Mature	Snapped branch	2	S		
NT 38368 38430	Category 1†	Ash	Mature	Hole		W		
NT 38368 38430	Category 1†	Ash	Mature	Hole		E		

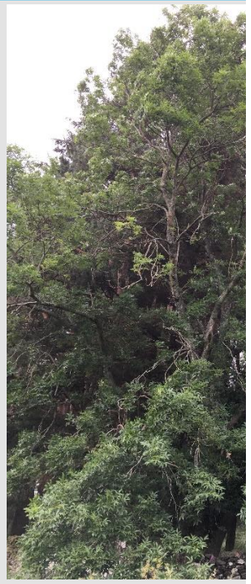
Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 38368 38430	Category 1†	Ash	Mature	Lifting bark		W		
NT 38278 38596	Category 1†	Alder	Mature	Hole; Snapped branch			Line of 30 semi-mature and mature Alder trees. Multiple potential roost features present. Trees with cracks, lifting bark, missing limbs and knot holes. Start - NT 38278 38596 End - NT 38354 38451	
NT 37923 38731	Category 1†	Alder	Early-mature	Hole; Snapped branch; Internal crack	0-7	E and S	Line of 25-30 alder trees, many with broken limbs, fissures, knot holes, lifting bark. Start of line - nt 37923 38731 End of line - nt 38278 38108 Max height - 8m; Min height - 4.5m Max circumference - 2; Min - 1.5	
NT 37954 38719	Category 1†	Alder	Mature	Hole; Rot	0-6	E	Nearly hollow with large holes at various points on trunk. Height - 6 Circumference- 3	

Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 37780 38783	Category 1†	Alder	Early-mature	Lifting bark	1-2.5m	SW and N	Two alder trees next to each other Height - 5-6m Circumference- 2-2.5m	
NT 37780 38783	Category 1†	Alder	Early-mature	Internal crack	1		Two alder trees next to each other Height - 5-6m Circumference- 2-2.5m	
NT 37780 38783	Category 1†	Alder	Early-mature	Hole	2-2.5	S and N	Two alder trees next to each other Height - 5-6m Circumference- 2-2.5m	
NT 37671 38847	Category 1†	Alder	Early-mature	Hole	1-1.5m	E and NE	Two alder trees Height - 5 Circumference- 1.5	

Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 37671 38847	Category 1†	Alder	Early-mature	Internal crack; Wound	0-2m	SE	Two alder trees Height - 5 Circumference- 1.5	

Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 37671 38847	Category 1†	Alder	Early-mature	Snapped branch	1-2m	E	Two alder trees Height - 5 Circumference- 1.5	
NT 37671 38847	Category 1†	Alder	Early-mature	Hole	1	SE	Two alder trees Height - 5 Circumference- 1.5	
NT 37679 38844	Category 1†	Alder	Early-mature	Hole	1.5	NE	height - 5 Circumference- 1.5	
NT 37679 38844	Category 1†	Alder	Early-mature	Lifting bark	1.5-3m	SE	height - 5 Circumference- 1.5	

Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 37317 39759	Category 1†	Alder	Semi-mature	Hole	4m	S	Tree height - 8 Circumference - 1.5	
NT 37317 39759	Category 1†	Alder	Semi-mature	Snapped branch; Internal crack	6.5-8m	S	Tree height - 8 Circumference - 1.5	

Grid Reference	Roost Potential	Tree Species	Life Stage	PRF	Height	Orientation	Notes	Photos
NT 37695 40818	Category 2‡	Ash	Early-mature	Hole	1.5m	E	Tree height - 10 Circumference - 2 On edge of Scots pine forest block nest to burn	

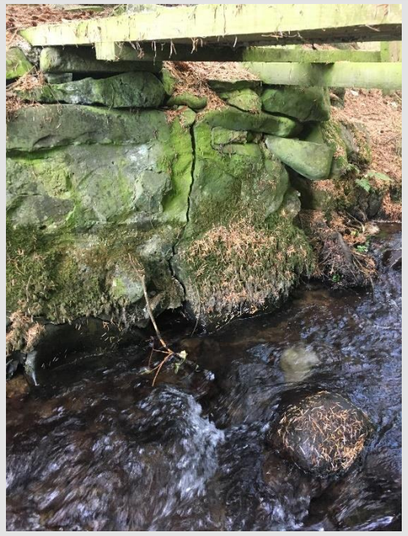
† *Category 1 – Limited PRF*

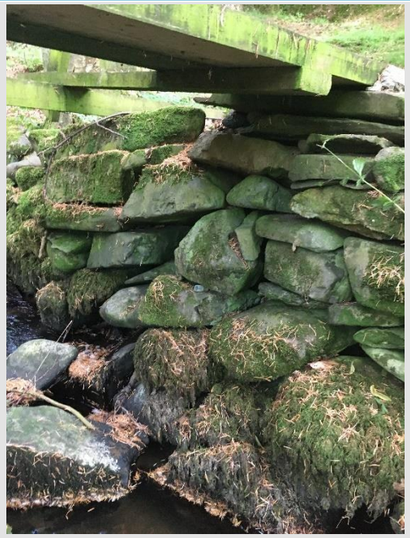
‡ *Category 2 – Very limited PRF*

Source: Natural Power

Table A7.13: PRFs recorded in structures during bat walkover surveys 2019

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
NT 38730 37549	Other		No	Old stone bridge, main road runs over the top. Busy road. Cracks and gaps present in walls.	Moderate			
NT 38721 37578	Other		No	Old stone bridge, no longer used as a bridge. Covered in ivy, surrounded by broadleaf trees and grassland.	Moderate			

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
NT 38669 37772	Other		No	Stone wall under wooden bridge over burn. Broadleaf trees (alder) and grassland nearby	Low			
NT 38687 37684	Other		No	Stone wall under wooden bridge over burn. Broadleaf trees (alder) and grassland surrounding.	Low			

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
								
NT 37360 41600	Other		No	Open moorland and grassland	Low	Borrow pit, some small cracks in both rock faces.		
NT 38559 37698	House - pitched	Slate	Windows present; Yes	Two storey house with 2 stone outbuildings.	Low	Some lifting slates on roof		

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
NT 38559 37698	House - pitched	Slate	Windows present; Yes	Two storey house with 2 stone outbuildings.	Low		Both outbuildings have cracks in the outer walls and gaps around doors	
NT 38528 37699	House - pitched	Slate	Yes	Grassland and forest blocks	Low	Two storey house, ivy running up outside of house. Metal roof shed at rear of house not suitable	Some lifting slates on roof	
NT 38528 37699	House - pitched	Slate	Yes	Grassland and forest blocks	Low	Two storey house, ivy running up outside of house. Metal roof shed at rear of house not suitable	Ivy running up outside of house and onto the roof	

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
NT 38284 38581	Other -flat	Corrugate	No	Broadleaf trees, grassland, burn	Low	Brick shed with corrugated metal roof. Lots of available access, holes in wall, low gate covers doorway.	Multiple Cracks in brick walls of shed	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Lifting slate, gaps present.	

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Lifting flashing around chimneys	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Crack in render on middle chimney	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Cracks present at gable end on right hand side of house	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Gaps between guttering and roof above door on porch	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	.Gap present above sliding door of outbuilding	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Gaps present between guttering and bottom of roof along outbuilding	
NT 37758 40848	House - pitched	Slate	Yes	Moorland, grassland and next to block of forestry	Low	House with stone outbuilding. Wooden shed with corrugated metal roof attached to far side of outbuilding.	Lifting flashing around skylight, multiple gaps present	

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Lifting slates on roof	
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Missing flashing around left and right chimney	
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Guttering close to bottom of roof and wooden panel getting replaced on porch soffit	
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Missing render on right chimney, cracks present	
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Lifting slates and missing slates on shed	
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Cracks and holes in stone and render	
NT 37642 40827	House - pitched	Slate	Windows present	Moorland, grassland and small forest block	Low	Currently been renovated. House and stone shed.	Gaps present under edge of shed roof	

Grid Reference	Roof design	Roof material	Roof void	Habitat	Roost Potential	Access notes	Notes	Photos

Source: Natural Power

Table A7.14: Summary bat roost assessment

Reference	Type	Suitability	Closest Turbine	Distance to closest turbine (m)
NT 38414 37683	Mature tree	Low	T5	3.58 km
NT 38529 37699	Mature tree	Low	T5	3.61 km
NT 38330 38553	Mature tree	Moderate	T5	2.79 km
NT 38389 38486	Mature tree	Moderate	T5	2.87 km
NT 38562 38403	Mature tree	Moderate	T5	3.03 km
NT 38368 38430	Mature tree	Moderate	T5	2.90 km
NT 38278 38596	Mature tree	Moderate	T5	2.72 km
NT 37923 38731	Mature tree	Moderate	T5	2.42 km
NT 37954 38719	Mature tree	Moderate	T5	2.43 km
NT 37780 38783	Early mature tree	Moderate	T5	2.30 km
NT 37671 38847	Early mature tree	Moderate	T5	2.20 km
NT 37679 38844	Early mature tree	Moderate	T5	2.20 km
NT 37317 39759	Semi-mature tree	Moderate	T5	1.21 km
NT 37695 40818	Semi-mature tree	Low	T5	0.87 km
NT 38730 37549	Bridge	Moderate	T5	3.81 km
NT 38721 37578	Bridge	Moderate	T5	3.81 km
NT 38669 37772	Bridge	Low	T5	3.61 km
NT 38687 37684	Bridge	Low	T5	3.71 km
NT 37360 41600	Quarry	Low	T5	0.88 km
NT 38559 37698	Building	Low	T5	5.67 km
NT 38528 37699	Building	Low	T5	3.59 km
NT 38284 38581	Building	Low	T5	2.73 km
NT 37758 40848	Building	Low	T5	0.93 km
NT 37642 40827	Building	Low	T5	0.83 km

Source: Natural Power

Table A7.15: Key metrics for each detector and bat species recorded

Detector ID	Species/Species Group	Median Percentile	95% CIs	Max Percentile	Nights Recorded	Reference Range
MCB	*Myotis* bat species	35	32 - 43	65	18	107.2
MCB	*Nyctalus* bat species	33	0	33	1	245
MCB	Common noctule	56	45.5 - 64.5	89	25	223.5
MCB	Pipistrelle sp.	93	78 - 96.5	99	15	263.7

MCB	Nathusius' pipistrelle	0	0 - 0	5	4	70
MCB	Common pipistrelle	69	56 - 76	98	34	198.2
MCB	Soprano pipistrelle	80	69.5 - 85.5	98	36	187.7
MCB	Brown long eared	31	18.5 - 43.5	52	11	61.45
Pond	*Myotis* bat species	35	24.5 - 45	64	23	100.4
Pond	*Nyctalus* bat species	47	0	47	1	245
Pond	Common noctule	57	48.5 - 73	95	23	223.6
Pond	Pipistrelle sp.	94	86 - 95	100	21	261.5
Pond	Nathusius' pipistrelle	32	21 - 49	74	18	69.22
Pond	Common pipistrelle	67	63.5 - 77	94	33	203.1
Pond	Soprano pipistrelle	82	65 - 85	99	39	186.7
Pond	Brown long eared	2	2 - 2	24	5	68
Stream	*Myotis* bat species	33	24 - 42.5	72	27	88.26
Stream	*Nyctalus* bat species	62	41 - 69.5	74	7	246.6
Stream	Common noctule	43	33.5 - 55	83	23	214
Stream	Pipistrelle sp.	95	84.5 - 96.5	99	23	225
Stream	Nathusius' pipistrelle	32	17.5 - 46.5	59	14	77.5
Stream	Common pipistrelle	87	63.5 - 89	98	34	192.2
Stream	Soprano pipistrelle	84	66 - 87.5	99	35	191.9
Stream	Brown long eared	2	2 - 22.5	43	14	58.79
A	*Myotis* bat species	21	18.5 - 35	48	17	107
A	*Nyctalus* bat species	24	24 - 24	43	2	140.5
A	Common noctule	33	24 - 47.5	80	18	223.6
A	Pipistrelle sp.	99	86 - 99.5	100	17	267.9
A	Nathusius' pipistrelle	2	2 - 17.5	33	8	86.62
A	Common pipistrelle	86	71 - 88.5	100	35	193.6
A	Soprano pipistrelle	82	60.5 - 86	100	30	217
A	Brown long eared	5	3.5 - 33	42	11	60.36
B	*Myotis* bat species	2	2 - 24	24	6	113
B	*Nyctalus* bat species	5	0	5	1	25
B	Common noctule	21	11.5 - 47	58	14	223.5
B	Pipistrelle sp.	82	62 - 88	88	4	290.8
B	Nathusius' pipistrelle	11	10.5 - 10.5	21	2	84
B	Common pipistrelle	56	40.5 - 66.5	96	21	220.7
B	Soprano pipistrelle	47	35.5 - 59.5	95	22	244.2
B	Brown long eared	2	2 - 26.5	51	6	67
C	*Myotis* bat species	2	24 - 24	24	5	112.8
C	Common noctule	21	13 - 45	66	15	223.6
C	Pipistrelle sp.	89	85 - 93	93	4	293.5

C	Nathusius' pipistrelle	36	21 - 57	57	4	84
C	Common pipistrelle	64	43 - 71	90	15	240
C	Soprano pipistrelle	52	36.5 - 73.5	94	17	232.3
C	Brown long eared	2	22.5 - 22.5	43	3	67
D	*Nyctalus* bat species	42	0	42	1	245
D	Common noctule	24	24 - 42	51	13	223.5
D	Pipistrelle sp.	75	75 - 75	91	2	288
D	Nathusius' pipistrelle	2	2 - 2	33	3	88.67
D	Common pipistrelle	58	30 - 70	85	11	240
D	Soprano pipistrelle	35	29.5 - 67	82	13	244.2
D	Brown long eared	2	2 - 2	2	2	68
E	*Myotis* bat species	2	0	2	1	114
E	*Nyctalus* bat species	34	34 - 34	35	2	250.5
E	Common noctule	39	27 - 59.5	76	8	223.6
E	Pipistrelle sp.	79	0	79	1	288
E	Nathusius' pipistrelle	0	0	0	1	84
E	Common pipistrelle	35	29.5 - 65	74	7	240
E	Soprano pipistrelle	45	22 - 65	76	8	244.2
E	Brown long eared	2	0	2	1	68
F	*Myotis* bat species	5	0	5	1	19
F	Common noctule	42	25 - 58	70	17	223.6
F	Pipistrelle sp.	77	38 - 85	87	7	260.4
F	Nathusius' pipistrelle	11	10.5 - 10.5	21	2	84
F	Common pipistrelle	33	17.5 - 61	75	14	225.5
F	Soprano pipistrelle	54	36.5 - 74	80	12	227.2
F	Brown long eared	2	2 - 2	2	3	68
G	*Myotis* bat species	2	0	2	1	114
G	*Nyctalus* bat species	63	0	63	1	245
G	Common noctule	33	27 - 51.5	68	11	223.3
G	Pipistrelle sp.	79	55 - 93	93	3	288
G	Nathusius' pipistrelle	0	0	0	1	84
G	Common pipistrelle	43	22.5 - 75	88	11	240
G	Soprano pipistrelle	42	25 - 62	80	14	244
G	Brown long eared	2	2 - 2	2	4	68
H	*Myotis* bat species	2	2 - 21.5	41	7	99.14
H	Common noctule	80	53.5 - 82.5	94	23	214
H	Pipistrelle sp.	82	27 - 92.5	93	7	258.9
H	Nathusius' pipistrelle	21	11.5 - 34	47	8	87.5
H	Common pipistrelle	78	40.5 - 82	89	12	223.1

H	Soprano pipistrelle	33	32.5 - 70	86	18	221.4
H	Brown long eared	13	13 - 13	24	2	68
I	*Myotis* bat species	24	13 - 33	35	10	112.5
I	Common noctule	70	46.5 - 76.5	92	24	223.5
I	Pipistrelle sp.	83	71 - 88.5	95	11	292
I	Nathusius' pipistrelle	27	21 - 51	51	4	84
I	Common pipistrelle	52	34.5 - 71	90	18	228.7
I	*Pipistrellus pygmaeus*	59	41 - 74.5	91	17	231.9
I	Brown long eared	2	2 - 2	35	3	68
J	*Myotis* bat species	23	13 - 42	43	6	112.5
J	*Nyctalus* bat species	72	0	72	1	256
J	Common noctule	59	39 - 68.5	90	23	223.4
J	Pipistrelle sp.	77	51 - 87.5	95	13	259.2
J	Nathusius' pipistrelle	21	21 - 21	42	5	84
J	Common pipistrelle	60	42.5 - 72	92	18	240
J	Soprano pipistrelle	60	44 - 72.5	90	18	232.8
J	Brown long eared	2	2 - 3.5	24	8	59.75

Source: Ecobat/Natural Power

Table A7.16: Ecobat relative bat activity for the median activity level (percentile) of bats recorded across each night of the bat survey for the Proposed Development summarised by season and for the whole year.

Species	Spring	Summer	Autumn	Year
Mouse-eared bat species	Low	Low to Moderate	Low to Moderate	Low to Moderate
Nyctalus bat species	Low	Moderate	Low to Moderate	Moderate
Common noctule	Moderate	Moderate	Low to Moderate	Moderate
Pipistrelle sp.	Moderate to High	High	High	High
Nathusius' pipistrelle	Low	Low to Moderate	Low	Low to Moderate
Common pipistrelle	Moderate	Moderate to High	Moderate to High	Moderate to High
Soprano pipistrelle	Moderate	Moderate	Moderate to High	Moderate to high
Brown long eared	Low	Low	Low	Low

Source: Ecobat/Natural Power

Table A7.17: Ecobat relative bat activity for the maximum activity level (percentile) of bats recorded across each night of the bat survey for the Proposed Development summarised by season and for the whole year.

Species	Spring	Summer	Autumn	Year
Mouse-eared bat species	Moderate	Moderate to High	Moderate to High	Moderate to High
Nyctalus bat species	Moderate to High	Moderate to High	Moderate to High	Moderate to High
Common noctule	High	High	High	High
Pipistrelle sp.	High	High	High	High
Nathusius' pipistrelle	Moderate to High	Moderate to High	Low to Moderate	Moderate to High
Common pipistrelle	High	High	High	High
Soprano pipistrelle	High	High	High	High
Brown long eared	Low to Moderate	Moderate	Moderate	Moderate

Source: Ecobat/Natural Power

Table A7.18: Relative bat activity confidence intervals* for Table A7.16 and Table A7.17.

Species	Spring	Summer	Autumn
Mouse-eared bat species	5-5	33-33	29.5-43.5
Nyctalus bat species	0	51-68.5	0
Common noctule	0	62.5-84.5	45.5-63.5
Pipistrelle sp.	95-95	92.5-98	99.5-100
Nathusius' pipistrelle	5-33.5	37.5-57	2-24
Common pipistrelle	49-86	66-88	94-98
Soprano pipistrelle	65-91	79.5-94.5	96-99

Species	Spring	Summer	Autumn
Brown long eared	18-18	25.5-25.5	22.5-22.5

*The 95% confidence intervals represent the range of values that you can be 95% certain contains the true average bat activity for each species based on the range of data used in the assessment.

Source: Ecobat/Natural Power

Table A7.19: The Ecobat relative bat activity for the median activity level (percentile) of bats recorded across each night of the bat survey for each detector location summarised for the whole year.

Species	Detector ID												
	MCB	Pond	Stream	A	B	C	D	E	F	G	H	I	J
Mouse-eared bat species	Low - Mod	Low -Mod	Low - Mod	Low - Mod	Low	Low	NA	Low	Low	Low	Low	Low - Mod	Low - Mod
Nyctalus bat species	Low - Mod	Mod	Mod - High	Low - Mod	Low	NA	Mod	Low - Mod	NA	Mod - High	NA	NA	Mod - High
Common noctule	Mod	Mod	Mod	Low - Mod	Low - Mod	Low - Mod	Low - Mod	Low - Mod	Low - Mod	Low - Mod	High	Mod - High	Mod
Pipistrelle sp.	High	High	High	High	High	High	Mod	Mod - High	Mod - High	Mod - High	High	High	Mod - High
Nathusius' pipistrelle	Low	Low - Mod	Low - Mod	Low	Low	Low - Mod	Low	Low	Low	Low	Low - Mod	Low - Mod	Low - Mod
Common pipistrelle	Mod - High	Mod - High	High	High	Mod	Mod - High	Mod	Low - Mod	Mod	Mod	Mod - High	Mod	Mod
Soprano pipistrelle	High	High	High	High	Mod	Mod	Low - Mod	Mod	Mod	Mod	Low - Mod	Mod	Mod
Brown long eared	Low - Mod	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low	Low
Dist. from turbine (m)	**685**	**883**	**810**	**978**	**749**	**462**	**285**	**125**	**20**	**407**	**409**	**734**	**1137**

Source: Ecobat/Natural Power

Table A7.20: The Ecobat relative bat activity for the maximum activity level (percentile) of bats recorded across each night of the bat survey for each detector location summarised for the whole year.

Species	Detector ID												
	MCB	Pond	Stream	A	B	C	D	E	F	G	H	I	J
Mouse-eared bat species	Mod - High	Mod - High	Mod - High	Mod	Low - Mod	Low - Mod	NA	Low	Low	Low	Mod	Low - Mod	Mod
Nyctalus bat species	Low - Mod	Mod	Mod - High	Mod	Low	NA	Mod	Low - Mod	NA	Mod - High	NA	NA	Mod - High
Common noctule	High	High	High	High	Mod	Mod - High	Mod	Mod - High	Mod - High	Mod - High	High	High	High
Pipistrelle sp.	High	High	High	High	High	High	High	Mod - High	High	High	High	High	High
Nathusius' pipistrelle	Low	Mod - High	Mod	Low - Mod	Low - Mod	Mod	Low - Mod	Low	Low - Mod	Low	Mod	Mod	Mod
Common pipistrelle	High	High	High	High	High	High	High	Mod - High	High	High	High	High	High
Soprano pipistrelle	High	High	High	High	High	High	High	Mod - High	High	High	High	High	High
Brown long eared	Mod	Low - Mod	Mod	Low - Mod	Mod	Mod	Low	Low	Low	Low	Low - Mod	Low - Mod	Low - Mod
Dist. from turbine (m)	**685**	**883**	**810**	**978**	**749**	**462**	**285**	**125**	**20**	**407**	**409**	**734**	**1137**

Source: Ecobat/Natural Power

Protected Mammals

A7.4.5 A summary of all protected mammal signs recorded in the Proposed Development Area in 2019 area are shown in Table A7.21.

Table A7.21: Protected mammal survey results in the Proposed Development Area 2019

Date	Grid Reference	Species	Confidence of record	Nature of record	No. signs	Freshness of sign	Status	Comments
23/07/2019	NT 38689 37845	Squirrel sp.	Definite	Feeding Sign	1	Recent		
23/07/2019	NT 38419 38175	Otter	Probable	Spraint	1	Old		
23/07/2019	NT 38730 37549	Otter	Definite	Spraint/scat	3	Old		
24/07/2019	NT 38011 38698	Otter	Probable	Spraint/scat	1	Old		
25/07/2019	NT 37407 39807	Squirrel sp.	Probable	Remains/corpse	1	Old		
25/07/2019	NT 37437 39872	Squirrel sp.	Definite	Feeding sign	1	Recent		
26/07/2019	NT 38499 38150	Squirrel sp.	Definite	Feeding sign	2	Recent		
26/07/2019	NT 39309 37483	Red squirrel	Definite	Live sighting	1			Red squirrel seen running down farm drive
26/07/2019	NT 38665 37811	Grey squirrel	Definite	Live sighting	1		Active	Grey squirrel sighting.
26/07/2019	NT 38587 37770	Squirrel sp.	Definite	Feeding sign	20	Old		Old, chewed cones within small conifer block.
26/07/2019	NT 38386 37872	Squirrel sp.	Definite	Feeding sign	20	Old		Old, chewed cones within small conifer blocks.
26/07/2019	Confidential*	Badger	Possible	Burrow/hole	6	Old	Potential	Six entrance sett. Only signs of rabbit recorded.
26/07/2019	NT 38365 37901	Badger	Definite	Latrine	3	Recent		Two fresh latrines adjacent to pathway.
26/07/2019	Confidential*	Badger	Definite	Burrow/hole	6	Recent	Active	Four entrance badger sett on open hill. Bedding, hairs, recent digging.
26/07/2019	Confidential*	Badger	Probable	Burrow/hole	2	Old	Inactive	Two entrance badger sett within small conifer block. No evidence of current use.
26/07/2019	Confidential*	Badger	Definite	Burrow/hole	5	Recent	Active	Single entrance badger sett. Recent latrines adjacent.

Source: Natural Power
** The locations of badger setts are confidential – see Ecology Confidential Appendix 7.2 for details of location.*

Fish Habitat

A7.4.6 Descriptions of all habitats recorded during the fish habitat survey within the Proposed Development Area are presented in Table A7.22

Table A7.22: Fish habitat survey results in the Proposed Development Area 2019

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
25/07/2019	NT 37268 39468	20	55	15	10	na*	na	5	25	25	30	5	na	5	5	Low	Clear	0	Yes	20				2	Fish seen in burn.
25/07/2019	NT 37281 39504	15	65	15	5	na	na	5	20	30	30	5	na	5	5	Low	Clear	0	No	30				3	
25/07/2019	NT 37286 39593	15	60	20	5	na	na	5	25	35	25	5	na	5	na	Low	Clear	0	Yes	20				2	
25/07/2019	NT 37296 39635	10	60	20	10	na	na	5	25	30	25	5	na	5	5	Low	Clear	0	No	30				3	
25/07/2019	NT 37288 39662	15	70	15	0	na	Water gate	5	25	30	25	10	na	5	na	Low	Clear	0	No	30				4	
25/07/2019	NT 37307 39687	10	70	15	5	na	Water gate	5	25	25	30	10	na	5	na	Low	Clear	0	No	25				3	
25/07/2019	NT 37325 39737	0	80	20	0	na	Culvert small bridge	5	25	25	30	0	na	15	na	Low	Clear	0	Yes, heavily	10				0.3	
25/07/2019	NT 37321 39753	10	70	15	5	na	Watergate	5	25	25	30	5	na	10	na	Low	Clear	0	No	20				3	
25/07/2019	NT 37325 39836	10	70	15	5	na	na	5	20	30	30	10	na	5	na	Low	Clear	0	Yes	20				3	
25/07/2019	NT 37345 39906	10	70	15	5	na	na	5	20	30	25	15	na	5	na	Low	Clear	0	Yes	20				3	
25/07/2019	NT 37365 39983	15	65	15	5	na	na	5	20	35	25	10	na	5	na	Low	Clear	0	Yes	30				3	
25/07/2019	NT 37396 40048	20	60	15	5	na	Water gate	5	20	30	25	15	na	5	na	Low	Clear	0	Yes	40				3	
25/07/2019	NT 37446 40124	15	60	15	10	Small islands	na	5	25	25	25	10	na	10	na	Low	Clear	0	Yes	30				3	
25/07/2019	NT 37448 40169	15	65	15	5	na	na	5	20	30	25	10	na	10	na	Low	Clear	0	No	30				2	
25/07/2019	NT 37460 40228	15	65	15	5	na	na	5	20	30	30	10	na	5	na	Low	Clear	0	No	40				2	
25/07/2019	NT 37464 40273	10	70	15	5	na	na	5	20	35	25	10	na	5	na	Low	Clear	0	No	20				2	
25/07/2019	NT 37491 40376	10	70	15	5	na	na	5	20	35	20	15	na	5	na	Low	Clear	0	No	40				3	
25/07/2019	NT 37574 40377	10	65	20	5	na	na	5	20	25	20	15	na	15	na	Low	Clear	0	No	30				3	

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
25/07/2019	NT 37530 40446	15	55	20	10	na	na	5	25	30	20	10	na	10	na	Low	Clear	0	Yes	40				3	
25/07/2019	NT 37535 40526	15	60	15	10	na	Water gate	5	30	30	15	10	na	10	na	Low	Clear	0	Yes	40				2	
25/07/2019	NT 37529 46568	15	55	15	15	Old gate forming fall	na	5	25	30	20	5	na	15	na	Low	Clear	0	Yes	20				3	
25/07/2019	NT 37541 40663	15	60	15	10	na	na	5	25	30	15	10	na	10	5	Low	Clear	0	Yes	20				3	
25/07/2019	NT 37561 40694	20	60	15	5	na	Water gate	5	25	30	15	10	na	10	na	Low	Clear	0	Yes	30				3	Fish seen.
25/07/2019	NT 37574 40742	20	60	15	5	Bog myrtle plant	na	5	30	30	20	5	na	10	na	Low	Clear	0	Yes	30				2	Fish seen
25/07/2019	NT 37575 40780	15	60	15	10	Waste	na	5	25	30	20	5	na	15	na	Low	Clear	0	Yes	30				2	Fish seen.
25/07/2019	NT 37581 40801	25	40	15	20	Corrugated sheet fence post	na	5	20	25	25	5	na	20	na	Low	Clear	0	Yes	40				2	Fish seen
25/07/2019	NT 37590 40809	15	65	15	5	na	Small bridge	5	30	30	25	5	na	5	na	Low	Clear	0	Yes	20				1	Fish seen. Parting of waters below white house going up valley.
25/07/2019	NT 37602 40835	5	65	30	0	na	na	5	30	30	10	5	na	20	na	Low	Clear	0	Yes	20				1	Vegetation overhanging. Parting of waters below white house going up valley.
25/07/2019	NT 37591 40856	5	65	30	0	na	na	5	30	30	10	5	na	15	na	Low	Clear	0	Yes	20				1	Vegetation overhanging.
25/07/2019	NT 37579 40872	10	65	25	0	na	na	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	20				1	Vegetation overhanging.
25/07/2019	NT 37599 40894	10	80	10	0	na	na	5	30	35	10	5	na	5	na	Low	Clear	0	Yes	10				1	Fish seen.
25/07/2019	NT 37591 40905	15	75	10	0	na	na	5	30	30	15	5	na	5	na	Low	Clear	0	No	10				1	Fish seen.
25/07/2019	NT 37579 40913	15	75	10	0	na	na	5	30	35	10	5	na	5	na	Low	Clear	0	No	10				1	Fish seen.
25/07/2019	NT 37571 40921	15	75	10	0	na	Water gate	5	30	35	20	5	na	5	na	Low	Clear	0	Yes	10				1	Fish seen.

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
25/07/2019	NT 37568 40940	15	65	10	10	na	na	5	25	30	20	5	na	15	na	Low	Clear	0	No	30				1	Fish seen.
25/07/2019	NT 37561 40958	10	65	10	15	Fallen trees and branches	na	5	25	25	10	10	na	20	5	Low	Clear	100	No	20				2	Fish seen.
25/07/2019	NT 37549 40996	10	65	10	15	Fallen trees and branches	na	5	25	30	15	10	na	15	na	Low	Clear	100	No	20				2	Fish seen.
25/07/2019	NT 37525 41026	10	65	15	10	na	na	5	30	35	10	5	na	15	na	Low	Clear	0	No	20				1	Fish seen.
25/07/2019	NT 37514 41043	10	65	15	10	na	na	5	30	35	10	5	na	15	na	Low	Clear	0	No	20				1	Fish seen.
25/07/2019	NT 37498 41050	15	65	10	10	na	Hose	5	30	30	20	5	na	10	na	Low	Clear	0	No	20				1	Fish seen.
25/07/2019	NT 37487 41045	10	60	15	15	na	Tunnel and bridge	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	30				1	Fish seen.
25/07/2019	NT 37473 41063	10	60	20	10	na	na	5	30	35	5	5	na	20	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37461 41085	15	55	20	10	na	na	5	40	35	5	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37954 41107	10	60	20	10	na	na	5	40	40	5	5	na	5	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37441 41118	15	65	15	5	na	na	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	30				1	Fish seen.
25/07/2019	NT 37433 41136	15	65	15	5	na	na	5	35	40	5	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37424 41148	15	60	15	10	na	na	5	35	35	5	5	na	15	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37408 41159	10	75	10	5	na	na	5	35	40	5	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37406 41174	10	75	10	5	na	na	5	40	40	5	5	na	5	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37401 41200	10	75	10	5	na	na	5	40	40	5	5	na	5	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37403 41218	10	80	15	5	na	na	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37389 41235	15	75	10	0	na	na	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
25/07/2019	NT 37386 41258	15	60	15	10	na	na	5	30	35	15	5	na	10	na	Low	Clear	0	Yes	20				2	Fish seen.
25/07/2019	NT 37374 41281	15	55	15	15	na	na	5	30	35	10	5	na	15	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37364 41293	10	65	15	10	na	Metal bridge	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37357 41311	10	70	10	10	na	na	5	35	35	10	5	na	10	na	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37352 41334	10	75	10	5	na	na	5	30	35	10	5	na	15	ma	Low	Clear	0	Yes	20				1	Fish seen.
25/07/2019	NT 37355 41355	15	70	10	5	na	na	5	35	35	10	5	na	10	na	Low	Clear	0	No	20				1	Fish seen.
25/07/2019	NT 37356 41374	15	65	10	10	na	na	5	30	35	10	5	na	15	na	Low	Clear	0	No	20				1	Fish seen.
25/07/2019	NT 37359 41394	15	65	10	10	na	na	5	35	35	5	5	na	15	na	Low	Clear	0	No	20				1	Fish seen.
25/07/2019	NT 37352 41413	15	70	10	5	na	na	5	35	35	5	5	na	15	na	Low	Clear	0	No	20				1	Fish seen.
24/07/2019	NT 38285 38663	10	65	20	5	na	Culvert	5	35	15	20	10	na	15	na	Low	Clear	100	No			12		1.5	
24/07/2019	NT 38295 38663	20	65	15	0	na	na	5	20	25	20	10	na	20	na	Low	Clear	100	No			10		1.5	
24/07/2019	NT 38305 38701	15	65	20	0	Branch debris	na	5	15	20	30	10	na	20	na	Low	Clear	90	No			10		1.5	
24/07/2019	NT 38309 38730	10	70	20	0	Branch debris	na	10	30	25	20	10	na	25	na	Low	Clear	90	No			10		1	
24/07/2019	NT 38317 38785	15	55	25	5	Branch debris	na	5	30	25	15	15	na	20	na	Low	Clear	100	No			10		1	
24/07/2019	NT 38320 38831	20	60	20	0	Debris	na	5	25	10	15	20	na	25	na	Low	Clear	100	No			15		1.5	
24/07/2019	NT 38320 38865	25	35	35	5	Debris	na	5	30	10	20	15	na	20	na	Low	Clear	100	No			10		1.5	
24/07/2019	NT 38314 38942	25	45	25	5	na	na	5	30	15	20	15	na	25	na	Low	Clear	100	No			10		1	

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
24/07/2019	NT 38308 38978	25	50	25	5	na	na	5	35	20	15	10	na	15	na	Low	Clear	90	No			10		1	
25/07/2019	NT 37628 40812	5	50	30	15	na	Road bridge	5	20	15	45	10	na	5	na	Low	Clear	100	No			20		1	
25/07/2019	NT 37667 40811	15	45	20	20	na	na	5	25	20	40	5	na	5	na	Low	Clear	100	No			20		1	
25/07/2019	NT 37731 40827	10	60	30	0	na	Water gate	5	15	15	55	5	na	5	na	Low	Clear	100	No			25		1	
25/07/2019	NT 37785 40860	15	65	15	5	na	na	5	10	20	50	10	na	5	na	Low	Clear	100	No			25		1	
25/07/2019	NT 37827 40870	10	50	30	10	na	na	5	10	25	40	10	na	10	na	Low	Clear	100	No			20		1	
25/07/2019	NT 37888 40891	15	55	20	10	na	na	5	10	15	45	15	na	10	na	Low	Clear	100	No			15		1	
25/07/2019	NT 37914 40891	10	60	20	10	na	Water gate	5	15	20	45	10	na	5	na	Low	Clear	100	No			15		1	
25/07/2019	NT 32966 40918	15	45	30	10	na	na	5	15	15	40	15	na	10	na	Low	Clear	100	Yes			25		1	
25/07/2019	NT 38015 40931	15	40	35	10	na	na	5	20	25	25	20	na	5	na	Low	Clear	100	No			20		1	
25/07/2019	NT 38060 40939	20	45	20	15	na	na	5	15	15	30	30	na	5	na	Low	Clear	100	Yes			15		1	
25/07/2019	NT 38105 40965	15	40	35	40	na	na	5	15	15	30	25	na	10	na	Low	Clear	100	Yes			25		1	
25/07/2019	NT 38140 40980	20	40	30	10	na	na	5	15	15	30	25	na	10	na	Low	Clear	100	Yes			12		1	
25/07/2019	NT 38174 40983	15	35	35	15	na	na	5	20	20	15	35	na	5	na	Low	Clear	100	Yes			20		0.8	
25/07/2019	NT 38207 41040	20	40	25	15	na	na	10	30	15	15	20	na	10	na	Low	Clear	100	Yes			15		0.8	
25/07/2019	NT 38244 41080	20	30	30	20	na	na	10	30	20	20	15	na	10	na	Low	Clear	100	Yes			15		0.8	
25/07/2019	NT 38277 41136	25	35	25	15	na	na	10	30	15	20	10	na	10	5	Low	Clear	100	Yes			12		0.7	

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
25/07/2019	NT 38274 41207	25	30	25	20	na	na	5	25	20	20	20	na	10	na	Low	Clear	100	No			10		0.5	
25/07/2019	NT 38253 41266	30	35	15	20	na	na	10	30	20	15	15	na	10	na	Low	Clear	100	Yes			10		0.5	
25/07/2019	NT 38259 41329	30	40	15	15	na	na	5	35	20	20	10	na	10	na	Low	Clear	100	Yes			10		0.5	Watercourse overgrown and incoherent from this point upstream
25/07/2019	NT 37348 41575	25	60	15	0	na	na	5	15	30	25	15	na	10	na	Low	Clear	100	Yes			8		0.5	
25/07/2019	NT 37339 41536	20	45	25	10	na	na	10	20	25	30	10	na	5	na	Low	Clear	100	Yes			12		0.5	
25/07/2019	NT 37335 41493	30	30	15	25	na	na	10	20	20	20	15	na	15	na	Low	Clear	100	Yes			25		0.5	
25/07/2019	NT 37318 41472	25	40	20	15	na	na	10	30	10	25	15	na	10	na	Low	Clear	100	No			8		0.5	
25/07/2019	NT 37332 41453	15	60	15	10	na	na	5	35	20	20	15	na	5	na	Low	Clear	100	No			12		0.5	
25/07/2019	NT 37348 41434	20	60	15	5	na	na	5	25	25	25	10	na	10	na	Low	Clear	100	No			30		0.5	
24/07/2019	NT 38272 38582	35	45	20	0	na	Stone bridge	5	25	25	25	15	na	5	na	Low	Clear	80	No	40				2	Fish seen. 100% bank veg. grasses, rushes
24/07/2019	NT 38260 38609	15	65	15	5	Hose	Water gate	5	20	30	35	0	na	5	5	Low	Clear	60	Yes	20				2	
24/07/2019	NT 38219 38614	20	60	15	5	na	na	5	20	25	35	5	na	10	na	Low	Clear	50	Yes	30				2	
24/07/2019	NT 38201 38622	20	55	20	5	na	na	5	20	20	30	5	na	15	5	Low	Clear	60	Yes	20				3	
24/07/2019	NT 38183 38646	30	50	15	5	na	Water gate	5	20	25	25	10	na	15	na	Low	Clear	70	Yes	30				3	
24/07/2019	NT 38145 38666	20	50	20	10	na	na	5	20	20	30	5	na	20	na	Low	Clear	90	Yes	30				4	
24/07/2019	NT 38092 38675	15	60	15	10	Tree grown mid-stream	na	5	25	25	25	5	na	15	na	Low	Clear	90	Yes	20				2	

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
24/07/2019	NT 38065 38681	15	60	15	10	na	2 pipe culvert, small bridge	5	20	20	30	5	na	15	5	Low	Clear	60	Yes	30				3	
24/07/2019	NT 38068 38681	0	30	50	20	Build-up of silt and branch debris	na	5	5	0	0	0	na	90	na	Low	Clear	100	Yes	10				1	Heavily vegetated
24/07/2019	NT 38000 38698	15	65	15	5	Branch debris	na	5	25	35	20	5	na	15	5	High	Clear	0	Yes	20				2	
24/07/2019	NT 37931 38707	20	60	15	5	Branch debris	na	5	20	25	25	5	na	10	10	High	Clear	0	Yes	30				2	100% bank veg. grasses, rushes
24/07/2019	NT 37917 38726	15	65	15	5	Branch debris	na	5	20	30	30	5	na	5	5	High	Clear	10	Yes, heavily	20				2	
24/07/2019	NT 37975 38706	20	60	15	5	na	Water gate	5	25	30	25	5	na	5	5	High	Clear	0	Yes, heavily	20				2	
24/07/2019	NT 37858 38737	20	55	20	5	Tree stumps	Wooden bridge	5	25	30	25	5	na	10	na	High	Clear	10	Yes	30				4	
24/07/2019	NT 37773 38796	25	55	15	5	na	na	5	55	25	30	5	na	5	5	High	Clear	5	Yes	30				2	
24/07/2019	NT 37770 38827	15	75	5	5	na	na	5	25	25	35	5	na	5	na	High	Clear	0	Yes	30				2	
24/07/2019	NT 37720 38834	0	70	25	5	na	na	10	30	35	5	0	na	20	na	Low	Clear	0	Yes	10				1	
24/07/2019	NT 37694 38826	15	55	25	5	Branch debris	na	5	20	30	30	5	na	10	na	High	Clear	0	Yes	20				2	
24/07/2019	NT 37661 38858	10	60	25	5	na	na	5	20	25	30	5	na	15	na	High	Clear	25	Yes	30				2	
24/07/2019	NT 37629 38864	20	60	20	0	na	na	5	25	30	30	5	na	5	na	High	Clear	0	Yes	20				2	
24/07/2019	NT 37599 28871	20	55	15	10	Fallen trees and branches	na	5	25	30	30	5	na	5	na	High	Clear	0	Yes	30				2	Fish present
24/07/2019	NT 37564 38900	15	55	15	15	na	na	5	25	25	30	5	na	10	na	High	Clear	10	Yes	30				2	
24/07/2019	NT 37534 38920	20	45	20	15	na	na	5	25	30	25	5	na	15	na	High	Clear	0	Yes	40				2	
24/07/2019	NT 37516 38935	25	40	20	15	na	na	5	25	30	25	5	na	15	na	High	Clear	0	Yes	30				2	

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
24/07/2019	NT 37505 38962	20	60	15	5	na	Manmade waterfall	5	25	35	25	5	na	5	na	High	Clear	0	Yes	25				2	
24/07/2019	NT 37476 38988	15	65	15	5	na	na	5	20	35	30	5	na	5	na	High	Clear	0	No	30				5	
24/07/2019	NT 37455 39014	15	65	15	5	na	Water gate	5	25	35	25	5	na	5	na	High	Clear	0	No	20				2	
24/07/2019	NT 37413 39059	20	70	10	0	na	na	5	20	35	30	5	na	5	na	High	Clear	0	No	20				2	
24/07/2019	NT 37397 39094	20	65	15	0	na	na	5	20	35	30	5	na	5	na	High	Clear	0	No	20				2	
24/07/2019	NT 37366 39127	15	70	15	0	na	na	5	20	30	30	5	na	10	na	High	Clear	0	No	30				2	
24/07/2019	NT 37345 39155	10	75	15	0	na	na	5	25	30	30	5	na	5	na	High	Clear	0	No	30				3	100% bank veg. bracken, grasses, rushes
24/07/2019	NT 37325 39184	20	60	15	5	na	na	5	25	30	30	5	na	5	na	High	Clear	0	Yes	40				3	
24/07/2019	NT 37309 39224	25	55	15	5	na	na	5	25	25	35	5	na	5	na	High	Clear	0	No	50				2	
24/07/2019	NT 37296 39263	20	60	15	5	na	na	5	20	30	30	10	na	5	na	High	Clear	0	No	30				3	
24/07/2019	NT 37277 39312	25	55	15	0	na	na	5	20	20	40	10	na	5	na	High	Clear	0	No	20				3	
24/07/2019	NT 37268 39358	20	60	20	0	na	na	5	20	25	35	10	na	5	na	High	Clear	0	No	20				3	
24/07/2019	NT 37280 39696	15	60	20	5	na	na	5	20	30	30	10	na	5	na	High	Clear	0	No	40				2	
24/07/2019	NT 37271 39447	15	65	15	5	na	na	5	25	25	30	5	na	5	5	High	Clear	0	No	30				2	
23/07/2019	NT 38305 38539	5	75	20	0	na	Wooden bridge	0	30	20	30	15	na	5	na	Low	Clear	60	Yes	15				2	Tree vegetation. Fish seen all along burn
23/07/2019	NT 38306 38528	10	70	20	0	na	na	0	25	20	35	10	na	10	na	Low	Clear	50	Yes	15				2	Fish seen all along burn
23/07/2019	NT 38320 38491	15	20	55	10	na	na	0	20	20	20	10	na	30	na	Low	Clear	70	No	10				2	Fish seen all along burn

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
23/07/2019	NT 38332 38449	15	40	40	5	Fallen branch	na	0	15	20	30	10	na	25	na	Low	Clear	60	No	12				2	Fish seen all along burn
23/07/2019	NT 38356 38406	15	30	45	10	In stream tree	Wooden bridge	0	20	20	30	5	na	25	na	Low	Clear	60	Yes	20				2	Fish seen all along burn
23/07/2019	NT 38346 38349	5	45	50	0	na	na	0	20	30	15	5	na	20	na	Low	Clear	60	No	20				2	Fish seen all along burn
23/07/2019	NT 38357 38332	10	35	50	5	Pile of twigs	na	0	20	30	25	5	na	15	5	Low	Clear	20	Yes	5				2	
23/07/2019	NT 38370 38333	10	65	15	10	na	na	0	30	35	10	10	na	10	5	Low	Clear	80	Yes	10				4	
23/07/2019	NT 38365 38281	10	50	30	10	na	na	0	20	35	10	10	na	25	na	Low	Clear	40	Yes	30				2	
23/07/2019	NT 38380 38231	10	55	30	5	Plastic lid and twigs	na	0	20	30	20	10	na	20	na	Low	Clear	80	No	20				2	
23/07/2019	NT 38390 38209	10	65	15	10	Broken branch and fallen tree	na	5	20	20	25	5	na	20	5	Low	Clear	100	No	20				2.5	Many fish seen along burn. Bank vegetation 100% grasses.
23/07/2019	NT 38410 38192	20	65	10	5	na	na	5	20	35	20	10	na	10	na	Low	Clear	80	No	20				2	
23/07/2019	NT 38427 38173	15	40	25	20	Branch debris	na	5	20	35	25	10	na	5	na	Low	Clear	90	No	15				2	
23/07/2019	NT 38435 38151	10	60	25	5	na	na	5	25	25	20	5	na	20	na	Low	Clear	90	No	25				2.5	
23/07/2019	NT 38457 38125	15	65	20	0	Branch debris	Wooden bridge	5	25	35	20	5	na	10	na	Low	Clear	65	Yes	10				2	
23/07/2019	NT 38467 38096	15	55	15	15	Branch debris	na	5	15	15	25	10	na	25	5	Low	Clear	50	No	20				5	
23/07/2019	NT 38512 38070	10	75	15	0	na	Wooden bridge	5	25	25	20	10	na	10	na	Low	Clear	70	No	10				3	
23/07/2019	NT 38555 38040	15	65	15	5	Branch debris	na	5	20	30	20	15	na	10	na	Low	Clear	60	Yes	20				3	
23/07/2019	NT 38541 38028	10	65	15	10	na	na	5	25	25	30	5	na	10	na	Low	Clear	80	No	25				3	
23/07/2019	NT 38557	5	75	15	5	Overhanging branches	na	5	20	35	20	5	5	10	na	Low	Clear	80	No	25				3	

		Habitat details						Instream sediment type (%)								Additional Site Info				Measurements Depth (m)				Width (m)	Notes
Date	Grid reference	Riffle	Glides	Slack	Pools	Flow constrictions	Structures	Sand	Gravel	Pebble	Cobble	Boulder	Bedrock	Silt	Clay	Flow	Visibility	Bank Vegetation L/R	Instream vegetation	Measured	LHS	Middle	RHS		
	37999																								
23/07/2019	NT 38579 37980	10	80	10	0	na	Wooden bridge	5	20	25	30	10	na	10	na	Low	Clear	90	No	25				2.5	
23/07/2019	NT 38614 37962	10	70	15	5	Branch debris	na	5	15	20	35	5	na	5	5	Low	Clear	40	No	15				3	
23/07/2019	NT 38649 37937	5	65	20	10	Fallen tree	Water gate	5	30	40	20	0	na	5	na	Low	Clear	80	No	10				4	
23/07/2019	NT 38667 37903	5	75	15	5	Branch debris	na	5	20	30	30	5	na	10	na	Low	Clear	90	No	30				2	
23/07/2019	NT 38662 37863	5	15	50	30	Branch debris	Dam	5	10	20	15	0	na	50	na	Low	Clear	60	No	30				2	
23/07/2019	NT 38647 37852	20	45	15	20	na	Dam. Fish ladder	5	20	25	10	25	5	10	na	Low	Clear	100	No	20				4	
23/07/2019	NT 38662 37813	25	50	15	10	Branch debris	Wooden bridge	5	15	20	20	25	na	15	na	Low	Clear	100	No	20				5	
23/07/2019	NT 38670 37763	5	80	10	5	na	Water gate	5	20	30	30	10	na	5	na	Low	Clear	90	No	20				5	
23/07/2019	NT 38673 37748	5	75	10	10	na	na	5	20	35	15	15	na	10	na	Low	Clear	100	No	20				4	
23/07/2019	NT 38684 37685	5	70	15	10	na	Wooden bridge	5	20	35	20	15	na	5	na	Low	Clear	100	No	15				4	
23/07/2019	NT 38704 37670	20	60	15	5	na	na	5	20	35	20	15	na	5	na	Low	Clear	100	No	40				2	
23/07/2019	NT 38707 37690	15	65	15	5	na	na	5	20	40	15	15	na	5	na	Low	Clear	100	No	20				3	
23/07/2019	NT 38714 37594	15	70	15	0	na	Old stone bridge and gate	5	20	35	15	10	na	15	na	Low	Clear	60	Yes	20				8	
23/07/2019	NT 38730 37559	15	65	20	0	na	Bridge and water gate	5	20	25	15	20	na	15	na	Low	Clear	100	No	20				3	

Source: Natural Power

*na = not present

Pinch Point Assessment

A7.4.7 The results from the Pinch Point Assessment is provided in Table A7.23.

Table A7.23: Assessment of Pinch Point and swept path analysis along the proposed AIL route.

Pinch Point no.	Requirement of overrun and oversail	Removal of trees or other vegetation	Within designated area	Mitigation
Pinch Point 1 – Central Dock Rd to South Shore Rd	No overrun Area of oversail	No removal of trees	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 2 – Exit from Docks from South Shore Road to Powdrake Road	Area of overrun and oversail	No removal of trees Some removal of amenity grassland	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 3 – Right Hand Bend on Powdrake Road	Area of overrun and oversail	No removal of trees Some removal of amenity grassland	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 4 – Powdrake Roundabout	Area of overrun and oversail	No removal of trees Some removal of amenity grassland	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 5 – Inchyra Roundabout	Area of oversail	No removal of trees	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 6 – Wholeflats Roundabout	Area of overrun and oversail	No removal of trees or other vegetation	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 7 – Slip Road onto M9 at Junction 5	Area of oversail	No removal of trees or other vegetation	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 8 – Not Used	No longer required due to further assessment of PP8 indicated that no oversail or overrun beyond the carriageway extents would be required	No removal of trees or other vegetation	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 9 – Old Craighall Roundabout	No overrun Area of oversail	No removal of trees or other vegetation	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 10 – Millerhill Junction	Potential overrun of earth bund tbc after topographic survey. Area of oversail	No removal of trees. Potential of other vegetation removal	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 11 – A68 Through Pathhead	Area of overrun and oversail	No removal of trees or other vegetation	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 12 – Junction of A68 onto B6458	Area of overrun and oversail	Trees present but removal not required Removal of roadside grass verge and third party agricultural land	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 13 – B6367 Border Rail Crossing	New road required into third party land. Area of overrun and oversail	No removal of trees. Removal of vegetation along roadside verge and within pasture field	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works

Pinch Point no.	Requirement of overrun and oversail	Removal of trees or other vegetation	Within designated area	Mitigation
Pinch Point 14 – Return of Off-route Track from Pinch Point 13	New road required into third party land. Area of overrun and oversail	No removal of trees. Removal of vegetation along roadside verge and within pasture field	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 15 – Right Hand Bend on B6367	Area of overrun and oversail into third party land	Some removal of agricultural land and roadside verge	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 16 – Junction of B6367 onto the A7	Area of overrun and oversail into third party land	Some removal of agricultural land and roadside verge	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 17 – Junction of A7 onto B7007	Area of overrun and oversail into third party land	Some removal of trees, roadside verge and some potential minor earthworks (tbc) to facilitate oversail into third party agricultural land	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 18 – Right Hand Bend on B7007	Area of oversail over third party land	No removal of trees	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 19 – Left Hand Bend on B7007	Area of oversail over third party land	No removal of trees	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 20 – Right Hand Bend on B7007	No overrun Area of oversail	No removal of trees	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 21 – Left Hand Bend at The Mound on the B7007	Area of overrun and oversail	Significant earthworks required to provide overrun. Removal of vegetation and cut and fill	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 22 – Left Hand Bend on B7007	Area of oversail including some third party land	No removal of trees	no	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 23 – S Bends on B7007	Area of overrun and oversail	Removal of vegetation predominantly within the roadside verge	Moorfoot Hills SAC/ SSSI Area of overrun 158.16 m^2 at pinch point Area of overrun within SAC 99.21 m^2	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 24 – Right Hand Bend on B7007	Area of overrun and oversail including some in third party land	Removal of vegetation predominantly within the roadside verge	Moorfoot Hills SAC/ SSSI Area of overrun 57.05 m^2 at pinch point Area of overrun within SAC 57.05 m^2	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 25 – Right Hand Bend on B709 After Junction with B7007	Area of overrun and oversail including some in third party land	Removal of vegetation predominantly within the roadside verge. Also it is anticipated that large excavation and landscaping of the knoll on the inside of the road to facilitate oversail will be required	Moorfoot Hills SAC/ SSSI Area of overrun 37.48 m^2 at pinch point Area of overrun within SAC 6.96 m^2	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works
Pinch Point 26 – B709 on Approach to Blackhopebyres Steading	Area of oversail including third party land	No removal of trees	Moorfoot Hills SAC/ SSSI Area of overrun 0 m^2 at pinch point Area of overrun within SAC 0 m^2	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works

Pinch Point no.	Requirement of overrun and oversail	Removal of trees or other vegetation	Within designated area	Mitigation
Pinch Point 27 – Southern Section of B709 to Site Entrance	Areas of overrun and oversail	It is anticipated that there will be the removal of roadside vegetation at multiple locations along the section of road to facilitate overrun	Moorfoot Hills SAC/ SSSI Area of overrun 2315.66 m^2 at pinch point Area of overrun within SAC 2315.66 m^2	Desk study of whether protected species surveys will be required pre-construction/ ECoW present during road widening works

Source: Natural Power