61253

Environmental Impact Assessment Report

Cummeennabuddoge Wind Farm

Chapter 8: Biodiversity (Resubmitted)

Cummeennabuddoge Wind (DAC)

March 2026

Contents

8 Biodiversity 1

8.1 Introduction 1

8.1.1 Project Team 1

8.2 Methodology and Approach 3

8.2.1 Desktop and Field Survey 3

8.2.2 Legislation and Guidance 3

8.2.3 Policy 3

8.2.4 Consultation 3

8.2.5 Methodology 4

8.2.6 Definitions and Criteria 11

8.3 Baseline Conditions 14

8.3.1 Desk study 14

8.3.2 Field surveys 18

8.3.3 Ecological Features Brought Forward for Further Assessment 22

8.3.4 Do-nothing scenario 25

8.4 Assessment of Effects 25

8.4.1 Assessment of Effects Pre Mitigation 25

8.4.2 Mitigation Measures 29

8.4.3 Assessment of Effects Post Mitigation 36

8.4.4 Residual effects 39

8.5 Cumulative Effects 39

8.6 Summary and Statement of Significance 42

8.7 References 44

Appendices 48

Annexure A: Ecological KCC and CCC LDP Objectives 48

Annexure B: Marsh Fritillary Habitat Condition Assessment Methodology 55

Contents

Tables

Table 8-1: Consultation 4
Table 8-2: Criteria for Determining Bat Activity Levels 7
Table 8-3: Conservation status of Bat Species in Ireland 8
Table 8-4: Valuation of Sites & Foraging Areas/Commuting Routes 8
Table 8-5: Statutory designated sites for non-avian interests within 10km of the Site 15
Table 8-6: Predicted habitat loss for habitats brought forward for assessment 26
Table 8-7: Cumulative Wind Farm Developments 40
Table 8-8: Cumulative non-Wind Farm Developments 40
Table 8-9: Summary of Significant Effects 42

Figures

Figure 8-1: Designated Sites
Figure 8-2a – 8-2e: Habitat Mapping
Figure 8-3: Invasive Species
Figure 8-4: Kerry Slug
Figure 8-5: Bat Static Detector Locations
Figure 8-6a – 8-6d: Aquatic Sampling Locations
Figure 8-7a – 8-7c: Electrofishing and Freshwater Pearl Mussel Survey Results
Figure 8-8a – 8-8e: Habitat Management Plan

List of Technical Appendices

Technical Appendix 8-1: Terrestrial Ecology
Technical Appendix 8-2: Bat Surveys
Technical Appendix 8-3: Aquatic Ecology and Fish Surveys
Technical Appendix 8-4: Habitat Management Plan
Technical Appendix 8-5: Kerry Slug Method Statement
Technical Appendix 8-6: Habitat Review
RFI Report Technical Appendix Q: 2026 Kerry Slug Survey
RFI Report Technical Appendix S: 2024 Habitat Survey
RFI Report Technical Appendix T: 2024 Bat Activity Survey

Glossary of Terms

Term	Definition
The Applicant	Cummeennabuddoge Wind Designated Activity Company (DAC)
The Agent	Atmos Consulting Limited
Environmental Advisors and Planning Consultants	Atmos Consulting Limited
Environmental Impact Assessment	A means of carrying out, in a systematic way, an assessment of the likely significant environmental effects from a development
Environmental Impact Assessment Regulations	Schedule 6 of the Planning and Development Regulations 2001(as amended)
Environmental Impact Assessment Report	A document reporting the findings of the EIA and produced in accordance with the EIA Regulations
The Proposed Development	Cummeennabuddoge Wind Farm
The Proposed Development Site	The land enclosed by the red line shown on Figure 1-1a
The Planning Act	Directive 2011/92/EU (as amended by Directive 2014/52/EU, the EIA Directive).

List of Abbreviations

Abbreviation	Description
BAP	Biodiversity Action Plan
BMWP	Biological Monitoring Working Party
BPpH	Bat Passes per Hour
CDP	County Development Plans
CEMP	Construction Environmental Management Plan
CIEEM	Chartered Institute of Ecology and Environmental Management
CTMP	Construction Traffic Management Plan
ECoW	Ecological Clerk of Works
EIA	Environmental Impact Assessment
EIAR	Environmental Impact Assessment Report
FBA	Freshwater Biological Association
FPM	freshwater pearl mussel
FPO	Flora (Protection) Order
EMP	Environmental Management Plans
HMP	Habitat Management Plan
IAS	Invasive Alien Species
IEF	Important Ecological Features
IFI	Inland Fisheries Ireland
INNS	Invasive Non-Native Species
MWP	Malachy Walsh & Partners
NBAP	National Biodiversity Action Plan
NBDC	National Biodiversity Data Centre
NHA	Natural Heritage Area

Abbreviation	Description
NVC	National Vegetation Classification
PC	Principal Contractor
pNHA	Proposed Natural Heritage Area
PMP	Peat Management Plan
SAC	Special Area of Conservation
SHD	Strategic Housing Development
SID	Strategic infrastructure development
SWMP	Surface Water Management Plan
SuDS	Sustainable Urban Drainage System
SQE	Suitably Qualified Ecologist
ZoI	Zone of Influence

8 Biodiversity

8.1 Introduction

An Coimisiún Pleanála (ACP) requested that the biodiversity assessments submitted as Chapter 8: Biodiversity in the 2024 Environmental Impact Assessment (EIA) Report for the proposed Cummeennabuddoge Wind Farm be resubmitted detailing potential significant effects (direct and indirect) in the absence of mitigation to allow for assessment of effects and analysis of likely effectiveness of mitigation. **Error! Reference source not found.**

Although guidelines for Ecological Impact Assessment in the UK and Ireland produced by the Chartered Institute of Ecology and Environmental Management (CIEEM) (2018[1]) represent best industry practice and state that it is only essential to assess and report significant residual effects that remain after mitigation measures have been taken into account, following ACP comment on the planning application, an assessment of effects both in the absence of mitigation and as residual effects following implementation of mitigation, is provided herein.

This resubmitted chapter of the Environmental Impact Assessment Report (EIAR) describes and evaluates the baseline ecological value of the Proposed Development in relation to terrestrial and aquatic habitats, and non-avian animal species. It has been updated to account for new information in relation to Kerry slug, habitats and bats gathered from updated surveys in 2024 and 2026, as described in Section 8.2.5 and included in the Request for Further Information document as Technical Appendix Q (2026 Kerry slug Survey), Technical Appendix S (2024 Habitat Survey)and Technical Appendix T (2024 Bat Activity Survey). All other accompanying figures and appendices are as per the original EIAR chapter and have not been re-submitted.

The Proposed Development Site ("the Site") is defined as the red line boundary which includes the site access, turbines and infrastructure, grid route to Ballyvouskill, and turbine delivery route.

This chapter of the EIAR comprises results of terrestrial and aquatic ecological baseline surveys and desk-based studies undertaken between 2019-23 for the Proposed Development. Technical Appendices 8.1 – 8.6 should be read in conjunction with this document.

8.1.1 Project Team

The contributors to the baseline ecology surveys and chapter are listed in this section.

Stephen McNee BSc, MSc, ACIEEM is an experienced ecologist having worked in the consultancy sector for over 14 years. He has worked on a range of transport and power projects across the UK, and for the last 4 years he has been working almost exclusively

[1] CIEEM (2018, as amended). Guidelines for Ecological Impact Assessment in the UK and Ireland. Chartered Institute for Ecology and Environmental Management.

on wind farm developments. He has written several EIAR chapters including several for Atmos Consulting and is currently working as a Principal Ecologist.

Malachy Walsh and Partners

Malachy Walsh & Partners (MWP) undertook all baseline surveys for the proposed wind farm with the exception of the Kerry Slug *Geomalacus maculosus* Method Statement which was compiled by APEM (Technical Appendix 8-5). The ecologists from MWP also prepared the baseline reports.

Ms Monica Kane acted as the Project Manager for MWP overseeing the survey work and report production. Monica is experienced in a range of coastal and land based infrastructural and energy projects with a particular focus on wind energy.

Mr. Pat Ryan (Senior Ecologist) and Mr Gerard Hayes (Senior Aquatic Ecologist wrote the baseline ecology reports for the survey work carried out by MWP. Pat is experienced in standard field survey methodologies for birds, ground mammals, bats, and invertebrates. He has conducted a significant number of preliminary bat roost and bat activity surveys.

Gerard has over 15 years' experience in environmental consultancy. He is a member of Chartered Institute of Ecology and Environmental Management (MCIEEM) and Freshwater Biological Association (FBA) and is certified with FBA accreditation.

APEM

Owen Twomey carried out the ecological surveys and prepared the associated report on behalf of APEM. Owen holds a BSc (Hons) Environmental Science with a major in Zoology and a Postgraduate Diploma (PgDip) in Ecological Assessment from University College Cork. Owen has worked in ecological consultancy since 2016 and his specialist areas are mammal surveys, habitat survey, mapping and classification; ecological impact assessment; appropriate assessment; and geographical information systems.

Dr Michael Dobson is an Associate Director with APEM. He holds a BSc (Hons) in Biology from the University of Southampton and a PhD is freshwater ecology from the University of London (Queen Mary College). Dr Dobson technically reviewed the report prepared by APEM.

AECOM

Nick Dadds is a Principal ecologist of 23 years' experience and oversaw the survey comprising the Habitat Review of 2024. His particular expertise is in ecological impact assessment, protected species and National Vegetation Classification (NVC). He has been responsible for high quality and well-received EIA and Natur-related assessments, as well as ecological mitigation and protected species licensing, for a variety of statutory and private clients. Projects he has been involved with range from largescale infrastructure and energy schemes (including wind farms, pipelines, power lines, transport projects and masterplan schemes) to conservation-related projects (including commissioned work for Scottish Natural Heritage).

8.2 Methodology and Approach

8.2.1 Desktop and Field Survey

Relevant planning policy is summarised in Chapter 5 Planning Policy and Development Context: this section focuses solely on policy/guidance which is relevant to non-avian Ecology.

8.2.2 Legislation and Guidance

The following are the key legislative provisions applicable to ecological receptors in Ireland:

- The EC Habitats Directive (Council Directive 92/43/EEC on the conservation of natural habitats and of wild fauna and flora) (transposed into Irish law via the Birds and Natural Habitats) Regulations 2011 as amended).
- The Convention on the Conservation of Migratory Species of Wild Animals (Bonn Convention 1979, enacted 1983).
- EU Water Framework Directive ('Directive 2000/60/EC of the European Parliament and of the Council of 23 October 2000 establishing a framework for Community action in the field of water policy').
- The Wildlife Acts 1976 to 2023.
- Planning and Development Act 2000 (as amended).
- Flora (Protection) Order (FPO), 2022.
- The European Communities Environmental Objectives (Surface Waters) Regulations 2009 (S.I. 272 of 2009) (as amended).

8.2.3 Policy

- The National Biodiversity Action Plan 2017-2021 (NBAP).
- All Ireland Pollinator Plan 2021-2025.
- Kerry County Development Plan 2022-2028:
- Kerry County Council's Biodiversity Action Plan, 2022-2028 (BAP).
- Cork County Development Plan 2022.
- County Cork Biodiversity Action Plan 2009-2014 (BAP).

Relevant policy from both the Kerry County Council and Cork County Council Development Plans considered in this EIAR is included in Annex A.

8.2.4 Consultation

The assessment process has been informed by consultation with ACP including the Scoping Opinion (August 2021) and responses after receipt of the Scoping Opinion. A summary of the key consultation responses relevant to non-avian Biodiversity is described in Table 8-1.

Table 8-1: Consultation

Consultee	Summary of Consultee Response	Applicant Response
Bat Conservation Ireland	All wind farm projects require a full bat survey according to best practice guidelines	Methodology shown in 8.2.5 Assessment and 8.3 Baseline sections. The approach used follows NatureScot guidance.
Cork County Council	• Confirmed approach is acceptable • Preference for grid connection to be underground • Suggested refence is made to Judicial Review overturning permission for Derryadd Windfarm (SID - APB) [2020 No. 5571	• The grid connection will be underground • with reference to the Judicial Review overturning Derryadd Windfarm (SID - APB) [2020 No. 557) turbines will be located within a specified range in accordance with the Derryadd judgment.
Department of Agriculture, Food and the Marine Environment	• Identified need for felling licence	A felling licence will be obtained and works undertaken as per Felling and Reforestation Policy
Inland Fisheries Ireland	• No physical interference with watercourses without consultation and no use of watercourses as mitigation measures • Protection of water courses during construction	• There will be no in-stream working • Protection of water courses during construction is described in 8.5. Detailed Project Description.
Kerry County Council - Environment Department	• Concern over water quality impacts • Discussion to be included at a pre-planning meeting	• Water Quality effects addressed in this chapter and Chapter 11 Hydrology, Water Quality and Flood Risk.
Waterways Ireland	No impact	n/a

The following organisations responded but did not provide material comments:

- National Parks and Wildlife Service Development Applications Unit.
- Environmental Protection Agency.
- An Taisce – National Trust for Ireland.
- Irish Wildlife Trust.

No response was received from the Irish Peatland Conservation Council.

8.2.5 Methodology

Best practice guidance and methodologies were used in the studies defining the ecological baseline conditions.

The study area used for different ecological features varies for those features dependent upon the survey methodology for those features. Details on specific study areas is contained with the within Desk Study and Field Surveys below.

The Zone of Influence (ZoI) is defined as the area where there is the potential for effects and can be analogous to study area. Further information is provided within the sections below.

Desk Study

The search area for the desk study was initially 10km from the Site. as shown in Figure 1.2, minus the eastern access track and grid route to Ballyvouskill, for to include these would extend the buffer disproportionately. A 10km search area was used to allow for species which use watercourses that have a hydrological connection to the Site.

Records of all protected and invasive alien species that are held by the National Biodiversity Data Centre (NBDC) for the 10km grid squares overlapping the study area were compiled and listed in Tables 2-5 in EIAR Technical Appendix 8-1: Terrestrial Ecology.

The initial search area was then reduced to a study area based on the presence of Important Ecological Features (IEFs) of potential relevance to this assessment.

Field surveys

For terrestrial habitats and species, the study area is regarded as the Site only. This is also regarded as the ZoI.

For most aquatic IEFs, the study area comprised watercourses within the Site and those downstream, within the receiving environment, as shown on EIAR Figure 8.6. The scope of aquatic surveys, beyond the Site, focused on accessible and representative areas of the Flesk catchment as that is the only such catchment potentially impacted by the Proposed Development included on the NPWS Margaritifera Sensitive Areas Map (NPWS, 2023). This Site and Flesk catchment comprise the maximum ZoI for aquatic IEFs.

The results of the desk study were used to inform the design of ecological surveys and ensure that all surveyors were cognisant of the potential presence of protected species within the study areas. Surveys were undertaken between April 2020 and July 2022, on dates included in brackets within the following EIAR Technical Appendices:

- EIAR Technical Appendix 8-1. Terrestrial Ecology (July 2021).
- EIAR Technical Appendix 8-2. Bats (April 2020 to September 2021).
- EIAR Technical Appendix 8-3. Aquatic Ecology (August 2020 to September 2021).
- EIAR Technical Appendix 8-5[2]. Method Statement for Kerry Slug *Geomalacus maculosus*.

In 2024 the Applicant commissioned the following additional studies from AECOM Ireland Limited:

- RFI Report Technical Appendix S: Habitat Report (March to May 2024).
- RFI Report Technical Appendix T: Bat Activity Survey (May to September 2024)

Updated Kerry Slug surveys were completed on site in January 2026 by APEM Group Woodrow, the results of which are presented in Technical Appendix Q of the RFI Report.

[2] Technical Appendix 8-4 is the Habitat Management Plan and is not listed here as it is not a baseline survey report.

The associated Regulation 54 derogation application is provided as Technical Appendix R of the RFI Report.

Habitats

The Site was walked on July 12th, 2021, by MWP ecologists. Weather conditions were overcast, with intermittent mist and rain with a calm breeze. The temperature was 20°C. The purpose of the survey was to describe the habitats within the Site and is based on accepted standard practice and methods. Habitats within the Site were classified after '*A Guide to Habitats in Ireland*' (Fossitt, 2000) based on the dominant plant species as recorded in the field surveys.

Incidental sightings or evidence of birds, mammals or amphibians were also noted during the habitat survey and habitats within the Site were evaluated for their potential to support protected species.

On completion of the survey the habitats were mapped using desk-based GIS software, namely ArcMap (10.6) which was also used to calculate habitat areas and lengths. (Figure 8-2).

The 2024 habitat survey (Technical Appendix S of the RFI Report) encompassed land within 250 m of proposed turbine locations and 100 m of proposed access tracks. Previously mapped habitats were compared with the current habitats (in March 2024), and any differences noted. This Technical Note uses the Fossitt habitat system (Fossitt, 2000) as used during the original survey and commonly used throughout Ireland. In addition to referring to the original habitat mapping, this survey also referred to recent aerial photography to aid identification and separation of vegetation patches. Field notes were recorded in ESRI FieldMaps on a GPS-enabled tablet pre-loaded with aerial photography, to maximise accuracy.

Terrestrial Mammals

Targeted mammal surveys included checking for evidence of activity such as prints, droppings, burrow-holes, dens and food caches, activity trails, disturbed vegetation, and direct visual observations in suitable breeding and foraging habitats. Surveys for protected mammals followed the methodology outlined in Chanin (2003), The surveys included searches for evidence of activity such as prints, droppings, burrow-holes, dens and food caches, activity trails, disturbed vegetation, and direct visual observations in suitable breeding and foraging habitats.

Bats

In the 2020-21 surveys, static bat detectors were deployed as close to turbines locations as possible. On three occasions during April – September in 2020 and for a further three occasions during May – September 2021. An additional detector was deployed in 2021 to provide better coverage as a result of minor design changes since 2020. See Technical Appendix 8-2 and Figure 8-5 for further information. Full spectrum bat detectors (Wildlife Acoustics Song Meter SM4 BAT-FS detectors were used). Detectors were set up to record activity from 30 minutes before sunset to 30 minutes after sunrise for a period of at least 10 nights for each visit, as per NatureScot 2021.

Sonogram Analysis of full spectrum WAV files was undertaken using the Kaleidoscope Pro Auto ID feature for the data collected in 2020 and AnalookW v4.4a with the assistance of bespoke species filters (using zero cross outputs) for 2021 data.

In the absence of detailed survey methods or mitigation strategies with regards to wind energy developments in Ireland at the time, the 2024 bat activity surveys (Technical Appendix T of the RFI Report) followed the most recent guidance for bats and onshore wind turbines published in the UK: Bats and onshore wind turbines – survey, assessment and mitigation (NatureScot, 2021). This guidance is implemented across the UK as best practice, including in Northern Ireland, where the Northern Ireland Environment Agency (NIEA) prepared Guidance on Bat Surveys, Assessment and Mitigation for Onshore Wind Turbine Developments in Northern Ireland (NIEA, Natural Environment Division, 2024). The NatureScot guidelines recommend that for wind energy developments comprising up to ten turbines, static bat detectors be deployed at each proposed turbine location. For developments comprising more than ten turbines, the NatureScot guidance recommend that static bat detectors be deployed at ten turbine locations plus a third of other turbine locations, up to a maximum of 40 locations.

Static bat detectors (SM4) and Song Meter Mini2 ('SM Mini') (both Wildlife Acoustics Inc.) were deployed nearby the locations of twelve of the seventeen proposed wind turbines for the Proposed Development, as shown in Technical Appendix T of the RFI Report; Figure 1. The static detectors were distributed according to a system of stratified sampling based on the availability of different habitats and topographical features on the Site in line with NatureScot guidance (2021). Detectors were timed to start recording 30 minutes before sunset and finish recording 30 minutes after sunrise for each day they were deployed. Static detectors were left remote for at least ten nights and were then collected and redeployed in the following season with fresh memory cards and batteries. As such, twelve static detectors were deployed for ten consecutive nights (selecting nights with the best weather) on three occasions between May and September 2024. The static detectors were deployed in May/June 2024 for the beginning of the spring monitoring period, in July 2024 for the summer monitoring period, and in September 2024 for the autumn monitoring.

To allow comparison of activity levels between static detector locations, data was transformed to Bat Passes per Hour (BPpH) by dividing the total number of bat passes recorded at each static location by the total number of hours for which the unit was operational.

As the Ecobat bat activity level assessment tool is off-line, and has been for some time, a bespoke assessment methodology was employed. For ease of examination, three arbitrary levels were created to provide a context in which to discuss the results. Table 8-2 indicates the levels of activity required to be considered to be "low", "medium" or "high" activity. These criteria have been developed by Atmos Consulting based on over 6 years working on multiple upland windfarm projects. It should be recognised that in the context of bat activity across wider landscapes these activity brackets are all relatively low as would be expected for a site at this altitude supporting upland habitats.

Table 8-2: Criteria for Determining Bat Activity Levels

Activity Level	Number of bat passes per hour [1]
Low	< 2
Medium	2 – 5
High	> 5

[1] A bat pass is classified as the presence of a species within a single WAV file.

The index of bat activity was taken to be a sonogram file (maximum length of 15 secs) recorded from the static detectors. Although this is to some degree an arbitrary measure, the activity levels are comparable across detectors and is a frequently used index (Collins, 2016). For the purpose of this report each file containing a call from a species is termed a 'pass'. Data is then converted to passes per hour adjusting for location specific night-time duration (sunset to sunrise) and days of deployment (adjusted to each detectors period of functioning).

Assessment Criteria for Bats

The nature conservation value of the bat population of the Site is based upon a geographic hierarchy of importance based on the conservation status of Irish bat species (Marnell *et al.,* 2009) (Table 8-3) and the approach used in Wray *et al*. (2010) (see Table 8-4).

Table 8-3: Conservation status of Bat Species in Ireland

Species	Irish Status (Marnell *et al.* 2009)
Daubenton's bat *Myotis daubentonii*	Least concern
Whiskered bat *Myotis mystacinus*	Least concern
Natterer's bat *Myotis nattereri*	Least concern
Leisler's bat *Nyctalus leisleri*	Near Threatened
Common pipistrelle *Pipistrellus pipistrellus*	Least concern
Soprano pipistrelle *Pipistrellus pygmaeus*	Least concern
Nathusius'pipistrelle *Pipistrellus nathusii*	Least concern
Brown long-eared bat *Plecotus auritus*	Least concern
Lesser horseshow bat *Rhinolophus hipposideros*	Least concern

As listed in Table 8-3 Leisler's bats are considered Near Threatened, while all other species are categorised as Least Concern. Wray *et al*. regards a population range of between 10,000 to 100,000 as a *Rarer* population. Rarer is thus considered an appropriate categorisation for Leisler's bat in Ireland based on a 20.000+ population estimate for Ireland (Vincent Wildlife Trust, 2023). In the context of the Proposed Development other species listed in Table 8-4 are categorised as *Common*, following the Wray *et al.* (2010) approach.

Table 8-4 is adapted from Wray *et al*. (2010) and summarises the method for scoring foraging habitat and commuting features after considering the conservation status, the number of bats recorded, and the occurrence or potential occurrence of roosts.

Table 8-4: Valuation of Sites & Foraging Areas/Commuting Routes

Score	Species	Score	Number of bats	Score	Roosts/ potential roosts nearby	Score	Foraging habitat characteristics
							Type and complexity of linear features
2	Common	5	Individual bats	1	None	1	Site without established vegetation e.g., urban
						1	Absence of (other) linear features
				3	Small number	2	Suburban areas or intensive agriculture

						2	Unvegetated fences and large field sizes
5	Rarer	10	Small number	4	Moderate number or not known	3	Isolated woodland, less intensive agriculture etc
						3	Walls, with many gaps or flailed hedgerows, isolated well grown hedgerows, and moderate field sizes
				5	Large number or close to protected areas for bats	4	Large, connected woodland blocks, mixed agriculture etc
						4	Well-grown and well-connected hedgerows, small field sizes)
20	Rarest	20	Large number	20	Close to or within SAC for bats	5	Mosaic of pasture, woodlands, and wetlands
						5	Complex network of mature well-established hedgerows, small fields, and rivers/streams

Importance	Score
International	>50
National	41-50
Regional	31-40
County	21-30
Local	11-20
Not important	1-10

Kerry slug

Kerry slug surveys within the Site were carried out under licence in August – September 2021 by MWP in support of the preparation of the EIAR for the proposed wind farm development. These surveys consisted of live refuge trapping and hand searching for Kerry slug under licence. Five traps were set out at eight different locations where stone outcropping occurred within the Site. Hand searching was carried out in tandem with the metric outcrop trapping. The survey methods are described in detail in Technical Appendix 8-1.

Updated surveys were undertaken by APEM Group Woodrow in January 2026. As described in Technical Appendix Q of the RFI Report, two complementary methods were used in line with established best-practice guidance (NPWS, 2010; Reich *et al.*, 2012): live refuge trapping and timed hand searches. Incidental observations of Kerry Slug were also recorded. All survey work was carried out under NPWS licence DER-KERRY SLUG-2026-02, issued on 18 December 2025. Survey locations were selected to fall within the proposed works footprint.

Marsh Fritillary

Habitat Condition Assessment for marsh fritillary was carried out at areas of suitable habitat within the Site and recorded on a survey sheet designed to specifically for this

purpose. The methodology followed that of the National Biodiversity Data Centre's Marsh Fritillary Monitoring Scheme and is replicated in Annex 2.

Invasive Plant and Animal Species

Invasive Alien Species (IAS) - plants and animals – were noted if present during ecological survey work on the Site. The GPS location, size and area of infestation (Figure 8-3) was recorded. Focus was given to species listed on the Third Schedule of the European Union (Birds and Natural Habitats) (Amendment) Regulations 2021.

Amphibians and Reptiles

Amphibian and reptile surveys were scoped out due to a lack of suitable habitat within the Site, but incidental records were noted during other surveys.

Aquatic Ecology

Aquatic habitat assessment was carried out using the methodology given in the Environment Agency's '*River Habitat Survey in Britain and Ireland Field Survey Guidance Manual 2003*' (EA, 2003). The physical habitats of study sites were assessed in relation to macroinvertebrates using a method given by Barbour and Stribling (1991).

The results of the aquatic habitat survey were used in conjunction with documents that included '*Ecology of the Atlantic Salmon'* (Hendry and Cragg-Hine, 2003) to assess habitat suitability for salmonids at selected representative locations.

An electric fishing survey was carried out in the River Finn catchment under authorisation from the Department of Communication, Energy and Natural Resources under Section 14 of the Fisheries Act (1980) (Figure 8-7). The purpose of this survey was to assess fish populations present at selected locations on watercourses draining the proposed development. Locations were surveyed following the methodology outlined in the CFB guidance '*Methods for the Water Framework Directive - Electric Fishing in Wadable Reaches*' (CFB, 2008).

Semi-quantitative sampling of benthic macroinvertebrates, or aquatic insects, was undertaken at all river locations using kick-sampling (Toner *et al*., 2005) and hand-net sampling as per ISO 5667-3:2004: Water Quality – Sampling – Part 3: Guidance on the Preservation and Handling of Water Samples and ISO 7828: 'Water Quality – Methods of biological sampling – Guidance on Hand net sampling of aquatic benthic macro-invertebrates'.

NPWS issued a licence for MWP Ireland to undertake Freshwater pearl mussel *Margaritifera margaritifera* (No. C47/2021) survey. Surveys were carried out following the NPWS guidance Stage 1 and Stage 2 survey guidelines, Irish Wildlife Manuals, No. 12' (Anon, 2004). The areas surveyed were selected on the basis of accessibility (including safety), proximity to Site, watercourse size and coverage within the receiving environment. The study area extended up to 10km from the Proposed Development.

The following biotic indices were used to assess water quality:

- Quality Rating (Q) System.
- Biological Monitoring Working Party (BMWP).
- Average Score Per Taxa.
- EPT Index.

Two locations were assigned chemical status on a scale of High-Good-Moderate-Poor-Bad based on water quality standards given in Surface Water Regulations (DoEHLG, 2009),

Further information on methodologies is provided in Technical Appendix 8-3. Aquatic Ecology and Figure 8-6.

Limitations

There are not considered to be any limitations to any surveys as all were carried out at optimal times of year and there was no issue with access. Whilst there were differences between methods for analysis for bat static survey data between 2020 and 2021, only one year is required as per guidance (NatureScot, 2021) i.e. the 2021 data on which the assessment is based. The 2020 data is regarded as contextual information, supplementing the understanding of how bats use the Site.

Electrical fishing efficiency was reduced at some locations due to overhanging banks (Figure 8-7, locations 1 and 3), and entrapment of small fish between boulders at sampling locations 1 and 10. Water at some locations (locations 7, 8 and 9) was turbid which impacted visibility. Effort efficiency was not significantly affected however, and these aspects are not considered to be limiting. The streams were small and shallow, thus facilitating capture of fish by placement of dip nets across the full width of these channels.

8.2.6 Definitions and Criteria

The ecological evaluation and impact assessment approach used in this report is based on *Guidelines for Ecological Impact Assessment in the United Kingdom and Ireland* ("CIEEM guidelines") (CIEEM, 2018).

Important Ecological Features

Ecological features can be important for a variety of reasons and the rationale used to identify them is explained in the text. Importance may relate, for example, to the quality or extent of the site or habitats therein; habitat and/ or species rarity; the extent to which such habitats and/ or species are threatened throughout their range, or to their rate of decline.

Determining Importance

The importance of an ecological feature should be considered within a defined geographical context. The following frame of reference has been used in this case, relying on known/ published accounts of distribution and rarity where available, and professional experience:

- International (nature conservation designation, habitat, or populations of species of international importance, e.g., a Special Area of Conservation (SAC) or significant numbers of a designated population outside the designated site).
- National (nature conservation designation, habitat, or populations of species of Irish importance, e.g., a Natural Heritage Area (NHA), a nationally important population / assemblage of a European Protected Species and / or a species listed within the Wildlife Acts 1976 to 2021).

- Regional (habitat or populations of species which are important for Munster, e.g., a site / population that meets NHA designation criteria but has not been designated due to better examples being present in the regional area or a regionally important population.
- County (i.e., Kerry) (a population or habitat of a high conservation species which represent an important part of the county population of that species or habitat).
- Local (i.e., within 3km of the Site Boundary) (a nature conservation site including proposed NHAs, habitat, or species of importance in the local or district area.
- Less than local (common habitat or species of interest at the scale of the Site).

The above frame of reference is applied to the ecological features identified during the desk study and surveys to inform this report.

The value of habitats has been measured against published selection criteria where available. Examples of relevant criteria include descriptions of habitats and species listed on County Development Plans (CDP) for Cork and Kerry.

In assigning a level of value to a species, it is necessary to consider its distribution and status, including a consideration of trends based on available historical records. Reference has therefore been made to published lists and criteria where available. Examples of relevant lists and criteria include species of European conservation importance (as listed on Annexes II, IV and V of the Habitats Directive and within guidance, legislation and policy as listed in section 8.2.)

For the purposes of this report ecological features of Local level importance or greater and/or subject to legal protection have been subject to detailed assessment in accordance with the CIEEM (2018) guidelines. Effects on other ecological features are considered unlikely to be significant in legal or policy terms.

Impact Assessment

The impact assessment process involves the following steps in accordance with the CIEEM (2018) guidelines:

- identifying and characterising potential impacts and effects.
- incorporating measures to avoid and mitigate (reduce) these impacts and effects.
- assessing the significance of any residual effects after mitigation.
- identifying appropriate compensation measures to offset significant residual effects (if required).
- identifying opportunities for ecological enhancement.

When describing impacts and effects, reference has been made to the following characteristics, as appropriate:

- Positive or negative
- Extent
- Magnitude
- Duration
- Timing
- Frequency

- Reversibility

The impact assessment process considers both direct and indirect impacts: direct ecological impacts are changes that are directly attributable to a defined action, e.g., the physical loss of habitat occupied by a species during the construction process. Indirect ecological impacts are attributable to an action, but which affect ecological resources through effects on an intermediary ecosystem, process, or feature, e.g., the creation of roads which cause hydrological changes, which, in the absence of mitigation, could lead to the drying out of peatland of groundwater dependant habitats.

Consideration of conservation status is important for evaluating the effects of impacts on individual habitats and species and assessing their significance:

- Habitats – conservation status is determined by the sum of the influences acting on the habitat that may affect its extent, structure, and functions as well as its distribution and its typical species within a given geographical area.
- Species – conservation status is determined by the sum of influences acting on the species concerned that may affect its abundance and distribution within a given geographical area.

Significant Effects

The EIAR was prepared in line with the EPA (2022) "Guidelines on the Information to be Contained in Environmental Impact Assessment Reports". The concept of ecological significance is addressed in paragraphs 5.24 through to 5.28 of CIEEM guidelines. Significance is a concept related to the weight that should be attached to effects when decisions are made. For the purpose of EcIA, a 'significant effect' is an effect that either supports or undermines biodiversity conservation objectives for 'important ecological features' or for biodiversity in general. Conservation objectives may be specific (e.g., for a designated site) or broad (e.g., national/local nature conservation policy) or more wide-ranging (enhancement of biodiversity). Effects can be considered significant at a wide range of scales from international to local and the scale of significance of an effect may or may not be the same as the geographic context in which the feature is considered important.

Cumulative Effects

Cumulative effects can result from individually insignificant but collectively significant actions taking place over a period of time or concentrated in a location. Cumulative effects can occur where a proposed development results in individually insignificant impacts that, when considered in-combination with impacts of other proposed, permitted or existing plans and projects, can result in significant effects.

The area of search for cumulative assessment is 10km and is based on all information accessible from sources listed in the Cumulative assessment section (8.6.4).

Given the dependence of some species included within this assessment upon riverine systems a 10km area of search is considered appropriate. Both wind farm and non-wind farm developments were considered in the planning search.

Avoidance, Mitigation, Compensation and Enhancement

When seeking mitigation or compensation solutions, efforts should be consistent with the geographical scale at which an effect is significant. For example, mitigation and compensation for effects on a species population significant at a county scale should ensure no net loss of the population at a county scale. The relative geographical scale at which the effect is significant will have a bearing on the required outcome which must be achieved.

Where potentially significant effects have been identified, the mitigation hierarchy has been applied, as recommended in the CIEEM Guidelines. The mitigation hierarchy sets out a sequential approach beginning with the avoidance of impacts where possible, the application of mitigation measures to minimise unavoidable impacts and then compensation for any remaining impacts. Once avoidance and mitigation measures have been applied residual effects are then identified along with any necessary compensation measures, and incorporation of opportunities for enhancement.

It is important for the EcIA to clearly differentiate between avoidance, mitigation, compensation and enhancement and these terms are defined here as follows:

- Avoidance is used where an impact has been avoided, e.g., through changes in scheme design.
- Mitigation is used to refer to measures to reduce or remedy a specific negative impact in situ.
- Compensation describes measures taken to offset residual effects, i.e., where mitigation in situ is not possible or does not fully address the effect.
- Enhancement is the provision of new benefits for biodiversity that are additional to those provided as part of mitigation or compensation measures, although they can be complementary.

8.3 Baseline Conditions

8.3.1 Desk study

Statutory Designated Nature Conservation Sites

Designated sites for non-avian interests within 10km of the Site were included in the study area and are shown in Table 8-5.

Five designated sites are present all of which are Special Areas of Conservation (SACs). The closest *are Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC* and *Mullaghanish Bog SAC* which intersect the Site on the northern and southern boundaries respectively.

For designated sites relating to ornithology see EIA Chapter 9: Ornithology.

Distances are based on the Proposed Development to designated site boundaries. As a result, the actual distance between Proposed Development infrastructure and a designated site is likely to be greater.

Table 8-5: Statutory designated sites for non-avian interests within 10km of the Site

Designated Site	Site Designation	Distance from the Site
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC*	Oligotrophic Waters containing very few minerals Oligotrophic to Mesotrophic Standing Waters Floating River Vegetation Wet Heath Dry Heath Alpine and Subalpine Heaths Juniper Scrub Calaminarian Grassland Molinia Meadows Blanket Bogs (Active)* Rhynchosporion Vegetation Old Oak Woodlands Alluvial Forests* Yew Woodlands* Kerry Slug (*Geomalacus maculosus*) Freshwater Pearl Mussel (*Margaritifera margaritifera)* Marsh Fritillary (*Euphydryas aurinia*) Sea Lamprey (*Petromyzon marinus*) Brook Lamprey (*Lampetra planeri*) River Lamprey (*Lampetra fluviatilis*) Twaite Shad (*Alosa fallax*) Atlantic Salmon (*Salmo salar*) Lesser Horseshoe Bat (*Rhinolophus hipposideros*) Otter (*Lutra lutra*) Killarney Fern (*Trichomanes speciosum*) Slender Naiad (*Najas flexilis*)	Adjacent, northern boundary Distance to nearest turbine is 0.17 km, distance to nearest infrastructure (track) is 0.03 km
Mullaghanish Bog SAC*	Blanket Bogs	0.67km from southern boundary Distance to nearest turbine is 1.51 km, distance to nearest infrastructure (cable trench) is 0.17 km
St. Gobnet's Wood SAC*	Old Oak Woodlands	4km south
Blackwater River (Cork/Waterford) SAC*	Estuaries Tidal Mudflats and Sandflats Perennial Vegetation of Stony Banks Salicornia Mud Atlantic Salt Meadows Mediterranean Salt Meadows Floating River Vegetation Old Oak Woodlands Alluvial Forests* Freshwater Pearl Mussel White-clawed Crayfish (*Austropotamobius pallipes*)	4km northeast

Designated Site	Site Designation	Distance from the Site
	Sea Lamprey Brook Lamprey River Lamprey Twaite Shad Atlantic Salmon Otter Killarney Fern	
*Also considered a Proposed Natural Heritage Area (pNHA)		

There is no hydrological connection between the Mullaghanish Bog SAC and the Proposed Development, for the SAC is upslope of the latter. Given the upslope location and distance, secondary effects - in the form of habitat drying or dust deposition – are considered unlikely. As such, this SAC is not considered further.

There is no functional connection between the Site and the Old Oak Woodlands St. Gobnet's Wood SAC; a designated site which is not sensitive to potential impacts and effects of a wind farm development. The nature of the development is such that it will not result in impacts and effects that this habitat is sensitive to. As such, this SAC is not considered further.

The hydrological studies have indicated that the water environment on Site drains entirely north westwards into the River Flesk catchment. Blackwater River (Cork / Warterford) is located 6km northeast, therefore there is no connectivity to the Site. This SAC is therefore screened out from further assessment due to lack of connectivity and distance.

There is a hydrological connection running north from two streams passing from the Proposed Development into the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. In the context of the potential impact pathway to the SAC it is considered of International value.

Whilst there is a possible hydrological connection from the Proposed Development into the Blackwater River (Cork/Waterford) SAC the distance of the designated site (6km northeast) means that it is considered as a Regional value receptor in the context of potential impact pathways.

Non - Designated Nature Conservation Sites

Prohus Wood pNHA is located 9.6km southeast of Proposed Development. This site is a very young wood derived due to clearance about forty years ago (1986) and not considered further based on a lack of functional ecological connectivity given its distance from the Proposed Development.

Species Records

The following species records were obtained from the NBDC for 10 km grid squares covering the Site (W18 and W28). Data was obtained in September 2021 and checked again in September 2023. Conservation status is included in brackets.

- Common frog (*Rana temporia*) (Habitats Directive [92/42/EEC] Annex V[3]. The Wildlife Acts 1976 to 2023).
- Clubmoss (*Huperzia selago*) (Habitats Directive [92/42/EEC] Annex V).
- Kerry slug (Habitats Directive [92/42/EEC] Annex I, Annex IV. Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix I. The Wildlife Acts 1976 to 2023).
- Badger (*Meles meles*) (The Wildlife Acts 1976 to 2023).
- Otter (Habitats Directive [92/42/EEC] Annex II, Annex IV. Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix II. Convention on Trade in Endangered Species of Wild Fauna and Flora (CITES) Appendix I. The Wildlife Acts 1976 to 2023).
- Pine marten (*Martes martes*) (Habitats Directive [92/42/EEC] Annex V. Convention on the Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix III. The Wildlife Acts 1976 to 2023).
- Red Deer (*Cervus elaphus*) (The Wildlife Acts 1976 to 2023).
- Red Squirrel (*Sciurus vulgaris*) (Conservation of European Wildlife and Natural Habitats (Bern Convention) Appendix III. The Wildlife Acts 1976 to 2023).

The following Invasive Alien Species (IAS) records were obtained from the NBDC for grid squares covering the Site (W18 and W28).

- Cherry Laurel (*Prunus laurocerasus*)
- Japanese Knotweed (*Reynoutria japonica*)
- Rhododendron (*Rhododendron ponticum*)
- Sycamore (*Acer pseudoplatanus*)f
- American Mink (*Mustela vison*)
- Bank Vole (*Myodes glareolus*)
- Rabbit (*Oryctolagus cuniculus*)
- Sika Deer (*Cervus nippon*).

Further information on species records, including dates and datasets and legally protected status, is included in Technical Appendix 8-1.

The desk-top results informed field surveyors as to possible presence and helped to target survey effort. However, the existence of records does not constitute an IEF within the assessment if those IEFs were not found during the ground-truthing provided by surveys. The 10km grid square is considered suitable on a precautionary basis as it includes IEFs that *may* be present, however the large size may provide records which are not relevant to the Site. The records are used as a guide as to what may be present and inform the ground-truthing provided by the surveys.

Invasive Alien Species are included as a guide to inform best practice working methods and mitigation immediately prior to, and during construction. Further information on these methods included in section 8.5 and the HMP (Technical Appendix 8-4).

[3] Animal and plant species of Community interest whose taking in the wild and exploitation may be subject to management measures.

8.3.2 Field surveys

Habitats

The habitats listed below are all evaluated as being of Local Importance or greater. Habitats evaluated as less than Local Importance are described in EIAR Technical Appendix 8-1 (2020-21 surveys) and are included on EIAR Figure 8-2.

The full results of the update habitat survey were reported in September 2024 (AECOM, 2024); the report is appended to the Request for Further Information report as Technical Appendix S and includes habitat detail relevant to the assessment, notably the condition of habitats. The survey work concluded that there was little significant change in the types of habitats present in 2021 and 2024, with the main change primarily being the alteration, following clear-felling, of several large areas of mature plantation to very young recently planted commercial conifers. The survey assessed the condition of habitats, including the condition of Annex I H4010/HH3 wet heath, which was found to be variable across the site, as described below.

HH3 Wet Heath

The wet heath habitat present within the Site is fragmented and composed of functionally isolated remnants of this habitat mainly in poor condition. Wet heath, in a mosaic with rock outcropping and blanket bog is commonly occurring in the surrounding landscape. However, the wet heath habitat within the Site is surrounded by forestry plantation and it is likely that its hydrology has been altered as a result. While this habitat may still correspond floristically to the Annex I habitat 'Northern Atlantic wet heaths with *Erica tetralix* (4010)' it is not likely to function as such due to fragmentation and interruption of groundwater flows.

The 2024 survey confirmed that most of the wet heath comprises small patches / thin strips in poor condition. The only exception to this were locations in the proposed cable corridor, where wet heath near a broadleaved plantation woodland and a strip of wet heath adjacent to the curved historic track, which is fenced off from livestock, appeared to be in Favourable condition.

Wet heath habitat within the Site is evaluated as important at the County level, due to the abundance of this habitat in both Co. Cork and Co. Kerry, combined with the isolated and fragmented nature of the habitat within the Site. Given the fragmented nature of the wet heath on site and the general poor condition of the habitat, assigning County-level importance is done on a precautionary basis.

GS4 Wet grassland

Two small areas of this habitat type were recorded at bankside locations abutting the Clydagh River within the Site. This habitat, which was noted in the Cork Biodiversity Action Plan 2009-14, is rare within the Site, but common within the county. It is considered of Local value.

HH3 Wet Heath/PB2 Upland Blanket Bog

This habitat is considered a degraded form of PB2 Upland Blanket Bog as the mosaic including wet heath indicates drying out, from what was previously bog. It does not support significant peat-forming vegetation, and is therefore concluded to not be active bog. It is located on the access track, where 0.15ha will be lost. It is a habitat

noted in the Cork Biodiversity Action Plan 2009-14 and though rare upon the Site is common within the county. Given that it can potentially be restored to active bog it is considered of Local value.

PB4 Cutover bog

Present to the north of Lough Carrignamork and Lough Gall and also the southern slopes of Caherbarnagh and at other locations in the Clydagh Valley. It does not support significant peat-forming vegetation, and is therefore concluded to not be active bog. It is a habitat noted in the Cork Biodiversity Action Plan 2009-14 and is rare upon the Site. It is considered of Local value.

HH3/GS4 Wet heath/Wet grassland

Present as linear corridors along streams. It is a rare habitat locally but common within the county and considered of Local value.

HH3/GS3/GS4 Wet heath/Dry-humid acid grassland/Wet grassland

Given the Site is dominated by plantation/clear-fell this habitat is limited on Site. As such, it is considered of Local value.

WS1 Scrub

Isolated stands of willow scrub are distributed throughout the Site. It is likely to provide an important function in providing nesting and foraging opportunities. As such, it is considered of Local value in this context.

FW1 Eroding/ Upland Rivers

Approximately six first-order tributary streams of the Clydagh River rise within the Site flowing northwards. Another tributary of the Clydagh River rises within the Site and drains south/southwest passing close to the southwestern access point to the Site from the N22 National Primary Road. This habitat is noted in the Cork Biodiversity Action Plan 2009-14 and is therefore considered of Local value.

Habitat Review 2024

Overall, there is little significant change in the habitats from the previously mapped habitats. The largest changes are the alteration, following clear-felling, of several large areas of mature plantation to very young recently planted conifers. However, this has no impact on habitat value, since both young and mature non-native conifer plantation is unnatural and of negligible floristic interest. Some differences were noted for riparian vegetation alongside streams, including presence of some PF2 poor fen/flush and, locally, degraded PB2 upland blanket bog, however these differences are of little consequence given that they involve areas that are only very locally impacted by the proposed infrastructure.

Fauna (terrestrial)

Technical Appendices 8-1 Terrestrial Ecology, Technical Appendix S of the RFI Report (2024 Habitat Survey), Technical Appendix 8-2 Bats (2020-21) and Technical Appendix T of the RFI Report (2024 Bat Activity Survey) should be consulted with this section. The data on which evaluations of ecological importance are based, particularly in relation to bats, are contained within the relevant TA.

No potentially suitable habitat for marsh fritillary was recorded by surveyors during the habitat surveys and in line with standard practice no dedicated marsh fritillary surveys were therefore undertaken. The Site is not considered to support habitats forming part of the lifecycle for this species. This species is therefore not considered further.

Kerry Slug

Kerry slug was recorded within all eight transects surveyed within the Site in 2021, with a total of 88 individuals recorded in conifer woodland. As described in Technical Appendix Q of the RFI Report, the 2026 surveys confirmed the continued presence and active use of the area, with at least 23 individual Kerry slugs - potentially up to 31 individuals - recorded at four of the ten transects (near the proposed locations of Turbines 1, 5, 6 and 8), indicating continued use of a broad range of habitats within the Site.

As a resident or regularly occurring population of an animal listed in Annex II of the Habitats Directive and restricted in its range this species is evaluated as important at the National level.

Leisler's bat

Leisler's bat is listed in Annex IV of the Habitats Directive and the Wildlife Acts 1976 to 2023. Based on criteria set out in Table 8-3 and given that this species was the second most recorded during bat surveys in 2020-21 (7,312 passes in 2020, 4,846 passes in 2021), and the third-most recorded species in 2024 (2,047 passes), it is considered of Regional Importance.

Myotis species[4]

Daubenton's, Whiskered and Natterer's bat are *Myotis* species found in Ireland. All are listed in Annex IV of the Habitats Directive and protected under the Wildlife Acts 1976 to 2023.

Based on criteria set out in Table 8-3, but considering the overall low activity recorded in both 2020-21 (848 passes in 2020, 486 passes in 2021) and 2024 (1,019 passes; Daubenton's = 277 passes, Whiskered = 158 passes, Natterer's = 128 passes, and unidentified Myotis = 456 passes), the Myotis bat population of the Site is evaluated as important at the County Level.

Common pipistrelle

This species is listed in Annex IV of the Habitats Directive and the Wildlife Acts 1976 to 2023. Given the high activity levels recorded within the Site in both 2020-21 (21,309 passes in 2020, 12,679 passes in 2021) and 2024 (13,288 passes), and based on criteria set out in Table 8-3, the Common pipistrelle population within the Site is evaluated as important at the County Level.

[4] Myotis records were not identified to species level in 2020-21 (due to the inherent difficulties in identifying this genus). Therefore 'Rarer' status is considered the most appropriate based on criteria within Table 8.3.

Soprano pipistrelle

This species is listed in Annex IV of the Habitats Directive. Given the activity levels recorded during surveys in 2020-21 (3,071 passes in 2020, 1,391 passes in 2021) and 2024 (5,114 passes), based on the criteria in Table 8-3, the Soprano pipistrelle population within the Site is evaluated as important at the Local level.

Brown long-eared bat

This species is listed in Annex IV of the Habitats Directive. The very low levels of activity recorded for this species (around 1-2% in all surveys), combined with the criteria in Table 8-3, result in a Local level valuation for this species.

Lesser horseshoe bat

This species is listed in Annex IV of the Habitats Directive. The very low levels of activity recorded for this species (none in the 2020-21 surveys, 9 passes in 2024), combined with the criteria in Table 8-3, but also acknowledging that this species is a feature of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, result in a Local level valuation for this species.

Nathusius' pipistrelle

This species is listed in Annex IV of the Habitats Directive. The very low levels of activity recorded for this species (none in the 2020-21 surveys, 2 passes in 2024), combined with the criteria in Table 8-3, result in a less than Local level valuation for this species.

Common frog

Common frog was encountered on several occasions during surveys and it is protected under the Wildlife Acts. Given the proximity of a number of large waterbodies on the southern boundary of the Site, and the frequency with which this species was observed on the ground, suitable breeding and foraging habitat is present and as such the population on Site is evaluated as important at the Local level.

Hedgehog

Hedgehog (*Erinaceus europaeus*) is protected under the Wildlife Acts. It was the only terrestrial mammal species found during surveys. However, as only one scat found at one streamside location the Site is considered of less than Local value.

Invasive Non-Native Species

Invasive Non-Native Species (INNS) were present within the Site and recorded during site surveys are shown in Figure 8-3. INNS recorded include:

- Cherry laurel was recorded at one location adjacent to the western access point to the Site.
- Himalayan knotweed (*Persicaria wallichii*) was recorded at a location to the east of turbine 5.
- Pairs of Sika deer were recorded during survey work.

Fauna (aquatic)

Section 8.2.5 summarises the results of the aquatic surveys undertaken. Technical appendix 8-3 sets out the survey work and results in detail.

Salmonids

The watercourses draining the Site are considered optimal for the early life stages of salmonids and suitable for spawning adult salmonids. Atlantic salmon and brown trout were the only species recorded during the electrofishing survey, which was undertaken upon sections of the Clydagh, Clydaghroe and Mullaghanish rivers (sites 1 to 10 on Figure 8-6). The salmonids in the subject watercourses were mostly juvenile fish, highlighting the importance of these channels for the early life stages of trout and salmon.

Siltation and nutrient enrichment arising from surrounding agricultural lands has resulted in the reduction of the quality of salmonid spawning and nursery habitat within the watercourses draining the Site. The small size of the watercourses near the Proposed Development are unsuitable for holding large salmonids: the small/shallow pools are not considered sufficiently large for large trout and adult salmon througout the year.Salmonids are evaluated as County value IEFs.

Lamprey species

Lampreys have similar habitat requirements for spawning to small trout and there is adequate lamprey spawning habitat in the watercourses draining the Proposed Development, particularly for smaller lamprey species (brook lamprey), but there is a general lack of sand/silt deposits, a requirement for lamprey larvae. As such, they are not considered as resident or part of regularly occurring populations within the Site. The populations within the Site are therefore evaluated as Local IEFs.

Freshwater pearl mussel

A single Freshwater pearl mussel (FPM) was recorded approximately 17km from the Proposed Development - when taking account of hydrological separation from the Site (from site 10, Figure 8-6), This mussel was found near the right bank of the river at survey reach R2 upstream of the N22 Bridge. It is considered that the FPM population in the River Flesk has seriously declined and faces extinction.

There was no further evidence of FPM recorded during the field investigations, despite extensive searches on deposits at the leeward side of bends. The stretches of watercourses examined were deemed representative of the rivers and a variety of microhabitats were surveyed (e.g. clean substrates in riffle, glide and pool under partial and full shade). Approximately 8.3km of the River Flesk was surveyed (115 transects) in total, which represents a significant proportion (approximately 15%) of this watercourse, the primary river receptor for the Site.

FPM were not detected during the surveys carried out at all other surveyed reaches and the watercourses draining the Site are not suitable to support freshwater pearl mussel populations due to the levels of siltation and macroalgal coverage and limited suitability to support host fish. The FPM population of the Site is evaluated as not important due to the absence of suitable habitat and limited availability of host fish.

8.3.3 Ecological Features Brought Forward for Further Assessment

The EIAR baseline was established through a mix of desk study and field survey, important ecological features (the IEFs) were then identified and those requiring assessment established through a reasoned process of valuation and consideration of

factors, such as statutory requirements, policy objectives for biodiversity, conservation status of the IEF (habitat or species), habitat connectivity and spatial separation from the Proposed Development.

Following the CIEEM (2018) guidance, impacts which are likely to be significant are included, whereas impacts that are either unlikely to occur or that may occur but are unlikely to be significant can be scoped out.

Specifically for bats, three of the species recorded in the surveys are considered to be at high risk from wind turbines: Common pipistrelle, Soprano pipistrelle and Leisler's bat (Wray *et al.*, 2010). This is due to the type of flight each species exhibits, the height at which each species flies at, and the type of habitat preferred. Leisler's bats in particular fly at height often crossing open spaces, making them "high risk" species. At the population level in Ireland Leisler's bat is also considered to be "high risk". The NatureScot (2021) guidelines, which in the absence of an Irish equivalent have been used in the assessment, considers both Common and Soprano pipistrelles to be at high risk of direct impacts from wind turbines. This is based on a study investigating bat collisions at wind farm sites across the UK (Mathews *et al.*, 2016), which found both pipistrelle species to be amongst the most commonly recorded casualties during searches of turbines. However, because Common and Soprano pipistrelle bats, as well as *Myotis* bat species, are more common, their overall populations are less threatened by impacts from wind turbines than may be the case for scarcer species. This has resulted in a "medium risk" classification at the population level. These thresholds, in conjunction with levels of recorded activity, result in the inclusion of Leisler's bat, Common pipistrelle and *Myotis* spp. within the assessment. The group '*Myotis* spp.' at the Proposed Development comprise Daubenton's, Whiskered and Natterer's bats only. Lesser horseshoe bat is a feature of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, but it is considered to have low collision risk (Wray *et al.*, 2010); it was also not recorded in the 2020-21 surveys and recorded within only 9 passes in 2024. It is therefore not likely to be affected by the Proposed Development.

Specifically for Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment Special Area of Conservation SAC, impact pathways have not been identified for terrestrial features, and such features have therefore been scoped out of the assessment, as shown by strikethrough in the list below. As described in Technical Appendix Q of the RFI Report, any functional connectivity between the Site and the SAC is highly unlikely for Kerry slug due to the natural barrier created by the River Clydagh. In terms of aquatic features, Twaite shad and Slender naiad are only found in loughs, and these are not connected to the site's watercourses; these features are therefore also scoped out of the assessment as shown by strikethrough in the list below. Therefore, only the remaining aquatic qualifying features (including a range of species and habitats) are considered potentially vulnerable to effects and brought forward for assessment.

The range of IEFs brought forward for assessment is summarised below. As mentioned above, SAC features shown with a strikethrough have been scoped out of the assessment. IEF value is provided in brackets:

- Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC (International);
    - Oligotrophic Waters containing very few minerals

  - Oligotrophic to Mesotrophic Standing Waters
  - Floating River Vegetation
  - ~~Wet Heath~~
  - ~~Dry Heath~~
  - ~~Alpine and Subalpine Heaths~~
  - ~~Juniper Scrub~~
  - ~~Calaminarian Grassland~~
  - ~~Molinia Meadows~~
  - ~~Blanket Bogs (Active)~~
  - ~~Rhynchosporion Vegetation~~
  - ~~Old Oak Woodlands~~
  - ~~Alluvial Forests~~
  - ~~Yew Woodlands~~
  - ~~Kerry Slug (*Geomalacus maculosus*)~~
  - Freshwater Pearl Mussel (*Margaritifera margaritifera*)
  - ~~Marsh Fritillary (*Euphydryas aurinia*)~~
  - Sea Lamprey (*Petromyzon marinus*)
  - Brook Lamprey (*Lampetra planeri*)
  - River Lamprey (*Lampetra fluviatilis*)
  - ~~Twaite Shad (*Alosa fallax*)~~
  - Atlantic Salmon (*Salmo salar*)
  - ~~Lesser Horseshoe Bat (*Rhinolophus hipposideros*)~~
  - Otter (*Lutra lutra*)
  - ~~Killarney Fern (*Trichomanes speciosum*)~~
- Slender Naiad (*Najas flexilis*)
- HH3 Wet Heath (County);
- Kerry Slug (National);
- Bat species:
  - Leisler's Bat (Regional);
  - *Myotis* bat species (Daubenton's, Whiskered and Natterer's Bats) (County);
  - Common Pipistrelle (County);
- Fish species:
  - Atlantic Salmon (County);
  - Trout (County); and
  - Lamprey species (Local).

8.3.4 Do-nothing scenario

The Site is dominated by commercial forestry plantation and high open ground. In the absence of the Proposed Development, commercial forestry operations would continue at the Site and no significant change in the baseline would be predicted to occur in the short term.

However, effects of climate change are likely to be manifest in the medium to long term, with warmer average temperatures, wetter winters but drier summers, and extreme weather events like heatwaves and heavy rainfall events affecting habitats and the wildlife that depends on them (Environmental Protection Agency, no date[5]). Hydrologically sensitive habitats, such as wet heath, may be at particular risk of drying and undergoing change to other habitat types, e.g. dry heath, as a result.

8.4 Assessment of Effects

8.4.1 Assessment of Effects Pre Mitigation

Some IEFs are grouped to avoid repetition where the same potential impact pathways are present.

Construction phase effects pre mitigation

During construction it is anticipated that, in the absence of mitigation, likely sources of direct and secondary effects may arise from:

- Habitat loss or damage (permanent and temporary) due to construction of the Proposed Development infrastructure;
- Sedimentation or other pollution of watercourses from construction activities and vehicular traffic;
- Secondary effects on sensitive habitats through siltation/pollution/spread of invasive species;
- Inadvertent killing of or injury to fauna; and
- Disturbance to fauna due to vehicular traffic, operating plant, and the presence of construction workers.

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC

The Site is hydrologically connected to the River Clydagh, which is part of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC. There is potential for pollution events and suspended solids from construction works to enter watercourses and adversely affect the water quality of the Oligotrophic Waters and Floating Vegetation within the SAC as well as Atlantic salmon, pearl mussels and lamprey within the SAC boundary. There is also a potential risk of a pollution event adversely affecting Salmon, River and Sea lamprey of the SAC populations as they

[5] Environmental protection Agency (no date). What impact will climate change have on Ireland? Available online at: https://www.epa.ie/environment-and-you/climate-change/what-impact-will-climate-change-have-for-ireland

migrate from the sea into the SAC, although the likelihood that such an event would be on a scale to remain significant once it reached the lower reaches of the watershed is likely to be low owing to dilution. Otters would also experience effects from reduced prey availability. In the absence of any mitigation, there is therefore potential for moderate adverse indirect effects on aquatic notified SAC features.

Overall, it is concluded that in the absence of mitigation there is potential for **moderate adverse indirect effects on this International-value IEF that would be significant in EIA terms**.

HH3 Wet Heath

Table 8-6 shows the predicted loss of wet heath to the Proposed Development. Loss calculations have included a 10m buffer around the permanent infrastructure to account for drying effects. 10m is a buffer is typically applied to blanket bog and used here on a precautionary basis.

Table 8-6: Predicted habitat loss for habitats brought forward for assessment

Habitat Type Fossitt 2000	Direct Loss (ha)	Direct Loss and Indirect Loss (drying effects based on a 10m buffer of Direct Loss) (ha)	Total Habitat within the Site (ha)	% Total Habitat within the Site subject to loss & drying effects in the absence of mitigation
HH3 Wet heath	0.9	2.96	6.9	42.9

The proposed cable will be buried, which will necessitate excavation of 0.9ha of HH3 Wet Heath. The condition of wet heath is generally poor though some areas of good quality wet heath occur in the cable corridor. Given the condition and fragmented nature of wet heath in good condition along the cable route corridor, drying effects from excavation are likely to be temporary and not significant. On a precautionary basis therefore, **in the absence of mitigation**, although HH3 Wet Heath would be expected to re-establish over time, the 0.9ha loss will comprise **a low-moderate adverse effect on this County-value IEF that would be significant in EIA terms.**

Kerry Slug

Given the continued presence of Kerry slug within the works footprint, including within multiple habitat types, in the absence of mitigation there is a potential for direct mortality and injury from construction activities, loss of suitable habitat as well as a reduction in habitat suitability due to the spread of invasive species such as *Rhododendron ponticum*, which could be exacerbated by construction activities. Because the species moves within suitable microhabitats and does not remain fixed to any specific point, it is not possible to reliably predict the maximum number of individuals that may be affected. As such, in the absence of mitigation a **permanent moderate adverse effect is predicted on this National-value IEF that would be significant in EIA terms.**

Bats

Leisler's bat is considered an IEF of Regional value, whereas *Myotis* spp. and common pipistrelle are regarded as of County value. Potential impacts at construction relate to loss of foraging and commuting habitat only as no potential roost features have been identified on what is a largely commercial forestry site.

The removal of trees for the Proposed Development is likely to be beneficial for Leisler's bats, which show a preference for foraging over open habitat. Forestry has dominated the local area (including the site of the Proposed Development) for over 30 years and will continue throughout the lifetime of the Proposed Development. Therefore the local Leisler's bat population reflects existing forestry operations and the changeable extent and location of woodland cover within the Site. Given its preference for open habitats, no significant adverse effects are considered likely on Leisler's bats as a result of construction, which mainly affects areas of forestry.

Myotis spp. (which at the Proposed Development comprise Daubenton's, whiskered and Natterer's bats) and common pipistrelle favour wooded and riparian habitats, and the loss of favoured foraging/commuting flightlines along woodland edges could affect local populations, although this effect would likely be similar to the felling of forestry coupes during existing forestry operations. The creation of new edges for key-holed turbines could encourage bats into the area coming into conflict with turbines, which is further discussed as an Operational effect (see below). Artificial construction lighting could also have an adverse effect on prey behaviour and therefore bat foraging. These changes in habitat structure, plus disturbance from construction lighting and activity could have a **low adverse effect on Daubenton's, whiskered and Natterer's and common pipistrelle bats, that would be significant in EIA terms in the absence of mitigation**.

Fish (non-SAC populations)

Atlantic salmon and trout were recorded in surveys within the Site and suitable spawning habitat for brook lamprey was also found within the Site, although the species was not found to be present. Salmon and trout are considered County-value IEFs and brook lamprey a Local-value IEF. In the absence of mitigation, siltation from in-stream works and pollution events could result in a **permanent moderate adverse effect on salmonids that would be significant in EIA terms**. A pollution event could also affect any salmonids and lamprey further downstream, although the likelihood of such an event being on the scale where it would remain significant once it reached the lower reaches of the watershed is likely to be low owing to dilution.

Operation phase effects pre mitigation

During operation it is anticipated that impacts may arise from:

- Death or injury to bats from collision with wind turbines and displacement of bats from commuting routes by presence of infrastructure.
- Minor pollution events connected to machinery used for maintenance.
- Inadvertent killing, injuring or disturbance of bats during from the movement of operational plant.

Some IEFS are grouped to avoid repetition where the same potential impact pathways are present.

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC

Even in the absence of mitigation, no effects are considered likely on the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC as Site activity will be minimal, comprising occasional maintenance visits by low numbers of contractors. Impacts and effects are likely to be similar to or even on a smaller scale

than existing forestry operations. The opportunities for uncontrolled pollution events is considered negligible in the context of an operational Wind Farm and **potential effects on this IEF of International value are not significant.**

Habitats

As there are no new impacts generated by the operational phase **no significant operational effect upon HH3 Wet heath is likely.**

Bats

Leisler's bat is at high risk at both the individual and population level from barotrauma and turbine blade collision. The population in Ireland is considered important on an international scale due to its large population within the country. Leisler's were the second most common identifiable species in the automated static surveys in 2020-21, and the third most d the third-most recorded species in 2024. In the absence of mitigation, therefore, **a permanent moderate significant adverse effect on this Regional IEF is likely that would be significant in EIA terms.**

Common pipistrelle is at high risk at the population level from barotrauma and/or turbine collision. The species had the highest activity of all bats species with over 50% of all passes in each survey year. As the mean seasonal activity levels ranged from medium to high in 2020 (Spring – high; Summer – medium; Autumn – high), and from low to high in 2021 and 2024 (Spring – low; Summer – medium; Autumn – high), the Site is considered to be important to the local population. The unmitigated risk of barotrauma and/or turbine blade collision therefore presents a **permanent moderate significant adverse effect on common pipistrelle that would be significant in EIA terms.**

Myotis spp. (Daubenton's, whiskered and Natterer's bats, which are designated under Annex IV of the Habitats Directive and protected under the Wildlife Acts 1976 to 2023, are considered at lower risk of mortality from wind turbines but are vulnerable to disturbance and displacement due to the presence of operational wind turbines. Given this, a **permanent moderate significant adverse effect on *Myotis* spp. is likely that would be significant in EIA terms.**

Decommission phase effects pre mitigation

Once the Site ceases operation after the period of generation, all major equipment and structures will be removed or may be replaced with a new set of turbines subject to planning permission being obtained.

Upon decommissioning of the Proposed Development, the wind turbines would be disassembled in reverse order to how they were erected. All above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place and will be covered with topsoil. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.

Access tracks will remain in place for future forestry operations. Underground cables, including grid connection, will be removed and the ducting left in place.

It is estimated that this process will take approximately 12 months.

In the absence of designated environmental input (site supervision by an Ecological Clerk of Works, a Decommissioning Plan with protocols and monitoring parameters) effects similar to that detailed for construction are possible, though much smaller in scale.

8.4.2 Mitigation Measures

Based on the established ecological baseline, the following mitigation measures and good practice will be applied to the project to ensure that any effects on the IEFs are reduced.

General mitigation

Design mitigation

The design of the Proposed Development has been optimised to position the turbines and associated infrastructure to capture the maximum wind energy possible within a suitable area determined by environmental and technical constraints. This included best efforts to avoid areas of deep peat and peatland, nature conservation designations, and habitats of conservation interest.

The Proposed Development has also been designed to minimise works in the vicinity of watercourses and to minimise the need for new water crossings to reduce the risk of pollution and changes to watercourse morphology. Only eight watercourse crossings are proposed.

General construction mitigation

Full details of construction mitigation measures are provided in the CEMP and align with best practice Information which is included on the following ecology related activities.

Works will be overseen by an Ecological Clerk of Works (ECoW) and appointed by the Developer or the Contractor(s). The ECoW is responsible for:

- Undertaking regular Site inspections and overseeing all sensitive habitat removal and works at watercourse crossings.
- Ensuring implementation of biodiversity /habitat mitigation measures, as per the Habitat Management Plan (Technical Appendix 8-4) (see also specific mitigation and compensation section below).
- Being present during construction to undertake regular Site inspections.
- Undertaking toolbox talks to Contractors on regular rotation (to ensure all are informed as to their responsibilities with regard to sensitive environmental features (e.g. use of spill-kits, working near watercourses etc)).

The ECoW will have the authority to stop works where significant effects are considered likely to occur, and to instigate control/mitigation measures to rectify noncompliance. He/she will work closely with the Construction Site Manager and Project Manager to provide advice as required.

The ECoW will liaise with Contractors responsible for Environmental Management Plans (EMPs) where there is potential for ecological effects, including the following plans (not an exhaustive list):

- Site Waste Management Plan (Technical Appendix 11-4);

- Water Quality Monitoring and Response Plan (Technical Appendix 11-3);
- Peat Management Plan (Technical Appendix 10-3; and
- Construction Traffic Management Plan (Technical Appendix 4-1).

General mitigation for aquatic features

The section covers Atlantic salmon, trout and lamprey species, which exist as IEFs both in their own right and as part of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC.

A total of eight watercourse crossings are needed but there will be no instream works during the various phases of the Proposed Development, as temporary bridging platforms/ Bailey Bridges will be used. The driver for this measure is that fish species, many of which are also qualifying interests of the SAC, were found in most survey locations throughout the Site. Not working within watercourses will ensure there are no modifications to watercourse morphology and will minimise impacts on water quality and bottomless box culverts would be used and designed to accommodate a 1 in 200-year flood event. Works adjacent to watercourses will follow IFI (2016) guidelines.

The CEMP (Technical Appendix 4-1) will include a Peat Management Plan (PMP) (Technical Appendix 10-3) and Surface Water Management Plan (SWMP) (Technical Appendix 11-4). The CEMP will be a key contract document that the contractor will be required to implement in full.

The Proposed Development's drainage design has been designed specifically with the intention of having no negative impact on the water quality of the Site and its associated rivers and lakes (Technical Appendix 11-4 Surface Water Management Plan). No routes of any natural drainage features will be altered as part of the Proposed Development. The objective of mitigation for all water features is to preserve existing water quality ratings as a minimum.

As shown in Annex A of Appendix 11-4 Surface Water Management Plan, there will be no direct discharges to any natural watercourses, with all drainage waters being dispersed using existing overland flow routes or through new features such as swales and settlement ponds encompassed by a robust and proven Sustainable Drainage System (SuDS) design, which will be used to control drainage and silt management on the Site. The Ecological Clerk of Works (ECoW) will liaise with engineers to inform the installation of SuDS measures to avoid erosion or siltation of existing watercourses. Where appropriate, and at the discretion of the ECoW, discharges will be made over vegetation filters at an appropriate distance from natural watercourses. Buffer zones of 60m around watercourses have been applied in the design of the Proposed Development components, with exception for water crossings (although watercourses will not be affected as temporary bridging platforms/ Bailey Bridges will be used) and have been used to inform the layout of the Proposed Development.

Mitigation measures to protect the aquatic environment during construction will include:

- Avoidance of sensitive aquatic areas by implementing a 60m construction zone buffer to significant watercourses (catchment >0.25km^2).
- Avoidance of sensitive aquatic areas by implementing a 10m construction zone buffer to minor watercourses (catchment <0.25km^2).

- For locations where works will be undertaken within water protection buffer zones, double silt fences will be installed around the watercourse to prevent sediment/silt infiltration into the watercourse.
- Works for stream crossings will be carried out during the July to September (inclusive) as defined by Inland Fisheries Ireland (IFI), to avoid vulnerable spawning salmonids/lamprey that may be present in downstream environments outside of this window. Any works outside of this period would require a derogation under the Local Authorities (Works) Act, 1949. There will be no works within watercourses at any time.
- The existing impassable features to fish in watercourses at sites 7 and 8 will be removed by contractors under supervision of the ECoW and the ECoW will monitor these locations to confirm whether fish are subsequently able to pass (Figure 8.6).
- There will be no direct dewatering to watercourses during the construction phase. All outflows from drainage associated with construction will be by diffuse overland drainage at appropriate locations and through settlement ponds/riparian vegetation buffers strips.
- Cement, hydrocarbons, and any other potential pollutions will not be permitted to discharge to any waters, and control measures to prevent release of pollutants will include. Further details are provided in the CEMP.

The SWMP includes several measures, including those below, to ensure no of sediment to receiving waters:

- Wastewater emanating on-site (e.g. sewage, wastewater from Site office) will be taken off-site for disposal/treatment at controlled facilities. To this effect, welfare facilities for construction site workers will include self-contained port-a-loos with an integrated waste holding tank. No water will be sourced on the Site, nor will any wastewater be discharged to the Site.
- Settlements ponds and buffered outfalls to control and store development runoff to allow settlement prior to discharge at greenfield runoff rates.

Other measures will include a water quality monitoring program, which will be implemented to monitor effects on the surface water quality regime during the infrastructure construction, operational and decommissioning phases of the Proposed Development, in order to;

- Demonstrate that the mitigation measures and surface water management is performing as designed.
- Provide validation that the in-place mitigation measures are not having an adverse effect upon the environment.
- Indicate the need for additional mitigation measures to prevent, reduce or remove any effects on the water environment, such as additional temporary settlement or filtration structures or short-term flocculant dosing to suit observed site conditions.

The water quality monitoring sites will be the two used during the aquatic surveys (Technical Appendix 8-3, Figure 8-6) to provide a baseline to compare against. This will be undertaken on a monthly basis during construction and decommissioning by the ECoW, and every three months during the operational period by a Suitably Qualified Ecologist (SQE). The determinants to be collected will be the same as in the aquatic surveys.

Electrofishing will occur in years 1 and 3 following the same methodology at the same 10 sites used in pre-construction surveys (Technical Appendix 8-3).

Riparian habitat enhancement will include in-stream enhancement, such as the placement of woody debris to create pools and selective broad-leaved woodland bank-side planting are included in the HMP (Technical Appendix 8-4).

General mitigation for bat species

The assessment in this Request for Further Information (RFI) accounts for a range of turbine parameters which included the maximum rotor diameter and hub heights for the bat buffer from turbines to woodland features. Therefore, the maximum extents to felling and buffering have been applied to the assessment.

NatureScot (2021) sets out the approach to determining the minimum buffer distance required between a feature of potential value for bats, such as the edge of a forest, treeline and hedgerow, and the tip of a wind turbine blade. These informed the design evolution in relation to turbine position and potential effects on bats. The calculation for the recommended minimum 50m buffer from blade tips is calculated using the formula:

- Buffer distance from edge/feature = $\sqrt{(50m + bl)^2 – (hh – fh)^2}$

Where "bl" = blade length, "hh" = the hub height and "fh" = feature height. For plantation up to 15m in height and the proposed turbine specifications, this corresponds to a maximum buffer of 81m between turbine towers to provide the required 50m from the nearest woodland/edge feature.

As there is a minimum felling requirement of 100m from each turbine for operational purposes, the 81m requirement has been fully met.

General mitigation for other fauna

The following measures will be implemented at the discretion of the ECoW and may therefore be limited to parts of the Proposed Development where there is deemed risk to a specific receptor.

- Pre-construction surveys will be undertaken to cover all species observed in the baseline surveys which have informed the assessment.
- The ECoW will review proposed areas for clearance and determine whether their presence is required for pre-clearance check based on the potential presence of sensitive habitats or species (e.g. Kerry slug). They will have the authority to halt works should harm or damage be possible without this intervention.
- Excavations/holes will be covered at the end of each working day, or a wooden plank placed inside to allow faunal species to escape, should they enter the hole. Any temporarily exposed open pipe system will be capped to prevent wildlife gaining access.
- Frogs and spawn where encountered within the footprint of the works will be collected and relocated under licence during construction works. A Method Statement will be produced by the ECoW.

Opportunities for enhancement are part of the Habitat Management Plan (Technical Appendix 8-4)(see also specific mitigation and compensation section below). Objectives within the Habitat Management Plan address issues regarding Salmonids / brook lamprey/ freshwater pearl mussel and common frog.

Specific mitigation and compensation

This relates to measures to be implemented based on the results of baseline surveys, without which there remains a potential for significant effects.

Specific mitigation measures

Specific mitigation for bat species

During construction downward-directed artificial lighting will be used to shine light to the working area only and reduce 'light leakage' that may temporarily affect bat flightlines.

The clearance of vegetation within 50 m of turbines to minimise risk to bat mortality does have the potential create a rich foraging area for bats in the immediate time post-clear felling, and the extent of increased bat activity which may correspondingly occur will depend on the size of the area cleared and the bat species in question. Therefore, a minimum of 6–12 months will lapse after clear felling before the installation of turbines.

Following the approach outlined in NatureScot (2021) operational curtailment will be employed at locations where high levels of bat activity of high-risk species was recorded, as follows:

- Summer (June – mid-August): turbines 7, 10 and 13.
- Autumn (mid-August – mid September): turbines 2, 7, 8, 10, 13, 14 and 17.

Curtailment involves raising the cut-in speed and NatureScot recommends cut-in between 5.0 m/s and 6.5m/s and at temperatures above approximately 10 °C or 11°C measured at the nacelle.

During the first year a further 30 days of automated static monitoring will take place at the locations and seasons described again following the NatureScot (2021) guidance.

Following the 1st year of curtailment and survey, data will be reviewed, and results considered in tandem with carcass searches at which point the curtailment strategy will be revised if needed. This monitoring will accord with Best Practice as described in NatureScot (2021).

Post-construction bat monitoring and bat carcass searches using dogs will be carried out at the turbines listed above comparing turbines where no curtailment is intended. Predator removal rates will be informed by Scavenger removal trials. The aim of these surveys will be to monitor changes in foraging, commuting and roosting behaviour within the site and to record any fatalities.

In accordance with best practice guidelines (NatureScot, 2021), a minimum of three years post-construction monitoring will be undertaken. In accordance with best practice, post-construction activity surveys will be carried out in conjunction with fatality searches. A dusk and a dawn survey will be carried out on the night preceding any bat fatality search. Activity surveys will comprise walked transects. The aim of post-construction activity surveys is to assess any changes in bat activity and habitat use on Site, monitor the effectiveness of prescribed buffer distances and to provide context to fatality search results.

Results from post-construction monitoring, fatality searches and efficiency trials will be compiled for each year and reported to relevant bodies including NPWS. Reporting will provide an estimate of overall fatality rates for all turbines, taking into consideration any identified search biases. In addition, fatality estimates will consider any cumulative effects that may arise from adjacent wind farm developments. If a negative effect on bats is found as a result, further mitigation, will include additional curtailment to that described in a plan of action will be determined with the NPWS without delay. The imperative of monitoring will be to ensure no significant effect and should this be likely, further measures will include additional curtailment to that discussed. This mechanism of monitoring and review, with adaptive measures as required, will ensure no significant effect on bat populations from collision strike,

Specific mitigation for Kerry slug

An application for a Derogation licence under Regulation 54 & 54A of the European Communities (Birds and Natural Habitats) Regulations 2011, as amended, has been submitted by APEM Group Woodrow. As described in the application, Kerry Slug translocation will serve as the primary mitigation measure and will prevent mortality that would otherwise occur if animals remained within areas subject to habitat loss. Individuals will be carefully located, collected, and transferred to receptor sites that have been assessed as suitable and capable of supporting additional animals. This ensures that the most significant potential impact, which is the direct loss of individuals, is avoided.

Disturbance associated with capture and handling will be temporary, controlled, and kept to the minimum necessary to safely relocate animals. Handling will be brief and conducted using methods that maintain humidity, avoid desiccation risk, and minimise stress. No deliberate injury or killing of individuals, or damaging alteration of occupied habitat is proposed. Habitat disturbance will be limited to the areas directly affected by construction, and all microhabitats, such as lumps of moss or pieces of wood temporarily disturbed during hand search or capture, will be reinstated immediately.

An important population-level consideration is that while the development footprint will experience a reduction in numbers, the receptor areas will experience an increase. This represents a redistribution of individual Kerry Slugs rather than a loss in their numbers in the locality. Receptor sites will be selected based on availability of suitable habitat and their size to accommodate additional individuals without compromising ecological balance. The number of Kerry Slugs relocated to a new area will be based on the estimated number of Kerry Slugs per ha of suitable habitat inferred from the numbers recorded during the 2026 surveys. This ensures that the increase is sustainable and does not adversely affect existing populations.

Mitigation and safeguards include:

- All capture, handling, and translocation carried out by experienced ecologists trained in working with Kerry slugs.
- All actions will be carried out under a valid derogation licence and in full compliance with all licence conditions.
- Use of the least intrusive methods practicable for locating and collecting individuals.
- Immediate reinstatement of any temporarily disturbed microhabitat (e.g., lumps of moss, pieces of wood).

- A stop work protocol if any adverse effects on individuals or habitat are observed, allowing methods to be reviewed and adapted before continuing.

A Method Statement to inform a derogation licence has been submitted with the Application that supersedes EIA Technical Appendix 8-6.

An invasive species survey will be carried out within one month prior to construction, and measures to deal with invasive species identified within the baseline survey will be included in the HMP. The main invasive species of consideration is rhododendron due to its capacity to reduce the quality of habitat for Kerry Slug. Measures will include:

- Plants to be cut and stumps removed.
- If stumps cannot be removed stumps to be spot sprayed with glyphosate.
- Brash piles to be erected around cleared areas to prevent mammal (primarily deer) ingress which can cause to spread.

In addition:

- The Principal Contractor (PC) appointed to construct the wind farm will be responsible to ensure that there will be no use of machinery outside of the footprint of the Proposed Development to prevent accidental death of Kerry Slug in areas that have not been surveyed or where slugs have not been translocated.
- The PC appointed for the construction phase will be responsible for ensuring that no machinery is allowed to enter lands outside of the development footprint to prevent damage to suitable Kerry Slug habitat outside of the Proposed Development.
- To reduce the potential barrier effect of internal roads on the Kerry Slug population, underpasses will be provided underneath the road surfaces. Underpasses will be made of neutral to slightly acidic material and will have a minimum diameter of 30cm to reduce the likelihood of blockage.

Compensation measures

Habitat Management Plan

Reinstatement of habitats will be undertaken after each stage of the project is completed and in accordance with planning condition requirements within the Habitat Management Plan (Technical Appendix 8 -4).

Reinstatement will include re-using peat removed for the cable route on adjacent verges to prevent or mitigate indirect drying effects. Wet heath turves will be carefully excavated and stored for reinstatement once the cable has been installed.

Stump flipping will be used within excavated areas where peat is present and then ground smoothing to raise the level of the water table. Large trunks cleared as part of tree removal will be placed within deeper excavations in order to encourage standing water and to encourage water retention and re-wetting.

The final methodology used for reinstatement will be agreed with the Planning Authority and implemented by measures outlined in detail within a future version of the HMP (Technical Appendix 8 -4).

During the operational phase the following mitigation will be in place:

- A SQE will monitor the condition of sensitive habitats, including areas of restored wet heath, peat, and watercourses. Details of the monitoring programme are included in the HMP (Technical Appendix 8 -4).
- Materials and other temporary infrastructure will be removed off-site and all temporary construction areas will be reinstated. The proposed and upgraded access tracks will be left in place after completion of the construction phase as they will provide access for maintenance, repairs, and the eventual decommissioning phase.
- Hardstanding areas at each turbine location will be retained for use in on-going maintenance operations, with the edges blended to the adjacent contours with natural vegetation being allowed to re-establish.

The HMP commits to restoring 4.76ha HH3 wet heath. This is to compensate for the loss of 0.9ha to the cable route, although this loss is itself only temporary owing to wet heath turves being reinstated over the installed cable. It also provides enhancement because of the scale of the restoration proposed. The HMP includes a monitoring programme running to at least the 5th year of operation.

8.4.3 Assessment of Effects Post Mitigation

Construction phase effects post mitigation

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC

Given the hydrological connection between the Site and the River Clydagh, which is part of the SAC, and the potential for indirect effects from the Proposed Development, mitigation has been designed to specifically minimise the risk of impacts to watercourses. There will be no instream works and stream crossings will be carried out during the July to September (inclusive) as defined by Inland Fisheries Ireland (IFI) to avoid the most sensitive time for spawning fish. In tandem with the additional mitigation outlined in Section 8.4.2 that include measures from the CEMP (Technical Appendix 4-1), PMP (Technical Appendix 10-3) and SWMP (Technical Appendix 11-4), such as implementation of no-works buffers around watercourses, avoidance of direct discharge into watercourses, and removal of wastewater, the implementation of which will be overseen by the ECoW, the likelihood of a potential pollution event is very low. Should an event occur an emergency response plan will be in place to deal with accidental spillages.

On adoption of this mitigation **no adverse effects on the aquatic IEFs for which the SAC is notified are considered likely.**

Implementation of the mitigation cited herein aligns with the Natura Impact Statement (NIS) which has been prepared to provide the information necessary to allow the Competent Authority to conduct the screening for the Appropriate Assessment required under In Article 6(3) of the EC Council Directive 92/43/EEC, on the conservation of natural habitats and of wild fauna and flora – The Habitats Directive.

HH3 Wet Heath

The proposed cable will result in the excavation of 0.9ha of HH3 Wet Heath, but this loss is temporary only, as the excavated turves will be reinstated. The quality of this habitat is generally poor across the site, though some areas of wet heath in good condition

occur in the cable route corridor. It is therefore considered that there will be **temporary minor adverse effect based on up to 0.9ha wet heath, but that this would not be significant in EIA terms**. A beneficial effect is predicted from the enhancement of 4.76ha of wet heath, which would not be in place in the absence of the Proposed Development. This will deliver net benefits during the operational phase (see below).

Fauna

Some IEFs are grouped to avoid repetition where the same potential impact pathways are present.

Kerry slug

The need to avoid effects upon Kerry Slug has been one of the guiding principles of design evolution and has necessitated the following measures: avoidance of infrastructure in sensitive habitats insofar as possible, pre-construction checks and translocation of encountered slugs. Given that individuals will be preserved, suitable habitat is available elsewhere within the receptor locations, and all handling and translocation measures are tightly controlled, the overall impact on the species wider population is expected to be neutral. **As a result, impacts are concluded to be not significant on the population of Kerry Slug.**

Bats

As noted in section 8.4.1, the removal of trees for the Proposed Development is likely to be beneficial as Leisler's show a preference for foraging over open habitat and forestry has operated in the area (including the Proposed Development) on the Site for over 30 years and will continue throughout operation of the Proposed Development. The local populations of bats are established within this context. **Disturbance to foraging and commuting Leisler's is therefore assessed as not significant.**

As the minimum buffer of 81m between turbine towers to provide the required 50m from the nearest woodland/edge feature is part of the design, and due to the use of downward facing lighting cowls, the loss of a limited amount of further potential commuting/foraging habitat is not considered significant. **Disturbance to foraging and commuting *Myotis* spp. and common pipistrelle bats is assessed as not significant.**

Fish

Atlantic salmon and trout were found during surveys within the Site and suitable spawning habitat for brook lamprey was found within the Site. Mitigation, as discussed under the SAC in this section, applies to fish populations on Site, but outwith the SAC. The potential for pollution is low. As such, **no significant effects are likely on Atlantic salmon, trout or the three species of lamprey.**

Operation phase effects post mitigation

Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC

No effects are considered likely on the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC as activity will be minimal, comprising occasional maintenance visits by low numbers of contractors. The opportunities for uncontrolled pollution events are considered negligible in the context of an operational Wind Farm and **potential effects are not significant.**

Habitats

Implementation of the HMP (Technical Appendix 8-4) will enhance 4.76ha of wet heath and 4.69ha of degraded blanket bog will be enhanced to good condition; set against the losses of 2.03ha degraded wet heath and 1.56ha of degraded bog, this will deliver a net gain, which would not be in place in the absence of the Proposed Development and which is considered **a moderate beneficial effect and significant in EIA terms.**

Bats

With the Site speed limit in place and the limited use of vehicles on the tracks during darkness, operational effects are considered to be limited to bats.

On adoption of curtailment at areas of high risk to Leisler's measures as detailed in section 0 this is likely to reduce the significance of the risk of barotrauma and collision **to a level that is not significant.** It is noted that post-construction monitoring facilitates an adaptive approach so curtailment can be refined based on fatality results. The curtailment regime could either go up or down based on monitoring results. Curtailment **will reduce potential adverse effects to a non-significant level on this Regional value IEF.**

Common pipistrelle is a common species at the population level, albeit considered at high risk of collisions. Given that curtailment at locations above is likely to reduce collision impacts for common pipistrelle (much of the high activity locations are shared between species) **no significant effects are likely on common pipistrelle.**

Based on the above measures, and in relation to *Myotis* species (Daubenton's, whiskered and Natterer's bats) for which activity levels were predominantly low, **no significant effects are likely on *Myotis* spp.**

Decommission phase effects post mitigation

As before, once the Site ceases operation after the period of generation, all major equipment and structures will be removed or may be replaced with a new set of turbines subject to planning permission being obtained.

Upon decommissioning of the Proposed Development, the wind turbines would be disassembled in reverse order to how they were erected. All above ground turbine components would be separated and removed off-site for recycling. Turbine foundations would remain in place and will be covered with topsoil. Leaving the turbine foundations in-situ is considered a more environmentally prudent option, as to remove that volume of reinforced concrete from the ground could result in significant environment nuisances such as noise, dust and/or vibration.

Access tracks will remain in place for future forestry operations. Underground cables, including grid connection, will be removed and the ducting left in place.

It is estimated that this process will take approximately 12 months.

In the absence of designated environmental input (site supervision by an ECoW, a Decommissioning Plan with protocols and monitoring parameters) effects similar to that detailed for construction are possible, though much smaller in scale.

8.4.4 Residual effects

With the implementation of the mitigation and compensation measures outlined in Section 8.4.2, no significant, adverse effects are predicted, and therefore no additional mitigation or compensation is required.

Enhancement of 4.76ha of wet heath to good condition will deliver a net gain in wet heath of 3.86ha, which would not be in place in the absence of the Proposed Development and **is considered a moderate beneficial effect and significant in EIA terms.**

8.5 Cumulative Effects

Cumulative effects can occur where impacts from one development which may not be significant at the population level when combined across many developments in combination could result in a detrimental effect on a wider scale. This could mean habitat loss, disturbance to species (for example of several wind farms adjacent to each other were they to be in construction either simultaneously or consecutively) or impacts across connected receptors, such as watercourses which form part of one river system.

A planning search was carried out to identify all projects in the wider receiving environment up to 10km from the Proposed Development displayed on the following online resources:

- Kerry County Council planning viewer https://www.kerrycoco.ie/planning/online-planning-enquiry/;
- Cork County Council planning viewer http://planning.corkcoco.ie/ePlan/SearchTypes;
- ACP (Strategic infrastructure development (SID) applications, Strategic Housing Development (SHD) applications and major project applications including wind farms) https://www.pleanala.ie/en-ie/home;
- Wind Energy Ireland (https://windenergyireland.com/); and
- Department of Department of Housing, Local Government and Heritage's EIA Portal https://www.gov.ie/en/publication/9f9e7-eia-portal/.

This list of projects and plans was reviewed and the potential for cumulative impacts on terrestrial biodiversity was considered. Most consent applications pertain to one-off residential dwelling or farm buildings/structures or minor 33kv cabling projects at discreet locations undertaken by the Local Planning Authority. There is no potential for significant in-combination/cumulative effects with the Proposed Development arising from such developments.

Table 8-7 and Table 8-8, and subsequent paragraphs, regard projects that were deemed to have greatest potential to act cumulatively or in combination with the proposed wind farm project.

All stages of projects, except those which have been Refused, are considered. Projects in bold type rate to KCC area, normal type relates to CCC.

Table 8-7: Cumulative Wind Farm Developments

Site Name	Planning reference	Tip Height	No of Turbines	Distance from Site	Status
Coomacheo	031997	121	17	Adjacent	Operational
Gneeves	99616	91	13	Adjacent	Operational
Curragh	0710105	121	8	Adjacent	Operational
Caherdowney	033079	100	4	Adjacent	Operational
Clydaghroe	**04/3152** **07/306**	100	5	Adjacent	Operational
Clydaghroe Ext.	**10/1302**	109.5	1	Adjacent	Approved
Knocknamork	194972	150	7	Adjacent	Approved
Inchamore	235145	185	5	1km	At Appeal
Carrignaima Community	074102	120	6	3km	Operational
Gortyrahilly	n/a[6]	185	14	7km	In Planning
Kilgarven	**021241**	125	15	9km	Operational
Midas	**031188**	78	6	9.8km	Operational
Midas Ext.	**089120**	80	2	10km	Approved

Relevant non-Wind Farm developments are considered in Table 8-8: . Relevant developments were found within the Kerry County Council area only.

Table 8-8: Cumulative non-Wind Farm Developments

Site Name	Planning reference	Description	Distance from Site	Status
Cummeennabuddoge/ Clydagh	201263	A 100m temporary guyed meteorological mast to be in place for 5 years	Adjacent	Conditional
Cummeennabuddoge/ Killahaco	101023	Alterations/ extensions to existing 110kv control buildings	Adjacent	Conditional

Potential cumulative effects during construction relate to impacts on water quality downstream, including effects on Qualifying Interests of the Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC, the Kerry Slug population within the Site and direct effects on HH3 wet heath habitat. Potential cumulative effects during operation are limited to collision strike on bat species.

In relation to the **Coomacheo, Gneeves, Curragh and Caherdowney Wind Farms**, these sites are already operational so any potential effects they are having has been incorporated into the baseline description.

Clydaghroe Wind Farm is adjacent to the Site. No ecological information was available from documents on the KCC planning portal. Reference 04/3152 comprised two turbines and service roadway and 07/306 one turbine and a roadway. These small-

[6] It was not possible to find the reference on the CCC planning portal nor online.

scale projects are not likely to significantly affect the existing or future baseline in respect of the Proposed Development.

Clydaghroe Wind Farm Extension is adjacent to the Site. No significant effects were identified on any IEF given the small scale of this single turbine development. Habitats were of low conservation value nor was non-avian fauna of high conservation concern.

Knocknamork Wind Farm is adjacent to the Site. The NIS for Knocknamork concluded that by itself, or in combination with other plans and projects, the integrity of the relevant European sites would not be adversely affected. As with the Proposed Development, the resident population of Kerry Slug was considered distinct from the population within the SAC, and whilst a potential short-term adverse effect was identified on individuals as a result of habitat loss/disturbance, this did not apply to the population as a whole. As intended for the Site a translocation took place at Knocknamork to limit effects upon individuals. In terms of effects on HH3 wet heath whilst limited direct and secondary effects were identified, they were not considered significant. No large bat populations were identified, and activity was low. As a result, whilst a long-term low-moderate effect was identified it was not considered to be significant.

Inchamore Wind Farm is approximately 1km from the Site entrance and therefore shares many of the same IEFs. As with the Proposed Development no Freshwater Pearl Mussel was found and whilst brown trout was recorded, much of Inchamore Wind Farm is unsuitable due to high gradients. Other IEFS included Kerry Slug, loss of wet heath and common pipistrelle. All effects were considered reduced to a non-significant effect on successful implementation of mitigation, which included a CEMP to address potential water quality issues, and a Habitat Enhancement Plan. When these potential impacts are considered in relation to the Proposed Development, they are considered to comprise a non-significant cumulative effect.

Carrignaima Community Wind Farm: No environmental information was available on the CCC planning portal nor found online in relation to this project. However, it is 3km from the Site and located within a separate catchment. As a result, there is no pathway for interaction between the two projects.

Gortyrahilly Wind Farm is approximately 7km from the Site. The primary ecological impacts identified were water quality, which was not found to comprise a significant impact following mitigation, and the loss of 28ha of wet heath which was found to result in a moderate significant effect. Given the limited loss of wet heath under the Proposed Development (0.9ha), the distance between the two projects plus the intended habitat restoration, there is not considered to be a cumulative interaction between the two projects.

Kllgarven, Midas and Midas Extensions Wind Farms are between 9-10km from the Site and located within a separate sub-catchment. As such there is no pathway for interaction between these projects and the Site.

Cummeennabuddoge/ Clydagh Meteorological Met Mast is adjacent to the Site. The boundary of Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC is approximately 1.9km north and west of the proposed Met Mast location. There is an area of conifer plantation between the SAC boundary and the Met Mast location and there is no ecological connectivity between the proposed Met

Mast location and the SAC. The nearest watercourse is 200m away from the Met Mast location at its closest point and the nature of the intervening ground means any surface run off from the site will not reach the watercourse. Due to the lack of felling and minimal and localised disturbance of soils required to construct the development, no significant impacts on the water quality are envisaged. Given the localised nature of the project, no other potentially significant ecological effects have been identified within assessment reporting (Atmos Consulting, 2020).

It was not possible to find information **Cummeennabuddoge / Killahaco 110kv substation** works planned adjacent to the Site. However, given highly localised nature of the works significantly adverse effects are considered unlikely.

As many of the projects discussed above returned no likely significant effects for many of the same IEFs it is considered that the addition of the Site, to the cluster of existing operational projects, will not add significant ecological effect. As similarly potential adverse effects have been managed elsewhere the same is considered likely with the Site, especially given the extent of intended embedded mitigation. However, the increase in activity is likely to create **a short term slight adverse effect** to bats and Kerry slug when the Site is considered in relation to other projects. This is not considered to be significant.

When considering all projects against the Proposed Development no significant cumulative effects on IEFs are considered likely.

8.6 Summary and Statement of Significance

Table 8.9 below summarises the predicted significant effects of the Proposed Development on non-avian biodiversity features prior to and following mitigation and compensation, during both the construction and operational phases. Effects during decommission are anticipated to be similar to construction phase effects, albeit on a smaller scale.

Table 8-9: Summary of Significant Effects

IEF	Predicted Effect	Significance	Mitigation / Compensation	Significance of Residual Effect
Construction phase				
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC	Pollution and suspended solids affecting habitats and species	Adverse, moderate and significant	Appointment of ECoW, implementation of Site Waste Management Plan, Water Quality Monitoring and Response Plan, Peat Management Plan, and Construction Traffic Management Plan. Avoidance of in-stream works, implementation of buffer zones around watercourses, timing of works outside spawning period. Riparian and in-stream habitat enhancement.	Adverse, negligible and not significant

IEF	Predicted Effect	Significance	Mitigation / Compensation	Significance of Residual Effect
HH3 Wet Heath	Loss of habitat	Adverse, low-moderate and significant	Micrositing to minimise loss of habitat. Storage and reinstatement of excavated wet heath turves. Enhancement of 4.76ha of wet heath will deliver net benefits during the operational phase (see below).	Adverse, temporary, minor and not significant
Kerry slug	Direct mortality and injury, loss of suitable habitat including from invasive species establishment	Adverse, moderate and significant	Pre-construction surveys, checks of areas to be cleared. Translocation of individuals. Invasive species survey and control (if relevant). Implementation of delineated work zones. Provision of underpasses underneath road surfaces.	Adverse, negligible and not significant
Bat species	Temporary loss of foraging and commuting habitat	Lesiler's bat: Not significant *Myotis* spp. & common pipistrelle: Adverse, slight and significant	Downward-directed artificial lighting to be used only	Adverse, negligible and not significant
Fish species	Pollution and suspended solids directly affecting species or their habitats	Adverse, moderate and significant	Appointment of ECoW, implementation of Site Waste Management Plan, Water Quality Monitoring and Response Plan, Peat Management Plan, and Construction Traffic Management Plan. Avoidance of in-stream works, implementation of buffer zones around watercourses, timing of works outside spawning period. Riparian and in-stream habitat enhancement.	Adverse, negligible and not significant
Operation phase				
Killarney National Park, Macgillycuddy's Reeks and Caragh River Catchment SAC	None	Not significant	None needed	Not significant

IEF	Predicted Effect	Significance	Mitigation / Compensation	Significance of Residual Effect
HH3 Wet Heath	None	Not significant	Enhancement of 4.76ha of wet heath as part of HMP. Monitoring to assess success and inform adaptive management.	Beneficial, moderate and significant
Kerry slug	None	Not significant	None needed	Not significant
Bat species	Barotrauma and turbine blade collision	Adverse, moderate and significant	Implementation of 81m buffer between turbine blades and woodland edges. Curtailment at turbines 2, 7, 8 and 10. Monitoring and carcass searches	Adverse, negligible and not significant
Fish species	None	Not significant	None needed	Not significant

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Appendices

Annexure A: Ecological KCC and CCC LDP Objectives

A.1. Kerry County Council Development Plan Objectives

KCDP 11-1 Ensure that the requirements of relevant EU and national legislation, are complied with by the Council in undertaking its functions, including the requirements of the EU Birds and Habitats Directives

KCDP 11-2 Maintain the nature conservation value and integrity of Special Areas of Conservation, Special Protection Areas, Natural Heritage Areas (NHAs) and proposed Natural Heritage Areas (pNHAs). This shall include any other sites that may be designated at national level during the lifetime of the plan in co-operation with relevant state agencies.

KCDP 11-3 Work with all stakeholders in order to conserve, manage and where possible enhance the County's natural heritage including all habitats, species, landscapes and geological heritage of conservation interest and to promote increased understanding and awareness of the natural heritage of the County.

KCDP 11-4 Promote nature-based solutions to meet national objectives towards achieving a carbon neutral economy by 2050.

KCDP 11-5 Support and facilitate the actions in the National Biodiversity Action Plan and Kerry County Councils Biodiversity Action Plan 2022 – 2028.

KCDP 11-6 Support community groups undertaking biodiversity projects and any opportunities that may arise from biodiversity funding/grants.

KCDP 11-7 Support the sustainable provision of access and information at natural heritage sites around the county, at appropriate locations.

KCDP 11-8 Support the recording of biodiversity data in the county and its referral to National Biodiversity Data Centre.

KCDP 11-9 Support Agri-environment schemes; the MacGillycuddy Reeks Mountain Access Reeks Forum, the Magharees Conservation Association; EIPs; EU LIFE projects and other existing or proposed biodiversity programmes being undertaken in the county.

KCDP 11-10 Support the NPWS in the ongoing management of Killarney National Park.

KCDP 11-11 Work with NPWS and other partners to support the Kerry UNESCO Biosphere Reserve and the implementation of initiatives contained in the Periodic Review 2017.

KCDP 11-12 Support the protection of the biodiversity and tourism-value of Killarney National Park by proactively engaging with all stakeholders to tackle Rhododendron infestation and combating illegal fires.

KCDP 11-13 Support the sustainable use of wetlands, including our Ramsar sites, for educational, recreational and or tourism uses where appropriate and compatible with environmental protection designations.

KCDP 11-16 Ensure invasive species are managed in compliance with the provisions of the EC (Birds and Habitats) Regulations (SI 477 of 2011), as amended, particularly Sections 49, 50 and the Third Schedule. Best practices, as produced and updated by relevant authorities, are to be adhered to in the management of invasive species particularly on sites proposed for development.

KCDP 11-17 Facilitate, in collaboration with relevant stakeholders increased awareness and the implementation of biosecurity measures to prevent the spread of invasive species, particularly along watercourses.

KCDP 11-18 Facilitate the provision of an appropriate site in the County for the disposal and management of invasive species and contaminated soil, further to best practice guidelines and the provisions of the EC (Birds and Habitats) Regulations (SI 477 of 2011), as amended.

KCDP 11-19 Support actions from the All-Ireland Pollinator Plan including the plan's recommendations for grassland management and pollinator friendly species.

KCDP 11-20 Support the management of appropriate green areas to become natural biodiversity areas to encourage natural wildflowers to recolonise and support enhanced bee and insect populations.

KCDP 11-21 Require, where necessary, proposals to be accompanied by a habitat map prepared in accordance with the Heritage Councils Best Practice Guidance for Habitat Survey and Mapping, 2011.

KCDP 11-22 Encourage and facilitate the retention and creation of features of local biodiversity value, ecological corridors and networks that connect areas of high conservation value such as watercourses, woodlands, hedgerows, earth banks and wetlands.

KCDP 11-23 Identify key areas in the County, in collaboration with other relevant bodies, where habitat mapping would be of particular benefit to record existing features of local biodiversity and where applicable to integrate this information in the development management and plan preparation process.

KCDP 11-24 Promote the integration and improvement of natural watercourses in development proposals having regard to the IFI's guidance Planning for Watercourses in the Urban Environment.

KCDP 11-25 Support projects such as the swift nesting project (that are compatible with protection of our architectural heritage); pollinator friendly initiatives, tree planting, nature based sustainable urban drainage systems and other actions that seek to enhance urban wildlife.

KCDP 11-44 Take into consideration the Bat Conservation Trust 2018 Note 08/18 Bats and Artificial Lighting in the UK Guidelines when choosing lighting specifications for developments and/or Bat specialist advice, so as to ensure the requirements of the Habitats Directive are adhered to, including Article 10.

A.2. Cork County Council Development Plan Objectives

BE 15-1: Support and comply with national biodiversity protection policies

a) Support and comply with the objectives of the National Biodiversity Plan 2017-2021 (and any future National Biodiversity Plan which may be adopted during the period of this Plan) as appropriate,

b) Implement the current County Biodiversity Action Plan and any future updated Plan;

c) Support and comply with biodiversity policy set out in other national and regional policy documents as appropriate.

BE 15-2: Protect sites, habitats and species

a) Protect all natural heritage sites which are designated or proposed for designation under European legislation, National legislation and International Agreements. Maintain and where possible enhance appropriate ecological linkages between these. This includes Special Areas of Conservation, Special Protection Areas, Marine Protected Areas, Natural Heritage Areas, proposed Natural Heritage Areas, Statutory Nature Reserves, Refuges for Fauna and Ramsar Sites. These sites are listed in Volume 2 of the Plan.

b) Provide protection to species listed in the Flora Protection Order 2015, to Annexes of the Habitats and Birds Directives, and to animal species protected under the Wildlife Acts in accordance with relevant legal requirements. These species are listed in Volume 2 of the Plan.

c) Protect and where possible enhance areas of local biodiversity value, ecological corridors and habitats that are features of the County's ecological network. This includes rivers, lakes, streams and ponds, peatland and other wetland habitats, woodlands, hedgerows, tree lines, veteran trees, natural and semi-natural grasslands as well as coastal and marine habitats. It particularly includes habitats of special conservation significance in Cork as listed in Volume 2 of the Plan.

d) Recognise the value of protecting geological heritage sites of local and national interest, as they become notified to the local authority, and protect them from inappropriate development

e) Encourage, pursuant to Article 10 of the Habitats Directive, the protection and enhancement of features of the landscape, such as traditional field boundaries, important for the ecological coherence of the Natura 2000 network and essential for the migration, dispersal and genetic exchange of wild species.

BE 15-3: Local Authority plan making

a) Ensure that biodiversity issues are considered at the earliest possible stages of plan making;

b) Ensure that plans and strategies comply with nature conservation legislation and policy as required (fulfil Strategic Environmental Assessment and Appropriate Assessment requirements); and

c) Carry out ecological impact assessment of plans and strategies as appropriate.

BE 15-4: Local Authority development and projects

a) Ensure that biodiversity protection is considered at design stage for works and development planned and progressed by Cork County Council and that all such projects comply with nature conservation legislation and policy as required;

b) Fulfil Appropriate Assessment and Environmental Impact Assessment requirements and carry out Ecological Impact Assessment in relation to Local Authority plans and projects as appropriate.

BE 15-5: Biodiversity on Council owned and managed land and property

a) Protect biodiversity and support the principle of biodiversity net gain on land and property owned and managed by Cork County Council.

b) Support the implementation of positive conservation management on lands and property which are owned or managed by Cork County Council;

c) Support and implement best practice in the management of roadside boundaries including tree lines and hedgerows managed by Council;

d) Support national policy to create new woodlands on public land and participate in the Creation of Woodlands on Public Lands Scheme and any successor schemes;

e) Where possible, develop and implement Pollinator Plans and/or Biodiversity Action Plans for lands managed by Cork County Council in accordance with the National Biodiversity Action Plan (and any future National Biodiversity Plan which may be adopted during the lifetime of this Plan) and the All-Ireland Pollinator Plan;

f) Support the use of natural approaches to flood management and control on lands owned or managed by or on behalf of Cork County Council.

g) The Council will incorporate primarily native planting into new landscaping schemes within its own developments

BE 15-6: Biodiversity and New Development

Provide for the protection and enhancement of biodiversity in the development management process and when licensing or permitting other activities by:

a) Providing ongoing support and guidance to developers on incorporating biodiversity considerations into new development through preplanning communications and the Council's guidance document 'Biodiversity and the Planning Process – guidance for developments on the management of biodiversity issues during the planning process' and any updated versions of this advice;

b) Encouraging the retention and integration of existing trees, hedgerows and other features of high natural value within new developments;

c) Requiring the incorporation of primarily native tree and other plant species, particularly pollinator friendly species in the landscaping of new developments;

d) Fulfilling Appropriate Assessment and Environmental Impact Assessment obligations and carrying out Ecological Impact Assessment in relation to development and activities, as appropriate;

e) Ensuring that an appropriate level of assessment is completed in relation to wetland habitats subject to proposals which would involve drainage or reclamation. This

includes lakes and ponds, watercourses, springs and swamps, marshes, heath, peatlands, some woodlands as well as some coastal and marine habitats;

f) Ensuring that the implementation of appropriate mitigation (including habitat enhancement, new planting or other habitat creation initiatives) is incorporated into new development, where the implementation of such development would result in unavoidable impacts on biodiversity - supporting the principle of biodiversity net gain.

BE 15-7: Control of Invasive Alien Species

Implement best practice to minimise the risk of spread of invasive alien species, on Council owned or managed land, and require the development and implementation of Invasive Alien Species Management Plans for new developments where required.

BE 15-9: Support for Communities and Other Stakeholders

Support community organisations and other stakeholders as follows:

a. Implement the County Biodiversity Action Plan and any future updated Plan;

b. Support the implementation of the All-Ireland Pollinator Plan.

c. Where possible, support community led initiatives to protect biodiversity including the development of community led Biodiversity Action Plans and Pollinator Plans.

d. Work with statutory agencies, educational institutes and other organisations to address the issues relating to the protection of biodiversity in the County where possible and as appropriate.

BE 15-10: Soils

a) Ensure the protection and conservation of the soils in County Cork by encouraging sustainable management practices and the reuse of brownfield lands.

b) Identify areas of poorer soil in the County acknowledge their potential value for wildlife, and respect their limitations, particularly in terms of their assimilative properties to prevent pollution.

A.3. Protected Habitats and species

The following require particular consideration during impact assessment in the CCC area.

Irish Habitat Classification (Fossitt 2000)	Annex I Habitats	Examples of SACs where habitats are found
Freshwater Habitats		
Dystrophic lakes FL1	Natural dystrophic lakes and ponds	Caha Mountains.
Acid oligotrophic lakes FL2	Oligotrophic waters containing very few minerals of sandy plains	Glanmore Bog.
Acid oligotrophic lakes FL2	Oligotrophic to mesotrophic standing waters	Caha Mountains, Caherbarnagh (part of Killarney National Park).
Eroding/upland rivers FW1 Depositing/ lowland rivers FW2	Watercourses of plain to montane levels with aquatic vegetation	The Gearagh, Glanmore Bog, Bandon River, River Blackwater.

Irish Habitat Classification (Fossitt 2000)	Annex I Habitats	Examples of SACs where habitats are found
Eutrophic lakes FL5		
Reed and large sedge swamps FS1		
Marsh GM1		
Grassland Habitats		
Dry meadows and grassy verges GS2	Lowland hay meadows	Roaringwater Bay & Islands.
Dry calcareous grassland		
Species-rich wet grassland		
Molinia grassland		
Heath Habitats		
Dry siliceous heath HH1 Dry calcareous heath HH2	European dry heath	Roaringwater Bay & Islands, Sheep's Head, Three Castle Head to Mizen Head, Barley Cove To Ballyrisode Point, Kenmare River, Ballyhoura Mountains, Caherbarnagh (part of Killarney National Park).
Wet heath HH3	Northern Atlantic wet heaths with Erica tetralix	Sheep's Head, Caha Mountains, Cleanderry Wood, Glanmore Bog, Ballyhoura Mountains.
Montane heath HH4	Alpine and boreal heaths	Caha Mountains.
Woodland Habitats		
Oak-birch-holly woodland WN1	Old sessile oak woods with Ilex and Blechnum in the British Isles	Glengarriff Harbour & woodland, St Gobnet's Wood,The Gearagh, Cleanderry Wood, Blackwater River.
Wet pedunculate oak-ash woodland WN4	Alluvial forests with Alnus glutinosa and Fraxinus excelsior	Dunbeacon Shingle, Glengarriff Harbour & woodland,The Gearagh, Bandon River, Blackwater River.
Oak-ash-hazel woodland WN2		
Yew woodland WN3		
Wet willowalder-ash woodland WN6		
Peatland Habitats		
Upland blanket bog PB2	Blanket bog (*if active bog)	Caha Mountains, Glanmore Bog, Derryclogher Bog, Mullaghanish Bog, Ballyhoura Mountains, Caherbarnagh (part of Killarney National Park).
Cutover bog PB4		
Lowland blanket bog PB3		
Poor fen and flush PF2		
Transition mire PF3		

Irish Habitat Classification (Fossitt 2000)	Annex I Habitats	Examples of SACs where habitats are found
Exposed Rock		
Exposed siliceous rock ER1	Siliceous rocky slopes with chasmophytic vegetation	Caha Mountains.
Exposed calcareous rock ER2	Calcareous rocky slopes with chasmophytic vegetation	Caha Mountains.
Siliceous scree and loose rock ER3	Siliceous rocky slopes with chasmophytic vegetation	Caha Mountains.
Calcareous scree and loose rock ER4	Calcareous rocky slopes with chasmophytic vegetation	Caha Mountains.

A.4. Protected Species

Hedgehog Erinaceus europaeus

Pygmy Shrew Sorex minutus

Irish Hare Lepus timidus hibernicus

Red Squirrel Sciurus vulgaris

Pine Marten Martes martes

Irish Stoat Mustela erminea hibernica

Badger Meles meles

Otter Lutra lutra roensis

Red Deer Cervus elaphus

Sika Deer Cervus nippon

Fallow Deer Dama dama

Lesser Horseshoe Bat Rhinolophus hipposideros

Whiskered Bat Myotis mystacinus

Brandt's Bat Myotis brandti

Daubenton's Bat Myotis daubentoni

Common Pipistrelle Bat Pipistrellus pipistrellus

Soprano Pipistrelle Bat Pipistrellus pygmaeus

Nathusius Pipistrelle Bat Pipistrellus nathusii

Leisler's Bat Nyctalus leisleri

Brown Longeared Bat Plecotus auritus

Natterer's Bat Myotis nattereri

Grey Seal Halichoerus grypus

Common Seal Phoca vitulina

Bottlenose Dolphin Tursiops truncatus

Harbour Porpoise Phocoena Phocoena

Common Lizard Lacerta vivipara

Common Frog Rana temporaria

Common Newt Triturus vulgaris

White-clawed Crayfish Austropotamobius pallipes

Marsh Fritillary Euphydryas aurinia

Freshwater Pearl Mussel Margaritifera margaritifera

Kerry Slug Geomalacus maculosus

River Lamprey Lampetra fluviatilis

Brook Lamprey Lampetra planeri

Sea Lamprey Petromyzon marinus

Allis Shad Alosa alosa

Twaite Shad Alosa fallax

Atlantic Salmon Salmo salar

Smelt Osmerus eperlanus

Annexure B: Marsh Fritillary Habitat Condition Assessment Methodology

A.5. Habitat Condition Assessment For Marsh Fritillary

Habitat condition monitoring for the Marsh Fritillary involves fixed point habitat recording on a structured walk across a site, from which an assessment can be made. A separate survey and assessment should be completed for each sub-site.

A.6. Method

- Establish a W shape (zigzag) route that will cross thoroughly and evenly the whole site/sub-site.
- Decide stopping distances along this route where recordings of habitat condition will be made e.g. every 10 or 20 paces. Aim to have at least 20 stopping points for a small site (<1 ha) more than 40 stopping points for a medium-sized site (1-5 ha) and more than 50 stopping points for a large site (>5 ha).
- Follow your route and at each stopping point measure (in cm) the vegetation height at the point you stop (measure to the top of the leaves i.e. ignore the flowers of grasses and plants). Then, using an imaginary box with sides of 1 m in front of you, record the presence of Devil's-bit Scabious in one of these abundance categories (A = 1-2 plants, B = 3-9 plants, C = 10+ plants, D = No plants). Using the same area, record (mark with an 'X') the presence or absence of these three habitat attributes: structured vegetation, low (<25 cm tall) invading scrub with a cover of >10% and stock grazing signs (e.g. tracks, poach marks, dung).
- At the end of the assessment, then provide an estimate the cover (%) of tall (>0.5 m) scrub for the whole site/sub-site.

A.7. Marsh Fritillary Habitat Condition Survey Form

SITE NAME		**SUB-SITE**	
OS GRID REF		RECORDER(S)	
SURVEY DATE		TALL SCRUB COVER (%)	
MANAGEMENT OBSERVATIONS (e.g. enclosed, recently grazed or cut, peat cutting, burning, etc.)			
ASPECT AND SLOPE DESCRIPTION The main aspect and a brief description of whether the site has suitable habitat covering a variety of aspects (including variation at a micro scale such as banks)			

SITE NAME		SUB-SITE	
EXPOSURE (e.g. high exposure sites would be open coastal sites)			

Structured Walk Records

Key for recording attributes:

1. Vegetation Height:	A = <12 cm	B = 12-25 cm	C = 25-50 cm	D = >50 cm
2. Devil's bit scabious:	A = 1-2 plants/m2	B = 3-9 plants/m2	C = 10+ plants/m2	D = None
3. Structured vegetation:	Mark with an 'X' if there is presence of any steps in vegetation or ground that provide localised protection from elements at ground level. See figure below for guidance.			
4. Low invading scrub:	Tick if low invading scrub (e.g. birch, gorse, bog myrtle) <25 cm tall and >10% cover present. The word 'invading' is important here. Do not include scrub that is an integral part of the habitat (e.g. Juniper in Juniper heath systems).			
5. Evidence of stock grazing:	Tick if localised evidence present (e.g. poaching, dung, etc.)			

Example of Structured Vegetation:

No	Yes Varied vegetation height, bank or slope change, small tussocks or poaching etc.

Stop Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
1. Vegetation Height																				
2. Devil's-bit Scabious abundance																				
Mark with an 'X' if attributes below are present at each stop																				
3. Structured																				

Stop Number	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20
vegetation																				
4. Low invading scrub																				
5. Evidence of stock grazing																				

Stop Number	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
1. Vegetation Height																				
2. Devil's-bit Scabious abundance																				
Mark with an 'X' if attributes below are present at each stop																				
3. Structured vegetation																				
4. Low invading scrub																				
5. Evidence of stock grazing																				

Stop Number	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
1. Vegetation Height																				
2. Devil's-bit Scabious abundance																				
Mark with an 'X' if attributes below are present at each stop																				
3. Structured vegetation																				
4. Low invading scrub																				
5. Evidence of stock grazing																				

A.8. Data Analysis (Optional)

At the end of the field survey, calculate the following for each area sampled:

MEAN VEG. HEIGHT (cm)		% FREQUENCY OF CATEGORY B/C SCABIOUS IN <12 cm SWARDS	
% FREQUENCY OF SCABIOUS		% FREQUENCY OF CATEGORY B/C SCABIOUS IN >25 cm SWARDS	
% FREQUENCY OF SCABIOUS CATEGORY A		% FREQUENCY OF SRUCTURED VEGETATION	
% FREQUENCY OF SCABIOUS CATEGORY B		% FREQUENCY OF LOW INVADING SCRUB	
% FREQUENCY OF SCABIOUS CATEGORY C		% FREQUENCY OF STOCK GRAZING SIGNS	
% FREQUENCY OF 12-25 cm SWARDS		TALL (>0.5 m) SCRUB COVER (%)	
% FREQUENCY OF CATEGORY B/C SCABIOUS IN 12-25 cm SWARDS			

A.9. HABITAT CONDITION ASSESSMENT

Assess the condition to one of the following categories:

Good Condition Habitat (**GC**): >20% freq. of Scabious of category B/C abundance growing in 12-25 cm tall swards and <10% cover of tall scrub (>0.5 m tall)

Suitable (Under-grazed) Habitat (**SU**): >20% freq. of Scabious of category B/C abundance growing in >25 cm tall swards and <20% freq. of Scabious of category B/C abundance growing in 12-25 cm tall swards

Suitable (Over-grazed) Habitat (**SO**): >20% freq. of Scabious of category B/C abundance growing in <12cm tall swards and <20% freq. of Scabious of category B/C abundance growing in 12-25 cm tall swards

Unsuitable habitat (**US**): <5% freq. of Scabious of category B/C abundance growing in >25 cm tall swards

A.10. MANAGEMENT ALERTS

Undergrazing indicators	Overgrazing indicators
>10% cover of tall scrub (>0.5 m tall)	<25% frequency of structured vegetation
>75% frequency of structured vegetation	>80% frequency of evidence of stock grazing
>10% frequency of low invading scrub with >10% cover	Mean vegetation height <12 cm
<20% frequency of evidence of stock grazing	
Mean vegetation height >25cm	

A.11. SUMMARY DATA ANALYSIS

CONDITION CATEGORY		NOTES
MANAGEMENT ISSUES		