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6 Biodiversity (3 of 3)

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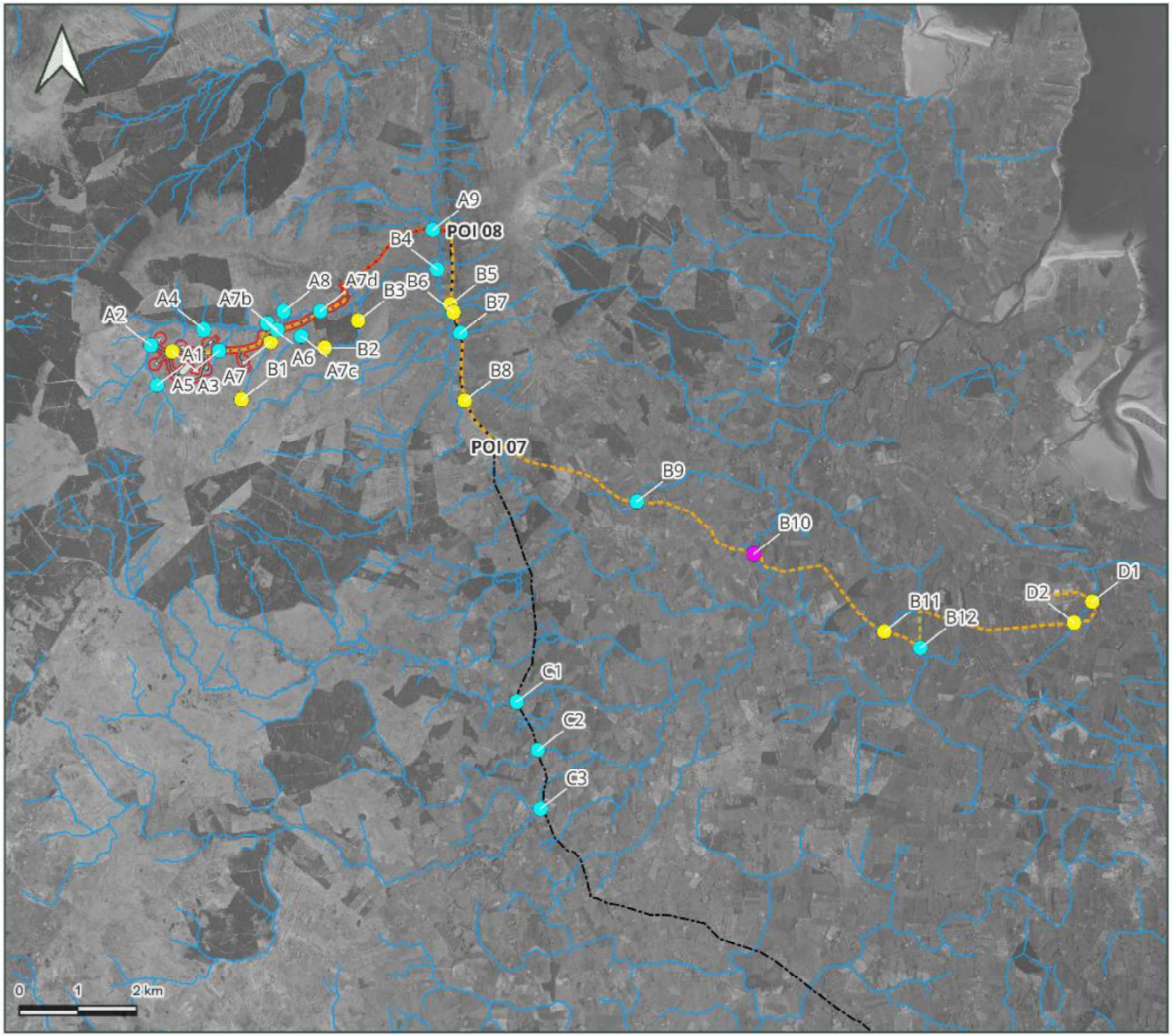

Figure 6.10a
Aquatic Evaluations

Project:
Keerglen Wind Farm

Prepared for:
ABO Energy

Claire McCarthy BSc (Hons) MSc
D: 08/07/2024

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O'DONNELL ENVIRONMENTAL

Legend

- Development Boundary
- Proposed Grid Connection Route
- Proposed Turbine Delivery Route
- Watercourses [EPA]

Aquatic Survey Sites

- County
- Local Importance (Higher Value)
- Local Importance (Lower Value)

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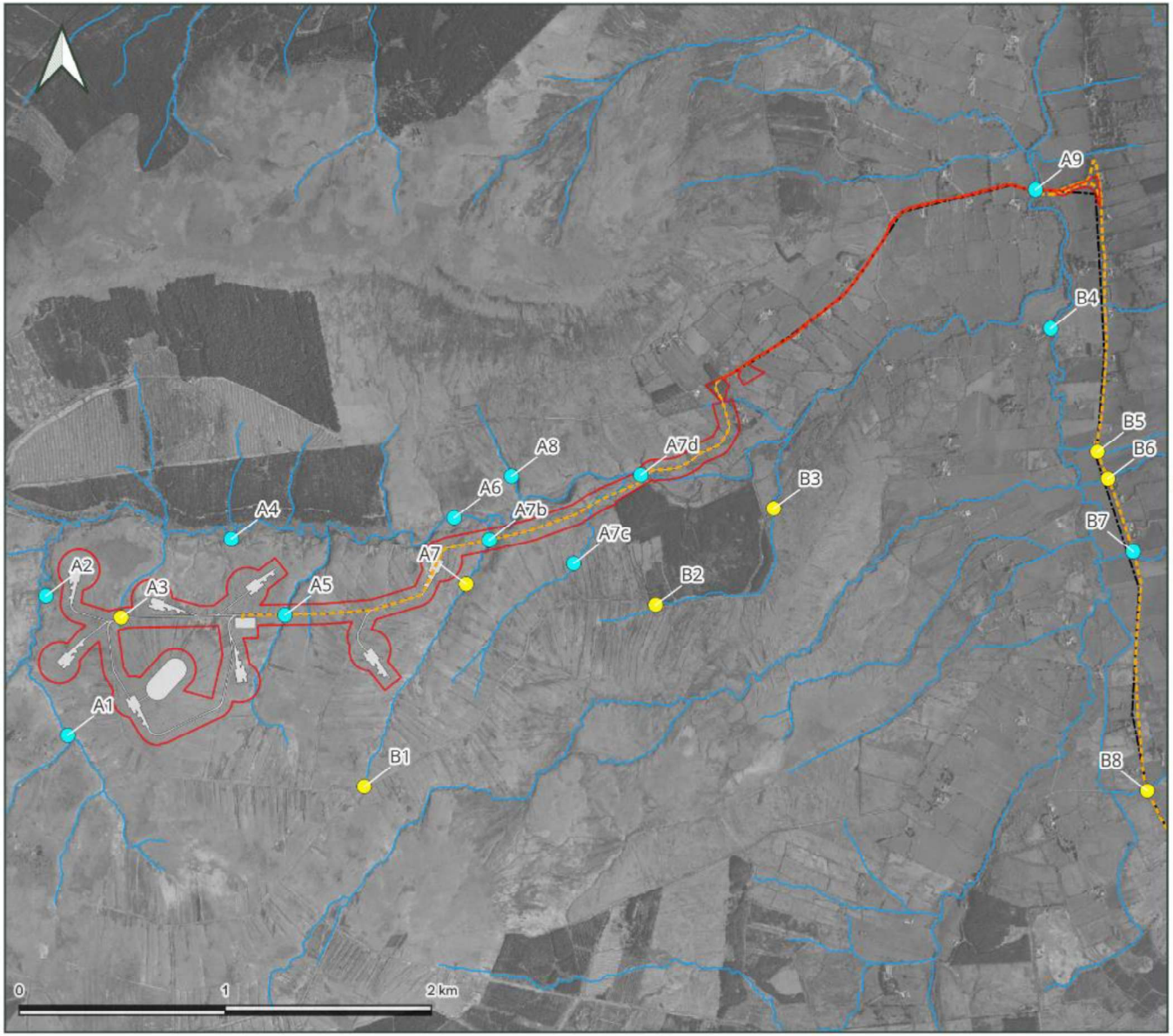

Figure 6.10b
Aquatic Evaluations

Project:
Keerglen Wind Farm

Prepared for:
ABO Energy

Claire McCarthy BSc (Hons) MSc
D: 08/07/2024

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O'DONNELL ENVIRONMENTAL

Legend

- Development Boundary
- Proposed Grid Connection Route
- Proposed Turbine Delivery Route
- Watercourses [EPA]

Aquatic Survey Sites

- Local Importance (Higher Value)
- Local Importance (Lower Value)

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6.7.6 Existing Environment – Non-Volant Mammals

A desktop review, walkover field surveys and camera trapping were completed to determine the presence of non-volant mammals at the proposed site and the importance of the site to the local population.

6.7.6.1 Desktop Review

Within the 10km grid square in which the proposed development site is located (G03, NBDC) there are historic and recent records for a range of non-volant mammal species (**Table 6.23**). Relevant 2km grid squares were reviewed, and Eurasian Otter has been recorded within one of the 2km grid squares which covers part of the redline boundary (G03K).

Table 6.23 Terrestrial mammals previously recorded in 10km grid squares G03 (NBDC)

Common Name	Scientific Name	Conservation Status*
Eurasian Badger	*Meles meles*	WA, lc
Eurasian Otter	*Lutra lutra*	Annex II/IV, WA, NT
Irish Hare	*Lepus timidus subsp. hibernicus*	Not legally protected, lc
Pine Marten	*Martes martes*	Annex V, WA, lc
Red Fox	*Vulpes vulpes*	Not legally protected, lc

https://maps.biodiversityireland.ie/Map Accessed 14/04/2024.

* Key: Annex status (EU Habitats Directive), WA (Protected under Wildlife Act 1976), lc – Least Concern, NT – Near Threatened (Marnell et al., 2019).

A threatened and protected species dataset was provided by NPWS on 14th October 2022, for records within the relevant 10km grid square (G03) and records are held for Eurasian Otter, Irish Hare and Pine Marten. No records overlap with the proposed development site, but records for Eurasian Otter are present along the Keerglen River proximal to the site along the western boundary and to the east of the site.

6.7.6.2 Field Survey Results

Dedicated mammal walkover surveys were carried out between October 2022 and April 2023 to assess the importance of the site to non-volant mammal species. Any casual mammal sightings or signs observed during the course of other ecological surveys were also recorded.

A range of mammal signs were encountered across the surveys, and two underground dwellings used by a protected mammal species were identified. The locations of features and observations recorded are shown in **Figure 6.11**. A total of five non-volant mammal species were identified onsite during the study. They are presented in **Table 6.24** below.

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Table 6.24 - Non-volant mammals confirmed to be present at the proposed wind farm site		
Common Name	**Scientific Name**	**Conservation Status (Marnell, 2019)**
Eurasian Badger	*Meles meles*	Least Concern
Pine marten	*Martes martes*	Least Concern
Irish hare	*Lepus timidus subsp. hibernicus*	Least Concern
Red fox	*Vulpes vulpes*	Least Concern
Sika Deer	*Cervus nippon*	Alien Invasive Species

A low level of Badger activity was recorded within the proposed wind farm site. A single print was located on an existing track road proximal to T1 (see **Plate 6.47h**). Badger were recorded on trail cameras within the site boundary on one occasion (see **Plate 6.47b**), Two badger setts were recorded proximal to the proposed development site, outside of the redline boundary (**Figure 6.11**).

One outlier badger sett was recorded approx. 280m north-east of the proposed redline boundary, within forestry located the north of the proposed access road (**Figure 6.11**). The sett was a single entrance sett with no signs of recent excavation. This sett was monitored continuously by an infrared trail camera ('Cam_4') from 24th January 2023 to 24th April 2023 and no signs of badger use were recorded during the passive trail camera survey. 'Cam_3' which was deployed nearby, recorded badger activity and so the sett which was considered disused during the surveys has the potential to become active again.

A second outlier badger sett was recorded among the high banks along the Keerglen River, outside of the redline boundary approx. 105m to the north of the redline boundary, and 148m north of the nearest proposed works (**Figure 6.11**). The sett is a well-established, single entrance sett with evidence of significant excavation, but no evidence of recent excavation at the time of discovery. The sett was monitored continuously by an infrared trail camera ('Cam_5') from 24th January 2023 to 24th April 2023. No Badger activity at the sett was recorded until 28th January 2023 at 12:39am when a Badger was recorded investigating the sett entrance (see **Plate 6.47d**) but evidently did not enter. A second recording of a Badger investigating the sett entrance was made on 9th February 2023, but it cannot be confirmed whether the badger entered the sett. Following this observation, no further activity was recorded. Based on these findings it was confirmed this was an outlier sett, used sporadically.

Outlier Badger setts may be occupied sporadically or seasonally, and use of individual outlier setts varies according to location and the badger group involved. Outlier setts are unlikely to be used by Badgers for breeding purposes.

Pine Marten was detected on 11 occasions on 'Cam_3' and on six occasions at 'Cam_4' (see **Plate 6.47a**). No evidence of their presence was found elsewhere in the wind farm site, but they are likely to occur throughout the site at least occasionally.

Otter spraint was recorded along the Keerglen River that runs proximal to the proposed site. Spraint was recorded at several locations on large rocks within the watercourse north-east and west of the site

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(**Plate 6.47e**). No Otter sightings were recorded on the trail cameras that were deployed on site and no Otter holts were discovered within the search area, nor were any holts or couches recorded during the aquatic ecology surveys at any of the 27 survey sites (see above).

Deer activity within the redline boundary was not recorded and no signs of deer were recorded during the site visits. Two Deer (likely Sika) were recorded along the Keerglen River on the 'Cam_6' trail camera (see **Plate 6.47f**) on 3rd February 2023.

Fox were regularly recorded during trail camera surveys throughout the site, but no dens were found to be present with in the relevant study area. Hare (sightings, signs) was regularly recorded on the trail cameras deployed in the hinterland and throughout the proposed wind farm site.

Wood mouse, brown rat and pygmy shrew are likely to occur throughout the site where suitable habitats and conditions for each individual species exist. Each of these species are subject to seasonal fluctuations in population as the availability of food changes throughout the year. The treelines, as well as the edge of the woodland and scrub habitats are suitable for Irish stoat and hedgehog but neither of these species was recorded during the current surveys.

Observations were made of non-volant mammal presence during ecological walkover surveys carried out along the proposed underground electricity export connection route and no evidence of mammals was recorded, with the exception of a Badger print at Crossing 11 (see **Plate 6.47g**). No evidence of mammals was recorded at the eight POI locations on the TDR.

Summary of the mammal images captured by trail cameras at the proposed site are provided in **Table 6.25** below. **Plates 6.47 a-f** below show images relevant to non-volant mammal surveys which were captured during camera trapping and ecological surveys.

Table 6.25 - Total number of detections per species during trail camera monitoring.

Species	Cam_1	Cam_2	Cam_3	Cam_4	Cam_5	Cam_6
Red Fox	0	42	18	3	0	3
Badger	0	1	17	1	2	0
Irish Hare	0	3	15	0	0	0
Pine Marten	0	0	11	8	0	0
Sika Deer	0	0	0	0	0	2

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Plate 6.47a Pine Marten. Cam_3, 27/12/2022.

Plate 6.47b Badger. Cam_2, 22/10/2022.

Plate 6.47c Red Fox Cam_2, 14/11/2022.

Plate 6.47d Badger Cam_5. 28/01/2023.

Plate 6.47e Otter spraint recorded at along Keerglen River. 24/01/2023.

Plate 6.47f Deer (likely Sika) recorded on Cam_6 along the Keerglen River. 03/02/2023.

Plate 6.47g Badger prints recorded downstream of Tonrehown Bridge, a proposed HDD site.

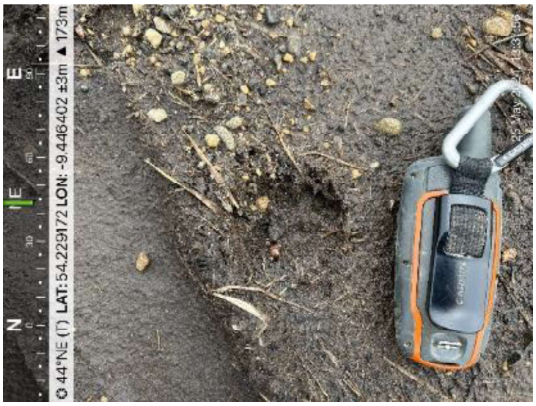

Plate 6.47h Badger print recorded on existing site road within the redline boundary.

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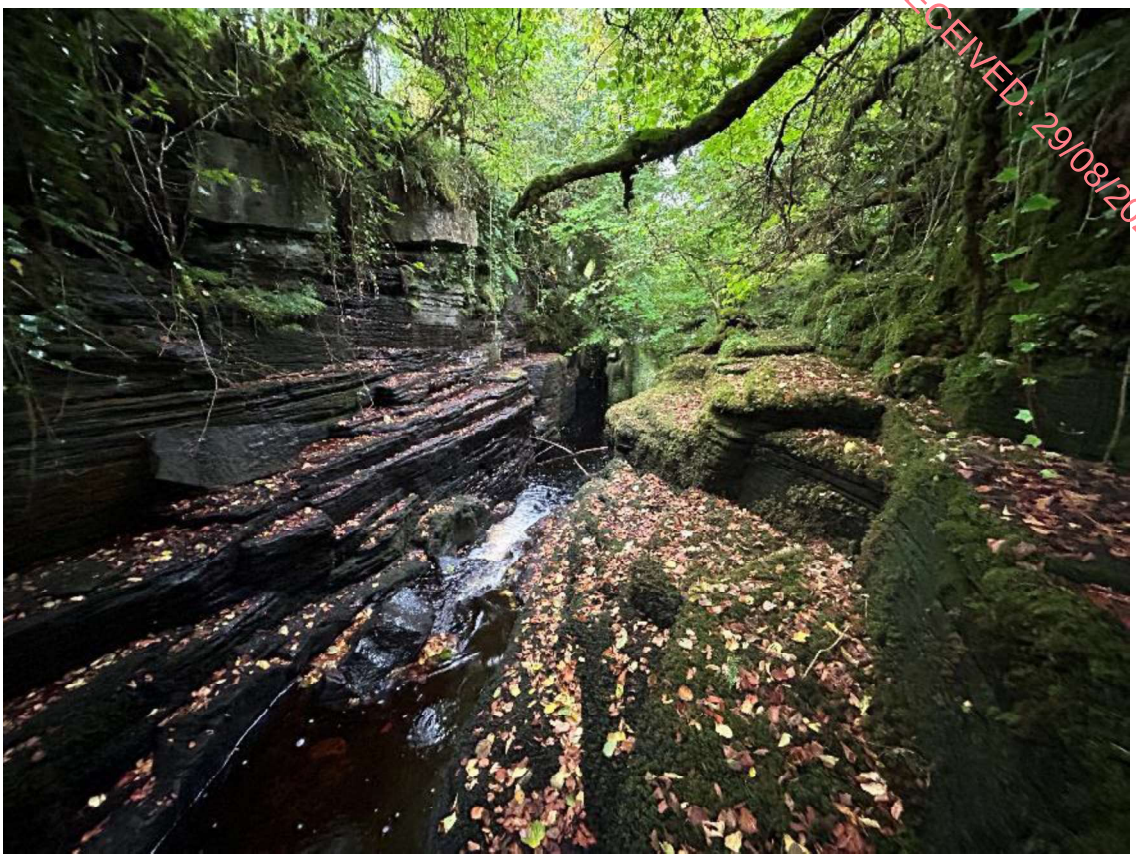

Plate 6.47i River channel at the proposed bridge crossing location. The proposed pre-cast bridge will clear span the Keerglen River channel.

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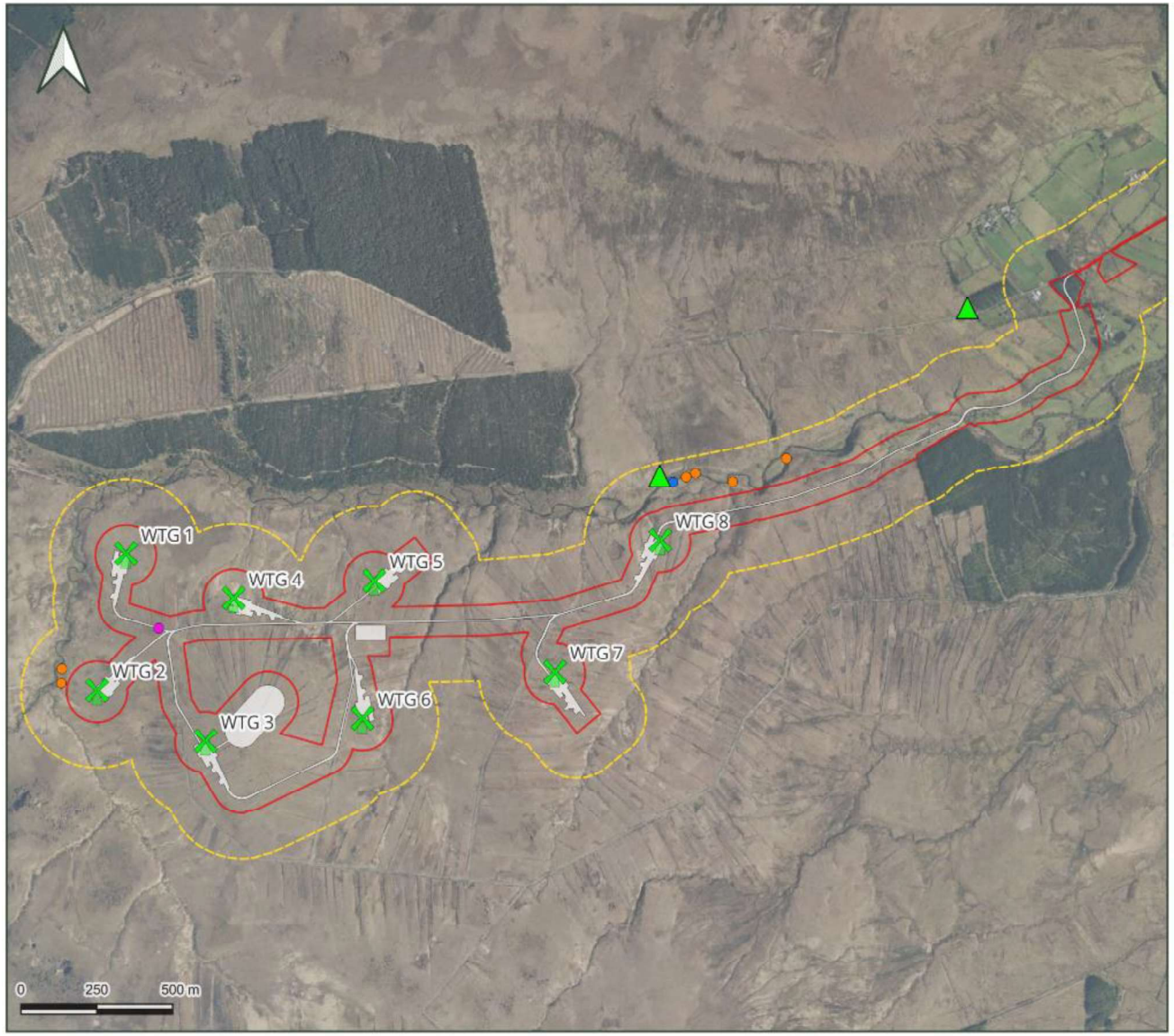

Figure 6.11
Non-Volant Mammal Results
Project:
Keerglen Wind Farm
Prepared for:
ABO Energy

Claire McCarthy BSc (Hons) MSc
D: 16/06/2024

Credit to: Ó Ceallaigh Ecology

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O'DONNELL ENVIRONMENTAL

Legend

- Redline Boundary
- Non-returnable Area
- Study Area (150m from redline)
- Outlier Badger Sett
- Otter Spraint
- Fox Scat
- Badger Print

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6.7.7 Existing Environment – Bats

All Irish bat species are protected under the Wildlife Act (1976 as amended). All Irish bats are listed in Annex IV of the Habitats Directive and the Lesser Horseshoe Bat is further listed under Annex II. A desktop review and field surveys were carried out to determine the importance of the proposed site to local bat populations which are described in detail below.

6.7.7.1 Desktop Survey

Following NatureScot (2021), a search was undertaken for nationally (NHA and pNHA) or internationally (SAC) designated sites within 15km of the proposed wind farm site which list bats as a qualifying interest. The development site is not located within any internationally or nationally designated sites. A search was undertaken for nationally or internationally designated bat roosting sites in proximity to the proposed site. No Special Areas of Conservation (SAC), National Heritage Areas (NHA) or proposed National Heritage Areas (pNHA) which include bats in their conservation interests are present within 15km of the redline boundary.

National Biodiversity Data Centre (NBDC) holds previous records of bats known to be present within the 10km grid square in which the proposed site is located (G03, NBDC). Two species of bat have been recorded within this 10km grid square, Soprano Pipistrelle (*Pipistrellus pygmaeus)* and Daubenton's Bat (*Myotis daubentonii*). It is important to note that an absence of other bat species records may be reflective of a lack of surveys undertaken to date rather than absence of bat species.

A protected species data request was submitted to NPWS and species records for the relevant area (10km grid squares which the proposed site overlaps) and no records were held for the Annex II listed Lesser Horseshoe Bat within the search area.

A desktop study of available information on the bat potential of the local area was carried out prior to the field surveys, with particular attention given to the model of Bat Landscapes as available on the NBDC website. This model is based on the relative importance of landscape and habitat associations for bat species across Ireland (see Lundy et al., 2011).

The overall bat suitability index value (*11*) according to 'Model of Bat Landscapes for Ireland' (Lundy et al. 2011) suggests the landscape in which the proposed wind farm site is located is of low suitability for bats in general. Species specific scores are provided in **Table 6.26**. The Annex II (EU Habitats Directive) listed bat species, Lesser Horseshoe Bat, is assigned a score of zero as the proposed site is outside the known range for this species.

Table 6.26 - Suitability of the wind farm site for the bat species according to 'Model of Bat Landscapes for Ireland' (Lundy et al. 2011).

Common name	Scientific name	Suitability index
All bats	-	*11*
Soprano pipistrelle	*Pipistrellus pygmaeus*	29

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Brown long-eared bat	*Plecotus auritus*	8
Common pipistrelle	*Pipistrellus pipistrellus*	22
Lesser horseshoe bat	*Rhinolophus hipposideros*	0
Leisler's bat	*Nyctalus leisleri*	14
Whiskered bat	*Myotis mystacinus*	0
Daubenton's bat	*Myotis daubentonii*	10
Nathusiius pipistrelle	*Pipistrellus nauthusii*	0
Natterer's bat	*Myotis nattererii*	16

Available bat records were provided by Bat Conservation Ireland (BCI) from their database of roosts locations and other bat records. Details of known roost locations in the target area as well as results from BCI Volunteer based surveys and records submitted by Ecological Consultants were provided and reviewed. Roost records are summarised in **Table 6.27** below and shown in **Figure 6.12a**. The relevant search area consisted of a 30km radius from a central point within the proposed wind farm site. Where roost locations occur in private dwellings the location shown refers to the central point in the relevant 1km grid square.

Table 6.27 - Records of known bat roosting locations (BCI) in the relevant 30km search area.

Structure Type	Grid reference	Species
Carrick Bridge Roost	G3004	*Myotis natterreri, Myotis daubentonii*
Private	G2825	*Pipistrellus pygmaeus*
Dun Ard	G1922	Unidentified Bat
Glenturkmore Bridge Roost	F8629	*Myotis daubentonni*
Private	G1336	*Myotis natterreri, Plecotus auritus, Pipistrellus pipistrellus* (45kHz), *Pipistrellus pygmaeus, Nyctalus leisleri*
Bat Box Scheme	G3412	*Pipistrellus pygmaeus, Nyctalus leisleri*, *Pipistrellus* spp. (45kHz/55kHz)
Private	G3412	*Pipistrellus pygmaeus*
Private	G3412	*Myotis natterreri, Myotis daubentonii*
Post Office Bridge Roost	F9520	Unidentified Bat
Private	G0931	*Plecotus auritus, Pipistrellus pygmaeus, Nyctalus leisleri*

A survey of 'Bridge Usage by Bats in County Leitrim and County Sligo' (Shiel, 1999) was reviewed. Although the route of the future TDR occurs partially within the relevant study area, no significant works will occur within this area.

Consideration was given to the location of the proposed site relative to the 'Core Sustenance Zones' (CSZ) of all known bat roosts proximal to the site. When considering development, Collins (2023) states that the CSZ could be used to indicate:

- The area surrounding a communal roost within which development work may impact the flight-paths and foraging habitat of bats using that roost.

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- The area within which it may be necessary to ensure no net reduction in the quality and availability of foraging habitat for the colony.

In the absence of information specific to Ireland, CSZ distances provided in Collins (2023) are considered to be the best available information. CSZ distances for species known to occur in Ireland range from 1km to 4km although these distances are based on limited information in some instances (Collins, 2023). Roost records within a 4km search area of the proposed wind farm site were considered and two roost records were identified (**Figure 6.12a**).

One roost of the Brown Long-eared Bat, Soprano Pipistrelle and Leisler's Bat is located within 1km of the proposed site to the southeast (G0931). The CSZ for all three of these species' is 3km and thus the proposed development site is within the CSZ of the species that occupy this roost. The next most proximal record, located approx. 3km east of the proposed development site, is for Natterer's Bat, Brown Long-eared Bat, Common Pipistrelle, Soprano Pipistrelle and Leisler's Bat (G1336). The proposed development is within the CSZ for all species of this roost except Natterer's Bat, which has a CSZ of 4km. The remaining roosts are more distant and are attributed to Daubenton's Bat, Natterer's Bat and unidentified bat species (**Figure 6.12a**). No records for Lesser Horseshoe Bat roosts were recorded within 30km of the proposed development site.

BCI Volunteer based surveys and records submitted by Ecological Consultants (Ad-hoc records) were provided and analysed for the presence of the Annex II (EU Habitats Directive) listed Lesser Horseshoe Bat.

EPA data regarding known locations of caves and historic mining operations was examined in order to identify the presence of any known underground features which could support a significant bat roost. No known underground sites are present within the redline boundary or along the proposed cable route. Some caves a present proximal to the TDR but are not likely to be impacted by the TDR given the nature of the works involved.

6.7.7.2 Assessment of Potential Roosting Features

Surveys were carried out to identify and investigate potential bat roosting features which may be directly or indirectly effected by the proposed development. Consideration was given too to the potential for effects on bats by works which would be required for future project elements i.e. UEECR and TDR.

The potential for significant roosts was investigated within an area extending to a minimum of 275m from the redline boundary, as it relates to turbines. During these surveys, all trees and bridges which might be impacted by the proposed design and structures which may potentially host significant bat roosts were inspected visually. Trees, structures (incl. bridges), where present, were considered and described according to Collins (2023).

Structures

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No features likely to support significant bat roosts are present within relevant 2.5km search area. A single man-made structure was identified by analysis of OSI 6" Black and White Historic Mapping, which appeared in ruins from the aerial, and this was confirmed from a site visit (see **Figure 6.12b**).

No bat roosts were recorded at the time of the surveys and no other structures with potential to support significant roosts were identified or are likely to occur in any locations such that the proposed works could directly or indirectly affect the feature.

A daytime visual inspection of Ballinglen Bridge was carried out on 10th September 2022 by Tom O'Donnell to assess the suitability of the structure for roosting bats. No evidence of bat roosting, current or historic was available. The bridge generally lacks suitable bat roosts features and has been subject to maintenance such as repointing (see **Plate 6.48b**). While some minor crevices were present, these were considered to be suboptimal for bat roosting. Due to the lack of viable roosting features, no further survey was considered to be warranted. Following Collins (2023), Ballinglen Bridge is considered to be of 'negligible' suitability for roosting bats (see **Table 6.4**).

Although not included in the redline boundary, the UEECR and TDR are an essential component of the overall wind farm project, and the potential impact of associated facilitation works is therefore considered. Visual survey and inspection of PRFs which may be directly or indirectly impacted by UEECR works was carried out. The majority of the proposed underground electricity export connection route will be installed within existing public roads, and would involve temporary disturbance due to noise, vibration and dust. Given the roads are already used by traffic, the effect of additional disturbance due to the installation of underground electricity export connection cables does not pose potential for significant effects and therefore the zone of influence of the UEECR works is typically confined to the carriageway and immediately adjoining linear features. In two locations only i.e. Ballinglen Bridge and Tonrehown Bridge, the UEECR currently has an 'off-road' option and a final route would be selected following further design and assessment.

Ballinglen Bridge occurs within the redline boundary, and as discussed above is considered to be of 'negligible' suitability for roosting bats. An off-road option here would involve tree loss and no trees with potential for bat roosting were noted within the likely works area. One structure in ruins was noted proximal to the likely works area, should the 'off-road' UEECR option at Ballinglen Bridge be chosen. This structure was considered to have 'low' suitability for bat roosting and no evidence was available of current or historic roosting. It cannot be ruled out that the ruin be used on occasion by small numbers of crevice dwelling bats.

Tonrehown Bridge is an eight-arch masonry bridge which presents numerous cracks and crevices with potential to support roosting bats. The bridge was inspected in detail for signs of bats such as bat droppings, feeding remains, potential bat access points identified by characteristic staining and scratches, noise made by bats etc. No roosting bats or signs of historic roosting were available at the time of the survey. Features were assessed following the classification scheme provided in Collins (2023) and the bridge is considered to be of 'Moderate' suitability for roosting bats (see **Table 6.4**). The

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bridge would be subject to survey in preparation for a future application for consent for UEECR and TDR works.

Visual survey and inspection of PRFs which may be directly or indirectly impacted by TDR facilitation works was carried out. Eight potential 'Points of Interest' (POIs) are located on the TDR where the requirement for facilitation works has been identified. Works along the TDR would include temporary installation of new sections of to extend the existing road network in 'pinch-points'. No structures of significant roosting potential were recorded at any of the POI locations where works might potentially impact upon a roost.

Plate 6.48a Ballinglen Bridge.

Plate 6.86b Section of the barrel of Ballinglen Bridge (easternmost arch).

Plate 6.48c Tonrehown Bridge crossing the Cloonaghmore River.

Plate 6.48d Tonrehown Bridge crossing the Cloonaghmore River.

Plate 6.48e Image of Tonrehown Bridge arch taken during assessment of bat roosting suitability.

Plate 6.48f Inspection of bridge for evidence of roosting bats using endoscope.

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Trees

The roosting potential of trees which are relevant to the proposed development was considered. A ground-level tree assessment (GLTA) was carried out for the proposed development by Tom O'Donnell, following Collins (2023). Following NatureScot (2021) potentially significant roosts were sought in an area extending to 275m from the site boundary as it relates to turbines. The wind farm site is located on an upland bog and trees are generally sparce and confined to the steep banks of the Keerglen River. No trees with potential to support a significant bat roost are present within the relevant search area.

No contemporary or historic evidence of roosting by bats was found within the redline boundary or in other areas likely to be directly or indirectly affected by the proposed works, including site access roads, passing bays etc. as well as other future project elements (UEECR and TDR). No trees of 'PRF-M' suitability (suitable for multiple bats e.g. a maternity colony) were recorded within or proximal to the redline boundary. A number of 'PRF-I' suitability trees were recorded along the existing public road, immediately adjoining the redline boundary (see **Plate 6.49a** & **6.49b**). These trees presented minor roosting features (e.g. dense ivy cover and minor rot holes) and were not considered to be suitable to host large numbers of bats but are likely used at least on occasion by individual bats. It is not envisaged that these trees will be impacted by the proposed development works. Collins (2023) recommends that no further surveys are required in relation to trees of 'PRF-I' suitability.

The development of the proposed site access requires removal of less than 1ha of commercial coniferous forestry and such trees typically present negligible suitability for roosting bats. Following Marnell et al. (2022), coniferous plantations with no specimen trees have decreased probability of being used by roosting bats and such trees do not require individual assessment for roosting potential. A visual assessment was made during walkover surveys by Tom O'Donnell, and no likelihood of suitability for bat roosting was identified.

Although not included in the redline boundary, the UEECR and TDR are an essential component of the overall wind farm project, and the potential impact of associated facilitation works is therefore considered. Consideration was given to the potential for bat roosting in trees which may be directly or indirectly impacted by UEECR works. The majority of the proposed underground electricity export connection route will be installed within existing public roads, and would involve temporary disturbance due to noise, vibration and dust. Given the roads are already used by traffic, the effect of additional disturbance due to the installation of underground electricity export connection cables does not pose potential for significant effects and therefore the zone of influence of the UEECR works is typically confined to the carriageway and immediately adjoining linear features. In two locations only i.e. Ballinglen Bridge and Tonrehown Bridge, the UEECR currently has an 'off-road' option and a final route would be selected following further design and assessment.

An 'off-road' option at Ballinglen Bridge would involve tree loss in order to facilitate the installation of a underground electricity export connection cable and watercourse crossing by means of HDD (UEECR

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feature 4, see Chapter 3), and no trees with potential for bat roosting were noted within the likely works area.

'Off-road' option at Tonrehown Bridge Ballinglen Bridge may involve loss of hedgerow habitat in order to facilitate the installation of a underground electricity export connection cable by HDD, east of the existing bridge (UEECR feature 11, see Chapter 3). No significant trees are present in the likely works area, and no trees of above negligible suitability for bat roosting are present in the works are or proximally.

Visual survey and inspection of PRFs which may be directly or indirectly impacted by TDR facilitation works was carried out. Eight potential 'Points of Interest' (POIs) are located on the TDR where the requirement for facilitation works has been identified. Works along the TDR will include temporary installation of new sections of to extend the existing road network in 'pinch-points' and reduction in the height of existing trees to facility 'over-sail' of turbine blades during transport to site may be required and is subject to further design and assessment. The habitats at the identified POIs mainly consisted of grassland, roadside verges and hedgerows. No trees of above negligible suitability for bat roosting are present in the works areas relating or any POI, or proximally.

Plate 6.49a PRF- I suitability trees located along the proposed access road / UEECR.

Plate 6.49b PRF- I suitability trees located along the proposed access road / UEECR.

Plate 6.49c Commercial forestry at proposed site access.

Plate 6.49d PRF- I suitability trees located along the proposed access road / UEECR.

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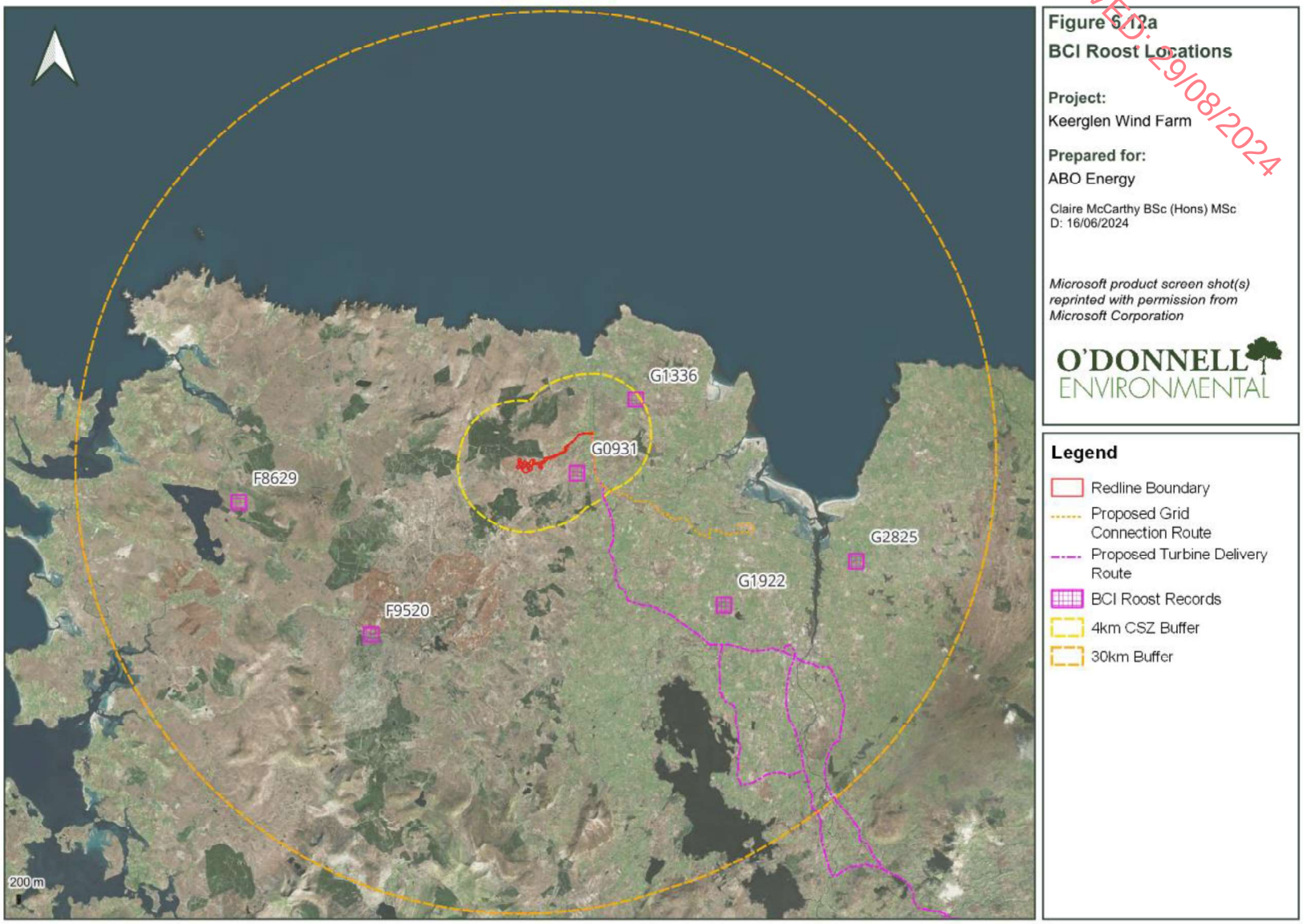

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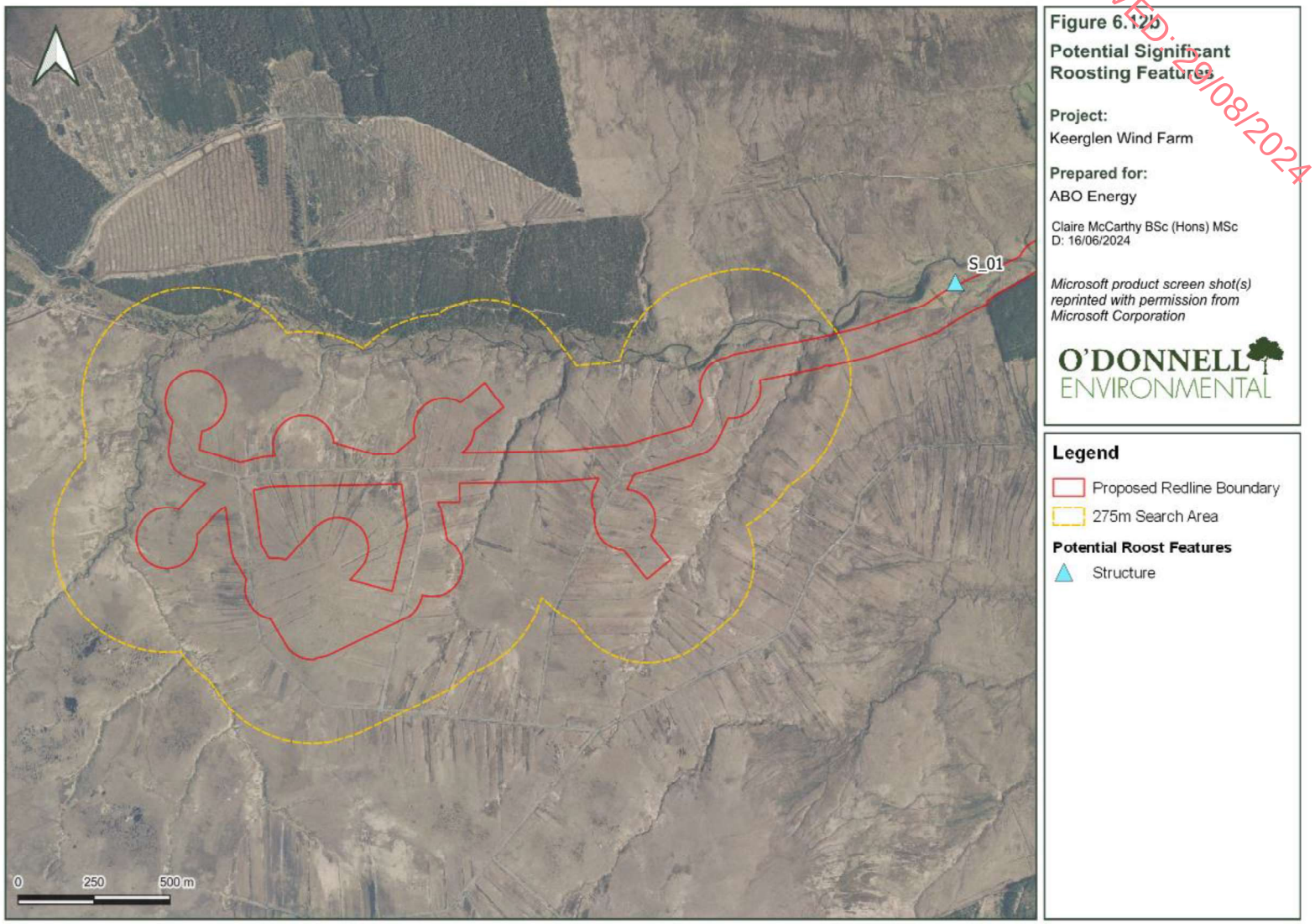

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6.7.7.3 Passive Bat Detection Surveys

Ultrasonic detector surveys were carried out at the proposed wind farm site across four seasons to record bat activity in the area, from which information on species composition, relative abundance and landscape usage could be derived. Following best practice guidelines, detectors were deployed within 15m of the proposed turbine location where safely feasible. Surveys were carried out from at least eight monitoring locations in summer 2022, autumn 2022, spring 2023 and spring 2024. The monitoring locations coincide exactly with the proposed eight turbine locations. Additional monitoring locations (T_09 and T_09P) were used based on an initial turbine layout and have been omitted from the discussion below but has been included in **Table 6.28** for completeness. The proposed access road was subject to passive monitoring in spring 2024 and discussed in further detail below.

Overall, a low level of activity was recorded at the wind farm site, and a moderate level of species diversity. Eight of the nine resident Irish bat species were recorded. The Annex II species Lesser Horseshoe Bat was not recorded during any of the passive surveys. The proposed wind farm site generally lacks bat roosting opportunities and primarily represents a sub-optimal foraging and commuting habitat.

The level of activity recorded at the wind farm site varied according to season, location and species. The results of passive bat monitoring are presented in **Table 6.28**. The total count of registrations across all species was highest in summer 2022 (62.8%), followed by autumn 2022 (18.5%), spring 2023 (10.7%), and spring 2024 (8%). Total registrations of all bat species regardless of survey season were uniformly spread across all of the proposed turbine locations (between 10-19% respectively), likely due to the similar environmental conditions at all locations in the form of exposed and low productivity foraging and commuting habitat.

Four species comprised the majority of registrations across the site and across all survey seasons. These species include Common Pipistrelle (25.6%), Soprano Pipistrelle (24%), Leisler's Bat (23.5%) and Natterer's Bat (20.1%). These species are all considered common and widespread within and Irish context and are largely considered generalist foraging species, despite their general avoidance of peatland habitat (Roche et al., 2014; Lundy et al., 2011). The notable exception is Natterer's Bat which tends to select more strongly for areas of woodland and riparian habitat (Lundy et al., 2011). Brown Long-eared Bat comprised the remaining majority of registrations (6.6%), with Daubenton's Bat, Whiskered Bat and Nathusius' Pipistrelle comprising less than 0.1% respectively and only recorded in a subset of seasons.

Summer 2022 Passive Monitoring

A moderate level of species diversity was recorded during the summer 2022 monitoring period, with a total of seven bat species confirmed. A low-moderate level of activity was recorded with a total of 1,880 bat registrations across the 32-night survey period and eight detector locations. The summer 2022 survey season comprised the vast majority of bat activity (62.8%) across all survey seasons.

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Three species comprised a similar majority of registrations during this season, including Soprano Pipistrelle (29.5%), Leisler's Bat (28%) and Common Pipistrelle (26.4%). Natterer's Bat and Brown Long-eared Bat comprised the remaining majority of registrations (9.2% and 6.8% respectively). The distribution of these species registrations are evenly spread across all turbine locations (between 8-15% respectively). As discussed above this is likely due to the generalist foraging nature of the majority of these species, alongside the homogenous habitat present across the site.

Natterer's Bat and Brown Long-eared Bat are considered more sensitive species and represent a relatively high proportion of registrations across all turbine locations despite the general lack of optimal or otherwise productive commuting and foraging habitat. These species are typically associated with woodland (typically broadleaf variety) or otherwise spatially cluttered environments and riparian habitats within an Irish context (Roche et al., 2014; Russ, 2012). Additionally, Brown Long-eared Bat are often underrepresented in ultrasonic detection surveys due to their weak echolocation call, which is often only detected within 5m of an individual (Russ, 2012). Additionally, Nathusius' Pipistrelle and Whiskered Bat were recorded in a single instance during summer 2022, both at turbine eight.

The distribution of bat registrations during the summer 2022 survey season shows that the wind farm, site as a whole, is dominated by early-night activity, which then tapers off gradually as the night progresses (see **Figure 6.12c**). Early-night activity is dominated by common and widespread species and consists almost entirely of Leisler's Bat with some instances of Common Pipistrelle. The earliest registrations appear approximately 30 minutes before sunset by Leisler's Bat, with a single instance of Common Pipistrelle approximately 60 minutes before sunset. The average emergence times for these species are 20 and 25 minutes after sunset respectively (Collins, 2023). These registrations were largely spread between turbines four, five, seven and eight. No registrations were recorded proximal to sunrise.

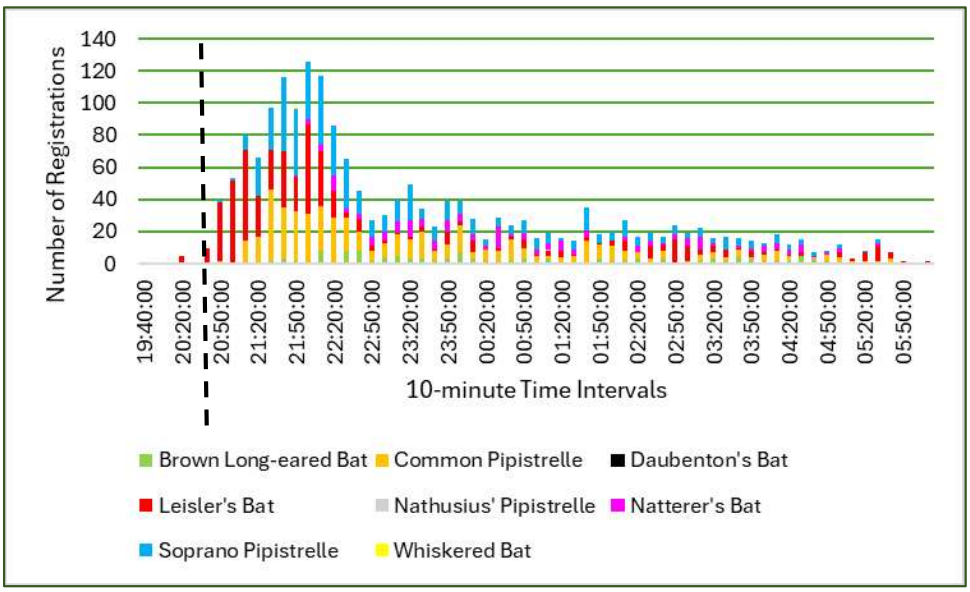

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Figure 6.12c Distribution of total bat registrations by 10-minute time intervals during the summer 2022 passive monitoring season. Mean sunset and sunrise times were 20:44 (dashed black line) and 06:32 respectively.

Autumn 2022 Passive Monitoring

A moderate level of species diversity was recorded during the autumn 2022 monitoring period, with a total of six bat species confirmed. A low level of activity was recorded with a total of 555 bat registrations across the 25-night survey period and eight detector locations. Activity levels recorded during the autumn 2022 period were the second highest of the seasons (18.5%), following the summer 2022 season. The majority of registrations were evenly distributed across all monitoring stations, with the exception of turbines one and two which comprised 23% and 22% of registrations respectively.

Natterer's Bat was the most commonly recorded species during this survey season, accounting for 60.7% of all registrations across all turbine locations. Registrations for this species were concentrated at turbines one and two, but was otherwise largely evenly distributed across the remaining monitoring stations. Natterer's Bat appear to be locally abundant within the wider landscape despite being recorded in sub-optimal foraging and commuting habitat for this species (Roche et al., 2014). This species was regularly encountered during the active bat surveys carried out as part of this assessment (see **Section 6.4.6.2** below).

Following this, Soprano Pipistrelle, Brown Long-eared Bat and Common Pipistrelle comprised the remaining majority of registrations, accounting for 15.7%, 10.8% and 8.6% respectively. Leisler's Bat comprised 4% of the remaining registrations. Similar to above, registrations for these species are largely evenly distributed across all turbine locations, likely due to the homogeneity in habitat-type present throughout the site. The only remaining species recorded during the summer 2022 survey season was Daubenton's Bat in a single instance at turbine one.

The distribution of bat registrations during the autumn 2022 survey season shows that the wind farm site, as a whole, is largely comprised of early-night activity which tapers off gradually as the night progresses. The earliest registrations during this survey period comprised entirely Common Pipistrelle and Soprano Pipistrelle, with the earliest instance at approximately 25 minutes after sunset. The average emergence time for these species is approximately 25 minutes after sunset (Collins, 2023). No registrations of any species were recorded proximal to sunrise. Otherwise, there were few registrations recorded proximal to sunset and no registrations were recorded proximal to sunrise.

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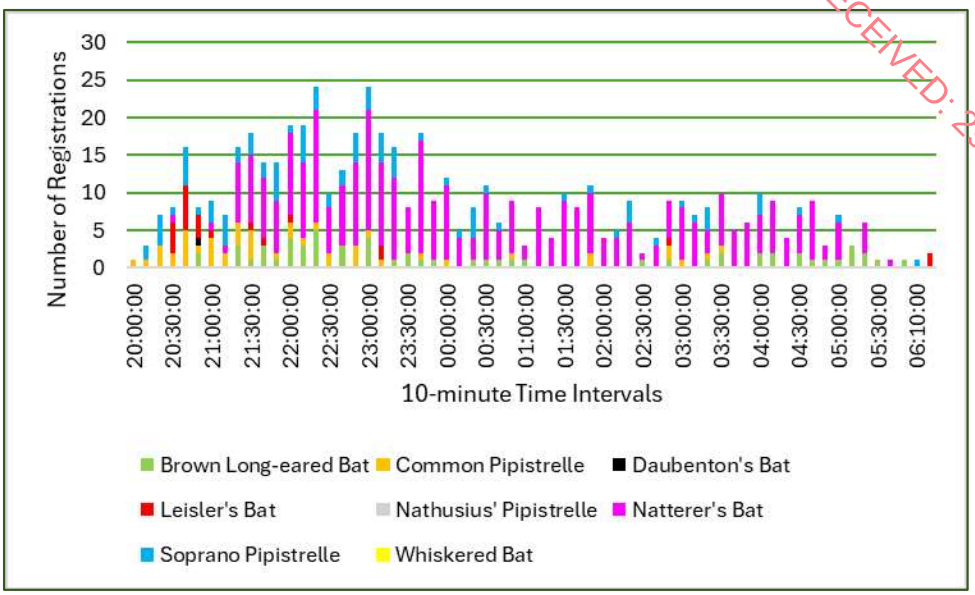

Figure 6.12d Distribution of total bat registrations by 10-minute time intervals during the autumn 2022 passive monitoring season. Mean sunset and sunrise times were 19:35 and 07:23 respectively.

Spring 2023 Passive Monitoring

A moderate level of species diversity was recorded during the spring 2023 monitoring period, with a total of six bat species confirmed. A low level of activity was recorded with a total of 319 bat registrations across the 23-night survey period and eight detector locations. Activity during the spring 2023 survey season was the second lowest recorded of the four seasons, accounting for only 10.7% of the overall activity recorded across the four seasons.

Leisler's Bat was the most commonly recorded species during this survey season, accounting for 40.2% of all registrations. This species was most commonly recorded at turbines eight (56.7%) and five (17.2%) with the remaining few registrations evenly distributed across the site. Following this, Common Pipistrelle was the second most recorded species, accounting for 23.2% of registrations with the majority recorded at turbines eight and seven. The remaining majority of registrations were composed of Natterer's Bat (17.2%) and Soprano Pipistrelle (14.1%). The majority of these registrations were similarly recorded at turbines four and, seven and eight for these species. Brown Long-eared Bat comprised the remainder of registrations (2.8%), with Daubenton's Bat the only other species which was recorded at two occasions at T1 & T7.

The distribution of bat registrations during the spring 2023 survey season shows the wind farm site, as a whole, displays some pre-sunset and general early-night activity which peaks approximately sixty minutes after sunset and is not sustained throughout the night. This activity was dominated by Leisler's Bat and Common Pipistrelle with some Soprano Pipistrelle, with the entirety of pre-sunset and early-night activity recorded at turbine eight. The earliest registrations appear approximately forty to sixty minutes prior to sunset. The average emergence times for these species are 20 (Leisler's Bat), 25 (Common Pipistrelle) and 30 (Soprano Pipistrelle) minutes after sunset respectively (Collins, 2023).

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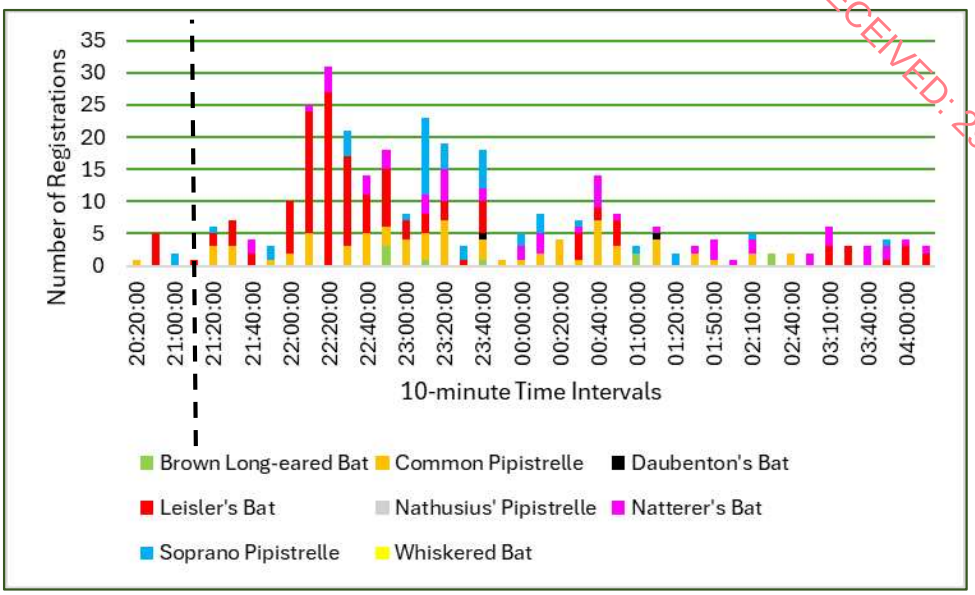

Figure 6.12e Distribution of total bat registrations by 10-minute time intervals during the summer 2022 passive monitoring season. Mean sunset and sunrise times were 21:17 (dashed black line) and 05:48 respectively.

Spring 2024 Passive Monitoring

A low-moderate level of species diversity was recorded during the spring 2024 monitoring period, with a total of five bat species confirmed. A low level of activity was recorded with a total of 241 bat registrations across the 23-night survey period and eight detector locations. Activity during the spring 2024 survey season was the lowest recorded of the four seasons, accounting for only 8% of the overall activity recorded across the four seasons. Turbine eight recorded the majority of registrations during this period (43.5%).

Common Pipistrelle was the commonly recorded species and comprised the majority of registrations (61.8%), of which most registrations were recorded at turbine eight. Natterer's Bat (14.9%), Soprano Pipistrelle (13.7%) and Leisler's Bat (9.1%) make up the remaining majority of registrations. These species were largely evenly distributed across the site, as with previous survey seasons, with a minor peak at turbine eight. Whiskered Bat was the only remaining species recorded during the spring 2024 survey season, with a single instance at turbine eight.

The distribution of bat registrations during the spring 2024 survey season shows the wind farm site, as a whole, displays largely early-night activity as with previous survey seasons which then declines steadily and remains low for the remaining majority of the night. The majority of the earliest registrations appear approximately twenty to forty minutes after sunset and were dominated by Common Pipistrelle and a single instance of Leisler's Bat. The average emergence time for these species are 20 and 25 minutes after sunset respectively (Collins, 2023). There was no activity recorded proximal to sunrise.

In response to updated design information during this survey season, an additional passive monitor was deployed along the proposed access track proximal to existing commercial forestry. A total of twelve registrations were recorded during the twenty-three night survey period, of which was comprised

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of Common Pipistrelle, Natterer's Bat and Soprano Pipistrelle in that order. Overall, limited bat activity was recorded at this monitoring station across all bat species.

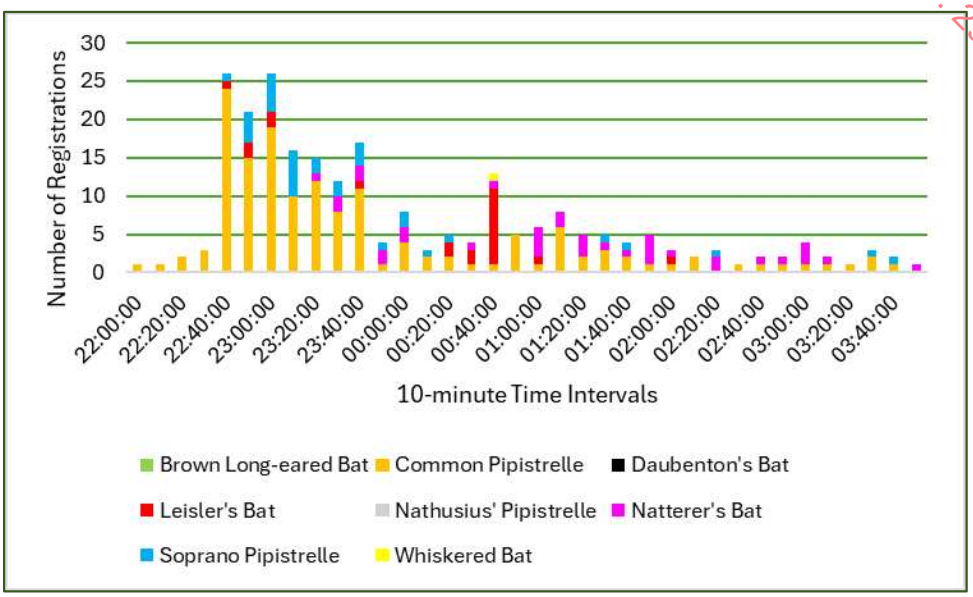

Figure 6.12f Distribution of total bat registrations by 10-minute time intervals during the spring 2024 passive monitoring season. Mean sunset and sunrise times were 22:04 (dashed black line) and 05:06 respectively.

Proposed Access Road

In order to assess bat activity at the location tree felling planned for the proposed access road, a passive bat detector (B_10; see **Figure 6.5**) for 23 nights in May and June 2024. A total of twelve registrations were recorded during the survey period, of which was comprised of Common Pipistrelle, Natterer's Bat and Soprano Pipistrelle in that order. Overall, low bat activity was recorded at this monitoring station across all bat species.

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Table 6.28 - Results of passive bat monitoring

	Common Name	T1	T2	T3	T4	T5	T6	T7	T8	*T9p*	*T9*
Summer 2022	Brown Long-eared Bat	0.7[4]	0.25[1]	0.6[4]	0.55[2]	0.6[5]	0.5[2]	0.35[3]	0.5[4]	*2.15[14]*	-
	Common Pipistrelle	2.35[11]	1.5[9]	2[12]	2.9[14]	2.7[9]	3.1[15]	2[10]	2.45[13]	*64.25[194]*	-
	Daubenton's Bat	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	*0[1]*	-
	Leisler's Bat	2.05[8]	1.4[10]	1.7[12]	3.2[13]	3.3[19]	1.6[7]	2[8]	2.6[11]	*5.6[23]*	-
	Nathusius' Pipistrelle	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[1]	*0.05[1]*	-
	Natterer's Bat	0.6[2]	0.7[3]	1.2[15]	0.84375[4]	0.45[4]	0.5[2]	0.45[4]	0.75[3]	*2.5[10]*	-
	Soprano Pipistrelle	2.6[8]	2.25[8]	2.7[14]	2.3125[9]	1.6[15]	2.9[12]	2.85[10]	3.55[16]	*98.55[355]*	-
	Whiskered Bat	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[1]	*0.1[1]*	-
Autumn 2022	Brown Long-eared Bat	0.6[2]	0.5[3]	0.3[1]	0.7[4]	0.5[2]	0.3[2]	0.6[4]	0.3[4]	*1.5[5]*	-
	Common Pipistrelle	0.4[4]	0.4[2]	0.3[2]	0.4[2]	0.3[2]	0.1[1]	0.2[1]	0.5[5]	*15.2[127]*	-
	Daubenton's Bat	0.1[1]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	*0.1[1]*	-
	Leisler's Bat	0[0]	0.2[2]	0[0]	0.1[1]	0.1[1]	0.3[2]	0.4[6]	0.3[3]	*0.2[1]*	-
	Natterer's Bat	6.1[26]	3.6[14]	2.9[13]	2.8[8]	1.5[4]	1[3]	0.9[3]	0.4[4]	*1.7[5]*	-
	Soprano Pipistrelle	1.1[4]	0.4[3]	0.3[2]	1[3]	0.7[3]	0.9[5]	0.3[3]	0.7[5]	*25.1[115]*	-
Spring 2023	Brown Long-eared Bat	0.4[4]	0[0]	0[0]	0.3[3]	0[0]	0[0]	0[0]	0.1[1]	*3.6[16]*	*3.6[16]*
	Common Pipistrelle	0.6[3]	0.3[2]	0.2[2]	0.1[3]	0.2[2]	0.5[3]	1.1[6]	1[7]	*3.4[12]*	*3.4[12]*
	Daubenton's Bat	0[1]	0[0]	0[0]	0[0]	0[0]	0[0]	0[1]	0[0]	*0[1]*	*0[1]*
	Leisler's Bat	0.4[2]	0.3[3]	1.9[9]	0.6[5]	1.9[9]	0.6[3]	0.8[5]	6.8[47]	*2.6[18]*	*2.6[18]*
	Natterer's Bat	0.2[2]	0[0]	0[2]	0.6[5]	0[2]	0.2[2]	0.3[3]	0.6[4]	*0.7[5]*	*0.7[5]*

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	Soprano Pipistrelle	0.3[3]	0.1[1]	0.1[1]	0.7[3]	0.1[1]	0.2[2]	0.5[3]	0.1[4]	*1.5[7]*	*1.5[7]*
Spring 2024	Common Pipistrelle	0.7[3]	0.3[1]	0.4[2]	0.9[3]	0.6[4]	0.2[1]	0.7[4]	3[18]	-	-
	Leisler's Bat	0.2[1]	0[0]	0[0]	0.1[1]	0[0]	0.1[1]	0.1[1]	1.5[14]	-	-
	Natterer's Bat	0.1[1]	0.2[2]	0[0]	0.2[1]	0.4[2]	0.2[1]	0[0]	0.1[1]	-	-
	Soprano Pipistrelle	0.2[1]	0.1[1]	0.3[2]	0.5[3]	0.1[1]	0.2[1]	0[0]	0.9[5]	-	-
	Whiskered Bat	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	0[0]	-	-

(Note: Data is presented as “average [peak]” where average is the average number of registrations per night on 10 selected nights in the spring season, 20 selected nights in the summer season and 15 in the autumn. Peak data represents the maximum number of nightly registrations from any night in the relevant recording period).)

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6.7.7.4 Active Bat Surveys

Active bat surveys were used to complement the information gained from passive bat monitoring at the proposed wind farm site. The aim of the surveys was to characterise activity at the proposed wind farm sites and along the proposed underground electricity export connection route, and to seek to identify any particular flight-lines which may be apparent or to identify emergence behaviour which would indicate the presence of a roost.

Active transect surveys were carried out on three separate occasions on the 9th August 2022, 17th May 2023 and 14th September 2023 at the proposed wind farm site and along the UEECR. Weather conditions were optimal for each survey. Active surveys were designed based on a previous iteration of the proposed design which was modified on ecological advice to omit a ninth turbine (T_09) north of the Keerglen River.

A total of five bat species were recorded during the course of active bat surveys:

- Common Pipistrelle
- Soprano Pipistrelle
- Leisler's Bat
- Natterer's Bat
- Brown Long-eared Bat

All of the above species were also recorded during passive bat detection surveys. The locations of registrations recorded during active bat surveys at the proposed wind farm site is shown in **Figure 6.12g-i** below.

13th September 2023

This survey focused on the UEECR and the initial stages of the access roads leading to the core of the wind farm site up to the Keerglen River. This survey was completed by two surveyors and was both walked and driven (see **Figure 6.12g**). The walked transect along the proposed access roads began at an occupied residence and associated agricultural stone outbuildings (54.23855,-9.39893). Early night activity in this area was dominated entirely by small numbers of Soprano Pipistrelle, with the first registrations appearing approximately 25 minutes after sunset proximal to the stone outbuildings. Roosting by small numbers of bats, at least occasionally, is deemed likely within these outbuildings although was not confirmed during these surveys and the buildings will not be directly or indirectly affected by the proposed works. Foraging was observed in these individuals along the conifer treeline south of the stone outbuildings and was noted to provide significant shelter from wind.

Activity was entirely confined to the area surrounding the stone outbuildings, likely due to the sheltered conditions from prevailing winds. Activity ceased entirely when the surveyor moved beyond the stone outbuildings and along the beginnings of the proposed access road towards the Keerglen River, despite the availability of sheltered and suitable foraging habitat. Bat activity once again resumed when the

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surveyor returned to the stone outbuildings, with overall bat activity concentrating in this area. Natterer's Bat was the only other recorded bat species in this area, appearing approximately 65 minutes after sunset.

Bat activity was sampled by driven transect along the UEECR and was dominated also by Soprano Pipistrelle although activity was noted overall to be limited along the UEECR, with no attributable behavioural trends aside from the expected local foraging along treelines and hedgerows bordering the existing roadway. A single instance of Brown Long-eared Bat was recorded at the northern extent of the UEECR within riparian woodland and represents the only other confirmed bat species recorded on this date.

17th May 2023

This survey focused again on a section of the UEECR along existing local roads, terminating where the local road meets the R315. Surplus data was acquired on this night due to previous iterations of the proposed design which was modified on ecological advice to omit a ninth turbine north of the river. This survey was completed by two surveyors and was both walked and driven.

A walked transect from the proposed access road, west along an existing track and back, continuing east. Bat activity was limited at this time, with the first registration, attributed to foraging Soprano Pipistrelle, appearing 50 minutes after sunset along the edge of conifer forestry adjacent to the roadway. As surveys progressed, activity was dominated by Soprano Pipistrelle foraging locally around conifer forestry edge-habitat with intact hedgerows adjacent. Leisler's Bat was recorded occasionally along this transect and was observed flying at treeline height above the conifer forestry. A single instance of Brown Long-eared Bat was recorded in similar habitat also. A general commuting pattern was observed in an east-west direction, with individual bats appearing to commute from the locality towards sheltered foraging habitat in the form of forestry-edge and hedgerow as noted above.

Bat activity along the driven UEECR was generally sparse with no discernible activity patterns aside from local foraging along treelines and hedgerows adjacent to the existing roadway. Activity was dominated by Soprano Pipistrelle and Common Pipistrelle, with Leisler's Bat recorded in a single location. Bat activity picked up slightly along the roadway adjacent to the existing substation at the end of the UEECR.

9th August 2022

This transect survey focused on the core of the wind farm site utilising existing trackways along the cutover bog. The habitat present was entirely open and exposed, presenting poor landscape connectivity for commuting bats. Bat activity was limited along the exposed cutover bog trackways adjacent to the proposed turbines. Bat activity was entirely dominated by Common Pipistrelle and Soprano Pipistrelle. Registrations were noted as sparse and widely dispersed, with activity being attributed to a limited number of individuals. Limited foraging activity was recorded, with the majority of bat activity attributed to commuting across the cutover bog. Initial registrations appear approximately

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65 minutes after sunset from an easterly direction, although no general commuting pattern was noted. Activity ceased entirely approximately 75 minutes after sunset.

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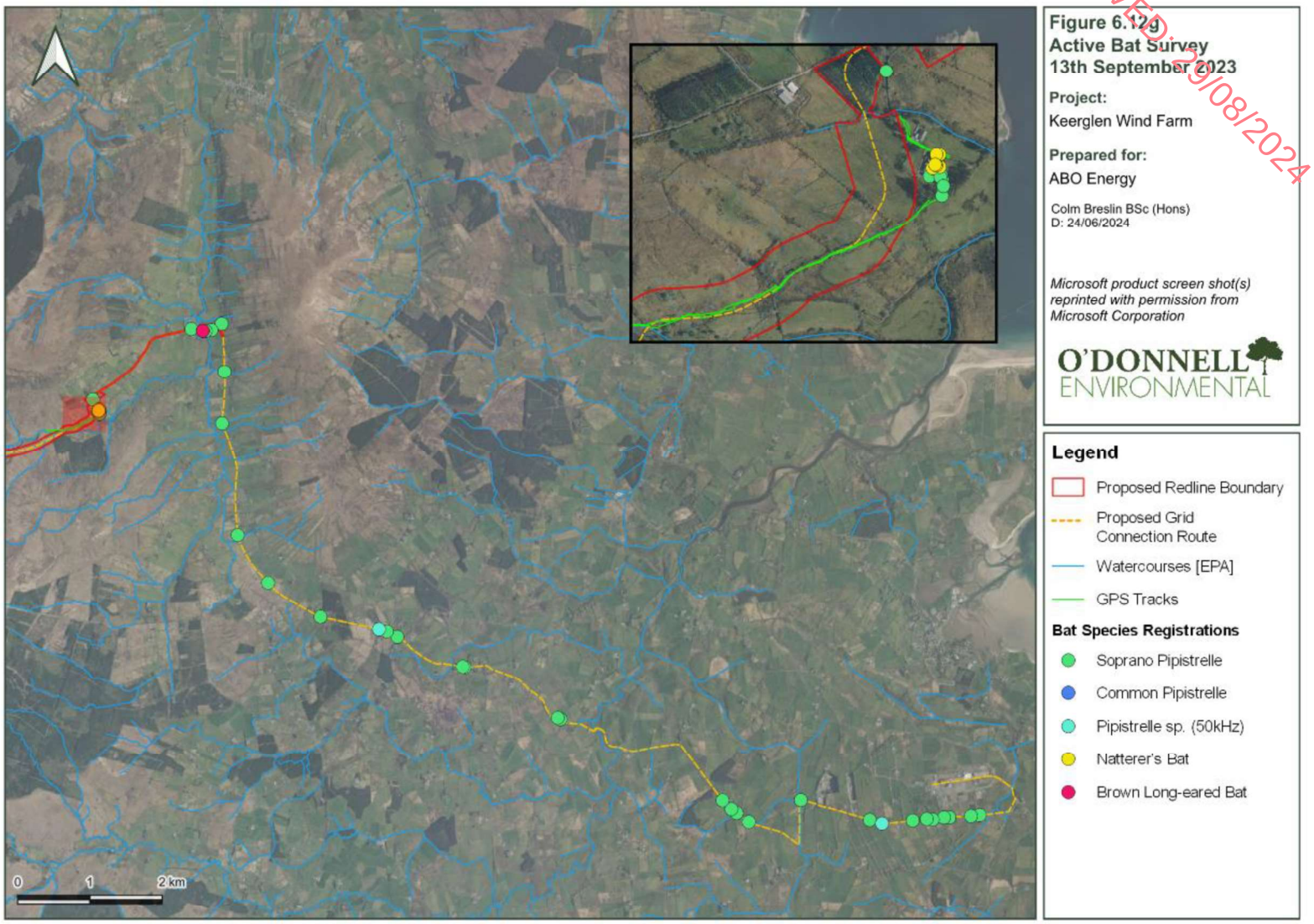

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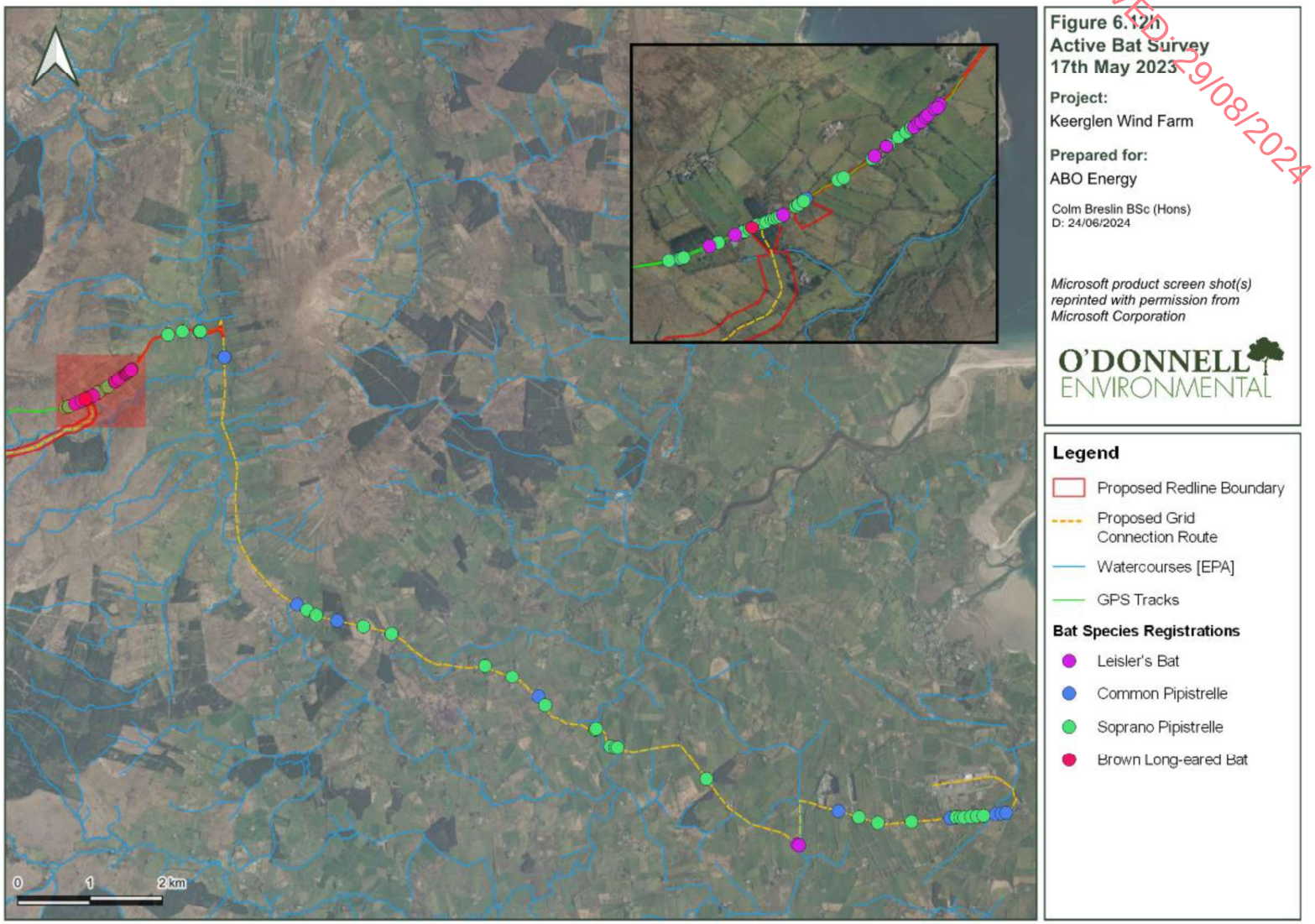

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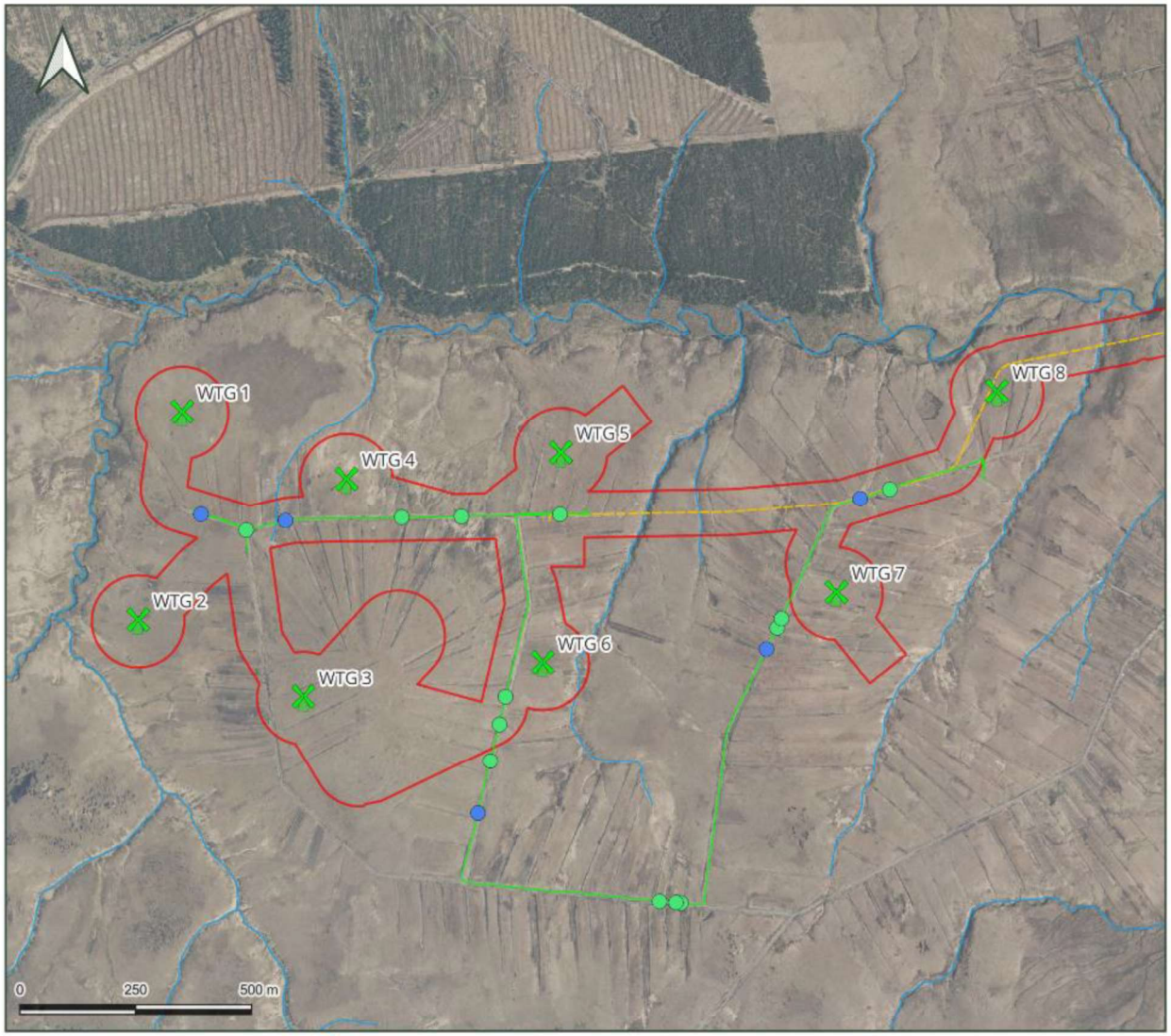

Figure 6.12
Active Bat Survey
9th August 2022

Project:
Keerglen Wind Farm

Prepared for:
ABO Energy

Colm Breslin BSc (Hons)
D: 24/06/2024

Microsoft product screen shot(s) reprinted with permission from Microsoft Corporation

O'DONNELL ENVIRONMENTAL

Legend

- Proposed Redline Boundary
- Proposed Wind Turbines
- Proposed Grid Connection Route
- Watercourses [EPA]
- GPS Tracks

Bat Species Registrations

- Soprano Pipistrelle
- Common Pipistrelle

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6.7.8 Existing Environment- Other Taxa

A desktop review of other taxa that have been recorded within the relevant 10km grid square (G03) was carried out and all sightings of other taxa were recorded during all ecological surveys.

NBDC holds records of protected and threatened species for the 10km grid square which overlaps the proposed development site (G03). **Table 6.29** lists the protected, near threatened, endangered and vulnerable amphibian, reptile and invertebrate species historically recorded within this grid square area and describes their conservation status.

Table 6.29 Other protected and near threatened, Endangered and Vulnerable taxa historically recorded in the 10km grid square in which the proposed development is located.

Species	Status	Date of Record	10km Grid Square
Common Frog (*Rana temporaria*)	Protected Species: EU Habitats Directive || Protected Species: EU Habitats Directive >> Annex V || Protected Species: Wildlife Acts	09/03/2003	G03
Mayfly (*Ephemeroptera*)	Threatened Species: Data Deficient	30/06/2020	G03

Many of the records of endangered invertebrates are aged records, most likely reflecting lack of contemporary survey effort and in other cases a likely absence of the species in question in these areas in recent decades.

Frog spawn was recorded during the habitat surveys carried out by Ó Ceallaigh Ecology within the wet grassland (GS4) area adjoining south of the existing access road (**Plate 6.50a**). Common frog was recorded within the wind farm site (likely to occur widespread throughout the site) and at the proposed 'Crossing 16' location (**Plate 6.50b**) The mayfly *Ecdyonurus dispar* was recorded at eight of 12 aquatic surveys sights.

No evidence of Marsh Fritillary Butterfly was noted, and no viable areas of suitable habitat exists within the proposed site. Marsh Fritillary occur on grassland habitats and heaths primarily, which contain at last a 25% density of Devils Bit Scabious. A sward height of 12 to 25cm is preferred with an open sward which leaves the food plant unshaded. No records of the species occur within or proximal to the proposed site. There were no records for this species from hectad G03, which contains the proposed wind farm site. The species has been recorded approximately 1.1km west of POI 7 on the proposed TDR, but otherwise not within approximately 3km from any other point on the TDR or UEECR. No evidence of the species was found during surveys by Ecologists, i.e. sightings of adults in spring/summer or larvals web in late autumn. Fox Moth (*Macrothylacia rubi*) caterpillar was recorded at the proposed development site (**Plate 6.50c**) during the course of other ecological surveys. This species is common in Ireland found in heathland and wet grassland habitats.

Potential impacts and appropriate mitigation measures for these other taxa are given further consideration in the following sections.

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Plate 6.50a Frog spawn recorded within the wet grassland.

Plate 6.50b Common Frog recorded along the banks of the watercourse at 'Crossing 16' of the UEECR.

Plate 6.50c Fox Moth Caterpillar recorded at the proposed development site.

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6.8 Potential Impacts

The potential impacts on habitats and flora, aquatic ecology, mammals and other taxa, which may arise from the construction, operation and decommissioning of the proposed development are discussed in detail below. The evaluation of likely and residual effects associated with the proposed development on the existing habitats and species are outlined. This assessment follows guidelines published by the EPA (2022).

6.8.1 Mitigation-by-Design

O'Donnell Environmental engaged with ABO Energy early in the design process to communicate the key ecological sensitivities and constraints associated with the proposed site. A mitigation-by-design approach was taken in relation to the design of the principal features of the development which sought to avoid areas of high sensitivity for key habitats and species. The established strategies for the successful mitigation of effects are avoidance, prevention and reduction (EPA, 2022). Various measures of mitigation by avoidance were undertaken at early stages of the proposed development and include site selection and design configuration.

Lands within the Ummerantarry Bog NHA were removed from consideration on ecological grounds and the proposal does not involve works within any Natura 2000 site or other sensitive environmental areas such as Freshwater Pearl Mussel catchments.

Intact peatland habitats are a key conservation priority in the current instance and the proposed design was modified to omit the originally proposed Turbine 9, north of the Keerglen River, and to modify the location of the proposed Keerglen River crossing in order to avoid significant impacts on sensitive habitats and species (e.g. Otter). The formerly proposed T_09 WTG location contains poor fen and flush (a nationally important habitat) and the road and hardstand required to service the turbine would have occurred in a predominantly wet heath habitat. This habitat is of 'Annex 1' quality (EU Habitats Directive) and areas north of the Keerglen River, which have not historically been subject to turf cutting, provide good example of the habitat. Wet heath habitat in this area corresponds to the 'Annex I' habitat 'northern Atlantic wet heaths with *Erica tetralix* (4010)'. To this end, it was determined that proposed Turbine 9 and access road would be removed as it would lead to direct disturbance and removal of Annex I heathland habitat, in addition to fragmentation and potential indirect habitat degradation.

Set-back buffers were implemented in the selection of turbine locations and design of associated hardstands and roads to protect water-quality and aquatic habitats. 50m setback buffers were implemented in relation to main watercourses and 10m set-back buffers were implemented in relation to main drains where possible.

Existing tracks will be utilised and upgraded where possible to avoid the unnecessary loss of habitat. Approximately 3.5km of existing agricultural tracks will be upgraded to accommodate the proposed development site internal access.

6.8.2 "Do Nothing Scenario"

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In the "Do Nothing Scenario" the general pattern of land use of the site is likely to remain consistent. The general biodiversity on the site, as described in this chapter, would therefore likely remain similar to its current state, in the short term, as activity levels and land use (peat cutting and livestock grazing) would not change significantly.

The habitat in the area reflects a landscape that has been the subject of considerable anthropogenic influence and modification. The dominant habitat types within the redline boundary are cutover bog (PB4) (58%) and degrading upland blanket bog (PB2) (12%). In terms of hydrology, the existing surface water drainage regime would continue to function but drains may be extended in places to facilitate ongoing peat extraction (Chapter 7).

In the medium and long term, it is likely that the ongoing exploitation of the habitat for peat extraction would result in a decrease in the biodiversity, and ongoing degradation of in-situ and adjoining peatland habitats, and pressures in terms of water quality.

If the proposed development were not to proceed, the opportunity to generate renewable energy and electrical supply to the national grid would be lost, as would the opportunity to further contribute to meeting Government and EU targets for the production and consumption of electricity from renewable resources and the reduction of greenhouse gas emissions (Chapter 7).

6.8.3 Potential Impacts- Designated Sites

The proposed wind farm site itself does not lie within any EU Natura 2000 or nationally designated conservation sites, nor does the UEECR cross any designated sites. The TDR crosses multiple Natura 2000 sites and a number of pNHAs (see **Section 6.7.1**).

European Designated Sites

The potential impacts on European designated conservation sites and their qualifying interests are considered in detail in the Appropriate Assessment Screening and Natura Impact Statement that accompanies the EIAR (O'Donnell Environmental, 2024).

The proposed wind farm site itself does not lie within any Natura 2000 sites or nationally designated sites and is not linked hydrologically or otherwise to any inland Natura 2000 sites. A remote, indirect, hydrological connection exists between the proposed wind farm site and coastal Natura 2000 sites such as Illanmaster SPA and Lackan Saltmarsh and Kilcummin Head SAC. No other source-receptor pathway exists in hydrological terms. Consideration is given to the potential for ex-situ impacts of bird species which are listed as special conservation interests of relevant Special Protection Areas (SPA) for birds. SPAs are located within the wider landscape including Killala Bay / Moy Estuary SPA, Illanmaster SPA, Lough Conn and Lough Cullin SPA, Owenduff / Nephin Complex SPA, Blacksod Bay/Broadhaven SPA and Carrowmore Lake SPA.

Appropriate Assessment Screening and Natura Impact Statement considers the impact of the current proposed cumulatively with other plans and projects. Included in this cumulative assessment were elements

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of the overall proposed Keerglen Wind Farm project which are not included in the current application, but which are essential components of the scheme and would be the subject of a future application and environmental assessment, namely the planned UEECR and TDR.

The AA Screening concludes that the currently proposed development alone is not likely to have any significant adverse effect on any Natura 2000 sites. The potential for adverse effects as a result of future elements of the proposed scheme (i.e. UEECR and TDR) is considered in the NIS. The NIS concludes that with the implementation of the environmental controls and reinstatement plans in the construction phase, that there will be no significant adverse effects upon any of the Natura 2000 sites, or their qualifying interests, arising from the development of Keerglen Wind Farm.

Nationally Designated Sites

As outlined with Chapter 7 of this EIAR, the proposed wind farm site is not hydrologically connected to any nationally designed sites. Ummerantarry Bog NHA is located in the west of the proposed site. This designated site is located to the west of the Fiddauncushaneen Stream and the Keerglen River which act as a hydrological barrier between the proposed development infrastructure and the Ummerantarry Bog NHA. The NHA is considered of conservation importance as it contains intact upland blanket bog and wet heath and features pool systems, flushes and undisturbed blanket bog. The site is used by breeding Golden Plover and is currently red-listed with regard to both its breeding and wintering population in the most recent publication of *Birds of Conservation Concern in Ireland 2020-2026* (Gilbert et al., 2021). The site is a remaining portion of an extensive upland bog habitat which has otherwise largely been destroyed by peat cutting and afforestation.

Should the proposed project cause any changes in local hydrogeological patterns, Ummerantarry Bog NHA would be vulnerable to disturbance. Chapter 7 of this EIAR describes monitoring carried out to investigate groundwater patterns at Ummerantarry Bog in relation to the most proximal proposed turbines, which found that ground water flows towards the Keerglen River. The wind farm site is underlain by an aquifer of low permeability, and the groundwater flow paths are therefore typically very short (~300m maximum) and follow surface topography discharging into the Keerglen River and its tributaries. The proposed site has no other viable source-receptor pathway with Ummerantarry Bog NHA or any other nationally designated site and therefore the potential for effects does not arise. The outline Construction Method Statement (see Appendix 3.1) contains measures in relation to dust control, which are considered sufficient to avoid any significant effects on Ummerantarry Bog NHA during the construction phase. These measures will also be applied during the decommissioning phase. No effects on Ummerantarry Bog NHA as a result of dust are anticipated to arise during the operational phase of the proposed wind farm. It is noted that in the ‘do-nothing scenario’, the existing site roads would continue to be trafficked as part of ongoing peat harvesting. The potential for effects on bird species associated with Ummerantarry Bog NHA are addressed in Chapter 5.

5km is considered to be an appropriate screening distance within which to consider the potential for effects on nationally designated sites. This includes all sites with hydrological or other hydrological connectivity to the proposed works.

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The proposed underground electricity export connection connection route is upstream of the Killala Bay Moy Estuary NHA. Elements of the route occur within approximately 600m of the Killala Esker NHA, although there is no connectivity hydrological or otherwise to this site. There is no viable pathway to any other nationally designated site.

The TDR will occur long existing road infrastructure and will cross through the Moy Valley pNHA (2078), Cummeen Strand / Drumcliff Bay (Sligo Bay) pNHA (0627), Lough Melvin pNHA (0428) and Donegal Bay (Murvagh) pNHA (0133). No facilitation works will be carried out within the bounds of any nationally designated site and it is concluded that there is no potential for significant effects on any nationally designed sites as a result of the proposed TDR.

The effect of the proposed project on nationally designed sites is considered to be **neutral**.

There is no potential for effects to occur on the Knockmoyle Sheskin Nature Reserve or the Owenboy Nature Reserve as a result of the current proposal, due to the separation distances involved and the absence of a source-receptor pathway.

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6.8.4 Potential Construction Phase Impacts

The potential ecological impacts which could arise as a result of the proposed wind energy development are discussed in detail below. Avoidance and mitigation measures in respect of the identified potential impacts are discussed in **Section 6.9 - Avoidance and Mitigation Measures**. The predicted residual impact of identified potential impacts following application of avoidance and mitigation measures are discussed in **Section 6.10 - Residual Impacts**.

Potential Construction Phase Impacts – Habitats and Flora

Habitats recorded within the study area which potentially correspond with Annex I habitats listed under the EU Habitats Directive are upland blanket bog (PB2) and wet heath (HH3) (see Table 6.15). Upland blanket bog (PB2) is located along the western and north-western boundaries of the proposed windfarm site, while wet heath (HH3) is present within the wider survey area, (and along one section of the proposed access track), with expansive areas of this habitat occurring north of the Keerglen River valley. Upland blanket bog habitats on site are not considered to be 'active' due to the poor cover abundance of Sphagnum cover and therefore do not meet with the priority Annex I classification of this habitat. The Annex I habitat blanket bogs (7130). Nonetheless, these habitats are capable of ongoing regeneration and correspond with the Annex I habitat 'blanket bogs (7130)'.

No botanical species protected under the Flora (Protection) 2022 or listed as flora of conservation concern in Ireland were recorded within the proposed windfarm site, ancillary works areas or adjoining areas.

The proposed development site (redline boundary) extends to an area of 81.88ha, however the direct loss of habitat resulting from the proposed infrastructure is less than this. The actual permanent land-take ("non-returnable area") will be limited to the area of the turbine hardstands, crane hardstands, new and existing access tracks and the substation, plus an outer buffer of 1m to allow for drainage etc. if required. The proposed borrow pit (plus its short access road) measures 2.452 ha and although this area will be remediated post-construction, it was included in the 'non-returnable area' due to significant transformation that would take place here and the length of time it may take to recover. In total, the non-returnable areas amount to c. 11.9ha. The composition of this permanent footprint in terms of habitats is detailed in **Table 6.30** below.

Table 6.30 Habitat areas within "non-returnable area"

Fossitt Code	Habitat Type	Area (ha)	%
PB4	Cutover bog	7.4685	62.90%
BL3	Buildings and artificial surfaces	1.3074	11.01%
PB2	Upland blanket bog	1.1887	10.01%
PB2/PB4	Upland blanket bog / Cutover bog	0.8232	6.93%
PF2	Poor fen and flush	0.2624	2.21%
PB4/PB2	Cutover bog / Upland blanket bog	0.1724	1.45%
GS4	Wet grassland	0.162	1.36%

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HH3	Wet heath	0.1346	1.13%
ED3/BL2/WS1	Recolonising bare ground / Earth banks / Scrub	0.1187	1.00%
WD4	Conifer woodland	0.0945	0.80%
GS3/HD1	Dry humid acid grassland / Dense bracken	0.0354	0.30%
HH3/PF2	Wet heath / Poor fen and flush	0.0223	0.19%
PF2/GS4	Poor fen and flush / Wet grassland	0.0195	0.16%
GS4/PF2	Wet grassland / Poor fen and flush	0.0187	0.16%
WS1	Scrub	0.0185	0.16%
PB2/PF2	Upland blanket bog /Poor fen and flush	0.0162	0.14%
GA1/HD1	Improved agricultural grassland / Dense bracken	0.0041	0.03%
HH3/GS3	Wet heath / Dry humid acid grassland	0.0031	0.03%
PF2/HD1	Poor fen and flush / Dense bracken	0.0025	0.02%
GA1	Improved agricultural grassland	0.0017	0.01%
		11.88	

The largest habitat type to be impacted by the proposed windfarm development is cutover bog (PB4). Approx. 7.5ha of cutover bog (PB4), excluding that which is present in a mosaic with other habitats, will be lost. Cutover bog habitats on site that are in varying stages of recolonisation, comprise poor *Sphagnum* cover and moderate species diversity and are considered to be of **Local Importance (Lower Value)** in terms of habitats and flora.

Approx. 1.19ha of upland blanket bog (PB2), excluding that which is present in a mosaic with other habitats, will be permanently lost as a result of the proposed infrastructure, including at the locations of T1 and T2, with partial intersection of this habitat at T5. This represents a **permanent**, **significant negative** impact on a habitat type which is becoming increasingly scarce on a national level.

Small areas of wet heath (HH3), wet heath / poor fen and flush mosaic (HH3/PF2), upland blanket bog (PB2) and upland blanket bog / cutover bog mosaic (PB2/PB4) will be permanently lost as a result of the proposed access track. Additionally, small patches of wet heath (HH3) and poor fen and flush (PF2) will be lost as a result of theredlined area along the local road, and although this area will be remediated post-construction, the sensitivity of these habitats is such that their disturbance would likely represent a permanent impact. The total area of wet heath habitat lost, not including that which is present in a mosaic with other habitats, as a result of the proposed infrastructure will be c. 0.135ha. This represents a **moderate negative impact on the local scale** on a peatland habitat that is common within the receiving and surrounding environment.

Smaller areas of degraded wet heath and upland blanket bog, considered to be of **County Importance**, will be directly and indirectly impacted by the proposed windfarm site and internal access route respectively.

Habitats of **Local Importance (Higher Value)** that will potentially be impacted under the footprint and environs of the proposed access route include wet grassland (GS4), dry humid acid grassland (GS3), poor fen and flush (PF2), scrub (WS1) and drainage ditches (FW4).

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Remaining habitats of **Local Importance (Lower Value)** potentially impacted along the access road network, east of the windfarm site footprint, are semi-improved grassland (GA1), dense bracken (HD1), conifer plantation (WD4) and spoil and bare ground (ED2) / recolonising bare ground (ED3).

A total of 0.5 ha of conifer plantation (WD4) will be permanently felled within the wind farm site. The area to be felled is located to the south of the L51723 along a new proposed site access track. The tree felling activities required as part of the proposed development will be the subject of a Felling Licence application to the Forest Service, in accordance with the Forestry Act 2014 and the Forestry Regulations 2017 (SI 191/2017) and as per the Forest Service's policy on granting felling licenses for wind farm developments.

Eroding upland river (FW1) habitat and flora associated with aquatic habitats in the study area and downstream could be adversely affected by the project through indirect hydrological/water quality effects such as nutrient release, siltation and/or contaminated run-off arising from the development works footprint. The Keerglen Watercourse and its tributaries are considered to be of **County Importance** due to their collective size and contribution to the downstream Ballinglen River.

Temporary land take areas, such as the construction compound and passing bays will be reinstated following the construction of the proposed development. With the exception of wet heath (HH3) and poor fen and flush (PF2) habitats the loss of which is considered to be permanent (considered above), habitats within temporary working areas including cutover bog (PB4), wet grassland (GS4) are considered to be amenable to reinstatement. PB4 habitats adjoining roads will also be used to store peat (see Appendix 8.2). The temporary disturbance of habitats within the temporary landtake of the scheme is considered to represent a **short-term, slight, negative effect at a local level** (following EPA, 2022).

Peat slide would represent a significant negative impact on affected habitats and downstream receiving waterbodies. An analysis of the risk of a peat slide occurring was carried out at all the main proposed infrastructure locations across the Wind Farm Site (see Chapter 7). This peat stability assessment was undertaken considering lessons-learned from peat failures that occurred on other peatland sites (e.g. Shass Mountain Co. Leitrim (2020), Meenbog, Co. Donegal (2020)). The findings of the Geotechnical and Peat Stability Assessment Report showed that the proposed wind farm site has a low risk of peat failure and is suitable for the Proposed Development. Peat slide is therefore considered unlikely to occur. The report includes recommendations and control measures for construction work in peatlands.

The current guidance on ecological assessments (CIEEM, 2022) states that:

"The 'Zone of Influence' for a project is the area over which ecological features may be affected by biophysical changes as a result of the proposed project and associated activities. This is likely to extend beyond the project site, for example where there are ecological or hydrological links beyond the site boundaries" and that "The zone of influence will vary for different ecological features depending on their sensitivity to an environmental change". Impacts associated with the direct loss of habitats will be confined to the 'non-returnable area'. The project has the potential to realise indirect loss or degradation of habitats adjoining proposed windfarm infrastructure, particularly larger hardstand areas. Consideration was given to hydrogeological connectivity (see Chapter 7), and in this instance, the ZoI of habitat loss was therefore

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defined as all lands within the proposed redline boundary. Consideration was also given to the UEECR and TDR.

Chapter 7 states that "temporary reductions in groundwater levels by short duration and transient dewatering works will be very localised and of small magnitude due to the nature and permeability of the local subsoil and bedrock geology". However, the installation of drainage associated with the proposed development is also likely to alter the near-surface hydrology of upland blanket bog habitats locally. This could result in disturbance and degradation of an additional area of upland blanket bog (PB2) and could, in the absence of mitigation, be a significant negative impact at the immediate local scale.

Overall, in the absence of mitigation, the effects on habitats and flora assessed within the windfarm site are considered to be a **permanent, moderate, negative effect** at a local level (following EPA, 2022).

The effect of the proposed project on improved and manmade habitats within the footprint of the TDR and UEECR works are considered to be **temporary, slight, negative effect** at the local level (following EPA, 2022).

Potential Construction Phase Impacts – Aquatic Ecology

There are a number of elements associated with the proposed development that may give rise to direct and indirect impacts on aquatic ecological receptors during the construction phase. The significance of these impacts depends on the scale as well as the ecological condition and the sensitivities of the qualifying interests. Potential impacts relating specifically to hydrology are dealt with in Chapter 7. The potential impacts on aquatic receptors relating to specific construction-phase activities include the following:

- Loss of habitat as a result of the land works and construction of the proposed infrastructure.
- Release of sediment and pollutants which may be discharged into surface water particularly during the installation of bridge/culverts, forestry felling and/or high rainfall events.
- Movement of vehicles and machinery associated with construction works and the potential for spillages of oils, fuels or other pollutants which could be transported to the surface water system during rainfall events.
- Transportation, pouring of concrete onsite and washing of concrete lorry flume posing risk for entry into surface water.
- Increased silt loading which may stunt aquatic plant growth, limit dissolved oxygen capacity and overall reduce the ecological quality of watercourses, with the most critical period associated with low flow conditions.
- The introduction or spread of invasive alien species.
- Disturbance to fauna (e.g. through noise from construction activity and/or human presence) resulting in the displacement of affected species.
- Accidental mortality of wildlife from construction machinery.

With regards to potential habitat degradation effects associated with the potential release of sediment and other pollutants to surface water and aquatic ecology, the ZoI of the proposed wind farm is considered to include receiving surface waterbodies within, adjacent to or downstream of the proposed development site during the construction phase. Consideration was also given to the areas of facilitation works proposed along the UEECR and TDR.

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The principle impacts from the proposed development on the aquatic environment are expected to occur during the construction phase of the wind farm. Primarily, these risks relate to water pollution and or contamination via siltation (suspended solids), hydrocarbons, concrete etc. The provision of new watercourse crossings, new access tracks (e.g. deforestation), new passings bays and upgrade of existing tracks has the potential to contribute to the increase in surface water run-off and cause more localised water quality impacts through sediment- and nutrient-laden run-off. Works leading to erosion of the riverbanks/bed could result in the release of suspended solids. This may impact sensitive aquatic ecological receptors in receiving watercourses (such as salmonids) through mobilisation of sediment and or contaminants, as well as additional erosion, resulting in impacts to both water quality and aquatic habitat. The proposed bridge crossing location has been selected to minimise loss of riparian habitat and its clear span (pre-cast) structure offers a suitable setback to the river channel, to minimise risk of pollutants entering the Keerglen River. Peat ecosystems are particularly sensitive to alkaline influxes (e.g. surface water containing concrete residues, surface water flowing over un-washed limestone gravel/aggregates) as they are dependent on low pH conditions.

The displacement of fauna species could potentially occur within the vicinity of the proposed project. Blasting and invertebrates resulting in mortalities and changes to fish and invertebrate community composition at the local scale. Siltation of watercourses could also lead to increased natural deposition, thus encouraging a proliferation of filamentous algae and or macrophytes, changing local hydrology, water quality (dissolved oxygen) and overall aquatic habitat quality. An increase in suspended solids/sedimentation can have significant negative impacts on aquatic biota and instream flora through a reduction in light penetration and habitat heterogeneity, altering overall aquatic ecology. Fish, mollusc, crustaceans and semi-aquatic species such as Otter can be affected by pollution events or litter that can lead to death or a reduced level of health or fitness (e.g., through reduced breeding or feeding success) in populations. Pollution events can also affect the habitat they use. No contaminated land was noted at the wind farm site, and therefore pollution issues are not anticipated in this respect (see Chapter 7). Proven and effective measures to mitigate the risk of releases of sediment will be discussed in **Section 6.9** which will break the pathway between the potential sources and the receptor. Standard measures to ensure quality of discharged surface water are detailed in Chapter 7 including measures for sediment control and measures for the control of hydrocarbons.

A total of 0.5ha of forestry will have to be permanently felled within the wind farm site. The area to be felled is located to the south of the L51723 along a new proposed site access track. The total area to be felled accounts for 0.08% of the proposed development site area. Potential effects during tree felling typically occurs mainly from:

- Exposure of soil and subsoils due to vehicle tracking and skidding or forwarding extraction methods resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface watercourses.
- Entrainment of suspended sediment in watercourses due to vehicle tracking through watercourses.
- Damage to roads resulting in a source of suspended sediment which can become entrained in surface water runoff and enter surface water courses.
- Release of sediment attached to timber in stacking areas.

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- Nutrient release.

These effects have the potential to affect the water quality and fish stocks of downstream water bodies. While no drainage ditches or significant watercourses are present within or proximal to the proposed areas of forestry clearance (which would precede road construction), and the area of felling is relatively small, the felling of conifers can result in periodic and localised changes to the pH of downslope receiving watercourses ('acid pulses'), largely driven by increases in dissolved organic carbon (DOC) concentrations. In the event this pulse were to reach a natural watercourse, it may impact aquatic invertebrate communities and the sensitive developmental stages of salmonids. Felling may also result in increases in heavy metal concentrations, which may impact development and growth of aquatic species, notably macro-invertebrates and salmonid fish. Potential effects on all watercourses downstream could be significant if not mitigated although in this instance there is no clear source-receptor pathway between the proposed felling and local surface watercourses.

Sensitive species can be disturbed and displaced from suitable habitat locations due to construction-related disturbance. The displacement of fauna species could potentially occur within the vicinity of the proposed project. Blasting is not proposed however, rock-breaking will be required for the extraction of materials at the proposed borrow pit (see Chapter 3). Rock-breaking and pling could result in temporary noise/vibration impacts on salmonids and other fish species, causing avoidance behaviour, changes in feeding behaviour and potentially affecting migration (in salmonids and European eel). The impact of noise on other relevant receptors (i.e. Otter) is address in Section 6.5.4.14, below.

With the exception of the Keerglen River, the habitats in watercourses at proposed crossings were identified as being unsuitable spawning habitat for Atlantic salmon or lamprey due to the high natural gradients and or lack of suitable spawning substrata. However, these minor tributaries did support brown trout populations. As shown on **Figure 7.10** (Chapter 7), two crossings are proposed over these (historically modified) features, one of which is approx. 310m east of the proposed substation and the other approx. 230m northeast of the proposed Turbine 7. While the installation of clear-span or bottomless culverts will result in localised habitat loss within minor tributaries and drainage ditches, there will be no significant loss of instream habitat in the context of natural/unmodified watercourses.

Peat slippage events would result in significant negative effects for downstream aquatic receptors. A Geotechnical and Peat Stability Assessment Report (FT, 2024) is attached in Appendix 7.1. he findings of the Geotechnical and Peat Stability Assessment Report showed that the proposed wind farm site has a low risk of peat failure and is suitable for the Proposed Development. The report includes recommendations and control measures for construction work in peatlands. Effects from peat slippage are **unlikely** to occur, but would result in a **short-term, significant, negative effect** on downstream aquatic receptors (following EPA, 2022).

Overall, in the absence of mitigation the effect of the construction of the proposed development would result in a **short-term, moderate, negative** effect on aquatic receptors at a local level.

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Potential Construction Phase Impacts – Non-volant Mammals

During the construction phase of the development, disturbance to non-volant mammals occurring on/near the works footprint and along the underground electricity export connection route and delivery routes would occur temporarily. The primary impact of wind farm development on non-volant mammals typically arises through the loss of habitat from road building and hardstand construction.

There are similar suitable habitats for the species recorded in the surrounding area and any individuals temporarily disturbed by the construction phase of the proposed development can take refuge in these areas. However, some species (e.g. Badger) are protected under the Irish Wildlife Acts 1976 (as amended) and must be protected accordingly. Following best practice guidance, the proposed development has been designed with early ecological input and mitigation in mind, vegetation clearance is minimal and ecological constraints have been considered. The construction of the proposed development will result in habitat loss and disturbance impacts which cannot be completely avoided, including the loss of habitats which may be used at least occasionally by foraging mammals such as Badger, Pine Marten and Deer.

No evidence of underground dwellings belonging to protected non-volant mammal species (e.g. Badger or Otter) were recorded within the redline boundary. Two outlier badger setts are present within proximity to the proposed redline boundary - at approx. 105m and 260m from the redline boundary. The former is an outlier badger sett located 148m from the nearest proposed works, and given the distance involved, and the screening effect of intermediate trees and habitat, is unlikely to be disturbed by noise or visual cues during construction, operation or decommissioning. The latter is considered to be outside the zone of influence of the current project (following NRA, 2006) and therefore no impacts are likely to arise.

Evidence of Otter (spraint) was noted in multiple locations on the Keerglen River during targeted walkover surveys, but no evidence of Otter holts could be found in the relevant search area. Although the location of the proposed bridge crossing was selected in part to minimise disturbance effects on Otter (see **Section 6.8.1**) the installation the bridge will nevertheless result in some disturbance to commuting and foraging Otter. Construction works on other project elements, including proposed roads and T8, will occur within 100m of the Keerglen River. There is no requirement for blasting, but rock breaking may occur. Although natural topography prevents a direct line of sight to much of the river corridor in this instance, indirect impacts on foraging and commuting Otter would occur on a temporary basis during construction in the absence of mitigation through noise, vibration, visual ques and temporary reduction in water quality effecting prey availably. Indirect disturbance resulting from localised increases in noise and dust levels are likely to occur during the construction phase and will cause some local displacement of and disturbance to terrestrial mammals (e.g. Badger) during site clearance, construction and decommissioning. In the absence of mitigation, these impacts could give rise to direct and indirect negative impacts on mammal species present in the local environment.

Consideration was given to the potential for site traffic leading to a risk of road casualties of non-volant mammals (e.g. Badger) occurring in the proposed wind farm site. The bulk of construction traffic and movement of machinery and personnel will occur during daylight hours and the site speed limits will be imposed. The risk of fatalities of non-volant mammals on site roads is considered insignificant.

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Deep excavation (e.g. ducting) can potentially entrap mammals commuting across or foraging within the site. Should there be pooled water in these excavations there is potential for drowning.

Inappropriate or excessive lighting during the construction phase can cause disturbance to mammals at night. The inappropriate disposal of food waste during the construction phase can encourage scavenging by mammals at the site.

Mammals associated with aquatic habitats (e.g. Otter) in the wider area could potentially be subject to negative impacts through activities associated with the proposed development, such as siltation, run-off and fuel spills.

Considering the above, the construction phase of the proposed development is considered likely to have a **slight, negative effect** on non-volant mammals during the construction and decommissioning periods at a local level, following EPA (2022), and this effect is mostly reversable during the operational phase.

Potential Construction Phase Impacts – Bats

Wind energy developments present four potential risks to bats (NatureScot, 2021):

- Collision mortality, barotrauma and other injuries.
- Loss or damage to commuting and foraging habitat.
- Loss of, or damage to, roosts.
- Displacement of individuals or populations.

For each of these four risks, the detailed knowledge of bat distribution and activity within the study area gained during the current assessment is used to predict the potential effects of the wind turbine development on bats. Eight bat species were noted within the proposed site, all of which are legally protected under the Irish Wildlife Acts (1976 as amended) and listed on the EU Habitats Directive.

While the site mainly consists of cutover bog (PB4), upland blanket bog (PB2) with a general lack of roosting opportunities, there exists low productivity foraging habitat and commuting habitat with connectivity to surrounding habitats. Peat extraction activities will continue in areas of the site post-construction.

A total of 0.5ha of forestry will be removed to facilitate the construction of the proposed access road, although this is not a favoured foraging habitat. The increase in forest edge habitats is likely to increase foraging and commuting locally. While hedgerows and treelines are common features of the wider landscape, the loss of commuting habitat will potentially displace some bats in the immediate locality of the access road works and marginally reduce habitat connectivity in the immediate locality of works and marginally reduce habitat connectivity locally. 120m of hedgerow and treelines will be removed to facilitate the proposed TDR access (POI 8) from the R315 to the L51723. The widening of the L51723 (to a minimum of 5m) will result in an additional approximately 10m of hedgerow removal. In each instance the opposite roadside hedgerow / treeline will remain intact, so impact of habitat fragmentation on foraging and commuting bats is considered to be negligible in this instance.

No bat roosts were confirmed within the site and surveys were characterised by typically low levels of activity. It is considered that there is no potential for a significant bat roost to occur within the relevant

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distance of the proposed turbines (NatureScot, 2021). No roosting features capable of supporting significant numbers of bats or a maternity colony were noted along the existing access road, however it is possible that individual bats or small numbers of bats may roost in trees or existing structures along the existing access road, at least occasionally, and the possibility of indirect disturbance cannot be ruled out. A number of 'PRF-I' suitability trees were recorded along the existing access road which present minor roosting features but is not envisaged that these trees will be impacted by the proposed development works, based on current information. The design and assessment of a future TDR will determine which trees, if any, along the existing L51723 access route (and TDR generally) require works to facilitate turbine passage (e.g. over-sail).

Construction phase lighting has the potential to attract certain bat species and displace others and floodlighting can be a significant source of disturbance to bat species. However, this impact will be temporary in nature and localized to areas around the site compound. Night-time lighting will be limited in extent (both static lighting, and vehicle headlights) as standard construction works will be carried out mostly during daylight hours.

Construction related run-off or degradation of aquatic habitats through hydrological links could potentially lead to a deterioration of the feeding resource for bats associated with watercourses within the redline boundary and in the wider area. Assessment of potential water quality impacts is addressed above, and in Chapter 7 of the EIAR.

Considering the above, potential effects on bats in the absence of mitigation are considered to be **imperceptible, negative** at a local level following EPA (2022).

Potential Construction Phase Impacts – Other Taxa

Common Frog which was recorded within the study area and is listed on Annex V of the EU Habitats Directive and is also legally protected by the Irish Wildlife Acts (1976 – 2012). Other taxa including Lepidoptera, Smooth Newt, Common Lizard etc. were not recorded during surveys, but may occur within the development site at least occasionally. The EIAR produced for the proposed Glenora Wind Farm notes that one common lizard and two smooth newts were recorded along drains on that nearby site (MKO, 2023) and it is likely that these species occur on the current site also, at least occasionally. The construction phase of the development will involve site preparation (e.g. earthworks, excavation etc.) which is likely to cause disturbance to other taxa which rely on the existing habitats at the proposed site.

In the absence of mitigation, the effect of the construction phase of the proposed development on other taxa is considered to be an **imperceptible, negative** effect at a local level (following EPA, 2022).

Potential Construction Phase Impacts – UEECR

Although not included as part of the current application (i.e. not within the redline boundary), the UEECR and TDR are essential components of the overall wind farm project, and the potential environmental effects of associated facilitation works is therefore considered. The assessment is based on currently available information as outlined herein, and the UEECR would be subject to a future design, environmental assessment and consenting process.

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The installation of ducts along the UEECR will require trenching which upon completion will be back filled and the surplus soil will be used for local restoration and landscaping along the route (Chapter 3). For trenches constructed within the public road excavated material will be removed from site and disposed at an appropriately licence facility. Where adequate cover exists above a culvert, bridge etc., the standard trench arrangement will be used where the cable ducts pass over a culvert without any contact with the existing culvert or water course. This method is amendable to mitigation measures and is not considered to have any likely significant impacts on the associated watercourses.

The UEECR design allows for special arrangements for the crossing of 17 structures, including water crossings. The recommended methodologies include Horizontal Directional Drilling (HDD), reduced cover trenches, standard trenches and culvert replacement. The details of these water crossings are provided in **Table 6.18**.

As well as direct habitat disturbance, in the absence of good design and proper mitigation, instream works can give rise to downstream water quality impacts, primarily from siltation but also possibly from hydrocarbons or uncured concrete. Disturbance effects on fish and other aquatic organisms, as well as terrestrial fauna such as Otter can also occur.

Horizontal Directional Drilling (HDD) is proposed at a maximum of nine locations on the UEECR. HDD is required due to there being insufficient cover and depth above existing structures. While HDD may reduce the potential for increased sedimentation during watercourse crossing, relative to open trenching for example, the installation still has the potential to cause indirect environmental damage through the release of drilling fluids which can be toxic (Reid, 1998).

Based on currently available design information, the potential for disturbance to habitats (other than artificial surfaces (BL3)) as a result of the proposed underground electricity export connection works are primarily limited to the 'off-road' HDD options at Ballinglen Bridge and Tonrehown Bridge. No terrestrial habitats of above Local Importance (Lower Value) were noted at these locations. Instream habitats on the Cloonaghmore River (Structure 11) are evaluated as being of County Importance based on the presence of Annex I floating river vegetation [3260] instream. In the absence of any instream works at this location, it is considered unlikely that any significant impacts would arise on this habitat as a result of either the in-road or off-road HDD options.

The potential for spread of invasive species as a result of these proposed ancillary works was considered. Consideration was also given to the presence of Alien Invasive Plant Species (AIPS) which are subject to restrictions under Regulations 49 and 50 of the Birds and Natural Habitats Regulations (2011)) and a 'High' impact invasive species (Kelly et al., 2013) along the UEECR. With the exception of one instance, no other surface expression of any such plant species was found. Himalayan balsam (*Impatiens glandulifera*) was present (but rare) proximal to Ballinglen Bridge. *Rhododendon ponticum* is also abundant in this area. These are 'Third Schedule' species which is subject to restrictions under Regulations 49 and 50 of the Birds and Natural Habitats Regulations (2011)) and a 'High' impact invasive species (Kelly et al., 2013). The 'off-road' HDD option immediately upstream of Ballinglen Bridge would involve the disturbance to riverside habitat,

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but no in-stream works. In the absence of mitigation, the spread of an invasive alien species could occur, and this would represent a moderate, negative effect at a local level.

Deep excavations (e.g. during ducting) can potentially entrap mammals commuting across or foraging within the site. Should there be pooled water in these excavations there is potential for drowning. Drilling or excavation works proximal to an underground dwelling (e.g. sett or holt) would cause disturbance.

The potential for bat roosting in areas which may be affected by the UEECR installation was considered. Based on current information, no tree removal will be required to facilitate the proposed underground electricity export connection route. A number of 'PRF-I' suitability trees were recorded along the existing L51723 local road which present minor roosting features and other trees with suitability to support roosting bats occur along the proposed route. No trees with suitability to support significant numbers of roosting bats ('PRF-M') were noted along the UEECR. Temporary, indirect disturbance effects could arise on any bats roosting in roadside trees during the works due to noise and dust emissions. Ballinglen Bridge is considered to have negligible potential to support roosting bats currently, due to bridge maintenance and a lack of viable roosting features. Although bat roosting was not identified at Tonrehown Bridge, features suitable to support roosting bats were identified, and both in-road and off-road UEECR options at this location have potential to disturb roosting bats due to noise and vibration during ducting and HDD works.

Based on the information available at the time of the assessment, the overall impact of the construction phase UEECR works are considered to result in a **temporary, slight**, **negative** effect (following EPA, 2022) and these effects are temporary and fully reversible following completion of works.

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Table 6.31 Summary of aquatic receptors and potential interactions with UEECR (outside redline boundary)									
Structure No.	**Crossing**	**Existing**	**Recommend**	**Lat.**	**Lng.**	**Proximal Aquatic Survey Site**	**Watercourse**	**EPA Code**	**Evaluation of importance**
4	Drain	Stone slab culvert	Reduced cover trench	54.2487	-9.3778	A9	Ballinglen River	33B01	**Local Importance (Higher Value)**
5	Stream	Stone arch bridge	Horizontal Directional Drilling	54.2439	-9.3725	B4	Ballinglen River	33B01	**Local Importance (Higher Value)**
6	Stream	Stone slab culvert	Horizontal Directional Drilling	54.2374	-9.3728	B5	Annagh More Stream	33A10	Local Importance (Lower Value)
7	Stream	Stone slab culvert	Reduced cover trench	54.2363	-9.3720	B6	Unnamed stream	n/a	Local Importance (Lower Value)
8	Stream	Stone slab culvert	Horizontal Directional Drilling	54.2331	-9.3700	B7	Annagh Beg River	33A09	**Local Importance (Higher Value)**
9	Stream	Stone slab culvert	Horizontal Directional Drilling	54.2227	-9.3686	B8	Unnamed river	n/a	Local Importance (Lower Value)
10	Stream	Stone slab culvert	Reduced cover trench	54.2078	-9.3231	B9	Farmhill Stream	34F21	**Local Importance (Higher Value)**
11	Cloonaghmore River	Stone arch bridge	Horizontal Directional Drilling	54.2001	-9.2923	B10	Cloonaghmore River	34C03	**County importance**
12	Stream	Concrete slab bridge	Horizontal Directional Drilling	54.1977	-9.2862	B10	Cloonaghmore River	34C03	**County importance**
13	Stream	Concrete slab bridge	Reduced cover trench	54.1886	-9.2579	B11	Farragh River	34F20	Local Importance (Lower Value)
14	Stream	Stone arch bridge	Horizontal Directional Drilling	54.1862	-9.2486	B12	Magherabrack River	34M16	**Local Importance (Higher Value)**
15	Stream	Stone arch bridge	Reduced cover trench	54.1917	-9.2487	B12	Magherabrack River	34M16	**Local Importance (Higher Value)**
16	Stream	Concrete slab bridge	Horizontal Directional Drilling	54.1904	-9.2084	D1	Moyne River	34M19	Local Importance (Lower Value)
17	Stream	Concrete culverts	Standard Trench	54.1937	-9.2037	D2	Moyne River	34M19	Local Importance (Lower Value)

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Potential Construction Phase Impacts - TDR

Although not included as part of the current application (i.e. not within the redline boundary), the UEECR and TDR are essential components of the overall wind farm project, and the potential environmental effects of associated facilitation works is therefore considered. The assessment is based on currently available information as outlined herein, and the TDR would be subject to a future design, environmental assessment and consenting process.

Eight POI locations where road extension ('overrun') is proposed to facilitate the TDR were surveyed by an Ecologist as part of the current assessment, the details of which are shown in **Table 6.17**. Otherwise, based on current information, the turbine delivery will involve trafficking of existing roads by vehicles and no significant effects are likely to occur.

No habitats of above Local Importance (Lower Value) were noted at the eight POI's along the TDR. The tarmacked roads (BL3) are of no particular ecological value at present, while the improved agricultural grassland (GA1) and roadside verges (i.e. dry meadow and grassy verge GS2) are of Local importance (Lower value) and hedgerows (WL1) and trees/Treelines (WL2), wet grassland (GS4) and stone walls and other stonework (BL1) (i.e. bridges) are of Local importance (Higher value) due to the potential flora and fauna supported by this habitat e.g. bats in bridges, invertebrates and birds, mammals supported by hedgerows and treelines.

The potential for spread of invasive species as a result of these proposed ancillary works was considered. Consideration was also given to the presence of Alien Invasive Plant Species (AIPS) which are subject to restrictions under Regulations 49 and 50 of the Birds and Natural Habitats Regulations (2011)) and a 'High' impact invasive species (Kelly et al., 2013) at the eight POIs which occur on the TDR. No such species were noted.

Non-native Butterfly Bush (Buddleja) was recorded at the 'N2' POI within the area of disturbed ground that has recolonised, this species is not a Third Schedule species or considered 'High' impact (Kelly et al., 2013) and is common and widespread in Ireland. Non-native Cherry Lauryl (*Prunus laurocerasus*) was recorded in proximity to the 'W6' POI, which is classified as 'High' risk of having damaging effects on native species after NBDC and Kelly et al., (2013).

Construction works within these areas can potentially disturb stands of invasive plants and/or soils contaminated with invasive plant material and cause them to spread onsite. In addition to lands within the proposed works areas, there is an identified risk of invasive plant species being spread onto neighbouring lands and onto public roads and other locations. Construction works could therefore result in the spread of invasive plant species both in-situ and ex-situ. The most common ways that these species can be spread are:

- Site and vegetation clearance, mowing, hedge-cutting or other landscaping activities.
- Spread of seeds or plant fragments during the movement or transport of soil.
- Spread of seeds or plant fragments through the local surface water and drainage network.
- Contamination of vehicles or equipment with seeds or plant fragments which are then transported to other areas.

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- Importation of soil from off-site sources contaminated with invasive species plant material.

A number of POIs along the TDR (e.g. W6, W4, S3) occur within proximity to River Moy SAC. Otter is a qualifying interest of the site, but no evidence of Otter was noted at these locations. Given the small size of any proximal watercourses, the occurrence of Otter at any of the POIs along the TDR is unlikely. Given the ecological context of the proposed TDR POI's, the temporary nature of the works and the small scale of each site, the likelihood of ex-situ effects on Otter as a result of the TDR works can be ruled out.

Although the TDR crosses numerous surface water features, no alterations to the existing road networks are generally proposed in this location. Aquatic surveys were carried out at points C1, C2, and C3 (see Section **0**) prior to the availability a preliminary design, and these locations are now not relevant to any the POIs where road extension is likely to be required on the TDR. The identified POI's along the TDR generally do not interact with any natural surface water features. Minor drainage ditches are present within the works areas at some of the POI's (W3 and W6), and these were highly modified, dry at the time of survey, heavily vegetated and are considered to have negligible fisheries potential. However, such features have potential to act as vectors for pollution downstream, in the absence of mitigation.

The potential for bat roosting in areas which may be affected by the POIs along the TDR was considered. The design and assessment of a future TDR will determine which trees or hedgerow, if any, along the TDR require works to facilitate turbine passage (e.g. over-sail). As outlined above, a number of 'PRF-I' suitability trees were recorded along the existing L51723 local road which present minor roosting features.

Based on the information available at the time of the assessment, the overall impact of the construction phase TDR works are considered to result in **temporary, slight**, **negative** effects (following EPA, 2022) and these effects are short-term and fully reversible following completion of works.

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6.8.5 Potential Operational Phase Impacts

The potential operational phase impacts are largely related to the turbine activity and to a lesser extent to the maintenance of the site infrastructure and are discussed below.

Designated Sites

The potential for impacts on European Designated sites is addressed comprehensively within the accompanying AA Screening and NIS Report (O'Donnell Environmental, 2024). The NIS objectively concluded that the proposed project is not likely to cause significant adverse effects on any Natura 2000 site, individually or in combination with other plans or projects.

No nationally designated sites occur within the potential zone of influence of the proposed wind farm site with the exception of Ummerantarry Bog NHA. As outlined above, the site is hydrologically disconnected from this site and therefore no potential for effects arises as a result of hydrological disturbance in the operational phase. Negligible emissions of dust are likely to occur during the operation phase associated with routine maintenance. Measures presented within the Environmental Management Plan (Appendix 3.5) are considered sufficient to ensure that the effect of the proposed development on the nearby Ummerantarry Bog NHA is neutral.

It is considered the project will have a **neutral** effect on designated sites and nature reserves in the operational phase.

Potential Operational Phase Impacts – Habitats and Flora

Following the completion of the construction phase and the recolonisation of the disturbed ground, there will be no additional removal of habitat during the operational phase of the proposed development. As a result, there is no potential for direct negative impacts on habitat and flora arising from the operational phase of the development.

The proposed development will result in the replacement of the vegetated surfaces with less permeable surfaces such as hardstands and access tracks which may result in an increase in the proportion and velocity of surface water run-off reaching the surface water drainage network and receiving watercourses. During storm rainfall events, additional run-off coupled with increased velocity of flow could increase hydraulic loading, resulting in erosion of watercourses. This could lead to adverse effects on aquatic habitats and flora, most notably through sedimentation of instream habitats through increased erosion rates.

Operational stage maintenance works has the potential to introduce silt, hydrocarbons and other chemicals into the surrounding peatland habitats and receiving watercourses.

There is the potential for ongoing degradation of adjacent peatland or heathland habitats during the project operational phase. Such degradation may arise as a result of ongoing drainage patterns associated with the windfarm hard standing areas, especially the access tracks, turbine hard standing and met masts. Drainage patterns that redirect or deflect water from down gradient peatland or heathland habitats could contribute to indirect impacts, resulting in the desiccation of the underlying organic substrates and consequent reduction of plant species diversity and habitat quality. Drainage measures outlined in Chapter 7 have sought to

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minimise impacts on peatland habitats by minimising the impact on current drainage and seeking to redistribute clean water diffusely downslope of works.

Considering the above, in the absence of mitigation the operational phase of the proposed development is considered likely to have an **imperceptible, negative effect** on the habitats at a local level following EPA (2022).

Potential Operational Phase Impacts – Aquatic Ecology

Operational wind farms are not normally considered to have the potential to significantly impact on the aquatic environment. The main risk to watercourses is via water quality impacts, when hydrocarbons/ oils/ lubricants are used on the site (e.g. site road maintenance, transformer maintenance, construction vehicle/plant refuelling, storage in electrical control building). If such substances leaked/spilled from machinery or maintenance areas or were disposed of inappropriately, there is a risk of water contamination and subsequent impacts to aquatic ecology. However, the likelihood of this occurring is low considering the low volumes of vehicular traffic involved in typical wind farm operations. Maintenance works (infrequent) will likely be contained within the wind farm site boundaries and no maintenance works are likely to be required along the underground electricity export connection.

Increases in surface water during the lifetime of the wind farm project could potentially impact slow-swimming fish species in downstream receiving watercourses, such as European eel, or impact hydrological regimes of receiving watercourses. However, no increases in the surface water run-off volume as a result of less-permeable surfaces of the wind farm (e.g. hardstands, access tracks etc.) are predicted. The proposed development design has been optimised to utilise the existing infrastructure (i.e. site access roads) where practicable. This design prevents the unnecessary creation of additional hardstand areas which would increase surface water runoff from the proposed development site. There will, in fact, be a reduction in the overall runoff coefficient of the wind farm site (see Table 7.24, Chapter 7).

During the operational phase, the potential for silt-laden runoff and subsequent impacts to aquatic ecological receptors is much reduced compared to the construction phase. However, operational (maintenance) activities as outlined above could result in the release of suspended solids to surface waters and an increase in the suspended sediment load, increasing turbidity and impacting aquatic species and habitats in downstream watercourses. These works would be of a very minor scale and would be very infrequent. In addition, all permanent drainage controls will be in place and the disturbance of ground and excavation works will be complete, further reducing the risk of contamination. Potential sources of sediment laden water would only arise from surface water runoff from small areas where new material is added during maintenance works.

Considering the above, in the absence of mitigation the operational phase of the proposed development is considered likely to have an **imperceptible, negative effect** on the aquatic environment at a local level following EPA (2022).

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Potential Operational Phase Impacts – Non-volant Mammals

No additional habitat loss will occur during the operational phase. Relative to the context of the site prior to construction, the proposed development will lead to a minor reduction in foraging habitat for non-volant mammals.

The non-volant mammal species recorded on site are widespread and abundant in the Irish landscape. The level of anthropogenic disturbance from maintenance and management of the proposed development is not generally likely to increase significantly relative to the current situation as the site is currently managed for agriculture and turbary. The proposed Keerglen River crossing is not likely to significantly impact Otter passage due to the location chosen, which clear spans a deep straight-sided section of gorge which is over 4m deep (see **Plate 6.47i**). Sufficient space has been allowed for on the elevated bankside to allow Otter to pass during times of flood, when the river channel may be impassable. The road will typically not be used at night (outside of the construction or decommissioning phases) which further limits the potential to disturb commuting or foraging Otters.

Any wastes generated by visitors to the site (e.g. at the substation) could potentially attract mammalian scavengers. Such impacts are amenable to mitigation as described in the mitigation measures outlined in this report.

Following construction and remediation, no additional impacts during the operational phase are likely to occur as a result of the proposed development.

Overall, the proposed wind turbine development in its operational phase is likely to have an **imperceptible, negative effect** on non-volant mammals at a local level (following EPA, 2022).

Potential Operational Phase Impacts – Bats

No additional habitat loss will occur during the operational phase of the development. The operation of wind turbine at this site has the potential to result in disturbance to commuting and foraging bats. Bat activity at the site was low but included high collision-risk species. Decreased connectivity and foraging habitat resulting from vegetation removal along the access road will persist during the operational phase but is considered likely to have a negligible effect.

Collision Risk

There is little or no published evidence available on prevalence of bat fatalities at wind farms in an Irish context. Where fatalities have been monitored at wind farms in the USA, most losses have been related to periods of migration (e.g. https://rewi.org/guide/).

Both direct collision with turbine blades and barotrauma resulting from close contact with blades have been reported as an issue for bats at wind farms (e.g. Cryan et al., 2009). The susceptibility of bat species likely to be at risk of impacts from wind turbines is partly associated with the likelihood of different species flying at rotor blade height. In an Irish context for example, Leisler's Bat is considered to have a somewhat greater mortality risk at wind farms than the other species recorded on (or adjacent to) the site, as this species is a

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relatively large and high-flying species and typically do not follow landscape features such as treelines or woodland edges when foraging.

A general assessment of vulnerability of bat populations to collision with wind turbines, based on best available scientific information, is provided below. This is adapted for use in an Irish context from the collision risk scheme provided in SNH (2019) and NatureScot (2021). NatureScot (2021) provides a generic assessment of bat collision risk for UK species, based on species behaviour and flight categorisation as well as evidence of casualty rates in the UK and Europe. This bat species collision risk assessment is considered to represent best available information in an Irish context.

This species collision risk categorisation is used in combination with relative abundance to indicate the potential vulnerability of bat populations. Relative abundance for Irish species was determined in accordance with a scheme for rarity of bat species provided in Wray et al. (2010) in combination with best available population data provided in Article 17 reports (NPWS, 2019). The limitations in terms of Irish bat population data are acknowledged in the latter report.

The collision risk estimation scheme for Irish bat species is presented in **Table 6.32** below.

Table 6.32. Scheme for estimation of Irish Bat species' population vulnerability to wind development

Relative Abundance	Collision-Risk		
	Low	Medium	High
Common (100,000 plus)			Common Pipistrelle Soprano Pipistrelle
Rarer (10,000 – 100,000)	Daubenton's Bat Brown Long-eared Bat Lesser Horse-shoe Bat		Leisler's Bat
Rarest (under 10,000)	Natterer's Bat Whiskered Bat		Nathusius Pipistrelle

Population vulnerability: yellow = low, orange = medium, red = high.

In determining the project specific potential risk to bats, NatureScot (2021) recommends a two-stage process as follows:

- Stage 1: Indicatively assess potential site risk based on consideration of habitat present and development related features (i.e. number of turbines, size of turbines and proximity to other wind farms).
- Stage 2: Overall assessment of risk for high collision-risk species, considering bat activity results and the relative vulnerability of species.

Initially an assessment of the general site risk based on habitats present was carried out following the scheme presented in SNH (2019) and NatureScot (2021). The site represents a low productivity foraging habitat which could be used by a small number of foraging bats. Although the site has some natural features

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and is relatively well connected to the surrounding landscape it is assigned a habitat risk of 'Low' based on the quality and extent of foraging habitat available and the general lack of roosting opportunities within the development site.

Although the proposed development consists of ≤10 turbines (eight-turbine project) it is considered 'Medium' as there other operational and proposed wind farms within 10km. According to the project size categories in NatureScot (2021), turbines of height >100m are included in the 'Large' project category. This height refers to the 'tip height' of the turbine (P. Taylor (NatureScot), Pers. Comm.). The maximum tip height of the turbines proposed for this development is 180m, however given the number of turbines (significantly less than the threshold for a large site >40 no. turbines) it is considered that 'Medium' remains the appropriate project size category. Based on the above initial site risk assessment, the proposed project is considered to be 'Medium Risk' to bats and a site risk score of 2 is applicable.

The next stage of the process is applicable to 'high collision-risk' species only and utilises information on the activity level recorded on site in each monitoring period. This assessment is intended to identify projects which are of greatest concern in terms of bat collision risk.

The following high collision-risk species have been recorded at the current site:

- Leisler's Bat
- Common Pipistrelle
- Soprano Pipistrelle
- Nathusius' Pipistrelle

Leisler's bats are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. While Leisler's Bat is rare in a European context, Ireland is a stronghold for the species. They are classified as 'Rarer' for the purposes of this assessment but the minimum population range for the species in Ireland is estimated at 63,000 to 113,000 (NPWS, 2019) and therefore the species may be 'Common'. Leisler's Bats were recorded during activity surveys across the site (see **Table 6.28**). Overall activity levels for Leisler's Bat in the context of the proposed wind turbine site are considered 'Low' across all four survey seasons, with the exception of spring 2024 where activity was regarded as 'Low-Moderate'.

Common Pipistrelle are a common and widespread species in Ireland which are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. Common Pipistrelles were one of the most commonly recorded species across the site. Overall activity levels for Common Pipistrelles in the context of the proposed wind farm are considered be 'Low' across all four survey seasons.

Soprano Pipistrelle is another common and widespread species in Ireland which are considered to be a high-collision risk species due to their foraging ecology and flight characteristics. Overall activity levels for Soprano Pipistrelles in the context of the proposed wind farm are considered to be 'Low' across all four survey seasons.

Nathusius' Pipistrelle has a fast flight and is slightly less agile in flight than the other Pipistrelle species and is positively associated with broadleaf woodland and areas where pasture is less extensive (Roche et al.,

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2014). This species is considered to be of high-collision risk due to their foraging ecology and flight characteristics. Nathusius' Pipistrelle was only recorded during the summer 2022 survey period yielding a 'Low' activity category for this season.

Table 6.33 Overall collision risk assessment of relevant (high-risk) species.

	Species	Site Risk Level	Activity Category	Overall Assessment
Summer 2022	Common Pipistrelle	2	Low (1)	2
	Soprano Pipistrelle	2	Low (1)	2
	Leisler's Bat	2	Low (1)	2
	Nathusius' Pipistrelle	2	Low (1)	2
Autumn 2022	Common Pipistrelle	2	Low (1)	2
	Soprano Pipistrelle	2	Low (1)	2
	Leisler's Bat	2	Low (1)	2
Spring 2023	Common Pipistrelle	2	Low (1)	2
	Soprano Pipistrelle	2	Low (1)	2
	Leisler's Bat	2	Low to Moderate (2)	4
Spring 2024	Common Pipistrelle	2	Low (1)	2
	Soprano Pipistrelle	2	Low (1)	2
	Leisler's Bat	2	Low (1)	2

Overall collision risk assessment: Low (green), medium (amber), high (red) (following SNH, 2019).

While activity levels of the above species varied between survey locations (corresponding to proposed turbine locations) it is not possible to determine with any accuracy the different levels of collision risk presented by individual turbines (NatureScot, 2021).

As per NatureScot (2021) there is no requirement to complete an Overall Risk Assessment for low-risk species. The low-risk species recorded at this proposed development site were Brown Long-eared Bat, Daubenton's Bat, Natterer's Bat and Whiskered Bat. Overall activity levels were 'Low' for these species and by virtue of their low potential vulnerability to wind energy developments, no significant collision related risk is likely.

As outlined above, the proposed wind farm site is located within the CSZ of two bat roosts. The relevant species are Common Pipistrelle, Soprano Pipistrelle, Leisler's Bat and Brown Long-eared Bat. No recent data was available as to the current status of these roosts. Given the absence of optimal foraging or roosting habitat within 270m of the proposed turbines (NatureScot, 2021) and the relatively low level of bat activity recorded at the proposed site, the risk of impacts due to collision with turbines such that an impact would arise on identified roosts in the wider landscape can be ruled out.

Overall, the proposed wind farm development in its operational phase is likely to have an **imperceptible negative effect** on bats at a local level (following EPA, 2022).

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Potential Operational Phase Impacts – Other Taxa

The operational phase of the proposed wind farm development is not likely have any significant effects on other taxa. Overall, the proposed wind farm development in its operational phase is likely to have an **imperceptible negative** effect on other taxa at a local level (following EPA, 2022).

Potential Operational Phase Impacts – UEECR & TDR

The operational phase of the future UEECR & TDR is likely to have a **neutral** effect no biodiversity, following completion of reinstatement works.

6.8.6 Potential Impacts - Cumulative Impacts

While a single development may only result in a minor environmental impact, when considered in combination with other impacts it may result in a cumulative impact which could be considered significant (EPA, 2022).

Ecological Impact Assessment aims to determine what, if any, effects a proposed project would have on ecological conditions, relative to baseline conditions. As part of this process, the potential for cumulative impacts is considered. Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location (CIEEM, 2022).

Projects to be considered in an assessment of cumulative impacts would include the following types of future development within the same zone of influence:

- Proposals for which consent has been applied which are awaiting determination in any regulatory process (not necessarily limited to planning permission)
- Projects which have been granted consent (not limited to planning permissions) but which have not yet been started or which have been started but are not yet completed (i.e. under construction)
- Proposals which have been refused permission, but which are subject to appeal and the appeal is undetermined to the extent that their details are in the public domain,
- Proposed projects that will be implemented by a public body but for which no consent is needed from a competent authority (CIEEM, 2022).

In some situations, it may be necessary to also consider:

- Constructed developments whose full environmental effects are not yet felt and therefore cannot be accounted for in the baseline.
- Developments specifically referenced in a National Policy Statement, a National Plan or a Local Plan (draft or adopted) (CIEEM, 2022).

Relevant plans and guidance documents have been taken into consideration as part of this assessment, included the following:

- Mayo County Development Plan 2022 – 2028.
- 4th National Biodiversity Action Plan 2023-2030.

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- The Regional Planning Guidelines for the West 2010-2022.

Cumulative Impacts with Other Wind Farm Developments

There are a total of 13 operational, consented and proposed wind farms within 20km of the proposed development, which may interact with the proposed Keerglen Wind Farm. The ecological findings from other proposed and permitted developments in the wider area were considered as part of the Ecological Assessment of the proposed wind farm development. Potential cumulative or in-combination effects can occur on Natura 2000 sites where multiple developments are constructed within the same sensitive water catchment, particularly when developments are constructed concurrently. **Table 6.34** summarises other permitted and constructed wind farm projects in the wider area. The potential cumulative impacts on avian species are considered in Chapter 5.

The proposed development is located within the Blacksod-Broadhaven catchment. The only wind farm located partially within this catchment is the proposed Glenora Wind Farm. All other wind farms are located in separate river sub-catchments.

Table 6.34 Wind farm developments considered in the cumulative assessment

Wind Farm Name	Number of turbines	Distance and Direction from Proposed Development Site (to nearest turbine)	Status
5 to 10km			
Glenora WF	22	600m north	Proposed (with ABP)
Oweninny 1	29	6.8km southwest	Operational
Oweninny 3	18	6.9km southwest	Proposed (with APB)
Corvoderry Wind Farm	10	9.3km south/southwest	Expired Oct ' 22
ABO Sheskin	8	9km southwest	Operational
Tirawley	24	7.5km east	Pre-planning
10 to 15km			
Bellacorrick	21	12km south	Decommissioning
Oweninny 2	30	11.4km southwest	Operational
Sheskin South	21	11.2km southwest	Permitted
Killala	6	12.8km east	Operational
Dooleg	1	13km south	Permitted
Gortnahurra	18	10.3km southwest	Pre-planning
15 to 20km			
Kilsallagh	13	17.2km southwest	Pre-planning

The proposed Glenora Wind Farm (22 WTGs) is currently under consideration by An Bord Pleanála (Ref: 318701) and, if approved, could result in effects which are not yet represented in baseline ecological data

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as presented herein. The application relates to a site 600m north of the current proposal. The proposed UEECR of Glenora Wind Farm overlaps with the current proposal from the R315 junction onwards to Tawnaghmore ESB Substation or a large energy user at Killala Business Park. The EIAR and NIS Reports for the Glenora wind farm development detail potential hydrological and hydrogeological issues relating to the construction, operation and decommissioning phases and proposes a suite of best practice mitigation measures.

The EIAR prepared in relation to the Proposed Glenora Wind Farm Development (MKO, 2023) considers the current proposal in its assessment of cumulative impacts, describing an earlier, larger, iteration of the design (14 WTGs).

The EIAR (MKO, 2023) states that "following the implementation of mitigation, there will be no significant residual effect on aquatic habitats or species as a result of the proposed development". Similarly, the report states that there is no potential for significant residual effects on bats, Otter or Badger species and the implementation of the BMEP will result in a significant positive effect on peatlands, a receptor of County Importance.

Overall, it is considered that the proposed Keerglen Wind Farm, in combination with other plans and projects, does not give rise to any additional significant environmental effects.

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6.8.7 Potential Decommissioning Phase Impacts

No other potential impacts other than those already discussed above for the construction and operational phases are likely to occur during decommissioning. Decommissioning activities are assumed to be similar to construction activities, having similar type risks and sensitive receptors associated with them. However, they are considerably less intrusive. All decommissioning works will be governed by the same requirements to control habitat loss and damage, run-off or pollution to watercourses as will be implemented during the construction phase.

Overall, the effect of the proposed development during decommissioning of the wind farm on the receiving environment is considered to be '**neutral**' at a local level following EPA (2022).

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6.9 Mitigation Measures

A mitigation-by-design approach was taken to siting of the principal features of the development to avoid areas of high sensitivity for key habitats and species occurring or likely to occur at the Keerglen Wind Farm site.

An Outline Construction Method Statement (OCMS) and an Environmental Management Plan (EMP) have been prepared by ABO Energy as part of the proposed development. These documents provide detail on the proposed construction methodology and a framework for proposed mitigation measures and environmental monitoring, to ensure that changes arising from the construction and operation of the wind farm do not exceed environmental quality standards or objectives of the project. The EMP provides details of responsibilities and timeframes for the implementation of measures and management controls for each environmental discipline (where relevant). The EMP is a precursor to the Construction Environment Management Plan (CEMP) which is prepared and submitted to the Planning Authority prior to commencement of construction.

The recommendations within the EMP will be implemented fully. The outline plan will be further refined at the post-planning and construction stages, by the Client and on the appointment of the main Contractor to the project and the receipt of the finalised civil design.

An Ecological Clerk of Works EcCoW who is suitably qualified and experienced will be appointed to oversee the successful implementation of ecological measures and to carry out routine (minimum twice-monthly) site audits during the site establishment and construction, reinstatement and decommissioning phases.

6.9.1 Construction Phase Mitigation Measures - Habitats and Flora

No removal of habitats outside the footprint of the development will take place.

Measures are Peat and Spoil Management Plan (Fehily Timoney, 2024) for peat placement during the construction phase. Peat will only be stored at the borrow put or in degraded areas of cutover bog (PB4), and not on any other habitats.

A Peat and Spoil Management Plan (Fehily Timoney, 2024) has been prepared for the proposed development (Appendix 8.2). General measure to minimise the potential risk of peat instability during the construction phase are detailed in the management plan and include the following:

- Uncontrolled and concentrated water discharge onto peat slopes will be avoided and instead will be piped over areas specifically assessed as being suitable.
- All excavations will be suitably supported to prevent collapse and the development of tension cracks.
- Excavations and the placement of fill in the vicinity of steep slopes will be avoided where possible.
- Geotechnical instrumentation will be installed during the construction phase and regularly monitored.

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- Ground conditions will be assessed by a suitably qualified Geotechnical Engineer and site reporting procedures will ensure that working practices are suitable for the ground conditions.
- Staff will be regularly briefed and feedback provided on the construction and ground performance and to promote the reporting of observed changes in ground conditions.
- Routine inspections of the site will be carried out by the Contractor and Project Geotechnical Engineer.

Where excessive peat movement is recorded then all activities will cease in the affected area, monitoring will be increased and the location until such time that the movement ceases and the works will only recommence following agreement with all parties involved. As a contingency measure a check barrage procedure has been included in the management plan to prevent peat slide from moving downstream within a watercourse. This will involve the placement of rock fill (from the onsite borrow pit) across a watercourse which will allow the passage of water but not the passing of peat debris. The details of the check barrage construction and procedure are detailed in Appendix 8.2.

It is proposed that the borrow pit be reinstated using excavated peat and soil, while the excavated rock will be used for the construction of infrastructure on site (i.e. hardstands etc.) Cells will be constructed within the row pit for the placement of excavated peat and spoil. This is to allow for the safe placement and grading of the peat and spoil using dumper trucks and excavators and eliminates the need to construct above ground retaining structures which may have an unnecessary impact and increase the development footprint of the proposed wind farm. Details on the borrow pit construction are reported in Appendix 8.2.

A 'Habitat and Species Management Plan' (HSMP) will be prepared and submitted to the local authority prior to construction and will be implemented as part of the proposed project. The plan will be to include measures such as:

- Restoration of habitats temporarily affected by the proposed work to an equal or greater ecological value, including cut-over bog, wet grassland and hedgerow habitats.
- Blocking of existing drains in agreed areas within upland bog or cutover bog habitats.
- The restoration of peat exploited areas using peat extracted from infrastructure areas.
- Sensitive management of habitats by the implementation of a grazing plan.
- Reinstatement and management of habitats following All-Ireland Pollinator Plan guidance document for wind farms entitled 'Pollinator friendly Management of Wind Farms' (NBDC, 2021).

The HSMP measures will be monitored by an ecologist during years 1,2, 3, 5 and 10 post-construction to ensure appropriate actions are being implemented to protect and enhance biodiversity.

Restoration measures outlined in the HSMP will help minimise localised disturbance of peatland habitats and ensure long-term restoration of peatland plant communities (e.g. on reinstated peat deposition areas).

Measures will be designed to improve the status of peatland habitats in the peat deposition area which will restore ecologically viable peatland habitat in the longer term. The implementation of the HSMP will ensure that areas of remaining habitat directly impacted by the construction works will be restored, reducing the

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potential negative effects arising from loss of habitat as a result of construction works for the proposed wind farm development.

All construction traffic will be instructed to stay on prearranged routes to avoid damage to habitats with road signage and "no-go area" fencing erected to supplement these instructions. Toolbox talks will be carried out for all site staff to ensure traffic management rules are adhered to onsite.

Invasive Plant Species

Maintaining site hygiene at all times in an area where invasive non-native species are present is essential to prevent further spread. Himalayan balsam and *Rhododendron ponticum* were present at Ballinglen Bridge over the Ballinglen River (Site A9). This is a Third Schedule and 'High' impact invasive species (Kelly et al., 2013). Facilitation works to support the UEECR are planned at this location (i.e. HDD and a reduced cover trench). A further survey of the UEECR will be carried out as part of the future consenting process, considering the design available at that time. Measures will be put in place at that time to manage the current infestation of these species in works areas, and to prevent their spread. Himalayan Balsam responds to manual removal (prior to annual seed production) and this method is preferrable to use of herbicides.

Construction Phase Mitigation Measures - Aquatic Ecology

Construction phase mitigation measures for aquatic ecology predominantly involve the preservation of water quality. Construction phase mitigation for hydrology and water quality is detailed in Chapter 7 which presents detailed measures which will protect water quality during the course of construction works to include peat extraction, water crossings, tree-felling, directional drilling and wastewater disposal. The mitigation measures outlined will be adhered to in conjunction with those outlined in this section.

As outlined above, the handling and storage of peat and spoil (e.g. from borrow pits) will be done in accordance with the 'Peat and Spoil Management Plan' which is included as Appendix 8.2. All measures for the protection of water quality within the proposed development site will also protect the aquatic ecology and fisheries value of downstream watercourses.

The new proposed crossing over the Keerglen River will involve the construction of a new clear span bridge (9.5m) and avoid disturbance to the existing river channel. All other watercourse crossings will be completed via piped or box culverts. Mitigation measures for the upgrade of the existing crossing and the new proposed crossing are detailed below:

- All proposed new stream crossings will be bottomless or clear span culverts and the existing banks will remain undisturbed, the design will allow for a minimum 300mm embed of the pipe below the existing bed level, plus sufficient freeboard.
- IFI will be provided with a copy of the finalised pipe crossing dimensions and construction method statements. If the channels are not fully dried out during the construction period, a water management technique will be employed (dam and pump over or temporary piping) to dry out the construction reach. Any additional measures stipulated by IFI will be incorporated into the final design and construction method statement for the proposed crossing.

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- Instream construction will be carried out in the period July to September inclusive. This is a conservative working window that will help ensure construction occurs during very low or no flow and will minimise the risk of entrainment of suspended sediment in surface water runoff to the Keerglen tributary of the Ballinglen River; and,
- During the near-stream construction work, double row silt fences will be placed immediately down-gradient of the construction areas for the duration of the construction phase. There will be no batching or storage of cement allowed on-site. The bottom edge of geotextile silt fence material will be installed to a 200mm embed below ground level. Stakes will be placed at the ends, on any bends, and at 2m intervals along the silt fence. Stakes will be driven a minimum of 400mm to provide adequate support. The silt fence will have a tensioned wire backing - a minimum of 2 lines of wire run along the stakes. The top wire is used to clip the geotextile onto to hold it up and provide strength against trapped sediment. Silt fences will be checked and maintained weekly at minimum, and always before any forecasted heavy rain event.

Concrete has a high pH and presents a potential significant risk to the aquatic environment. No batching of wet-cement products will occur on the wind farm site and pre-cast elements for culverts and concrete works will be used, as opposed to in-situ casting. No washing out of any plant used in concrete transport or concreting operations will be allowed on-site with the exception of the chute. The resulting wash-water will be managed using temporary lined wash-out pits located near the proposed wind farm site compound. These temporary lined wash-out pits will be removed from the wind farm site at the end of the construction phase.

During the construction phase, a self-contained port-a-loo with an integrated waste holding tank will be used, maintained by the providing contractor, and removed from the site on completion of the construction works. Water supply for the site office and other sanitation will be brought to site and removed after use by a licensed contractor to be discharged at a suitable off-site treatment location. No water or wastewater will be sourced on the site, nor discharged to the site.

'Siltbusters' will be used to remove suspended sediments from water prior to discharge in emergency scenarios where all other water treatment systems have proven ineffective (see Chapter 7). These operate through the use of coagulants and flocculants (e.g. poly aluminium chloride (PAC), aluminium sulphate, ferric iron and ferrous iron) to accelerate the settlement process. The benefits of using enhanced settlement systems on downstream surface water quality are widely known and are a positive effect. However, potential overdosing with chemical agents means there is a perceived risk of chemical carryover in post treatment water which could result in negative effects on downstream water quality. These agents are commonly used in drinking water treatment plants and there is significant scientific knowledge around their use and control. Chapter 7 includes measures to reduce the likelihood of spillage or overdosing of agent, including the use of biodegradable agent, an electronic in-line dosing system and monitoring.

A drainage plan has been prepared for the site (see Chapter 7; Appendix 7.5) which utilises existing drainage as much as possible. Cut-off drains will be used to divert clean water away from construction areas and into existing drains. To treat drainage from works areas, settlement ponds have been designed and additional temporary drainage measures have been identified which will be installed prior to wind farm

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construction commencing. Groundwater seepages will likely occur in turbine bases, substation and compound excavations etc., and the arising water will be pumped out and treated by the drainage management system.

Construction Phase Mitigation Measures - Non-Volant Mammals

A pre-construction mammal survey will be carried out by a suitably qualified Ecologist immediately before the commencement of vegetation clearance. The methodology will repeat that outlined in the current report, and the relevant survey area will extend to 150m from all proposed infrastructure.

This purpose of the survey is to identify any change in the usage of the site, particularly regarding the presence of any protected breeding or resting sites, in the period between the submission of the planning application and the commencement of associated site works. The Ecologist will advise on the need for any additional requirements in the event the ecological context of the site has changed.

Should an otter breeding (holt) or resting area (couch) be detected, a derogation licence may need to be obtained from the NPWS to facilitate works which will only be carried out under the supervision of a suitably qualified Ecologist. Minimum setback distances/protection zones in relation to operating machinery will adhere to best practice guidance (NRA, 2006a) e.g. a natal den requires a 150m protection zone.

Should a Badger sett be detected within the zone of influence of the proposed works, treatment of the sett will adhere to best practice guidance (e.g. NRA (2006) or subsequent updates).

All site personnel should be fully briefed concerning the presence of Badgers and Otters in the area, the mitigation measures to follow and the relevant legislation regarding the protection of these species. Any sightings of mammals on-site will be logged on the wildlife register which will be maintained by the Ecological Clerk of Works (EcCoW). This includes any fatalities recorded during construction or in the operational phase.

No night-time work (works between sunset and sunrise) will generally be allowed during the construction phase, with the exception of concrete pours for turbine bases, turbine delivery and the lifting of key wind turbine components into position. These works involve only works on site roads and hardstands are not considered to as impactful in terms of disturbance to mammals as road construction, rock-breaking etc.

During the construction and/or decommissioning phase of the proposed development any excavations will be left with a means of escape (such as a ramp or slope) for any Badgers, Otters or other animals that may enter overnight.

Measures to mitigate impacts relating to noise are detailed in Chapter 12, to include limiting the hours during which site activities are likely to create high levels of noise (or vibration) and monitoring the typical levels of noise (and vibration) during critical periods and at sensitive locations. Generators will generally be located at the site compound, and not within 50m of any sensitive ecological features.

Construction Phase Mitigation Measures - Bats

Where vegetation clearance is required, pre-construction surveys will be carried out by an Ecologist immediately prior to the commencement of clearance to establish if the baseline conditions reported herein

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remain valid, given the potential for delays between reporting and the commencement of construction. This will ensure that any changes in site context in relation to suitability for bats will be highlighted and that any additional mitigation measures which are then required are applied.

Given the nature of the habitat within which the turbines are proposed, no vegetation clearance buffer areas around the turbines or to generally to facilitate site roads are required. No measures in relation to bats are warranted to facilitate the removal of commercial forestry. Some tree removal may be required to facilitate the TDR, and this is discussed below.

Night-time lighting will be limited in extent (both static lighting and vehicle headlights) as standard construction operations will take place during the hours of daylight in as far as possible to minimise disturbances to bats and other wildlife. It is recognised that key works such as turbine delivery and erection may require night-time working. All lighting systems will be designed to minimise nuisance through light spillage. Shielded, downward directed lighting will be used wherever possible, and all non-essential lighting will be switched off during the hours of darkness.

Construction Phase Mitigation Measures - Other Taxa

The proposed mitigation measures in Chapter 7 will ensure that run-off and drainage are controlled and that there is no potential for significant water run-off impacts or indirect habitat loss or deterioration of the surrounding habitats as a result of construction works from the proposed wind farm development.

Areas where spoil is to be stored temporarily, or permanently, should be checked in advance for the presence of Frogs (and spawn). If protected species are present, the environmental staff will translocate these, if possible (under licence if applicable). The same measure should be applied for any drains or areas of standing water forded by construction machinery. These areas will be checked on an ongoing basis by the ECoW and any areas with breeding frogs, spawn or tadpoles will be mapped and if possible, fenced off temporarily to allow Frogs to metamorphose. If such areas cannot be avoided by site traffic the environmental staff will translocate the frogs (adults/young) under licence if applicable.

If other taxa such as Lepidoptera, Common Lizard etc. are recorded within or adjacent to the site, or the turbine delivery and underground electricity export connection routes, these sightings will be logged on the wildlife register and appropriate mitigation measures will be implemented as necessary in accordance with the advices of the appointed project ecologist or ECoW.

Construction Phase Mitigation - UEECR

Although not included as part of the current application (i.e. not within the redline boundary), the UEECR and TDR are essential components of the overall wind farm project, and the potential environmental effects of associated facilitation works is therefore considered. The assessment is based on currently available information as outlined herein, and the UEECR would be subject to a future design, environmental assessment and consenting process.

The underground electricity export connection installation will require water crossings, bridge crossing and directional drilling which could potentially have an impact on the watercourses it will cross. The infrastructure

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will predominantly be installed within the confines of the road and verges (where necessary). The details of the works required at watercourse crossings along the UEECR are detailed in Chapter 3 and Appendix 3.3. Reduced cover trenches are proposed at several locations, a standard trench is proposed at a and the replacement of a culvert is proposed at a separate location. Horizontal Directional Drilling (HDD) is proposed at some water crossing locations.

Mitigation measures to prevent the escapement of suspended solids to receiving watercourses (e.g. silt fences, roadside drain blocking etc.) are outlined in Chapter 7, and these will be implemented in full. No additional measures are considered warranted.

Although bat roosting was not identified at Tonrehown Bridge, features suitable to support roosting bats were identified, and both in-road and off-road UEECR options at this location have potential to disturb roosting bats due to noise and vibration during ducting and HDD works. As part of the assessment of a final design, further surveys will be carried out in accordance with Collins (2023) to determine if roosting occurs in the bridge. If roosting is detected, and disturbance cannot be avoided, a disturbance license will be received from NPWS to facilitate the works. In that event the works would only be carried out in compliance with any conditions of the license.

Bat roosting is unlikely to occur within Ballinglen Bridge due to the absence of viable PRFs. No trees with potential for bat roosting were noted within the likely works areas. One structure in ruins was noted proximal to the likely works area, should the 'off-road' UEECR option at Ballinglen Bridge be chosen. This structure was considered to have 'low' suitability for bat roosting but may be used on occasion by small numbers of crevice dwelling bats.

Construction Phase Mitigation - TDR

Although not included as part of the current application (i.e. not within the redline boundary), the UEECR and TDR are essential components of the overall wind farm project, and the potential environmental effects of associated facilitation works is therefore considered. The assessment is based on currently available information as outlined herein, and the TDR would be subject to a future design, environmental assessment and consenting process.

Eight POI locations where road extension ('overrun') is proposed to facilitate the TDR were considered. Otherwise, based on current information, the turbine delivery will involve trafficking of existing roads by vehicles and no significant effects are likely to occur.

A pre-construction survey will be carried out by an Ecologist in advance of works, to confirm that no evidence of protected mammals or 'Schedule 3' AIPS species are present in the zone of influence of the works.

Mitigation measures to prevent the escapement of suspended solids to receiving watercourses (e.g. silt fences, roadside drain blocking etc.) are outlined in Chapter 7, and these will be implemented in full. No additional measures are considered warranted.

Prior to the commencement of site clearance, surveys will be carried out on trees identified as having some (i.e. 'PRF-I' or 'PRF-M' in this instance) suitability for bat roosting. If roosts are found or are likely to be

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present, an appropriate mitigation strategy will be devised following Marnell et al. (2022) and Collins (2023) or other relevant guidance, and an application to NPWS for a derogation license under Section 55 of the Birds and Natural Habitats Regulations (2011) will be made. Removal of trees with bat roost suitability will be carried out under the supervision of a bat licensed Ecologist and subject to receipt of derogation license (if required) and any additional conditions contained therein. Trees with ivy-cover or other features which may conceal roosting bats, once felled, should be left intact onsite for 24 hours prior to disposal to allow any bats present to depart.

A derogation license is required where disturbance to a bat roost is likely to occur (Marnell et al., 2022). Based on current information, a derogation license issued under Regulation 54 of the European Communities (Birds and Natural Habitats) Regulations 2011 is not required to facilitate the proposed works.

Following works, the sites will each be remediated to a satisfactory condition, in consultation with the ECoW.

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6.9.2 Operational Phase Mitigation Measures

An Operational Environmental Management Plan (OEMP) will be developed for the operational phase of the proposed wind farm development.

Operational Phase Mitigation Measures - Habitats and Flora

Regular inspections will be carried out by site staff to ensure that the drainage regime is adequately maintained to protect the future stability of the surrounding high value habitats and botanical species as a whole.

Measures will be detailed in the Habitat and Species Management Plan to establish a peatland vegetative community on the peat deposition areas, and these measures will be fully implemented. The plan will include provision of monitoring of the revegetation process post-construction.

Operational Phase Mitigation Measures - Aquatic Ecology

Due to the natural 'grassing-over' of drainage swales and revegetation of other exposed surfaces, and the non-intrusive nature of site operations, there will be a further reduction in the risk of sediment release to the watercourses during the operational stage.

Operational phase mitigation measures for aquatic ecology are outlined in Chapter 7 and include off-site refuelling, the presence of spill kits in all on-site vehicles, bunding of any storage areas to 110% (with storm drainage systems and appropriate oil interceptors), and the use of authorised quarries (washed substrata) for use in road and hardstand maintenance. No other measures are considered warranted.

The operational phase drainage system will be installed and constructed in conjunction with the existing site drainage network and will include the following:

- Interceptor drains will be installed up-slope of all proposed infrastructure to collect clean surface runoff, in order to minimise the amount of runoff reaching areas where suspended sediment could become entrained. It will then be directed to areas where it can be re-distributed downslope.
- Collector drains will be used to gather runoff from access roads and turbine hardstanding areas of the site likely to have entrained suspended sediment, and channel it to new local settlement ponds for sediment settling.
- The electrical control building (at the substation) will be bunded appropriately to the volume of oils likely to be stored and to prevent leakage of any associated chemicals to groundwater or surface water. The bunded area will be fitted with a storm drainage system and an appropriate oil interceptor.
- The plant used during construction will be regularly inspected for leaks and fitness for purpose.
- An emergency response plan for the construction phase to deal with accidental spillages will be contained within the Construction Environmental Management Plan (which is contained in Appendix 3.5).

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Operational Phase Mitigation Measures - Non-Volant Mammals

No operational phase measures are considered warranted in relation to non-volant mammals.

Operational Phase Mitigation Measures - Bats

A high level of bat activity has not been identified for any bat species in any of the bat activity seasons. Based on best available information, species-specific collision risk has been identified in relation to high-collision-risk bat species, in all three activity seasons.

No vegetation buffers around the turbines are considered necessary in the context of the proposed development, given the nature of the existing environment within which the turbines are proposed (i.e. cutover bog / upland blanket bog).

Reduced rotation speed will be implemented when turbines are idling. 'Feathering' of idling blades may reduce fatality rates by up to 50% and does not result in loss of output (SNH, 2021). No additional control measures to avoid/reduce collision related bat fatalities are considered warranted in this instance.

Post-construction fatality monitoring will be carried out in years 1, 2, 3 and 5 post construction. The purpose of this monitoring will be to contribute to the understanding of the impacts of wind energy developments on bat populations in an Irish context. Post-construction monitoring will consist of:

- Passive bat monitoring at eight turbine locations during the bat activity season in order to monitor changes in activity levels relative to pre-construction baseline information (presented herein).
- Fatality monitoring following the methodology presented NIEA (2022). Carcass searches, to monitor and record bat (and bird) fatalities, will be conducted at each turbine. This will include searcher efficiency trials and an assessment of scavenger removal rates to determine the appropriate correction factor to be applied in relation to determining an accurate estimate of collision mortality.

Post-construction monitoring data will be analysed and presented in report format to the relevant planning authority.

No additional lighting will be provided during the operational phase.

Operational Phase Mitigation Measures - Other Taxa

Other taxa will benefit from the measures outlined above in relation to habitats and flora and protection of water quality in particular. It is considered that no additional measures are required.

6.9.3 Decommissioning Phase Mitigation Measures

A Decommissioning Environmental Management Plan (DEMP) will be developed for the decommissioning phase of the proposed wind farm development (EMP, 2024).

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There will be no additional habitat loss associated with the decommissioning of the Proposed Development and therefore there will be no significant effects in this regard. In addition, the removal of the in infrastructure will involve similar operations to those involved in construction but without the largescale earth moving or excavations as the turbine bases and roads etc. will be left in place. These works would therefore be of a smaller scale but would have similar impacts on ecology to those experienced during construction. There would be no additional or ancillary impacts associated with the decommissioning phase.

The same mitigation to prevent significant impacts on water quality and associated aquatic fauna and other terrestrial fauna during construction will be applicable to the decommissioning phase. The CEMP for the project provides the details of the mitigation and best practice that will be employed to avoid any potential for significant residual effects on biodiversity during decommissioning of the proposed wind farm.

The proposed development will generate waste through the decommissioning phase which will be treated in accordance with the specific site waste management plan prepared at that time. All above surface mechanical/electrical equipment and the control building will be removed, the concrete bases will be covered over with soil, reinstated and allowed to naturally revegetate. The proper handling and disposal of any contamination material (e.g. lubricating/cooling oils) will be ensured by the developer such that all contaminating material will be removed from the site in accordance with best practice.

6.10 Residual Impacts

The mitigation measures described for posed Keerglen Wind Farm development have been designed to minimise the impact of the development, include the future UEECR and TDR, from the construction phase to the decommissioning phase.

The mitigation-by-design approach followed has been effective in identifying and insofar as possible avoiding or reducing potential effects on the receiving environment.

The NIS objectively concluded that the proposed project is not likely to cause significant adverse effects on any Natura 2000 site, individually or in combination with other plans or projects. equally, no significant negative effects are likely to occur on any nationally designated site as a result of the proposed works.

The mitigation measures set out in the EIAR are comprehensive and backed by a detailed OCMS and EMP. Ongoing monitoring and implementation of the mitigation and monitoring measures described in the EIAR will ensure the preservation and future stability of the surrounding habitats as a whole.

With the implementation of the mitigation measures outlined in the EIAR it is concluded that, overall, the residual effect of the proposed scheme will be a **slight, negative effect at a local level** (following EPA, 2022), due to the loss of 1.2 ha of upland blanket bog as well as smaller areas of other peatland habitats. Following design and implementation of a robust Habitat and Species Management Plan (HSMP) which achieves maintenance of existing peatlands and restoration of cutover bog, the development has potential to achieve a **neutral** effect on biodiversity (following EPA (2022).

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