Appendix to Chapter 8: Biodiversity

Appendix 8.8: Bat & Non-Volant Mammals Data

The data and descriptions in this appendix have informed the cumulative evaluations in the EIA Main Report.

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A8-8.1 Desktop Review - Bats

A8-8.1.1 Landsacpe Suitability for Bats

National landscape suitability maps for Irish bat species (Lundy *et al.,* 2010) were reviewed using the Map Viewer of the National Biodiversity Data Centre. The suitability index for the 'all bats combined' layer varies across the Whole UWF Project; areas of high suitability are found at the western end and in the centre of the UWF Grid Connection, while the eastern end of the UWF Grid Connection route and Upperchurch Windfarm are of moderate suitability. Overall, the landscape suitability follows a west to east pattern of decreasing suitability for all species, which roughly corresponds with the changes in altitude.

Landscape suitability in respect of Bats as available from the above cited source is illustrated in Plate 1.

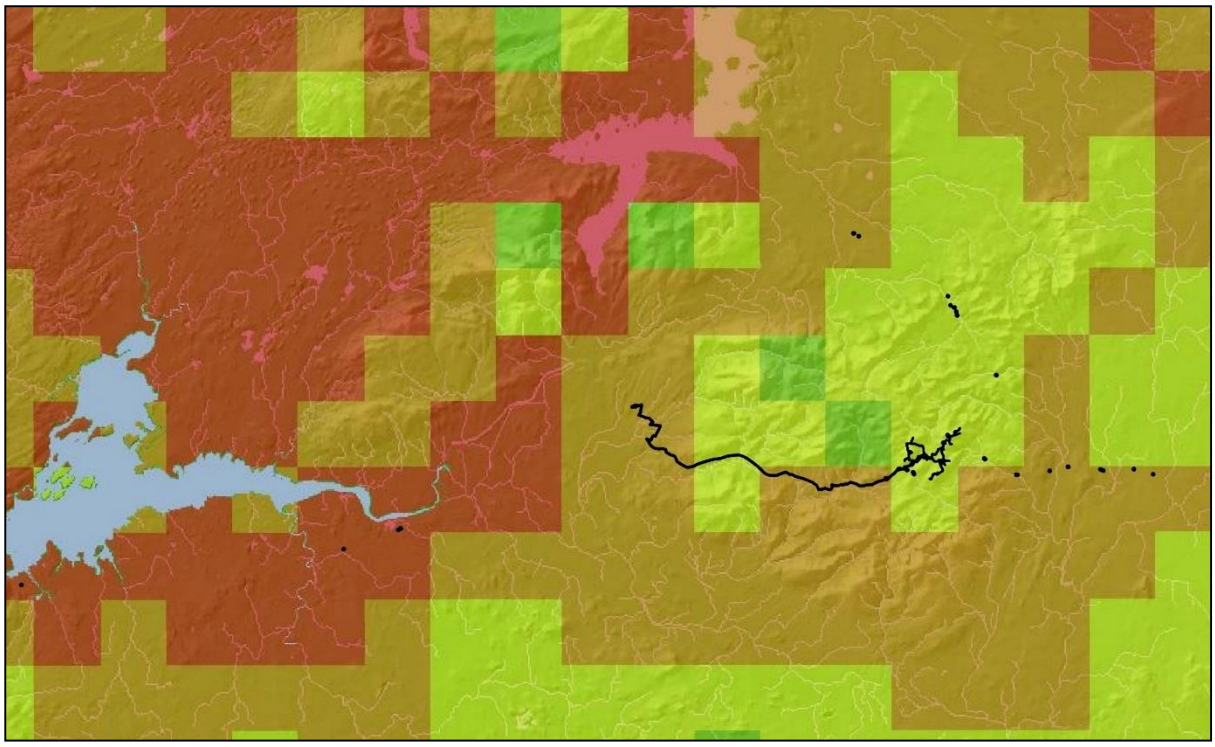

Plate 1: Bat Suitability Areas as per National Bat Suitability Landscape Mapping

(Areas shown in red have the highest habitat suitability index, and those in green, the lowest suitability index. However, squares highlighted as less favourable may still have local areas of abundance).

A8-8.1.2 Records of Known Bat Roosts

Records of known bat roosts within 10km of the UWF Grid Connection were obtained from the Bat Conservation Ireland database on the 5th September 2016. Eighteen roosts were identified, but all were located more than 5km from the UWF Grid Connection; most were from the banks of the River Shannon, and a small number were from the towns of Murroe (Glenstal Abbey), Ballyvoureen and Silvermines in County Tipperary. Consultations for this 2nd 2019 application were carried out with Bat Conservation Ireland in 2019, no feedback was received.

There were a number of activity records of Daubenton's bat, common pipistrelle, soprano pipistrelle and Leisler's bat within 10km of the UWF Grid Connection, with a few records of Natterer's bat and brown long-eared bat. The project is outside the geographical range of the lesser horseshoe bat, as the closest desktop records of this species were at Annacotty, Co. Limerick and Doonass, Co. Clare, approximately 8-10km to the west of the UWF Grid Connection.

A8-8.2 Fieldwork - Bats & Non-Volant Mammals

A8-8.2.1 Fieldwork - Bats

The key sensitivities of bats are the destruction or disturbance of their roosting places, and the modification of their commuting routes and foraging habitats (NPWS 2013, Collins et al., 2016).

Survey aims

The aims of the bat surveys were to:

- Assess the bat roost suitability of bridges, buildings and mature trees that will be directly affected by the Whole UWF Project
- Identify potential indirect effects on bats, e.g. from disruption of commuting routes, or lighting

Designated sites

Bats are not listed as conservation interests for any designated sites within 5km of the UWF Grid Connection.

A8-8.2.1.1 Survey of potential bat roosts in 2019

Surveys of buildings: A Preliminary Ecological Appraisal was carried out for all buildings within 150m of the development works using the approach outlined in Section 4.3 of Bat Conservation Trusts Guidelines (Collins, 2016). These surveys were conducted during ecological survey on 17th, 22nd and 23rd January 2019. All buildings were assigned a suitability category of negligible, low, moderate or high suitability, based on their age, construction, and condition. Detailed surveys of buildings were not carried out, because direct impacts on bat roosts in buildings was subsequently scoped out of the assessment.

Surveys of Trees: Mature trees within 50m of the UWF Grid Connection construction works area were inspected from ground level. Ground-level roost assessments were carried out for all trees with moderate or low bat suitability within 50m of the development works.

Surveys of Existing Watercourse Crossing Structures: As the 110kV UGC will be installed over/under c. 65 watercourse crossing structures (i.e. bridges and culverts), all structures along the route were inspected. It is noted that the development will cross 3 other watercourses (giving a total of 68 watercourse crossings), but there are no existing structures (bridges or culverts) at these locations. Within the study area, 11 no. watercourse crossing structures had moderate suitability for roosting bats, 6 no. bridges had low suitability, and 48 had negligible suitability. The Bridges with moderate and low suitability were surveyed using a high-powered torch, endoscope (with regard to Section 5.3 of the Bat Conservation Trust guidelines 2016) and/or bat detector survey, to determine whether or not roosting bats were present. Preliminary ecological appraisals were conducted in January 2019, and endoscope surveys / bat detector surveys were conducted in May and June 2019. All surveys were carried out in suitable weather conditions

A8-8.2.1.2 Mountphilips Substation and Upperchurch Substation Bat Activity surveys

Bat activity surveys using automated detectors were carried out at four locations near the Mountphilips Substation site and two locations near the consented Upperchurch Windfarm substation in 2016, in the mid-summer period (June – August 2016) and in the autumn season (September / October 2016). There was no change in the habitat at these locations between 2016 and 2019, and bat populations are stable on a national scale, so the data from 2016 is still considered to be representative of current bat activity.

Surveys were undertaken using automated Anabat Express bat detectors (Titley Scientific); these are high-specification modern bat detectors that are fit for purpose. External microphones were mounted on canes at a height of approximately 1.5m in order to obtain 'clean' recordings that were not affected by surrounding vegetation.

One detector was placed in each location for two nights in the mid-summer period (June – August 2016) and two nights in the autumn season (September / October 2016). Night length ranged from 7.15 hours in late June to 12.45 hours in early October, giving a total survey effort of approx. 35-40 hours at each sampling point. We consider that this survey effort was sufficient to provide a good representation of bat activity during their most active periods, and that it was proportionate to the potential effects of the Whole UWF Project, as discussed in Section 2.2.5 of Collins (2016).

Surveys were carried out during suitable weather conditions, i.e. minimum temperatures above 10°C, average winds of less than 4m/s and little or no rainfall. There was wet weather or high winds on some of the survey nights in September 2016, so the survey was extended until two nights of suitable conditions were obtained.

Species identification and interpretation of data

Sonograms from Anabat Express detectors were obtained in the 'zero-crossing' format and viewed using AnalookW software (Corben 2014). Species were identified with reference to *British Bat Calls: A Guide to Species Identification* (Russ 2012) based primarily on frequency and call shape, but also with reference to call slope for *Myotis* spp. Social calls were classified as unidentified bats unless they closely matched the examples provided in Russ (2012).

It is acknowledged that *Myotis* spp. can have very similar calls, and that the classification of sonograms can be imprecise, so all *Myotis* records in this document should be considered as conferre records, i.e. *Myotis* cf *daubentonii*. There can also be overlaps in call frequency between *Pipistrellus* spp. - calls with a CF component at 50 kHz may be either soprano pipistrelle or common pipistrelle, while calls at 40 kHz may be either common pipistrelle or Nathusius' pipistrelles – but in most cases, it is possible to determine the species based on call characteristics and/or other calls immediately before or after the recording. If a bat pass could not be confidently identified to species level it was recorded as an unidentified bat, or identified only to genus level (e.g. *Myotis* spp.).

Calculation and comparison of bat activity indices

In order to standardise bat activity between the mid-summer and autumn survey periods, results are displayed as a 'Bat Activity Index', which is the total number of bat passes divided by the number of hours per night (Hundt, 2012). This was calculated from sunset to sunrise, using publicly-available data from www.timeanddate.com.

At present there is not a standard system to categorise bat activity as low, moderate or high, because the results vary depending on the species involved and the location of the site. For the purposes of this report we use a bespoke system to discuss and compare levels of bat activity at the site, as outlined in the Table 1. This approach uses standardised terms (e.g. occasional, frequent) to categorise bat activity indices within certain ranges; the average time interval between passes is also provided to give a more-intuitive interpretation of the terms. Activity levels (from the Mountphilips Substation site sampling locations) were were rated using a Bat Activity Index,as outlined in Table 1.

Table 1: Characterisation of Bat Activity Indices

Bat Activity Index	Average interval between calls	Terms of characterisation
<2	> 30 minutes	Negligible
2 - 12	5 – 30 minutes	Occasional
12 – 60	1 – 5 minutes	Frequent
>60	< 1 minute	Near-constant

A8-8.2.1.3 Species identification and interpretation of data

Sonograms from Anabat Express detectors were obtained in the 'zero-crossing' format and viewed using AnalookW software (Corben 2014). Species were identified with reference to *British Bat Calls: A Guide to Species Identification (Russ 2012)* based primarily on frequency and call shape, but also with reference to call slope for Myotis spp. Social calls were classified as unidentified bats unless they closely matched the examples provided in Russ (2012).

A8-8.2.1.4 Previous Surveys for Other Elements of the Whole UWF Project

A Preliminary Ecological Appraisal was carried out in 2016 for all buildings within 150m of the Other Elements of the Whole UWF Project. Ground-level roost assessments were carried out for all trees with moderate or low bat suitability within 50m of the Whole UWF Project, using binoculars. Bat activity surveys using automated Anabat Express bat detectors were carried out at two locations near the consented Upperchurch Windfarm substation. Follow-up surveys were carried out for features of high or moderate roost suitability. In most cases this included a preliminary roost appraisal and a presence / absence survey, as defined in Collins (2016).

Results of Bat Surveys are presented below in Section A8-8.3.1.

A8-8.2.2 Fieldwork - Non-Volant Mammals

Surveys for all legally protected non-volant mammal species were undertaken within a 50m buffer of the UWF Grid Connection, with the exception of otter as detailed below.

The surveys to inform the first planning application (partially relied on herein) was undertaken on 8th – 11th March, 2016. Additional surveys were undertaken on 29th August 2016, 29th September 2016, 5th/6th April 2017.

Updated surveys of the revised UWF Grid Connection project (subject development) were completed in 17th, 22nd, 23rd January and 30th May 2019.

A8-8.2.2.1 Otters

Otter surveys followed the NRA *Guidelines for Treatment of Otters During Construction of National Road Schemes* (NRA, 2008), which state that, although there are no seasonal constraints for otter surveys, any dense vegetation (especially in summer) can reduce success in the identification of otter holts or couches. A total of 26 watercourses were surveyed for Otter (in tandem with Kingfisher), 300m upstream and downstream, which include the Newport River (W7), Clare River (W36) and Bilboa River (53) and 23 other watercourses (W5, W8, W9, W18, W21, W22, W23, W26, W28, W29, W30, W33, W35, W39, W41, W42, W46, W47, W48, W49, W50, W51 and W52. Surveys were conducted in January 2019 in order to optimize detection of otters within the study area. Surveys of watercourses on the section of grid route around Newport where conducted in May, 2019, it is not thought that vegetation in May hampered the survey as vegetation remains low in spring compared to summer vegetation cover.

Guidance on the extent of the study area for otters was taken from the *British Highways Agency's Nature Conservation Advice in Relation to Otters HA8199* (Highways Agency, 1999) which dictates a linear search of 300m upstream and downstream of each watercourse crossing is undertaken.

A8-8.2.2.2 Badgers

According to the NRA *Guidelines for the Treatment of Badgers Prior to Construction of National Road Schemes* (NRA, 2005), survey of setts within 50m of the proposed works location is required. Badger surveys are significantly constrained by vegetative cover and season, and are best conducted from November to April (NRA, 2005). In accordance with NRA guidance, all areas were systematically searched for setts and all hedgerows and boundaries were checked comprehensively by Inis ecologists. Badger territorial activity is high from mid-January to March and surveys at this time are most efficient in identification of badger paths, latrines and feeding signs. Badger surveys were conducted in January 2019 along the majoriy of the route and in May 2019 for the section of 110kV UGC route around Newport, it is not thought that vegetation cover in May hampered the survey as vegetation remains low in spring compared to summer vegetation cover.

A8-8.2.2.3 Other Mammals

The following field signs of all mammals were recorded during non-volant mammal surveys within the study area:

- Well-used pathways;
- Prints/tracks;
- Scat/spraints/droppings;
- Signs of feeding (foraged pine cones, badger snuffle holes)
- Places of shelter and features or areas likely to be of particular value as foraging resources).

Photographs and detailed notes were also recorded for each feature and mapped using ArcGIS 10.4.

Results of the Non-Volent Mammals Survey are presented below in Section A8-8.3.2

A8-8.3 Survey Results

A8-8.3.1 Survey Results - Bats

A8-8.3.1.1 Bat Roost Survey Results: Suitability of Buildings

Preliminary inspections of buildings within the survey corridor are provided below. Detailed surveys of these buildings were not carried out, because direct effects to roosts within buildings were subsequently scoped out of the assessment, as the 110kV UGC will be installed entirely within road pavements – i.e. no works or damage to buildings will occur.

Table 2: Preliminary bat roost suitability of buildings within survey corridor

Code	ITM Grid Ref		Description	Rating
1	572911	664350	Two-storey house	Low
2	572917	664380	Bungalow	Low
3	572930	664448	Bungalow	Low
4	573083	663753	Barns	Low
5	573605	661571	Two-storey house	Moderate
6	573624	661496	Farmhouse and barns	High
7	57361	661577	Two houses	High
8	573652	663110	Bungalow	Moderate
9	573676	661944	Farmhouse and barns	Moderate
10	573883	662253	Farmhouse and barns	Moderate
11	575382	660716	Shed	Low
12	576215	659967	Barn	Moderate
13	576444	659881	Barn	Low
14	576591	659847	Shed	Low
15	576630	659914	Derelict house	Moderate
16	577049	660050	Derelict house	Moderate
17	577082	660061	Farm buildings	Low
18	577356	660116	Shed	Low
19	578290	660445	Bungalow	Moderate
20	578689	660533	Barn	Moderate
21	578838	660566	House	High
22	579850	660799	Derelict house	Moderate
23	580007	660797	House	High
24	580194	660822	Barn	Moderate
25	580281	660844	Shed	Moderate
26	580675	660750	Shed	High
27	580679	660778	Bungalow	High
28	580741	660725	Bungalow	Moderate
29	581593	660094	Bungalow	Moderate
30	582615	659316	Barn	Moderate
31	583575	659441	Barn	High
32	583601	659438	Shed	Low

Code	ITM Grid Ref		Description	Rating
33	583601	659438	Derelict house	Moderate
34	584464	659274	Derelict house	High
35	585213	659047	Derelict house	High
36	585581	658914	House	Moderate
37	585668	658875	House and shed	Moderate
38	586591	658227	House	High
39	587054	658265	Shed	Moderate
40	588254	658572	Bungalow	High
41	588330	658608	Derelict house	Moderate
42	588911	658779	Farm buildings	High
43	589887	658488	Shed	High
44	592577	659794	Metal-roofed barns	Negligible
45	592660	659789	Bungalow	Low
46	592747	659741	Bungalow	Low
47	592805	659732	Two-storey house	Low
48	592823	659756	Bungalow	Low
49	592855	659730	Bungalow	Low
50	592921	659806	Bungalow and barns	Low
51	592961	659742	Farmhouse and barns	Low
52	593267	659975	Bungalow	Low
53	593327	659998	Bungalow	Low
54	593332	660032	Bungalow	Low
55	593343	660032	Barn	Moderate
56	593371	660016	Metal-roofed barn	Low
57	593411	660036	Bungalow	Low
58	593446	660059	Two-storey house	Low
59	593654	660420	Metal-roofed barns	Negligible
60	593741	660362	Bungalow	Low
61	593756	660301	Two-storey house	Low
62	593815	660412	Two-storey house	Moderate
63	593873	660405	Ruins	Low
64	593892	660401	House	Moderate
65	593915	660483	Incomplete house	Low
66	593951	660527	Two-storey house	Low
67	593994	660673	House and shed	Moderate
68	593998	660679	Derelict house	Negligible
69	595050	660559	Derelict house, shed	High

A8-8.3.1.2 Bat Roost Survey Results: Suitability of Trees

Preliminary inspections of mature trees are provided below. Ground-level roost assessments were carried out for all trees with moderate or low bat suitability within 50m of the UWF Grid Connection. No live bats were seen or heard, and no field signs were observed (e.g. droppings, fur-oil staining, urine splashes), so none of these trees were confirmed to be supported roosting bats at the time of survey. All other broadleaf trees within 50m of the UWF Grid Connection were inspected, but none had any potential roost features that would be suitable for bats, so they were considered to have negligible roost suitability.

Table 3: Preliminary bat roost suitability of trees within survey corridor

Code	ITM Grid Ref		Number of trees	Rating
1	572213	664603	1	Low
2	572932	664502	9	Low
3	572218	664333	1	Moderate
4	572405	664616	1	Low
5	572936	664459	1	Moderate
6	572952	664534	1	Low
7	573728	661504	5	Low
8	574766	661249	1	low
9	576501	659885	2	Low
10	580014	660809	1	Low

A8-8.3.1.3 Bat Roost Survey Results: Suitability of Bridges/Watercourse Crossing Structures

Preliminary inspections of bridges / watercourse crossings are provided below. 11 no. bridges had moderate suitability for roosting bats, 7 no. bridges had low suitability, and 47 had negligible suitability. Bridges with moderate suitability were surveyed by endoscope or bat detector survey, and bat roosts were recorded in two structures: bridges W33 and W44. Both were of a single soprano pipistrelle bat, and thus were considered to be day roosts / satellite roosts, which would be of negligible ecological value. Endoscope surveys were carried out for bridges with low suitability for bats, but no roosting bats were found.

Table 4: Preliminary bat roost suitability rating for bridges within survey corridor and details of endoscope and/or activity surveys

Code	ITM Grid Ref		Description	Preliminary Rating	Endoscope/Activity Surveyed conducted
W4	572862	664009	Concrete Block Box Culvert	Negligible	
W5	573131	663713	Masonary Single Arch Bridge	Negligible	
W6	573587	663589	Concrete Circular Culvert	Low	
W7	573819	663380	Masonary Single Arch Bridge	Moderate	Yes
W8	574375	662952	Concrete Salb Bridge	Low	
W9	574192	662602	Concrete Slab Bridge	Low	Yes
W10	574524	661296	Plastic Circular Culvert	Negligible	

Code	ITM Grid Ref		Description	Preliminary Rating	Endoscope/Activity Surveyed conducted
W11	575519	660667	Masonry Box Culvert	Negligible	
W12	576075	660062	Masonry Box Culvert, circular culvert other side concrete circular culvert	Negligible	
W13	576440	659886	Masonry Box Culvert	Negligible	
W14	576616	659900	Masonry Box Culvert	Negligible	
W15	576900	659963	Masonry Box Culvert	Negligible	
W16	576988	659992	Plastic Circular Culvert	Negligible	
W17	577104	660067	Masonry Box Culvert	Negligible	
W18	577225	660134	Masonry Box Culvert	Moderate	Yes
W19	577338	660175	Masonry Box Culvert	Negligible	
W20	577758	660305	Masonry Box Culvert	Negligible	
W21	577911	660350	Masonry Single Arch Bridge	Low	Yes
W22	578130	660412	Masonry Arch Bridge	Low	Yes
W23	578284	660456	Masonry Arch Bridge	Moderate	Yes
W24	578470	660491	Concrete Circular Culvert	Negligible	
W25	578580	660507	Plastic Circular Culvert	Negligible	
W26	578696	660524	Concrete Circular Culvert	Negligible	
W27	578829	660544	Masonry Box Culvert	Negligible	
W28	579117	660608	Masonry Box Culvert	Moderate	Yes
W29	579430	660718	Concrete Slab Bridge	Low	Yes
W30	579691	660761	Masonry Box Culvert	Low	Yes
W31	580017	660796	Concrete Circular Culvert	Negligible	

Code	ITM Grid Ref		Description	Preliminary Rating	Endoscope/Activity Surveyed conducted
W32	580180	660813	Masonry Box Culvert	Negligible	
W33	580524	660771	Masonry Arch Bridge - Single	Moderate	Yes, roost found single soprano pipistrelle bat
W34	580871	660622	Masonry Box Culvert	Negligible	
W35	580924	660593	Double Masonry Arch	Negligible	
W36	581397	660263	Double Masonry Arch	Moderate	Yes
W37	581837	659906	Masonry Arch	Negligible	
W38	581937	659811	Plastic Circular Culvert	Negligible	
W39	582792	659264	Plastic Circular Culvert	Negligible	
W40	583808	659491	Circular Culvert	Negligible	
W41	584369	659330	Masonry Box Culvert	Moderate	Yes
W42	584924	659119	Masonry Box Culvert	Negligible	
W43	585276	659017	Masonry Arch	Moderate	Yes
W44	585502	658935	Masonry Arch	Moderate	Yes, roost found - *single soprano pipistrelle bat*
W45	586013	658701	Concrete Circular Culvert	Negligible	
W46	586250	658535	Masonry Box Culvert	Negligible	
W47	586604	658207	Masonry Box Culvert	Negligible	
W48	586892	658283	Plastic Circular Culvert	Negligible	
W49	587421	658558	Masonry Arch	Moderate	Yes
W50	587698	658493	Masonry Box Culvert	Negligible	
W51	587892	658501	Masonry Box Culvert	Negligible	
W52	588325	658580	Masonry Box Culvert	Negligible	
W53	588920	658727	Double Masonry Arch	Moderate	Yes
W54	589306	658623	Plastic Circular Culvert	Negligible	

Code	ITM Grid Ref		Description	Preliminary Rating	Endoscope/Activity Surveyed conducted
W55	589659	658463	Masonry Box Culvert	Negligible	
W56	589835	658492	Concrete Circular Culvert	Negligible	
W57	590060	658539	Masonry Box Culvert	Negligible	
W58	590574	658624	Concrete Circular Culvert	Negligible	
W59	590819	658754	1 X Concrete Culvert and 1 X Masonry Box CUlvert	Negligible	
W60	591131	658859	Masonry Box Culvert	Negligible	
W61	592457	659714	Masonry Box Culvert	Negligible	
W62	593239	659980	Masonry Box Culvert	Negligible	
W63	593652	660259	Concrete Circular Culvert	Negligible	
W64	593939	660564	Masonry Box Culvert	Negligible	
W65	594023	660695	Concrete Circular Culvert	Negligible	
W66	594275	660792	Concrete Circular Culvert	Negligible	
W67	594611	660624	Concrete Circular Culvert	Negligible	
W68	594860	660610	Concrete Circular Culvert	Negligible	

A8-8.3.1.4 Bat Activity Survey Results

Bat activity surveys using automated detectors were carried out at four locations near the Mountphilips Substation site and two locations near the consented Upperchurch Windfarm substation (2016). Activity levels (from six sampling locations) were relatively high, with an average of one bat pass every 2 - 3 minutes throughout the survey period (a Bat Activity Index, BAI, of 23.4). The most frequently-recorded species were common pipistrelles, followed by soprano pipistrelles, *Myotis* spp. and Leisler's bat, in order of abundance. Lesser-horseshoe bats were not recorded

Table 5: Summary of bat activity levels at each sampling point using automated detectors

Species codes are as follows: CP (common pipistrelle), SP (soprano pipistrelle), L (Leisler's bat) and MY (Myotis spp.)

Sampling Location	Habitat	Month	Characterisation of activity (BAI)	Importance Evaluation
SD1	Mature treeline	Jun	Frequent CP, occasional SP	Local
		Sept	Frequent CP, occasional SP & MY	
SD2	Hedgerow	Aug	Frequent CP	Local
		Sept	Occasional CP	
SD3	Hedgerow	Jun	Negligible	Local
		Sept	Frequent SP, occasional CP	
SD4	Hedgerow	Jun	Frequent CP, occasional SP	Local
		Sept	Occasional CP	
SD27*	Edge of conifer plantation	Jun	Occasional CP	Negligible
		Sept	Negligible	

* It should be noted that sampling locations SD 1 to SD 4 are at Mounthilips. SD27 is at the Upperchurch Windfarm Substation, this also within the zone of influence of the UWF Related Works, and are discussed in relation to same within the relevant section of this report.

To assist with the interpretation and comparison of BAIs we classify the results as negligible, occasional, frequent and near-constant, using a bespoke system (as per Table 1). One of the sampling sites was considered to be of County Importance as a feeding areas / commuting route, four to be of Local Importance, and one of Negligible Importance.

A8-8.3.2 Survey Results - Non-Volant Mammals

Table 6: Observations/evidence of otter recorded during 2019 in the UWF Grid Connection Study Area

Species	Evidence	Watercrouse Crossing	Notes
Otter	Otter Print	W33	Underneath W33 bridge structure
Otter	Otter Spraint	W33	45 metres downstream of watercourse crossing W33
Otter	Otter Slide	W36	135 metres upstream of watercourse Crossing W36
Otter	Otter Slide	W53	60 metres downstream of watercourse crossing W53

Table 7: Observations/evidence of badger recorded in the UWF Grid Connection Study Area.

Species	Evidence	Easting (ITM)	Northing (ITM)	Notes
Badger	Badger tracks/print	594777	660632	
Badger	Badger tracks/print	572468	664451	
Badger	Badger latrine/scat	572278	664412	Small latrine, along edge of hedgerow in field
Badger	Badger latrine/scat	572251	664437	Small latrine, along edge of hedgerow in field
Badger	Badger latrine/scat	572220	664438	Small latrine, along edge of hedgerow in field
Badger	Badger latrine/scat	572187	664435	Small latrine, along edge of hedgerow in field
Badger	Badger latrine/scat	572114	664432	Small latrine, along edge of hedgerow in field
Badger	Badger latrine/scat	572052	664432	Small latrine, along edge of hedgerow in field

Table 8: Observations/evidence of all other non-volant mammals recorded in the UWF Grid Connection Study Area

Species	Evidence	Easting (ITM)	Northing (ITM)	Notes
Deer sp.	Deer tracks/slot	594802	660625	
Deer sp.	Deer tracks/slot	572567	664537	Slots and droppings on track
Pine Marten	Pine Marten scat	594682	660714	
Fox	Fox tracks/print	572470	664456	Fox print in mud
Fox	Fox scat	572451	664462	Fox scat on top of GWT shrew in track within field
Squirrel sp.	Hazelnut feeding sign	572568	664538	Split hazelnut shell with distinctive notch on tip
Rat	Burrow	573659	663423	
Mammal	Mammal Path	579187	660627	
Mammal	Mammal Path	583443	659316	
Mammal	Mammal Path	576755	659944	
Mammal	Mammal Path	576740	659961	
Mammal	Mammal Path	575153	660845	
Mammal	Mammal Path	575428	660727	
Mammal	Mammal Path	575431	660705	
Mammal	Mammal Path	575469	660689	
Mammal	Mammal Path	575726	660275	
Mammal	Mammal Path	576165	660010	
Mammal	Mammal Path	576130	660029	
Mammal	Mammal Path	587439	658476	
Mammal	Mammal Path	573187	663696	
Mammal	Mammal Path	573605	663481	
Mammal	Mammal Path	573770	663379	
Mammal	Mammal Path	573659	663423	
Mammal	Mammal Path	573846	663359	
Mammal	Mammal Path	573829	663381	

Table 9: Observations/evidence of invasive non-volant mammals recorded during 2019 surveys for the UWF Grid Connection

Species	Evidence	Easting (ITM)	Northing (ITM)	Notes
Greater white toothed shrew	Corpse	572451	664462	GWT shrew under fox scat

A8-8.3.2.1 Survey Results – Other Elements

Observations/Evidence of mammals recorded during surveys for UWF Related Works/Upperchurch Windfarm/UWF Replacement Forestry

Table 10: Summary of bat activity levels at each sampling point using automated detectors – UWF Related Works

Species codes are as follows: CP (common pipistrelle), SP (soprano pipistrelle), L (Leisler's bat) and MY (Myotis spp.)

Sampling Location	Habitat	Month	Characterisation of activity (BAI)	Importance Evaluation
SD26*	Farmyard	Jun	Near-constant CP	County
		Sept	Occasional CP	
SD27*	Edge of conifer plantation	Jun	Occasional CP	Negligible
		Sept	Negligible	

* SD27 is at the Upperchurch Windfarm Substation, along the UWF Grid Connection UGC route and is also within the zone of influence of the UWF Grid Connection, and are discussed in relation to same within the relevant section of this report.

Table 11: Observations/evidence of non-volant mammals recorded during surveys for Other Elements (UWF Related Works /Upperchurch Windfarm)

Other Element	Species	Evidence	Easting (ITM)	Northing (ITM)	Notes
Upperchurch Windfarm	Badger	Badger entrance	595771	660284	An old disused single entrance badger sett was recorded along a hedgerowapproximately 250m south west of turbine T7. The entrance was overgrown and did not appear to have been used for a significant period of time.
Upperchurch Windfarm	Badger	Badger sett	595693	659683	A potential single entrance badger sett was recorded along a field boundary 150m west of turbine T4
Upperchurch Windfarm	Fox	Presence noted			
UWF Replacement Forestry	Badger	Badger print	594687	661526	
UWF Replacement Forestry	Fox	Presence noted			
UWF Replacement Forestry	Fallow Deer	Presence noted			
UWF Related Works	Fox	Fox Scat	594483	661518	Droppings on edge of farm track
UWF Related Works	Fox	Fox Scat	594689	661471	Droppings at mammal crossing point on earth bank.
UWF Related Works	Fox	Fox Scat	594584	661694	Dropping on mammal trail near crossing point of stream

UWF Other Activities: Incidental records of mammal signs and individuals were made during surveys with the overhead line activietes study area, findings are detailed below

Table 12: Observations/evidence of non-volant mammals recorded during surveys for the UWF Other Activities – Overhead Line Activities

Species	Notes
Otter	An old Otter holt was recorded within the bank of a drainage ditch shared by water-course crossing 2 (W2). An otter pathway located 80 metres west of AM 3 was recorded leading from the Groody River over a grassland field and into an adjoining stream
Badger	No active Badger setts were recorded within close proximity to the poles. An old badger sett was recorded within the hedgerow 180 metres north east AM 78
Fox	The smell of fox was recorded along a hedgerow leading to water crossing 1 (W1)
Deer	A herd of 6 deer, Fallow, were observed in the conifer planation adjacent to IMP 83
Rabbit	Rabbit burrows were recorded on occasion within some of the hedgerows. A rabbit was observed adjacent to Annacotty Business Park
Mammal Pathways	Mammal pathways were recorded frequently within hedgerows and through treelines. These could be used by a number of mammals including Badger and Fox

Plate 2: Deer slot in mud

Plate 3: Badger print in mud.

Plate 4: Otter spraint on boulder under bridge.

Plate 5: Greater white toothed shrew and fox droppings on track in field