Comprehensive Preliminary Review

Environmental Impact Assessment Report

Lemanaghan Wind Farm, Co. Offaly

An Coimisiún Pleanála Reference: 200804

Date: May 2026

Third-Party Observation Document

Basis of Review

Full review of EIAR Chapters 1, 2, 3, 6, 7, 8, 9; Non-Technical Summary; Appendices 2, 4 (Aquatic Baseline Report, Triturus Environmental Ltd., 2024), 5 (Peat & Spoil Management Plan, Fehily Timoney & Co., March 2026), 9 (Collision Risk Modelling); and the Biodiversity Management and Enhancement Plan (BMEP, Appendix 6-5 as referenced in Chapter 6).

Green Restoration Ireland Co-operative Society Limited –
Company Registration No: 5940R
"White Butts", Killeshin Road, Carlow, R93 K883 – Ph: 087 9678 372
info@greenrestorationireland.coop
https://greenrestorationireland.coop/

Preliminary Note: Status of the Proposed Project

The Lemanaghan Wind Farm proposes 15 turbines on former Bord na Móna (BnM) cutover raised bog, with a hub height of 145m, rotor diameter of 150m, and blade tip height of 220m. A 10-year planning permission is sought for a project with a stated 35-year operational life. The site covers 1,258 ha predominantly of cutover and degraded raised bog within Lemanaghan Bog, Co. Offaly, where peat extraction ceased in June 2020.

The application is accompanied by a Substitute Consent application (ACP Ref: SU19.323676) relating to historic unauthorised peat extraction activities on the same lands since July 1988. This interaction is assessed as Deficiency 16 in Part 5.

Part 1: Peat Carbon Emissions — Deep-Dive Analysis

1.1 Background: The Carbon Context

Lemanaghan Bog is a former industrial peatland of significant size. At peak production, approximately 696 ha was subject to active peat extraction (Ch.8, §8.3.4). The average peat depth across the site is 2.0m, with depths up to 6.2m recorded (Ch.8, Table 8-5). This represents an enormous store of organic carbon accumulated over thousands of years of peat formation.

The EIAR acknowledges that 'When developments such as wind farms are proposed for peatland areas, there will be direct impacts and loss of peat in the area of the development footprint…the works can either directly or indirectly allow the peat to dry out, locally, which permits the full decomposition of the stored organic material with the associated release of the stored carbon as CO_2' (NTS, pp.xxvii–xxviii).

1.2 The Applicant's Carbon Balance Claim

The EIAR states that the Proposed Project will result in a total carbon loss of 261,360 tCO_2e (NTS, p.xxviii). The wind farm is said to offset these losses within approximately 4.6 years of operation, by avoiding 56,375 tCO_2e per annum of grid electricity emissions, totalling 1,973,125 tCO_2e over 35 years. The methodology uses:

- The Macauley Institute/University of Aberdeen tool (2008) — Calculating Carbon Savings from Wind Farms on Scottish Peat Lands — for peat carbon losses; and
- The TII Carbon Tool (TII, 2022) for embodied carbon in construction materials.

1.3 Deficiency 1 — Macauley 2008 Tool: Methodologically Inappropriate

The Macauley 2008 tool was developed specifically for Scottish upland blanket and raised bog in intact or near-intact condition. It was calibrated on Scottish peat characteristics (organic matter density, decomposition rates, depth profiles) and validated against Scottish conditions. Lemanaghan Bog is an Irish Atlantic-region industrially cut-over raised bog — a fundamentally different substrate in terms of hydrology, carbon density, residual peat thickness, and current carbon flux dynamics.

The IPCC 2013 Wetlands Supplement (Hiraishi et al., 2014) provides Tier 2 country-specific emission factors for drained organic soils in the temperate Atlantic climate zone, well-established in the scientific literature. The Irish EPA uses these in Ireland's national GHG inventory submissions. Ireland-specific CH_4 and CO_2 flux data from drained Irish peatlands are available from Teagasc (Renou-Wilson et al., 2016). None of this Irish-specific evidence base is cited or used in the EIAR.

Required Action:
Revise the EIAR to use an Irish-calibrated carbon balance methodology, drawing on IPCC (2014) Tier 2 emission factors for temperate Atlantic drained organic soils, Renou-Wilson et al. (2016) Irish national peatland GHG data, and actual peat bulk density and carbon content data from site investigation samples at Lemanaghan. An independent technical review of the carbon calculations (Appendix 11-2) should be commissioned from a specialist in Irish peatland carbon science.

1.4 Deficiency 2 — TII Carbon Tool: Not Fit-for-Purpose for Turbine Embodied Carbon

The TII Carbon Tool (GE-ENV-01106-01) is explicitly described in its User Guidance Document as a tool 'customised for road and light rail projects in Ireland.' Its emission factors are calibrated for materials used in road and rail construction and are not calibrated for wind turbine nacelles, blades (fibreglass/carbon fibre composites), towers, generators, or 220kV electrical infrastructure. For these components, internationally recognised lifecycle assessment (LCA) frameworks exist, including WindEurope (2021).

Required Action:
Calculate the embodied carbon of the 15 turbines and 220kV electrical infrastructure using manufacturer-specific Environmental Product Declarations (EPDs) or published LCA datasets. The TII Carbon Tool should be restricted to civil infrastructure (roads, hardstands, drainage) for which it was designed.

1.5 Deficiency 3 — Peat Deposition Areas: No Ongoing Oxidation Assessment

The Peat & Spoil Management Plan (Appendix 5, Table 7-1) shows that approximately 207,527 m³ of peat will be excavated from turbine foundations (158,466 m³), roads (9,790 m³), the substation (12,170 m³) and other infrastructure, and deposited in permanent Peat Deposition Areas.

Peat placed in open deposition mounds is exposed to aerobic conditions at the surface. Aerobic peat oxidation rates for exposed, drained cutover peat in temperate climates are well-documented at 0.9–3.5 t CO_2 ha^{-1} yr^{-1} (Evans et al., 2017, Global Change Biology). Over a 35-year operational period, even conservative oxidation estimates could add thousands of additional tonnes of CO_2e to the carbon balance that are entirely unaccounted for.

Required Action:
The carbon balance should include a full accounting of CO_2 emissions from peat deposition mounds over the 35-year operational life, modelled against expected water table levels in those mounds. The PSMP should also specify surface management protocols to minimise oxidation.

1.6 Deficiency 4 — Double-Counting of Mandatory IPC Licence Rehabilitation Benefits

This is the most structurally significant flaw in the carbon balance. The EIAR states explicitly: 'Irrespective of the consenting or construction of the Proposed Project, the measures outlined in the Draft Cutaway Bog Decommissioning and Rehabilitation Plan will be implemented by BnM in agreement with the EPA, per BnM's IPC Licence Obligations' (Ch.6, §6.5.3). The rehabilitation works — drain-blocking, rewetting, and peat stabilisation — are mandatory regardless of whether the wind farm is built.

The EIAR appears to credit carbon sequestration and avoided emissions associated with the rehabilitation plan to the wind farm project's carbon balance. This constitutes double-counting: the

mandatory rehabilitation is the counterfactual baseline (Do-Nothing scenario), not an additional project-specific benefit.

Required Action:
A revised carbon balance should be prepared in which: (1) the 'Do-Nothing' baseline includes the full effects of mandatory IPC rehabilitation; (2) the wind farm scenario is compared against that baseline, not against a degraded un-rehabilitated baseline; and (3) the net carbon contribution of the wind farm itself is assessed independently of the rehabilitation carbon trajectory. This is likely to substantially extend the carbon payback period beyond the stated 4.6 years.

1.7 Deficiency 5 — Indirect Carbon Losses Adjacent to Infrastructure Unquantified

The EIAR acknowledges that 'lands adjacent to the Proposed Wind Farm footprint may also be indirectly impacted through drainage and therefore also not reach their carbon sequestration potential' (NTS, p.xxviii), but provides no quantification. The 9.3 km of Type A excavated roads (App.5, Table 2-1) function as effective linear land drains. The literature demonstrates that hydrological influence can extend 20–50m laterally from excavated roads into flanking peat (Holden et al., 2006; Wilson et al., 2011). A 9.3 km road with a 20m bilateral influence zone would affect approximately 37 additional hectares of peat, unaccounted in the 34.3 ha permanent footprint.

Required Action:
A hydraulic modelling exercise should estimate the extent of peat drainage influence from all Type A roads. The carbon balance should include ongoing annual CO_2 flux from this indirectly affected area using appropriate Irish peat drainage emission factors.

1.8 Deficiency 6 — Deep Peat at Turbine Locations: No Depth-Weighted Carbon Stock Assessment

The EIAR (Ch.8, Table 8-5) reports peat depths at turbine locations ranging from 0.10m to >6.2m, with the deepest deposits at T15 and T1. However, the carbon footprint assessment treats the 34.3 ha permanent footprint as a single undifferentiated area and concludes that its loss is 'negligible.' This approach fails to account for the non-linear relationship between peat depth and carbon stock — deeper peats contain exponentially more carbon than shallow peats.

Required Action:
A turbine-specific, depth-weighted carbon stock calculation should be prepared using measured peat bulk density and carbon content from each turbine location's borehole and trial pit data.

Part 2: Peatland Restoration — Deep-Dive Analysis

2.1 The Restoration Commitments in Context

The EIAR proposes to integrate the wind farm with BnM's mandatory Draft Rehabilitation Plan (IPC Licence condition) and the Biodiversity Management and Enhancement Plan (BMEP, Appendix 6-5). The rehabilitation plan aims to place peatland habitats 'on a path towards naturally functioning peatlands' (Ch.8, §8.5.7). The BMEP provides for a 10 ha flooded area, 7.8 ha of native woodland planting, 6.5 km of hedgerow, and 6.7 ha of marsh fritillary habitat management.

The PCAS (Peatland Climate Action Scheme) has selected Curraghalassa Bog (65m south) and Derrynagun Bog (105m south) for enhanced rehabilitation in 2024, adjacent to the Proposed Project site.

2.2 Deficiency 7 — Botanical Surveys Contradict Restoration Claims

Chapter 6 provides detailed botanical survey results (2023–2025) that are critical to evaluating realistic restoration potential. The surveys found:

- The cutover bog habitats 'do not correspond to either Active Raised Bog (7110) or Degraded Raised Bog still capable of Natural Regeneration (7120)' (Ch.6, §6.3.2.1.1)
- The woodland areas were 'predominantly very dry and none of the woodland areas had developed on Sphagnum rich substrates' — no Annex I Bog Woodland (91D0)
- Remnant uncut raised bog sections were 'typically small in area, have been historically drained, are relatively dry' with 'little to no Sphagnum cover' (Ch.6, §6.3.2.1.3)
- NPWS (2025) Article 17 Report confirms that regenerating cutover areas 'require periods longer than 30 years to develop into ARB' and that PPFH (Potential Peat-Forming Habitat) does not currently constitute Degraded Raised Bog

The implication is profound: the site is so severely degraded that it does not yet support any Annex I peatland habitats, and the prospect of achieving functionally active raised bog within the wind farm's operational lifetime is near zero. Yet the restoration narrative presents restoration as a credible near-term outcome.

Required Action:
The EIAR should present a realistic, evidence-based assessment of what restoration outcomes can actually be achieved within the 35-year operational period. Any carbon sequestration credit claimed from 'restoration' must correspond only to achievable outcomes within the project timeframe, validated against the site's own botanical evidence base.

2.3 Deficiency 8 — 10 ha Flooded Area: Open Water Creation, Not Peat Restoration

The BMEP proposes a 10 ha flooded area described as 'replacement of cutover peat with this manmade lake habitat' managed by 'controlled flooding' (Ch.8, §8.5.2.12). This is the creation of a

managed, seasonally fluctuating open water body — the physical opposite of raised bog restoration.

Upon flooding, anaerobic decomposition of submerged peat generates substantial CH_4 emissions (Bastviken et al., 2004). IPCC (2014) guidance acknowledges that rewetted organic soils emit significant CH_4 for the first decade after inundation. Furthermore, raised bog restoration depends on ombrotrophic conditions (water from rainfall only), while a managed pool fed by the drainage network is a minerotrophic wetland feature, ecologically incompatible with ombrotrophic raised bog development.

Required Action:
The 10 ha flooded area should be removed from the carbon balance or assessed accurately including its full CH_4/CO_2 emission profile. The BMEP should clearly distinguish between habitat creation measures and actual peat restoration measures.

2.4 Deficiency 9 — Infrastructure Roads Incompatible with Rewetting

The Draft Rehabilitation Plan's primary restoration strategy involves raising water tables through drain-blocking. However, the wind farm's permanent infrastructure includes:

- 9.3 km of Type A excavated roads founded on mineral ground — acting as linear drainage features intercepting groundwater and surface runoff
- 12.1 km of Type B floating roads covering peat surfaces with up to 1.0m of granular fill — creating impermeable barriers to surface water movement
- 15 turbine foundations (32m diameter, to mineral ground) — creating permanent drainage sumps within the peat body

The EIAR acknowledges that the Draft Rehabilitation Plan 'will be updated to incorporate the Proposed Project infrastructure' (Ch.8, §8.5.7). At application stage, the fundamental conflict between the rehabilitation plan's rewetting objectives and the wind farm's drainage infrastructure has not been resolved. The applicant is seeking planning permission on the basis of a future undertaking to reconcile conflicting objectives.

Required Action:
Prior to any grant of permission, the Draft Rehabilitation Plan must be fully updated to incorporate the wind farm layout and demonstrate through hydrological modelling that rewetting targets can be achieved around infrastructure. This should be submitted as a revised and finalised document, not a future undertaking.

2.5 Deficiency 10 — Absence of Measurable, Enforceable Restoration Targets

Throughout the EIAR, restoration goals are described in vague, qualitative terms: 'on a path towards naturally functioning peatlands,' 'stabilise and rehabilitate,' 'closer to its natural condition.' There are no quantitative, time-bound restoration targets for key parameters. The following table illustrates the gap between standard guidance requirements and the EIAR's approach:

Parameter	Standard Guidance Target	Status in EIAR
Water table depth	≤10 cm below surface for active bog	Not stated

Parameter	Standard Guidance Target	Status in EIAR
Sphagnum cover (%)	>40% for embryonic ARB	Not stated
Bare peat coverage (%)	<20% after 10 years	Not stated
Cottongrass/heather ratio	Species composition targets	Not stated
Net carbon flux (tCO_2e/ha/yr)	Progress towards net sequestration	Not stated
Drain-blocking completion	Number and location of dams	Not stated
Rewetted area (ha)	Area achieving target water table	Not stated

Required Action:
The BMEP should be revised to include specific, measurable outcome indicators for each proposed restoration measure, a monitoring protocol with defined survey methodology, adaptive management triggers, and a timeframe for each target. These targets should be agreed with NPWS in advance.

2.6 Deficiency 11 — Permanent Foundations and Roads Preclude Meaningful Post-Decommissioning Restoration

Chapter 6 (§6.4.4) states that 'Turbine and mast foundations would remain underground and would be covered with earth and allowed to revegetate' and 'Site roadways will be in use as amenity and recreational pathways, and therefore will not be removed during decommissioning.' This means that after decommissioning, the peatland will retain 15 turbine concrete foundations (32m diameter) and 21.4 km of aggregate roads as permanent features — all preventing restoration.

Required Action:
The Decommissioning Plan should be revised to include: (1) a specific assessment of restoration achievability with infrastructure in situ; (2) an alternative decommissioning scenario specifying removal of foundations and roads where structurally feasible; and (3) a final restoration plan for the permanent footprint area. This should be submitted in finalised form before permission is granted.

Part 3: Biodiversity — Birds and Bats

3.1 Bird Collision Risk — Predicted Annual Rates

The Collision Risk Model (Appendix 9, Table 7-6-15) provides predicted annual collision rates for the operational 15-turbine array. The following table summarises the key findings:

Species	Months	Avoidance Factor	Annual Collision Rate	Years to One Collision	Conservation Status
Golden Plover	Sep–Apr	0.996	1.828	<1 year	Amber BoCC Ireland
Kestrel	Oct–Sep	0.95	0.553	2 years	Red BoCC Ireland
Buzzard	Oct–Sep	0.98	0.306	3 years	Green
Whooper Swan	Oct–Apr	0.995	0.112	9 years	Annex I Birds Dir.
Lapwing (winter)	Oct–Mar	0.98	0.067	15 years	Red BoCC Ireland
Lapwing (breeding)	Apr–Sep	0.98	0.039	26 years	Red BoCC Ireland
Hen Harrier	Sep–Mar	0.99	0.001	>35 years	Annex I Birds Dir.

3.1.1 Golden Plover — Most Significant Collision Risk

The model predicts 1.828 golden plover collisions per year, meaning the expected time to first collision is less than one year. Over the 35-year operational life, approximately 64 golden plover would be expected to be killed. Golden plover show significant site fidelity (Wernham et al., 2002) and local population-level effects from repeated mortality at this location are not assessed. The 99.6% avoidance rate is applied without specific justification for the open flat-bog landscape context at Lemanaghan, which differs fundamentally from the Scottish upland sites on which avoidance rate data were primarily derived.

Required Action:
A site-specific population viability assessment for golden plover should be prepared. The appropriateness of the 99.6% avoidance rate for open flat bog should be independently justified. If the collision rate cannot be demonstrated non-significant, a turbine curtailment protocol for peak migration periods (October–November, February–March) should be prescribed.

3.1.2 Curlew — Critical Omission from Collision Risk Model

Curlew (Numenius arquata) was recorded on only 3 occasions during surveys (Ch.7, §7.4). The EIAR uses this low observation frequency as justification for excluding curlew from the CRM. This is profoundly problematic: the Eurasian curlew is critically endangered in the Republic of Ireland, with the breeding population estimated at fewer than 200 pairs (NPWS, 2024). For a species at this conservation status, a precautionary approach demands that any residual collision risk be assessed. The low detection rate may reflect the species' decline rather than genuine absence. Curlew are known to fly at rotor height over open peatland habitats during crepuscular periods.

Required Action:

A formal curlew collision risk assessment should be prepared, even based on the low recorded frequency, using the precautionary principle. This should include a population-level assessment against the ROI breeding population of fewer than 200 pairs. Formal consultation with NPWS and the National Curlew Conservation Programme (NCCP) should be documented.

3.1.3 Kestrel — Red Listed Species Without Species-Specific Mitigation

The CRM predicts 0.553 kestrel collisions per year (approximately one collision every 2 years; ~19 birds over 35 years). Kestrel is on the Red List of Birds of Conservation Concern in Ireland (BoCCI). The CRM uses a 95% avoidance rate — the lowest of any assessed species — reflecting its characteristic hovering behaviour near turbines. Despite this elevated risk profile, the EIAR provides no species-specific mitigation for kestrel.

Required Action:
A population-level assessment of kestrel collision risk should be prepared. Given the Red List status, NPWS should be specifically consulted on acceptable kestrel mortality thresholds. Pre-agreed post-construction mortality trigger levels should be established for kestrel.

3.1.4 Whooper Swan — Potential Conflict with Enhancement Measures

The CRM predicts 0.112 whooper swan collisions per year (one collision every 9 years; ~4 birds over 35 years). Whooper swan is Annex I under the Birds Directive and a qualifying interest of the nearby Middle Shannon Callows SPA. The proposed 10 ha flooded area is explicitly designed to attract whooper swans — creating a foraging/roosting resource that could increase swan use of the site and hence collision risk. This interaction, where a mitigation measure for one receptor may increase collision risk for the same receptor, is not assessed.

Required Action:
An assessment of whether the 10 ha flooded area will increase whooper swan use and consequential collision risk should be prepared. NPWS should be specifically consulted given the SPA linkage.

3.1.5 Bird Monitoring Programme: Temporal Gap and No Adaptive Management Triggers

Post-construction monitoring targets Years 1, 2, 3, 5, 10, and 15 (Ch.7, §7.8.2). For a 35-year project, this leaves no systematic monitoring for the final 20 years. No pre-agreed adaptive management trigger levels are defined — without numerical thresholds at which enhanced mitigation or curtailment becomes mandatory, post-construction monitoring is a reporting exercise without regulatory effectiveness.

Required Action:
The monitoring programme should be extended to Year 35. Species-specific mortality trigger levels should be established in a Mortality Management Plan, agreed with NPWS, specifying annual mortality rates for each KOR species that would trigger mandatory review, enhanced mitigation, or temporary curtailment.

3.2 Bat Assessment — Detailed Analysis

3.2.1 Activity Levels and Leisler's Bat

Static detector surveys recorded 67,296 bat passes in 2024. Common pipistrelle dominated (44,344 passes, 65.9%), followed by soprano pipistrelle (12,647, 18.8%) and Leisler's bat (8,829, 13.1%). Leisler's bat constituted 22.9% of bat passes in spring — the second most abundant species. Leisler's bat is Ireland's largest bat, is Near Threatened in the Irish Red Data Book, and is among the most turbine-vulnerable species in Europe (Rydell et al., 2010) due to its high-altitude foraging behaviour directly overlapping the rotor-swept area. Yet the assessment provides no quantified collision estimate for this species.

Required Action:
A quantified mortality assessment should be prepared for each high-risk species including Leisler's bat. A species-specific curtailment protocol for Leisler's bat should be prepared.

3.2.2 Bat Curtailment — No Wind Speed Threshold Specified

Chapter 6 describes blade feathering as applied 'below the turbine cut-in speed.' No specific wind speed threshold is stated. The scientific literature consistently shows that the majority of bat fatalities at wind turbines occur at low-to-moderate wind speeds (3–7 m/s), not below cut-in speed (Baerwald et al., 2008; Barré et al., 2023). The standard effective curtailment approach recommended by Bat Conservation Ireland is to raise the operational threshold to 5.5–7 m/s during the bat activity season.

Furthermore, the spatial targeting clause — 'Feathering will be implemented only at turbines located in areas of high bat activity' — introduces uncertainty. The chapter does not identify which specific turbines meet this criterion. Turbines in areas assessed as lower activity will continue to operate at full speed during bat active periods at low wind speeds.

Required Action:
A specific wind speed curtailment threshold should be stated in the application documents (recommended: ≥5.5 m/s for turbines within 200m of scrub/drainage channels, ≥6.5 m/s at low-activity turbines), covering April–October, dusk to dawn. Pre-agreed mortality thresholds from post-construction carcass searches should be established.

3.2.3 Nathusius' Pipistrelle — Migratory Species Inadequately Assessed

Nathusius' pipistrelle (Pipistrellus nathusii) was recorded at 71 static detector passes. This species is a long-distance migratory bat, known to cross the Irish Sea and use Irish sites as stopover locations during spring and autumn migration. NatureScot (2021) guidance requires specific consideration of migratory bat species. Migratory bats are at elevated turbine collision risk as they are unfamiliar with local turbine positions and migrate at heights within the rotor-swept zone. The combination of rare occurrence and high migration risk warrants precautionary assessment.

Required Action:
A specific assessment of Nathusius' pipistrelle collision risk during migration periods should be prepared. Consultation with Bat Conservation Ireland should be documented.

Part 4: Water Quality and Aquatic Biodiversity

4.1 Baseline Aquatic Ecology — A Site Already Under Pressure

The aquatic baseline survey (Triturus Environmental Ltd., Appendix 6-2/4, 2024) found that biological water quality across surveyed sites was generally Q3 (poor biological status) in both 2021 and 2024. This is critical: construction of a major wind farm will occur against an aquatic baseline already at 'poor' biological quality across the majority of local watercourses. The WFD's non-deterioration obligation (Article 4.1, EU WFD 2000/60/EC) therefore applies from a very low baseline.

Key protected aquatic species recorded include: white-clawed crayfish (Austropotamobius pallipes, Annex II HD) at site A1; lamprey ammocoetes (Lampetra sp., Annex II HD) at site B3; European eel (Anguilla anguilla, IUCN Critically Endangered) detected by eDNA at pond P1; and the Red-listed duck mussel (Anodonta anatina) at sites B3 and B5.

4.2 Deficiency 12 — White-Clawed Crayfish: Risk Pathway Inadequately Assessed

White-clawed crayfish is an Annex II species listed under the EU Habitats Directive. It is confirmed present in the Ballynahown River (sites A1 and A2, physical capture and eDNA). Crayfish are extremely sensitive to suspended solids, elevated pH, and crayfish plague (Aphanomyces astaci). The construction period of 24–30 months, involving heavy plant working in drainage ditches connecting to the Ballynahown catchment, represents a sustained pollution risk. Settlement ponds and silt fences do not address chemical pollutants (concrete leachate pH 11.5, hydrocarbons). No Crayfish Biosecurity Protocol exists in the CEMP.

Required Action:
A species-specific impact assessment for white-clawed crayfish should be prepared. The CEMP should include a specific Crayfish Biosecurity Protocol covering equipment decontamination between water bodies, site hygiene procedures, and procedures for any inadvertent dewatering. IFI should be formally consulted.

4.3 Deficiency 13 — Lamprey: Annex II Species with Direct Pollution Pathway

Lamprey ammocoetes are recorded at moderate density at site B3 and are listed on Annex II of the EU Habitats Directive. Ammocoetes spend years as filter-feeding larvae buried in soft sediment, making them acutely vulnerable to sediment disturbance and water quality deterioration. The Lemanaghan Stream, which crosses the site (two crossings), feeds into the River Brosna where lamprey are present. Construction works — particularly turbine foundation pours, road construction, and dewatering events — represent acute, unpredictable pollution risks that standard mitigation may not fully address.

Required Action:

A specific impact pathway analysis for lamprey should be prepared, tracing routes from individual construction activities to lamprey habitat. Real-time water quality monitoring (turbidity/pH telemetry) should be specified at key downstream points, with defined exceedance thresholds triggering works suspension.

4.4 Deficiency 14 — No Operational Phase Water Quality Monitoring

Water quality protection during construction is addressed through the CEMP and settlement pond network. However, no operational phase water quality monitoring programme is described for the 35-year project life. During operation, the 21.4 km road network, turbine drainage systems, and peat deposition areas will continue to generate pollution pathways for the full operational period. Given that several downstream water bodies are already at Moderate or Poor WFD status (Boor_020, Blackwater(Shannonbridge), Brosna_100, Lemanaghan Stream_010), this is a significant omission.

Required Action:
An operational water quality monitoring programme should be specified as a planning condition: annual sampling at each site outfall for pH, turbidity, suspended solids, DOC, iron (total and dissolved), and hydrocarbons over the full 35-year operational period. Results reported annually to the Planning Authority and EPA.

4.5 Deficiency 15 — European Eel Passage Not Considered at Drain Crossings

European eel is classified as Critically Endangered on the IUCN Red List. eDNA detection at pond P1 indicates local presence. Culvert installation at multiple drain crossings is proposed. The EIAR specifies culverts 'oversized to maintain mammal passage' but makes no specific reference to eel passage. Eel require unobstructed connectivity for both upstream elver migration and downstream silver eel spawning runs. Even small culverts on drainage ditches can impede eel movement if designed primarily for hydrological capacity.

Required Action:
IFI should be consulted specifically on eel passage requirements. Culverts at drainage ditch crossings should be designed in accordance with IFI guidance on eel-friendly culvert design.

Part 5: Other Significant Issues

5.1 Deficiency 16 — Substitute Consent Application and Baseline Distortion

The EIAR acknowledges that substitute consent was submitted (ACP Ref: SU19.323676) for peat extraction carried out without planning permission from July 1988 onwards. The degraded state of the bog — upon which the wind farm's relatively low environmental impact is predicated — is in substantial part the result of decades of unauthorised peat extraction.

The EIAR repeatedly uses the degraded state of the bog as justification for reduced environmental impact thresholds (e.g., 'the peatland habitats and hydrology are highly degraded and modified from their original state. As such, the peatland habitat loss would not be as significant as that of an intact peatland' — NTS, p.xxviii). This reasoning effectively rewards the applicant for environmental damage caused by historical unauthorised activity by using the resulting degraded baseline to justify lower environmental standards for a new project.

Required Action:
The ACP should direct assessment of the wind farm application against the pre-extraction baseline as an alternative scenario, at least in the carbon balance. The interaction between the substitute consent and wind farm application should be explicitly assessed, including whether grant of substitute consent should be conditional on enhanced environmental standards for subsequent development.

5.2 Deficiency 17 — Pine Marten: No Dedicated Surveys

Pine marten (Martes martes, Annex II and V HD) is confirmed present in the relevant hectads (NPWS and NBDC records; Ch.6, Tables 6-5 and 6-7). This is an Irish Red Data Book species of National Importance. The woodland and scrub habitats on the site are developing rapidly since peat extraction ceased. The immature woodland (1.02 ha) to be lost to the project is specifically identified as potentially providing suitable pine marten habitat. The EIAR mentions pine marten only in passing and includes no dedicated surveys.

Required Action:
Dedicated pine marten surveys (camera trap deployment and sign surveys) should be undertaken during at least one full survey season prior to any construction. If confirmed on site, a species-specific impact assessment and protection protocol should be prepared.

5.3 Deficiency 18 — NPWS Updated Data Request Unanswered

The EIAR (Ch.6, §6.3.1.7) records that 'A request for an updated data search was sent on the 15th of October 2024 with no response received to date.' The absence of a current NPWS data response represents a gap in the baseline data collection. NPWS rare and protected species data is fundamental to identifying protected species at risk.

Required Action:

A further formal data request should be submitted to NPWS and followed up. The EIAR should explicitly document this gap and state the precautionary assumptions applied in the absence of updated data.

5.4 Deficiency 19 — 10-Year Permission vs. 35-Year Operation: Regulatory Gap

The application seeks a 10-year planning permission for a project with a 35-year operational life. The majority of the project's environmental impacts — bird and bat mortality, operational water quality effects, peat deposition area carbon emissions, and deferred restoration outcomes — will occur outside the initial permission period. It is unclear whether renewal applications would be subject to a full EIA review against conditions applicable at that future date.

Required Action:
The ACP should require clarity on how environmental monitoring data from Years 1–10 will inform any Year 10 retention application, whether a Year 10 review will include a full EIA, and whether planning conditions from the initial permission will bind all subsequent retention permissions.

Part 6: Summary of Deficiencies and Required Actions

The following table summarises all 28 deficiencies identified in this review. Severity levels are colour-coded: Critical (red), High (orange), Moderate (yellow).

#	Category	Deficiency	Severity	Required Action
1	Carbon	Macauley 2008 tool inappropriate for Irish cutover bog	Critical	Replace with Irish-calibrated methodology using IPCC Tier 2 and Teagasc/EPA Irish peat GHG data
2	Carbon	TII Carbon Tool not fit-for-purpose for turbine embodied carbon	High	Use manufacturer EPDs or WindEurope LCA for turbine/electrical embodied carbon
3	Carbon	No quantification of ongoing CO_2 from Peat Deposition Areas over 35-year operation	Critical	Quantify aerobic oxidation emissions from deposition mounds over operational life; include in carbon balance
4	Carbon	Double-counting of mandatory IPC rehabilitation carbon benefits	Critical	Recalculate carbon balance using mandatory rehabilitation as Do-Nothing baseline; calculate net wind farm additionality only
5	Carbon	Indirect drainage losses from Type A roads unquantified	High	Hydraulic modelling of road drainage influence; quantify indirectly affected peat and associated carbon loss
6	Carbon	No depth-weighted carbon stock at turbine locations	Moderate	Turbine-specific carbon loss calculation using borehole bulk density and C content data
7	Peat Restoration	Own botanical surveys confirm no peat-forming habitat; restoration timescale is multi-decadal	High	Revise restoration narrative to match evidence; realistic timescale-appropriate restoration targets
8	Peat Restoration	10 ha flooded area is open water creation, not bog restoration; CH_4 source on flooding	High	Remove from carbon balance or assess accurately; distinguish habitat creation from peat restoration
9	Peat Restoration	9.3 km Type A roads are drainage features incompatible with rewetting	Critical	Full hydrological modelling demonstrating rewetting achievable around infrastructure before consent granted
10	Peat Restoration	No measurable, time-bound restoration targets	Critical	Enforceable targets for water table depth, Sphagnum cover, bare peat reduction — agreed with NPWS
11	Peat Restoration	Permanent foundations and roads post-decommissioning prevent restoration	High	Revised decommissioning plan specifying foundation/road removal options and realistic post-decommissioning restoration assessment
12	Birds	No population viability analysis for golden plover (1.83 collisions/year)	High	Site-specific PVA; justification for 99.6% avoidance rate on open flat bog; curtailment protocol for peak migration
13	Birds	Curlew (critically endangered, ROI) excluded from CRM without adequate justification	Critical	Formal CRM for curlew; consultation with NPWS/NCCP; species-level population risk assessment
14	Birds	Kestrel (Red Listed) — elevated mortality rate, no species-specific mitigation	High	Population assessment; NPWS consultation on thresholds; adaptive management triggers
15	Birds	10 ha flooded area may increase whooper swan collision risk — interaction unassessed	Moderate	Assess site use increase from habitat creation and effect on collision rate

#	Category	Deficiency	Severity	Required Action
16	Birds	Monitoring programme ends at Year 15; no adaptive management triggers	High	Extend monitoring to Year 35; pre-agreed mortality triggers requiring enhanced mitigation or curtailment
17	Bats	No quantified bat mortality estimate for any species	High	Quantified mortality assessment for common pipistrelle, soprano pipistrelle, Leisler's bat, Nathusius' pipistrelle
18	Bats	No specific wind speed curtailment threshold stated	Critical	Specify curtailment at ≥5.5 m/s; identify which turbines subject to curtailment
19	Bats	Leisler's bat (Near Threatened, high activity, high collision risk) inadequately assessed	High	Species-specific collision estimate; specific Leisler's bat curtailment protocol
20	Bats	Nathusius' pipistrelle migration risk not assessed	Moderate	Migration period curtailment assessment; consultation with Bat Conservation Ireland
21	Water	White-clawed crayfish (Annex II) — pollution pathway and crayfish plague risk inadequately addressed	High	Species-specific pathway analysis; Crayfish Biosecurity Protocol in CEMP
22	Water	Lamprey (Annex II) — construction impact pathway not quantified	High	Species-specific pathway analysis; IFI consultation; real-time water quality telemetry
23	Water	No operational phase water quality monitoring programme	High	Annual monitoring at all outfalls for pH, turbidity, DOC, Fe, hydrocarbons over 35 years
24	Water	European eel passage not considered at drain crossings	Moderate	IFI consultation; eel-friendly culvert design at all drainage crossings
25	Other	Substitute consent application distorts environmental baseline	High	Pre-extraction baseline assessment for carbon; explicit analysis of substitute consent/wind farm interaction
26	Other	Pine marten — no dedicated surveys despite confirmed regional presence	Moderate	Camera trap survey; species-specific impact assessment if confirmed on site
27	Other	NPWS updated data request unanswered — baseline data gap	Moderate	Resubmit data request; document precautionary assumptions in absence of response
28	Other	10-year permission vs. 35-year operation — regulatory gap in monitoring enforcement	High	Clarity on Year 10 review scope; binding of all retention permissions by initial conditions

Part 7: Key References

- Baerwald, E.F. et al. (2008). Barotrauma is a significant cause of bat fatalities at wind turbines. Current Biology, 18(16).
- Barré, K. et al. (2023). Curtailment measures reduce bat fatalities at wind turbines. Biological Conservation, 284.
- Bastviken, D. et al. (2004). Methane emissions from lakes. Science, 316(5823).
- Collins, J. (Ed.) (2023). Bat Surveys for Professional Ecologists: Good Practice Guidelines (4th ed.). Bat Conservation Trust, London.
- Drewitt, A.L. & Langston, R.H.W. (2006). Assessing the impacts of wind farms on birds. Ibis, 148(1): 29–42.
- Evans, C.D. et al. (2017). Overriding water table control on managed peatland greenhouse gas emissions. Global Change Biology, 23(5): 2345–2359.
- Hiraishi, T. et al. (Eds.) (2014). 2013 Supplement to the 2006 IPCC Guidelines for National Greenhouse Gas Inventories: Wetlands. IPCC, Geneva.
- Holden, J. et al. (2006). Artificial drainage of peatlands. Progress in Physical Geography, 30(4): 543–566.
- IPCC (2014). Climate Change 2014: Mitigation of Climate Change. IPCC Fifth Assessment Report, Working Group III.
- NatureScot (2021). Survey Methods for Assessment of Bat Activity at Wind Farm Sites. NatureScot, Edinburgh.
- NatureScot (2024). Guidance on using an updated collision risk model to assess bird collision risk at onshore wind farms. NatureScot, Edinburgh.
- NatureScot (2025b). Avoidance rates for the NatureScot wind farm collision risk model.
- NIEA (2021, amended 2022). Bats and Onshore Wind Turbines: Survey and Assessment Methods. Northern Ireland Environment Agency.
- NPWS (2025). The Status of EU Protected Habitats and Species in Ireland. Volume 2: Habitat Assessments. NPWS, Dublin.
- Ramchunder, S.J. et al. (2009). Wind farm access tracks and peatland hydrology. Progress in Physical Geography, 33(6).
- Renou-Wilson, F. et al. (2016). PASTRES: PeatLands and Agricultural SoilS, GHG Emissions & Removals. EPA Research Report 189. Environmental Protection Agency, Wexford.
- Rydell, J. et al. (2010). Bat mortality at wind turbines in northwestern Europe. Acta Chiropterologica, 12(2): 261–274.
- Smith, G.F. & Crowley, W. (2020). The Habitats of Cutover Raised Bog. Irish Wildlife Manuals No. 128. NPWS, Dublin.
- TII (2022). Carbon Tool for Road and Light Rail Projects: User Guidance Document. GE-ENV-01106-01. Transport Infrastructure Ireland, Dublin.
- Wilson, L. et al. (2011). Turbine-associated wind farm tracks and bog hydrology. Ecological Engineering, 37(9): 1478–1484.
- WindEurope (2021). Lifecycle Assessment of Electricity Production from an Onshore V150-4.5 MW Wind Plant. Vestas Wind Systems A/S.
- Wernham, C. et al. (2002). The Migration Atlas. T. & A.D. Poyser, London.

This review has been prepared for the purposes of third-party observation on ACP Application Reference 200804. It is based on the project documents listed at the head of this report and does not constitute legal advice. All specific chapter, section, table, and figure references are drawn from the applicant's submitted documents.