Specialist Report to Inspector (Appendix to main report)

R323783_App1

Development	Planning permission for Cloonkett Wind Farm consisting of 14 no. wind turbines, a permanent 220kV substation and ancillary development
Type of Application	Private Development - REDIII Application
Topic	Freshwater Pearl Mussel and Bats
Ecologist/Scientist/Engineer	Donncha Madden
Planning Inspector	Alaine Clarke, Yolande McMahon
Date	14 August 2026

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1.0 Introduction

1.1. Background

1.1.1. Cloonkett Green Energy has applied for permission for a strategic renewable energy development comprising 14 wind turbines together with associated infrastructure including turbine foundations, crane hardstandings, access tracks, borrow pits, drainage infrastructure, underground cabling, a permanent 220 kV substation and ancillary development within the townlands of Carrowreagh East and West, Cloondrinagh, Cloonkett, Burrenfadda, Shessiv, Craghera, Glenconaun More and Ballyduneen, County Clare.

1.1.2. The site is located within the Cloon River catchment, which is hydrologically connected to watercourses supporting Freshwater Pearl Mussel (*Margaritifera margaritifera*) associated with the Lower River Shannon Special Area of Conservation (SAC).

1.1.3. The Inspector sought specialist ecological advice in relation to Freshwater Pearl Mussel (FWPM) and bats, including consideration of baseline information, impact assessment, submissions received, and the conclusions of the EIAR and Natura Impact Statement (NIS).

1.2. Purpose of Report

1.2.1. This report has been prepared to provide specialist ecological advice to the Inspector and Commissioners in relation to the ecological effects of the proposed development. The report primarily considers Freshwater Pearl Mussel and bats, discussing methodology and assessment of likely impacts relevant to FWPM and bats in the context of EIA and AA, providing comment on the validity of the conclusions in the EIAR and the NIS on FWPM and bats and setting out a clear recommendation regarding consent for the development from the perspective of FWPM and bats, including relevant conditions or reasons for refusal as may be appropriate.

1.2.2. Particular regard has been had to observations from the National Parks and Wildlife Service (NPWS), Clare County Council and the findings of the Inspectorate Environmental Scientist's Technical Note[1], which assessed the effectiveness of the

[1] Technical Note (R323783_TN_App1) by An Coimisiun Pleanala (ACP) Senior Env Scientist. This report will be referred to as "Inspectorate Environmental Scientist's Technical Note" hereafter.

mitigation measures proposed to protect water quality and Freshwater Pearl Mussel habitat.

1.3. Scope of Assessment

1.3.1. This report does not seek to duplicate the findings of specialist hydrological, hydrogeological or engineering assessments.

1.3.2. The technical design of settlement ponds, drainage systems and water treatment infrastructure has been addressed elsewhere. The purpose of the present report is to consider the ecological significance of those findings, particularly in relation to Freshwater Pearl Mussel conservation objectives and the integrity of the Lower River Shannon SAC.

2.0 Documents Reviewed

2.1. Introduction

2.1.1. I have reviewed the planning application documentation including the Environmental Impact Assessment Report (EIAR), Natura Impact Statement (NIS), associated appendices, further information submissions and responses to observations received during the course of the application process.

2.1.2. The principal documentation reviewed includes:

- Environmental Impact Assessment Report;
- Natura Impact Statement;
- Biodiversity Chapter and Appendices;
- Freshwater Pearl Mussel survey reports;
- Fisheries assessments;
- Water quality assessments;
- Ecohydrological reports;
- Bat surveys;
- Aquatic Habitat Management and Enhancement Plan;
- Construction Environmental Management Plan;
- Surface Water Management Plan;
- Peat and Spoil Management Plan;
- Water Framework Directive Assessment.

2.1.3. I reviewed submissions and observations received from relevant prescribed bodies including Dept. of Housing, Local Government and Heritage (Development Applications Unit), Clare County Council, I also reviewed the applicant's responses to these issues.

2.1.4. I have also reviewed the Inspectorate Environmental Scientist's Technical Note which provides an independent professional opinion, proportional to the development

proposed, on the overall impact assessment highlighting any inadequacies relating to water quality.

2.1.5. I have had regard to the following guidance and policy documents:

- NPWS (2012) Conservation Objectives: Lower River Shannon SAC 002165. Version 1.0. National Parks and Wildlife Service, Department of Arts, Heritage and the Gaeltacht;
- Atkinson, S., Magee, M., Moorkens, E.A. & Heavey, M. (2023). Supplementary Guidance on Assessment and Construction Management in Margaritifera Catchments in Ireland: Blackwater River (Cork/Waterford) SAC;
- Cloon Freshwater Pearl Mussel Sub-Basin Management Plan (Moorkens, 2010);
- Clare County Development Plan 2023-2029; and
- Clare Wind Energy Strategy: (Volume 6, Clare County Development Plan 2023-2029).

2.2. Adequacy of Information

2.2.1. Having reviewed the documentation submitted, I am satisfied that a substantial body of ecological, hydrological and environmental information is available to inform consideration of the proposed development. This includes detailed investigations of Freshwater Pearl Mussel, aquatic ecology, ecohydrology, fisheries, water quality and bats.

3.0 Freshwater Pearl Mussel (*Margaritifera margaritifera*)

3.1. Introduction

3.1.1. Freshwater Pearl Mussel (FWPM) is the principal ecological receptor relevant to this application. The proposed development is located within the Cloon catchment, which is hydrologically connected to the Lower River Shannon SAC, for which FWPM is a Qualifying Interest.

3.1.2. The ecological assessment of the proposed development therefore centres on whether the proposed development, either alone or in combination with other plans or projects, could adversely affect the conservation objectives and integrity of the Lower River Shannon SAC through impacts on FWPM habitat, water quality or associated ecological processes.

3.2. Conservation Objectives and Catchment Context

3.2.1. FWPM is one of the most environmentally sensitive freshwater species in Europe and is dependent upon exceptionally high water quality, clean stable substrates and suitable hydrological conditions. Successful recruitment requires clean, oxygenated gravels with minimal fine sediment accumulation.

3.2.2. The conservation objectives for FWPM extend beyond the protection of adult mussels and include restoration and maintenance of the ecological conditions necessary to support recruitment, habitat quality and long-term population viability. Consequently, assessments of potential effects on FWPM must consider not only direct mortality, but also the ecological processes that underpin population recovery.

3.2.3. The Cloon catchment has been identified as supporting an important FWPM population and has been the subject of extensive investigation and conservation planning. The Cloon Freshwater Pearl Mussel Sub-Basin Management Plan[2] identified sedimentation, nutrient enrichment and recruitment limitation as key constraints affecting ecological condition within the catchment. The Plan emphasises the importance of reducing sediment and nutrient inputs and restoring habitat conditions capable of supporting successful recruitment.

[2] Received, upon direct request, by email from National Parks and Wildlife Service on 07 July 2026.

3.2.4. Accordingly, the Cloon catchment should be regarded as a sensitive and recovering FWPM catchment where conservation objectives remain restoration-focused rather than maintenance-focused.

3.3. Issues Raised During Assessment

3.3.1. The principal concerns raised by the NPWS and other prescribed bodies relate to:

- sediment mobilisation;
- nutrient mobilisation;
- hydrological pathways;
- efficacy of mitigation measures; and
- the conclusions reached within the Natura Impact Statement.

3.3.2. Importantly, the concerns raised do not primarily relate to the adequacy of ecological survey effort or baseline information.

3.3.3. Rather, they relate to whether sufficient evidence has been presented to demonstrate that the proposed mitigation measures will be effective in preventing adverse effects on FWPM habitat and associated conservation objectives.

3.3.4. In my opinion, this distinction is fundamental to the consideration of the application.

3.4. Adequacy of the Applicant's Assessment

3.4.1. The applicant undertook an extensive programme of ecological investigation including:

- Freshwater Pearl Mussel surveys;
- fisheries investigations;
- aquatic ecology assessments;
- water quality monitoring;
- ecohydrological investigations;
- groundwater monitoring;
- eDNA studies; and
- catchment-scale ecological assessment.

3.4.2. The applicant's assessment successfully identifies:

- the principal ecological receptor;
- the relevant impact pathways;
- hydrological connectivity between the site and FWPM waters;
- the sensitivity of FWPM to water quality changes; and
- the potential for sediment and nutrient mobilisation in the absence of mitigation.

3.4.3. I am therefore satisfied that adequate ecological information has been provided to inform both Environmental Impact Assessment and Appropriate Assessment.

3.5. Hydrological Pathways and Water Quality

3.5.1. There is no dispute that hydrological pathways exist between the proposed development and downstream FWPM habitat. This position is accepted throughout the applicant's assessment and forms the basis of the Natura Impact Statement.

3.5.2. Similarly, there is no dispute regarding the sensitivity of FWPM to changes in water quality, particularly increased sediment and nutrient inputs.

3.5.3. The proposed development includes a range of activities with the potential to generate sediment and nutrient-rich runoff, including:

- peat excavation;
- access track construction;
- turbine foundation excavation;
- borrow pit development;
- forestry clearance; and
- associated drainage works.

3.5.4. In the absence of mitigation, these activities would have the potential to adversely affect downstream FWPM habitat.

3.5.5. Consequently, the acceptability of the proposal is dependent on the effectiveness of the mitigation measures relied upon within the assessment.

3.6. Findings of the Inspectorate Environmental Scientist’s Technical Note

3.6.1. The Inspectorate Environmental Scientist's Technical Note assessed the efficacy of the mitigation measures proposed to protect water quality and FWPM habitat.

3.6.2. The report concluded that the applicant has undertaken substantial assessment and has proposed a comprehensive suite of mitigation measures. However, it also identified a number of areas where uncertainty remains regarding the effectiveness of those measures.

3.6.3. In particular, the report identified concerns regarding:

- the ability of settlement ponds to effectively remove fine sediment and clay-sized particles;
- management of peat-derived suspended solids;
- nutrient retention within the proposed drainage system;
- the proposed use of flocculants and contingency treatment measures;
- reliance on monitoring and adaptive management measures; and
- the absence of sufficient evidence demonstrating that the proposed system can consistently achieve the level of treatment required to protect downstream FWPM habitat.

3.6.4. The findings of the Inspectorate Environmental Scientist's Technical Note are of direct ecological relevance because they relate to the principal pathways by which impacts on FWPM could occur. From my review of the applicant's documentation I concur with the findings in the Inspectorate Environmental Scientist's Technical Note and I therefore have taken these findings into account in this report.

3.7. Appropriate Assessment

3.7.1. The central issue arising from review of the application is not whether a pathway exists between the proposed development and FWPM habitat.

3.7.2. Neither is it a question of whether FWPM is sensitive to water quality changes.

3.7.3. Nor is there any doubt that, in the absence of mitigation, the proposed development would have the potential to adversely affect downstream FWPM habitat.

3.7.4. The key question for Appropriate Assessment is whether the mitigation measures relied upon within the Natura Impact Statement have been demonstrated to be effective to the degree required under Article 6(3) of the Habitats Directive.

3.7.5. The applicant has proposed an extensive suite of mitigation measures and has developed a comprehensive monitoring and management framework intended to minimise risk.

3.7.6. However, the conclusions of the Natura Impact Statement rely heavily on the successful performance of those measures throughout construction and operation.

3.7.7. Having regard to:

- the conservation objectives applicable to the Cloon catchment;
- the recognised sensitivity of FWPM to fine sediment and nutrient enrichment;
- the historical importance of sediment as a limiting factor within the catchment;
- the findings of the Inspectorate Environmental Scientist's Technical Note regarding mitigation effectiveness; and
- the residual uncertainty associated with sediment and nutrient management,

3.7.8. I am not satisfied that sufficient evidence has been presented to demonstrate that adverse effects on FWPM conservation objectives can be excluded beyond reasonable scientific doubt.

3.8. Conclusion

3.8.1. I am satisfied that the applicant has assembled a comprehensive ecological evidence base and that sufficient information has been provided to identify the relevant receptors, pathways and potential impacts.

3.8.2. I am also satisfied that FWPM is the principal ecological receptor relevant to determination of the application and that sediment and nutrient pathways represent the principal mechanisms through which effects could arise.

3.8.3. However, the principal issue in this case is not the adequacy of ecological information or the identification of impact pathways. Rather, it is whether the mitigation measures

relied upon within the Natura Impact Statement have been demonstrated to be effective.

3.8.4. Having regard to the findings of the Inspectorate Environmental Scientist's Technical Note and the ecological significance of the uncertainties identified therein, I am not satisfied that adverse effects on the conservation objectives and integrity of the Lower River Shannon SAC can be excluded beyond reasonable scientific doubt.

3.8.5. Accordingly, I do not concur with the conclusion of the Natura Impact Statement in respect of Freshwater Pearl Mussel.

4.0 Bats

4.1. Introduction

4.1.1. The Inspector requested specialist ecological advice in relation to bats, including consideration of the adequacy of baseline information, likely impacts, mitigation measures and the conclusions of the ecological assessment.

4.1.2. The applicant undertook an extensive bat assessment programme and a number of concerns relating to Lesser Horseshoe Bat were raised during the assessment process and are considered below.

4.2. Baseline Information and Survey Effort

4.2.1. The applicant undertook a comprehensive programme of bat surveys comprising:

- desk study review;
- habitat assessment;
- static detector surveys;
- activity transects;
- roost inspections;
- emergence surveys;
- winter bat surveys; and
- targeted investigations relating to Lesser Horseshoe Bat.

4.2.2. The survey work was undertaken over a number of seasons and generated a substantial body of information regarding species presence, habitat use, commuting routes and activity levels throughout the study area.

4.2.3. A number of bat species were recorded and the applicant identified a network of habitats used for foraging and commuting. Particular consideration was given to Lesser Horseshoe Bat due to the proximity of known roosting and foraging habitat and due to concerns raised by prescribed bodies.

4.2.4. Having reviewed the survey information submitted, I am satisfied that the level of survey effort is extensive and proportionate to the sensitivity of the receiving

environment. I am also satisfied that sufficient information is available to characterise bat usage of the site and assess likely impacts arising from the proposed development.

4.3. Lesser Horseshoe Bat

4.3.1. Lesser Horseshoe Bat (LHB) is one of Ireland's most conservation-sensitive bat species and is strongly associated with connected landscapes containing treelines, hedgerows, woodland edges and riparian corridors used for commuting and foraging. The species generally avoids crossing open areas and is therefore particularly sensitive to habitat fragmentation and loss of connectivity.

4.3.2. The Department noted the presence of a LHB maternity roost in proximity to the proposed development and raised concerns regarding:

- habitat connectivity;
- potential disturbance to roosting bats;
- impacts on commuting and foraging routes;
- forestry removal;
- operational impacts associated with turbines; and
- the adequacy of operational mitigation measures.

4.3.3. The applicant undertook targeted LHB surveys and specifically considered the location of the maternity roost, Core Sustenance Zone, commuting routes and foraging habitats. The results of these investigations informed the iterative design process and the development of mitigation measures proposed for the site.

4.3.4. Having reviewed the surveys and assessment material submitted, I am satisfied that the applicant appropriately identified the key LHB receptors and assessed the principal pathways through which impacts could arise.

4.4. Habitat Connectivity and Forestry Removal

4.4.1. Habitat connectivity represents the principal ecological consideration for bats within this application.

4.4.2. The Department expressed concern that several turbines and associated infrastructure are located in proximity to linear habitat features which function as commuting and foraging corridors for bats. The Department also considered that

species-specific buffer distances and avoidance measures required further clarification.

4.4.3. The applicant assessed habitat connectivity using habitat surveys, detector surveys and specific assessments relating to LHB. The mitigation strategy includes:

- retention of key habitat features where possible;
- design modifications;
- habitat enhancement measures;
- replacement planting;
- maintenance of commuting corridors; and
- specific mitigation within the Lesser Horseshoe Bat Core Sustenance Zone.

4.4.4. The applicant also adopted turbine buffer distances informed by NatureScot guidance, including minimum separation distances from identified bat habitat features and a 250 m stand-off distance in relation to the known LHB maternity roost.

4.4.5. While habitat loss and alteration will occur, I am satisfied that habitat connectivity has been specifically considered in project design and that the applicant has appropriately assessed the landscape features most relevant to bat movement and foraging activity.

4.5. Operational Effects

4.5.1. Potential operational impacts on bats include:

- collision risk;
- barotrauma;
- displacement from foraging habitat;
- disturbance effects; and
- barrier effects associated with turbine operation.

4.5.2. The Department expressed concern that the application did not contain sufficiently detailed operational mitigation measures and considered that the mitigation proposed was not fully aligned with NPWS or EUROBATS guidance. In particular, concerns

were raised regarding turbine curtailment, real-time monitoring and shut-down thresholds.

4.5.3. Having reviewed Section 9.7.3.2 of the EIAR, I note that operational mitigation measures have been proposed and are considerably more detailed than implied by the Department's submission. The applicant proposes:

- turbine feathering below cut-in speed;
- smart curtailment during periods of elevated bat activity;
- wind speed-based operational restrictions;
- post-construction bat activity monitoring;
- mortality monitoring;
- adaptive management; and
- refinement of curtailment measures following review of monitoring results.

4.5.4. The mitigation strategy includes defined curtailment periods and wind speed thresholds for higher-risk species and is supported by a post-construction monitoring programme extending over multiple years. The applicant also references current guidance and published evidence relating to the effectiveness of turbine curtailment and feathering in reducing bat mortality.

4.5.5. Accordingly, I do not concur that operational mitigation is absent from the application documentation. Rather, the Department's concern appears to relate to the degree of detail provided regarding implementation and operational triggers. While additional operational detail may have been useful, I am satisfied that operational mitigation has been proposed, assessed and incorporated into the applicant's evaluation of likely effects on bats.

4.5.6. Having reviewed the assessment material submitted, I am satisfied that likely operational impacts on bats have been appropriately assessed and that the proposed mitigation measures are generally consistent with current practice for wind energy developments in bat-sensitive landscapes.

4.6. Conclusion

4.6.1. I am satisfied that the applicant undertook an extensive and proportionate bat survey programme and that sufficient information has been provided to assess likely impacts on bats, including LHB.

4.6.2. The applicant has appropriately considered habitat connectivity, commuting routes, forestry removal and operational effects and has proposed mitigation measures including habitat management, turbine feathering, curtailment and post-construction monitoring.

4.6.3. While the Department raised concerns regarding operational mitigation and LHB, I am satisfied that these issues have been considered within the assessment and that sufficient information has been provided to evaluate likely impacts. I broadly concur with the applicant's conclusions in relation to bats.

5.0 Conclusions and Recommendation

5.1. Freshwater Pearl Mussel

5.1.1. Freshwater Pearl Mussel (FWPM) is the principal ecological receptor relevant to consideration of this application. The proposed development is hydrologically connected to the Cloon catchment, which supports FWPM associated with the Lower River Shannon SAC. FWPM is highly sensitive to changes in water quality, particularly elevated sediment and nutrient inputs, and the conservation objectives for the Cloon population remain focused on restoration of habitat quality and recruitment.

5.1.2. I am satisfied that the applicant has undertaken extensive ecological, aquatic and ecohydrological investigations and that adequate information has been provided to identify the principal receptors, pathways and potential impacts associated with the proposed development. I do not consider the principal issue in this case to be one of baseline data inadequacy.

5.1.3. There is no dispute that hydrological pathways exist between the proposed development and downstream FWPM habitat. Similarly, there is no dispute regarding the sensitivity of FWPM to sediment and nutrient enrichment or that, in the absence of mitigation, the proposed development would have the potential to adversely affect downstream aquatic habitat.

5.1.4. The central issue for Appropriate Assessment is therefore whether the mitigation measures relied upon within the Natura Impact Statement have been demonstrated to be effective to the degree necessary to exclude adverse effects on the conservation objectives and integrity of the Lower River Shannon SAC beyond reasonable scientific doubt.

5.1.5. The Inspectorate Environmental Scientist's Technical Note concluded that uncertainty remains regarding the effectiveness of the proposed mitigation measures in relation to fine sediment control, peat-derived suspended solids, nutrient retention and contingency treatment measures. These issues are directly relevant to the ecological pathways by which impacts on FWPM could arise.

5.1.6. Having regard to:

- the sensitivity of FWPM to sediment and nutrient inputs;

- the conservation objectives applicable to the Cloon catchment;
- the findings of the Inspectorate Environmental Scientist's Technical Note;
- the concerns raised by the NPWS; and
- the residual uncertainty regarding the effectiveness of the proposed mitigation measures,

5.1.7. I am not satisfied that adverse effects on the integrity of the Lower River Shannon SAC can be excluded beyond reasonable scientific doubt.

5.1.8. Accordingly, I do not concur with the conclusion of the Natura Impact Statement in respect of Freshwater Pearl Mussel.

5.2. Bats

5.2.1. The applicant undertook an extensive programme of bat surveys including targeted assessment of Lesser Horseshoe Bat. Having reviewed the information submitted, I am satisfied that sufficient information has been provided to characterise bat activity within the receiving environment and to assess likely impacts arising from the proposed development.

5.2.2. The applicant has considered habitat connectivity, commuting routes, foraging habitat and operational effects and has proposed appropriate mitigation measures. While impacts on bats require consideration, I do not consider bats to represent a determining ecological issue in this application.

5.2.3. I am satisfied that the assessment of bat impacts is adequate and I broadly concur with the conclusions reached by the applicant in relation to bats.

5.3. Recommendation

5.3.1. I conclude that:

- adequate ecological information has been submitted to inform Environmental Impact Assessment and Appropriate Assessment;
- Freshwater Pearl Mussel is the principal ecological receptor relevant to the determination of the application;

- the principal ecological issue is not baseline data adequacy but the effectiveness and certainty of the mitigation measures relied upon to protect downstream FWPM habitat;
- bats do not represent a determining ecological issue; and
- having regard to the findings of the Inspectorate Environmental Scientist's Technical Note and the ecological significance of the identified uncertainties, I am not satisfied that adverse effects on the integrity of the Lower River Shannon SAC can be excluded beyond reasonable scientific doubt.

5.3.2. Therefore, based on the information available, I conclude that reasonable scientific doubt remains as to the potential effects arising from the proposed development, that adverse effects on the Cloon River Freshwater Pearl Mussel Population cannot be excluded and therefore the potential for adverse effects on the site integrity of the Lower River Shannon SAC exists.

5.4. Declaration

I confirm that this report represents my professional ecological assessment, judgement and opinion on the matter assigned to me and that no person has influenced or sought to influence me, directly or indirectly, following my professional assessment and recommendation set out in my report in an improper or inappropriate way



Donncha Madden

Senior Ecologist

14 August 2026