Chapter 31 Addendum: Bats in the Marine Environment

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ORIEL WIND FARM PROJECT

Environmental Impact Assessment Report - Addendum
Chapter 31 Addendum: Bats in the Marine Environment

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31.1 Introduction

This Addendum provides information to supplement the assessment of bats in the marine environment presented in chapter 31 of the Environmental Impact Assessment Report (EIAR) (2024)(volume 2C). It has been prepared in response to a Request for Further Information (RFI) from An Coimisiún Pleanála (ACP)(formerly An Bord Pleanála) regarding the planning application (case reference ABP-319799-24) for the Oriel Wind Farm Project (hereafter referred to as "the Project").

Table 31A-1 outlines the specific information requested according to the referencing used in the 'Schedule-Further Information Request' provided by ACP (e.g. 14.A which refers to bat survey data). Table 31A-1 also indicates where the corresponding information / responses can be found within this Addendum to chapter 31 and provides a concluding statement on any resulting updates or changes to the assessment previously presented in the EIAR (2024).

The section and subsection headings in this Addendum correspond to those used in chapter 31: Bats in the Marine Environment of the EIAR (volume 2C). The reader is directed to review the information presented in this Addendum alongside the assessment presented in the EIAR chapter.

Table 31A-1: Further information requested on Bats in the Marine Environment and details on Applicant's response.

Reference	Request for Further Information	Response / Reference to where information is presented	Concluding statement
14	The Board notes the submission of the DAU in relation to bats, both offshore and migratory, noting the effort to collect bat data both offshore and on coastal headlands. The applicant is requested to respond to the submission made by the DAU and address concerns raised. The applicant is requested to submit the following further information:	The Applicant has reviewed the submission made by the Development Applications Unit (DAU) and has detailed below where the requested information is (i) contained within the EIAR, (ii) contained within the EIAR Addendum, or (iii) provided in the Response to Submissions Report (prepared in response to the submissions received by ACP during the eight-week statutory consultation period which ran from 04 June 2024 to 30 July 2024).	The Applicant's response to the submission has not resulted in changes to the conclusions of the assessment.
14.A	The applicant is requested to provide clarity in terms of the surveys undertaken, particularly within the landfall location, and confirm the dates of the most recent surveys for bat activity in this area. Bat surveys are required to be undertaken at coastal headlands proximate to the project site in order to provide data on the potential migratory movements of bats identified within the EIAR, particularly within an established migratory period.	The Applicant can confirm that the landfall location was surveyed as part of the walked bat activity transect surveys a total of ten times over ten nights between 2019 and 2023 (see appendix 19-1 Addendum: Onshore Biodiversity – Supporting Information (EIAR volume 2C)). The landfall was additionally surveyed three times in 2024 during walked bat activity transect surveys (see appendix 19-1 Addendum: Onshore Biodiversity – Supporting Information). During the above surveys, the landfall was defined as a listening point, where surveyors detected statically for five-minute intervals. Details on the bat surveys undertaken in 2024 and 2025 at coastal headlands and offshore are provided in the following sections of this Addendum: • Section 31.3; • Section 31.6.2; • Section 31.7.3; • Section 31.7.5; • Section 31.10; and • Section 31.10.3. Further details on the offshore bat surveys are provided in: • Appendix 31-2: Offshore Bat Survey (Autumn Migration 2024) Report. • Appendix 31-3: Offshore Bat Survey (Spring Migration 2025) Report.	<u>Bat surveys at the landfall location</u> The recent bat survey data resulted in no changes to the baseline environment presented in the EIAR and therefore no changes to the assessment or conclusions presented in chapter 31: Bats in the Marine Environment (EIAR volume 2C). <u>Bat surveys – coastal headland and offshore</u> Although no bats were recorded offshore during the boat-based surveys in 2024 and 2025, mitigation is proposed to provide a framework for adaptive management, should it be required in the future. There are amendments to the assessment and conclusions presented in chapter 31: Bats in the Marine Environment (EIAR volume 2C). As no bats were recorded offshore during the boat-based surveys, the assessment of the potential effects is predicted to be not significant.

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Reference	Request for Further Information	Response / Reference to where information is presented	Concluding statement
14.B	In view of the identified significance of impacts associated with the proposed development in terms of the operational and maintenance phase of the project, due to barotrauma and collision risk, and in the absence of published empirical data, further information is required to be provided on the details of the proposed mitigation system (detection and active response curtailment (DARC)) and evidence of its effectiveness in the off-shore environment in mitigating potential impacts on bats to ensure an assessment of impacts on bats can be undertaken in terms of potential mortality and disturbance.	Further information on DARC is provided in the section 31.10.3 of this Addendum.	There are amendments to the assessment and conclusions presented in chapter 31: Bats in the Marine Environment (EIAR volume 2C). As no bats were recorded offshore during the boat-based surveys, the assessment of the potential effects is predicted to be not significant. The further information provided on the proposed mitigation system has not resulted in changes to the assessment or conclusions provided in chapter 31: Bats in the Marine Environment (EIAR volume 2C). It is recognised that bat activity offshore is an emerging scientific field within Europe with many countries exploring innovative methods to monitor bat movements and provide adaptive curtailment around offshore wind farms, including DARC type systems. Apart from the few dedicated scientific studies demonstrating a reduction in bat fatalities when employing curtailment (largely onshore) which also highlight the importance of adaptive curtailment mitigations, there are few publicly available studies which demonstrate curtailment effectiveness post-construction at offshore wind farms. The Applicant remains committed to the future monitoring programme across all phases of the Project outlined in chapter 31: Bats in the Marine Environment (EIAR volume 2C), to collect data on potential bat migration activity in the Irish Sea and to inform future adaptive curtailment mitigation.
14.C	The Board notes that the EIAR has scoped out disturbance from lighting for bats. However, the applicant is requested to provide an assessment (with regard to appropriate lux contours) having regard to the lighting and marking plan, to determine the extent, if any, to which lighting in the offshore array area, including turbines and the offshore substation platform, may result in the	An assessment of the potential effects on offshore migrating bat receptors caused by disturbance from lighting is included section 31.10.1 of the Addendum. Changes arising from the assessment of the potential impact of lighting are provided in the following section of the Addendum: • Section 31.8.1; • Section 31.8.3; and	The assessment of the potential effects on offshore migrating bat receptors caused by disturbance form lighting has concluded effects to be not significant.

Reference	Request for Further Information	Response / Reference to where information is presented	Concluding statement
	vertical displacement of bats, and potentially increasing activity within the swept zone.	• Section 31.14.	
14.D	The Isle of Man has made a submission in terms of potential transboundary effects noting its the exclusion as a potential migratory route for bats. The applicant is requested to comment on this submission.	The Applicant has reviewed the submission made by the Isle of Man, and has provided a response in the Response to Submissions Report. Regarding the potential migratory route for bats, these were considered as part of the assessment. The Isle of Man is included in the study area shown in Figure 31-1 in chapter 31: Bats in the Marine Environment (EIAR volume 2C). The Applicant acknowledges that the Isle of Man was not mentioned in section 31.12 Transboundary effects however, this wording has been clarified in this Addendum in response to the submission made by the Isle of Man. This change did not require any update to the assessment. The Isle of Man submission also stated that the proposed Mooir Vanin wind farm was not considered as part of the cumulative impact assessment. The Applicant confirms that Mooir Vannin wind farm was considered in the cumulative impact assessment but was scoped out at stage 1 (see EIAR volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex). The Applicant is committed to sharing any future monitoring results as a result of the Project with the Department of Environment, Food and Agriculture (DEFA) and the Manx Bat Group, once available. The Applicant has reviewed the Isle of Man National Biodiversity Network (NBN) Atlas[1] as a source of desktop study information and has incorporated any relevant information where appropriate. The following sections of the Addendum provide a response regarding the Bats in the Marine Environment	Overall, the updates provided in response to RFI 14.D do not change the conclusions presented in chapter 31: Bats in the Marine Environment (EIAR volume 2C).

[1] Isle of Man NBN Atlas: https://isleofman.nbnatlas.org/

Reference	Request for Further Information	Response / Reference to where information is presented	Concluding statement
		Study Area, future monitoring results, cumulative impacts and transboundary effects regarding the submission made by Isle of Man • Section 31.3; • Section 31.10.4; • Section 31.11; and • Section 31.11.3.	
14.E	In terms of the impacts to terrestrial bats, the Board notes the high activity for bats at the eastern crossing of the River Dee. It is further noted that the development will include the felling of 7 mature trees – BT4, BT5, BT14-18 – all of which have been identified as having low suitability for roosting bats. The Board notes that trees BT14-18 are located within close proximity to the identified 'hotspot' at the eastern crossing of the River Dee. While potential direct effects have been identified to bats in the EIAR, and notwithstanding the disturbance measures included in Table 19-12 of Chapter 19: Onshore Biodiversity of the EIAR, the Board requests further justification in terms of the removal of the above 5 trees which are clustered proximate to this hotspot, together with the removal of the other trees identified, with regard to potential impacts to bats. The potential location for bat boxes, as indicated as an enhancement measure, should also be identified.	Further justification in terms of the removal of trees is provided in chapter 19 Addendum: Onshore Biodiversity.	No change to the assessment or conclusions presented in chapter 19: Onshore Biodiversity (EIAR volume 2C), which provided a comprehensive assessment on bats in accordance with guidance.

31.2 Purpose of this chapter

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.3 Study area

In response to RFI 14.D regarding the Isle of Man submission, it is noted that the Bats in the Marine Environment Study Area presented in the EIAR was for the Irish Sea. This therefore included the potential migration corridors associated with the jurisdiction of the Isle of Man.

31.4 Policy context and legislation

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.5 Consultation

Table 31A-2 summarises the issues identified, together with how these issues have been considered in the preparation of this Addendum. Consultation with the NPWS was held in October 2025.

Table 31A-2: Summary of key issues raised during consultation on Bats in the Marine Environment.

Date	Consultee and type of response	Issues raised	Response to issue raised and/or where considered in this Addendum
October 2025	NPWS – meeting.	The following issues were discussed: • Overview of offshore bat survey data collected post-submission; • The proposed mitigation system (in EIAR chapter 31: Bats in the Marine Environment), including adaptive management; and • Baseline conditions and potential requirement for derogation. – Applicant to address potential requirement for derogation and consider three tests for derogation	See section 31.7 for details on baseline data See section 31.8.2 for details on the proposed DARC system. In assessing the requirement for an application for derogation for potential negative effects on bat species, the Applicant has considered the following guidance documents: '*Guidance on the Strict Protection of Certain Animal and Plant Species under the Habitats Directive in Ireland*' (NPWS, 2021), '*Applications for Regulation 54 Derogations for Annex IV species: Guidance for Applicants*' (NPWS, 2025b), '*Strict Protection of Animal Species'* (Mullens *et al.*, 2021), and '*Commission notice: Guidance document on the strict protection of animal species of Community interest under the Habitats Directive*' (EC, 2021). As no bats were recorded offshore during the boat-based surveys, activities listed under Regulation 51 of the European Communities Birds and Natural Habitats Regulations 2011 (as amended) are not deemed to apply to the Project. Therefore, the further considerations under Regulation 54 regarding: requirement (Test 1), alternatives (Test 2), and maintenance of the population (Test 3) do not apply either.

31.6 Methodology to inform the baseline

31.6.1 Desktop study

Since the application was submitted in May 2024, additional desktop sources have become available and are listed below. In response to RFI 14.D, the Applicant has also reviewed and included the Isle of Man National Biodiversity Network (NBN) Atlas and the Isle of Man Manx Bat Group as a source of desktop study information:

- Hooker, J., Lintott, P., Boughey, K., Worledge, L., Park, K. and Collins, J. (2025) Assessing migration of bat species and interactions with Offshore Wind Farms in British Waters. Natural England Commissioned Report, NECR562. Natural England, York.
- Isle of Man NBN Atlas. Available online at: https://isleofman.nbnatlas.org/.
- Isle of Man Manx Bat Group. Available online at: https://manxbatgroup.org/.
- NPWS (2025a) All-Ireland Nathusius' Pipistrelle Bat project. Summary of work undertaken in 2024. Project Icarus Ireland: Tracking Long-Range Movements of Leisler's Bats Nyctalus Leisler in Ireland.[2]
- Signe MM Brinkløv, Astrid Særmark Uebel, Esben T Fjederholt and Morten Elmeros (2025) Sensitivity mapping of relative risks to bats from Danish offshore wind energy. Aarhus University, DCE – Danish Centre for Environment and Energy, 55 pp. Technical Report.
- Walsh, C., Hüppop, O., Karwinkel, T., Liedvogel, M., Lindecke, O., McLaren, J. D., Schmaljohann, H. and Siebenhüner, B. (2025) Marine artificial light at night: Implications and potential hazards for offshore songbird and bat movements in the Greater North Sea. Conservation Science and Practice, 7(3), e70008.

31.6.2 Site specific surveys

In response to RFI 14.A regarding bat surveys, site-specific surveys were undertaken. A summary of the surveys undertaken to inform the impact assessment on bats in the marine environment is outlined in Table 31A-3 with full detailed methodologies outlined in appendix 31-2: Offshore Bat Survey (Autumn Migration 2024) Report; and appendix 31-3: Offshore Bat Survey (Spring Migration 2025) Report.

There is currently no published guidance or industry best practice standards for characterising offshore bat activity in the marine environment in Ireland or internationally. However, UNEP guidelines "*Guidelines for consideration of bats in wind farm projects*" recommend surveying offshore wind turbine projects in the same manner as land-based turbines (Rodrigues *et al.*, 2015). Therefore, a bespoke boat-based survey methodology considering these guidelines was developed by RPS for the Project.

Table 31A-3: Summary of site-specific survey data.

Title	Extent of survey	Overview of survey	Survey contractor	Dates	Reference to further information
Bats	Offshore Wind Farm Area; and proximate headland locations – Dunany Point and Templetown Beach.	Identification of migrating bats.	Irish commercial Charter boats (ICCB) and RPS.	Mid-September – November 2024; and Mid-March – May 2025.	Appendix 31-2: Offshore Bat Survey (Autumn Migration 2024) Report. Appendix 31-3: Offshore Bat Survey (Spring Migration 2025) Report.

31.7 Baseline environment

31.7.1 Resident bat species

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.7.2 Bat species sensitivity

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

[2] NPWS (2025): https://www.npws.ie/sites/default/files/general/derogation/der-bat-2025-277-281/2025-07-11%20Supporting%20Doc.pdf.

31.7.3 Data capture

In response to RFI 14.A, site-specific surveys were undertaken comprising of Autumn migration surveys (mid-September to November 2024) and Spring migration surveys (mid-March to May 2025). The results are provided below.

31.7.3.1 Boat-based surveys

Autumn migration

During the Autumn migration period, boat-based surveys were completed during suitable weather conditions[3]. The deployment period for bat detectors aboard the Rós Áine survey vessel was between the 24 September and 14 November 2024. During this period, the vessels operated for a combined total of 12 nights. No bats were recorded within the offshore wind farm area during the deployment dates outlined in appendix 31-2: Offshore Bat Survey (Autumn Migration 2024) Report. The detectors deployed during the boat-based surveys recorded high levels of noise; however, no bat records were identified.

Spring migration

During the Spring migration period, boat-based surveys were completed during suitable weather conditions[3]. The deployment period for bat detectors aboard the Lisín 1 survey vessel was between 07 April and 27 May 2025. During this period, the vessels operated for a combined total of nine nights. No bats were recorded within the offshore wind farm area during the deployment dates outlined in appendix 31-3: Offshore Bat Survey (Spring Migration 2025) Report. The detectors deployed during the boat-based surveys recorded high levels of noise; however, no bat records were identified. Additionally, some incidental records of bats were recorded whilst the vessel was idle at Skerries harbour: on 11 April 2025, seven passes of Leisler bat (*Nyctalus leisleri*) were recorded, on 12 April 2025 a single pass of Leisler bat was recorded, and on 02 May and 13 May 2025, a single pass of Leisler bat was recorded. These records indicate that Leisler bat may be foraging and commuting along the coast and/or within coastal habitats.

Overall no bats were recorded offshore, although survey limitations (section 31.7.5) are noted.

31.7.3.2 Coastal headland survey

Autumn migration

During the Autumn migration period, headland surveys were undertaken from 18 September 2024 to 30 November 2024. Bat detectors were deployed for 73 consecutive nights and captured data for a total of 68 nights at Templetown Beach and 70 nights at Dunany Point. Further detail including tabulated data results and graphed data is provided in section 3 of appendix 31-2: Offshore Bat Survey (Autumn Migration 2024) Report.

A total of seven species of bat including common pipistrelle (*Pipistrellus pipistrellus*), soprano pipistrelle (*Pipistrellus pygmaeus*), Nathusius' pipistrelle (*Pipistrellus nathusii*), Leisler's bat, brown long-eared (*Plecotus auratus*), Daubenton's (*Myotis daubentoniid*) and Natterer's bat (*Myotis nattereri*) were identified foraging and/or commuting in the vicinity of the static detector deployment locations. Daubenton's bat was identified at Templetown beach only, and Natterer's bat was identified at Dunany Point only. In addition, unidentified *Pipistrellus* species and unidentified *Myotis* species were also recorded.

Dunany point headland had the highest total passes across the survey period, which were dominated by soprano pipistrelle (47%), Leisler's bat (25.6%), and common pipistrelle (23.1%). Templetown beach headland was dominated by common pipistrelle (67.5%) and soprano pipistrelle (26.9%) bat passes, with a smaller proportion of Leisler's bat (3.2%).

Peak bat activity at Dunany Point was recorded on 01 and 02 November 2024 (1,462 and 1,626 records of soprano pipistrelle) during south and south-westerly winds. Peak bat activity at Templetown Beach was recorded on 01 and 14 November 2024 at Templetown Beach (234 and 398 records of common pipistrelle)

[3] Suitable conditions: sunset temperatures above 10 °C (Collins, 2023); wind speeds of < 5.4 m/s (20 km/hr) (Collins, 2023); rainfall < 4 mm/hr (i.e. low to moderate rainfall levels).

during south and north-westerly winds. Overall, peak Bat Passes Per Night (BPPN) was observed in November for both Dunany Point (180.7 BPPN) and Templetown Beach (33.5 BPPN). The most frequently recorded species were soprano pipistrelle's, followed by common pipistrelle.

As no bats were recorded offshore, it is difficult to contextualise the bat activity recorded at both Templetown Beach and Dunany Point. As described above, the largest peak in activity at the headland locations occurred on 01, 02 and 14 November 2024 which coincides with the Autumn migration window. On these same dates, bat detectors were also deployed on boat-based surveys, however no bats were recorded.

Overall, and mindful of the survey limitations (section 31.7.5), records could either be a result of commuting/foraging behaviour or migration behaviour. However, neither can be confirmed from the data collected.

Spring migration

During the Spring migration period, headland surveys were undertaken from 13 March 2025 to 01 June 2025. Bat detectors were deployed for 80 consecutive nights and captured data for a total of 71 nights at Templetown Beach and 72 nights at Dunany Point. Further detail including tabulated data results and graphed data is provided in section 3 of appendix 31-3: Offshore Bat Survey (Spring Migration 2025) Report).

A total of five species of bat including common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, and brown long-eared were identified foraging and/or commuting in the vicinity of the static detector deployment locations. Nathusius' pipistrelle was identified at Templetown beach only, and unidentified *Pipistrellus* species and unidentified *Myotis* species were also recorded at both headland locations.

Templetown beach headland had the highest total passes across the survey period, which were dominated by common pipistrelle (59.6%), Leisler's bat (23.6%), and soprano pipistrelle (11.7%). Dunany point headland was dominated by Leisler's bat (45.1%), common pipistrelle (37.6%) and soprano pipistrelle (11.9%) bat passes.

Peak bat activity at Dunany Point was recorded on 01 May (877 records of Leisler's bat) during north-easterly winds. Peak bat activity at Templetown Beach was recorded on 02 May (686 records of common pipistrelle) during north-easterly winds. Overall, peak Bat Passes Per Night (BPPN) was observed in May for both Dunany Point (154.3 BPPN) and Templetown Beach (257.9 BPPN).

As detailed above, the most frequently recorded species were common pipistrelle, followed by Leisler's bat and soprano pipistrelle. Individual results for these three species demonstrates peak BPPN for all three species at both headland locations, in the month of May. Further analysis was undertaken of the records for these three species during the month of May, presenting the number of bat passes by week, time and location to identify foraging and/or migrating trends/patterns present within the data (see appendix E of appendix 31-3: Offshore Bat Survey (Spring Migration 2025) Report).

The results for May typically indicate that the peak concentration of bat passes are likely associated with local populations using coastal areas for foraging and commuting i.e. foraging bats are typically active for 1-2 hours after dusk, rest for a short period, and then feed again before daybreak. Although there are peak concentrations of common pipistrelle passes after 1.00am at Templetown beach (week 4 and 5 in May), and peak concentrations of Leisler's bat passes occurring after 1.00am at both Templetown beach and Dunany point (weeks 1 and 4 in May) there is no clear evidence indicating the movement of bats out to sea for foraging, migrating and/or commuting between headlands.

Overall, and mindful of the survey limitations (section 31.7.5), records could either be a result of commuting/foraging behaviour or migration behaviour. However, neither can be confirmed from the data collected.

31.7.4 Important Ecological Features (IEF)

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.7.5 Data validity and limitations

As outlined in chapter 31: Bats in the Marine Environment (EIAR volume 2C), there are no standard survey methods or guidelines in Ireland or internationally for characterising offshore bat activity which can be

implemented; however, UNEP guidelines (Rodrigues et al., 2015) recommend surveying offshore wind turbines in the same manner as land-based turbines. In response to RFI 14.A, site-specific surveys were undertaken comprising of Autumn migration surveys (mid-September to November 2024) and Spring migration surveys (mid-March to May 2025) using a bespoke survey method developed by RPS. The limitations associated with the bespoke survey methodology are provided below.

Survey methodology

Given that a bespoke survey methodology had been developed, there were risks associated with the collation of the data, e.g. equipment failure in the marine environment and potential interference from other emitting equipment. However, the methodology was developed with specific actions incorporated to minimise these risks, e.g. thorough checks on data collection, on board maintenance regime, check-ins for troubleshooting exercises, etc. In relation to survey methods, there were a number of limitations and/or considerations in relation to survey timing, data collection and the interpretation of data, including:

- The boat-based and headland surveys were completed between mid-September and November 2024. In the event that seasonal migration does occur between Ireland and UK/Europe, the survey commenced slightly outside of the typical window (mid-August to October) where such migration may be evident. It should be noted, however, that bats are generally active in Ireland between April to October (Marnell *et al.,* 2022) and can be detected on warmer evenings in November. Therefore, the boat-based and headland surveys were undertaken during the season when bats are still active.
- Surveying for bats offshore can be challenging due to the potentially harsh environment effecting the number of available survey nights with suitable conditions for migrating bats, suitable conditions for when vessels to safely travel offshore during the night and the impact this potentially has on equipment.
- It is expected due to the harsh offshore environment that there may be some level of equipment failure which could, in part, be mitigated through regular maintenance/data collection to ensure that the equipment was working effectively. Such measures were incorporated into the survey methodology to limit these risks.
- During data collection for both the boat-based and coastal headland survey, there was some loss of data due to data corruption (1 night), human error (2 nights), battery charge levels (3 nights), and poor weather conditions (1 night) i.e. boat returning early or inability to complete boat surveys due to wind conditions effecting sea state. However, importantly – data was available from the second bat detector during all of the above nights. Additionally, every effort was made to collect data on every available survey night during the boat-based survey and was collected over the majority of survey days at coastal headlands.
- The microphones used have a typical detection range of between 15 m to 30 m. This could be a limitation if some species fly higher than can be detected by the microphones.
- Due to the lack of available studies and data sets of a similar nature to this survey type, it is unknown if the presence of the vessel (increased light and noise) itself causes avoidance behaviour in bats. This has the potential to be a limiting factor if bats avoid the monitoring area, resulting in their presence not being detected by the equipment. To mitigate this limitation, listening points were used along transect routes during boat-based surveys where the boat remained idle for a minimum of five minutes and a maximum of 15 minutes at each survey station.
- When undertaking coastal headland surveys, such surveys do not detect the flight path of individual bats, and therefore this survey type cannot characterise the relationship between a bat recorded along the coast and the offshore environment. However, data collected at coastal headlands proximate to the Survey Area can provide additional context to offshore bat data collected during the Autumn migration period.

31.8 Key parameters for assessment

31.8.1 Project design parameters

In response to RFI 14.C, Table 31A-4 outlines the project design parameters that have been used to inform the assessment of potential impacts of lighting during the operational and maintenance phase of the Project on bats in the marine environment (see section 31.10.1 of this Addendum).

Table 31A-4: Project design parameters considered for the assessment of potential impacts on migrating bats in the marine environment.

Potential impact	Phase[1] C	O	D	Project design parameters	Justification
Disturbance – artificial lighting	x	✓	x	**Operational and maintenance phase** • Presence of 25 Wind Turbine Generators (WTG) and 1 Offshore substation (OSS) within the offshore wind farm area. • WTGs will be illuminated up to a range of not less than 5 nautical miles (nm) with: - Yellow flashing marine lighting (selected peripheral structures (SPS)). - White flashing marine warning lights (SPS). - Red lighting (all structures - Search and Rescue (SAR), steady when in use, off otherwise). - Low intensity green lighting will also be used during hoist operations at the nacelle, and WTG railings will be marked with red, yellow and green lighting zones for identification of boundaries. • The OSS) will be illuminated up to a range of not less than 5 nm: - Red lighting (SAR - steady when in use, off otherwise). - Low intensity green lighting will also be used during hoist operations, and railings will be marked with red, yellow and green lighting zones for identification of boundaries. • Vessel lighting – not as bright as lighting required for WTGs and OSS. A maximum of 4. installation or operational vessels within a 24-hour period.	Structures and vessels with artificial lighting that have the potential to result in disturbance.

31.8.2 Measures included in the Project

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.8.3 Impacts scoped out of the assessment

In response to RFI 14.C, disturbance from lighting during the operational and maintenance phase is scoped in for assessment for migrating bats in the marine environment in this Addendum. A description of the potential effect on offshore migrating bat receptors caused by disturbance from lighting is provided in section 31.10.1

31.9 Impact assessment methodology

31.9.1 Overview

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.9.2 Ecological impact assessment process

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.9.3 Impact assessment criteria

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.10 Assessment of significance

31.10.1 Disturbance/ ultrasonic emission interference - operational and maintenance phase

Emission interference – foraging success during migration

Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Emission interference – navigation

Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Artificial lighting

Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat and Daubenton's bat

Based on the current baseline for the Project as outlined in section 31.7.3, no bats were recorded offshore and therefore no bats could potentially be impacted by disturbance from lighting. However, in response to RFI 14.C, a description of the potential effect on offshore migrating bat receptors caused by disturbance from lighting is provided below.

The impacts of artificial lighting on land are relatively well studied, however there is limited information on the risk to bats from lighting at sea - associated with offshore wind turbines, and the sensitivity/tolerance of various species to such effects, particularly during migration periods.

According to Bat Conservation Ireland (BCI, 2010) artificial lighting can cause reduced vision in bats when foraging, commuting and/or roosting, resulting in disorientation. Light sensitivity can vary between species, with bats having a higher tolerance to red visual light than white light. All bat species are considered to have a low tolerance for light levels, but the following bat species (which have been identified as IEF's) are particularly sensitive to elevated light levels: brown long-eared bat and Daubenton's bat (BCI, 2010).

Additionally, according to BCT (2023), slower-flying, broad winged species (identified as IEF's in this assessment) such as long-eared and Myotis species have been shown to avoid commuting and foraging routes illuminated with a variety of different street luminaires, whilst faster-flying species (identified as IEF's in this assessment) such as Leisler's and pipistrelle have been recorded congregating around white light sources in the onshore environment (BCT, 2023 – GN08/23).

Other sources demonstrate that some migrating species exhibit attraction behaviour only toward red and green light, rather than white light (Voigt *et al.,* 2018), and that overall, in the onshore environment, bats tend to avoid lighting (in particular white lighting) demonstrating avoidance behaviours (Barré *et al.,* 2021).

During the operational and maintenance phase, structures within the offshore wind farm area will be marked and illuminated in accordance with relevant guidance and stakeholder requirements including: the Irish Aviation Authority (IAA), the International Association of Marine Aids to Navigation and Lighthouse Authorities (IALA), the International Civil Aviation Organisation (ICAO), the UK Civil Aviation Authority (CAA) and the UK Maritime and Coastguard Agency (MCA). All lighting will be agreed by the IAA, Commissioners of Irish Lights (CIL), the Irish Coast Guard (IRCG) and the Department of Defence (DoD).

Therefore, as a health and safety requirement, lighting required includes yellow flashing lights (SPS), white flashing lights (SPS), and red SAR lighting (WTGs and OSS) up to a range of no less than 5 nm. Red lighting will be off unless in use by SAR. Light intensities will be a minimum of 200 candela (cd) and a maximum of 2,000 cd (at night). Illuminance (lux) up to 1 nm are summarised below in Table 31A-5 to demonstrate lux levels from <0.1 to 80 lux. To put Table 31A-5 in perspective, 0.2 lux level is equivalent to moonlight (BCI, 2010).

In addition, low intensity green lighting will also be used during hoist operations at the nacelle, WTG railings will be marked with red, yellow and green lighting zones; and vessels required for the operational and monitoring phase. There will also be a maximum of four operational and maintenance vessels with low

intensity lighting in the offshore wind farm area at any one time, with a maximum schedule of 24 hours a day, seven days a week.

Table 31A-5: Illuminance levels associated with light intensity of 200-2000 candela, up to a range of 1 nm.

		Minimum light intensity (candela) - 200	Maximum light intensity (candela) - 2000
Distance (km)*	Distance (m)	Lux level	Lux level
0.005	5	8	80
0.01	10	2	20
0.05	50	0.08	0.8
0.1	100	0.02	0.2 (moonlight equivalent)
0.25	250	0.0032	0.032
0.5	500	0.0008	0.008
1	1,000	0.0002	0.002
1.25	1,250	0.0001	0.0013
1.5	1,500	0.0001	0.0009
2	2,000	0.0001	0.0005

* 2 km = 1.07 nm.

In the absence of available guidance relating to lux level thresholds at sea, the BCI (2010) Bats and Lighting guidance note has been consulted, which states that (in relation to Sports Playing pitches), a lighting level of 3 lux or less is recommended. This guidance note also states that the optimum level of light for bats emerging is preferred to be less than 1 lux. The BCT Guidance note (GN 08/23) on bats and artificial lighting highlights several studies.

Based on Table 31A-5 and taking into consideration onshore guidance (BCI, 2010), disturbance to migrating bats (i.e. avoidance or attraction behaviour) is likely to occur up to 50 m from illuminated structures. In relation to operational and maintenance vessels, lighting will be of low intensity and is not considered to result in significant levels of disturbance to migrating bats. Therefore, only illuminated structures are considered to potentially result in disturbance. However, as described above, no bats were recorded offshore (see section 31.7.3) and therefore no bats could potentially be impacted by disturbance from lighting as a result of the Project.

31.10.2 Injury and/or fatality

Operational and maintenance phase

Barotrauma

Nathusius' pipistrelle

In response to RFI 14.A, the assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to Nathusius' pipistrelle during migration is predicted to be **not significant**.

Common pipistrelle, soprano pipistrelle, and Leisler's bat

In response to RFI 14.A, the assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to common pipistrelle, soprano pipistrelle and Leisler's bat during migration is predicted to be **not significant**.

Brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Collision with rotors

Nathusius' pipistrelle

In response to RFI 14.A, the assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to Nathusius' pipistrelle during migration is predicted to be **not significant**.

Common pipistrelle, soprano pipistrelle, and Leisler's bat

In response to RFI 14.A, the assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to common pipistrelle, soprano pipistrelle and Leisler's bat during migration is predicted to be **not significant**.

Brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.10.3 Mitigation and residual effects

In response to RFI 14.A, the mitigation proposed has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. Although no bats were recorded offshore during the boat-based surveys, it is not proposed to make amendments to the adaptive curtailment mitigation measures which were proposed as part of EIAR chapter 31: Bats in the Marine Environment (volume 2C). No amendments are proposed on foot of the application of the precautionary principle.

In response to RFI 14.B, Detection and Active Response Curtailment (DARC) type mitigation systems have been proposed, and the Applicant is committed to implementing this on a precautionary basis.

Bat activity in the marine environment is an emerging scientific field within Europe with many countries exploring innovative methods to monitor bat movements and provide adaptive curtailment around offshore wind farms, including DARC type systems. For example, in the UK, following on from guidance compiled on the effects of onshore wind energy on bats (NatureScot *et al.,* 2021) there has been a call by the Bat Conservation Trust in collaboration with the University of the West of England and University of Stirling for information, data, case studies or research to assess Migration of Bat Species and Interactions with Offshore Wind Farms including bat migration within and between Europe and the UK. Similarly, the Natural England Commissioned Report (NECR562) by Hooker *et al.,* (2025) addresses the need to progress this evidence gap and the importance of undertaking pre and post construction monitoring to do so.

DARC type systems are a new and emerging technology, and an excellent example of the type of detection system which may be used to locate bats in the offshore wind farm area automatically sending signals to advise on slowing down individual wind turbines. DARC type systems are becoming a widely regarded method for operational mitigation on offshore wind farm projects with several studies demonstrating curtailment effectiveness. Studies have shown that deploying operational curtailment measures effectively and substantially reduce bat mortalities (Behr *et al.,* 2017; Bennet et al., 2022; Voigt et *al.,* 2022), emphasising the importance of its implementation.

DARC type systems (e.g. EchoSense, DTBat, WindPRO, Pro Bat, Chirotech), allow adaptive management of curtailment thresholds and proactive implementation of bat curtailment measures. In-combination with an acoustic monitoring scheme at the pre-construction phase, construction phase and operational and maintenance phase - bat activity can be determined, and operational adjustments can be made to the curtailment scheme.

Limited published information is publicly available regarding operational monitoring results and effectiveness of curtailment systems. Bat curtailment measures are known to have been installed across both existing and proposed European offshore wind farms, including Windpark Krammer, EcoWende Hollande Kust West (the Netherlands) and Arcadis Ost (Germany), however information regarding their results and effectiveness are not publicly available.

In Switzerland, the performance of the real-time bat detection system DTBat at Calandawind wind turbine was undertaken between March and October 2014 (SWILD, 2015). DTBat is a developed model of the

DTBird system, with operators of the system still exploring its technical capabilities[4]. The goal of the study which included a 'stop algorithm' (i.e. completely stop turbines) was to avoid ≥ 95% of bat collisions. At Calandawind, DTBat was equipped with three Anabat SDII bat detectors, each one installed at different heights; 5, 31 and 119m. Most of the bat activity was recorded during the Autumn migration season, with migrating species accounting for 80.55% of bat passes. Overall, the mortality of ≤5% was not fully achieved, however DTBat and SWILD (2015) demonstrates the promising scenarios to reach best adaptive mitigation performance.

In Germany, Behr *et al.* (2017) present a model-based approach for developing curtailment algorithms. The study compiled bat acoustic data across 70 onshore wind turbines at 35 different sites, deploying bat recorders inside the bottom of the nacelle. The results were statistically modelled using predictive variables such as wind speed and temperature to differentiate times of low and high bat activity. Nyctaloids and Pipistrelloids accounted for 86% of all recordings, with wind speed, temperature and precipitation having the strongest influences on bat activity. A generalised linear model (GLM) was used to predict bat activity (number of recordings; total activity of all bat species) and, hence, times of high collision risk for bats at the wind turbines from the predictive variables wind speed, temperature, precipitation, month, time of night, and turbine. The results showed that the tested predictive variables had a highly significant effect on the activity of bats at the turbines and that the model can be used to predict times of higher bat activity with a high temporal resolution to effectively reduce bat mortality at wind turbines while maximising energy production.

In France, Barré *et al.* (2023) compiled bat acoustic data recorded over four years at 34 onshore wind turbine nacelles from post-construction regulatory studies to assess whether curtailment based on an algorithm would be more efficient than blanket curtailment to limit bat exposure. Similar to Behr *et al.* (2017), the incorporation of variables such as landscape features, rainfall, turbine functioning, and seasonality into multi-factor algorithms contributed to reducing bat fatalities. Algorithm-based curtailment was found to be effective (and more so than blanket curtailment) with a reduction in average exposure between 7 and 31% for bat species recorded, highlighting the effectiveness of adaptive curtailment and its benefits for energy production and biodiversity. According to Barré *et al.* (2023), the presented approach of acoustic monitoring at the nacelle and turbine specific curtailment has become the standard method to mitigate collision risk of bats at wind turbines in Germany.

Boonman (2018) investigated a theoretical curtailment strategy to determine the settings of an optimal curtailment strategy for offshore wind farms, to reduce bat mortalities during high-risk time frames (i.e. migration) and to limit energy production losses. Boonman (2018) draws upon Wageningen Marine Research relating to the presence of bats in the Dutch offshore wind farms (Lagerveld *et al.,* 2017) to determine which parameters could be added to the strategy in order to improve it. Lagerveld *et al.* (2017) proposes a curtailment strategy including wind speed and time of year only. Boonman (2018) concludes that the addition of wind direction and temperature to a curtailment strategy can improve bat mortality by 15% in comparison with just wind speed and time of year (25% bat mortality). Boonman extends the discussion of curtailment strategies on demand to include the advantages and disadvantages of curtailment on demand systems such as Pro bat and Chirotech.

In the U.S. the issue surrounding the protection of bats and the deployment of smart curtailment on onshore wind farms has been researched since the early 2000's. Scientific review undertaken by Adams *et al.* (2021), and Whitby *et al.* (2024) demonstrate the effectiveness of smart curtailment across several onshore wind farms. For example, Adams *et al.* (2021) assessed the findings of 36 control-treatment studies from 17 wind farms. They found that by implementing turbine curtailment, fatality rates of bats at wind farms are reduced; with the total estimated fatality ratio across all studies showing a 63% decrease in fatalities. Whitby *et al.* (2024) assessed 29 implemented curtailment strategies and found that curtailment reduced total bat fatalities by 33% with every 1.0 ms^{-1} increase in curtailment wind speed. Across multiple facilities and years, a 5.0 ms^{-1} cut-in speed was estimated to reduce total bat fatalities by an average of 62%.

In 2015, the American Wind Energy Association announced new voluntary practices to reduce the overall impacts on bats, significantly reduce the collision risk for bats in low wind speed conditions when they are most at risk. In 2024, following scrutiny on wind farms operating within the tricolored bat's (*Perimyotis subflavus*) range, the U.S Fish and Wildlife Service (USFWS) produced Land-based Wind Energy Voluntary Avoidance Guidance for the Tricolored Bat (TCB Wind Guidance). This guidance articulates how (new or existing) land-based wind energy projects can operate and conduct standard postconstruction monitoring to validate the effectiveness of the guidance at individual wind projects.

[4] https://www.dtbird.com/index.php/fr/news/item/166-dtbat-system-evaluation

Apart from the few dedicated scientific studies demonstrating a reduction in bat fatalities when employing curtailment (largely onshore) which highlight the importance of adaptive curtailment mitigations, there are few publicly available studies which demonstrate curtailment effectiveness post-construction at offshore wind farms. For example, Hooker *et al*. (2025) demonstrates through a desk-based literature review and engagement with international and national projects; the evidence gaps relating to bats occurring offshore, the importance of the effort to collect data at pre- and post-construction phase of offshore wind farms; the need for published guidance; collaboration with experts and industry; and data modelling.

In line with the above recommendations set out by Hooker *et al*. (2025), the Applicant remains committed to the future monitoring across all phases of the Project, as outlined in EIAR chapter 31: Bats in the Marine Environment (EIAR volume 2C), to continue to collect data on potential bat migration activity in the Irish Sea. This will inform future adaptive curtailment mitigation or other mitigation solutions when presented through industry best practice guidance, should potential impacts on migrating bats be identified.

A similar approach has been taken for the North Sea I area (Brinkløv and Elmeros, 2024), whereby pre-investigations of bats in the offshore area have been conducted from Passive Acoustic Monitoring (PAM stations) on buoys, on wind turbines, and on survey vessels to collect information during the bat migration periods to adapt effective mitigation measures during the operational phase.

The are no changes to the residual effects outlined in EIAR chapter 31: Bats in the Marine Environment (EIAR volume 2C).

31.10.4 Future monitoring

In response to RFI 14.D, results associated with the bat monitoring scheme proposed during the pre-construction, construction, and operational and maintenance phases of the Project will be shared with the Isle of Man government – Department of Environment, Food and Agriculture (DEFA) and the Manx Bat Group, once available.

31.11 Cumulative Impact Assessment (CIA)

31.11.1 Methodology

An updated Cumulative Impact Assessment is provided in volume 2A Addendum, appendix 3-2: Cumulative Impact Assessment Report. Based on the current baseline for the Project as outlined in section 31.7.3, no bats were recorded offshore. The cumulative assessment therefore concludes that there is no potential for significant cumulative effects to Bats in the Marine Environment.

In response to RFI 14.D, Mooir Vannin wind farm was considered in the Cumulative Impact Assessment but was scoped out at Stage 1 (see EIAR volume 2A, appendix 3-1: Cumulative Impact Assessment Screening Annex). In the updated assessment included in appendix 3-2: Cumulative Impact Assessment Report (EIAR volume 2A Addendum), it is also screened out from assessment i.e. there is no change to the assessment or conclusions presented in EIAR chapter 31: Bats in the Marine Environment (EIAR volume 2C).

31.11.2 Assessment of significance

Disturbance/ ultrasonic emission interference - operational and maintenance phase

Emission interference – foraging success during migration

Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Emission interference – navigation

Common pipistrelle, soprano pipistrelle, Nathusius' pipistrelle, Leisler's bat, brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Injury and/or fatality - operational and maintenance phase

Barotrauma

Nathusius' pipistrelle

In response to RFI 14.A, the cumulative assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to Nathusius' pipistrelle during migration is predicted to be **not significant**.

Common pipistrelle, soprano pipistrelle, and Leisler's bat

In response to RFI 14.A, the cumulative assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to common pipistrelle, soprano pipistrelle and Leisler's bat during migration is predicted to be **not significant**.

Brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Collision with rotors

Nathusius' pipistrelle

In response to RFI 14.A, the cumulative assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to Nathusius' pipistrelle during migration is predicted to be **not significant.**

Common pipistrelle, soprano pipistrelle, and Leisler's bat

In response to RFI 14.A, the cumulative the assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential injury and/or fatality to common pipistrelle, soprano pipistrelle and Leisler's bat during migration is predicted to be **not significant**.

Brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

Alteration of migration routes - operational and maintenance phase

Nathusius' pipistrelle

In response to RFI 14.A, the cumulative assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential alteration of Nathusius' pipistrelle migration routes is predicted to be **not significant**.

Common pipistrelle, soprano pipistrelle, and Leisler's bat

In response to RFI 14.A, the cumulative assessment of significance has been reviewed in light of the most recent baseline surveys detailed in section 31.7.3. As no bats were recorded offshore during the boat-based surveys, the assessment of the potential alteration of common pipistrelle, soprano pipistrelle and Leisler's bat migratory routes is predicted to be **not significant**.

Brown long-eared bat and Daubenton's bat

The are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.11.3 Mitigation and residual effects

31.12 Transboundary effects

In response to RFI 14.D, it is noted that the Bats in the Marine Environment Study Area also extends into the jurisdiction of the Isle of Man, in addition to the UK and Northern Ireland. However, the potential effects of the Project on Bats in the Marine Environment are considered to be not significant. Therefore, there is no potential for significant transboundary effects with regard to Bats in the Marine Environment from the Project upon the interests of the Isle of Man, UK or other EEA States.

31.13 Interactions

There are no changes to EIAR chapter 31: Bats in the Marine Environment.

31.14 Summary of impacts, mitigation measures and residual effects

Table 31A-6 presents an updated summary of the potential impacts, mitigation measures and residual effects in respect bats in the marine environment. Changes are shown in blue text.

Table 31A-6: Summary of potential environment effects, mitigation and monitoring.

Potential impact	Phase C	Phase O	Phase D	Measures included in the Project	Extent	Magnitude	Duration	Timing/Frequency	Reversibility	Significance of effect	Mitigation measures	Residual effect	Proposed monitoring
Disturbance - ultrasonic emission interference	×	✓	×	N/A	~~Unknown~~ Based on the current baseline, no bats.	A reduction in feeding success	Operational lifetime of the Project (40 years).	Operational turbine parameters defined in EIAR volume 2A, chapter 5: Project Description.	~~Reversible~~ n/a	Not significant	None	None	None
Injury and/or fatality – (Nathusius' pipistrelle, common pipistrelle, soprano pipistrelle, and Leisler's bat)	×	✓	×	N/A	~~Unknown~~ Based on the current baseline, no bats.	Potential injury and/or fatality of an unknown numbers of bats during migration	Operational lifetime of the Project (40 years).	Operational turbine parameters defined in EIAR volume 2A, chapter 5: Project Description.	~~Potentially irreversible~~ n/a	~~Significant~~ Not significant	Turbine curtailment criteria will be established based on a combination of conditions (i.e. ideal conditions for bats) to stop or slow down the turbines during peak bat migration periods. Bat data will be collected at the lowest blade tip height and at the nacelle height, and upon agreement with the NPWS, an adjustment to the curtailment criteria may be made based on the results of bat migration records during the first year of operation. Static bat detectors will be re-deployed evenly across the 25 wind turbine offshore wind farm area. Upon agreement with the NPWS, static detector survey results from year one and year two will be used as an average to update the curtailment criteria, and no further acoustic surveys will be undertaken. Another survey may be useful to check any changes in bat migration after several years.	None	A competent and experienced Ecologist shall be appointed to ensure that the mitigation measures and monitoring scheme are implemented in full. Bat data collection will be undertaken pre and post construction at five locations across the offshore wind farm area. An annual detailed report will be submitted to the NPWS for discussion
Injury and/or fatality (Brown long-eared bat and Daubenton's bat)	×	✓	×	N/A	~~Unknown~~ Based on the current baseline, no bats.	Potential injury and/or fatality of an unknown numbers of bats during migration	Operational lifetime of the Project (40 years).	Operational turbine parameters defined in EIAR volume 2A, chapter 5: Project Description.	~~Reversible~~ n/a	Not significant	None	None	None

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